

September 20, 2022 Project No. 22149-01

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Subject: Consolidated Geotechnical Report to Support the Environmental Impact Report (EIR)

for Rich-Haven Specific Plan, City of Ontario, California

In accordance with your request, LGC Geotechnical, Inc. has prepared a geotechnical report to support the Environmental Impact Report (EIR) for the Rich-Haven Specific Plan in the City of Ontario, California. This report summarizes the results of our background review, previous subsurface explorations, and geotechnical analyses of the data collected, and presents our findings, conclusions, and preliminary recommendations for the proposed site.

If you should have any questions regarding this report, please do not hesitate to contact our office. We appreciate this opportunity to be of service.

Respectfully,

LGC Geotechnical. Inc.

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Distribution: (1) Addressee (electronic copy)

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## 1.0 INTRODUCTION

### 1.1 Purpose and Scope of Services

This compilation report presents the results of our previous geotechnical evaluations within the Rich-Haven Specific Plan area (see Site Location Map, Figure 1). The purpose of our work was to review previous reports and subsurface data in order to prepare a geotechnical report providing conclusions and preliminary recommendations to support the EIR. The geotechnical data from our previous subsurface geotechnical explorations can be found in Appendix B through Appendix I. Our scope of services included:

- Review of pertinent readily available geotechnical information and geologic maps (Appendix A).
- Review previous subsurface investigations including excavation, sampling, and logging of 64 small-diameter hollow stem borings (Appendix B through Appendix I).
- Review the previously pushed 41 Cone Penetration Test (CPT) soundings (Appendix B through Appendix I).
- Review previously performed infiltration testing within 11 of the hollow stem borings (Appendix B through Appendix I).
- Review the previous excavation of 86 geotechnical trenches (Appendix B through Appendix I).
- Review the previous excavation of 151 shallow trenches to assess the organic content of near surface "soils" (Appendix B through Appendix I).
- Review previous laboratory testing of representative samples obtained during our previous subsurface investigations (Appendix B through Appendix I).
- Geotechnical analysis and evaluation of the data obtained during these previous evaluations of the site.
- Preparation of this report presenting our findings, conclusions and preliminary recommendations with respect to the proposed site development.

Note that some of the data (Borings, CPT's, Trenches, Lab Data, etc.) from Appendix F is not a part of the subject Specific Plan.

#### 1.2 Existing Site Conditions and Proposed Improvements

The approximately 575-acre irregularly shaped site is bound to the west by Haven Avenue, to the north by East Riverside Drive, a school, and Southern California Edison (SCE) Substation, to the east by a school, an existing residential community, SCE substation, and Hamner Avenue and to the south by existing farms and a new residential development (Figure 1). Review of historic aerial photographs suggests the following:

As far back as 1938 the site was used for primarily agricultural farming and some livestock farming. Between the years 1959 and 1985 a larger percentage of the land had started to be used for livestock farming. By 2016, Ontario Ranch Road had been constructed and by 2018, some of the new residential developments had begun.

Based on the preliminary conceptual site plans, it is our understanding that site development will consist of construction of various residential, commercial, and industrial developments. Based on our experience, the proposed residential developments will be at-grade with relatively light building loads (column and wall loads assumed to be a maximum of approximately 30 kips and 3 kips per lineal foot, respectively). The proposed industrial buildings are anticipated to be an at-grade concrete tilt-up structure with estimated maximum column and wall loads of approximately

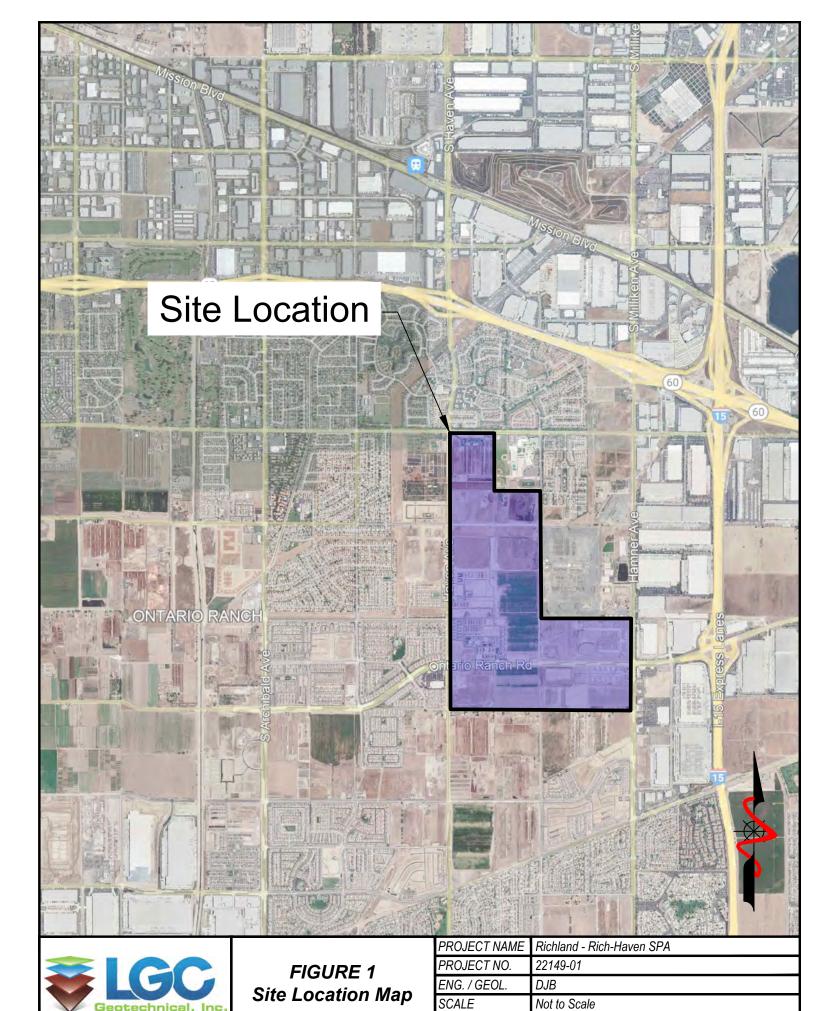
150 kips and 10 kips per linear foot, respectively.

The geotechnical engineer of record should be provided with updated project plans when they become available, in order to either confirm or modify the recommendations provided herein. Additional field work and/or laboratory testing will be necessary for final engineering.

#### 1.3 Previous Site Evaluations

LGC Geotechnical has previously performed eight separate geotechnical evaluations within the subject Specific Plan. These evaluations have been performed from 2016 through 2021. A separate geotechnical evaluation report has been prepared for each of eight properties within the Specific Plan (LGC, 2017a, 2017b, 2017c, 2018, 2019, 2020, 2021a, 2021b, and 2021c).

Within each appendix, the approximate locations of the previous subsurface work (borings, CPTs, test pits, etc.) are presented on our geotechnical map. The previous exploration logs, laboratory testing, etc. have been included in Appendix B through Appendix I.



September 2022

DATE

#### 2.0 GEOTECHNICAL CONDITIONS

#### 2.1 Regional Geology

The subject site is located south of the San Gabriel Mountains within the broad alluvial plain of the Santa Ana River Basin within the Peninsular Ranges Geomorphic Province. Specifically, the Specific Plan is located within the northern portion of the Perris Block, a geologic zone consisting of granitics overlain by sedimentary deposits that are bounded by active faults including the northwest-trending Whittier-Elsinore Fault Zone at the southwest and the northwest-trending San Jacinto Fault Zone at the northeast (USGS, 2002). The roughly rectangular Perris Block is transected by the southwest-trending Santa Ana River that passes several miles south of the subject site.

Regional geologic mapping and local topographic expressions do not indicate the presence of large-scale landslides within or adjacent to the Specific Plan.

## 2.2 <u>Site Geology and Generalized Subsurface Conditions</u>

Based on regional mapping (USGS, 2003), the subject site is underlain by Holocene- to Pleistocene-age eolian (wind-blown) sedimentary deposits. The materials below the eolian deposits are young alluvial fan deposits. As indicated in our field explorations, soils generally consisted of medium dense to dense sands with varying amounts of silt interbedded with thinner layers of stiff to very stiff fine-grained soils (i.e., silts and clays) to the maximum explored depth of approximately 50 feet below existing grade. Descriptions of the subsurface conditions are presented on the exploratory logs located in Appendix B through Appendix I.

Due to previous/current land use as farming, localized areas are underlain by near surface fill materials, topsoil, manure, etc. The lateral limits and depths (typically less than 5 feet) of these materials will be further evaluated during final engineering.

#### 2.3 Groundwater

Groundwater was not encountered to the maximum explored depth of approximately 50 feet below existing grade. Groundwater levels recorded in the area by California Department of Water Resources are at depths greater than 120 feet below the ground surface (CDWR, 2018). Note that localized perched groundwater was found at a depth of approximately 40 feet below existing grade in the southeastern portion of the site.

In general, groundwater levels fluctuate with the seasons and local zones of perched groundwater may be present within the near-surface deposits due to local seepage or during rainy seasons. Groundwater conditions below the site may be variable, depending on numerous factors including seasonal rainfall, local irrigation and groundwater pumping, among others.

#### 2.4 Field Infiltration Testing

Estimation of infiltration rates was performed in general accordance with guidelines set forth by the County of San Bernardino (2013). In general, a 3-inch diameter perforated PVC pipe was placed in each borehole to be tested and the annulus was backfilled with gravel, including placement of about 2 inches of gravel at the bottom of the borehole. The observed infiltration rates are considered representative of the site soils in the area of the proposed infiltration basins/systems. These observed infiltration rates do not include any factor of safety. Observed infiltration rates have been normalized to correct the 3-Dimensional flow that occurs within the field test to 1-Dimensional flow out of the bottom of the boring. The approximate infiltration test locations and the infiltration test data are located in Appendix B through Appendix I.

Eleven infiltration tests were run by LGC Geotechnical within the limits of the site. Infiltration tests were ran at depth of approximately 15 to 20 feet below existing grade. Infiltration rates ranged from approximately 0.6 inch/hr. to 7.0 inch/hr. for an average of approximately 2.6 inch/hr. These rates do not include a factor of safety.

It should be emphasized that infiltration test results are only representative of the location and depth where they are performed. Varying subsurface conditions may exist outside of the test locations which could alter the calculated infiltration rates indicated above. Infiltration tests are performed using relatively clean water free of particulates, silt, etc.

#### 2.5 Faulting and Seismic Hazards

The subject Specific Plan is not located within a State of California Earthquake Fault Zone (i.e., Alquist-Priolo Earthquake Fault Act Zone) and no active faults are known to cross the site (CGS, 2007). A fault is considered "active" if evidence of surface rupture in Holocene time (the last approximately 11,000 years) is present. The possibility of damage due to ground rupture is considered low since no active faults are known to cross the site.

Secondary effects of seismic shaking resulting from large earthquakes on the major faults in the Southern California region, which may affect the site, include ground lurching and shallow ground rupture, soil liquefaction, and dynamic settlement. These secondary effects of seismic shaking are a possibility throughout the Southern California region and are dependent on the distance between the site and causative fault and the onsite geology. The closest major active faults that could produce these secondary effects include the Chino-Central, San Jose, Elsinore, Sierra Madre and San Andreas Faults, among others. A discussion of these secondary effects is provided in the following sections.

#### 2.5.1 Liquefaction and Dynamic Settlement

Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Liquefaction occurs when three general conditions coexist: 1) shallow groundwater; 2) low density noncohesive (granular) soils; and 3) high-intensity ground motion. Studies indicate that loose, saturated, near-surface, cohesionless soils exhibit the highest liquefaction

potential, while dry, dense, cohesionless soils, and cohesive soils exhibit low to negligible liquefaction potential. In general, cohesive soils are not considered susceptible to liquefaction. Effects of liquefaction on level ground include settlement, sand boils, and bearing capacity failures below structures. Furthermore, dynamic settlement of dry sands can occur above the groundwater table as the sand particles tend to settle and densify as a result of a seismic event.

Based on our review of the City of Ontario General Plan (ECI, 2006), the subject site is located in an area of "low to moderate" liquefaction susceptibility based only on soil type (sediments being less than 10,000 years old and unconsolidated). Based on our evaluation and analysis, site soils are generally not susceptible to liquefaction due to a lack of groundwater in the upper 50 feet and liquefaction potential is considered low to very low.

# 2.5.2 <u>Lateral Spreading</u>

Lateral spreading is a type of liquefaction induced ground failure associated with the lateral displacement of surficial blocks of sediment resulting from liquefaction in a subsurface layer. Once liquefaction transforms the subsurface layer into a fluid mass, gravity plus the earthquake inertial forces may cause the mass to move downslope towards a free face (such as a river channel or an embankment). Lateral spreading may cause large horizontal displacements and such movement typically damages pipelines, utilities, bridges, and structures.

Due to the depth to groundwater, low potential for liquefaction and lack of nearby "free face" conditions, the potential for lateral spreading is considered very low.

#### 2.6 Seismic Design Criteria

The site seismic characteristics were evaluated per the guidelines set forth in Chapter 16, Section 1613 of the 2019 California Building Code (CBC) and applicable portions of ASCE 7-16 which has been adopted by the CBC. Please note that the following seismic parameters are only applicable for code-based acceleration response spectra and are not applicable for where site-specific ground motion procedures are required by ASCE 7-16. The following coordinates are from the northwest portion of the Specific Plan as this yields the most conservative seismic analysis. Representative site coordinates of latitude 34.018410 degrees north and longitude -117.575156 degrees west were utilized in our analyses. For each individual developments, the seismic analysis can be updated based on the proposed improvements, their location, and current building code. The maximum considered earthquake (MCE) spectral response accelerations ( $S_{MS}$ and  $S_{M1}$ ) and adjusted design spectral response acceleration parameters ( $S_{DS}$  and  $S_{D1}$ ) for Site Class D are provided in Table 1 on the following page. Since site soils are Site Class D, additional adjustments are required to code acceleration response spectrums as outlined below and provided in ASCE 7-16. The structural designer should contact the geotechnical consultant if structural conditions (e.g., number of stories, seismically isolated structures, etc.) require sitespecific ground motions.

<u>TABLE 1</u> <u>Seismic Design Parameters</u>

Selected Parameters from 2019 CBC, Section 1613 - Earthquake Loads	Seismic Design Values	Notes/Exceptions		
Distance to applicable faults classifies the "Near-Fault" site.	site as a	Section 11.4.1 of ASCE 7		
Site Class	D*	Chapter 20 of ASCE 7		
Ss (Risk-Targeted Spectral Acceleration for Short Periods)	1.612g	From SEAOC, 2022		
S <sub>1</sub> (Risk-Targeted Spectral Accelerations for 1-Second Periods)	0.585g	From SEAOC, 2022		
F <sub>a</sub> (per Table 1613.2.3(1))	1.000	For Simplified Design Procedure of Section 12.14 of ASCE 7, Fa shall be taken as 1.4 (Section 12.14.8.1)		
F <sub>v</sub> (per Table 1613.2.3(2))	1.715	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7		
$S_{MS}$ for Site Class D [Note: $S_{MS} = F_aS_s$ ]	1.612g	-		
$S_{M1}$ for Site Class D [Note: $S_{M1} = F_v S_1$ ]	1.003g	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7		
$S_{DS}$ for Site Class D [Note: $S_{DS} = (^2/_3)S_{MS}$ ]	1.075g	-		
$S_{D1}$ for Site Class D [Note: $S_{D1} = (^2/_3)S_{M1}$ ]	0.669g	Value is only applicable per requirements/exceptions per Section 11.4.8 of ASCE 7		
C <sub>RS</sub> (Mapped Risk Coefficient at 0.2 sec)	0.940	ASCE 7 Chapter 22		
C <sub>R1</sub> (Mapped Risk Coefficient at 1 sec)	0.917	ASCE 7 Chapter 22		

<sup>\*</sup>Since site soils are Site Class D and  $S_1$  is greater than or equal to 0.2, the seismic response coefficient Cs is determined by Eq. 12.8-2 for values of  $T \le 1.5T_s$  and taken equal to 1.5 times the value calculated in accordance with either Eq. 12.8-3 for  $T_L \ge T > T_s$ , or Eq. 12.8-4 for  $T > T_L$ . Refer to ASCE 7-16.

A deaggregation of the PGA based on a 2,475-year average return period (MCE) indicates that an earthquake magnitude of 6.75 at a distance of approximately 13.5 km from the site would contribute the most to this ground motion (USGS, 2014).

Section 1803.5.12 of the 2019 CBC (per Section 11.8.3 of ASCE 7) states that the maximum considered earthquake geometric mean (MCE<sub>G</sub>) Peak Ground Acceleration (PGA) should be used for liquefaction potential. The PGA<sub>M</sub> for the site is equal to 0.739g (SEAOC, 2022).

# 2.7 <u>Near Surface Organic Rich Soils</u>

Based on previous/current land use near surface organic materials (topsoil, manure, etc.) are present throughout. These lateral extent and depth of these materials will be further evaluated during final engineering, including recommendations for offsite export.

#### 2.8 Corrosivity to Concrete and Metal

Based on laboratory sulfate test results, the near surface soils are designated to a class "S0" per ACI 318, Table 19.3.1.1 with respect to sulfates. Concrete in direct contact with the onsite soils can be designed according to ACI 318, Table 19.3.2.1 using the "S0" sulfate classification.

Laboratory testing will need to be performed at the completion of grading by the project corrosion engineer to further evaluate the as-graded soil corrosivity characteristics. Accordingly, revision of the corrosion potential may be needed, should future test results differ substantially from the conditions reported herein. The client and/or other members of the development team should consider this during the design and planning phase of the project and formulate an appropriate course of action.

#### 2.9 Expansion Potential

Based on the results of previous laboratory testing by others and our recent laboratory testing, site soils are anticipated to have a "Very Low" expansion potential (EI of 20 or less per ASTM D4829). Final expansion potential of site soils should be determined at the completion of grading. Results of expansion testing at finish grades will be utilized to confirm final foundation design recommendations.

#### 3.0 CONCLUSIONS

Based on the results of our previous subsurface geotechnical evaluations, it is our opinion that the proposed Specific Plan is feasible from a geotechnical standpoint, provided that the recommendations contained in the following sections are incorporated during site grading and development. A summary of our geotechnical conclusions are as follows:

- The near-surface loose and compressible soils are not suitable for the planned improvements in their
  present condition and will require remedial grading in order to provide adequate support for the
  proposed improvements.
- Groundwater was not encountered in our field evaluation. Records indicate groundwater levels recorded in the area are at depths greater than 120 feet below the ground surface.
- The subject study area is not located within a mapped State of California Earthquake Fault Zone (i.e., Alquist-Priolo Earthquake Fault Act Zone), and based upon our review of published geologic mapping, no known active or potentially active faults are known to exist within or in the immediate vicinity of the site. Therefore, the potential for ground rupture as a result of faulting is considered very low.
- The main seismic hazard that may affect the site is ground shaking from one of the active regional faults. The subject site will likely experience strong seismic ground shaking during its design life.
- Site soils are generally not susceptible to liquefaction due to a lack of groundwater in the upper 50 feet.
- Based on the results of preliminary laboratory testing, site soils are anticipated to have "Very Low" expansion potential. This will be confirmed during final engineering.
- Based on laboratory sulfate test results, the near surface soils are designated to a class "S0" per ACI 318, Table 19.3.1.1 with respect to sulfates.). Concrete in direct contact with the onsite soils can be designed according to ACI 318, Table 19.3.2.1 using the "S0" sulfate classification.
- Field testing resulted in observed infiltration rates ranging from 0.6 to 7.0 inches per hour for an average of approximately 2.6 inches per hour. The observed infiltration rates do not include a factor of safety.

#### 4.0 RECOMMENDATIONS

The following recommendations are to be considered preliminary and should be confirmed upon completion of final engineering studies and ultimately after grading/earthwork operations. In addition, they should be considered minimal from a geotechnical viewpoint, as there may be more restrictive requirements from the architect, structural engineer, building codes, governing agencies, or the owner.

It should be noted that the following geotechnical recommendations are intended to provide sufficient information to develop the site in general accordance with the 2019 CBC requirements. With regard to the possible occurrence of potentially catastrophic geotechnical hazards such as fault rupture, earthquake-induced landslides, liquefaction, etc. the following geotechnical recommendations should provide adequate protection for the proposed development to the extent required to reduce seismic risk to an "acceptable level." The "acceptable level" of risk is defined by the California Code of Regulations as "that level that provides reasonable protection of the public safety, though it does not necessarily ensure continued structural integrity and functionality of the project" [Section 3721(a)]. Therefore, repair and remedial work of the proposed improvement may be required after a significant seismic event. With regards to the potential for less significant geologic hazards to the proposed development, the recommendations contained herein are intended as a reasonable protection against the potential damaging effects of geotechnical phenomena such as expansive soils, fill settlement, groundwater seepage, etc. It should be understood, however, that our recommendations are intended to maintain the structural integrity of the proposed development and structures given the site geotechnical conditions but cannot preclude the potential for some cosmetic distress or nuisance issues to develop as a result of the site geotechnical conditions.

The geotechnical recommendations contained herein must be confirmed to be suitable or modified based on the actual as-graded conditions.

#### 4.1 Site Earthwork

Rough grading shall include export of high organic content soils, remedial earthwork grading including mixing and blending followed by placement of engineered compacted fill to design grades. Geotechnical recommendations for precise grading and construction of the proposed new improvements will be provided, as necessary.

We recommend that earthwork onsite be performed in accordance with the following recommendations, future grading plan review report(s), the 2019 CBC/City of Ontario requirements, and the General Earthwork and Grading Specifications for Rough Grading included in Appendix J. In case of conflict, the following recommendations shall supersede those included in Appendix J. The following recommendations may be revised based on future subsurface work, geotechnical analysis, grading plan review reports, or based on the actual conditions encountered during site grading.

#### 4.1.1 Site Preparation

Prior to grading, areas to be developed should undergo the stripping and clearing of vegetation, high organic content soil removal/export and clearing of surface obstructions, pavements, foundation and slab elements from previous land use. Vegetation, debris, and excessive organic material should be removed and properly disposed of offsite. Recommendations for removal of organic rich soils are provided at final engineering. Holes resulting from removals of buried obstructions, which extend below proposed remedial and/or finish grades, should be replaced with suitable compacted fill material.

If cesspools or septic systems are encountered, they should be removed in their entirety. The resulting excavation should be backfilled with properly compacted fill soils. As an alternative, cesspools can be backfilled with lean sand-cement slurry. Any encountered wells should be properly abandoned in accordance with regulatory requirements.

#### 4.1.2 Remedial Grading Depths

In order to provide a relatively uniform bearing condition for the planned improvements, we recommend the near surface soils be temporarily removed and recompacted as fill. Based on our experience the depth of remedial grading averages approximately 5 feet below existing grade. Local conditions may be encountered during excavation that could require additional remedial grading beyond the above-noted minimum in order to obtain an acceptable subgrade. Material to be placed as fill should be brought to near-optimum moisture content (generally within optimum and 2 percent above optimum moisture content) and recompacted to at least 90 percent relative compaction (per ASTM D1557).

The actual depths and lateral extents of grading will be determined by the geotechnical consultant, based on subsurface conditions encountered during grading. Removal areas and areas to be over-excavated should be accurately staked in the field by the Project Surveyor.

#### 4.2 Preliminary Foundation Recommendations (Residential, Industrial, and Commercial)

The proposed structure(s) may be supported on a shallow foundation consisting of spread or continuous footings and conventional slabs, provided earthwork is performed in accordance with the recommendations presented in this report. Since the site soils are anticipated to be "Very Low" expansion potential (EI of 20 or less per ASTM D4829), special design considerations from a geotechnical perspective are not anticipated, however, this must be verified based on as-graded conditions. Footings should be supported on properly compacted fill.

#### 5.0 <u>LIMITA</u>TIONS

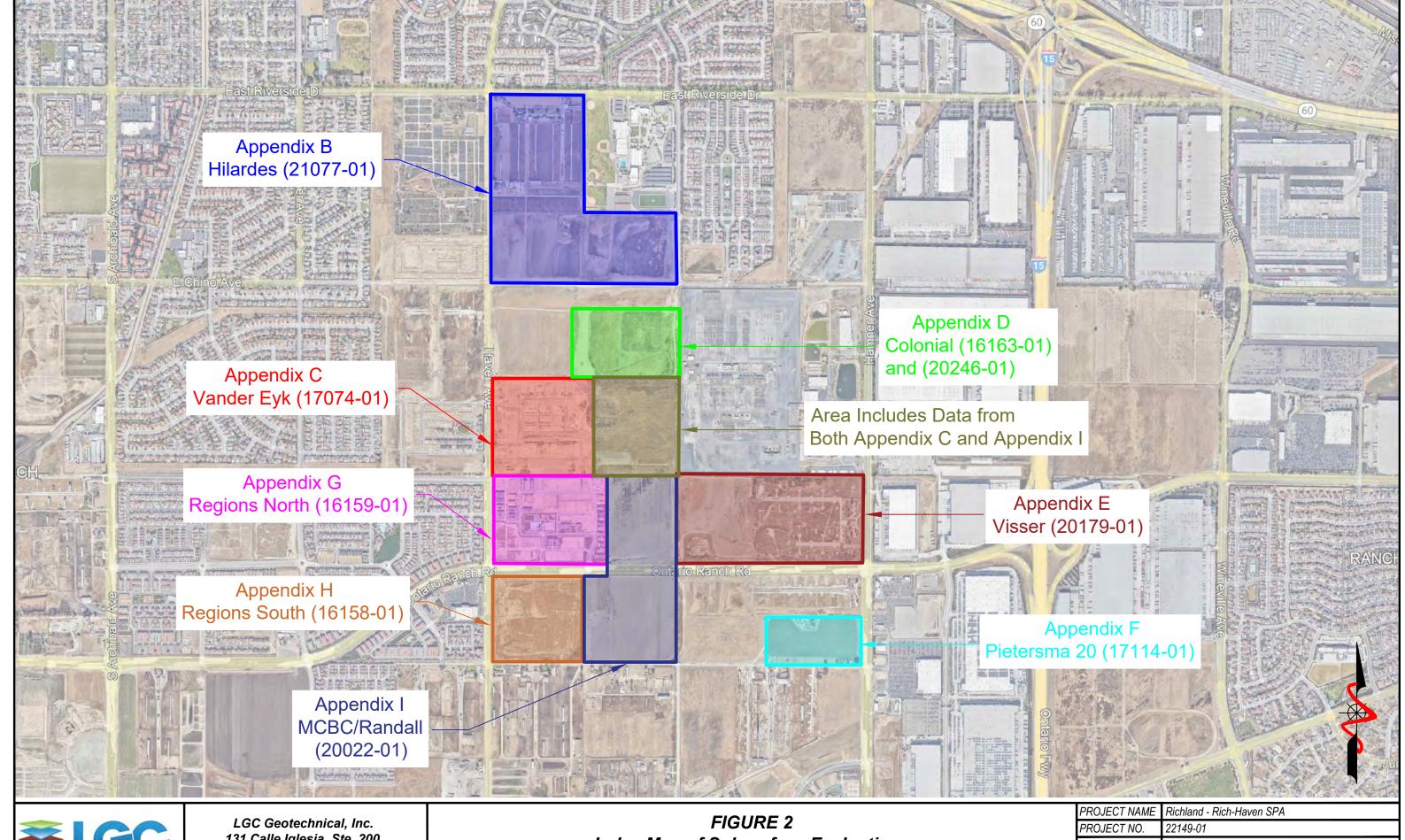
Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

This report is based on data obtained from limited observations of the site, which have been extrapolated to characterize the site. While the scope of services performed is considered suitable to adequately characterize the site geotechnical conditions relative to the proposed development, no practical evaluation can completely eliminate uncertainty regarding the anticipated geotechnical conditions in connection with a subject site. Variations may exist and conditions not observed or described in this report may be encountered during grading and construction.

This report is issued with the understanding that it is the responsibility of the owner, or of his/her representative, to ensure that the information and recommendations contained herein are brought to the attention of the other consultants (at a minimum the civil engineer, structural engineer, landscape architect) and incorporated into their plans. The contractor should properly implement the recommendations during construction and notify the owner if they consider any of the recommendations presented herein to be unsafe, or unsuitable.

The findings of this report are valid as of the present date. However, changes in the conditions of a site can and do occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. The findings, conclusions, and recommendations presented in this report can be relied upon only if LGC Geotechnical has the opportunity to observe the subsurface conditions during grading and construction of the project, in order to confirm that our preliminary findings are representative for the site. This report is intended exclusively for use by the client, any use of or reliance on this report by a third party shall be at such party's sole risk.

In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and modification.



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FIGURE 2
Index Map of Subsurface Evaluations
by LGC Geotechnical, Inc.

PROJECT NAME	Richland - Rich-Haven SPA
PROJECT NO.	22149-01
ENG. / GEOL.	DJB
SCALE	Not to Scale
DATE	September 2022

# Appendix A References

#### APPENDIX A

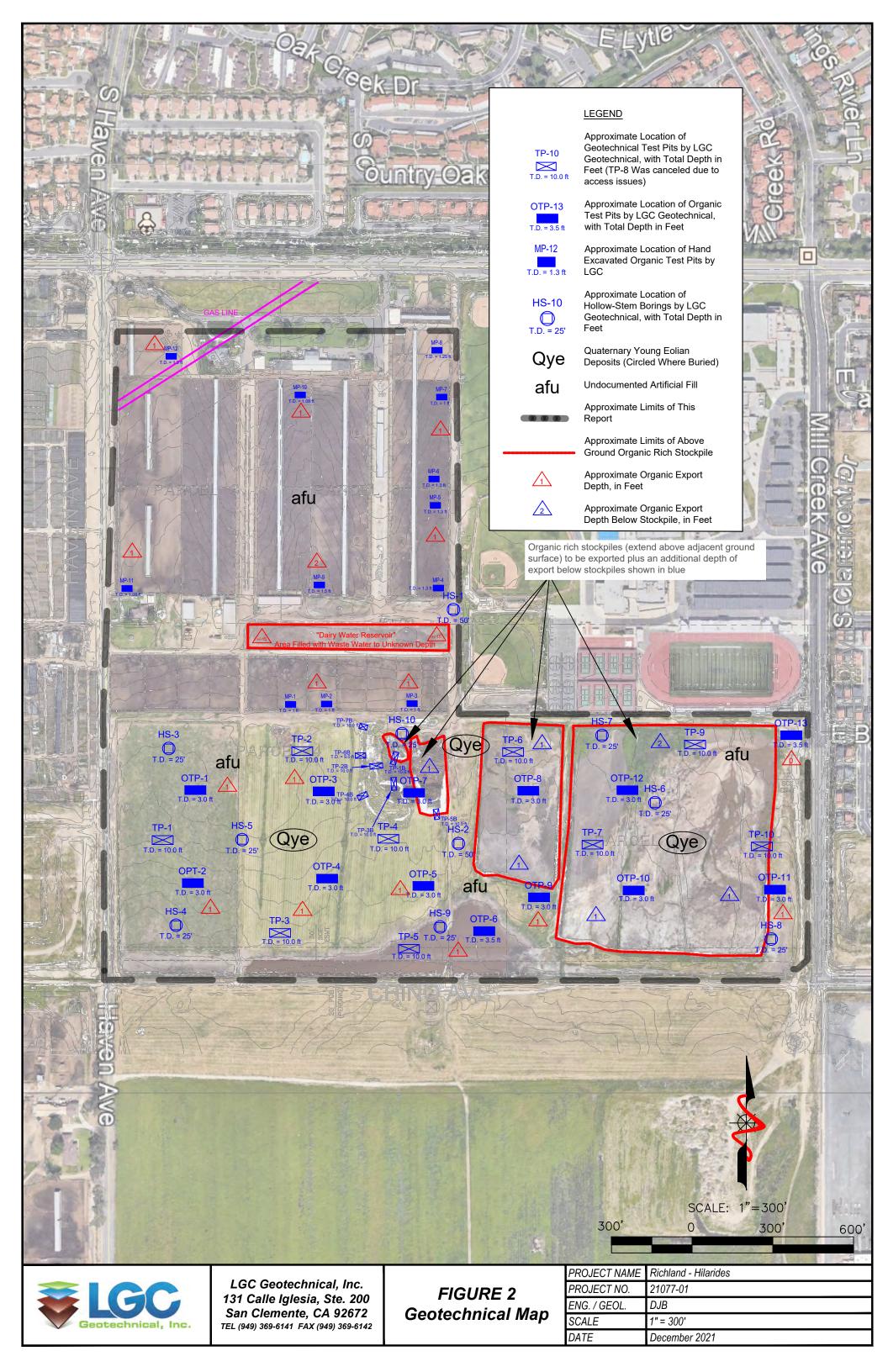
#### **References**

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# Appendix B Geotechnical Subsurface Evaluation Data – Hilardes (21077-01)



#### APPENDIX C

#### **Laboratory Testing Procedures and Test Results**

The laboratory testing program was formulated towards providing data relating to the relevant engineering properties of the soils with respect to residential construction. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

Expansion Index: The expansion potential of selected samples was evaluated by the Expansion Index Test, Standard ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the table below.

Sample Location	Expansion Index	Expansion Potential*	
HS-1 @ 1-5 feet	2	Very Low	
HS-6 @2.5-7.5 feet	25	Low	

<sup>\*</sup> ASTM D4829

<u>Grain Size Distribution/Fines Content</u>: Representative samples were dried, weighed and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140). Where applicable, the portion retained on the No. 200 sieve and dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D6913 (sieve).

Project No. 21077-01 C-1 December 2021

#### APPENDIX C (Cont'd)

#### **Laboratory Testing Procedures and Test Results**

Sample Location	-	
HS-1 @ 5 feet	Sandy Silt	77
HS-2 @ 5 feet	Silty Sand	32
HS-3 @ 5 feet	Silty Sand	31
HS-4 @ 5 feet	Silty Sand	31
HS-5 @ 5 feet	Silty Sand	57
HS-1 @ 1-5 feet	Silty Sand with Gravel	29
HS-2 @ 1-5 feet	Clay	88
HS-6 @ 2.5-7.5 feet	Silty Sand	19

<u>Consolidation</u>: Two consolidation test were performed per ASTM D2435. A sample (2.4 inches in diameter and 1 inch in height) was placed in a consolidometer and increasing loads were applied. The sample was allowed to consolidate under "double drainage" and total deformation for each loading step was recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height. The consolidation pressure curve is provided in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
*HS-1 @ 1-5 feet	Olive Silty Sand with Gravel	129.5	7.5
HS-2 @ 1-5 feet	Yellowish Brown Clay	114.0	13.5
HS-6 @ 2.5-7.5 feet	Olive Brown Silty Sand	114.0	14.0
OTP-10 @ 1-3 feet	Dark Brown Sand with Silt	109.0	14.0
TP-1 @ 5-8 feet	Grayish Brown Sand	101.5	9.0

<sup>\*</sup>Note: These max dry density results are based on a rock correction with approximately 23% retained on the No. 4 sieve.

#### APPENDIX C (Cont'd)

#### **Laboratory Testing Procedures and Test Results**

<u>Chloride Content</u>: Chloride content was tested in accordance with Caltrans Test Method (CTM) 422. The results are presented below.

Sample Location	Chloride Content, ppm		
HS-1 @ 1-5 feet	100		

<u>Soluble Sulfates</u>: The soluble sulfate contents of selected samples were determined by standard geochemical methods (CTM 417). The soluble sulfate content is used to determine the appropriate cement type and maximum water-cement ratios. The test results are presented in the table below.

Sample	Sulfate Content	Sulfate Exposure	
Location	(ppm)	Class *	
HS-1 @ 1-5 feet	128	S0	

<sup>\*</sup>Based on ACI 318R-14, Table 19.3.1.1

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	рН	Minimum Resistivity (ohms-cm)		
HS-1 @ 1-5 feet	7.85	1,280		

<u>Organic Matter Content of Soils</u>: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in the Table 6.

TP	-1	TP	-2	TF	P-3	TP	9-4
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0-1	6.0	0-1	11.9	0-1	6.3	0-1	10.3
1-2	0.8	1-2	0.7	1-2	0.7	1-2	1.3
2-3	0.5	2-3	0.3	2-3	3.7	2-3	0.4
TF	P-5	TP-6		TF	P-7	TP	9-9
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0-1	10.5	0-1	54.7	0-1	64.4	0-1	41.4
2-3	0.1	1-2	21.8	1-2	8.4	1-2	5.9
3-4	0.3	2-3	5.5	2-3	2.4	2-3	3.9
TP	-10	ОТ	P-1	ОТ	P-2	ОТ	P-3
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0-1	42.7	0-1	7.6	0-1	7.2	0-1	11.0
1-2	6.3	1-2	1.6	1-2	3.1	1-2	3.9
2-3	3.4	2-3	0.6	2-3	0.6	2-3	1.7
	P-4		P-5		P-6		P-7
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0-1	7.5	0-1	8.2	0-1	12.9	0-1	1.0
1-2	1.5	1-2	1.7	1-2	2.0	1-2	1.1
2-3	0.4	2-3	0.6	2-3	0.7	2-3	0.8
	P-8		P-9		P-10	OTP-11	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0-1	51.5	0-1	8.9	0-1	57.5	0-1	15.9
1-2	5.7	1-2	0.9	1-2	8.0	1-2	0.7
2-3	1.9	2-3	0.8	2-3	0.4	2-3	0.3
	P-12		P-13		-1B	TP-	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)*	% Organics	Depth (ft)*	% Organics
0-1	53.1	0-1	1.2	8-7	4.0	6-5	3.7
1-2	4.0	1-2	2.1	5-4	30.2		
2-3	1.4	2-3	0.4	2.0	2.4		
	-3B		- <b>7B</b>		P-1		P-2
Depth (ft)*	% Organics	Depth (ft)*	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
6-5	1.1	6-5	0.5	0-0.5	5.6	0-0.75	21.0
3-2	0.6						
B A I	P-3	المعصط					-
		<u>Legend</u>	<b>.</b> ⊏0/	Pacammandad	for Offsita Ramaya	d	
Depth (ft)	% Organics		> 5%  Recommended for Offsite Removal  2 to 5%  Recommended for Mixing/Blending with "Clean" So				
0-0.5	42.5		2 to 5% < 2%	"Clean" Soils	ioi iviixiiig/Biendin	ig with Clean Sol	5
	Note: * Indicates Depth from top of stockpile, where 0' is existing ground surface						
		<b>T</b> . I.				isting ground surface Richland - Hilardes	
<b>ELGC</b>		Table 6		Project Name			
		Summary of Measured Organic Content vs Depth of		Project Number  ENG./GEOL.		21077-01 DJB	
Geotechn	ical, Inc.	_	-				
		San	nple	Da	ate	Dec	:-21

MP-4		M	P-5	MI	P-6	M	P-7
Depth (ft)	% Organics						
0-0.25	40.6	0-0.5	2.2	0.5	1.2	0-0.5	2.4
0.3-1	1.1						
M	P-8	MP-9		MP-10		MP-11	
Depth (ft)	% Organics						
0-0.5	1.0	0-0.5	0.2	0-0.5	57.6	0-0.25	60.0
		1.1-1.5	13.7				
B.4.0	112						

MP	-12
Depth (ft)	% Organics
0-0.5	46.9

Legend

> 5% 2 to 5% < 2% Recommended for Offsite Removal Recommended for Mixing/Blending with "Clean" Soils "Clean" Soils



Table 6
Summary of Measured
Organic Content vs Depth of
Sample

Project Name	Richland - Hilardes
Project Number	21077-01
ENG./GEOL.	DJB
Date	Dec-21

# **ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435**

Project Name: Ontario Tested By: G. Bathala Date:

08/23/21 09/08/21 Project No.: 21077-01 Checked By: J. Ward Date:

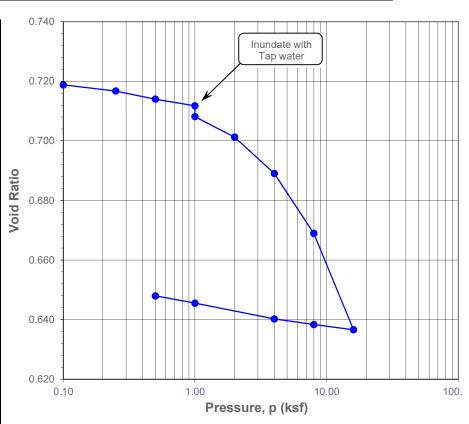
Boring No.: HS-1 Depth (ft.): 10.0

Soil Identification: Olive brown silt (ML)

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	173.58
Weight of Ring (g):	45.42
Height after consol. (in.):	0.9586
Before Test	
Wt. of Wet Sample+Cont. (g):	186.95
Wt. of Dry Sample+Cont. (g):	176.92
Weight of Container (g):	61.70
Initial Moisture Content (%)	8.7
Initial Dry Density (pcf)	98.1
Initial Saturation (%):	33
Initial Vertical Reading (in.)	0.1026
After Test	
Wt. of Wet Sample+Cont. (g):	241.79
Wt. of Dry Sample+Cont. (g):	216.56
Weight of Container (g):	52.57
Final Moisture Content (%)	21.28
Final Dry Density (pcf):	102.9
Final Saturation (%):	90
Final Vertical Reading (in.)	0.1466
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

R-4

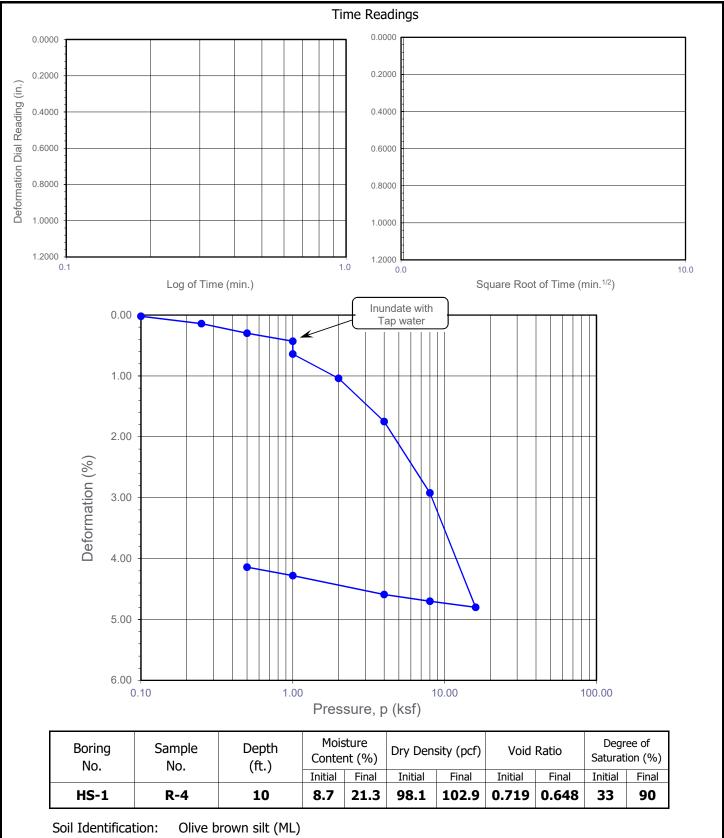
Sample No.:



Sample Type:

Ring

Pressure	Final	Void		Ti	Time Readings						
(p) (ksf)	Reading (in.)	Thickness (in.)	Compliance (%)	% of Sample Thickness	Ratio	Deforma- tion (%)	Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
0.10	0.1028	0.9998	0.00	0.02	0.719	0.02					
0.25	0.1045	0.9981	0.05	0.19	0.717	0.14					
0.50	0.1067	0.9959	0.11	0.41	0.714	0.30					
1.00	0.1087	0.9939	0.18	0.61	0.712	0.43					
1.00	0.1108	0.9918	0.18	0.82	0.708	0.64					
2.00	0.1158	0.9868	0.28	1.32	0.701	1.04					
4.00	0.1239	0.9787	0.38	2.13	0.689	1.75					
8.00	0.1369	0.9657	0.51	3.43	0.669	2.92					
16.00	0.1571	0.9455	0.65	5.45	0.637	4.80					
8.00	0.1553	0.9473	0.57	5.27	0.638	4.70					
4.00	0.1533	0.9493	0.48	5.07	0.640	4.59					
1.00	0.1487	0.9539	0.33	4.61	0.646	4.28					
0.50	0.1466	0.9560	0.26	4.40	0.648	4.14					



**ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435** 

Project No.: 21077-01

Ontario

09-21

# ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

**ASTM D 2435** 

Project Name: Ontario

21077-01

Boring No.: HS-2

Project No.:

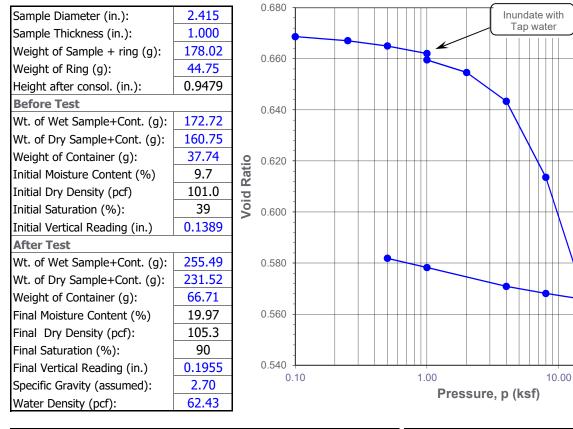
Sample No.: R-4

Soil Identification: Olive brown silty clay (CL-ML)

Tested By: G. Bathala Date: 08/23/21
Checked By: J. Ward Date: 09/08/21

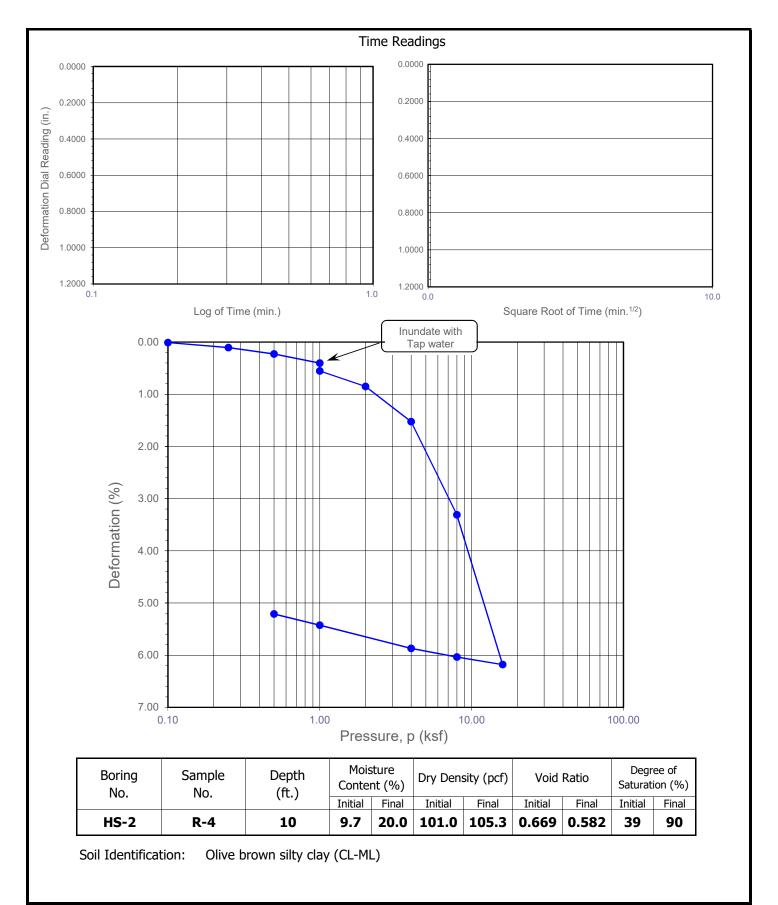
Depth (ft.): 10.0

Sample Type: Ring



Pressure	Final Reading	Apparent Thickness	Load Compliance	Deformation	mple VOIO Deforma-				Tir	ne Reading	S	
(p) (ksf)	(in.)	(in.)	(%)	% of Sample Thickness	Ratio	tion (%)	Dat	te	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
0.10	0.1390	0.9999	0.00	0.01	0.669	0.01						
0.25	0.1405	0.9985	0.05	0.15	0.667	0.10						
0.50	0.1423	0.9966	0.11	0.34	0.665	0.23						
1.00	0.1449	0.9941	0.19	0.60	0.662	0.41						
1.00	0.1464	0.9926	0.19	0.74	0.660	0.55						
2.00	0.1508	0.9881	0.34	1.19	0.655	0.85						
4.00	0.1591	0.9799	0.49	2.02	0.643	1.53						
8.00	0.1784	0.9605	0.64	3.95	0.614	3.31						
16.00	0.2086	0.9303	0.79	6.97	0.566	6.18						
8.00	0.2066	0.9324	0.73	6.77	0.568	6.04						
4.00	0.2042	0.9347	0.66	6.53	0.571	5.87						
1.00	0.1983	0.9407	0.51	5.94	0.578	5.43						
0.50	0.1955	0.9434	0.45	5.66	0.582	5.21						

100



ONE-DIMENSIONAL CONSOLIDATION
PROPERTIES of SOILS
ASTM D 2435

Project No.: 21077-01

Ontario

09-21

Date: 7/9/2021  Project Name: Richland - Hilardes  Project Number: 21077-01  Elevation of Top of Hole: ~776' MSL  Hole Location: See Geotechnical Map  Logged By MJG Sampled By MJG Sampled By MJG Checked By DJB  DESCRIPTION	ter: 8"
Project Number: 21077-01  Elevation of Top of Hole: ~776' MSL  Hole Location: See Geotechnical Map  Logged By MJG Sampled By MJG Sampled By MJG Checked By DJB	e 1 of 2
Elevation of Top of Hole: ~776' MSL Hole Location: See Geotechnical Map  Logged By MJG Sampled By MJG Sampled By MJG Checked By DJB	e 1 of 2
Hole Location: See Geotechnical Map  Logged By MJG Sampled By MJG Sampled By MJG Checked By DJB	
Logged By MJG Sampled By MJG Sampled By MJG Checked By DJB	
Sampled By MJG  Shecked By DJB	oe of Test
Sampled By MJG  Sampled By MJG  Checked By DJB  Checked By DJB  Checked By DJB	oe of Test
pth (ft) pth (ft) pth (ft) aphic Log www. Count y Density ( CS Symb CCS Symb COS Sym	oe of Test
aphic Louisture (CS Syr	oe of Te
mple	) e o
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	🗲
□ □ □ Ø Ø □ □ □ □ DESCRIPTION	<u> </u>
775 0 Undocumented Artificial Fill (afu):	MD
@1.5' to T.D Young Eolian Deposits (Qye):	EI CR
R-1 9 103.8 6.9 SM @2.5'- Silty SAND: brown, slightly moist, medium del	se -#200
5 R-2 8 94.5 8.9 ML @5'- Sandy SILT: dusky brown, slightly moist, very s	ff -#200
770 – F-2 R-2 8 9 94.5 8.9 ML @5'- Sandy SILT: dusky brown, slightly moist, very s	
B 2 B 3 CO 5 CO COM CO 7 SI City CAND due to brown we sick made time down	
R-3 8 99.5 9.2 SM @7.5'- Silty SAND: dusky brown, moist, medium den	e
765 R-4 R-4 98.1 8.7 ML @10'- SILT: olive brown, slightly moist, stiff	CN
15 SPT 1 7 3 22 MI S15' Sandy SII T: alive gray wet stiff	
To SPT-1 3 22.2 ML @15'- Sandy SILT: olive gray, wet, stiff	
R-5 82.6 39.4 ML/CL @20'- SILT/CLAY: olive brown, wet, very stiff	
755   R-5   5   82.6   39.4   ML/CL   @20'- SILT/CLAY: olive brown, wet, very stiff	
35 — SPT-2 6 9 4.4 SP @25'- SAND with Gravel: rusty brown, slightly moist, medium dense	
750 -   M 12   medium dense	
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION G GRAB SAMPLE SA SIEVE AN	DENSITY



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

 SAMPLE TYPES:
 1

 B
 BULK SAMPLE
 D

 C
 RING SAMPLE (CA Modified Sampler)
 S

 G
 GRAB SAMPLE
 S

 SPT
 STANDARD PENETRATION
 S

 TEST SAMPLE
 C

GROUNDWATER TABLE

				G	ieot	techi	nica	l Bor	ing Log Borehole HS-1	
Date:	7/9/2	2021							Drilling Company: Choice Drilling	
						Hilarde	S		Type of Rig: CME 75	
			<b>er:</b> 210						Drop: 30" Hole Diameter:	8"
									Drive Weight: 140 pounds	
Hole Location: See Geotechnical Map									Page 2 o	of 2
			١			:f)			Logged By MJG	
			Sample Number			Dry Density (pcf)		<u> </u>	Sampled By MJG	,
Elevation (ft)	_	Graphic Log	l n		ınt	ity	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
Uo.	( <del>I</del>	<u>                                      </u>	e e		Count	ens	<u>l</u> e	S		of T
vat	oth	hdi	ldu		×	Ď	stu	SS		96
	Depth (ft)	Gre	Sar		Blow (	)ry	Moi	)S	DESCRIPTION	Гур
	30		R-6			105.5	12.2	SM	@30'- Silty SAND: rusty olive brown, moist, dense	'
745-	30 _		K-0		12 18 21	105.5	12.2	Sivi	@30 - Silty SAND. Tusty olive brown, moist, defise	
	_			-						
	_			-						
	-			-						
	35 —		SPT-3	d	10 11		13.5	SM/ML	10 ,	
740-	_			Δ	15				moist/moist, dense/hard	
	_			-						
	_									
	40 —									
735-	40 —		R-7		15 19 30	110.1	2.5	SP	@40'- SAND: light brown, dry, dense	
733	_			_	30					
	_									
	_			_						
	45 —		SPT-4		5		23.9	ML	@45'- Sandy SILT: dusky brown, wet, very stiff	
730-	_		SF 1-4	X	5 9 13		23.9	IVIL	W40 - Sandy SIET. dusky blown, wet, very still	
	_				.0					
	_			-						
	_			-						
	50 —		R-8		10 11	110.8	17.2	SM/ML	@50'- Silty SAND/Sandy SILT: brown, wet/very moist,	
725	_				11 20				medium dense/very stiff	
	-			-					Total Depth = 50'	
	_			-					Groundwater Not Encountered	
	-			-					Backfilled with Cuttings on 7/9/2021	
700	55 —			-						
720-	_									
	_									
	_									
	60 —									
						THIS	SUMMARY	APPLIES ON	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
		1		6		OF TI SUBS	HIS BORING SURFACE C	G AND AT THE CONDITIONS I	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	·



OF THIS BORING AND AT THE TIME OF DRILLING.
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER
LOCATIONS AND MAY CHANGE AT THIS LOCATION
WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

□ GROUNDWATER TABLE

				Geo	techi	nica	l Bor	ing Log Borehole HS-2	
Date:	7/9/2	2021						Drilling Company: Choice Drilling	
			Richla			S		Type of Rig: CME 75	
			<b>er:</b> 210					Drop: 30" Hole Diameter:	8"
			op of F					Drive Weight: 140 pounds	
Hole Location: See Geotechnical Map								Page 1	of 2
			_		£			Logged By MJG	
		_	윤		<u>a</u>			Sampled By MJG	
Elevation (ft)	_	Graphic Log	Sample Number	ļ ţ	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
<u>io</u>	Depth (ft)	<u> </u>	<u>0</u>	Blow Count	SU6	<u>e</u>	S		)f
vat	oth	l de	l dμ	>	Ä	istu	CS		) e
	)eļ	(J)	Sar	<u>응</u>	<u>C</u>	٩	S	DESCRIPTION	<u> </u>
	0		0)	<b> </b>				@0' to 1.5' - Undocumented Artificial Fill (afu):	-#200
	- U		_	-					-#200 EI
	_			-	400.0	0.7	014	@1.5' to T.D Young Eolian Deposits (Qye):	MD
765	_		R-1	4 4 8	100.2	2.7	SM	@2.5'- Silty SAND: gray/brown, dry, loose	RV
	5 —	, T	R-2	7 9 13	103.0	3.4	SM	@5'- Silty SAND: gray/brown, dry, medium dense	-#200
	_	_		13					
760-	_		R-3	9 10	107.1	10.3	SM/ML	@7.5'- Silty SAND/Sandy SILT: olive brown, moist,	
7607				10 10				medium dense/very stiff	
	10 —			10	404.0	0.7	CL NAI	Odol City Ol AV alive beauty aliebath made a compatiff	CN
	_		R-4	10 16 18	101.0	9.7	CL-ML	@10'- Silty CLAY: olive brown, slightly moist, very stiff	CN
	_								
755-	_			-					
	_			.					
	15 —		SPT-1	1 4		11.3	SM/ML	@15'- Silty SAND/Sandy SILT: olive gray/brown, moist,	
	_			4 5 5				medium dense/stiff	
	_								
750-	_			•					
	-			1					
	20 —		R-5	9 12 18	100.6	2.5	SM	@20'- Silty SAND: dusky gray, dry, medium dense	
	_			18					
745-	_								
	_			.					
	25 —		SPT-2	9		26.5	ML	@25'- Sandy SILT: olive gray, wet, very stiff	
	_			9 9 12		20.0	101	wet, very suit	
	_		F	.]					
740-	_			-					
	_			-					
	30 —			-					
								ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
		1			SUBS	SURFACE (	CONDITIONS I	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	Υ



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV -#200

				Geo	techi	nica	l Bor	ing Log Borehole HS-2	
Date:	7/9/2	2021						Drilling Company: Choice Drilling	
					Hilarde	S		Type of Rig: CME 75	
			<b>:</b> 210					Drop: 30" Hole Diameter:	8"
			•		~768' <b>N</b>			Drive Weight: 140 pounds	
Hole	Locat	tion:	See C	Seote	chnical	Map		Page 2 c	of 2
			پ		<u>_</u>			Logged By MJG	
			Sample Number		Dry Density (pcf)		<del> </del>	Sampled By MJG	
( <del> </del>		og	l un	=	<u>\$</u>	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
5	(ft)	C   L	Z	l no	nsi	9	Syl	J	ĮΤ
Elevation (ft)	Depth (ft)	Graphic Log	)   1   1	Blow Count		stul	ပ္လ		0
<u>è</u>	eb	īa	an	<u>  §</u>	<u>&gt;</u>	<u>jō</u>	180	DECODIDE	ý
Ш		0						DESCRIPTION	_
	30 _		R-6	9 12 15	101.2	11.5	SM/ML	@30'- Silty SAND/Sandy SILT: olive gray, moist,	
	_			15				medium dense/very stiff	
735-	_			.					
	_			.					
	35 —		SPT-3	10		7.6	SP	@35'- SAND: brown, moist, dense	
	_		3F 1-3	10 12 13		7.0	31	(@33 - SAND. BIOWII, IIIOISI, delise	
	_	-	ľ	- ' '					
730-	_	-	-	-					
	_	-	-	.					
	40 —		R-7	15	102.2	8.3	SM	@40'- Silty SAND: rusty gray/brown, moist, dense	
	_			15 18 21		0.0		gray/aronn, more, acres	
	_	-	F	-					
725-	_	-	-	-					
	_	-							
	45 —	1	SPT-4	14 17		14.5	SM/ML	@45'- Silty SAND/Sandy SILT: dusky brown, very	
	_			20				moist/moist, dense/hard	
	_	1		•					
720-	_	-		-					
		-		•					
	50 —	1	R-8	12 15 19	99.9	21.3	ML	@50'- Sandy SILT: rusty gray/brown, wet, very stiff	
	_			19					
745	_			1				Total Depth = 50'	
715-	_	]						Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
	55 —							Backilled with Cuttings on 7/9/2021	
	35								
	_								
710-	_								
' '	_			.					
	60 —			.					
	-				THIS	SUMMARY	 'APPLIES ON	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					OF T SUBS	HIS BORING	G AND AT THI CONDITIONS I	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y
	7				LOCA	ATIONS ANI	D MAY CHAN	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	METER



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

□ GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Geo	techi	nica	l Bor	ing Log Borehole HS-3	
Date:	7/9/2	021						Drilling Company: Choice Drilling	
					Hilarde	S		Type of Rig: CME 75	
			<b>er:</b> 210					Drop: 30" Hole Diameter:	8"
					~772' N			Drive Weight: 140 pounds	
Hole Location: See Geotechnical Map								Page 1	of 1
					<del>-</del>			Logged By MJG	
			l upe		<u> </u>		<u> </u>	Sampled By MJG	ہ ا
Elevation (ft)		Graphic Log	Sample Number	l tr	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
l ë	Depth (ft)	ıjc	<u>e</u>	Blow Count	ens	ıre	Ś		of .
.vai	pth	aph	l m	≥	Q	istı	SS		ЭС
	De	Gr	Sal	e	٦	Mo	NS	DESCRIPTION	Ţ
	0			_				@0' to 1.5' - Undocumented Artificial Fill (afu):	
770-	<u>-</u> -		R-1	- 12 18 20	108.4	2.6	SM	@1.5' to T.D Young Eolian Deposits (Qye) @2.5'- Silty SAND: dusky gray, dry, medium dense	
	5 <del>-</del>		R-2	12 15 19	94.8	1.2		@5'- Silty SAND: gray, dry, medium dense	-#200
765-	- -		R-3	7 9 11	101.7	3.6		@7.5'- Silty SAND: olive brown, dry, medium dense	
700	10 —		R-4	8 9 9	96.1	8.5		@10'- Silty SAND: dusky brown, moist, medium dense	
760-	_ _ _		-	- - -					
755-	15 <del></del> 		SPT-1	2 3 7		18.2	ML	@15'- Sandy SILT: gray, wet, stiff	
	- - 20 <del></del>			-					
			R-5	10 15 17	80.8	34.5		@20'- Sandy SILT: brown, wet, very stiff	
750-	_			-   ''					
	_			-					
	25 — -		SPT-2	5 5 9		10.8	SM	@25'- Silty SAND: rusty brown, moist, medium dense	
745-	- - 30 —			- - - -				Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
		1		C	OF TO SUBS LOCA	HIS BORING SURFACE C ATIONS AND I THE PASS	G AND AT TH CONDITIONS D MAY CHAN GAGE OF TIM	SAMPLE TYPES:   TEST TYPES:	OMETER



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

GROUNDWATER TABLE

EI CN CR AL CO RV -#200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

			(	Geo	techi	nica	l Bor	ing Log Borehole HS-4	
Date:	7/9/2	2021						Drilling Company: Choice Drilling	
					Hilarde	S		Type of Rig: CME 75	
			er: 210					Drop: 30" Hole Diameter:	8"
					~767' <b>N</b>			Drive Weight: 140 pounds	
Hole	Locat	tion	See (	Geote	chnical	Мар	<b>i</b>	Page 1	of 1
			<u>_</u>		<del>-</del>			Logged By MJG	
		_	ďu		ğ		00	Sampled By MJG	ا پر ا
Ë		0	<u> </u>	l tr	sity	%)	<u>E</u>	Checked By DJB	les
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
s s	pth	aph	l m	<u> </u>	٥	istı	SS		be
	De	Ö	Sa	H	<u>ا</u> م	Mo	ns	DESCRIPTION	Ty
	0 _		-	-				@0' to 1.5' - Undocumented Artificial Fill (afu):	
765-	_ _ _		R-1	9 12 18	111.9	2.1	SM	@1.5' to T.D Young Eolian Deposits (Qye): @2.5'- Silty SAND: dusky brown, dry, medium dense	
700	5 — -		R-2	5 8 9	101.4	0.9		@5'- Silty SAND: gray/brown, dry, medium dense	-#200
760-	- - -		R-3	9 12 13	104.3	1.6		@7.5'- Silty SAND: dusky gray/brown, dry, medium dense	
755	10 —		R-4	9 12 15	99.7	5.7		@10'- Silty SAND: olive brown, slightly moist, medium dense	
755-	- -			- - -					
	15 — –		SPT-1	11 15 17		26.8	ML	@15'- Sandy SILT: olive gray, wet, hard	
750-	<u>-</u> -			-					
	20 —		R-5	15 19 21	116.9	10.1	SM	@20'- Silty SAND: dark olive gray, moist, dense	
745-	_			<b>■</b> 21					
	_			-					
	25 — -		SPT-3	5 5 7		17.8		@25'- Silty SAND: reddish brown, wet, medium dense	
740-	- - 30 —			-				Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
				C	OF T SUBS LOCA	HIS BORING SURFACE C ATIONS AND I THE PASS	S AND AT THE CONDITIONS O MAY CHAN FAGE OF TIM	SAMPLE TYPES:   TEST TYPES:	OMETER



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

EI CN CR AL CO RV -#200 GROUNDWATER TABLE

				Geo	techi	nica	l Bor	ring Log Borehole HS-5	
Date:	7/9/2	2021						Drilling Company: Choice Drilling	
Proje	ct Na	me:	Richla	and - H	Hilarde	S		Type of Rig: CME 75	
Proje	ct Nu	ımb	er: 210	77-01				Drop: 30" Hole Diameter:	8"
			op of F					Drive Weight: 140 pounds	
Hole	Locat	tion	: See C	Geote:	chnical	Мар		Page 1	of 1
					<u> </u>			Logged By MJG	
			<u>pe</u>		<u>  6</u>		<u>-</u>	Sampled By MJG	
<b>(</b> #)		go	L	<u> </u>	<u> </u>	(%	dπ	Checked By DJB	est
LO LO	(ft)	ر ا		no	nsi		Syl	J. 100 100 27 202	Į Į
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
<u>e</u>	ep	ja	an	<u>  8</u>	<u>&gt;</u>	lois	SC	DECODIDETION	yp.
ш		0	S S	<u>m</u>		2	$\supset$	DESCRIPTION	
	0 _			-				@0' to 1.5' - <u>Undocumented Artificial Fill (afu):</u>	
770-	_		R-1	-	112.9	4.9	SM	@1.5' to T.D Young Eolian Deposits (Qye): @2.5'- Silty SAND: dark gray, slightly moist, medium	
	_		N-1	6 7 7	112.9	4.9	SIVI	dense	
	5 —		R-2	8	109.3	8.1		@5'- Silty SAND: olive brown, moist, medium dense	-#200
	_		11-2	8 12 15	100.0	0.1		Go - Only CAND. Onve brown, most, mediam dense	-#200
765-	_		R-3	- 10	106.8	6.2	SP	@7.5'- SAND: gray/brown, slightly moist, medium dense	
	_			10 10 13	100.0	0.2		gray/brown, slightly moist, mediam defise	
	10 —		R-4	9	101.9	4.7		@10'- SAND: gray/brown, slightly moist, medium dense	
	_			9 10 15				gray, area, gray,	
760-	_			-					
				-					
	   15 —		SPT-1			16.1	SM	@15'- Silty SAND: brown, wet, medium dense	
	_		351-1	4 4 7		10.1	SIVI	(@15 - Silty SAND. brown, wet, medium dense	
755-	_		F	-					
	_			-					
	_			-					
	20 —		R-5	16 18 25	95.3	26.0	ML	@20'- SILT: gray/brown, wet, hard	
750	_			25					
750-									
				_					
	25 —		SPT-2	5		12.6	SM	@25'- Silty SAND: gray/brown, moist, medium dense	
	_		1-2	5 8 9		12.0	CIVI	W20 - Only Orivo. gray/brown, moist, medium dense	
745-	-			-				Total Depth = 25'	
	-			-				Groundwater Not Encountered	
	30 —			-				Backfilled with Cuttings on 7/9/2021	
	-	<u> </u>						NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IF TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
	>		2	1	SUBS	SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	
			-		WITH	THE PASS	AGE OF TIM	E. THE DATA  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE  EI EXPANSION INDEX ON CONSOLIDATION	



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

EI CN CR AL CO RV -#200 GROUNDWATER TABLE

				Geo	techi	nica	l Bor	ing Log Borehole HS-6	
Date:	7/16/	202						Drilling Company: Choice Drilling	
				and - H	Hilarde	s		Type of Rig: CME 75	
Proje	ct Nu	mbe	er: 210	77-01				Drop: 30" Hole Diameter:	8"
					~771' N			Drive Weight: 140 pounds	
Hole	Locat	ion:	See (	Geote:	chnical	Мар		Page 1	of 1
			_					Logged By BPP	
			pe		bC		<u> </u>	Sampled By BPP	
E E		gc	Sample Number	+	Dry Density (pcf)	(%	USCS Symbol	Checked By DJB	est
Elevation (ft)	ft)	Graphic Log	Z	Blow Count	ısi	Moisture (%)	Syl	Chocked by bob	Type of Test
atic	Depth (ft)	Ä	<u> </u>	0	] Ge	tur	S		0
<u>6</u>	ері	ğ	a	<u>ŏ</u>	_ 	Ois	SC		ype
Ш	О	9	S	В		Δ	<u> </u>	DESCRIPTION	
770-	0			_				@0' to 2.5' - <u>Undocumented Artificial Fill (afu):</u>	-#200
''0		7		_				@0'- Organics: brown @2.5' to T.D Young Eolian Deposits (Qye):	EI MD
			R-1	4	106.5	9.8	SM	@2.5'- Silty SAND: dark gray, moist, loose	
	_			4 4 5					
	5 —		R-2	3				@5'- No Recovery	
765	_		K-2	3 4 5					
	_			-					
	_	ш	R-3	5 9 9	111.3	14.6		@7.5'- Silty SAND: olive brown, very moist, medium	
	_			9				dense	
	10 —		R-4	8	110.6	20.0	SM/ML	@10'- Silty SAND/Sandy SILT: dark olive brown, wet,	
760-	_			8 10 10	110.0	20.0		medium dense, very stiff	
	_			-					
	_			-					
	_			-					
	15 —		SPT-1	2		14.3	SM	@15'- Silty SAND: brown, very moist, loose	
755	_			2 3 3					
	-			-					
	_			-					
	_			-					
	20 —		R-5	6 9 9	101.4	18.1		@20'- SILT: gray/brown, wet, stiff	
750-	_			9					
	_			-					
	_			-					
	25 —								
715	25 —		SPT-2	2 2 3		16.4		@25'- Silty SAND/Sandy SILT: rusty gray/brown,	
745-				3				wet/very moist, loose/medium stiff	
			[	_				Total Depth = 25'	
			[	_				Groundwater Not Encountered  Backfilled with Cuttings on 7/9/2021	
	30 —		[	-				Daskinsa with Cattlings on 170/2021	
					THIS	SUMMARY	APPLIES ON	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
	>				OF T	HIS BORIN	G AND AT THI	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y
					WITH	THE PASS	SAGE OF TIME	GE AT THIS LOCATION STANDARD PENETRATION S& SIEVE ANALYSIS E. THE DATA TEST SAMPLE SA SIEVE AND HYDRE SPT STANDARD PENETRATION S&H SIEVE AND HYDRE STANDARD PENETRATION S&H SIEVE AND HYDRE SET SAMPLE EI EXPANSION INDES	



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
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ENGINEERING ANALYSIS.

EI CN CR AL CO RV -#200

SIEVE AND INDOMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

GROUNDWATER TABLE

			(	Geo	techi	nica	l Bor	ing Log Borehole HS-7	
Date:	7/16/	202						Drilling Company: Choice Drilling	
					Hilarde	S		Type of Rig: CME 75	
			er: 210					Drop: 30" Hole Diameter:	8"
					~771' N			Drive Weight: 140 pounds	
Hole	Locat	ion:	See (	Geote	chnical	Мар		Page 1 c	of 1
			<u>_</u>		<del>_</del>			Logged By BPP	
		_	Sample Number		Dry Density (pcf)		8	Sampled By BPP	ب ا
Elevation (ft)		Graphic Log	j	ļ t	ity	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
ioi	(ft)	<u>:</u>	<u>e</u>	S	sue	ıre	S		of 1
vat	Depth (ft)	aph	dπ	Blow Count	Ŏ	istı	S		) e
	De	G	Saı	<u>@</u>	٦	Mo	NS	DESCRIPTION	Ty
	0			+-				@0' to 2.5' - Undocumented Artificial Fill (afu):	·
770-	_			-				@0'- Organics: brown	
	_		R-1	- a	98.6	12.3	SP	@2.5' to T.D Young Eolian Deposits (Qye)	
	_		N-1	9 10 12	90.0	12.3	35	@2.5'- SAND: dark gray/brown, very moist, medium dense	
	5 —								
765-	5 —		R-2	3 4	101.2	25.3	SM	@5'- Silty SAND: olive brown, wet, loose	
705				4					
	_		R-3	9	101.4	19.5		@7.5'- Silty SAND: olive brown, wet, medium dense	
	_			13					
	10 —		R-4	3	99.4	23.1		@10'- Silty SAND: olive brown, wet, loose	
760-	_		17.4	3 3 5	00.4	20.1		W TO CIRTY OF WEED SHOWIN, WOLL, 19636	
	_			-					
	_			-					
	_			-					
I	15 —		SPT-1	117		22.0	SM/ML		
755-	_			<b>∆</b> 9				dense/very stiff	
			Ī	-					
	20 —		D -		05.0	00.0	0.14	COOL CITE CAND allow become used above	
750-			R-5	12 18 21	95.2	23.0	SM	@20'- Silty SAND: olive brown, wet, dense	
	_			- 21					
	_			-					
	_			-					
	25 —		SPT-2	9 10		25.8	SP	@25'- SAND: gray/brown, wet, medium dense	
745-	=			X 10 10				J , ,,	
	-			-				Total Depth = 25'	
	_			-				Groundwater Not Encountered	
	20			-				Backfilled with Cuttings on 7/9/2021	
	30 —			-					
	>				OF T	HIS BORING	G AND AT THI	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y
					LOCA	ATIONS AND THE PASS	D MAY CHANG SAGE OF TIME	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	METER



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

EI CN CR AL CO RV -#200 GROUNDWATER TABLE

				Geo	tech	nica	Bor	ring Log Borehole HS-8	
Date:	7/16/	202	1					Drilling Company: Choice Drilling	
			Richla			S		Type of Rig: CME 75	
			er: 210					Drop: 30" Hole Diameter:	8"
			p of H					Drive Weight: 140 pounds	
Hole	Locat	ion	See (	3eote	chnica	l Map		Page 1 c	of 1
			<u>.</u>		<del>5</del>			Logged By BPP	
		_	du		d)		ЮС	Sampled By BPP	بہ
<del> </del>		o-	j	l t	ity	%)	/m/	Checked By DJB	les
ië	(ff.)	<u>i</u>	<u>e</u>	95	ens	ıre	S		of
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
	De	Grê	Saı	<b>음</b>	٦	Mo	SN	DESCRIPTION	<del> </del>
	0	7		+				@0' to 1.5' - Undocumented Artificial Fill (afu):	
		ı		-				@0'- Silty SAND: gray_dry	
	-		R-1	- 	95.0	14.4	SP	@1.5' to T.D Young Eolian Deposits (Qye): @2.5'- SAND: gray/brown, wet, loose	
765-	_		17-1	4 4 5	95.0	14.4	SF	@2.5 - SAND. gray/brown, wet, loose	
	_								
	5 — _		R-2	5 6 9	95.7	15.7		@5'- SAND: dark gray/brown, wet, medium dense	
	_			9					
760-	_		R-3	10 12	99.0	16.0		@7.5'- SAND with Gravel: dark gray/brown, wet,	
	_			15				medium dense	
	10 —		R-4	4	82.1	28.3		@10'- SAND: brown, wet, loose	
	_			4 4 8	02.1	20.0		With States, states, wet, leads	
	_			-					
755-	-			-					
	_			-					
	15 —		SPT-1	5 7 9		7.1		@15'- SAND: gray, moist, medium dense	
	_			<u>4</u> 9					
750-									
730	_			_					
	20 —		D 5	27	110.2	0.4		©201 CAND, gray/hray/n dm/ yam/danaa	
			R-5	27 50/4"	110.3	2.1		@20'- SAND: gray/brown, dry, very dense	
	_			-					
745-	_			-					
	-			-					
	25 —		SPT-2	12		2.3		@25'- SAND with Gravel: gray/brown, dry, very dense	
	_			12 18 26					
740	_			-				Total Depth = 25'	
740-	_			-				Groundwater Not Encountered	
	30 —							Backfilled with Cuttings on 7/9/2021	
	30 =				TUIC	SHWWWDA	ADDI IES ON	NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					OF T	HIS BORING	AND AT TH	IE TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y
						THE PASS	AGE OF TIM	GE AT THIS LOCATION E. THE DATA TEST SAMPLE SPT STANDARD PENETRATION TEST SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE E. EXPANSION INDEX TEST SAMPLE	



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

GROUNDWATER TABLE

EI CN CR AL CO RV -#200

				Geo	techi	nica	l Bor	ing Log Borehole HS-9	
Date:	7/16/	202						Drilling Company: Choice Drilling	
					Hilarde	S		Type of Rig: CME 75	
			<b>er:</b> 210					Drop: 30" Hole Diameter:	8"
					~767' N			Drive Weight: 140 pounds	
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1 c	of 1
			_		<del>-</del>			Logged By BPP	
		_	l du		<u>ä</u>		<u> </u>	Sampled By BPP	Ļ
Elevation (ft)		Graphic Log	Sample Number	ļ ţ	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By DJB	Type of Test
iei	(ft)	<u>.</u>	<u>0</u>	ŏ	l Si	<u>re</u>	S		of 1
vat	Depth (ft)	aph	dπ	Blow Count	Q	istı	SS		) e
	Del	D Sign	Sal	<u>8</u>	<u>ا</u> ح	₩	NS	DESCRIPTION	Tyk
	0			+	_			@0' to 1.5' - Undocumented Artificial Fill (afu):	-
	-			-				@0'- Silty SAND: gray, slightly moist	
765-	_		R-1	- 3	101.2	1.4	SP	@1.5' to T.D Young Eolian Deposits (Qye):	
	_		K-1	3 3 5	101.2	1.4	35	@2.5'- SAND: gray, dry, loose	
	_			1					
	5 —		R-2	11 9	93.1	4.5	SM	@5'- Silty SAND: light gray/brown, slightly moist,	
760-				11				medium dense	
700	_		R-3	8	98.4	10.7	SM/ML	@7.5'- Silty SAND/Sandy SILT: dusky brown, moist,	
	_			8 8 12				medium dense/very stiff	
	10 —		R-4	9	100.4	12.4		@10'- Silty SAND/Sandy SILT: dusky brown, moist,	
	_		11/-4	9 10 15	100.4	12.4		medium dense/very stiff	
755-	_			-					
	_		•	-					
	_			-					
	15 —		SPT-1	4 5 5		10.0	SM	@15'- Silty SAND: olive gray/brown, moist, medium	
	_			<u>∱</u> 5				dense	
750-	_			-					
	_			-					
	20 —		[						
			R-5	5 15 19	101.7	21.2	SM/ML	@20'- Silty SAND/Sandy SILT: dark olive brown, wet, medium dense/very stiff	
745-	_			- 19				medium dense/very sun	
	_			-					
	_			-					
	25 —		SPT-2	3 4		11.1	SM	@25'- Silty SAND: rusty brown, moist, medium dense	
	_		-	X 4 4					
740-	_			-				Total Depth = 25'	
	_			-				Groundwater Not Encountered	
	-			-				Backfilled with Cuttings on 7/9/2021	
	30 —			-					
					OF T	HIS BORIN	G AND AT THI	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,
					LOCA	ATIONS AN		GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	METER



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

			G	eot	echn	ical	Bori	ng Log Borehole HS-10	
Date:	7/16/	202	:1					Drilling Company: Choice Drilling	
			Richla			S		Type of Rig: CME 75	
			er: 210					Drop: 30" Hole Diameter:	8"
			op of H					Drive Weight: 140 pounds	
Hole	Locat	ion	: See C	eote	chnical	Мар		Page 1	ot 1
			5		cf)			Logged By BPP	
		(	훈		d)		00	Sampled By BPP	ا پو ا
<del>"</del>	(	Log	=	l Tr	sity	%)	l Ē	Checked By DJB	les
	(ft	ιic	<u>o</u>	8	ens	re	Ś		of .
Elevation (ft)	Depth (ft)	Graphic	Sample Number	3low Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
⊟	De	Gr	Sa	<del>B</del>	Dry	Mo	l SN	DESCRIPTION	<u> </u>
	0	7- 1-						@0' to 1.5' - Undocumented Artificial Fill (afu):	
	_	Ī	i t					@0'- Silty SAND: brown, dry	
	_		R-1	5	102.7	6.8	SM	@1.5' to T.D Young Eolian Deposits (Qye): @2.5'- Silty SAND: dusky brown, slightly moist, medium	
765-				5 12 15		0.0		dense	
103	5 —			12	400.0	4.0		OF City CAND dealer man alimbate maniet maniferm	
	_		R-2	12 15 19	103.9	4.6		@5'- Silty SAND: dusky gray, slightly moist, medium dense	
	_							46/166	
	_		R-3	8 8 12	99.4	12.5		@7.5'- Silty SAND: dusky brown, moist, medium dense	
760-	_			12					
	10 —		R-4	8 10	95.5	14.1	SM/ML	@10'- Silty SAND/Sandy SILT: dusky brown, very	
	_			10				moist/moist, medium dense/very stiff	
	_								
755	_								
755-	15 —			] ,,			l		
	15 _		SPT-1	10 7 7		21.6	ML	@15'- Sandy SILT: olive gray, wet, very stiff	
	_			) ′					
	_								
750-	_								
	20 —		R-5	12 18	96.4	3.6	SP	@20'- SAND: gray/brown, dry, dense	
	_			18 24					
	_								
745	_								
745-	25 —		_						
			SPT-2	9 9		5.4		@25'- SAND: gray/brown, slightly moist, medium dense	
				11				Total Danth - 251	
	_							Total Depth = 25' Groundwater Not Encountered	
740-	_		-					Backfilled with Cuttings on 7/9/2021	
	30 —								
								LUY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
	>		2		SUBS	SURFACE ( ATIONS AN	CONDITIONS I D MAY CHAN	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT' GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE AND LYDEC	
				1			SAGE OF TIME A SIMPLIFICA	E. THE DATA TEST SAMPLE ITION OF THE ACTUAL TO SPI STANDARD PENETRATION SAM SIEVE AND FIDER EXPANSION INDEX CN CONSOLIDATION CN CONSOLIDATION	



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

GROUNDWATER TABLE

EI CN CR AL CO RV -#200

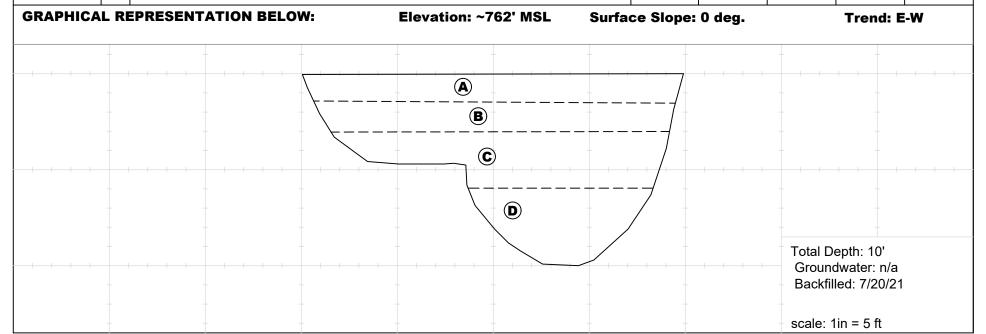
Project Na	ame:	Richland - Hilardis	Logged By: MJG	Trench N	lo.: TP-1				
Project Nu	umbe	er: 21077-01	Date: 7/20/2021	<b>F</b>	D		LC	16	
Equipmen	t: Ba	ckhoe	Location: See Geotechnical Map	Engineerii	Engineering Properties: Geotechni				
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT' (PCF)	
	A B	and roots  @ 1.5' to 4.5' - Quaternary Y @ 1.5' to 4.5' - Sandy SILT: dense, trace rootlets  @ 4.5' to T.D SAND: gray,	ht brown, dry, loose, dead vegetation  oung Eolian Deposits (Qye) ight gray, dry, loose to medium  dry to slightly moist, loose/friable in its" of slightly rounded granitic	afu Qye	SP	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3' G-4 @ 3'-4' B-1 @ 5'-8'	3.4 2.1 2.5		
GRAPHIC/	AL RI	EPRESENTATION BELOW:	Elevation: ~759' MSL Sur	face Slope:	0 deg.		Trend: N	l 85 <b>E</b>	
			(A) (B)						

Backfilled: 7/20/21

Project Na	ame:	Richland - Hilardis	Logged By: MJG	Trench N	lo.: TP-2		
Project N	umbe	r: 21077-01	Date: 7/20/2021	<b>P</b>	<b>D</b>	4	1
Equipmen	t: Ba	ckhoe	Location: See Geotechnical Map	Engineeri	ng Proper	ties:	_
Geologic Attitudes	Unit	SOIL DESCRIPTION:	•	GEOLOGIC UNIT	USCS	SAI	MPL No
		@ 0' to 1.5' - Artificial Undoc	umented Fill (afu)			G	<b>3-1</b>



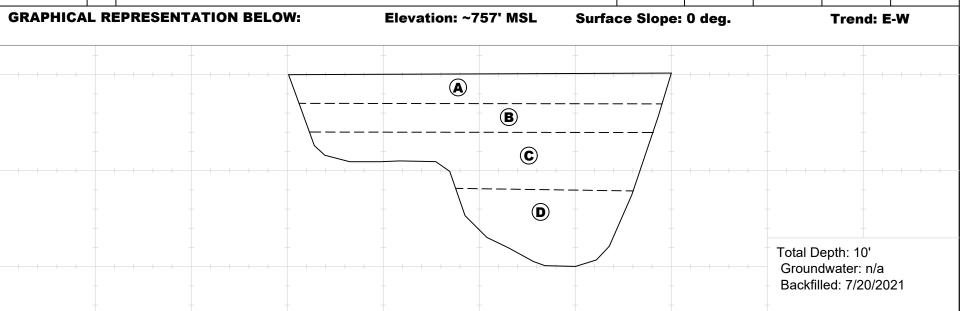
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, rootlets, dead vegetation	afu	ML	G-1 @ 0'-1' G-2	5.0	
		@ 1.5' to T.D Quaternary Young Eolian Deposits (Qye)	Qye		@ 1'-2'	5.3	
	В	@ 1.5' to 2.5' - Sandy SILT: light gray, dry, loose to medium dense, minor rootlets			G-3 @ 2'-3'	2.3	
	С	@ 2.5' to 6' - SAND: gray to white, some gravel, loose/friable, dry		SP	G-4 @ 3'-4'		
	D	@ 6' to T.D - SILT: gray, slightly moist, medium dense		ML	G-5 @ 5'-6'		



Project Nan	ne: Richland - Hilardis	Logged By: MJG	Trench No	o.: <b>TP</b> -3	
Project Nun	nber: 21077-01	Date: 7/20/2021	En alia a anta	D	
Equipment:	Backhoe	Location: See Geotechnical Map	Engineerin	g Properti	ies:
Geologic		·	GEOLOGIC		SAME



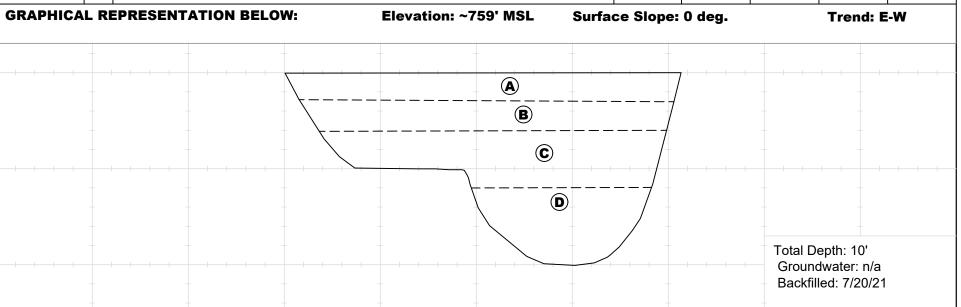
	@ 0' to 1.5' - Artificial Undocumented Fill (afu)					(PCF)
A	@ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead	afu	ML	G-1 @ 0'-1'	8.0	
В	vegetation/rootlets @ 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 2.5' Sandy SILT: light gray, dry, medium dense, minor rootlets	Qye		G-2 @ 1'-2' G-3	3.5	
С	@ 2.5' to 6' - SAND: light gray to white, slightly moist, medium dense, gravel/beds of gravel (1" to 2" thick bedding)/fine sand		SP	@ 2'-3' G-4	19.5	
D	@ 6' to T.D SILT: light olive gray, slightly moist, medium dense		ML	@ 3'-4'		



Project Na	ame:	Richland - Hilardis	Logged By: MJG	Trench N	lo.: TP-4		
Project N	umbe	r: 21077-01	Date: 7/20/2021	F. alia a aul	D		
Equipmen	t: Bac	ckhoe	Location: See Geotechnical Map	Engineeri	ng Propert	ies:	4
Geologic	Unit	SOIL DESCRIPTION:	•	GEOLOGIC	IISCS	SA	MP



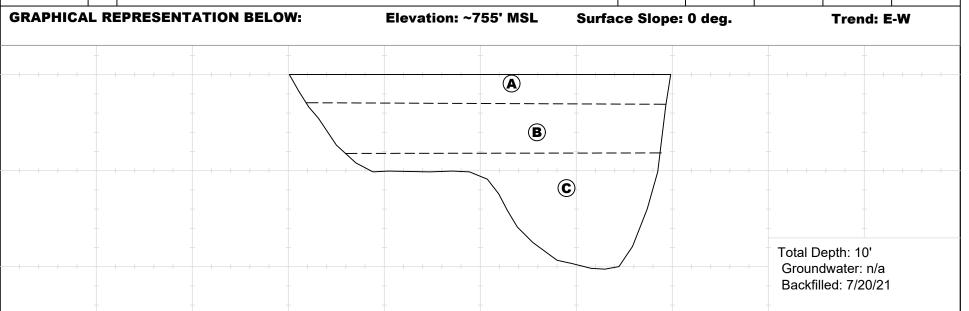
					I		
Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
A		<u>`</u> _	afu	ML	G-1 @ 0'-1'	7.2	
В	@ 1.5' to T.D.' - Quaternary You		Qye		G-2 @ 1'-2'	4.3	
С	@ 3' to 6' - Fine SAND: white/lig	ht gray, dry, loose		SP	G-3 @ 2'-3'		
D	@ 6' to T.D SILT: gray/olive gr	ay, slightly moist, medium dense		ML	G-4 @ 3'-4'		
	A B C	@ 0' to 1.5' - Artificial Undocum @ 0' to 1.5' - Sandy SILT: light by vegetation/rootlets @ 1.5' to T.D.' - Quaternary Your @ 1.5' to 3' Sandy SILT: light oli rootlets  C @ 3' to 6' - Fine SAND: white/lig	<ul> <li>© 0' to 1.5' - Artificial Undocumented Fill (afu)</li> <li>© 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets</li> <li>© 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye)</li> <li>© 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets</li> <li>C © 3' to 6' - Fine SAND: white/light gray, dry, loose</li> </ul>	© 0' to 1.5' - Artificial Undocumented Fill (afu) © 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets © 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye) © 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets  C © 3' to 6' - Fine SAND: white/light gray, dry, loose	© 0' to 1.5' - Artificial Undocumented Fill (afu) © 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets © 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye) © 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets  C © 3' to 6' - Fine SAND: white/light gray, dry, loose	Onit SOIL DESCRIPTION:  O 0' to 1.5' - Artificial Undocumented Fill (afu) O 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets O 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye) O 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets  C 0 3' to 6' - Fine SAND: white/light gray, dry, loose  D 0 6' to T.D SILT: gray/olive gray, slightly moist, medium dense  ML G-4	Unit SOIL DESCRIPTION:  @ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets @ 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets  C @ 3' to 6' - Fine SAND: white/light gray, dry, loose  D @ 6' to T.D SILT: gray/olive gray, slightly moist, medium dense  ML G-4  WL (%)  G-1 @ 0'-1' @ 0'-1' @ 0'-1'  G-2 @ 1'-2'  A.3  ML  G-3 @ 2'-3'



Project Na	me:	Richland - Hilardis	Logged By: MJG	Trench N	No.: TP-5		
Project Nu	ımbe	er: 21077-01	Date: 7/20/2021	<b>F</b>	<b>D</b>		1
Equipmen	t: Ba	ckhoe	Location: See Geotechnical Map	Engineeri	ng Propert	ies:	
Geologic Attitudes	Unit	SOIL DESCRIPTION:	1	GEOLOGIC UNIT	uscs	_	MPL No



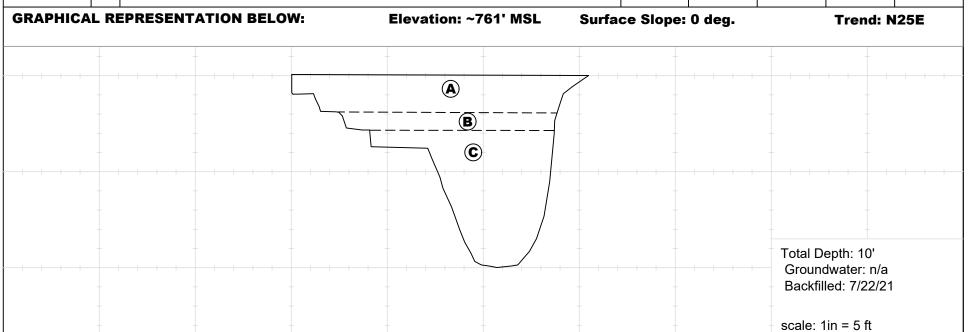
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1.5' - Artificial Undocument @ 0' to 1.5' Sandy SILT: light brown	<u>·</u>	afu	ML	G-1 @ 0'-1'	11.9	
	В	vegetation/roots @ 1.5' to T.D Quaternary Young E @ 1.5' to 4' - Fine SAND: gray/white		Qye	SP	G-2 @ 2'-3'	2.3	
	С	@ 4' to T.D SILT: white grade to a meidum dense	a dark gray, slightly moist,		ML	G-3 @ 3'-4'	3.8	



Project Na	me:	Richland - Hilardis	Logged By: MJG	Trench N	No.: TP-6		4
Project Nu	ımbe	r: 21077-01	Date: 7/22/2021	<b>F</b>	D	•	1
Equipment	t: Ba	ckhoe	Location: See Geotechnical Map	- Engineeri	ng Propert	ies:	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs		MPL No



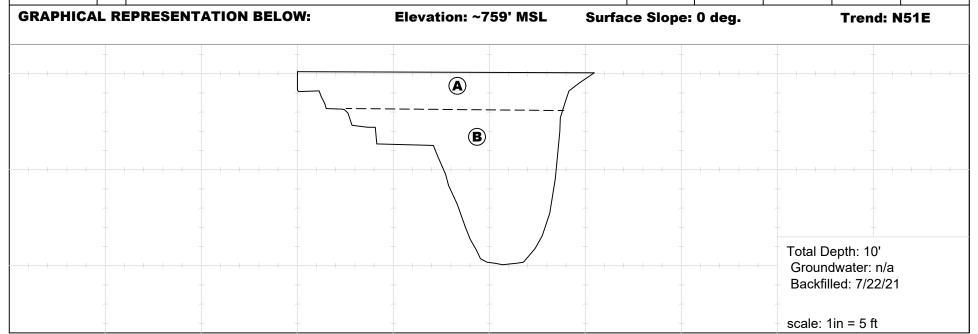
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	<ul> <li>© 0' to 1.5' - Artificial Undocumented Fill (afu)</li> <li>© 0.5' to 1' - Puffy grass followed by loose organics, looks like old manure, soil is dark brown, heavy vegetation/roots</li> </ul>	afu	ML	G-1 @ 0'-1'	39.8	
		@ 1.5' to T.D Quaternary Young Eolian Deposits (Qye) @ 1' to 2' - Sandy SILT: light brown, loose to medium dense,	Qye		G-2 @ 1'-2'	21.9	
	В	slightly moist to dry, rootlets			G-3 @ 2'-3'	7.5	
	С	@ 2' to T.D Sandy SILT: olive gray, slightly moist, medium dense, increase in sand content			G-4 @ 3'-4'		



Project Na	me:	Richland - Hilardis	Logged By: MJG	Trench N	lo.: TP-7	-
Project Nu	ımbe	r: 21077-01	Date: 7/22/2021	Enningeni	D	
Equipment	t: Ba	ckhoe	Location: See Geotechnical Map	Engineeri	ng Propert	ies:
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAM



- ЧР								
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1.5' - Artificial Undocum @ 0' to 1.5' Cow Manure: some of moist, some vegetation	<u> </u>	afu	ML	G-1 @ 0'-1'	149.2	
		@ 1.5' to T.D Quaternary Your	<u> </u>	Qye		G-2 @ 1'-2'	43.5	
	В	@ 1.5' to T.D Sandy SILT: olive	e gray, moist, medium dense			G-3 @ 2'-3'	30.0	
						G-4 @ 3'-4'		



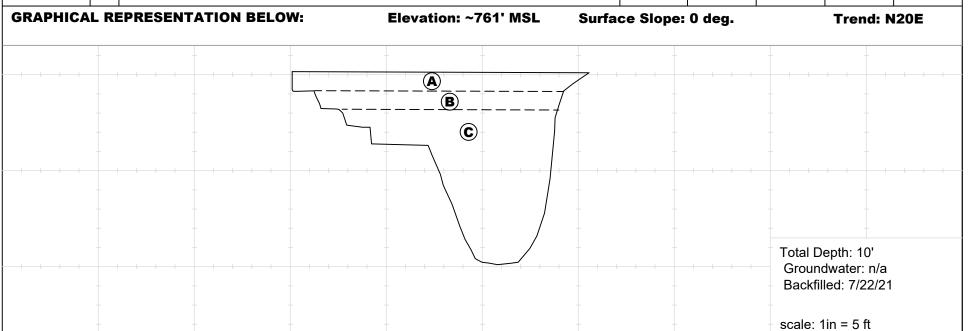
Project Na	ame:	Richland - Hilardis	Logged By: MJG	Trench N	lo.: TP-9			
Project N	ımbe	r: 21077-01	Date:7/22/2021	<b>F</b>	<b>D</b>		LC	16
Equipmen	t: Ba	ckhoe	Location: See Geotechnical Map	Engineeri	ng Propert	les:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A B C	<ul> <li>@ 1.5' to T.D Quaternary Y</li> <li>@ 1.5' to 7' - Sandy SILT to S</li> <li>to slightly moist at depth, m</li> </ul>	me dark brown Silt, loose, very moist oung Eolian Deposits (Qye) ilty SAND - dark gray, moist grades	afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3' G-4 @ 3'-4'	123.2 32.7 26.0	,
GRAPHIC/	AL RE	EPRESENTATION BELOW:	Elevation: ~763' MSL Surfa	ace Slope:	0 deg.		Trend: S	70W
+ + + +	- - - -		©				Depth: 10' dwater: n/a	

Backfilled: 7/22/21

Project Na	me:	Richland - Hilardis	Logged By: MJG	Trench N	No.: TP-10	
Project Nu	ımbe	r: 21077-01	Date: 7/22/2021	<b>F</b> !	D	
Equipmen	t: Ba	ckhoe	Location: See Geotechnical Map	– Engineeri	ng Propert	iles:
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPI No



			· · · · · · · · · · · · · · · · · · ·					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1' - Artificial Undocumente @ 0' to 1' - Cow Manure: dark brow	<del></del>	afu		G-1 @0-1'	114.9	
		@ 1' to T.D Quaternary Young Ed	olian Deposits (Qye)			G-2 @1-2'	30.2	
	В	@ 1' to 2' - Sandy SILT: olive gray loose, slightly moist	with slight brown mottle,	Qye	ML	G-3 @2-3'	23.7	
	С	@ 2' to T.D Sandy SILT: olive gradense	ay, slightly moist, medium					



	ame:	Richard - Hilardes		Logged By: MJG		Trench N	lo.: OTP-	1		
Project N	ımbe	r: 21077-01		Date: 7/20/2021			_		LC	jC
Equipmen	t: Ba	ckhoe		Location: See Ge	otechnical Map	Engineeri	ng Proper	ties:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION	ON:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	vegetation	ILT: light b	ented Fill (afu) rown, dry, loose, roo Eolian Deposits (Qy		afu	ML	G-1 @ 0'-1' G-2 @ 1'-2'	2.2 3.2	(. 0. )
	В		ILT: light o	live gray/tan, loose	<del></del>	Qye		G-3 @ 2'-3'	2.4	
					OLIMOL C	ince Slame.				
RAPHIC	AL RE	PRESENTATION BE	ELOW:	Elevation: 762	2 MSL Surt	ace Slope:	0 deg.		Trend: N	160W
RAPHIC	AL RE	PRESENTATION BE	ELOW:	Elevation: 762	z wst surr	ace Slope:	0 deg.	-	Trend: N	160W
RAPHICA	AL RE	EPRESENTATION BE	ELOW:	Elevation: 762	Z MSL Surr	ace Stope:	0 deg.		Trend: N	160W
RAPHICA	AL RE	EPRESENTATION BE	ELOW:	<b>_</b>	z MSL Sum	ace Stope:	0 deg.	Total		I60W
RAPHIC	AL RE	EPRESENTATION BE	ELOW:	<b>_</b>	Z MSL Sum	ace Stope:	0 deg.	Groun	Depth: 3' dwater: N/A lled: 7/20/21	

	ame:	Richard - Hilardes		Logged By: MJG		Trench N	lo.: OTP-2	2	<   _	
Project N	umbe	r: 21077-01		Date: 7/20/2021		English				16
Equipmen	t: Ba	ckhoe		Location: See Geotechn	ical Map	Engineeri	ng Proper	iles:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTI	ON:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	<ul><li>vegetation, rootle</li><li>@ 1.5' to 3' - Quate</li></ul>	y SILT: light ets ernary Youn y SILT: light	mented Fill (afu) brown, dry, loose, some d g Eolian Deposits (Qye) gray/brown, dry, loose to r		afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	7.2 3.1 0.6	(PCP)
RAPHIC	AL RI	PRESENTATION B	ELOW:	Elevation: 758' MSL	Surfa	ice Slope:	0 deg.		Trend: S	80W
+ + + +				(A) (B)			+ + + +			
+ + + +	-	-	-			-			-	

Project Na	me:	Richard -	Hilardes		Logged	l By: MJG			Trench N	o.: OTP-	3		
Project Nu	ımbe	r: 21077-0	)1		Date: 7	//20/2021			<b>F</b>	<b>D</b>	41	LC	jC
Equipmen	t: Ba	ckhoe			Location	on: See Ge	otechnical N	/lap	Engineerii	ig Proper	ties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DI	ESCRIPTION	l:					GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' vegetation	- Artificial I - SILT with ons and root - Quaternai	Sand: ligh tlets	nt brown,	, dry, loose			afu Qye	ML	G-1 @ 0'-1' G-2	5.7	(FOI)
	В	@ 1' to 3'	- SILT: light dense, distu	t brown, g	ray, sligl				wye		@ 1'-2 G-3 @ 2'-3'	12.4	
GRAPHIC <i>E</i>	AL RE	PRESENT	ATION BEL	OW:	Ele	evation: 76	2' MSL	Surfa	ace Slope:	0 deg.		Trend: E	- <b>W</b>
	_		_	+	+	_		-	+		+	-	
+ + + +	+					<b>A B</b>							
+ + + +			-		-				+ + + + + + + + + + + + + + + + + + + +		-		<del></del>
	† - - -		-		+ + + + +				† † †	+ + + + +	Grour	Depth: 3' ndwater: n/a illed: 7/20/21	
	+		+	+	+			+	+		+		

	ame:	Richard- Hilardes	i	Logged By: MJG		Trench I	No.: OTP-	4		
roject N	umbe	er: 21077-01		Date: 7/20/2021		<b></b>	· <b>D</b>	41	LC	jC
quipmen	t: Ba	ckhoe		Location: See Geo	otechnical Map	Engineer	ing Proper	ties:	Geotech	nnical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPT	ΓΙΟΝ:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	@ 1.5' to 3' - <b>Q</b> ua	dy SILT: light ternary Youn	mented Fill (afu) brown, dry, loose, d g Eolian Deposits (Q gray, dry, loose to n	ye)	afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	6.9 3.9 1.7	(FOI)
RAPHIC	AL RE	EPRESENTATION	BELOW:	Elevation: 759	)' MSL Surf	face Slope:	0 deg.		Trend: E	 E-W
RAPHIC	AL RE	EPRESENTATION	BELOW:	+ + +	)' MSL Surf	face Slope:	0 deg.	-	Trend: E	E-W
RAPHICA	AL RE	EPRESENTATION	BELOW:	Elevation: 759	O' MSL Surf	face Slope:	0 deg.	-	Trend: E	<b>≣-W</b>
RAPHICA	AL RE	EPRESENTATION	BELOW:	<b>A</b>	O' MSL Surf	face Slope:	0 deg.		Trend: E	<b>≡-W</b>
RAPHICA	AL RE	EPRESENTATION	BELOW:	<b>A</b>	O' MSL Surf	face Slope:	0 deg.	Groun	Depth: 3' adwater: n/a illed: 7/20/21	

Project Nu	me:	Richard - Hilardes		Logged By: MJG		Trench N	o.: OTP-	5		
Toject Nu	mbe	r: 21077-01		Date: 7/20/2021		F	<b>D</b>			jC
Equipment	: Ba	ckhoe		Location: See Ge	otechnical Map	Engineerii	ng Proper	ties:	Geotech	nical, Ind
Geologic Attitudes	Unit	SOIL DESCRIPTIO	N:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	@ 0' to 1.5' - Artificia @ 0' to 1.5' - Sandy s vegetation, plastic @ 1.5' to 3' - Quater @ 1.5' to 3' - Sandy s rootlets, clean	SILT: light b trash nary Young	prown, dry, loose, Eolian Deposits (C	Qye)	afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	7.9 3.7 2.4	(PGF)
RAPHICA	L RE	PRESENTATION BEI	LOW:	Elevation: 75	8' MSL Sur	face Slope:	0 deg.	-	Trend: E	-W
	- '			<b>A B</b>				-	-	

	ame:	Richard - I	Hilardes		Logged By:	MJG		Trench	No.: OTP-	6		
Project N	ımbe	er: 21077-0	1		Date: 7/20/2	021		Engine	ring Proper	tios	<b>*</b> L(	3C
Equipmen	t: Ba	ckhoe			Location: S	ee Geotechnical	Мар	Engineer	ing Proper	ties:	Geotec	hnical, In
Geologic Attitudes	Unit	SOIL DE	SCRIPTION:					GEOLOGIC UNIT	uscs	SAMPLI No	MOISTUR	E DRY DENSIT (PCF)
	В	@ 0' to 1. dead veg @ 1.5' to 3	5' - <mark>Sandy SII</mark> etation and r 3' - Quaterna	LT: light ( rootlets ry Young	Eolian Depo	orown, dry, loose		afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	4.0	-
	1											
RAPHICA	AL RE	EPRESENT	ATION BELO	W:	<u> </u>		Surfa	ace Slope:	: 0 deg.	-	Trend:	N-S
GRAPHICA	AL RE	EPRESENT	ATION BELO	W:	-		Surfa	ace Slope:	: 0 deg.		Trend:	N-S
BRAPHICA	AL RE	EPRESENT	ATION BELO	W:	<u> </u>		Surfa	ace Slope:	: 0 deg.	Grou	Depth: 3' indwater: n/a	1

Project Na	ame:	Richard- Hilardes	Logged By: MJG		Trench N	lo.: <b>OTP</b> -7			
Project N	umbe	r: 21077-01	Date: 7/20/2021		Engineerin	Duanauti			jC
Equipmen	t: Ba	ckhoe	Location: See Geotechnical	Мар	– Engineerii	ng Properti	les:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A B C		<u> </u>	lense	afu Qye	SM	G-1 @0-1' G-1 @1-2' G-1 @2-3'	1.3 2.2 8.9	( 3.,
RAPHIC	AL RE	EPRESENTATION BELOW:	Elevation: 760' MSL	Surfa	ace Slope:	0 deg.		Trend: N	I-S
			(A) (B) (C)	7	-		-	-	
								Pepth: 3' dwater: n/a	

roject Na	ame:	Richard -	Hilardes	Lo	gged By: MJG		Trench N	lo.: OTP-	8		
roject Nu	ımbe	er: 21077-0	1	Da	ate: 7/22/2021		Enningeni	D	41	LC	16
quipmen	t: Ba	ckhoe		Lo	cation: See Geo	otechnical Map	— Engineeri	ng Proper	ties:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DE	SCRIPTION:	,			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	@ 0 to 1.5 cow man	ure and dead 3' - Quaterna	grading into I vegetation ry Young Eol	ed Fill (afu <u>)</u> Silty SAND: ligh lian Deposits (Q , medium dense	ye)	afu Qye	ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	18.3 14.2 7.8	
RAPHIC	AL RE	EPRESENT	ATION BELO	W:	Elevation: 762	2' MSL Surf	ace Slope:	0 deg.	+	Trend: N	I-S
RAPHICA	AL RE	EPRESENT	ATION BELO	W:	Elevation: 762	2' MSL Surf	ace Slope:	0 deg.	+ + + + + + + + + + + + + + + + + + + +	Trend: N	I-S
RAPHICA	AL RE	EPRESENT	ATION BELO	W:		2' MSL Surf	ace Slope:	0 deg.		Trend: N	I-S
RAPHICA	AL RE	EPRESENT	ATION BELO	W:	<b>A</b>	2' MSL Surf	ace Slope:	0 deg.		Trend: N	I-S

Project Na	ame:	Richard - I	Hilardes		Logged By: MJ	G		Trench N	lo.: OTP-	9		
Project N	ımbe	r: 21077-0	1		Date: 7/22/202	1		Engineeri	na Dranar	dian.		jC
Equipmen	t: Ba	ckhoe			Location: See	Geotechnical I	Мар	Engineeri	ng Proper	ties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DE	SCRIPTION:					GEOLOGIC UNIT	uscs	SAMPL No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1.9 and rootle	5' - <mark>Sandy SII</mark> ets 3' - Quaterna	LT: light b	ented Fill (afu) rown, dry, loose Eolian Deposits : light gray, dry	s (Qye)		afu Qye	SM	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	2.8	
RAPHIC/	AL RE	EPRESENT	ATION BELO	w:	Elevation:	757' MSL	Surfa	ace Slope:	0 deg.		Trend: N	<b>I</b> -S
		-	-	+	<b>A</b>	-		+	+ + +	+	-	+ +
					B	/				-	-	
	-						+			-	-	
	-	-	-	+ ' '		_	_				_	

•	ame:	Richard - Hilardes		Logged By: MJG	Trench	No.: OTP-	10		
Project N	umbe	er: 21077-01		Date: 7/22/2021				LC	jC
Equipmer	t: Ba	ckhoe		Location: See Geotechnical Map		ing Proper	ties:	Geotech	nical, Ind
Geologic Attitudes	Unit	SOIL DESCRIPTION	N:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B C	(cow manure) cont @ 1' to 2' Sandy SIL to loose @ 2' to 3' - Quaterna	own, loose, s ent .T: light brow ary Young Eo	ted Fill (afu) lightly moist, very high organics on, slightly moist, medium dense blian Deposits (Qye) y, slightly moist, medium dense	afu Qye	ML SM	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3' B-1 @ 1'-3'	71.9 33.8 11.0	
							1		
RAPHIC	AL RE	EPRESENTATION BE	LOW:	Elevation: 760' MSL Su	rface Slope:	0 deg.		Trend: S	670E

Project Na	ame:	Richard - Hilardes		Logged By: MJG		Trench N	lo.: OTP-	11		
Project Nu	ımbe	r: 21077-01		Date: 7/22/2021		Engineeri	na Branar	tion	LC	jC
Equipmen	t: Ba	ckhoe		Location: See Geotech	nical Map	Engineeri	ng Proper	ties.	Geotech	•
Geologic Attitudes	Unit	SOIL DESCRIPTION	N:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	@ 0.5' to 3' - Quaterr	ND with Or ion and cov nary Young	ganics: light brown to g		afu Qye	SM	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	4.0 4.4 2.6	
RAPHICA	AL RE	PRESENTATION BEL	.OW:	Elevation: 760' MSI	. Surf	ace Slope:	0 deg.	+	Trend: N	I-S
				<b>B</b>						
							1 1 1			
<del>                                     </del>	-				-	-		Grour	Depth: 3' ndwater: n/a illed: 7/22/21	

Project Na	me:	Richard - Hila	ardes		Logged By: MJG		Trench N	lo.: OTP-	12		
Project Nu	ımbe	r: 21077-01			Date: 7/22/2021		Engineerin	es Branar	tion	LC	jC
Equipment	t: Ba	ckhoe			Location: See Geotechni	cal Map	Engineerii	ng Proper	ties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESC	RIPTION:				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B C	@ 0' to 1' - \overline{\text{C}} dead vegeta @ 1' to 2' - \overline{\text{Q}} @ 1' to 2' - \overline{\text{S}} dense to local	ow Manuration and ration and raternary andy SILT ose, roots	re (Organic roots · Young Eo : light bro	nted Fill (afu) cs): loose, slightlly moist, plian Deposits (Qye) wn/gray, slightly moist, n htly moist, medium dense	iedium	afu Qye	SM ML	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	90.5 26.6 28.5	
<b>FRAPHIC</b> A	AL RE	PRESENTAT	ION BELO	W:	Elevation: 761' MSL	Surfa	ace Slope:	0 deg.		Trend: N	165E
3RAPHIC <i>A</i>	AL RE	PRESENTAT	ION BELO	ow:	<b>A</b>	Surfa	ace Slope:	0 deg.		Trend: N	165E
3RAPHIC <i>A</i>	AL RE	EPRESENTAT	TION BELO	)W:	_	Surfa	ace Slope:	0 deg.		Trend: N	165E

Project Na	ame:	Richard - Hilar	des	Lo	gged By: MJG		Trench N	lo.: OTP-	13		
Project N	ımbe	r: 21077-01		Da	nte: 7/22/2021		Engineeri	na Duanau	4100	> LC	C
Equipmen	t: Ba	ckhoe		Lo	cation: See Ge	otechnical Map		ng Propen	iles:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCR	RIPTION:	·			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	dense @ 1.5' to 3.5' -	ty SAND with - Quaternary	n Gravel Young E	- light gray/bro	wn, dry, mediur (Qye) tly moist, clean	Qye	SM	G-1 @ 0'-1' G-2 @ 1'-2' G-3 @ 2'-3'	1.4 5.2 4.6	
RAPHICA	AL RE	PRESENTATIO	ON BELOW:		Elevation: 76	2' MSL Su	ırface Slope:	0 deg.		Trend: N	105W
+ + + +					<b>B</b>				Grou	Depth: 3.5' ndwater: n/a filled: 7/22/21	

Project N	ame:	Hilardes	Logged By: MJG		Trench N	lo.: TP-1I	3				
Project N	umbe	r: 21077-01	Date: 10/7/2021		Engineering Properti						
Equipmen	t: Bac	ckhoe	Location: See Geotechnica	I Мар	Engineerii	ng Proper	ties:	Geotech	nical, In		
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)		
		@ 10' to 0' - Artificial Fi	II (Af)		Af				, ,		
	С		D: light gray, some gravel, 0' is surface, 10' is approximate top o	f		SM	G-1 @ 8-7'				
	В	@ 6.5' to 5 ' - Manure/m woodchips, hay & grant	ulch decayed organics, dark brov avel	wn,		OL					
	A		gray overall, slightly moist to dry oodchips & trash, gray to light b			SM	G-2 @ 5-4'				
3RAPHIC	AL RE	PRESENTATION BELOW:	Elevation: ~780' MSL	Surfa	ace Slope:	35 deg.		Trend: N	122E		
+ + + +		+ + + + + + + + + + + + + + + + + + + +		10'	-		-	-			
				A	_		-	-			
				B	+		†	, , † .			
+ + +	+		©	B		<del>         </del>	-				

Project Na	ame:	Hilardes	Logged By: MJG	Trench N	lo.: TP-2B				
Project Nu	umbe	r: 21077-01	Date: 10/7/2021				<b>SLGC</b>		
Equipmen	t: Bac	khoe	Location: See Geotechnical Ma		ng Propertie	Si	Geotech	nical, In	
Geologic Attitudes	Unit	SOIL DESCRIPTION:	·	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
		@ 10' to 0' - Artificial F	ill (Af)	Af				(1 51)	
	A	@ 10' to 0' - SAND: yell	ow-light brown, dry, loose, gravel		SP	G-1 @ 6-5'			
	В	@ 0' - Sandy SILT: light	t brown/gray, traces of manure, dry,		SM	G-2 @ 0'			
GRAPHIC <i>i</i>	AL RE	PRESENTATION BELOW:	Elevation: ~775' MSL	Surface Slope:	35 deg.		Trend: N	85 <b>E</b>	
	_	+ +	+ + +	-					
+ + + + +				10'					
	- - -			-			-		
+ + + +	-		<b>A</b>	-		-	-		
	1	1					epth: 10'		

Backfilled: 10/7/21

Project Na	ame:	Hilardes	Logged By: MJG	Trench	No.: TP-3B					
Project N	umbe	r: 21077-01	Date: 10/7/2021	<b>-</b>			<b>EXECUTE</b>			
Equipmen	t: Bac	ckhoe	Location: See Geotechnical N		ring Propert	les:	Geotech	nical, Ir		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)		
		@ 10' to 0' - Artificial Fill (	Af)	Af				, ,		
	A		AND (dark brown) & Clay (dark grous) and the control of the contro	ray	SM	G-1 @ 6-5' G-2 @ 3-2' G-3 @ 0'				
RAPHICA	AL RE	PRESENTATION BELOW:	Elevation: ~780' MSL	Surface Slope	: 35 deg.		Trend: S	20W		
+ + + + +				10'		-				
+ + + +			<b>A</b>	0'		Total D	Depth: 10'			

Project Na	me: l	Hilardes		Logge	ed By: MJG			Trench N	lo.: TP-4B			
Project Nu	ımbeı	r: 21077-0	)1	Date: 10/7/2021		Engineering Proper		<b>SLG</b>				
Equipmen	t: Bac	khoe		Locat	ion: See Ge	eotechnical	Мар	Engineerii	ng Properti	esi	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DE	ESCRIPTION:					GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@ 9' to	o 0' - <u>Artificial Fill (</u>	<b>4</b> f)				Af				
	С	@ 9' to	o 6' - CLAY: dark bro	own, grou	ınd surface				CL	G-1 @ 6-5'		
	В	@ 6' to	o 3' - SILT: gray, slig	ghtly moi	st, layer of	pure silt			ML			
	A		o 0' - Silty SAND: Gr wn, red brown, sligh			gray, gray			SM	G-2 @ 3-2'		
										G-3 @ 0'		
RAPHIC/	AL RE	DRESENT	ATION BELOW:		levation: ~7	75' MSI	Surf	ace Slope:	45 dog		Trend: N	1955
				_		70 11102	Julie	ace olope.	-o ucg.		Trend. N	
			+ + + + + + + + + + + + + + + + + + + +			-		-		+		
	-			-		©	9'	-		-	-	
						<b>B</b>				Total	Conth: O'	
+ + + +	+						0'			Groun	Depth: 9' ndwater: n/a illed: 10/7/21	

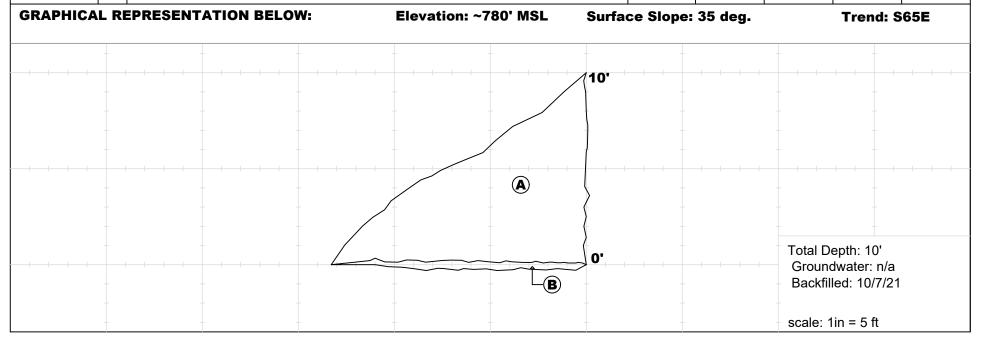
Project Na	ame:	Hilardes	Logged By: MJG	Trench N	o.: TP-5E	3		
Project Nu	ımbeı	r: 21077-01	Date: 10/7/2021	<b>F</b>	D		LC	jC
Equipmen	t: Bac	khoe	Location: See Geotechnical Map	<b>─</b> Engineerir	ig Propert	iles:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION:	1	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A B	<ul> <li>@ 10' to 0' - Artificial Fill (A</li> <li>@ 10' to 0' - Pure cow manu</li> <li>@ 0' - SILT: gray, moist, direction</li> </ul>	ure	Af	OL ML	G-1 @ 0'		
RAPHICA	AL RE	PRESENTATION BELOW:	Elevation: ~780' MSL Surfa	ace Slope:	45 deg.		Trend: N	5 <b>W</b>
			<b>A</b>					

Project Na	ame:	Hilardes	Logged By: MJG	Trench N	lo.: <b>TP</b> -6l	В		
Project Nu	umbe	r: 21077-01	Date: 10/7/2021		_		LC	16
Equipmen	t: Bac	ckhoe	Location: See Geotechnical Map	Engineeri	ng Proper	ties:	Geotech	nical, Inc
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE	MOISTURE (%)	DENSITY
		@ 9' to 0' - Artificial Fill (Af	)	Af				(PCF)
	A	@ 9' to 0' - Silty SAND: tan patches, dry, loose	overall, some gray & brown		SM	G-1 @ 5-4'		
	В	@ 0' - Silty SAND, light gray	y, dry, below stockpile			G-2 @ 0'		
GRAPHICA	AL RE	PRESENTATION BELOW:	Elevation: ~775' MSL Sui	face Slope:	35 deg.		Trend: E	- <b>W</b>
				-		-	-	
			<b>A</b>					
	-		0°		1 1 1	Grour	Depth: 9' ndwater: n/a illed: 10/7/21	
	_	+ +	+ + +	-		scale:	1in = 5 ft	

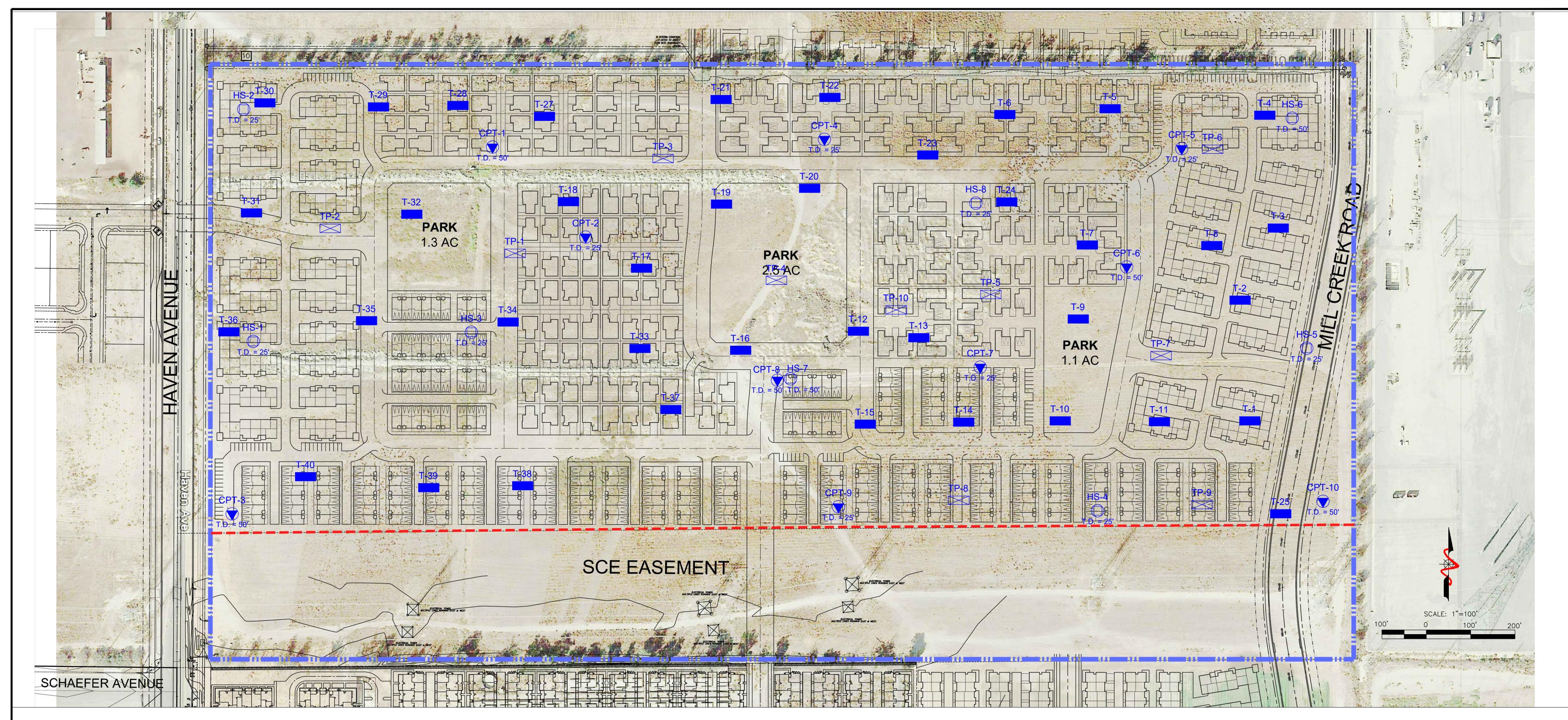
Project Na	me:	Hilardes	Logged By: MJG	Trench N	lo.: TP-7E	3	
Project Nu	ımbe	r: 21077-01	Date: 10/7/2021	Engineering Properties		1	
Equipmen	t: Ba	ckhoes	Location: See Geotechnical Map	– Engineeri	ng Proper	ies:	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAN	ИР No



<sub>l</sub> uipment	.: Бас	Knoes	Location: See Geotechnical Map					
Geologic Attitudes		SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@ 10' to 0' - Artificial Fill (A	<u>f)</u>	Af				
	A	@ 10' to 0' - Silty SAND with some gray patches & bro	n gravel: light tan overall with wn patches		SM	G-1@ 6-5'		
	В	@ 0' - SILT: gray, dry, below	stockpile		ML	G-2@ 3-2'		
						G-3@ 0'		



### Appendix C Geotechnical Subsurface Evaluation Data – Vander Eyk (17074-01)



## LEGEND



Approximate Location of Hollow Stem Boring, With Total Depth in Feet



Approximate Location of Cone Penetration Test (CPT) With Total Depth in Feet



Approximate Location of Geotechnical Trenches



Approximate Location of Trenches



Approximate SCE Easement Boundary



Approximate Limits of This Project

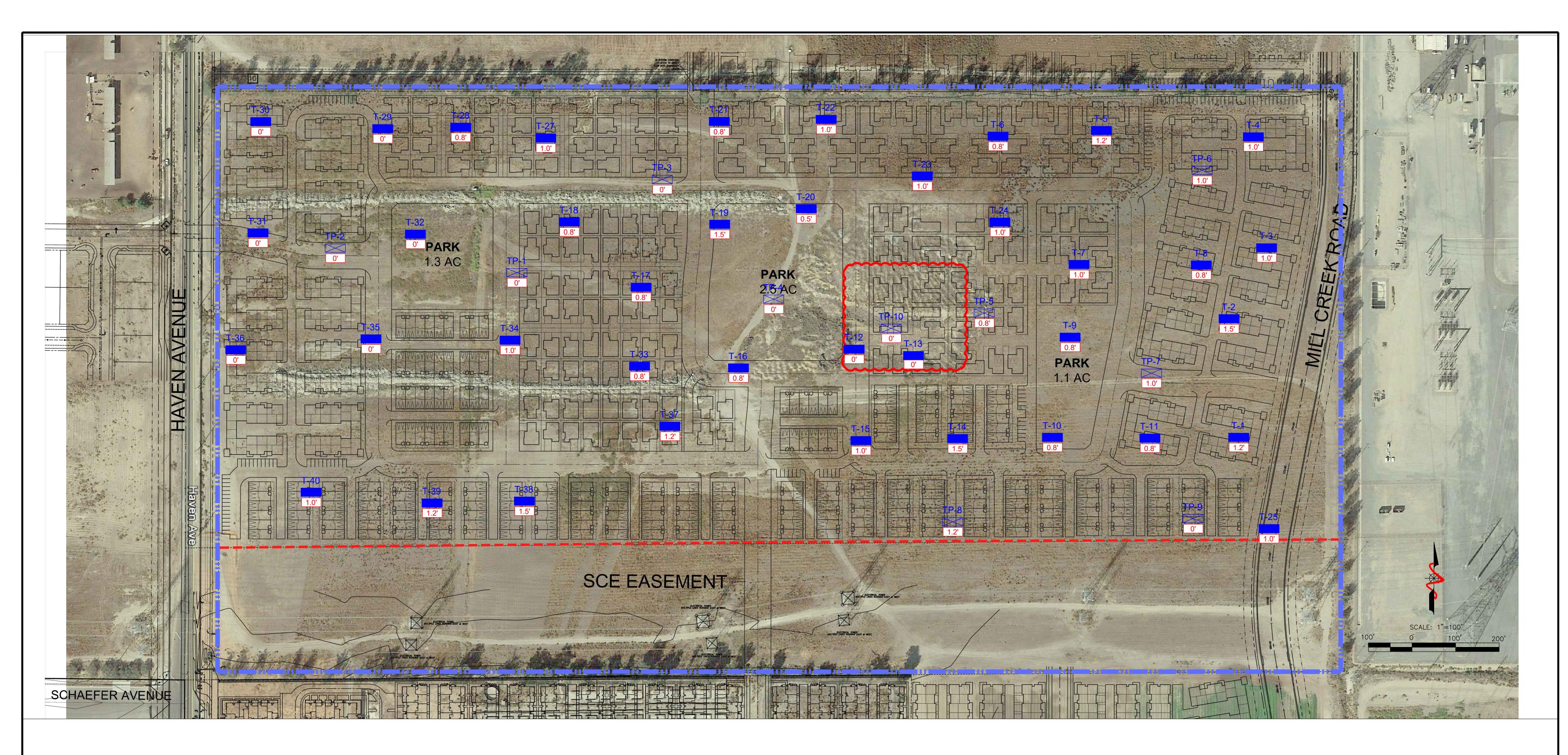


LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. A San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

# Geotechnical Exploration Location Map

CLIENT:
Richland Communities, Inc.
3161 Michelson Drive, Suite 425
Irvine, CA 92626

ROJECT NAME	Richland - VanderEyk	
ROJECT NO.	17074-01	
NG. / GEOL.	RLD/KTM	SHEET
CALE	1" = 100'	
ATE	August 2017	1 of 2



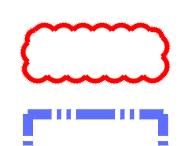
## LEGEND



Approximate Location of Geotechnical Trenches with Estimated Minimum Depth of Manure to be Removed, in Feet



Approximate Location of Trenches with Estimated Minimum Depth of Manure to be Removed, in Feet



Approximate SCE Easement Boundary

Approximate Location of Waste Water Pond Requiring Additional Organic Haul-Off (Removal Depths Estimated to be 5 feet)

Approximate Limits of This Project



LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. A San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

# Recommended Organics Removal Map

CLIENT:
Richland Communities, Inc.
3161 Michelson Drive, Suite 425
Irvine, CA 92626

PROJECT NAME	Richland - VanderEyk	
PROJECT NO.	17074-01	
ENG. / GEOL.	RLD/KTM	SHEET
SCALE	1" = 100'	_
DATE	August 2017	2 of 2

#### APPENDIX C

#### Laboratory Test Results

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution/Fines Content</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140). Where applicable, the portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D6913 (sieve).

Sample Location	Description	% Passing # 200 Sieve
HS-3 @ 7.5 ft	Silty Sand	37
HS-4 @ 5 ft	Silty Sand	29
HS-8 @ 10 ft	Sandy Silt	65

Atterberg Limits: The liquid and plastic limits ("Atterberg Limits") were determined per ASTM D4318 for engineering classification of fine-grained material and presented in the table below. The USCS soil classification indicated in the table below is based on the portion of sample passing the No. 40 sieve and may not necessarily be representative of the entire sample. The plot is provided in this Appendix.

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Soil Classification
HS-7 @ 15 ft	NP	NP	NP	ML

<u>Consolidation</u>: A consolidation test was performed per ASTM D2435. Sample (2.4 inches in diameter and 1-inch in height) was placed in a consolidometer and increasing loads were applied. The sample was allowed to consolidate under "double drainage" and total deformation for each loading step was

#### APPENDIX C

#### Laboratory Test Results (Continued)

recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height. The consolidation pressure curve is provided in this Appendix.

<u>Collapse/Swell Potential</u>: Collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The curves are presented in this Appendix.

<u>Direct Shear</u>: A direct shear test was performed on a driven sample. The ring samples were soaked for a minimum of 24 hours prior to testing. The samples were tested under various normal loads using a motor-driven, strain-controlled, direct-shear testing apparatus (ASTM D3080). The plot is provided in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-3 @ 2.5-5 ft	Sand with Silt	123.5	8.5
HS-4 @ 2.5-5 ft	Silty Sand	118.5	9.0

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-3 @ 2.5-5 ft	2	Very Low
HS-4 @ 2.5-5 ft	1	Very Low
HS-6 @ 2.5-5 ft	0	Very Low

<sup>\*</sup> Per ASTM D4829

<u>Soluble Sulfates</u>: The soluble sulfate content of select samples was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

#### APPENDIX C

#### Laboratory Test Results (Continued)

Sample Location	Sulfate Content, %
HS-3 @ 2.5-5 ft	< 0.02
HS-4 @ 2.5-5 ft	< 0.02

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm 544			
HS-3 @ 2.5-5 ft	544			
HS-4 @ 2.5-5 ft	104			

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	pН	Minimum Resistivity (ohms-cm)
HS-3 @ 2.5-5 ft	7.8	190
HS-4 @ 2.5-5 ft	6.3	737

TP-1	(0')*	TP-2	(0')*	TP-3	(0')*	TP-4	(0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	0.9	0.8'	2.2	1'	4.2	1'	0.6
1.2'	0.6	1.2'	0.4	1.5'	2.0	2'	0.6
2'	0.8	2'	0.4	2.2'	0.4	3'	0.3
	(0.8')*		(1')*	TP-7	` '	TP-8	` '
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8' 1.2'	9.8 0.6	0.8' 1.2'	15.8 0.6	0.8' 1.2'	13.7 0.9	0.8' 1.2'	10.8 3.9
2'	0.5	2.2'	0.6	2.2'	0.4	2.2'	0.9
_	(0')*		(0')*		1.2')*	T-2(	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1'	3.8	0.5'	1.5	0.8'	6.0	1.2'	10.1
1.5'	0.7	1.2'	1.0	1.5'	0.9	1.8'	2.0
2.5'	0.5			2'	0.4	2.2'	1.1
	(1')*		(1')*		1.2')*	T-6 (	· ·
Depth (ft) 0.8'	% Organics	Depth (ft) 1'	% Organics	Depth (ft) 0.8'	% Organics	Depth (ft)	% Organics
1.2'	11.4	1.5'	20.7 1.4	1.5'	6.8 0.3	0.8' 1.5'	9.4 0.7
2.2	0.8	2.5'	0.5	1.5	0.5	2.5'	0.5
	(1')*		0.8')*	T-9	(1')*		(0.8')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	9.9	0.8'	7.0	0.8'	8.0	0.8'	13.5
1.2'	0.3	1.2'	0.3	1.5'	0.3	1.2'	1.5
2'	0.4	<del></del> -	(01)*	2.5'	0.3	2.0	1.1
	(0.8')*		(0')*		(0')*	T-14	
Depth (ft) 0.8'	% Organics	Depth (ft) 0.5'	% Organics 0.7	Depth (ft) 0.5'	% Organics 0.7	Depth (ft) 1'	% Organics 9.3
1.2'	1.1	1.2'	0.4	1'	0.7	1.8'	1.1
2'	0.5	2'	0.4	1.5'	0.5	2.2'	0.8
T-15	(1')*	T-16	(0.8')*		(0.8')*		(0.8')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	16.0	0.8'	5.6	0.8'	5.7	0.8'	5.3
1.2'	0.8	1.2'	0.9	1.2'	0.7	1.2'	0.6
2'	0.5 (1.5')*	Т 20	(0.5')*	2'	0.6 (0.8')*	2'	0.5
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1'	5.8	0.5'	19.2	0.8'	12.6	0.8'	9.8
1.8'	2.4	1'	0.8	1.2'	2.2	1.2'	2.0
	•	1.5'	0.4	2'	0.4	2'	0.4
	(1')*		(1')*		(1')*	T-27	(1')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1'	52.0	1'	40.7	1'	10.6	0.8'	10.1
1.4'	0.8	1.5'	1.9	1.5'	0.8	1.2'	1.3
Т 20	(0.8')*	2'	0.7 (0')*	Т 20	(0')*	2' <b>T-31</b>	0.7
Depth (ft)		Depth (ft)		Depth (ft)	` ,	Depth (ft)	
0.8'	% Organics 5.8	0.5'	% Organics 2.1	0.5'	% Organics 0.2	0.8'	% Organics 2.6
1.2'	0.6	1'	0.6	1.2'	0.2	1.2'	1.1
		1.5'	0.3		0	2'	0.3
T-32	(0')*		(0.8')*	T-34	(1')*	T-35	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	2.4	0.8'	7.6	0.8'	22.0	0.8'	4.5
1'	3.9	1.2'	0.8	1.2'	0.7	1.5'	3.3
		1.8'	0.4			2'	0.3
	(0')*	T-37			(1.5')*	T-39	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	1.7	0.8'	13.2	1.2'	10.6	1.2'	5.9
1.2'	0.5	1.2' 2'	3.5 0.7	1.5'	0.8	1.5' 2'	1.0 1.4
T_40	(1')*	<u>Legend</u>	0.7			2	1.4
Depth (ft)	% Organics	LEGEHU	> 5%	Recommended	for Offsite Remova	al	
1'	13.1		2 to 5%			" ng with "Clean" Soil	s
1.2'	1.1		< 2%	"Clean" Soils		5 22 2.00 5011	
				l	anic Removal Depth i	in Feet.	
		Tah	le 5		t Name		VanderEyk
316			f Measured	Project	Number	1707	· ·
Geotech	nical, Inc.	-	ent vs Depth of		GEOL.	RLD	/KTM
				_	4		
		San	nple	Da	ate	Aug	g-17

				Geo	techr	nica	Bor	ing Log Borehole HS-1			
Date:	7/5/2	2017						Drilling Company: Cal Pac			
			Vande					Type of Rig: Limited Access Tracked Rig			
			er: 170					Drop: 30" Hole Diameter:	6"		
					~756' N			Drive Weight: 140 pounds			
Hole	Hole Location: See Geotechnical Map							Page 1 c	of 1		
								Logged By SHH			
			pe				<del>-</del>	Sampled By SHH			
( <del>L</del>		g	En	+=	<u> </u>	(%	qμ	Checked By RLD	əst		
5	(ft)	٦		lno	nsi	) e	Syl	Shooked By KEB	ĹΤ		
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test		
<u>`è</u>	ер	ä	ar	<u>ŏ</u>	<u>&gt;</u>	ois	SC		λb		
Ш		ဟ	S	Δ		Σ	n	DESCRIPTION	Η		
755-	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):			
	_		R-1	- 8	106.6	4.5	SP	@2.5' SAND: light brown, slightly moist, medium dense			
	_		112-1	8 9 9	100.0	4.5	OI	W2.5 GAND. light brown, slightly moist, medium dense			
	5 —	╽Ш	SPT-1	- 6		3.5	SM	@5' Silty SAND: grayish brown, slightly moist, medium			
750-	_			6 8 11		0.0	Olvi	dense			
	_		R-2	-	103.9	3.3	SP	@7.5' SAND: grayish brown, slightly moist, medium			
	-		N-2	6 10 14	103.9	3.3	SF	dense			
	10 —		SPT-2	3		8.3	SM	@10' Silty Fine SAND: light brown, moist, medium			
745-	_		-	3 5 6		0.0	J	dense			
	_			-							
	_			- -							
	15 —		R-3	5	105.1	14.6	ML	@15' Sandy SILT: light brown, moist, stiff			
740-	_			5 7 16	100.1	14.0	IVIL	Gro Sandy Cle 1: light Brown, moist, Still			
	_			-							
	_			-							
	20 —		CDT 2			0.4	CM	@201 Cilty Fine CAND, alive grey, mariet, madisum deman			
735-	_		SPT-3	5 6 7		9.4	SM	@20' Silty Fine SAND: olive gray, moist, medium dense			
	_			-							
	_			-							
	-		-	-							
730-	25 <del></del>		R-4	8 16 20	113.7	5.3		@25' Silty SAND: light brown, slightly moist, dense			
	_			- 20				Total Depth = 25'			
	_			-				Groundwater Not Encountered			
	-			-				Backfilled with Cuttings on 7/5/2017			
	30 —			-							
					OF TH	HIS BORING	AND AT TH	LY AT THE LOCATION  SAMPLE TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  DRIVES SAMPLE  DS MAXIMUM DENSITY	,		
					LOCA	TIONS AND		MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION  G GRAB SAMPLE  SPT STANDARD PENETRATION  S&H SIEVE AND HYDRO			



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV -#200 SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-2								
Date:	7/5/2	2017						Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
					~758' N			<b>Drive Weight:</b> 140 pounds	
Hole	Loca	tion:	See (	Geote	chnical	Мар		Page 1 c	of 1
			<u>_</u>		f)			Logged By SHH	
			pe		pd)	_	<u> </u>	Sampled By SHH	
Elevation (ft)		go	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test
o	(ft)	C	Z	no:	ınsi	<u>.</u>	Sy	,	<u>+</u>
⁄ati	Depth (ft)	Graphic Log	de	Blow Count	De	stul	SS		0
<u>6</u>	Эер	ja Ja	an	<u>ŏ</u>	١Ŋ	10is	SC	DECODIDATION	y y
Ш		0	(O)				ر	DESCRIPTION	
	0 _		-	-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
755-	- - -		R-1	3 5 8	107.0	5.5	SP	@2.5' SAND with Gravel: brown, slightly moist, medium dense	
	5 — -		SPT-1	3 3 3		4.7	SP-SM	@5' SAND with Silt: dark olive brown, slightly moist, loose	
750-	- -		R-2	6 14 11	101.9	5.2	SP	@7.5' SAND: grayish brown, slightly moist, medium dense	
	10 —		SPT-2	3 3 4		7.7	SM	@10' Silty fine SAND: brown, slightly moist, loose	
745-	-		-	-					
	15 — -		R-3	6 11 20	105.8	15.2	ML	@15' Sandy SILT:olive brown, moist, very stiff	
740-	- -			-					
	20 —		SPT-3	4 6 7		29.6		@20' Sandy SILT: light brown, very moist, stiff	
735-	_			-					
	25 — -		R-4	8 12 18	97.1	4.1		@25' Sandy SILT: light brown, slightly moist, very stiff	
730-	- - 30 —			- - -				Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017	
	2				OF TH SUBS LOCA	HIS BORING SURFACE C TIONS AND	G AND AT THE CONDITIONS N D MAY CHANG	LY AT THE LOCATION E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER G GRAB SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY G GRAB SAMPLE SA SIEVE ANALYSIS THE DATA  STANDARD PENETRATION SAH SIEVE AND HYDRO	



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-3											
	7/5/2							Drilling Company: Cal Pac				
			Vande					Type of Rig: Limited Access Tracked Rig				
			er: 170			401		Drop: 30" Hole Diameter:	6"			
					~758' N chnical			<b>Drive Weight:</b> 140 pounds Page 1 c	of 1			
noie	LUCAI	.1011.			Jillicai	ινιαρ			01 1			
			er		cf)		_	Logged By SHH				
Œ		စွာ	ä	t	у (р	(%	oqi	Sampled By SHH	st			
<u>,</u>	ţ)	Lo Lo	Ž		ısit	6) e	) Syn	Checked By RLD	_ 			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>6</u>	ept	гар	am	<u>o</u>	ry [	ois	SC		уре			
Ш		9	S	В		W	<u> </u>	DESCRIPTION	<u> </u>			
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):				
	_	B-1		-								
755-	_		R-1	6 8 8	103.8	2.7	SP	@2.5' SAND: dark brown, dry, medium dense	MD			
	_			8					EI CR			
	5 —	Ш	SPT-1	2 2 2 2		3.9	SP-SM	@5' SAND with Silt: olive brown, slightly moist, loose				
	_			<u> </u>								
750-			R-2	5	108.3	6.5	SM	@7.5' Silty SAND: dusky gray, slightly moist, medium	со			
730-				5 6 7				dense	-#200			
	10 —		SPT-2	7 3		11.3	ML	@10' Sandy SILT: light brown, moist, medium stiff				
	_		3F 1-2 \ 	3 3 3		11.3	IVIL	@ 10 Sandy SiE1. light brown, moist, medium sun				
	_		ļ .	-								
745-	_			-								
	4.5			-								
	15 —		R-3	10 7 10	106.5	6.6	SM	@15' Silty SAND: light brown, slightly moist, medium				
				10				dense				
740-	_			_								
	_			-								
	20 —		SPT-3	3		4.7		@20' Silty SAND with Gravel: light brown to gray,				
	_			3 6 8				slightly moist, medium dense				
	-			-								
735-	-			-								
	25 —											
	25 —		R-4	10 13 21	100.2	2.2	SP	@25' SAND: gray, dry, medium dense				
	_			<u>21</u>				Total Depth = 25'				
730-	_			-				Fotal Depth				
	_		-	-				Backfilled with Cuttings on 7/5/2017				
	30 —			-								
								LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR				
	$\geq$				LOCA	TIONS ANI		MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT' 3E AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS 5. THE DATA TEST SAMPLE EI EXPANSION INDEX	OMETER			



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

TEST SAMPLE GROUNDWATER TABLE

SIEVE AND HYDROMETE EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

				Geo	techi	nica	Bor	ing Log Borehole HS-4		
Date:	7/5/2	017						Drilling Company: Cal Pac		
			Vande					Type of Rig: Limited Access Tracked Rig		
			er: 170					Drop: 30" Hole Diameter:	6"	
					~756' N			Drive Weight: 140 pounds		
Hole	Locat	ion:	See (	Geote	chnical	Мар	T	Page 1 c	of 1	
			<u> </u>		÷			Logged By SHH		
			<del> </del>		)d)		00	Sampled By SHH	t l	
(H)	_	go-	<u>F</u>	⊒	ity	%)	mr	Checked By RLD	es	
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test	
vat	oth	hdı	l du		ă	stu	SS		96	
<u>e</u>	Эер	Gra	Sar	<u> </u>	)ry	۸oi	)S(	DESCRIPTION	Ŋ	
Ш		$\overline{}$	0,	╀╨			<b>-</b>			
755-	0 -			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):		
	_	3B-1	ODT 4	-			0.0	COSTONE		
	_		SPT-1	3 5 5		2.9	SP	@2.5' SAND: grayish brown, dry, loose	MD EI	
	_ =			7. 3					CR	
750	5 —	ш	R-1	6 7 9	105.3	5.8	SM	@5' Silty SAND: light olive brown, slightly moist, medium	SA	
750-				9				dense	СО	
			SPT-2	4		7.0		@7.5' Silty fine SAND: olive brown, slightly moist, loose		
				4 5 5						
	10 —		D 0	5	104.0	10.5		@401 Cilty CAND, alive brewer wegist readily and area		
745-	_		R-2	5 7 11	104.2	12.5		@10' Silty SAND: olive brown, moist, medium dense		
	_			-						
	_			-						
	_			-						
	15 —		SPT-3	4		7.9		@15' Silty SAND: grayish brown, slightly moist, medium		
740-	_			4 5 6				dense		
	_			-						
	-			-						
	00			-						
725	20 —		R-3	14 16 12	104.5	0.7	SP	@20' SAND: brown, dry, medium dense		
735-				12						
			[	_						
				_						
	25 —		SPT-4	7		20.7	SM	@25' Silty SAND: alive grove your maint madium dance		
730-	_		SF 1-4	X 7 11		20.7	SIVI	@25' Silty SAND: olive gray, very moist, medium dense		
	-			-				Total Depth = 25'		
	_			-				Groundwater Not Encountered		
	-			-				Backfilled with Cuttings on 7/5/2017		
	30 —			-						
								LLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR		
	$\geq$				SUBS LOCA	SURFACE C	ONDITIONS I	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA  TEST SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY SIEVE ANALYSIS		



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV #200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Geo	techr	nica	l Bor	ing Log Borehole HS-5	
Date:	7/5/2	017						Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
					~756' N			<b>Drive Weight:</b> 140 pounds	
Hole	Locat	ion:	See (	Geote	chnical	Map		Page 1 o	of 1
			_		if)			Logged By SHH	
			apr		od)		0	Sampled By SHH	ţ
#)	_			l t	ity	%)	m,	Checked By RLD	-es
ioi	(ft)	<u> </u>	<u>e</u>	ا کر کر	sue	Ire	S		of 1
vat	oth	aph	dμ	≥	, De	istu	SS		) e (
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
				+			_	@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
755-	_	_		-				go to 1.5. <u>additionally roung contail beposite (aye).</u>	
	-	<u>_</u>	SPT-1	- 3		3.5	SD SM	@2.5' SAND with Silt: olive brown, slightly moist, loose	
	_		SF 1-1	3 3 4		3.3	OF -OW	©2.3 SAND WITH SIR. Onve brown, slightly moist, loose	
	5 —								
750-	,		R-1	4 6 8	107.2	4.6	SP	@5' SAND with Gravel: brown, slightly moist, medium dense	
750	_			- 8 -				derise	
	_		SPT-2	4 7		3.7		@7.5' SAND: brown, slightly moist, medium dense	
	_			<u>/</u> 8					
	10 —		R-2	8	109.6	3.0	SM	@10' Silty SAND: brown, dry, medium dense	
745-	_			8 12 12	100.0	0.0		(a) to entry of the brown, ary, modition defined	
	_			-					
	_			-					
				-					
7.10	15 —		SPT-3	5 5 9		5.1	SP-SM	@15' SAND with Silt: brown, slightly moist, medium	
740-	_			<u>∱</u> ğ				dense	
	20 —			10	404.0		OD	2001 CAND with Crossely Eight brown days down	
735-			R-3	12 19 21	104.8	1.1	SP	@20' SAND with Gravel: light brown, dry, dense	
	_			- 21					
	_			-					
	-			-					
	25 —		SPT-4	4		12.9	SM	@25' Silty SAND: olive gray, moist, medium dense	
730-	_			X 5 7				3 37 7	
	_			-				Total Depth = 25'	
	_			-				Groundwater Not Encountered	
	20			-				Backfilled with Cuttings on 7/5/2017	
	30 —				<b>.</b>	0	ADDI ISS S	WAT THE LOCATION	
	>	1			OF TH	HIS BORING	3 AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: ETIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR  AAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,
					LOCA	TIONS AND THE PASS	MAY CHANG AGE OF TIME	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

R RING SAMPLE (CA Modified Sample G GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

				Geo	techr	nica	l Bor	ing Log Borehole HS-6	
Date:	7/6/2	017						Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
					~756' N			Drive Weight: 140 pounds	
Hole	Locat	ion:	See (	Geote	chnical	Мар		Page 1 c	of 2
			_		ĵť)			Logged By SHH	
			adr		od)		0	Sampled By SHH	,
Elevation (ft)	_	Graphic Log	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test
on le	(ft)	10	<del> </del>	Blow Count	sus	<u> </u>	Sy	-	of T
vat	Depth (ft)	hdı	ldu	≥	Ď	stu	SS		96
<u>e</u>	Эер	<u>J</u> ra	)   	30	٦ry	/oi	)S(	DESCRIPTION	Гур
Ш		)	0)	—Ш					
755-	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
	_	B-1		-					
	_		R-1	5 3	103.0	6.9	SP	@2.5' SAND: dark brown, slightly moist, very loose	EI
	_			1					
	5 —	Ш	SPT-1	2		5.2	SP-SM	@5' SAND with Silt: brown, slightly moist, loose	
750-	-			2 4 4					
	_		D 2	- 6	100.7	4.5		@7 FL CAND with City by a city by a city was divine	
	_		R-2	6 7 9	102.7	4.5		@7.5' SAND with Silt: brown, slightly moist, medium dense	
	-							usines	
745	10 —		SPT-2	3 4 5		9.4	SP	@10' SAND: brown, moist, loose	
745-	_			5 5					
	_			-					
				_					
	15 —				400.0			0.451.04315 111.0	
740-	15 _		R-3	3 8 20	100.6	3.9		@15' SAND with Gravel: brown to grayish brown, slightly moist, medium dense	
740	_			- 20				slightly moist, medium dense	
	_			_					
	_			-					
	20 —		SPT-3	4		5.5		@20' SAND: light brown, slightly moist, medium dense	
735-	_		01 1-3	XI в 10		0.5		©20 OAND. light brown, slightly moist, medium dense	
	_			-					
	_			-					
	-			-					
	25 —		R-4	7	111.4	9.4	ML	@25' Sandy SILT: mottled gray and brown, slightly	
730-	-			7 9 13				moist, stiff	
	-			-					
	_			-					
	-			-					
	30 —			-					
					OF TH	HIS BORING	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,
			-		SOBS	OURFACE C	CNDITIONS I	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	



OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

				Geo	techi	nical	Bor	ing Log Borehole HS-6	
Date:	7/6/2	2017						Drilling Company: Cal Pac	
			Vand					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
					~756' <b>N</b>			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 2 c	of 2
			_		_			Logged By SHH	
			Sample Number		Dry Density (pcf)		<del>-</del>	Sampled By SHH	
(#)		g	밀	+=	<u>&gt;</u>	Moisture (%)	USCS Symbol	Checked By RLD	est
Elevation (ft)	£	Graphic Log	Z	Blow Count	ısi	) e	Syl	Chocked by NEB	Type of Test
atic	<u>.</u>	Ϊį	l ble	l Ó	Oe	tur	လွ		0
<u>&amp;</u>	Depth (ft)	ğ	am	<u>ŏ</u>	<u>_</u>	ois	SC		ype
Ш		-				_		DESCRIPTION	É
725-	30		SPT-4	6 6		14.6	SM	@30' Silty SAND: olive brown, moist, medium dense	
725	_			Z\					
	_			_					
	_			-					
	25			_					
700	35 —		R-5	8 10 23	114.5	14.3		@35' Silty SAND: dark brown, moist, medium dense	
720-	_			23					
	_			-					
	_			-					
				-					
	40 —		SPT-5	12 17		5.2		@40' Silty SAND: light brown, slightly moist, dense	
715-	_			<u>1</u> 4					
	_			-					
	_			-					
	_			-					
	45 —		R-6	5	100.7	21.0		@45' Silty SAND: light brown, very moist, medium	
710-	_			5 10 14				dense	
	_			-					
	-			-					
	_			-					
	50 —		SPT-6	5 9		23.2	ML	@50' Sandy SILT: olive brown, very moist, very stiff	
705-	_			X 9 √ 13					
	_			-				Total Depth = 50'	
	-			-				Groundwater Not Encountered	
	_			-				Backfilled with Cuttings on 7/6/2017	
	55 —			-					
700-	_			-					
	_			-					
	_			-					
	_			-					
	60 —			-					
								ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y
	2							GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	METER



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV

				Geo	techi	nical	Bor	ing Log Borehole HS-7	
Date:	7/6/2	2017						Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
Proje	ct Nu	ımbe	er: 170	74-01				Drop: 30" Hole Diameter:	6"
					~756' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	3eote	chnical	Map		Page 1 c	of 2
			<u>_</u>		£			Logged By SHH	
		_	<del>ğ</del>		)d)		loc	Sampled By SHH	ţ
l (ft		ဝို	=	ınt	ity	%	m/	Checked By RLD	_es
iöi	Depth (ft)	Graphic Log	<u>e</u>	Blow Count	Dry Density (pcf)	<u>re</u>	USCS Symbol		Type of Test
·val	pth	l de	ᆈ	>	Ŏ	istı.	CS		ЭС (
Elevation (ft)	Del	G.	Sample Number	음	Dry	Moisture (%)	SN	DESCRIPTION	Туқ
755-	0							@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
755-		ļ -							
	_		R-1	10	109.2	11.6	SM	@2.5' Silty SAND: olive brown, moist, medium dense	
	_			10 8 11					
	5 —	Ш	SPT-1	4		2.8	SP	@5' SAND: grayish brown, dry, medium dense	
750-	_			4 4 7			<u> </u>	go o, g. ayion aronni, ary,canian acinco	
	_		R-2	- 7	99.1	2.1		@7.5' SAND: grayish brown, dry, medium dense	
	_		11-2	7 11 15	99.1	2.1		Grayish blown, dry, medium dense	
	10 —		CDT 25	7		3.8		@10' SAND with Croval, grow to brown, alightly maint	
745-	_		SPT-2	7 8 8		ა.0		@10' SAND with Gravel: gray to brown, slightly moist, medium dense	
	_			-					
	_			-					
	-		-	-					
740	15 —		R-3	4 6 10	94.8	21.3	ML	@15' SILT: olive brown, very moist, stiff	CN
740-	_			10					AL
	_								
	_			-					
	20 —		SPT-3	3		9.6	SM	@20' Silty SAND: olive brown, moist, loose	
735-	_			3 5 5				<u></u>	
	_			-					
	_			1					
	25 —		] [		400 /			00510 1 0117 1 1 1	
730-			R-4	8 8 12	102.1	21.4	ML	@25' Sandy SILT: dark brown, very moist, stiff	
	_			. 12					
	_			.					
	_			-					
	30 —			-					
					OF TI	HIS BORING	AND AT TH	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR DIRECT SHEAR DS MAYIMUM DENSITY	,
			-	5				MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	r



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

				Geo	techr	nical	Bor	ing Log Borehole HS-7	
	7/6/2							Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
					~756' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Seote	chnical	Мар		Page 2 o	of 2
			_		<del></del>			Logged By SHH	
			gu		<u>d</u>		00	Sampled By SHH	Į.
(H	_	6	l I	in t	<u> </u>	%)	'n	Checked By RLD	es
ion	(H)	<u>.</u> 2	e	ا ك	l sus	<u>e</u>	S		of T
vat	oth	句	ldu			str	CS		96 (
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30	-	SPT-4		_	14.3	SM	@30' Silty SAND: orange brown, moist, medium dense	
725-	30 _		7	4 5 6		14.5	OIVI	@30 Silty SAND. Grange brown, moist, medium dense	
	_			-					
	-			-					
	_			-					
	35 —		R-5	15 26 34	108.0	3.9	SP	@35' SAND: orangish brown, slightly moist, very dense	
720-	_			34					
	_			-					
	_			-					
	40			-					
715	40 —		SPT-5	10 15 20		3.4		@40' SAND with Gravel: brown, slightly moist, dense	
715-				20					
	_			_					
	45 —			4.5	400.0			CASLOAND Fold boson all ability market days	
710-	-		R-6	15 23 33	106.0	3.8		@45' SAND: light brown, slightly moist, dense	
	_			_ 33 -					
	_			-					
	_			-					
	50 —		SPT-6	1 14	115.9	6.9		@50' SAND: orangish brown, slightly moist, dense	
705-	_			14 17 15	110.5	0.5		GOO OAND: Ordingish brown, slightly moist, dense	
	_			-				Total Depth = 50'	
	-			-				Groundwater Not Encountered	
	_		-	-				Backfilled with Cuttings on 7/6/2017	
	55 <del></del>			-					
700-	_			-					
	_			-					
	_			-					
	-			-					
	60 —			-					
					OF TH	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,
								MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  CONTROL OF TAXABLE SA SIEVE ANALYSIS  CONTROL OF TAXABLE SA SIEVE ANALYSIS	METER



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

			(	Geo	techr	nica	l Bor	ing Log Borehole HS-8	
	7/6/2							Drilling Company: Cal Pac	
			Vande					Type of Rig: Limited Access Tracked Rig	
			er: 170					Drop: 30" Hole Diameter:	6"
			•		~756' N			Drive Weight: 140 pounds	
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 c	of 1
					(£)			Logged By SHH	
			   ape		od)		<u> </u>	Sampled By SHH	
Elevation (ft)		Graphic Log	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test
o	(ft)	C		l oʻ	SUS	ā	Sy	,	Į Į
/ati	Depth (ft)	phi	<u>d</u>	Blow Count	De	stu	်		e c
<u> </u>	Эер	ïa	l gal	8	)ry	10 <u>i</u>	<u> </u>	DECODIDATION	y Yp
ш		0	0)	Т —				DESCRIPTION	
755-	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
	_	<u> </u>		-					
	_		SPT-1	√ 4 6		2.6	SP	@2.5' SAND: grayish brown, dry, medium dense	
	_			8					
	5 —	Ш	R-1	4 4	103.4	5.5	ML	@5' SILT with Sand: olive brown, slightly moist, stiff	DS
750-	-			6					
	_		CDT 0	-		0.4	CM.	@7 El Cilty CAND, alive breven resist lesse	
	_		SPT-2	2 3 4		8.4	SM	@7.5' Silty SAND: olive brown, moist, loose	
	-		ĺ						
745-	10 —		R-2	4 6 7	95.7	5.0	ML	@10' Sandy SILT: olive brown, slightly moist, stiff	CO
745-				7					-#200
				_					
	_			_					
	15 —		CDT 3			0.6		@45! Canaly Cli To limbs brown alimbshy maries asiff	
740-	_		SPT-3	3 5 6		8.6		@15' Sandy SILT: light brown, slightly moist, stiff	
	_			-					
	_			-					
	_		-	-					
	20 —		R-3	6	98.9	4.2	SM	@20' Silty SAND: light brown, slightly moist, medium	
735-	_			11 17				dense	
	-			-					
	_			-					
	-			-					
700	25 —		SPT-4	√ 4 6		6.9		@25' Silty SAND: light brown, slightly moist, medium	
730-				<b>/</b> \				dense	
				_				Total Depth = 25'	
								Groundwater Not Encountered Backfilled with Cuttings on 7/6/2017	
	30 —		[	_				Daskinoa war oakango on 170/2017	
					ZIHT.	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					OF TH	HIS BORING	G AND AT TH	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY MAXIMUM DENSITY	Y
					LOCA	ATIONS ANI	MAY CHAN	GE AT THIS LOCATION G G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA STANDARD PENETRATION S&H SIEVE AND HYDROC TEST SAMPLE FL FYPANSION INDEX	



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE GROUNDWATER TABLE

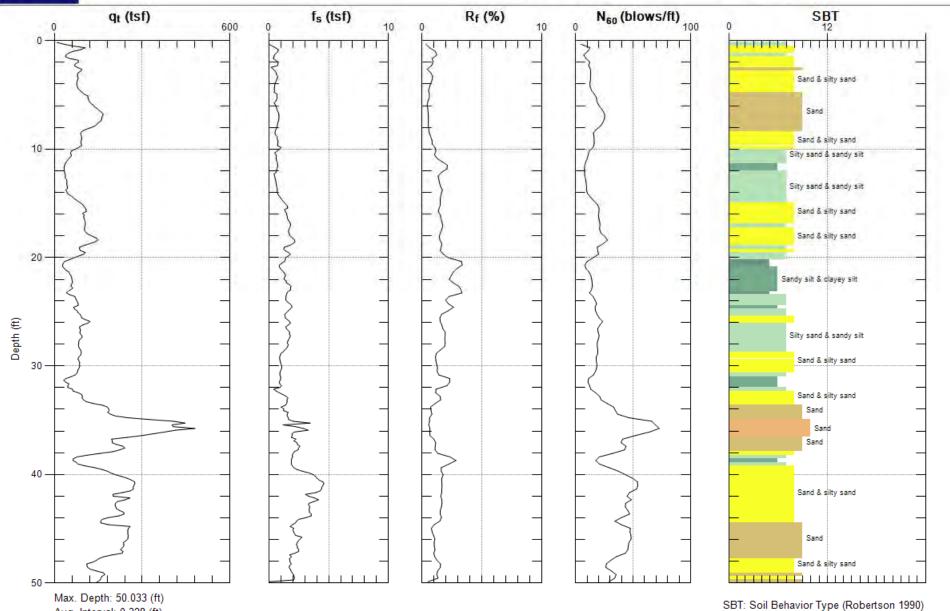
SIEVE AND HYDROMETE!
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPS/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200



#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-1 Date: 7/5/17 12:24

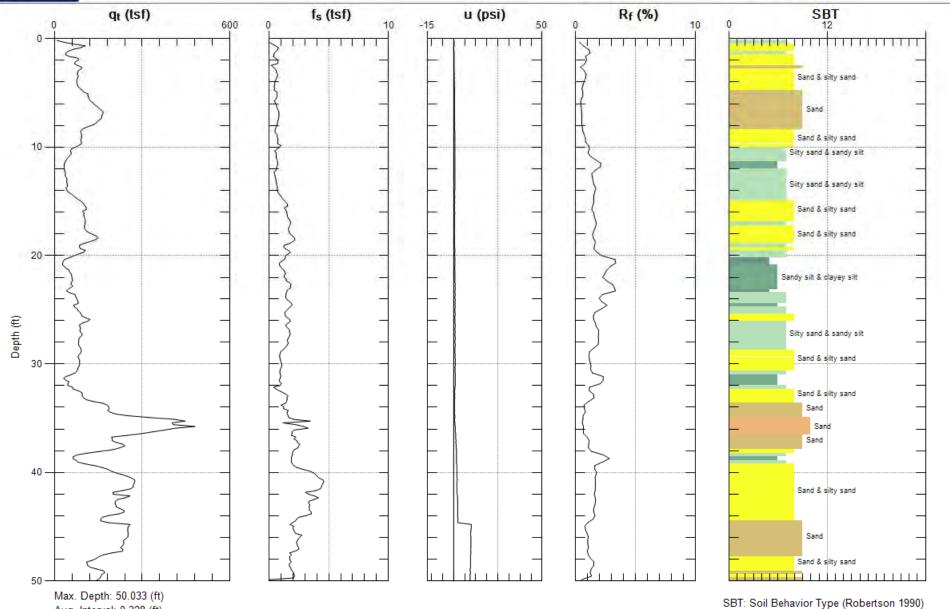




#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

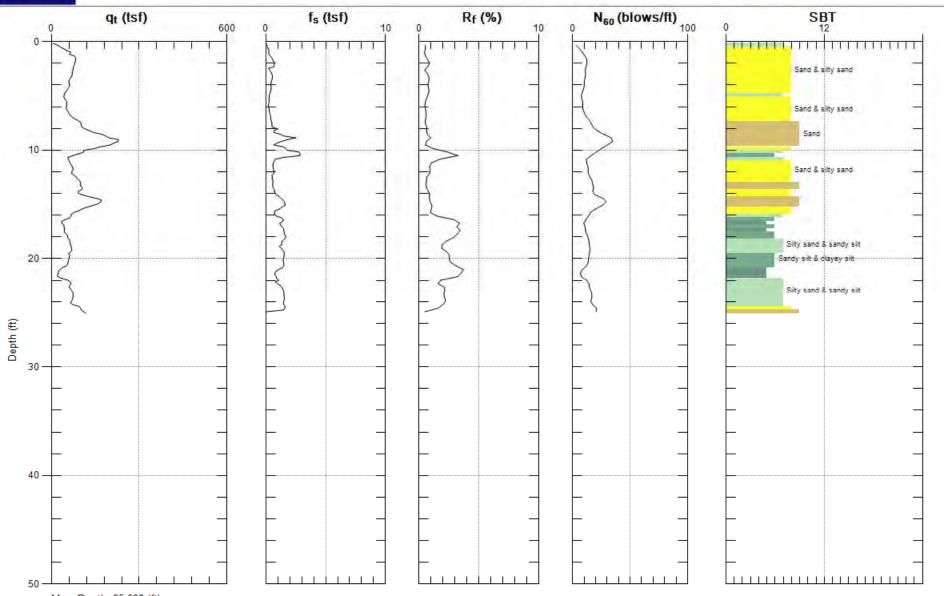
Sounding: CPT-1 Date: 7/5/17 12:24





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-2 Date: 7/5/17 11:14



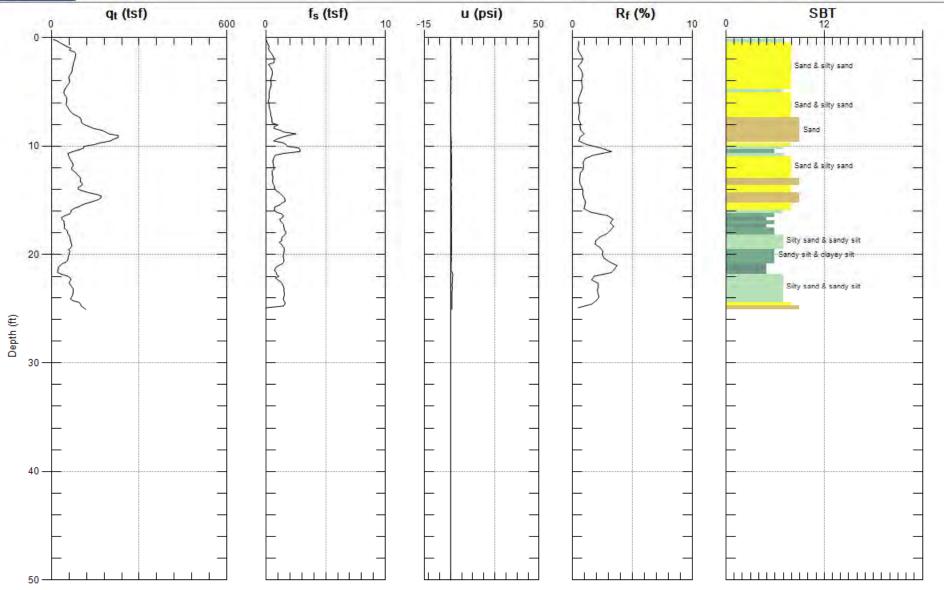
Max. Depth: 25.098 (ft) Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-2 Date: 7/5/17 11:14



Max. Depth: 25.098 (ft) Avg. Interval: 0.328 (ft)

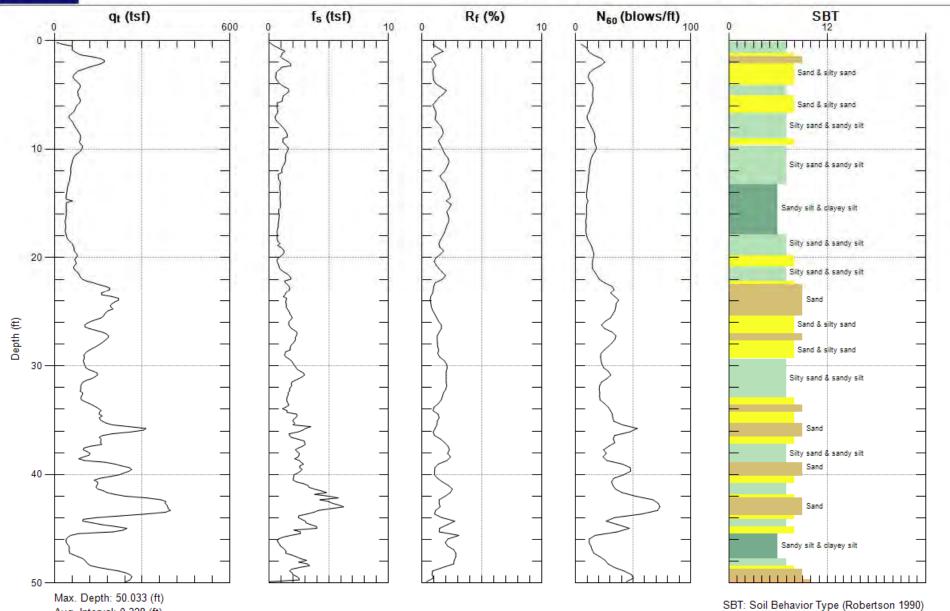
SBT: Soil Behavior Type (Robertson 1990)



#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

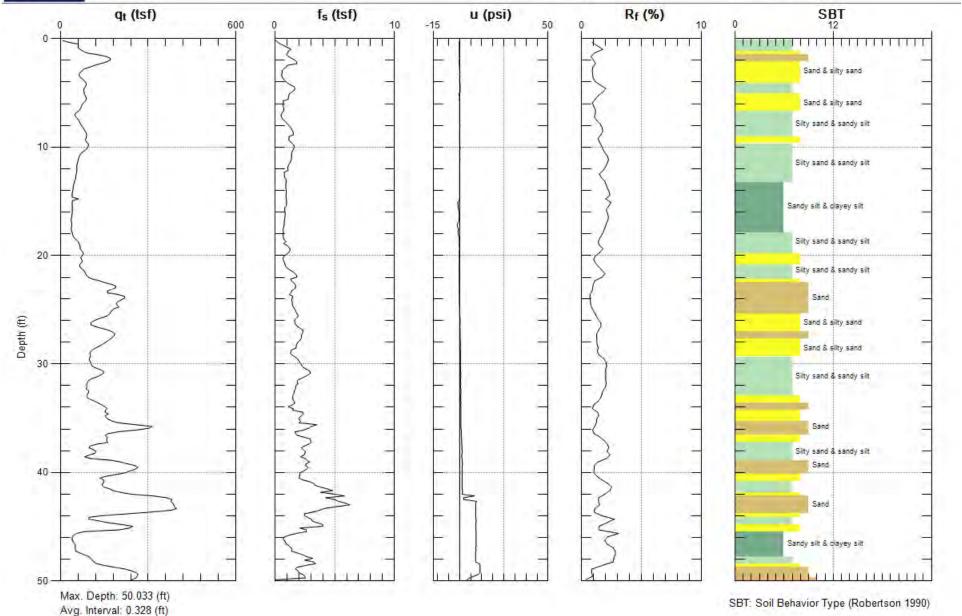
Sounding: CPT-3 Date: 7/5/17 01:10





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

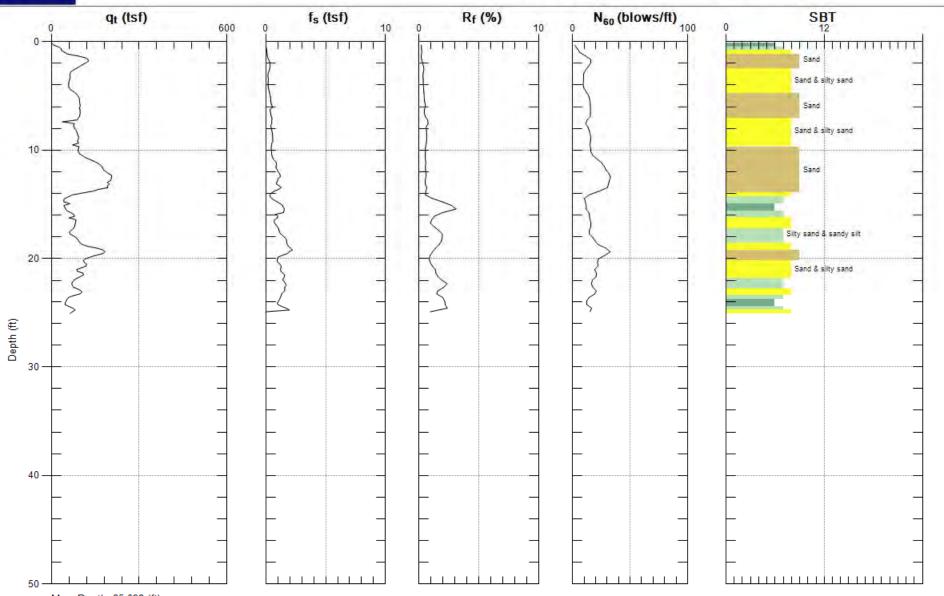
Sounding: CPT-3 Date: 7/5/17 01:10





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-4 Date: 7/5/17 11:59



Max. Depth: 25.098 (ft) Avg. Interval: 0.328 (ft)

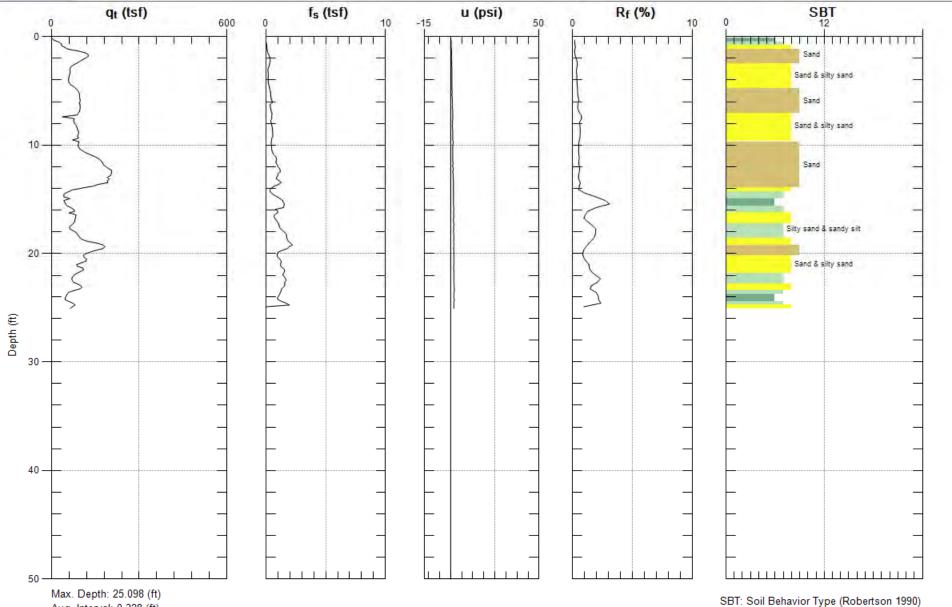
SBT: Soil Behavior Type (Robertson 1990)



### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-4 Date: 7/5/17 11:59

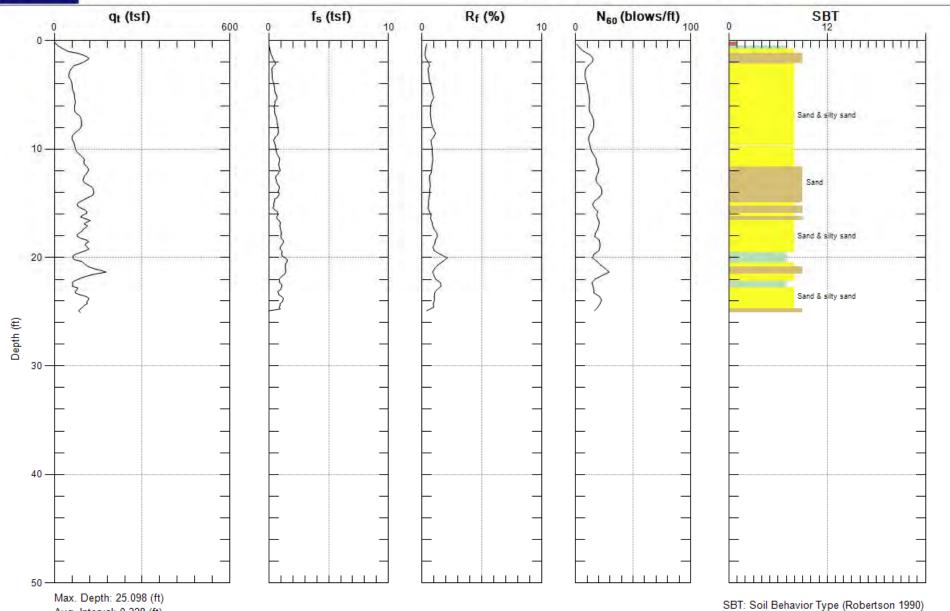




### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

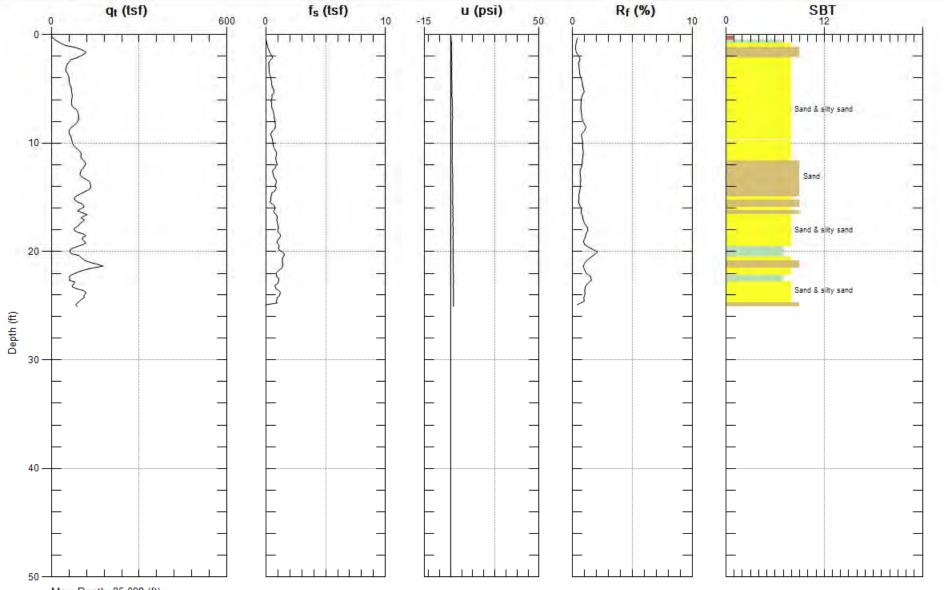
Sounding: CPT-5 Date: 7/5/17 09:40





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-5 Date: 7/5/17 09:40



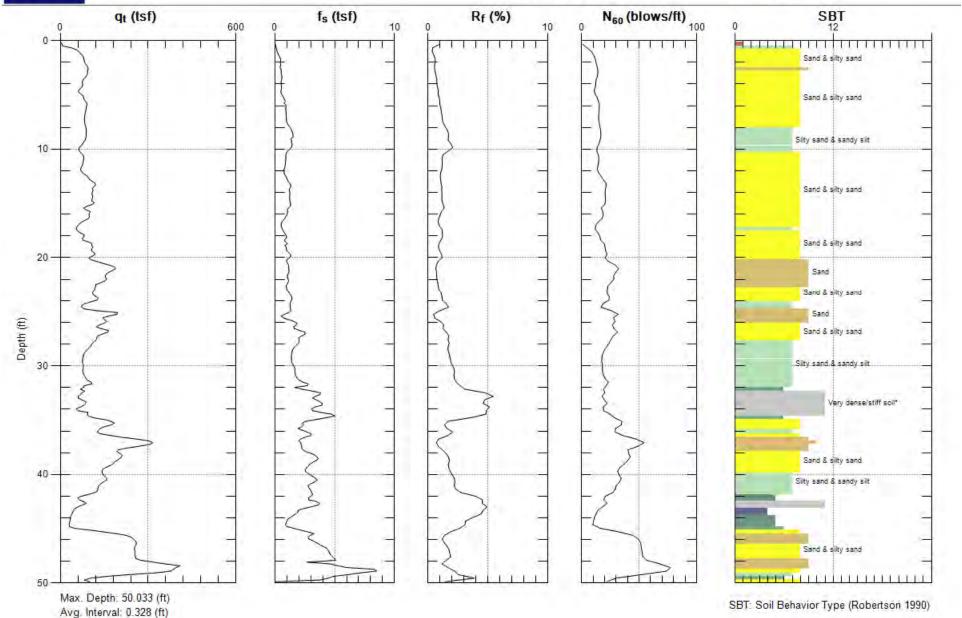
Max. Depth: 25.098 (ft) Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

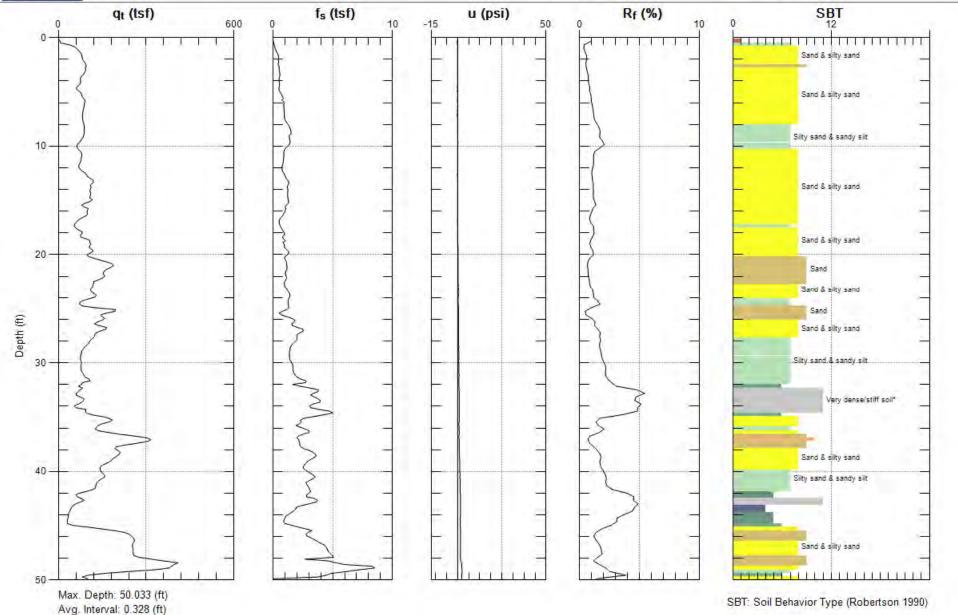
Sounding: CPT-6 Date: 7/5/17 09:03





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

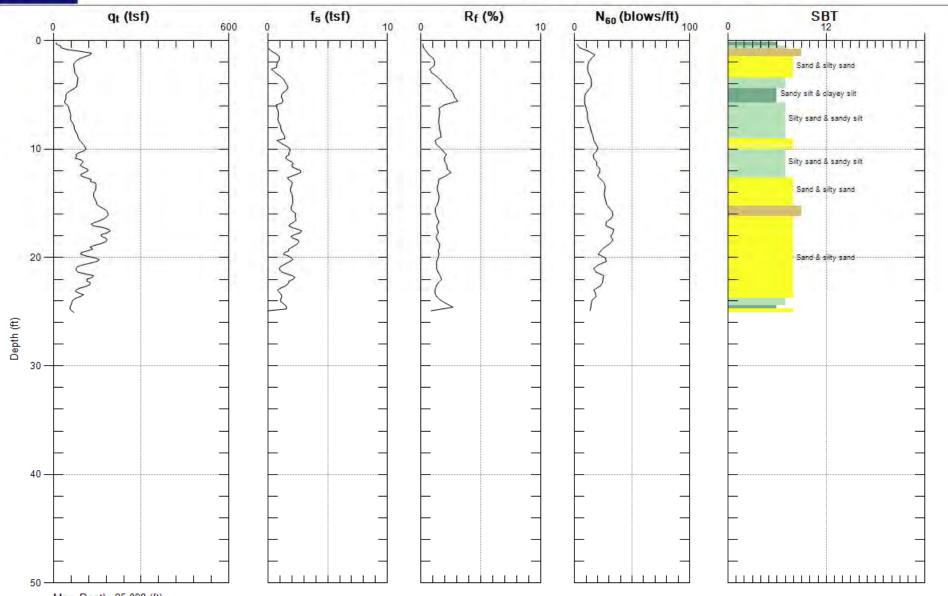
Sounding: CPT-6 Date: 7/5/17 09:03





Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-7 Date: 7/5/17 10:05



Max. Depth: 25.098 (ft) Avg. Interval: 0.328 (ft)

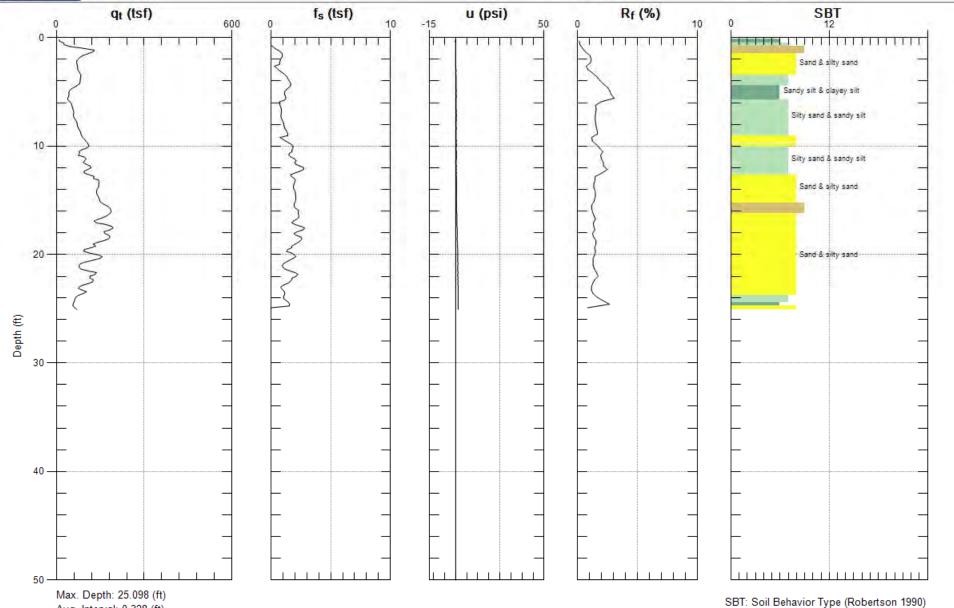
SBT: Soil Behavior Type (Robertson 1990)



### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-7 Date: 7/5/17 10:05

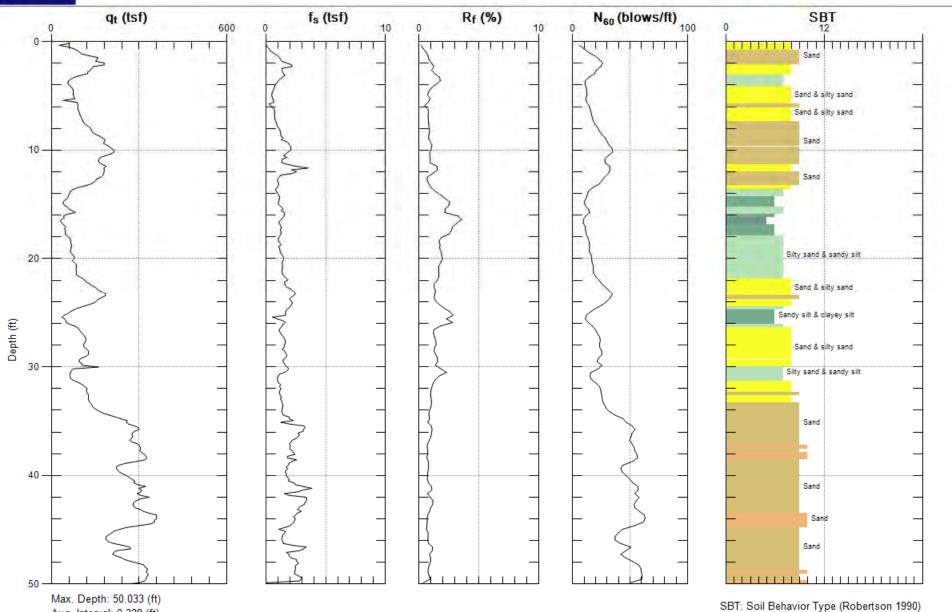




### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-8 Date: 7/5/17 10:30

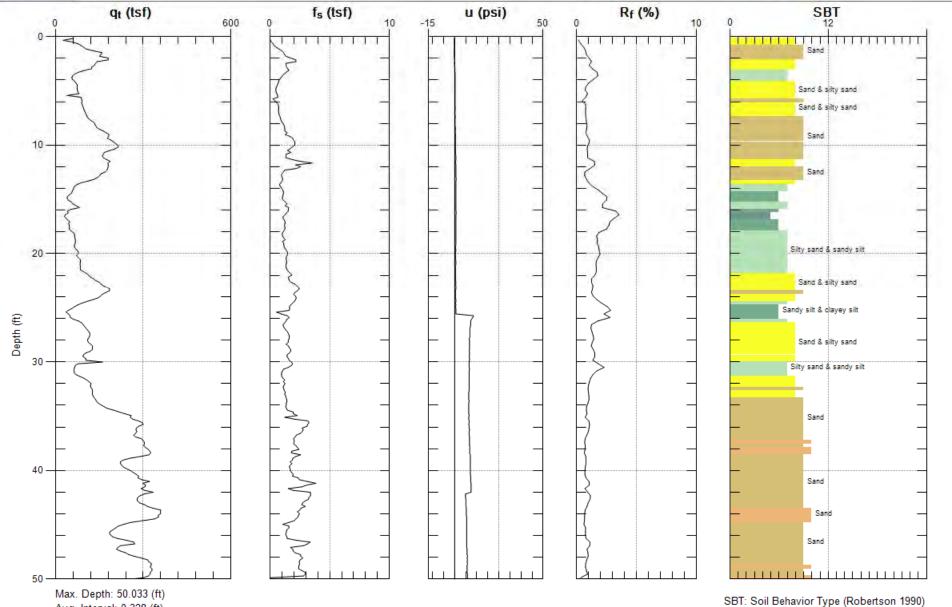




#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-8 Date: 7/5/17 10:30

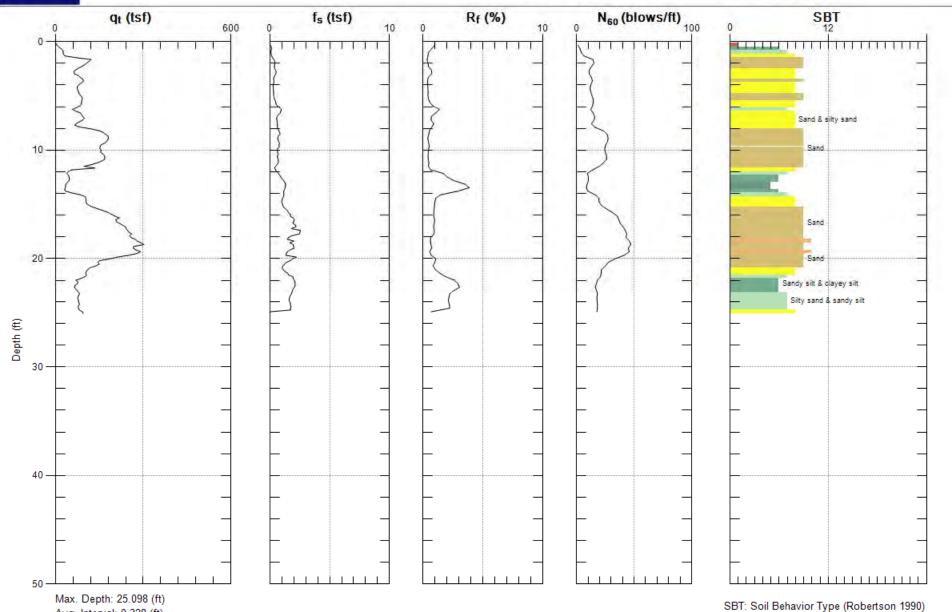




#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-9 Date: 7/5/17 07:39

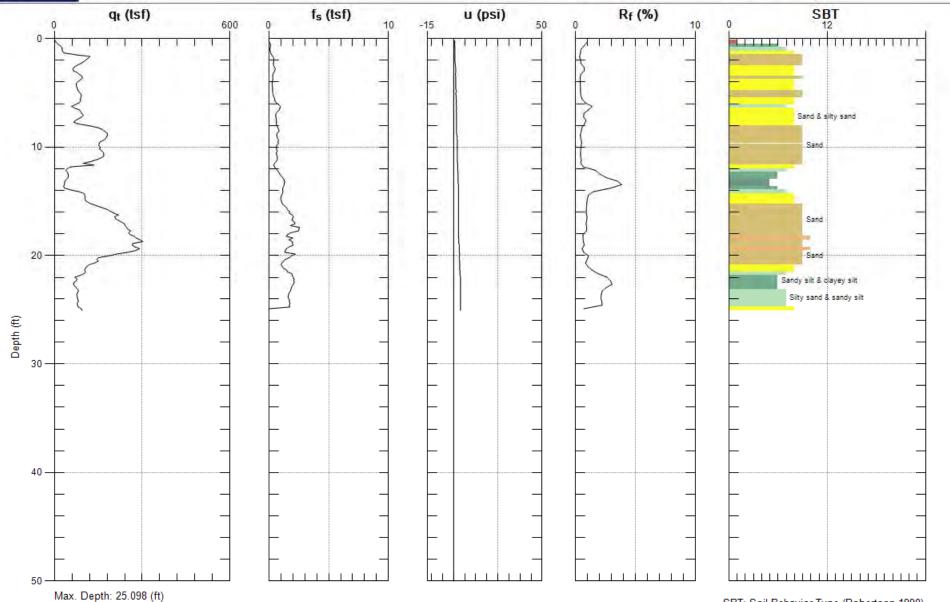




### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-9 Date: 7/5/17 07:39

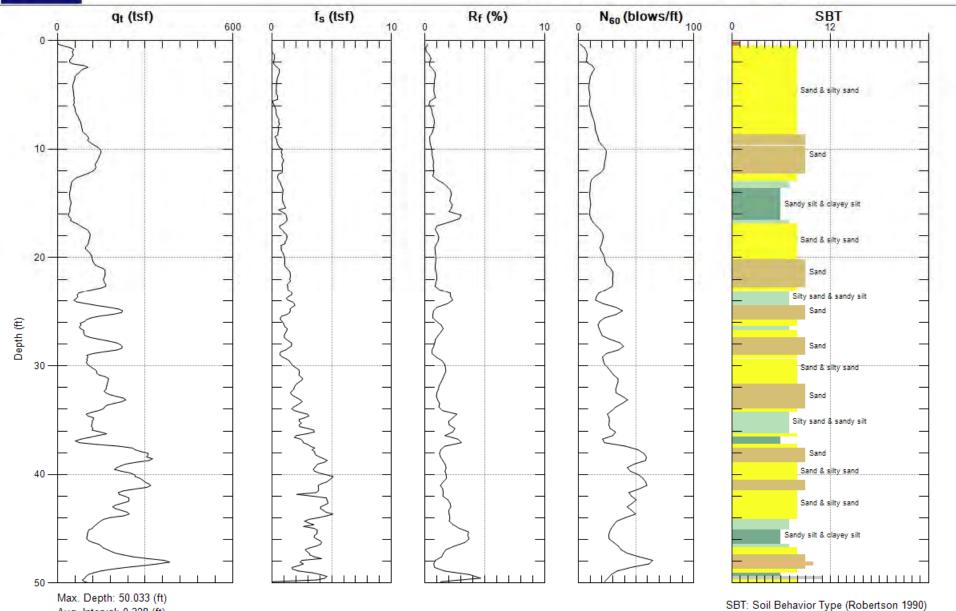




#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-10 Date: 7/5/17 08:24



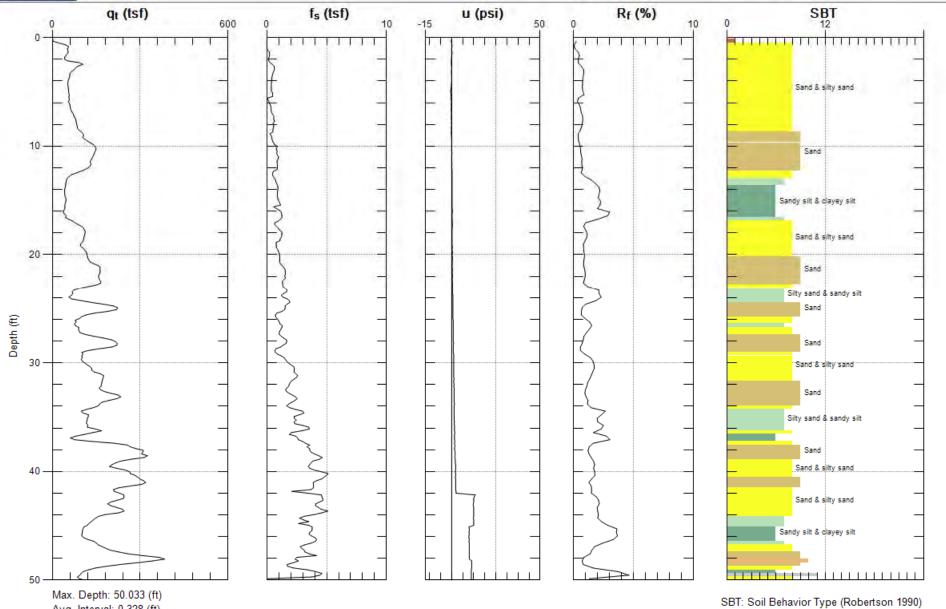


Avg. Interval: 0.328 (ft)

#### LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-10 Date: 7/5/17 08:24



Project Name: VanderEyk	Logged By: KTM	Trench No: TP-1	
Project Number : 17074-01	Date: 6/26/2017	Engine oring Dropoution	
Equipment: Case Backhoe	Location: See Geotechnical Map	Engineering Properties:	Geotechnie

.da.b	pilienti dase Backiloe		it. Case backing						
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	A	@ 0' to TD - Quaternary Young		Qye					
	A	@ 0' to 1' - Silty SAND to Sandy rootlets	SIL1: light brown, ary, loose;						
	В	@ 1' to 3' - SAND with some Sildense	t: light brown, moist, moderately			B-1 @ 2' to 5'			
	С	@ 3' to TD - SAND with few Gramoist, slightly dense	vels: light to moderate brown,						

GRAPHICAL REPRESENTATION BELOW:		Elevation : 754 ' MSL	Surface Slope: 0 deg.	Trend: 80W
	<b>B C</b>			
				Total Depth: 5.5' Groundwater: None Backfilled: 6/26/2017
_		+		scale : 1 in = 5 ft

Project Na	me:	VanderEyk	Logged By: KTM	Trench N	o: TP-2			
Project Nu	Project Number : 17074-01  Equipment: Case Backhoe  Date : 6/26/2017  Location: See Geotechnical M		Date: 6/26/2017		P4*			
Equipmen			Location: See Geotechnical Map	─ Engineerin	ig Properti	es:	Geotechnic	
Geologic Attitudes	Unit	SOIL DESCRIPTION:			uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	moist, moderately dense; r @ 1' to TD - Fine SAND: ligh	e Silt: light brown, dry to slightly potlets; slightly indurated nt brown, slightly moist grades to riable; zone from 1' to 2' is faintly	Qye				

GRAPHICAL REPRESENTATION BELOW: Elevation : 756 ' MSL Surface Slope: 0 deg. Trend: EW

B

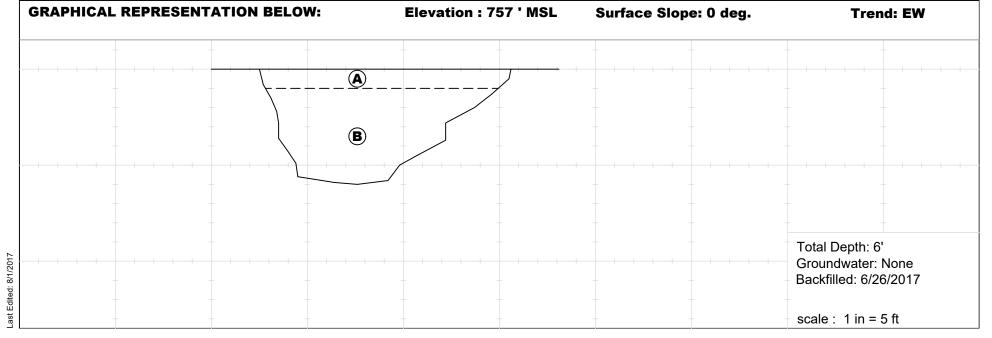
Total Depth: 8'
Groundwater: None
Backfilled: 6/26/2017
scale : 1 in = 5 ft

Project Name: VanderEyk	Logged By: KTM	Trench No: TP-3
Project Number : 17074-01	Date: 6/26/2017	Engineering Properties
		Engineering Properties:



Equipment: Case Backhoe	Location: See Geotechnical Map
-------------------------	--------------------------------

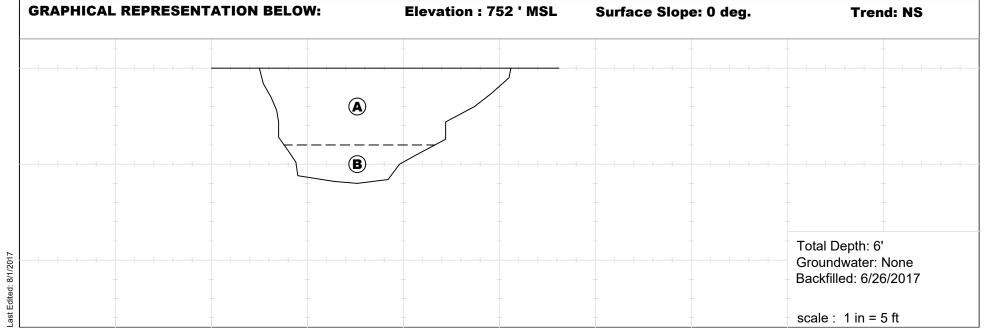
-	pinenti Gase Backiloe		Location occ occionnoa map					
Geologic Attitudes	nit	SOIL DESCRIPTION:		GEOLOGIC USCS		SAMPLE No	MOISTURE (%)	DENSITY
Attitudes	В	@ 0' to TD - Quaternary Young @ 0' to 1' - SAND with Silt: ligh loose to moderately dense; rod @ 1' to TD - SAND: light brown	t brown, dry to slightly moist, otlets	Qye		B-1 @ 3' to 5'	(78)	(PCF)



Project Name: VanderEyk	Logged By: KTM	Trench No: TP-4	
Project Number : 17074-01	Date: 6/26/2017	Frankrassina Bransation	
Equipment: Case Backhoe	Location: See Geotechnical Map	Engineering Properties:	Geote



-4								
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	very dry; roots	It: light brown, dry, loose to urated with rootlets to 4'; upper 1'	Qye				
	В	@ 4' to TD - SAND (fine): light   moderately dense; friable	brown, slightly moist to moist,					



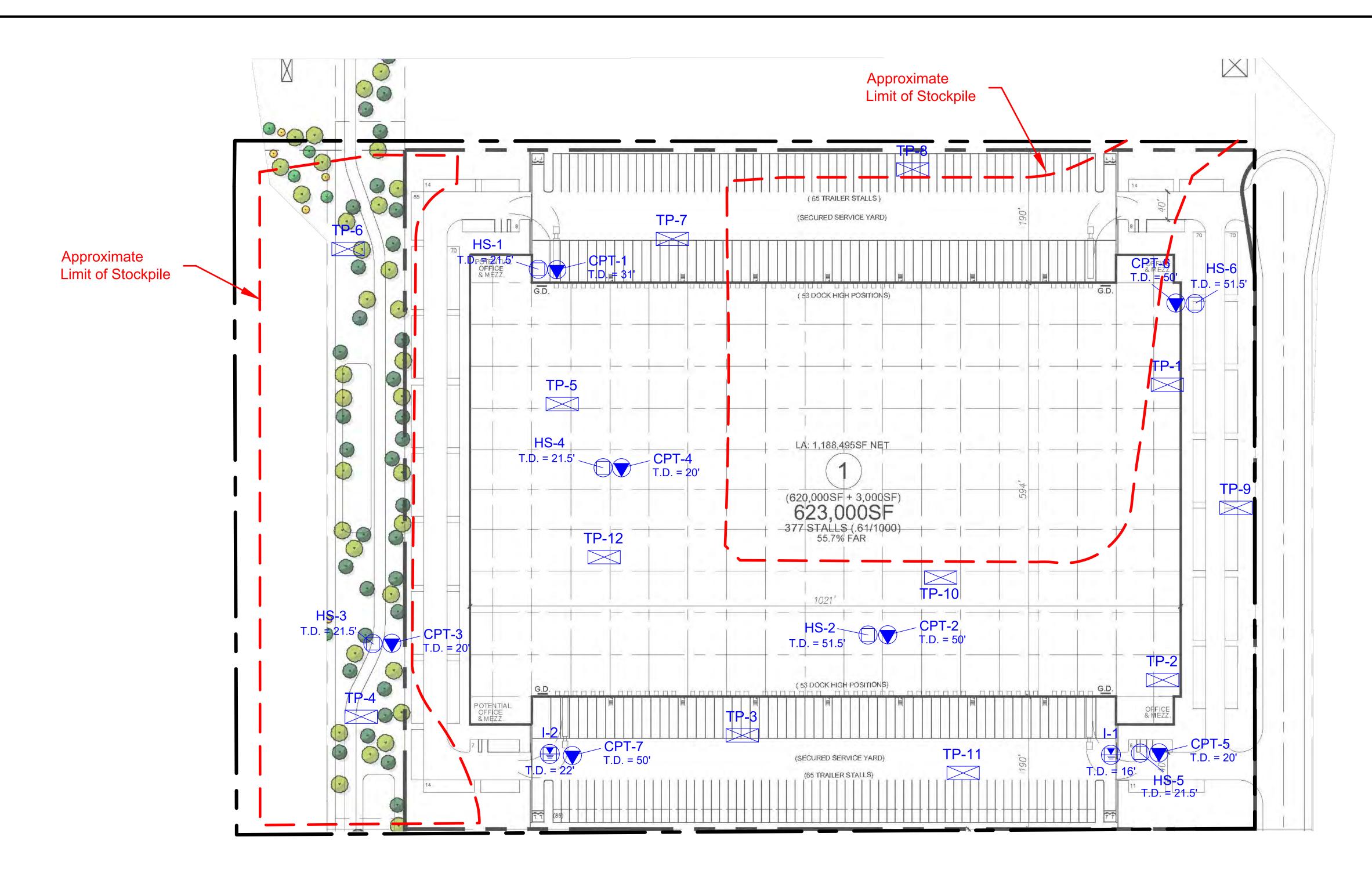
Project Name: VanderEyk  Project Number : 17074-01  Equipment: Case Backhoe		VanderEyk	Logged By: KTM	Trench N	lo: TP-5			
		r : 17074-01	Date: 6/26/2017				LC	jC
		se Backhoe	Location: See Geotechnical Map	Engineeri	Engineering Properties:		Geotechnical, I	
Geologic Attitudes			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A B C	<ul> <li>@ 0' to 0.8' - Organic la</li> <li>@ 0.8' to 1.5' - SAND w</li> <li>layer</li> <li>@ 1.5 to TD - SAND: lig</li> </ul>	Young Eolian Deposits: lyer ith some SILT: light brown; organic-rich ht brown, slightly moist to moist, loose to logenous; few rootlets to 2'	Qye				
SDA BILLOA	L RE	PRESENTATION BELOW	: Elevation : 752 ' MSL Suri	face Slope:	0 deg.	l	Trend: E	W

Total Depth: 6'
Groundwater: None
Backfilled: 6/26/2017

scale: 1 in = 5 ft

**©** 

Last Edited: 8/1/2017



\*See Sheet 3 for Additional Shallow Test Pit Locations

HS-6

T.D. = 21.5'

I-2

T.D. = 22'

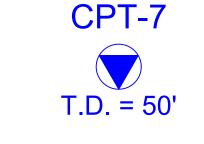
TP-12

**LEGEND** 

Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet

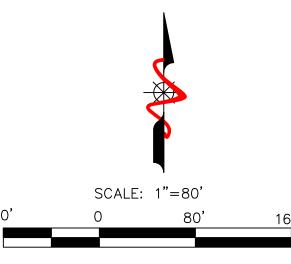
Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical



Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Limits of This Report

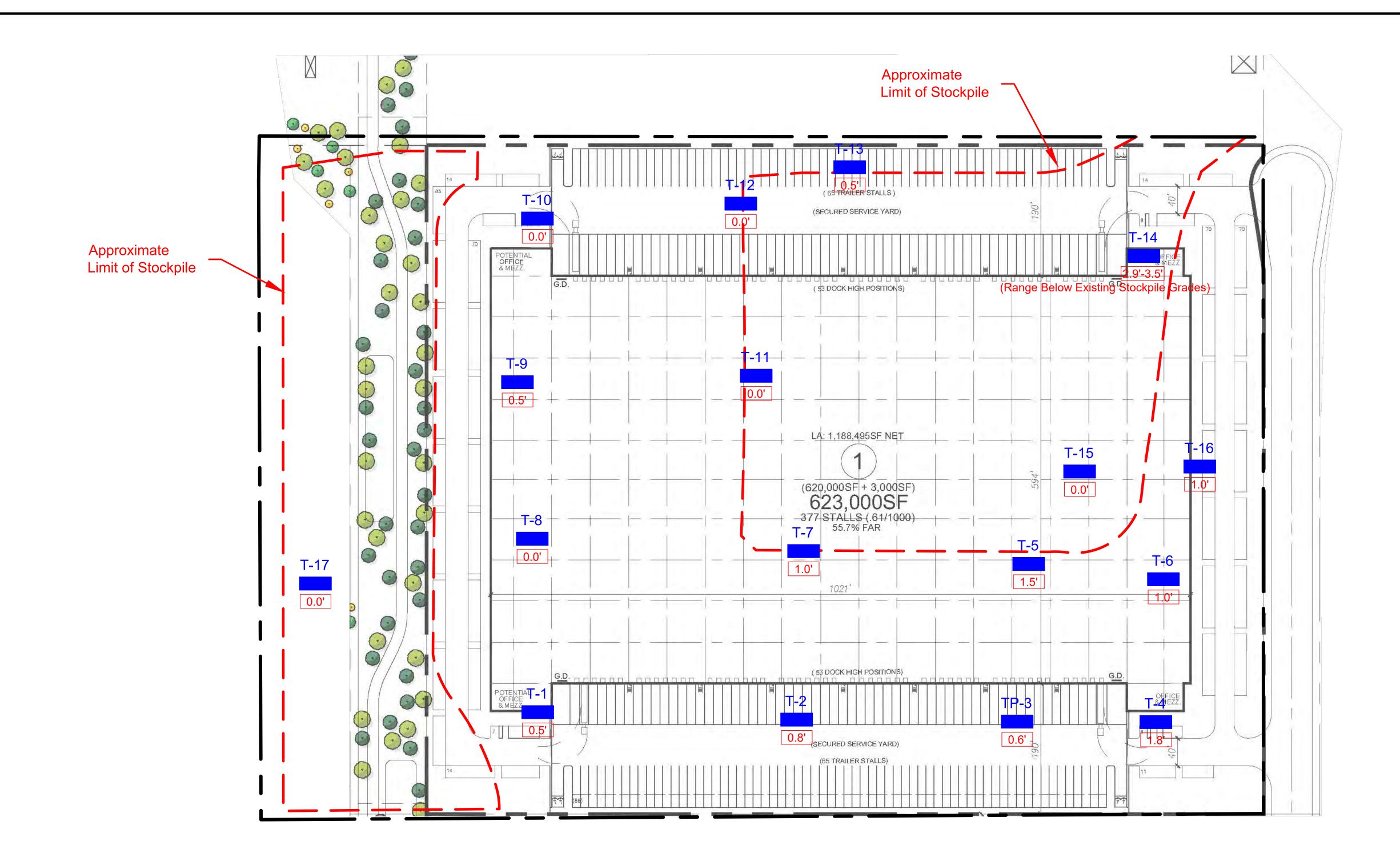




LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Exploration Location Map
With Conceptual Plan

PROJECT NAME	MCBC - Brookfield	
PROJECT NO.	20246-01	
ENG. / GEOL.	RLD	SHEET
SCALE	1" = 80'	
DATE	August 2021	2 of 3



\*See Sheets 1 and 2 for Boring, Infiltration Test, CPT and Geotechnical Trench Locations

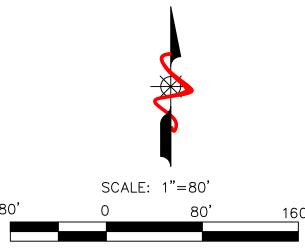
### **LEGEND**

T-17

0.0'

Approximate Location of Organics Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet

— — Approximate Limits of This Report





LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

### Recommended High Organic "Soil" Export Map

PROJECT NAME	MCBC - Brookfield	
PROJECT NO.	20246-01	
ENG. / GEOL.	RLD/ARN	SHEET
SCALE	1" = 80'	_
DATE	August 2021	3 of 3

#### <u>APPENDIX C</u>

#### **Laboratory Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140).

Sample Location	Description	% Passing # 200 Sieve
HS-1 @ 5.0 ft	Silty Sand	34
HS-2 @ 2.5 ft	Silty Sand	36
HS-3 @ 5.0 ft	Sandy Silt	71
HS-6 @ 7.5 ft	Silty Sand	43
I-1 @ 14 ft	Sandy Silt	61
I-2 @ 1-5 ft	Silty Sand	34
I-2 @ 20 ft	Sand with Silt	8

<u>Collapse/Swell Potential</u>: Collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The curves are presented in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-4 @ 2 to 5 ft	Silty Sand	113.0	11.5
HS-6 @ 2 to 5 ft	Silty Sand	104.5	12.5

#### APPENDIX C

#### **Laboratory Test Results (Continued)**

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-4 @ 2 to 5 ft	1	Very Low
HS-6 @ 2 to 5 ft	0	Very Low
I-2 @ 1-5 ft	0	Very Low

<sup>\*</sup> Per ASTM D4829

<u>Soluble Sulfates</u>: The soluble sulfate content of select sample was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

Sample Location	Sulfate Content, %
HS-4 @ 2 to 5 ft	< 0.02
I-2 @ 1-5 ft	< 0.03

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-4 @ 2 to 5 ft	148
I-2 @ 1-5 ft	120

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	рН	Minimum Resistivity (ohms-cm)
HS-4 @ 2 to 5 ft	7.63	1,480
I-2 @ 1-5 ft	8.53	1,994

#### APPENDIX C

#### **Laboratory Test Results (Continued)**

<u>Organic Matter Content of Soils</u>: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in Table 9.

# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Colonial Tested By: G. Bathala Date:

Project No.: 16163-01 Checked By: J. Ward Date:

Boring No.: HS-6 Sample Type: Ring Sample No.: R-2 Depth (ft.) 7.5

Sample Description: Light olive brown silty sand (SM)

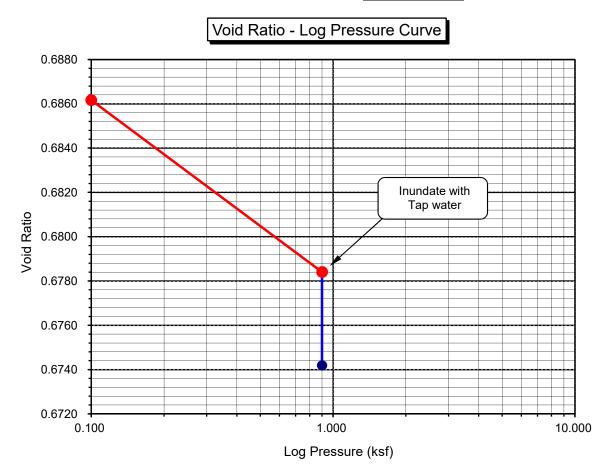
Initial Dry Density (pcf):	100.0
Initial Moisture (%):	9.04
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2702
Diameter(in):	2.415

Final Dry Density (pcf):	100.7
Final Moisture (%) :	23.0
Initial Void Ratio:	0.6862
Specific Gravity(assumed):	2.70
Initial Saturation (%)	35.6

07/16/19

07/25/19

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2702	1.0000	0.00	0.00	0.6862	0.00
0.900	0.2638	0.9936	0.18	-0.64	0.6784	-0.46
H2O	0.2613	0.9911	0.18	-0.89	0.6742	-0.71



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

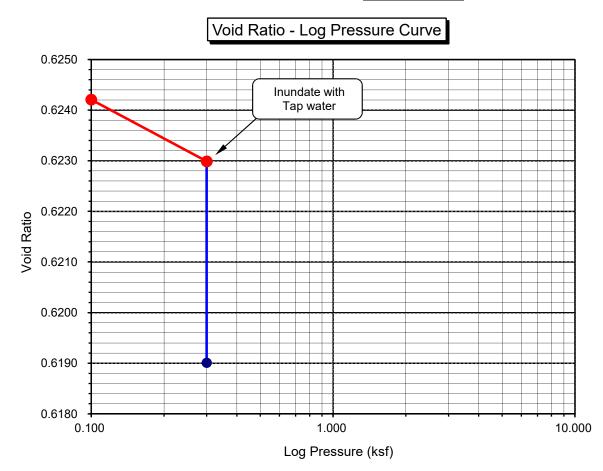
Project Name: Colonial Tested By: G. Bathala Date: 07/16/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-2 Sample Type: Ring Depth (ft.) 2.5

Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	103.7	Final Dry Density (pcf):	104.1
Initial Moisture (%):	4.44	Final Moisture (%) :	18.8
Initial Length (in.):	1.0000	Initial Void Ratio:	0.6249
Initial Dial Reading:	0.3294	Specific Gravity(assumed):	2.70
Diameter(in):	2.415	Initial Saturation (%)	19.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3290	0.9996	0.00	-0.04	0.6242	-0.04
0.300	0.32735	0.9980	0.09	-0.21	0.6230	-0.12
H2O	0.3249	0.9955	0.09	-0.45	0.6190	-0.36



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name:ColonialTested By:G. BathalaDate:07/17/19Project No.:16163-01Checked By:J. WardDate:07/25/19

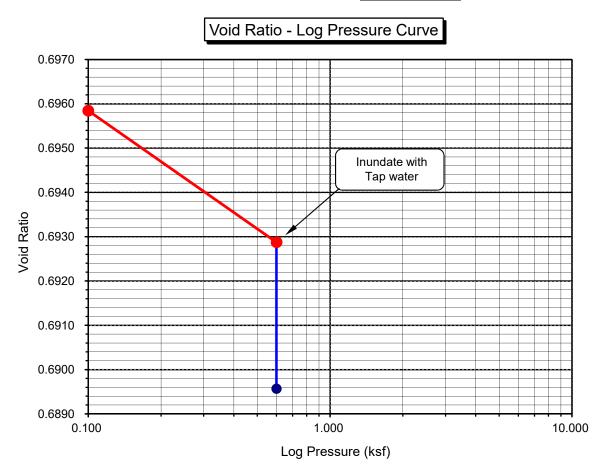
Boring No.: HS-3 Sample Type: Ring Sample No.: R-1 Depth (ft.) 5.0

Sample Description: Olive silt with sand (ML)s, organic material noted

Initial Dry Density (pcf):	99.4
Initial Moisture (%):	10.70
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3151
Diameter(in):	2.415

Final Dry Density (pcf):	99.8
Final Moisture (%) :	25.9
Initial Void Ratio:	0.6962
Specific Gravity(assumed):	2.70
Initial Saturation (%)	41.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3149	0.9998	0.00	-0.02	0.6958	-0.02
0.600	0.31245	0.9974	0.07	-0.27	0.6929	-0.20
H2O	0.3105	0.9954	0.07	-0.46	0.6896	-0.39



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Colonial Tested By: G. Bathala Date: 07/17/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

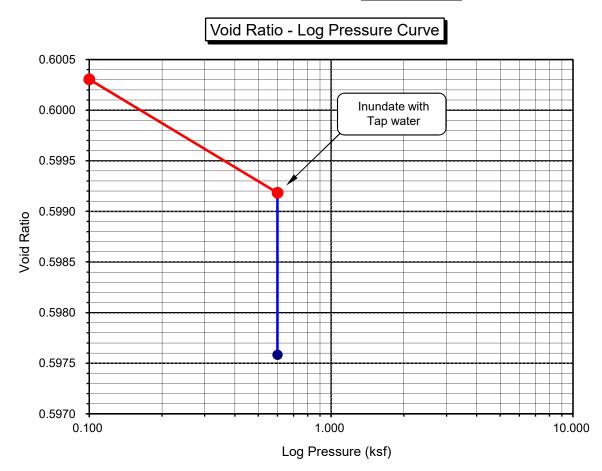
Boring No.: HS-1 Sample Type: Ring Depth (ft.) 5.0

Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	105.3
Initial Moisture (%):	5.30
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2910
Diameter(in):	2.415

Final Dry Density (pcf):	105.5
Final Moisture (%) :	18.5
Initial Void Ratio:	0.6003
Specific Gravity(assumed):	2.70
Initial Saturation (%)	23.8

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2910	1.0000	0.00	0.00	0.6003	0.00
0.600	0.2888	0.9978	0.15	-0.22	0.5992	-0.07
H2O	0.2878	0.9968	0.15	-0.32	0.5976	-0.17



Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-6 Depth (feet): 7.5

Sample No.: R-2

Soil Identification: <u>Light olive brown silty sand (SM)</u>

		Moisture Content of Total Air - Dry Soil	
Container No.:	XY	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	595.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	248.2	Wt. of Container No (g)	1.0
Dry Wt. of Soil (g)	347.0	Moisture Content (%)	0.0

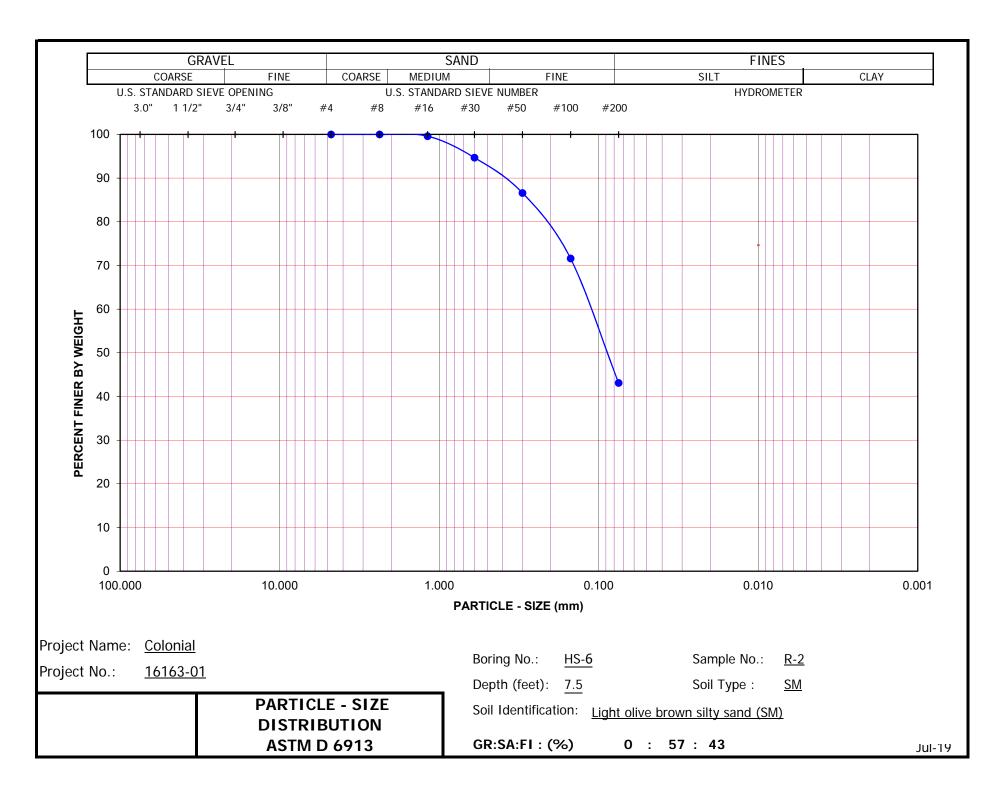
	Container No.	XY
After Wet Sieve	Wt. of Dry Soil + Container (g)	457.1
Arter Wet Sieve	Wt. of Container (g)	248.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	208.9

U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)
(in.)	(mm.)	Dry Soil Retained (g)	referrer assing (70)
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.1	100.0
#16	1.18	1.4	99.6
#30	0.600	18.5	94.7
#50	0.300	46.5	86.6
#100	0.150	98.4	71.6
#200	0.075	197.4	43.1
PAN			

GRAVEL:	0 %
SAND:	57 %
FINES:	43 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 



Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: <u>HS-2</u> Depth (feet): 2.5

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

			Moisture Content of Total Air - Dry Soil		ry Soil
Container No.:		ZK	Wt. of Air-Dry Soil + Cont.	(g)	0.0
Wt. of Air-Dried Soil + 0	Cont.(g)	564.9	Wt. of Dry Soil + Cont.	(g)	0.0
Wt. of Container	(g)	248.9	Wt. of Container No	(g)	1.0
Dry Wt. of Soil	(g)	316.0	Moisture Content (%)		0.0

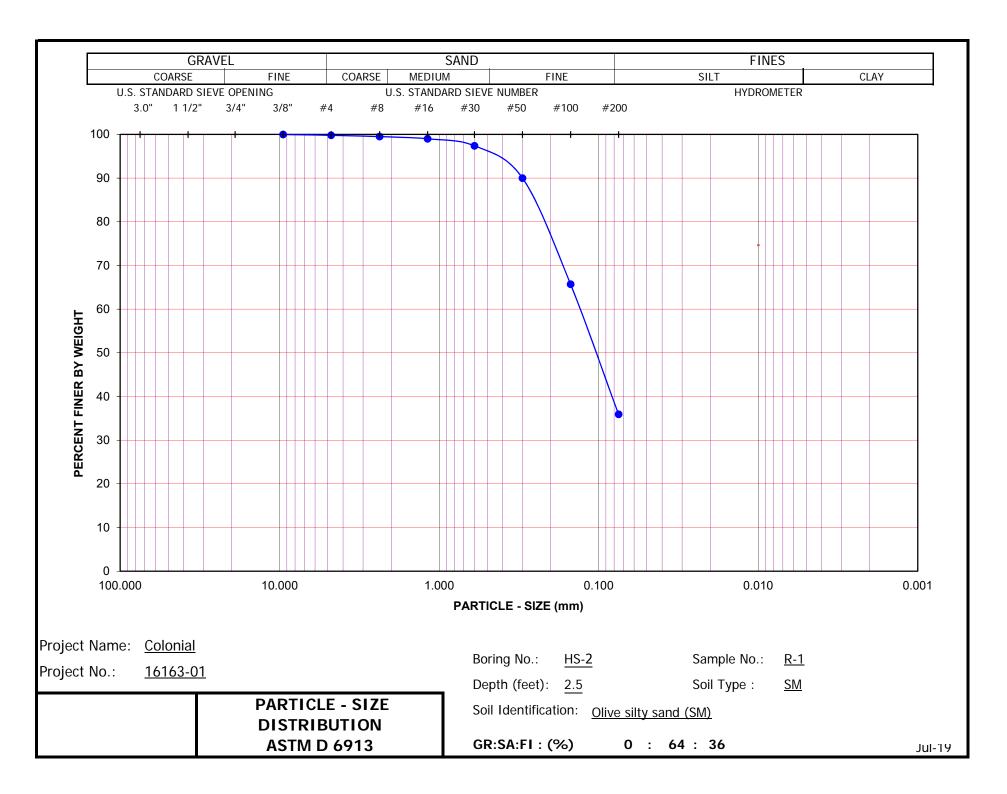
	Container No.	ZK
After Wet Sieve	Wt. of Dry Soil + Container (g)	459.5
Arter Wet Sieve	Wt. of Container (g)	248.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	210.6

U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)
(in.)	(mm.)	Dry Soil Retained (g)	referrer assing (70)
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.7	99.8
#8	2.36	1.5	99.5
#16	1.18	3.1	99.0
#30	0.600	8.1	97.4
#50	0.300	31.6	90.0
#100	0.150	108.5	65.7
#200	0.075	202.6	35.9
PAN			

GRAVEL:	0 %
SAND:	64 %
FINES:	36 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 



Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-3 Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silt with sand (ML)s, organic material noted

		Moisture Content of Total Air - Dry Soil		
Container No.:	НА	Wt. of Air-Dry Soil + Cont. (g)	0.0	
Wt. of Air-Dried Soil + Cont.(g)	533.2	Wt. of Dry Soil + Cont. (g)	0.0	
Wt. of Container (g)	246.0	Wt. of Container No (g)	1.0	
Dry Wt. of Soil (g)	287.2	Moisture Content (%)	0.0	

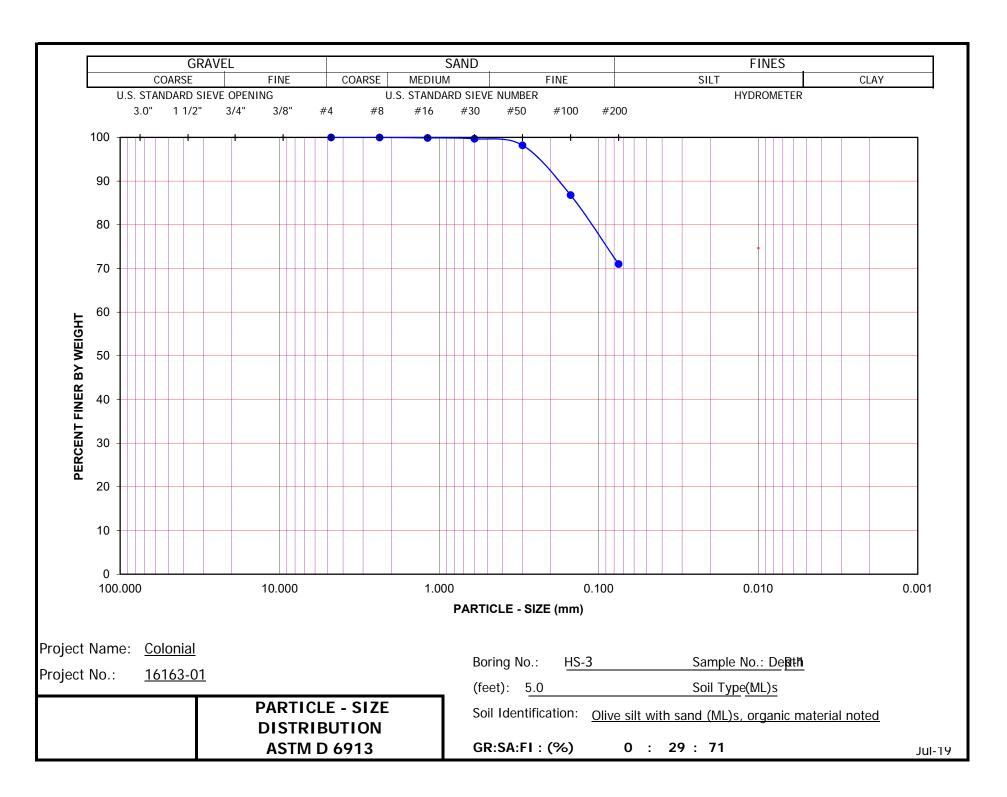
	Container No.	НА
After Wet Sieve	Wt. of Dry Soil + Container (g)	332.3
Aitel Wet Sieve	Wt. of Container (g)	246.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	86.3

U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)	
(in.)	(mm.)	Dry Soil Retained (g)		
1 1/2"	37.5			
1"	25.0			
3/4"	19.0			
1/2"	12.5			
3/8"	9.5			
#4	4.75	0.0	100.0	
#8	2.36	0.1	100.0	
#16	1.18	0.3	99.9	
#30	0.600	1.0	99.7	
#50	0.300	5.3	98.2	
#100	0.150	38.0	86.8	
#200	0.075	83.4	71.0	
PAN				

GRAVEL:	0 %
SAND:	29 %
FINES:	71 %

GROUP SYMBOL: (ML)s Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 



Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: <u>HS-1</u> Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

			Moisture Content of Total Air - Dry Soil	
Container No.:		GE	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil	+ Cont.(g)	599.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container	(g)	250.2	Wt. of Container No (g)	1.0
Dry Wt. of Soil	(g)	349.2	Moisture Content (%)	0.0

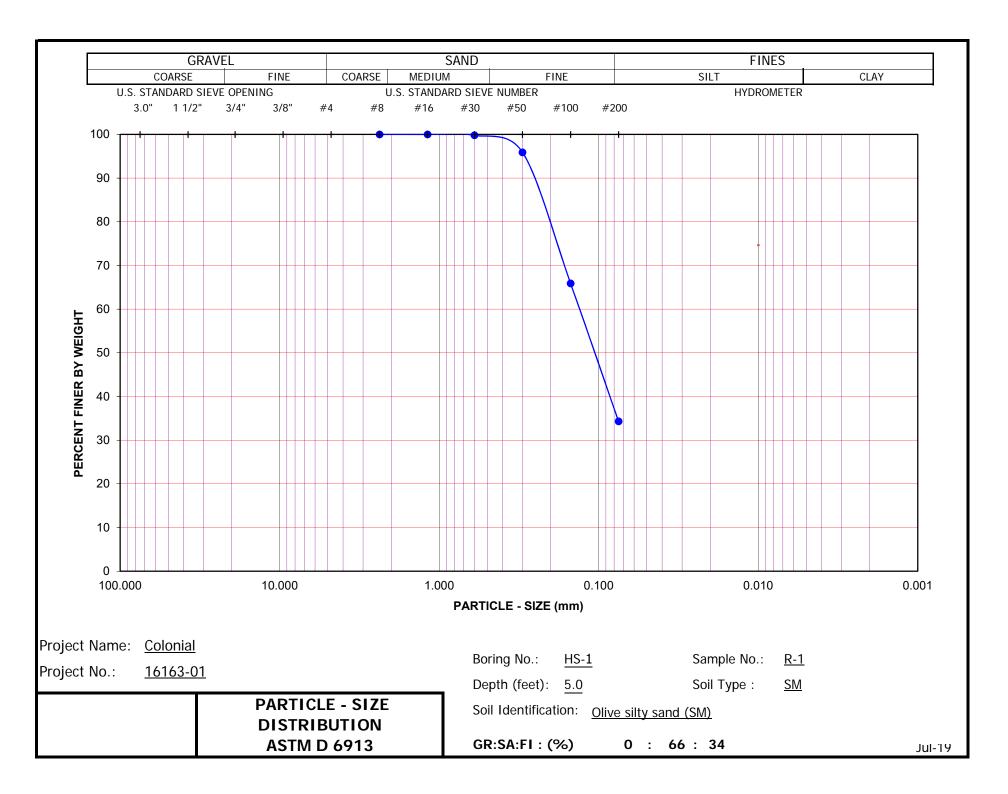
After Wet Sieve	Container No.	GE
	Wt. of Dry Soil + Container (g)	488.4
Arter Wet Sieve	Wt. of Container (g)	250.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.2

U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)	
(in.)	(mm.)	Dry Soil Retained (g)		
1 1/2"	37.5			
1"	25.0			
3/4"	19.0			
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#8	2.36	0.0	100.0	
#16	1.18	0.1	100.0	
#30	0.600	0.7	99.8	
#50	0.300	14.3	95.9	
#100	0.150	119.1	65.9	
#200	0.075	229.4	34.3	
PAN				

GRAVEL:	0 %
SAND:	66 %
FINES:	34 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 



T-1 (	0.5')*	T-2 (	0.8')*	T-3 (	0.6')*	T-4 (	1.8')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	5.1	0.2	4.1	0.4	19.1	0.4	6.3
0.5	1.8	0.5	20.9	0.7	1.6	1.5	9.6
1.0	0.5	0.8	0.4		-	2.0	1.5
T-5 (	1.5')*	T-6 (	1.0')*	T-7 (	1.0')*	T-8	(0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1.0	9.2	0.6	10.5	0.7	10.4	0.5	2.6
2.0	0.2	1.4	2.1	1.1	1.5	1.2	3.7
		1.6	0.3	1.4	0.4	1.7	1.7
T-9 (	0.5')*	T-10	(0')*	T-11	(0')*	T-12	(0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.4	4.6	0.5	2.7	0.3	0.6	0.3	4.1
1.2	2.1	1.1	1.7	2.3	1.3	1.0	1.2
1.5	1.1	1.5	1.0	2.7	0.8	1.5	0.5
-	-	-	-	3.5	0.7	-	-
T-13	(0.5')*	T-14 (2.9	' to 3.5')*	T-15	(0')*	T-16	(1.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	6.7	1.0	1.3	1.0	1.1	0.5	11.4
0.8	4.0	3.0	10.1	2.0	2.3	1.6	1.9
1.2	1.7	3.5	0.4	3.0	0.5	2.4	0.5
-	-	-	-	4.0	0.7	-	-
T-17	(O')*						

T-17	(0')*
Depth (ft)	% Organics
1.0	0.6
4.0	1.1

#### Legend

<u>==дони</u>	
> 5%	
2 to 5%	
< 2%	

"High" Organic Content "Soils" Recommended for Export from Site

"Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils

"Clean" Soils

te: (#')\* Indicates Recommended Organic Export Depth in Feet. Export depth may exceed the depths highlighted box



Table 8 - Summary of Organic Content - Organic Removal & Export Depths

Project Name	MCBC - Brookfield, Ontario
Project Number	20246-01
ENG./GEOL.	RLD/ARN
Date	August 2021

	Geotechnical Boring Log Borehole I-1											
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling				
					okfield			Type of Rig: Track Rig				
			er: 202					Drop: 30" Hole Diameter:	8"			
					~755' N			Drive Weight: 140 pounds				
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 o	of 1			
			<u>_</u>		<del>_</del>			Logged By ARN				
			qu		Sd	_	<del> </del>	Sampled By ARN				
IŒ		go	<u>L</u>	t	<u> </u>	(%	dπ	Checked By RLD	est			
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	J. 1.22	Type of Test			
atje	Depth (ft)	ij	aple		_ De	stui	ပ္သ		0			
<u> </u>	ер	<u>a</u>	a⊔	<u> </u>		10is	SC		ype			
Ш		9	S	<u> </u>		Λ		DESCRIPTION	<b>—</b>			
	0 _	H-1		_								
	_			_				@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)				
755-	_		R-1	5 6 7	105.7	2.1	SP-SM	@2.5' - SAND with Silt: dusky brown, dry, medium				
	_			7				dense				
	5 —	Ш	R-2	4	109.5	3.7	SM	@5' - Silty SAND: dusky brown, dry, medium dense				
	_		11-2	4 6 10	109.5	3.7	Sivi	GO - Silty SAND. dusky blown, dry, mediam dense				
	_			-								
750-	_			-								
	_			-								
	10 —		SPT-1	4		5.8		@10' - Silty SAND: dusky brown, slightly moist, medium				
	_			4 5 6				dense				
	-			-								
745-	_			-								
	_		R-3	4	101.2	8.1	ML	@14' - Sandy SILT: dusky brown slightly moist, stiff	-#200			
	15 —			4 8 13								
	_			-				Total Depth = 16'				
	-			-				Groundwater Not Encountered				
740-	_			-				Infiltration Well Installed Per County Guidelines				
	-			-				Backfilled with Cuttings on 12/19/2021				
	20 —											
735-												
135												
	25 —			_								
				_								
	_			_								
730-	_			_								
	_			_								
	30 —			-								
								LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
			2		OF TI SUBS	SURFACE (	CONDITIONS N	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  SA SIEVE ANALYSIS  G GRAB SAMPLE SA SIEVE ANALYSIS	Y			
					LOCA			GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  SPT STANDARD PENETRATION S&H SIEVE AND HYDROX  TEST SAMPLE	METER			



STANDARD PENETRATION TEST SAMPLE

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Ge	otech	nnic	al Bo	ring Log Borehole I-2	
Date:								Drilling Company: Cal Pac Drilling	
			MCBO					Type of Rig: Track Rig	
			er: 202		~757' N	101		Drop: 30" Hole Diameter: Drive Weight: 140 pounds	8"
					∼/5/ i chnical			Page 1	of 1
					_	Т		Logged By ARN	
			Sample Number		Dry Density (pcf)		<del> </del>	Sampled By ARN	
I€		бc	E	+=	<u>`</u>	(%	) Jupa	Checked By RLD	est
ا ا	(ft)	c L	Z	l no	nsi	re (	Syı	Chocked by NEB	f T
Elevation (ft)	Depth (ft)	Graphic Log	l du	Blow Count	De	Moisture (%)	USCS Symbol		Type of Test
	Эер	Эга	San	<u>  \delta \text{\sigma}   \delta \text{\sigma}   \delta \text{\sigma}  </u>	) J	Moi	)S(	DESCRIPTION	lyp
Ь	0			Н Ш				DESCRIPTION	
	0 -	i i		-				@2 Fl. to T.D. Overtownew Verman Feliam Demonito (Over)	
l	_		R-1	9	105.5	3.7	SM	<ul><li>@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)</li><li>@2.5' - Silty SAND: gray brown, dry, medium dense</li></ul>	EI
755	=		111	9 11 9	100.0	5.7	Olvi	W2.5 - Sitty OAND. gray brown, dry, mediam dense	CR
	5 —			] _	440.0	0.5		OFI CITY CAND I THE TOTAL THE TANK THE	-#200
	_		R-2	5 8 13	112.0	3.5		@5' - Silty SAND: dusky gray brown, dry, medium dense	
	_			-					
750-	=			-					
	_			-					
	10 —		SPT-1	6 5 6		5.9		@10' - Silty SAND: dusky gray brown, slightly moist,	
				<u>7</u> \ 6				medium dense	
745-	_			-					
	_			-					
	15 —								
	_			-					
740-				_					
740				_					
	20 —		R-3	7	101.2	1.9	SP-SM	@20' - SAND with Silt: dusky gray brown, dry, medium	-#200
	=		11-5	7 14 9	101.2	1.5	OI -OIVI	dense	-#200
	-			-				Total Donth = 22'	
735-	-			-				Total Depth = 22' Groundwater Not Encountered	
	25 —			-				Infiltration Well Installed Per County Guidelines	
	25		[	_				Backfilled with Cuttings on 12/19/2021	
	-			-					
730-	-			-					
				-					
	30 —			-					
	<b>—</b>	1 3			OF T	HIS BORIN	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y
	-				LOCA WITH	ATIONS AN	D MAY CHANG SAGE OF TIME	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	METER



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

				Geo	techi	nica	l Bor	ing Log Borehole HS-1	
	6/21							Drilling Company: Cal Pac	
			Colon					Type of Rig: Limited Access HS	
			<b>er:</b> 161					Drop: 30" Hole Diameter:	6"
					~766' N			Drive Weight: 140 pounds	
Hole	Locat	tion	: See (	Geote	chnical	Map		Page 1 o	of 1
					<del></del>			Logged By CNJ	
			Sample Number		Dry Density (pcf)		<u> </u>	Sampled By CNJ	ب
Elevation (ft)		Log		lnt	<u>:</u>	Moisture (%)	USCS Symbol		Type of Test
lo	(ft)	<u>  2</u>	<del> </del>	Count	SUS	<u> </u>	S		of T
∕at	Depth (ft)	Graphic	교		ا م	stu	ဗ္ဗ		e c
<u>e</u>	Эер	ia Ja	)   	Blow (	) Jy	loi	<u> </u>	DESCRIPTION	Ŋ
Ш			0)						
765-	0 _			-				@0' to 2.5' Artificial Fill - Undocumented (afu) @0' - Silty SAND: brown, dry, loose; scattered grass	
	_			-				and rootlets	
	_		SPT-1	3 4 5		3.8	SP	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)	
	_			/\ 5				@2.5' - SAND: gray brown, slightly moist, medium dense	
	5 —		R-1	5 8 15	106.6	5.3	SM	@5' - Silty SAND: olive gray, slightly moist, medium	-#200
760-	_			15				dense	CO
	_		SPT-2			6.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium	
	_		SF 1-2	₩ <sup>4</sup> 5 7		0.5	Sivi	dense	
	-								
755	10 —	1	R-2	4 9 15	105.6	2.3	SM	@10' - Silty SAND: gray brown, slightly moist, medium	
755-				15				dense	
	_								
	15 —		CDT A				CNA	QASI Cilla CAND alice amount displate maniet mandicus	
750-	_		SPT-3	5 6 8		3.4	SM	@15' - Silty SAND: olive gray, slightly moist, medium dense	
	_			- 0				delise	
	_			_					
	_			-					
	20 —		R-3	13	105.7	4.1	SP	@20' - SAND: gray brown, slightly moist, medium	
745-	_			13 14 16	100.7		0.	dense	
	_			-				Total Depth = 21.5'	
	_			-				Groundwater Not Encountered	
	_			-				Backfilled with Cuttings on 6/21/2019	
	25 —			-					
740-	_			-					
	_			-					
	_			-					
	-			-					
	30 —								
					OF T	HIS BORING	G AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR  BY BULK SAMPLE OF THE PROPERTY OF THE PROPE	,
								MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	•



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

				Geo	techi	nica	Bor	ing Log Borehole HS-2	
Date:	6/21/	201						Drilling Company: Cal Pac	
			Colon					Type of Rig: Limited Access HS	
			er: 161					Drop: 30" Hole Diameter:	6"
					~758' N			Drive Weight: 140 pounds	
Hole	Locat	ion	: See (	Geote	chnical	Мар		Page 1 c	of 2
			_		Æ			Logged By CNJ	
			월		<u>a</u>		00	Sampled By CNJ	ا ب
(ff	_	60 <u>-</u>	<u> </u>	⊒	<u>.</u>	%)	mk		es
<u>io</u>	(ft)	<u> </u>	Z	) j	SUS	<u>e</u>	S		of T
vat	oth	ldı	l du		ă	stu	SS		96
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
		$\overline{}$		┦╨			<b>`</b>	@0' to 2.5' Artificial Fill - Undocumented	'
	U -			-				@0' - Silty SAND: brown, dry, loose; scattered grass	
	_	П		╝,				and rootlets	
755-	_	B-1	R-1	4 5 7	102.0	4.4	SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, loose	
	_			1				(w2.5 - Silty SAIND: Olive blown, slightly moist, loose	-#200
	5 —	Ш	SPT-1	4 5 6		6.7	SM	@5' - Silty SAND: olive brown, slightly moist, medium	СО
	_			<u> </u>				dense	
750	_		R-2	14	101.1	2.5	SM	@7.5' - Silty fine SAND: gray brown, slightly moist,	
750-			``	14 15 18			0	medium dense	
	10 —		ODT O				014	OAGL O'III Fire OAND were brown allighther with	
	_		SPT-2	3 6 7		3.8	SM	@10' - Silty Fine SAND: gray brown, slightly moist, medium dense	
	_			-				mediam dense	
745-	_			-					
	_		-	-					
	15 —		R-3	8	111.1	3.5	SM	@15' - Silty SAND with Gravel: gray, slightly moist,	
	_			8 16 22				medium dense	
	_			-					
740-	_			-					
	-		-	-					
	20 —		SPT-3	6 6 8		8.0	SM	@20' - Silty SAND: brown, moist, medium dense	
	_			8					
735-									
133				_					
	25 —				06.0	4.0	C D	@25! CAND, grow brown allighth, as all to the	
			R-4	8 13 15	96.0	4.2	SP	@25' - SAND: gray brown, slightly moist, medium dense	
	_			-					
730-	_			-					
	_			-					
	30 —		<u> </u>						
								NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

R G SPT

BULK SAMPLE DS
RING SAMPLE (CA Modified Sampler) MD
GRAB SAMPLE SA
STANDARD PENETRATION S&H
TEST SAMPLE EI
CN
CR
GROUNDWATER TABLE AL
CO
RV
#200 GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-2 Date: 6/21/2019 Drilling Company: Cal Pac											
Date:	6/21	/201	9					Drilling Company: Cal Pac				
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS				
Proje	ct Nu	mbe	<b>:</b> 161	63-01				Drop: 30" Hole Diameter:	6"			
Eleva	ation o	of To	p of I	Hole:	~758' N	ИSL		Drive Weight: 140 pounds				
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 2 o	of 2			
			_					Logged By CNJ				
			Sample Number		Dry Density (pcf)		<del>-</del>	Sampled By CNJ				
(£		g	특	+=	) >	(%	qu	Campiod By ONO	st			
) uc	ft)	۲, ا	Ž		  Isi	) e	) Syr		Ĭ			
atic	)	ij	l ed l	Ŭ	)er	tur	S		o			
Elevation (ft)	Depth (ft)	Graphic Log	m	Blow Count	) ]	Moisture (%)	USCS Symbol		Type of Test			
Ш	Ŏ	Ō	iš		□	Σ	Š	DESCRIPTION	$\vdash$			
	30		SPT-4	5 6 11		10.9	SC	@30' - Clayey SAND: brown, moist, medium dense				
	_		l	<u>7</u> 11								
725-	_			-								
725-	_			-								
	35 —											
	33 —		R-5	8 14 22	114.5	9.5	SC	@35' - Clayey SAND: gray and reddish brown mottled,				
				_ 22				moist, medium dense; iron oxide staining; pin hole porosity				
720-	_			_				porodity				
720	_		_	_								
	40 —		ODT 5			400	014	0.491 0.311 0.4115				
	_		SPT-5	10 17 22		10.6	SM	@40' - Silty SAND: gray brown, moist, dense; minor iron oxide staining				
	_			- 22				Oxide stairing				
715-	_			_								
	_			_								
	45 —		R-6	6	110.2	18.2	ML	@45' - SILT: olive brown and reddish orange mottled,				
	_		K-0	6 12 18	110.2	10.2	IVIL	very moist, very stiff; iron oxide staining				
	_			-				vory moist, vory still, iron state stalling				
710-	_			-								
	_		-	-								
	50 —		SPT-6	13		9.5	SM	@50' - Silty SAND: gray brown, moist, very dense				
	_		SF 1-0	13 23 25		9.5	Sivi	(200 - Silty SAND. gray brown, moist, very dense				
	_		ĺ	-				Total Depth = 51.5'				
705-	_			-				Groundwater Not Encountered				
	_		-	-				Backfilled with Cuttings on 6/21/2019				
	55		-	-								
	_			-								
	_			-								
700-	_			-								
	_			-								
	60 <del></del>			-								
				•				ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES: IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR				
			-		SUBS	SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  TANDARD DEFITITATION	( 			



G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-3												
	6/21/							Drilling Company: Cal Pac					
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS					
			er: 161					Drop: 30" Hole Diameter:	6"				
					~757' [			Drive Weight: 140 pounds					
Hole	Locat	tion	: See (	Geote	chnica	Мар		Page 1 c	of 1				
			_					Logged By CNJ					
			ag		bc		<del>-</del>	Sampled By CNJ					
<b>#</b>		g	<u>L</u>	<u> </u>	_ ₹	%	gr.		est				
5	(ft)	<u>ا</u> ا		no	nsi	(e)	Syl		ĹΤ				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test				
<u>`è</u>	ер	ğ	au	<u>δ</u>	≥	<u>   </u>	SC		ype				
Ш	a	ပ	S	Ω		Σ		DESCRIPTION	Τ				
	0 _			-				<ul> <li>@0' to 2.5' <u>Artificial Fill - Undocumented</u></li> <li>@0' - Silty SAND: brown, dry, loose; scattered grass</li> </ul>					
755-	_		SPT-1	-  3		5.7	SM	and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye)					
	_		35 1-11	3 5 5		3.7	Sivi	@2.5' - Silty SAND: gray brown, slightly moist, medium					
	_							dense					
	5 —		R-1	8 8 11	101.9	10.7	ML	@5' - SILT with Sand: olive brown, moist, stiff; roots;	-#200				
750-				11				wood fragments	CO				
750-			SPT-2	 8		5.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium					
	_			8 9 11				dense					
	10 —		R-2	9	111.4	2.5	SP	@10' - SAND: gray brown, slightly moist, medium					
	_		11-2	9 15 21	111.4	2.5	OF .	dense					
745-	_			-									
	_			-									
	-		-	-									
	15 —		SPT-3	3		15.0	ML	@15' - Sandy SILT: olive gray, very moist, very stiff					
	_			3 6 9									
740-	_			-									
	_			-									
	-			-									
	20 —		R-3	3 9 14	99.6	12.6	SM	@20' - Silty SAND: olive brown, moist, medium dense;					
735-				14				white root casts					
735								Total Depth = 21.5'					
	_			_				Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019					
	25 —			_									
				_									
730-	_			-									
	_			-									
	-			-									
	30 —			-									
				<u> </u>				LIV AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IF TIME OF DRILLING B BULK SAMPLE DS DIRECT SHEAR					
	>			1	SUBS	SURFACE C	CONDITIONS	IE TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSIT           IGE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	Υ				



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-4										
Date:	6/21	/201	9					Drilling Company: Cal Pac			
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS			
Proje	ct Nu	mbe	er: 161	63-01				Drop: 30" Hole Diameter:	6"		
					~757' N			Drive Weight: 140 pounds			
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1 c	of 1		
			_		<u>_</u>			Logged By CNJ			
			pe		bc.		<del>-</del>	Sampled By CNJ			
(#)		go	Lin	+		%	qι		əst		
L C	(ft)	ا ا		Count	nsi	e	Syl		f T		
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	\ \cdot	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test		
<u>e</u>	ер	<u>a</u>	an	Blow	≥	<u>  0</u>	SC		ype		
Ш	a	ပ	S	Δ		Σ		DESCRIPTION	_		
	0 _		-	-				@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass			
755-	_	1 1	d b	_				and rootlets	EI		
	_	B-1	R-1	9 10 16	108.3	4.9	SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, medium	MD		
	_	- <sup>©</sup>		16				dense; white rootlets	CR		
	5 —	Щ	SPT-1	4 4		3.9	SM	@5' - Silty SAND: olive gray, slightly moist, loose			
	_			4							
750-	_		R-2	- 5	88.9	3.6	ML	@7.5' - Sandy Silt: gray, slightly moist, very stiff			
	_		N-Z	5 10 15	00.9	3.0	IVIL	(@1.5 - Sandy Siit. gray, Slightly Holst, Very Still			
	10 —										
	10		SPT-2	7 10		1.5	SM	@10' -Silty SAND: gray brown, dry, medium dense			
745-	_			<u>/                                    </u>							
, 10	_			_							
	_			_							
	15 —		R-3	8	99.9	10.2	SM	@15' - Silty SAND: brown, moist, medium dense			
	_		11-5	8 9 13	33.3	10.2	Olvi	W 10 - Only OAND. Brown, moist, medium dense			
740-	_			-							
	_			-							
	_			-							
	20 —		SPT-3	12		1.8	SP	@20' - SAND with Gravel: gray brown, dry, medium			
	_			10				dense			
735-	_			-				Total Depth = 21.5'			
	_			-				Groundwater Not Encountered			
	-			-				Backfilled with Cuttings on 6/21/2019			
	25 —			-							
730-	_										
130-	_										
			[	_							
	30 —			_							
					тніс	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:			
					OF T	HIS BORING	AND AT TH	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	<i>(</i>		
								GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS			



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-5											
Date:	6/21	/201	9					Drilling Company: Cal Pac				
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS				
Proje	ct Nu	mbe	er: 161	63-01				Drop: 30" Hole Diameter:	6"			
					~757' N			Drive Weight: 140 pounds				
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 c	of 1			
			<u> </u>		<u>_</u>			Logged By CNJ				
			ag		bc		<del>-</del>	Sampled By CNJ				
(#)		go	L	۲		%	qu	, , , ,	əst			
5	(ft)	ا ا		no	nsi	(e	Syl		ĹΤ			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>`è</u>	ер	ā	a⊔	<u> </u>	≥	<u>  0</u>	SC		ype			
Ш	a	ပ	S	Δ		Σ		DESCRIPTION				
	0 _		-	-				@0' to 2.5' <u>Artificial Fill - Undocumented</u> @0' - Silty SAND: brown, dry, loose; scattered grass				
755-	_		R-1	- 5	101.3	2.5	SP	and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye)	EI			
	_	<u>-</u>	12-1	5 8 9	101.5	2.5		@2.5' - SAND: gray brown, slightly moist, medium dense	MD			
	_											
	5 —		SPT-1	3 4 4		4.5	SP	@5' - SAND: gray brown, slightly moist, loose				
750-				<u>7\</u> 4								
730	_		R-2	8	106.8	7.7	SM	@7.5' - Silty SAND: olive brown, moist, medium dense				
	_			8 9 10								
	10 —		SPT-2	4		5.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium				
	_			4 6 8		0.1	Oivi	dense				
745-	_			-								
	_			-								
	_			-								
	15 —		R-3	9	130.6	1.8	SP	@15' - SAND: gray brown, dry, medium dense				
	_			9 14 19								
740-	_			-								
	_			-								
	-			-								
	20 —		SPT-3	√ 8 10		4.9	SP	@20' - SAND: gray brown, slightly moist, medium				
735-				7\ 9 _				dense				
735								Total Depth = 21.5'				
	_			_				Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019				
	25 —			_								
				_								
730-	_			-								
	_			-								
	_			-								
	30 —			-								
								ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES: F TIMF OF DRILLING B BULK SAMPLE DS DIRECT SHEAR				
		1	-		SUBS	SURFACE C	CONDITIONS	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSITY           GE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	′			



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-6											
Date:	6/21/	<u>/2</u> 01						Drilling Company: Cal Pac				
			Color					Type of Rig: Limited Access HS				
			er: 161					Drop: 30" Hole Diameter:	6"			
					~763' N			Drive Weight: 140 pounds				
Hole	Locat	ion	: See (	Geote	chnical	Map		Page 1 c	of 2			
			ا		Œ.			Logged By CNJ				
			Sample Number		Dry Density (pcf)		0	Sampled By CNJ				
Elevation (ft)		og	<u>u</u> n	nt	-\$	Moisture (%)	USCS Symbol	, ,	Type of Test			
o	(ft)	Graphic Log	Z	Blow Count	ISI	<u></u> <u></u>	Sy		ĹΤ			
'ati	Depth (ft)	phi	ald	0	De	stul	SS		0			
<u>ē</u>	ер	īal	an	<u>  0</u>		10 <u>i</u> s	SC	DECODIDE	yp			
Ш		9	S	В		2		DESCRIPTION	_			
	0 _							@0' to 2.5' Artificial Fill - Undocumented				
	_			_				@0' - Silty SAND: brown, dry, loose; scattered grass and rootlets	MD			
760-	_	_	R-1	5 6 10	103.4	4.0	SP	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)	EI			
, 00	_	B-1		10				@2.5' - SAND: olive brown, slightly moist, medium				
	5 —		CDT 4			40.7	00	dense				
	_	-	SPT-1	4 5 6		12.7	SC	@5' - Clayey SAND: brown, moist, medium dense				
	_	-		- 0								
755-	_	-	R-2	5 9 12	97.5	9.0	SM	@7.5' - Silty SAND: light olive brown, moist, medium	-#200			
	_			12				dense; white root casts	CO			
	10 —		SPT-2			8.7	SM	@10' Silty SAND, alive brown maint lease				
	_		SP1-2	$A = \begin{pmatrix} 4 \\ 4 \\ 4 \end{pmatrix}$		0.7	SIVI	@10' - Silty SAND: olive brown, moist, loose				
	_			-								
750-	_			_								
	_			_								
	15 —		R-3		102.6	8.5	SM	@15' - Silty SAND: gray brown, moist, medium dense				
	_		K-3	4 8 12	102.6	0.5	SIVI	@15 - Silly SAND. gray brown, moist, medium dense				
	_			- '2								
745-	_	-		_								
	_			-								
	20 —		SPT-3	√ 6		8.5	SP	@20' - SAND: gray brown, moist, medium dense				
	_		01 1-3	M 6 6 9		0.5	01	620 - SAND. gray brown, moist, medium dense				
	_			-								
740-	_	-		-								
	_			-								
	25 —		R-4	3	93.9	10.7	SM	@25' - Silty SAND: gray brown, moist, medium dense;				
	_		'\	3 6 9	30.3	10.7	CIVI	trace gravel				
				-								
735-	_			-								
	-			-								
	30—											
			1					ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	ı			
								E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y			



GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				G	eot	echr	nica	Bor	ing Log Borehole HS-6	
Date:	6/21	/201	9						Drilling Company: Cal Pac	
Proje	ct Na	me:	Color	nial					Type of Rig: Limited Access HS	
			<b>er:</b> 161						Drop: 30" Hole Diameter:	6"
			•			√763' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See	Ge	otec	hnical	Мар		Page 2 c	of 2
			_			<u>_</u>			Logged By CNJ	
			Sample Number			Dry Density (pcf)		<del>-</del>	Sampled By CNJ	
(#)		go	lπ		۱	<u>\$</u>	Moisture (%)	USCS Symbol	,	Type of Test
LC C	Œ	ا ا	Z		no	nsi	е.	Syl		Ĺ
atji	E)	ij	) bld		$\circ$	De	stur	တ္သ		O O
Elevation (ft)	Depth (ft)	Graphic Log	ап		Blow Count	≥	lois	SC		ά
Ш		-		11		Δ			DESCRIPTION	⊢
	30 _		SPT-4	М	5 6 10		15.4	ML	@30' - SILT: brown with reddish brown mottled, very	
	_			H	10				moist, very stiff	
730-	_			LI.						
	_			H						
	35 —		R-5		13	114.2	8.5	SC	@35' - Clayey SAND: reddish brown and brown	
	_		11-5		13 18 50	114.2	0.5	30	mottled, moist, very dense	
	_			F					, ,	
725-	-			H						
	_			H						
	40 —		SPT-5	Н	12		5.4	SP	@40' - SAND: brown, slightly moist, dense	
	_			A	12 15 20				, , ,	
	_			H						
720-	-			H						
	_	-		H						
	45 <del></del>		R-6		17 27 27	123.6	6.3	SP	@45' - SAND: brown, slightly moist, dense; trace	
	_				27				amounts of clay	
_,_	_	1		Ħ						
715-	_									
	- -									
	50 —	1	SPT-6	М	8 23 26		2.4	SP	@50' - SAND: reddish brown, slightly moist, very dense	
				<u> </u>	26					
710-									Total Depth = 51.5'	
710	_			Ll					Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
	55 —			Ll					Baskimoa with Sattings on 5/21/2010	
	_			Ll						
	_			$  \cdot  $						
705-	_			$  \cdot  $						
	_			$\vdash$						
	60 —			$\vdash$						
									LUY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
					-	SUBS	SURFACE C	ONDITIONS I	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler) MD         MAXIMUM DENSITY           GE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	′



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

### GEO TESTING INC.

#### LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

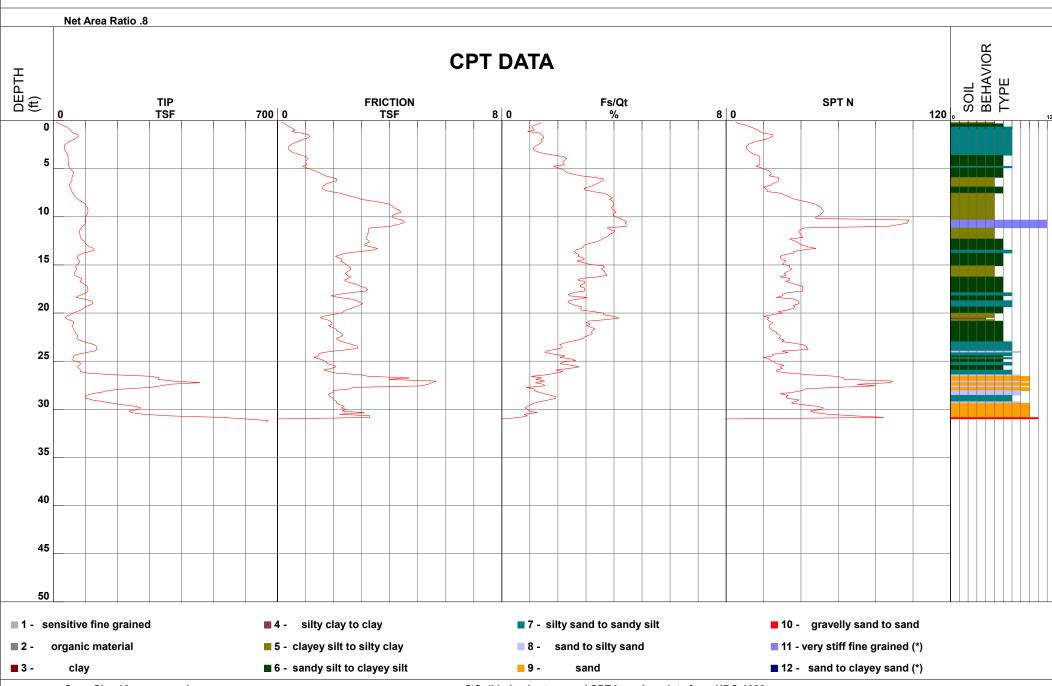
 Hole Number
 CPT-01

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 12:32:28 PM Filename SDF(768).cpt

GPS

Maximum Depth 31.33 ft



#### LGC Geotechnical, Inc.



 Project
 Colonial

 Job Number
 16163-01

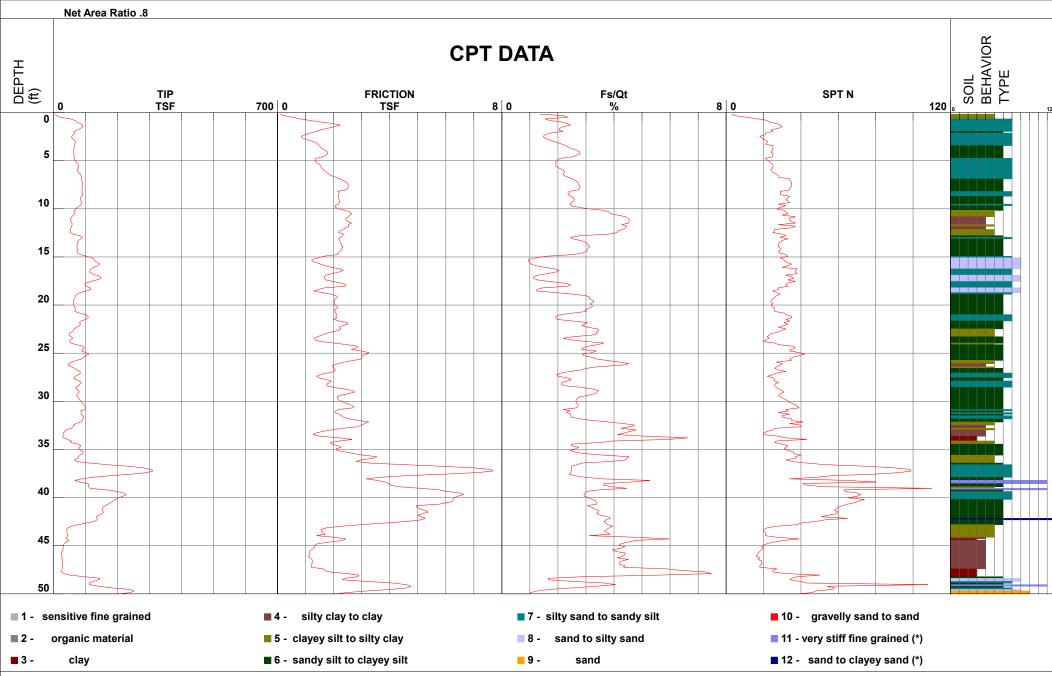
 Hole Number
 CPT-02

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 1:15:36 PM Filename SDF(769).cpt

GPS

Maximum Depth 50.52 ft



## GEO TESTING INC.

### LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

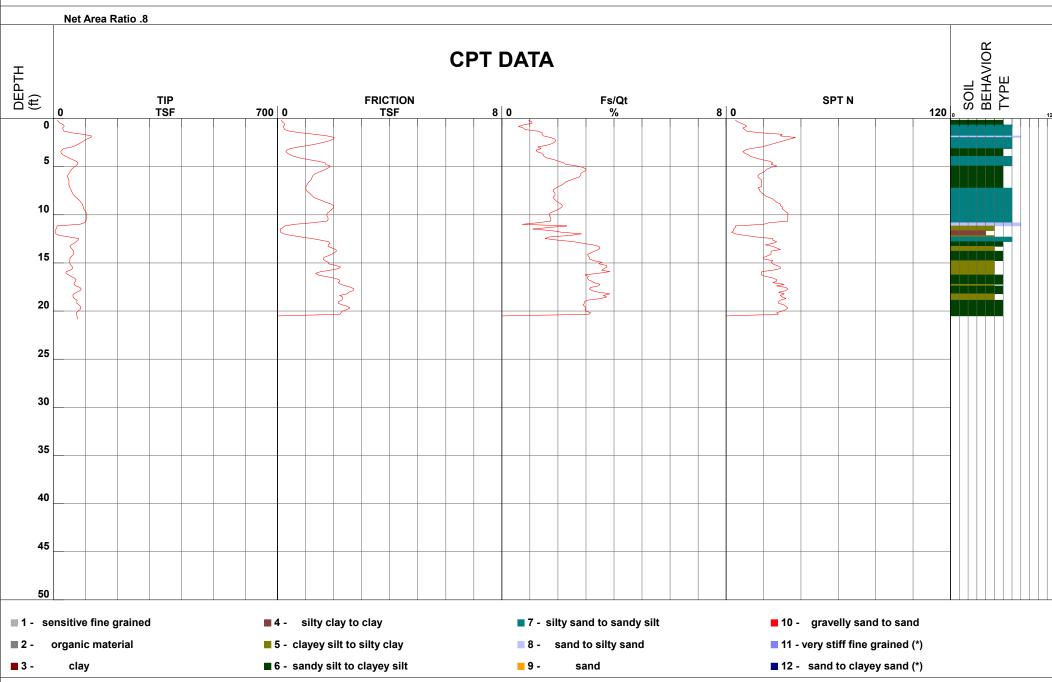
 Hole Number
 CPT-03

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:00:43 PM Filename SDF(770).cpt

GPS

Maximum Depth 20.83 ft



## GEO TESTING INC.

### LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

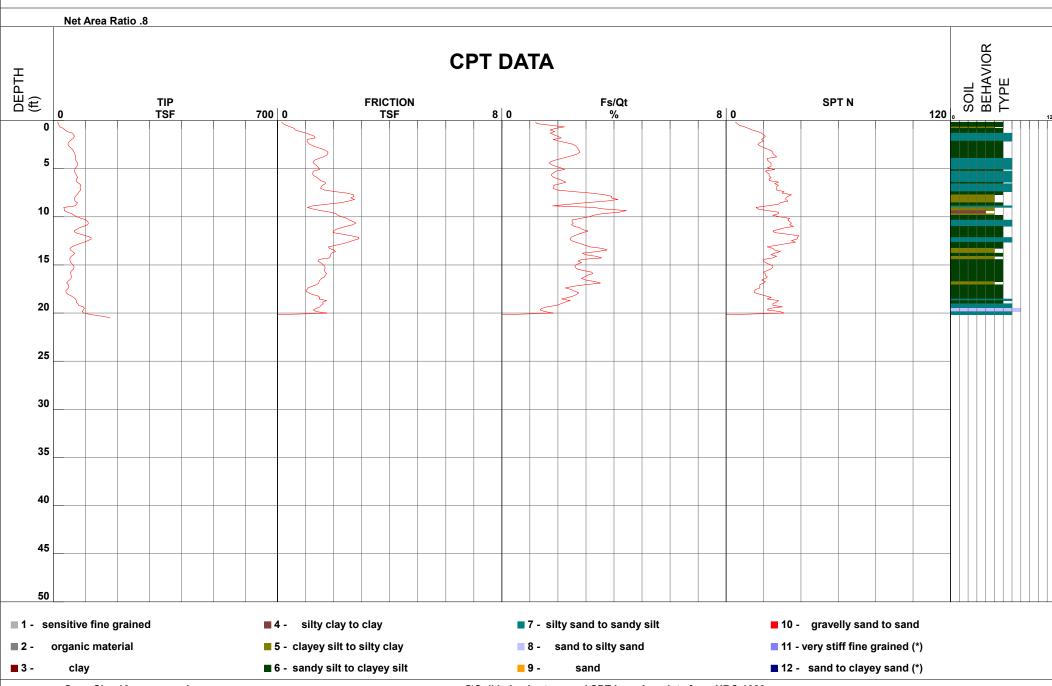
 Hole Number
 CPT-04

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:19:06 PM Filename SDF(771).cpt

GPS

Maximum Depth 20.51 ft



## GEO TESTING INC.

### LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

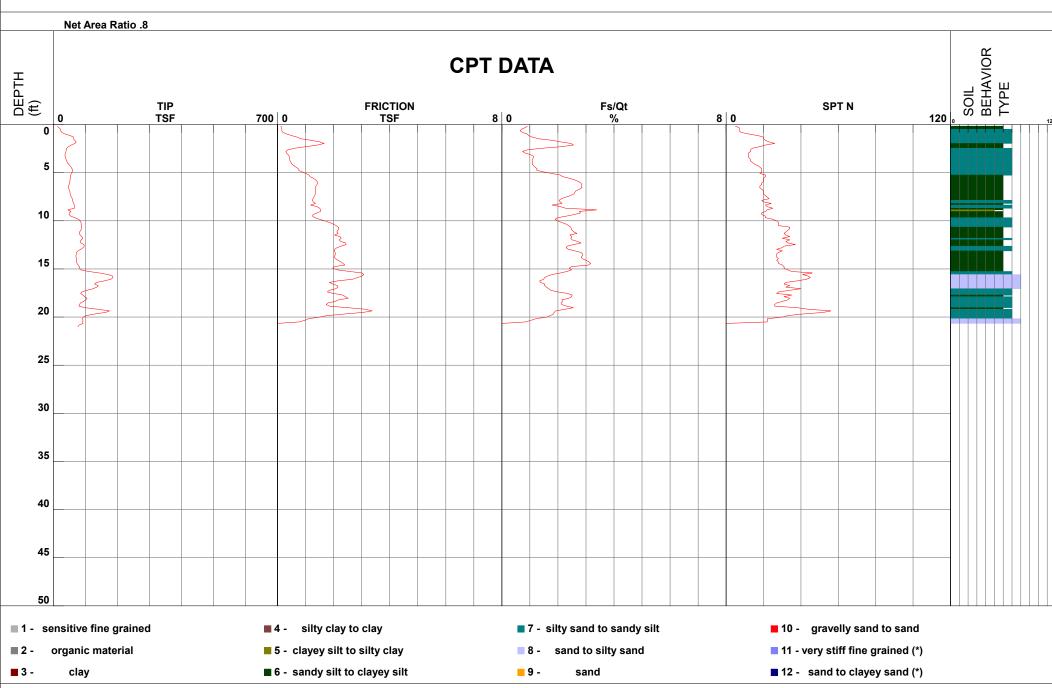
 Hole Number
 CPT-05

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:38:10 PM Filename SDF(772).cpt

GPS

Maximum Depth 21.00 ft



### LGC Geotechnical, Inc.



 Project
 Colonial

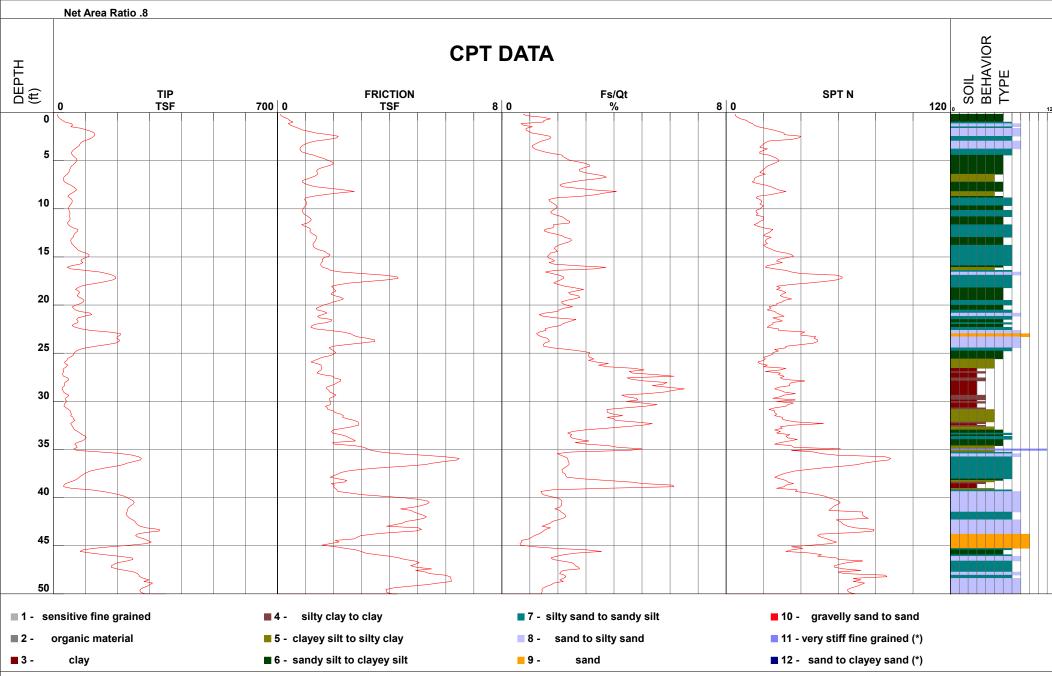
 Job Number
 16163-01

 Hole Number
 CPT-06

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:56:46 PM Filename
GPS
Maximum Depth

SDF(773).cpt 50.69 ft



Project Na	ame:	Colonial	Logged By: ARN	Trench N	No: TP-1					
Project N	ımbe	r : 16163-01	Date: 6/20/2019				LC	16		
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map		ing Proper	ties:	Geotech	nical, Ind		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)		
	a b	Artificial Fill - Undocumented @0'-1' Sandy SILT to Silty SANI loose/soft; abundant rootlets Quaternary Young Eolian Depo @1'-T.D. Silty SAND and SAND: moist, medium dense; increasi occasional root; masssive	osits medium to tan brown, slightly	afu Qye	SM/ML					
3RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 758 'MSL Su	rface Slope:	0 deg.		Trend: N	I-S		
						Ground	Depth: 6' dwater: None led: 6/20/201			

scale : 1 in = 5 ft

Project Na	Project Name: Colonial		Logged By: ARN	Trench N	lo: TP-2			
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019	F	<b>D</b>		LC	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ng Proper	iles:	Geotech	nical, Inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	loose/soft; abundant rootlets in Quaternary Young Eolian Depo	o <u>sits</u> ND: medium to tan brown, slightly	afu Qye	SM/ML	B-1		
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 756 'MSL Surfa	ace Slope:	0 deg.	-	Trend: N	I-S
					+ + + +	Ground Backfill	Depth: 6.2' dwater: None led: 6/20/201	

Project Na	roject Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-3			
Project No	umbe	er : 16163-01	Date: 6/20/2019					
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	– Engineeri	ng Propert	iles:	Geotech	nical, Inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	abundant rootlets; occasional Quaternary Young Eolian Depo	o <u>sits</u> D: medium to tan brown, slightly ent roots and old decaying	afu Qye	SM/ML			
GRAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 754 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	I-S
						Ground	Pepth: 5.1' Iwater: None ed: 6/20/20	

Project Na	Project Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-4			
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019	<b>-</b>	· <b>P</b>		LC	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ing Proper	ties:	Geotech	nical, Inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a b	Artificial Fill - Undocumented @0'-2' Silty SAND to Sandy SIL'soft/loose; abundant rootlets; a Quaternary Young Eolian Depo @2'-T.D. Silty SAND: medium bedense; some small zones of sadepth	scattered refuse osits	afu Qye	SM/ML			()
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 755 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	-S
	-			-		Ground Backfil	Depth: 5.5' dwater: None led: 6/20/201	

Project Na	ame:	Colonial	Logged By: ARN	Trench N	lo: TP-5			
Project N	umbe	er : 16163-01	Date: 6/20/2019	<b>P</b>	<b>D</b>		LC	16
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Ma	Engineeri ap	ng Proper	ties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	b	stiff; roots; scattered gravel	T: dusky brown, dry, loose/mediu tan brown, dry to slightly moist, ot; iron oxide stained burrow	afu Qye	SM/ML SM SM			
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 758 ' MSL S	Surface Slope:	0 deg.	-	Trend: N	I-S
+ + + +				-		Total D	Depth: 6'	-

scale : 1 in = 5 ft

Project Na	ame:	Colonial	Logged By: ARN	Trench N	No: TP-6			
Project Nu	ımbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	· <b>D</b>		LC	16
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Maj	Engineeri	ng Proper	ties:	Geotech	nical, Ind
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a b	Artificial Fill - Undocumented  @0'-1.5' Silty SAND to Sandy S loose/medium stiff; roots; scate Quaternary Young Eolian Depot @1.5'-T.D. Silty SAND: tan to remedium dense; some stainings homogeneous coloration	tered gravel osits nedium brown, slightly moist,	afu Qye	SM/ML			(* 5.)
RAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 764 ' MSL Su	rface Slope:	0 deg.		Trend: N	I-S
+ + + + +						Groun	Depth: 6' dwater: None led: 6/20/201	

scale : 1 in = 5 ft

roject Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-7			
umbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	·		LC	
nt: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ing Propert	iles:	Geotech	nical, Inc
Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
b	loose/soft, abundant rootlets; Quaternary Young Eolian Depo @1.5'-T.D. Sandy SILT and Silty	occasional gravel o <u>sits</u> y SAND: medium brown to tan,	afu Qye	SM/ML SM			
AL RI	EPRESENTATION BELOW:	Elevation: 762 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	I-S
		( · · · · · /					
1	Unit a	a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SIL loose/soft, abundant rootlets; b Quaternary Young Eolian Depo @1.5'-T.D. Sandy SILT and Silty slightly moist, medium dense/s	Unit SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel B Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Control of the c	Int: Cat 420F Excavator  Unit SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel b Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Slope:	Int: Cat 420F Excavator    Unit   SOIL DESCRIPTION:   GEOLOGIC UNIT   Uscs	Int: Cat 420F Excavator    Unit   SOIL DESCRIPTION:   GEOLOGIC   USCS   SAMPLE   No     a   Artificial Fill - Undocumented   @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel   Quaternary Young Eolian Deposits   @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand   Question in the company of the coarse sand   Question in the coarse sand	nt: Cat 420F Excavator  Location: See Geotechnical Map  SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0·-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel b Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Slope: 0 deg. Trend: N

Project Na	Project Name: Colonial		Logged By: ARN	Trench I	No: TP-8			
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019					
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineer	ing Proper	ties:	Geotech	nical, Inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a b	abundant rootlets; minor refus Quaternary Young Eolian Depo @2'-T.D. Silty SAND: tan to medium dense; occasional roothe formation; massive	osits dium brown, slightly moist, tlets; burrows in upper portions of	afu Qye	SM/ML			
GRAPIIIO	-	EPRESENTATION BELOW:	Elevation: 768 'MSL Surfa	ace Slope:	o deg.		Trend: N	
			B					
	-			+ + + + + + + + + + + + + + + + + + + +		Ground	epth: 7' dwater: None ed: 6/20/201	
			+ +	-		scale :	1 in = 5 ft	

Project Na	me:	Colonial	Logged By: ARN		Trench	No: TP-9			
roject Nu	ımbe	r : 16163-01	Date: 6/20/2019		<b>-</b>	<b>D</b>		LC	
quipmen	t: Ca	t 420F Excavator	Location: See Geotechnica	I Мар	Engineer	ing Proper	ties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	b	Artificial Fill - Undocumented  @0' - 1' Silty SAND to Sandy SI abundant rootlets; scarce gray Quaternary Young Eolian Depo @1'-2.5' Silty SAND: medium bi to medium dense @2.5'-T.D. Silty SAND and San moist, medium dense/stiff; not	vel o <u>sits</u> rown, dry to slightly moist, lo dy SILT: medium brown, sligh	ose	afu Qye	SM/ML SM SM-ML			(* 0.7)
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 760 ' MSL	Surfa	ace Slope:	o deg.	-	Trend: N	<b> -S</b>
			B	-			Groun	Depth: 6.5' dwater: None led: 6/20/201	

scale : 1 in = 5 ft

Project Na	ame:	Colonial	Logged By: ARN	Trench N	No: TP-10					
Project N	ımbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	· <b>P</b>			16		
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ing Proper	ties:	Geotech	%) (PCF)		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DENSITY		
	a b	Artificial Fill - Undocumented  @0'-1.5' Silty SAND to Sandy solves abundant rootlets; Quaternary Young Eolian Dep @1.5'-T.D. Silty SAND: medium medium dense; massive; occa	SILT: dusky to medium brown, dry, scattered gravel. <u>osits</u> i to tan brown, slightly moist,	afu Qye	SM/ML SM					
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 755 ' MSL Surf	ace Slope:	0 deg.	-	Trend: N	I-S		
						Ground	Depth: 5.5' dwater: None led: 6/20/20			

scale : 1 in = 5 ft

Project Na	roject Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-11			
Project Nu	ımbe	er : 16163-01	Date: 6/20/2019	- Engineeri	ng Propert	ies:	LC	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	_			Geotecn	nical, inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	abundant rootlets Quaternary Young Eolian Depo	o Sandy SILT: tan brown, slightly	afu Qye	SM/ML			
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 766 'MSL Surf	ace Slope:	0 deg.		Trend: N	-S
						Ground Backfill	Depth: 5.5' dwater: None led: 6/20/201	

Project Na	Project Name: Colonial	Colonial	Logged By: ARN	Trench I	No: TP-12			
-		r : 16163-01	Date: 6/20/2019	Engineer	ing Propert	ies:	Geotech	nical, Inc.
Geologic	Т	t 420F Excavator	Location: See Geotechnical Map	GEOLOGIC	liece	SAMPLE	MOISTURE	DRY DENSITY
Attitudes	b	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SI loose/soft; abundant rootlets; so Quaternary Young Eolian Depo	<u>esits</u> brown, slightly moist, medium	afu Qye	SM/ML	No	(%)	(PCF)
GRAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 766 'MSL Surfa	ace Slope:	0 deg.		Trend: N	I- <b>S</b>
						Ground Backfill	Depth: 5' dwater: None led: 6/20/201	

### **Infiltration Test Data Sheet**

### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: MCBC North
Project Number: 20246-01
Date: 12/22/2020

Boring Number: |-1

# Test hole dimensions (if circular) Boring Depth (feet)\*: 16 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test	pit	dimensions	(if	rectangular)

Pit Depth (feet):
Pit Length (feet):
Pit Breadth (feet):

### Pre-Test (Sandy Soil Criteria)\*

	Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
I	1	9:34	9:59	25.0	12.20	14.10	1.9	Yes
	2	10:03	10:28	25.0	11.80	13.91	2.11	Yes

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	to Water, D <sub>f</sub>	Change in Water Level, AD (feet)	Observed Infiltration Rate(in/hr)
1	11:49	12:00	11.0	11.92	13.02	1.1	3.2
2	12:02	12:14	12.0	12.05	13.01	0.96	2.6
3	12:18	12:28	10.0	12.43	12.88	0.45	1.5
4	12:31	12:41	10.0	12.31	12.85	0.54	1.8
5	12:44	12:56	12.0	11.9	12.72	0.82	2.1
6	12:58	13:10	12.0	11.87	12.71	0.84	2.2

Calculated Infiltration Rate (No factors of safety)

Factor of Safety

Calculated Infiltration Rate (With Factor of Safety)

Sketch:		l		

Notes:



Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 6/29/18

<sup>\*</sup>measured at time of test

### **Infiltration Test Data Sheet**

### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: MCBC North
Project Number: 20246-01
Date: 12/22/2020

Boring Number: 1-2

# Test hole dimensions (if circular) Boring Depth (feet)\*: 22 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test	pit	dimensi	ons (if	rectangular)	

Pit Depth (feet):

Pit Length (feet):

Pit Breadth (feet):

### Pre-Test (Sandy Soil Criteria)\*

	Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
	1	9:48	10:13	25.0	18.65	19.30	0.65	Yes
Ĺ	2	10:18	10:43	25.0	17.80	18.8	1.00	Yes

### **Main Test Data**

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Observed Infiltration Rate(in/hr)
1	11:58	12:08	10.0	17.85	18.27	0.42	1.2
2	12:12	12:22	10.0	18.15	18.45	0.30	0.9
3	12:25	12:35	10.0	18.05	18.33	0.28	0.8
4	12:38	12:49	11.0	18.04	18.39	0.35	1.0
5	12:53	13:03	10.0	18.11	18.42	0.31	1.0
6	13:08	13:18	10.0	17.63	18.1	0.47	1.3

1.3	Rate (No factors of safety)	Calculated Infiltratio
	Factor of Safety	
	ate (With Factor of Safety)	<b>Calculated Infiltration</b>

Sketch:			

Notes:



Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 6/29/18

<sup>\*</sup>measured at time of test

Project Name: VanderEyk	Logged By: KTM	Trench No: TP-6	~ 1 0/
Project Number : 17074-01	Date: 6/26/2017	Engineering Dropostices	
Equipment: Case Backhoe	Location: See Geotechnical Map	Engineering Properties:	Geotechnical

quipilient	. va	se backilde	Location. See Geotechnical map					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	0' to TD - Quaternary Young Eolian Deposits: 0' to 1' - SAND: moderately brown variable, dry, loose; ganics; roots		Qye				
	В		SILT: light brown, dry to slightly lerately dense; slightly indurated;					
	С	@ 3.5' to TD - SAND (fine): light "beach sand" appearance	t brown, slightly dense, moist;					

GRAPHICAL REPRESENTATION BELOW: Elevation: 755 ' MSL Surface Slope: 0 deg. Trend: EW

B

Total Depth: 6'
Groundwater: None
Backfilled: 6/26/2017
scale: 1 in = 5 ft

Last Edited: 8/1/2017

Project Name: VanderEyk	Logged By: KTM	Trench N	No: TP-7			
Project Number : 17074-01	Date: 6/26/2017	Engineering Properties:				
Equipment: Case Backhoe	Location: See Geotechnical Map			iles:	Geotech	nical, Inc.
Geologic Attitudes Unit SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)

Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to TD - Quaternary Young Eo @ 0' to 1' - Organic-rich SAND: mo loose	<u>-                                    </u>	Qye				
	B	<ul> <li>@ 1' to 3.5' - SAND with some Sil</li> <li>dense; slightly indurated; rootlet</li> <li>@ 3.5' to TD - SAND (fine): light b</li> </ul>	rown, slightly moist to moist,					
		loose to moderately dense; friabl	e; minor caving					

GRAPHICAL REPRESENTATION BELOW: Elevation: 752 ' MSL Surface Slope: 0 deg. Trend: EW

B

Total Depth: 6'
Groundwater: None
Backfilled: 6/26/2017
scale: 1 in = 5 ft

Project Name: VanderEyk  Project Number: 17074-01		VanderEyk	Logged By: KTM		Trench N	lo: TP-8			
		r : 17074-01	Date: 6/28/2017		Engineering Properties:			<b>SLGC</b>	
Equipmen	t: Ca	se Backhoe	Location: See Geotechnica	I Мар	Engineerii	ng Propert	les:	Geotech	nical, In
Geologic Attitudes				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A B	<ul> <li>@ 0' to TD - Quaternary Young</li> <li>@ 0' to 1.5' - Organic-rich SAN roots; organics</li> <li>@ 1.5' to 5.0' - Silty fine SAND moderately dense; increase minduration</li> <li>@ 5.0' to TD - SAND (fine), lighthomogeneous</li> </ul>	D and SILT: brown, dry, loose; : light brown, dry to slightly m	ioist,	Qye				
GRAPHIC <i>A</i>	AL RE	PRESENTATION BELOW:	Elevation : 749 ' MSL	Surfa	ace Slope:	0 deg.	-	Trend: E	:w
		B ©							

Last Edited: 8/1/2017

Total Depth: 6.5' Groundwater: None Backfilled: 6/28/2017

scale : 1 in = 5 ft

Project Na	me:	VanderEyk	Logged By: KTM		Trench N	lo: TP-9			
Project Number : 17074-01		r : 17074-01	Date: 6/28/2017					LC	16
Equipmen	t: Ca	se Backhoe	Location: See Geotechnical	Мар	Engineerii	ng Propertie	es:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:				uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	variable, dry, loose; rootlets; in @ 1.5' to TD - SAND with trace (increasing with depth), mode lenses	D and SILT: brown and light gra minor debris e Silt: light brown, moist	-	Qye				
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 748 ' MSL	Surfa	ice Slope:	0 deg.		Trend: E	W
		<b>B</b>				+ + + +		-	

Last Edited: 8/1/2017

Total Depth: 5' Groundwater: None Backfilled: 6/28/2017

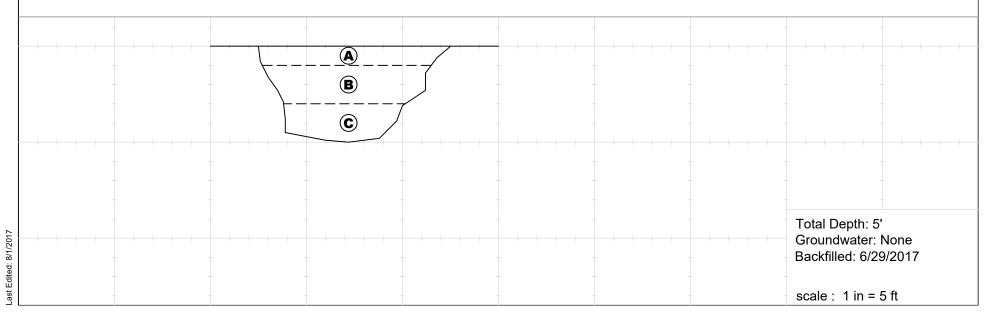
scale : 1 in = 5 ft

Project Na	ame:	VanderEyk	Logged By: KTM	Trench N	o: TP-10			
Project Number : 17074-01  Equipment: Case Backhoe		er : 17074-01	Date: 6/29/2017		jG			
		se Backhoe	Location: See Geotechnical Map	─ Engineerir	ng Propert	iles:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:	to TD - Quaternary Young Eolian Deposits: to 1' - SAND and SILT: brown (variable), dry, loose; rootlets; nic-rich to 3' - SAND and SAND with Silt: light brown and gray able, dry to slightly moist, moderately dense; lenses of silt;		uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B	<ul><li>@ 0' to 1' - SAND and SIL organic-rich</li><li>@ 1' to 3' - SAND and SA</li></ul>						
	С	@ 3' to 4' - Very thin Silt bed over SAND with Silt: brown and light brown layered; interbedded with coarse sand stringers						

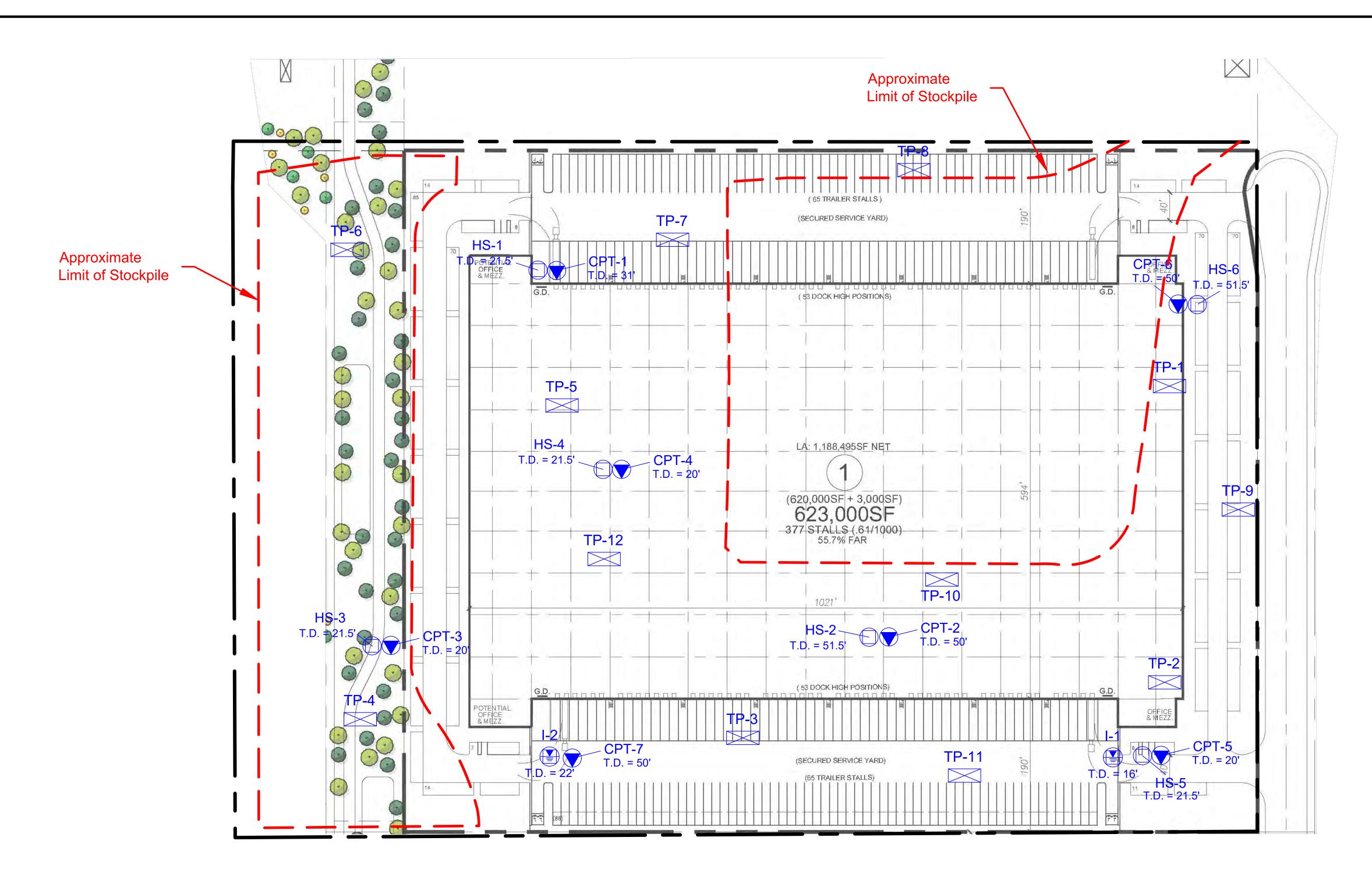
GRAPHICAL REPRESENTATION BELOW: Elevation: 736 'MSL Surface Slope: 0 deg. Trend: EW

@ 4 to TD - SAND: light brown, moist, loose to moderately dense;

subhorizontal iron oxidation banding; friable



### Appendix D Geotechnical Subsurface Evaluation Data -Colonial (16163-01and 20246-01)



\*See Sheet 3 for Additional Shallow Test Pit Locations

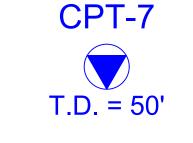
HS-6
T.D. = 21.5'
I-2
T.D. = 22'
TP-12

**LEGEND** 

Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet

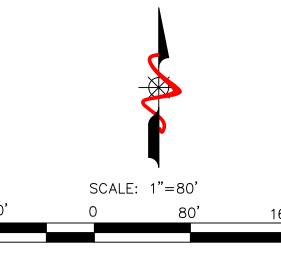
Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical



Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Limits of This Report

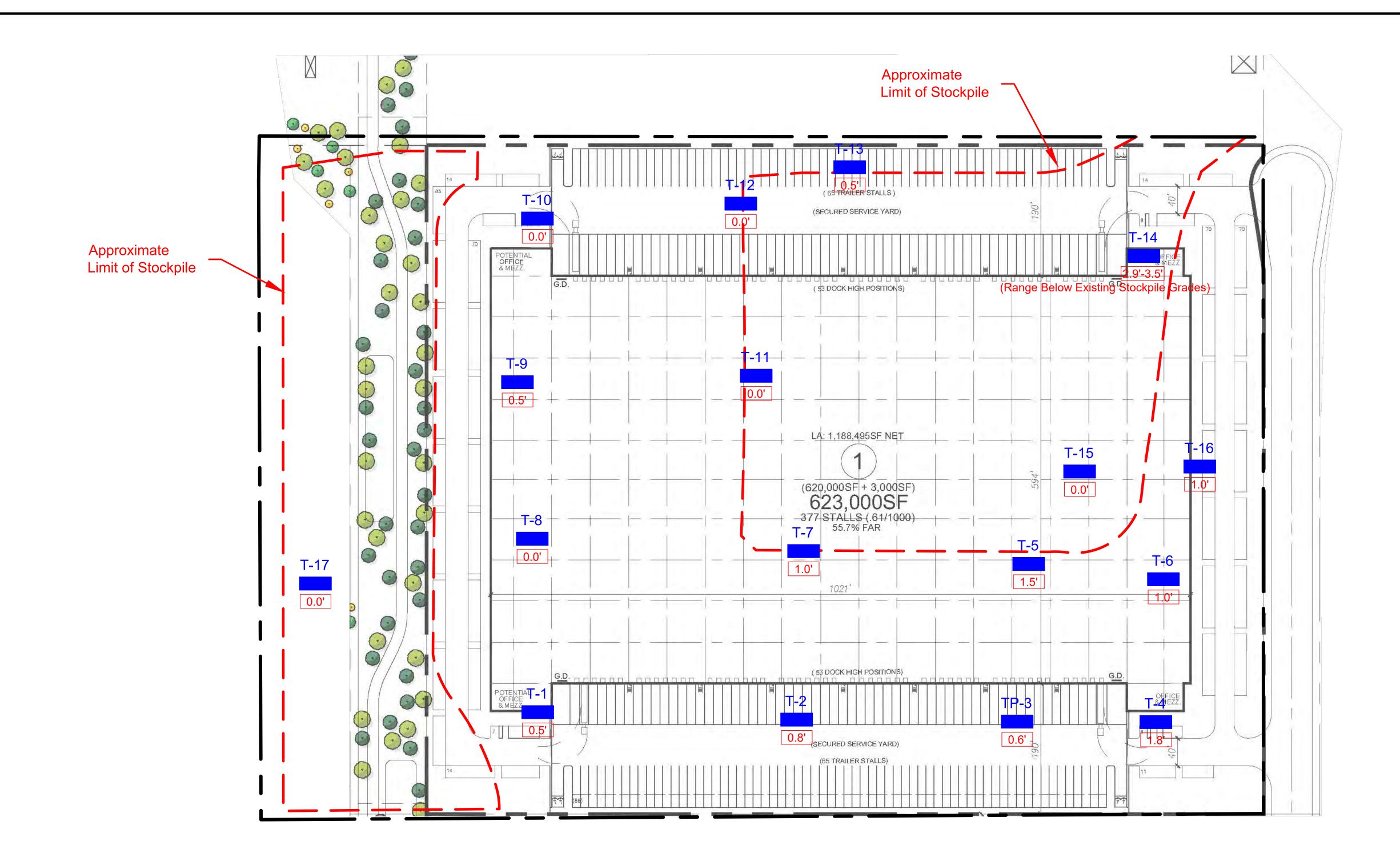




LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Exploration Location Map
With Conceptual Plan

PROJECT NAME	MCBC - Brookfield	1CBC - Brookfield			
PROJECT NO.	20246-01				
ENG. / GEOL.	RLD	SHEET			
SCALE	1" = 80'				
DATE	August 2021	2 of 3			



\*See Sheets 1 and 2 for Boring, Infiltration Test, CPT and Geotechnical Trench Locations

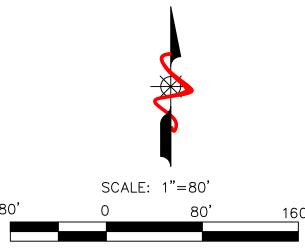
### **LEGEND**

T-17

0.0'

Approximate Location of Organics Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet

— — Approximate Limits of This Report





LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

## Recommended High Organic "Soil" Export Map

PROJECT NAME	MCBC - Brookfield	
PROJECT NO.	20246-01	
ENG. / GEOL.	RLD/ARN	SHEET
SCALE	1" = 80'	_
DATE	August 2021	3 of 3

#### <u>APPENDIX C</u>

### **Laboratory Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140).

Sample Location	Description	% Passing # 200 Sieve
HS-1 @ 5.0 ft	Silty Sand	34
HS-2 @ 2.5 ft	Silty Sand	36
HS-3 @ 5.0 ft	Sandy Silt	71
HS-6 @ 7.5 ft	Silty Sand	43
I-1 @ 14 ft	Sandy Silt	61
I-2 @ 1-5 ft	Silty Sand	34
I-2 @ 20 ft	Sand with Silt	8

<u>Collapse/Swell Potential</u>: Collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The curves are presented in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-4 @ 2 to 5 ft	Silty Sand	113.0	11.5
HS-6 @ 2 to 5 ft	Silty Sand	104.5	12.5

### APPENDIX C

### **Laboratory Test Results (Continued)**

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-4 @ 2 to 5 ft	1	Very Low
HS-6 @ 2 to 5 ft	0	Very Low
I-2 @ 1-5 ft	0	Very Low

<sup>\*</sup> Per ASTM D4829

<u>Soluble Sulfates</u>: The soluble sulfate content of select sample was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

Sample Location	Sulfate Content, %
HS-4 @ 2 to 5 ft	< 0.02
I-2 @ 1-5 ft	< 0.03

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-4 @ 2 to 5 ft	148
I-2 @ 1-5 ft	120

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	рН	Minimum Resistivity (ohms-cm)
HS-4 @ 2 to 5 ft	7.63	1,480
I-2 @ 1-5 ft	8.53	1,994

### APPENDIX C

### **Laboratory Test Results (Continued)**

<u>Organic Matter Content of Soils</u>: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in Table 9.

## ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Colonial Tested By: G. Bathala Date:

Project No.: 16163-01 Checked By: J. Ward Date:

Boring No.: HS-6 Sample Type: Ring Sample No.: R-2 Depth (ft.) 7.5

Sample Description: Light olive brown silty sand (SM)

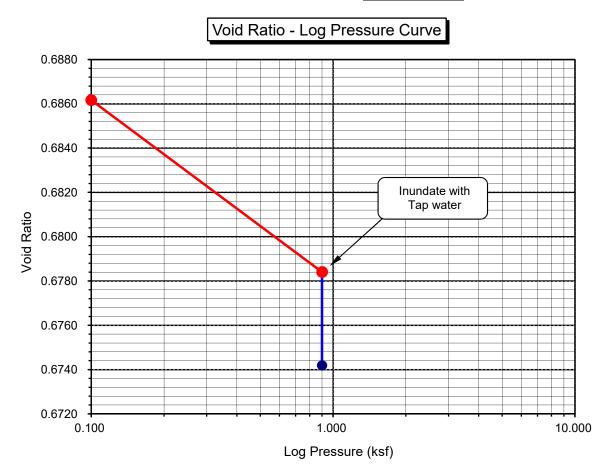
Initial Dry Density (pcf):	100.0
Initial Moisture (%):	9.04
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2702
Diameter(in):	2.415

Final Dry Density (pcf):	100.7
Final Moisture (%) :	23.0
Initial Void Ratio:	0.6862
Specific Gravity(assumed):	2.70
Initial Saturation (%)	35.6

07/16/19

07/25/19

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2702	1.0000	0.00	0.00	0.6862	0.00
0.900	0.2638	0.9936	0.18	-0.64	0.6784	-0.46
H2O	0.2613	0.9911	0.18	-0.89	0.6742	-0.71



## ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

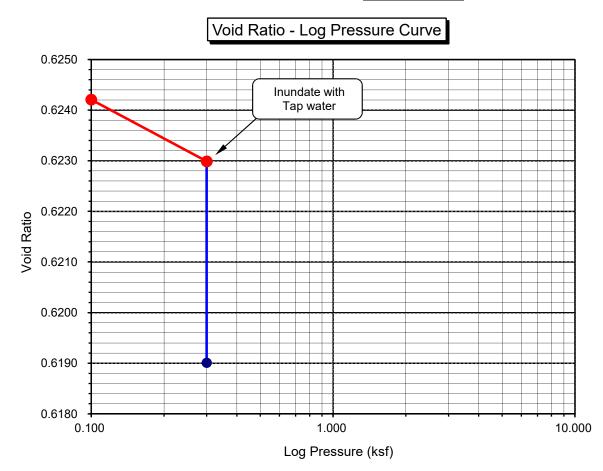
Project Name: Colonial Tested By: G. Bathala Date: 07/16/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-2 Sample Type: Ring Depth (ft.) 2.5

Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	103.7	Final Dry Density (pcf):	104.1
Initial Moisture (%):	4.44	Final Moisture (%) :	18.8
Initial Length (in.):	1.0000	Initial Void Ratio:	0.6249
Initial Dial Reading:	0.3294	Specific Gravity(assumed):	2.70
Diameter(in):	2.415	Initial Saturation (%)	19.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3290	0.9996	0.00	-0.04	0.6242	-0.04
0.300	0.32735	0.9980	0.09	-0.21	0.6230	-0.12
H2O	0.3249	0.9955	0.09	-0.45	0.6190	-0.36



## ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name:ColonialTested By:G. BathalaDate:07/17/19Project No.:16163-01Checked By:J. WardDate:07/25/19

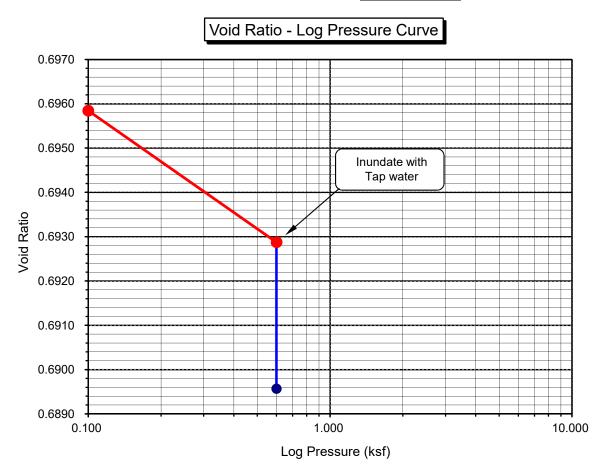
Boring No.: HS-3 Sample Type: Ring Sample No.: R-1 Depth (ft.) 5.0

Sample Description: Olive silt with sand (ML)s, organic material noted

Initial Dry Density (pcf):	99.4
Initial Moisture (%):	10.70
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3151
Diameter(in):	2.415

Final Dry Density (pcf):	99.8
Final Moisture (%) :	25.9
Initial Void Ratio:	0.6962
Specific Gravity(assumed):	2.70
Initial Saturation (%)	41.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3149	0.9998	0.00	-0.02	0.6958	-0.02
0.600	0.31245	0.9974	0.07	-0.27	0.6929	-0.20
H2O	0.3105	0.9954	0.07	-0.46	0.6896	-0.39



## ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Colonial Tested By: G. Bathala Date: 07/17/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

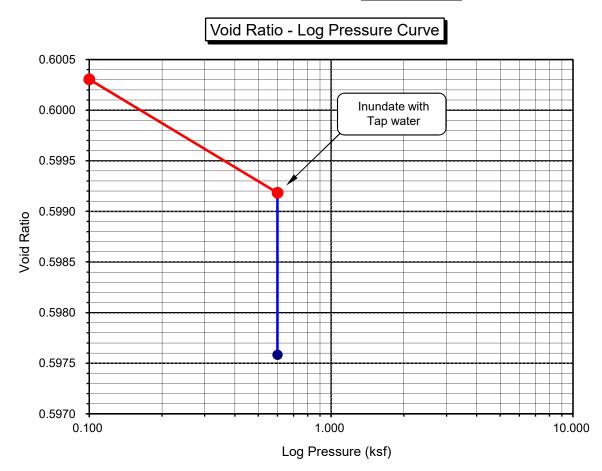
Boring No.: HS-1 Sample Type: Ring Depth (ft.) 5.0

Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	105.3
Initial Moisture (%):	5.30
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2910
Diameter(in):	2.415

Final Dry Density (pcf):	105.5
Final Moisture (%) :	18.5
Initial Void Ratio:	0.6003
Specific Gravity(assumed):	2.70
Initial Saturation (%)	23.8

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2910	1.0000	0.00	0.00	0.6003	0.00
0.600	0.2888	0.9978	0.15	-0.22	0.5992	-0.07
H2O	0.2878	0.9968	0.15	-0.32	0.5976	-0.17



## PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS ASTM D 6913

Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-6 Depth (feet): 7.5

Sample No.: R-2

Soil Identification: <u>Light olive brown silty sand (SM)</u>

		Moisture Content of Total Air - Dry Soil	
Container No.:	XY	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	595.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	248.2	Wt. of Container No (g)	1.0
Dry Wt. of Soil (g)	347.0	Moisture Content (%)	0.0

After Wet Sieve	Container No.	XY
	Wt. of Dry Soil + Container (g)	457.1
	Wt. of Container (g)	248.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	208.9

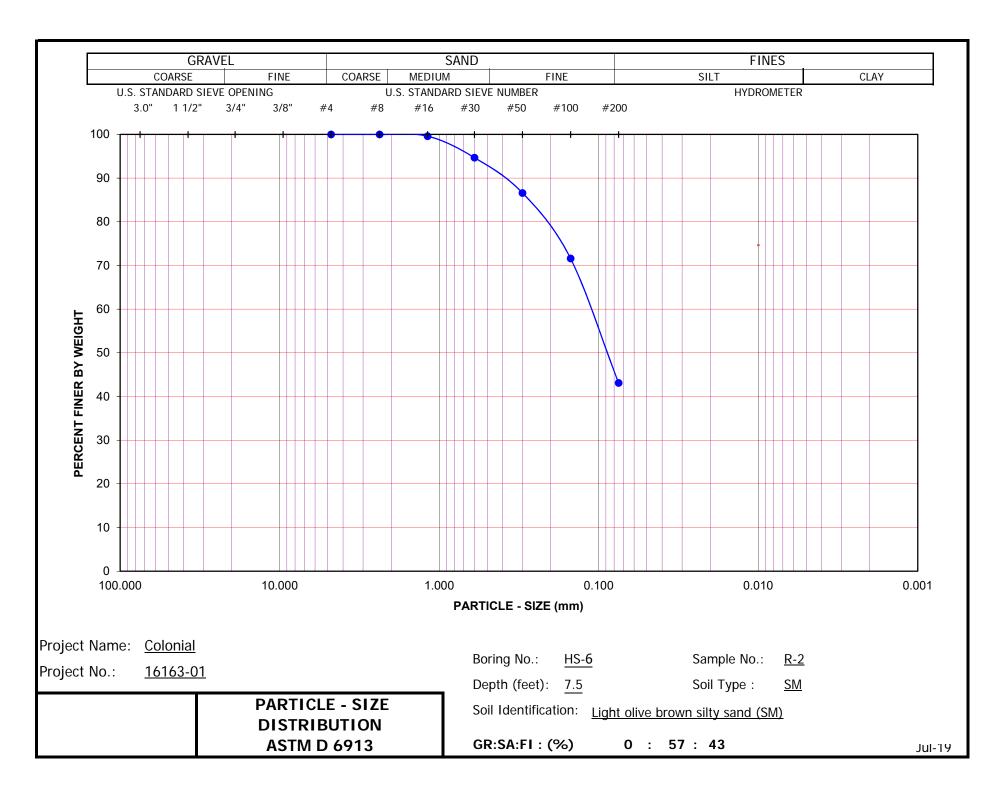
U. S. Sieve Size		Cumulative Weight	Percent Passing (%)
(in.)	(mm.)	Dry Soil Retained (g)	reicent rassing (70)
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.1	100.0
#16	1.18	1.4	99.6
#30	0.600	18.5	94.7
#50	0.300	46.5	86.6
#100	0.150	98.4	71.6
#200	0.075	197.4	43.1
PAN			

GRAVEL:	0 %
SAND:	57 %
FINES:	43 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 

Remarks:



## PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS ASTM D 6913

Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: <u>HS-2</u> Depth (feet): 2.5

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	ZK	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Con	t.(g) 564.9	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g	248.9	Wt. of Container No (g)	1.0
Dry Wt. of Soil (g	316.0	Moisture Content (%)	0.0

After Wet Sieve	Container No.	ZK
	Wt. of Dry Soil + Container (g)	459.5
	Wt. of Container (g)	248.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	210.6

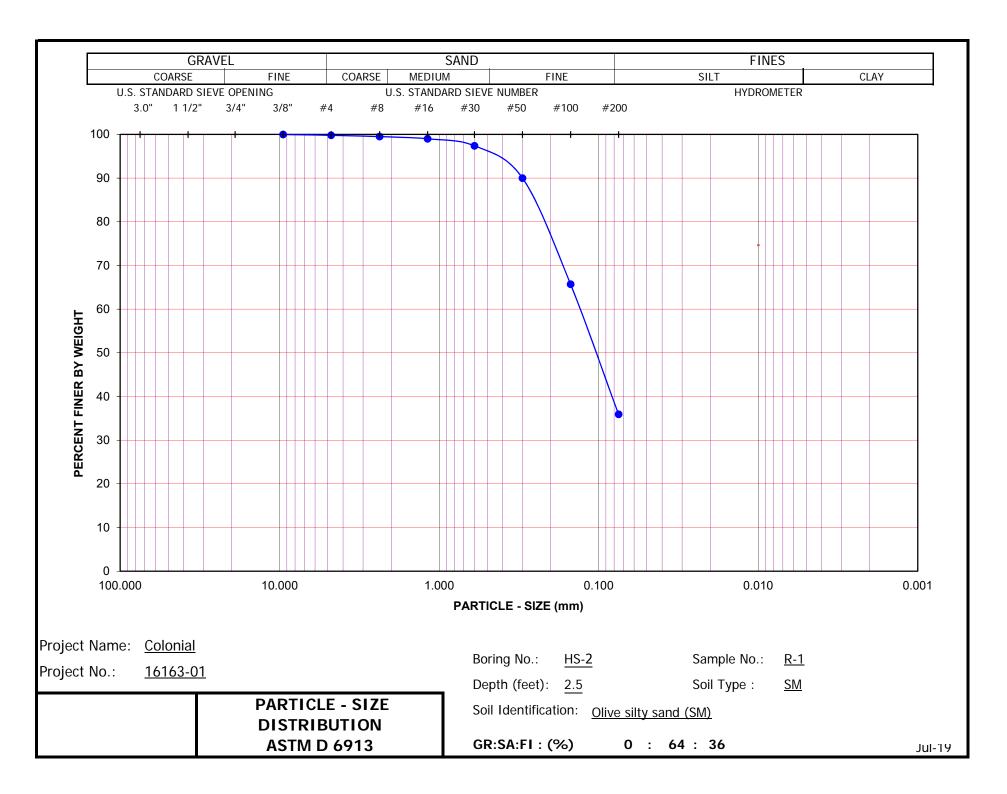
U. S. Sieve Size		Cumulative Weight	Percent Passing (%)
(in.)	(mm.)	Dry Soil Retained (g)	refletit rassing (70)
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.7	99.8
#8	2.36	1.5	99.5
#16	1.18	3.1	99.0
#30	0.600	8.1	97.4
#50	0.300	31.6	90.0
#100	0.150	108.5	65.7
#200	0.075	202.6	35.9
PAN			

GRAVEL:	0 %
SAND:	64 %
FINES:	36 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 

Remarks:



# PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS ASTM D 6913

Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: HS-3 Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silt with sand (ML)s, organic material noted

		Moisture Content of Total Air - Dry Soil	
Container No.:	НА	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	533.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	246.0	Wt. of Container No (g)	1.0
Dry Wt. of Soil (g)	287.2	Moisture Content (%)	0.0

	Container No.	НА
After Wet Sieve	Wt. of Dry Soil + Container (g)	332.3
Aitel Wet Sieve	Wt. of Container (g)	246.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	86.3

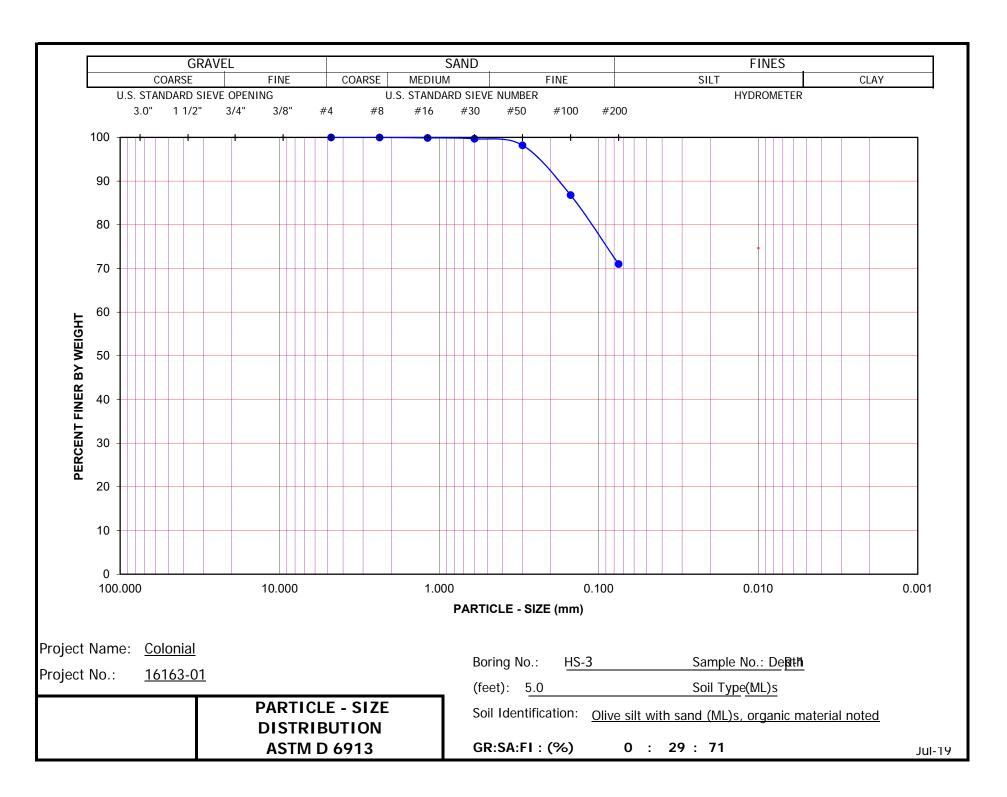
U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)	
(in.)	(mm.)	Dry Soil Retained (g)		
1 1/2"	37.5			
1"	25.0			
3/4"	19.0			
1/2"	12.5			
3/8"	9.5			
#4	4.75	0.0	100.0	
#8	2.36	0.1	100.0	
#16	1.18	0.3	99.9	
#30	0.600	1.0	99.7	
#50	0.300	5.3	98.2	
#100	0.150	38.0	86.8	
#200	0.075	83.4	71.0	
PAN				

GRAVEL:	0 %
SAND:	29 %
FINES:	71 %

GROUP SYMBOL: (ML)s Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 

Remarks:



# PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS ASTM D 6913

Project Name: Colonial Tested By: G. Bathala Date: 07/18/19
Project No.: 16163-01 Checked By: J. Ward Date: 07/25/19

Boring No.: <u>HS-1</u> Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

			Moisture Content of Total Air - Dry Soil		ry Soil
Container No.:		GE	Wt. of Air-Dry Soil + Cont.	(g)	0.0
Wt. of Air-Dried Soil + Co	ont.(g)	599.4	Wt. of Dry Soil + Cont.	(g)	0.0
Wt. of Container	(g)	250.2	Wt. of Container No	(g)	1.0
Dry Wt. of Soil (	(g)	349.2	Moisture Content (%)		0.0

After Wet Sieve	Container No.	GE
	Wt. of Dry Soil + Container (g)	488.4
Arter Wet Sieve	Wt. of Container (g)	250.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.2

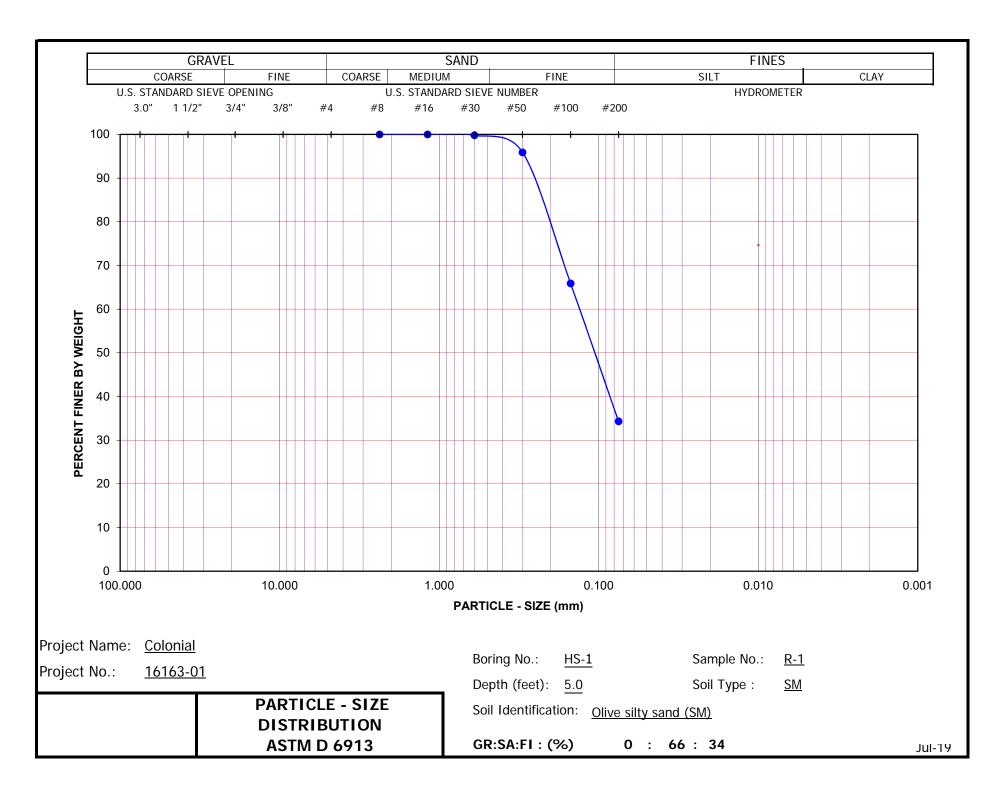
U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)	
(in.)	(mm.)	Dry Soil Retained (g)		
1 1/2"	37.5			
1"	25.0			
3/4"	19.0			
1/2"	12.5			
3/8"	9.5			
#4	4.75			
#8	2.36	0.0	100.0	
#16	1.18	0.1	100.0	
#30	0.600	0.7	99.8	
#50	0.300	14.3	95.9	
#100	0.150	119.1	65.9	
#200	0.075	229.4	34.3	
PAN				

GRAVEL:	0 %
SAND:	66 %
FINES:	34 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 

Remarks:



T-1 (	0.5')*	T-2 (	0.8')*	T-3 (	0.6')*	T-4 (	1.8')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	5.1	0.2	4.1	0.4	19.1	0.4	6.3
0.5	1.8	0.5	20.9	0.7	1.6	1.5	9.6
1.0	0.5	0.8	0.4		-	2.0	1.5
T-5 (	1.5')*	T-6 (	1.0')*	T-7 (	1.0')*	T-8 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1.0	9.2	0.6	10.5	0.7	10.4	0.5	2.6
2.0	0.2	1.4	2.1	1.1	1.5	1.2	3.7
		1.6	0.3	1.4	0.4	1.7	1.7
T-9 (	0.5')*	T-10	(0')*	T-11	(0')*	T-12	(0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.4	4.6	0.5	2.7	0.3	0.6	0.3	4.1
1.2	2.1	1.1	1.7	2.3	1.3	1.0	1.2
1.5	1.1	1.5	1.0	2.7	0.8	1.5	0.5
-	-	-	-	3.5	0.7	-	-
T-13	(0.5')*	T-14 (2.9	' to 3.5')*	T-15	(0')*	T-16	(1.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	6.7	1.0	1.3	1.0	1.1	0.5	11.4
0.8	4.0	3.0	10.1	2.0	2.3	1.6	1.9
1.2	1.7	3.5	0.4	3.0	0.5	2.4	0.5
-	-	-	-	4.0	0.7	-	-
T-17	(O')*						

T-17 (0')*			
Depth (ft)	% Organics		
1.0	0.6		
4.0	1.1		

#### Legend

<u>==дони</u>	
> 5%	
2 to 5%	
< 2%	

"High" Organic Content "Soils" Recommended for Export from Site

"Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils

"Clean" Soils

te: (#')\* Indicates Recommended Organic Export Depth in Feet. Export depth may exceed the depths highlighted box



Table 8 - Summary of Organic Content - Organic Removal & Export Depths

Project Name	MCBC - Brookfield, Ontario
Project Number	20246-01
ENG./GEOL.	RLD/ARN
Date	August 2021

	Geotechnical Boring Log Borehole I-1											
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling				
					okfield			Type of Rig: Track Rig				
			er: 202					Drop: 30" Hole Diameter:	8"			
					~755' N			Drive Weight: 140 pounds				
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 o				
			<u>_</u>		<del>_</del>			Logged By ARN				
			qu			_	<del> </del>	Sampled By ARN				
<b>H</b>		go	l un	l t	<u></u>	<b>%</b>	d m	Checked By RLD	est			
l e	(ft)		Z	no	ISI	ē	Sy	,	Į T			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>e</u>	ер	<u>a</u>	an	<u>8</u>	<u>&gt;</u>	<u> </u>	SC	DECODIDE	yp			
Ш		٥	S	<u> </u>		2		DESCRIPTION	_			
	0 _	H-1		_								
	_			_				@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)				
755-	755 R-1 5 105.7 2.1 SF							@2.5' - SAND with Silt: dusky brown, dry, medium				
	_			5 6 7				dense				
	5 —	Ш	R-2	4	109.5	3.7	SM	@5' - Silty SAND: dusky brown, dry, medium dense				
	_		11-2	4 6 10	109.5	3.7	Sivi	GO - Silty SAND. dusky blown, dry, mediam dense				
	_			-								
750-	_			-								
	_			-								
	10 —		SPT-1	4		5.8		@10' - Silty SAND: dusky brown, slightly moist, medium				
	_			4 5 6				dense				
	-			-								
745-	_			-								
	_		R-3	4	101.2	8.1	ML	@14' - Sandy SILT: dusky brown slightly moist, stiff	-#200			
	15 —			4 8 13								
	_			-				Total Depth = 16'				
	-			-				Groundwater Not Encountered				
740-	_			-				Infiltration Well Installed Per County Guidelines				
	-			-				Backfilled with Cuttings on 12/19/2021				
	20 —											
735-												
135												
	25 —			_								
	20 -			_								
	_			_								
730-	_			_								
	_			-								
	30 —			-								
								LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
			2		OF TI SUBS	SURFACE (	CONDITIONS N	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  SA SIEVE ANALYSIS  G GRAB SAMPLE SA SIEVE ANALYSIS	Y			
					LOCA			GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  SPT STANDARD PENETRATION S&H SIEVE AND HYDROX  TEST SAMPLE	METER			



STANDARD PENETRATION TEST SAMPLE

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole I-2												
Date:								Drilling Company: Cal Pac Drilling					
			MCBO					Type of Rig: Track Rig					
			er: 202		~757' N	401		Drop: 30" Hole Diameter: Drive Weight: 140 pounds	8"				
					∼/5/ i\ chnical			Page 1	of 1				
					_	- map		Logged By ARN					
			Sample Number		Dry Density (pcf)		<del> </del>	Sampled By ARN					
I €		бc	E	+=	ty (	(%	) Jupa	Checked By RLD	est				
l e	<b>£</b>	c L	Z	l no	nsi	e (	Syı	Chocked by NEB	f T				
Elevation (ft)	Depth (ft)	Graphic Log	l du	Blow Count	De	Moisture (%)	USCS Symbol		Type of Test				
	Эер	Эга	San	<u>8</u>	Ory	doi	)S(	DESCRIPTION	l yp				
Н	0			Ш				DESCRIPTION					
	٦ -	i i		-				@2 Fl. to T.D. Overtownew Verman Feliam Demonito (Over)					
I	-		R-1	9	105.5	3.7	SM	<ul><li>@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)</li><li>@2.5' - Silty SAND: gray brown, dry, medium dense</li></ul>	EI				
755	7		111	9 11 9	100.0	5.7	Olvi	W2.5 - Silty OAND. gray brown, dry, mediam dense	CR				
	5—				440.0	0.5		OFI CITY CAND I THE TOTAL THE TANK THE	-#200				
	_		R-2	5 8 13	112.0	3.5		@5' - Silty SAND: dusky gray brown, dry, medium dense					
	4			-									
750-	-			-									
				-									
	10 —		SPT-1	6 5 6		5.9		@10' - Silty SAND: dusky gray brown, slightly moist,					
				<i>†</i> ∖ 6 -				medium dense					
745-	4			_									
	4			-									
	15 —			-									
	4			-									
740	٦			-									
740-				_									
	20 —		R-3	7	101.2	1.9	SP-SM	@20' - SAND with Silt: dusky gray brown, dry, medium	-#200				
	4		11-5	7 14 9	101.2	1.9	OF -OW	dense	-#200				
	+			-				Total Danth - 22					
735-	-			-				Total Depth = 22' Groundwater Not Encountered					
	25 —			-				Infiltration Well Installed Per County Guidelines					
	23 _			_				Backfilled with Cuttings on 12/19/2021					
	4			-									
730-	4			-									
	4			-									
	30 —			-									
					OF TI	HIS BORIN	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER A T OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	,				
	>				LOCA WITH	ATIONS AN I THE PASS	D MAY CHANG SAGE OF TIME	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	METER				



WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

TEST SAMPLE

GROUNDWATER TABLE

EI CN CR AL CO RV -#200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-1											
	6/21							Drilling Company: Cal Pac				
			Colon					Type of Rig: Limited Access HS				
			<b>er</b> : 161					Drop: 30" Hole Diameter:	6"			
					~766' N			Drive Weight: 140 pounds				
Hole	Locat	tion	: See (	Geote	chnical	Map		Page 1 o	of 1			
			_		<del></del>			Logged By CNJ				
			Sample Number		Dry Density (pcf)		<u> </u>	Sampled By CNJ				
Elevation (ft)		Log	💆	l t	<u>:</u>	Moisture (%)	USCS Symbol		Type of Test			
lo	(ft)	<u>  2</u>	<del> </del>	Count	SUS	<u> </u>	S		of T			
∕at	Depth (ft)	Graphic	ᅵᆸ		ا م	stu	ဗ္ဗ		e o			
<u>e</u>	Эер	ia Ja	Sar	Blow (	) Jy	loi	<u> </u>	DESCRIPTION	Γ <sub>Z</sub>			
Ш			0)									
765-	0 _			-				@0' to 2.5' Artificial Fill - Undocumented (afu) @0' - Silty SAND: brown, dry, loose; scattered grass				
	_			-				and rootlets				
	_		SPT-1	3 4 5		3.8	SP	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)				
	_			/\ 5				@2.5' - SAND: gray brown, slightly moist, medium dense				
	5 —		R-1	5 8 15	106.6	5.3	SM	@5' - Silty SAND: olive gray, slightly moist, medium	-#200			
760-	_			15				dense	CO			
	_		SPT-2	-   4		6.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium				
	_		SF 1-2	¥ 5 7		0.5	Sivi	dense				
	-											
755	10 —	1	R-2	4 9 15	105.6	2.3	SM	@10' - Silty SAND: gray brown, slightly moist, medium				
755-				15				dense				
				_								
	_			_								
	15 —		CDT 0				CNA	QASI Cilla CAND alice anno alichtum sist madium				
750-	_		SPT-3	5 6 8		3.4	SM	@15' - Silty SAND: olive gray, slightly moist, medium dense				
	_			- 0				delise				
	_			-								
	_			-								
	20 —		R-3	13	105.7	4.1	SP	@20' - SAND: gray brown, slightly moist, medium				
745-	_		'`	13 14 16	100.7		0.	dense				
	_			-				Total Depth = 21.5'				
	_			-				Groundwater Not Encountered				
	_			- [				Backfilled with Cuttings on 6/21/2019				
	25 —			-								
740-	_			-								
	_			-								
	_			-								
	-			-								
	30 —			-								
	THIS SUMMARY APPLIES ONLY AT THE LOCATION <b>SAMPLE TYPES:</b> OF THIS BORING AND AT THE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR											
			-					MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	Y			



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole HS-2										
Date:	6/21/	201						Drilling Company: Cal Pac			
			Colon					Type of Rig: Limited Access HS			
			er: 161					Drop: 30" Hole Diameter:	6"		
					~758' N			Drive Weight: 140 pounds			
Hole	Locat	ion	: See (	Geote	chnical	Мар		Page 1 c	of 2		
			_		<del>5</del>			Logged By CNJ			
		_	agu		<u>a</u>		00	Sampled By CNJ	ا ب		
(#)	_	60-	<u> </u>	ır l	ΞĘ	8)	'n		es_		
ioi	(ft)	<u> </u>	<u>e</u>	) j	ens	<u>e</u>	S		of 1		
vat	oth	aph	ldπ	≥	Ŏ	istu	CS		) e (		
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test		
	0			+				@0' to 2.5' Artificial Fill - Undocumented			
			-	-				@0' - Silty SAND: brown, dry, loose; scattered grass			
	_	П	R-1		102.0	4.4	SM	and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye)			
755-	_	B-1	K-1	4 5 7	102.0	4.4	SIVI	@2.5' - Silty SAND: olive brown, slightly moist, loose	,,,,,,,		
	5 —								-#200 CO		
	5 <del>-</del>		SPT-1	4 5 6		6.7	SM	@5' - Silty SAND: olive brown, slightly moist, medium			
	_			<u>/\</u> 6 -				dense			
750-	_		R-2	14 15 18	101.1	2.5	SM	@7.5' - Silty fine SAND: gray brown, slightly moist,			
	_			18				medium dense			
	10 —		SPT-2	3		3.8	SM	@10' - Silty Fine SAND: gray brown, slightly moist,			
	-			3 6 7				medium dense			
	_		-	-							
745-	_			-							
	45		-	-							
	15 —		R-3	8 16 22	111.1	3.5	SM	@15' - Silty SAND with Gravel: gray, slightly moist,			
				_ 22				medium dense			
740-	_	-		_							
	_			_							
	20 —		SPT-3	6		8.0	SM	@20' - Silty SAND: brown, moist, medium dense			
	-		5. 1-3	X 6 6 8		0.0	Civi	Sity Of the Stown, moist, mediam dense			
	-			-]							
735-	-			-							
	-			-							
	25 —		R-4	8 13 15	96.0	4.2	SP	@25' - SAND: gray brown, slightly moist, medium			
				15				dense			
730-											
730			[	_							
	30 —			_							
			į					ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:			
					OF T	HIS BORING	AND AT TH	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR  MAXIMUM DENICITY	,		



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

R G SPT

BULK SAMPLE DS
RING SAMPLE (CA Modified Sampler) MD
GRAB SAMPLE SA
STANDARD PENETRATION S&H
TEST SAMPLE EI
CN
CR
GROUNDWATER TABLE AL
CO
RV
#200 GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-2										
Date:	6/21/	/201	9					Drilling Company: Cal Pac			
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS			
Proje	ct Nu	mbe	<b>:</b> 161	63-01				Drop: 30" Hole Diameter:	6"		
Eleva	tion o	of To	p of I	Hole:	~758' N	ИSL		Drive Weight: 140 pounds			
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 2 o	of 2		
			_					Logged By CNJ			
			Sample Number		Dry Density (pcf)		<del>_</del>	Sampled By CNJ			
(£		g	특	+=	) >	(%	USCS Symbol	Campion By Oliv	sst		
ט (	Æ	Ϊ̈́	Ž	] J	  sit	) e	3yr		Ţ		
atic	) H	hic	<u> </u>	ŏ	)er	tur	S		o		
Elevation (ft)	Depth (ft)	Graphic Log	E	Blow Count	)   	Moisture (%)	S		Type of Test		
Ш	Ğ	Ō	Š	<del>m</del>	_ <u>_</u>	Ĭ	ŝ	DESCRIPTION	_		
	30		SPT-4	5 6 11		10.9	SC	@30' - Clayey SAND: brown, moist, medium dense			
	_			11							
	_			-							
725-	_			-							
	0.5			-							
	35 —		R-5	8 14 22	114.5	9.5	SC	@35' - Clayey SAND: gray and reddish brown mottled,			
	_			22				moist, medium dense; iron oxide staining; pin hole			
700	_			-				porosity			
720-	_			-							
	40		Ī	-							
	40 —		SPT-5	10 17 22		10.6	SM	@40' - Silty SAND: gray brown, moist, dense; minor iron			
	_			22				oxide staining			
745				-							
715-			Ī	-							
	45 —										
	45 -		R-6	6 12 18	110.2	18.2	ML	@45' - SILT: olive brown and reddish orange mottled,			
				18				very moist, very stiff; iron oxide staining			
710-											
7107											
	50 —										
	JU _		SPT-6	13 23 25		9.5	SM	@50' - Silty SAND: gray brown, moist, very dense			
	_			/\ <u>25</u> -				T			
705-	_			_				Total Depth = 51.5' Groundwater Not Encountered			
100	_			_				Backfilled with Cuttings on 6/21/2019			
	55 —			_				Dasiamed with editings on 0/21/2010			
	_			_							
	_			_							
700-	_			_							
	_			-							
	60 —			-							
								ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:			
					SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	(		



G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole HS-3											
	6/21/							Drilling Company: Cal Pac				
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS				
			<b>er:</b> 161					Drop: 30" Hole Diameter:	6"			
					~757' <b>N</b>			Drive Weight: 140 pounds				
Hole	Locat	tion	: See (	Geote	chnical	Map		Page 1 c	of 1			
								Logged By CNJ				
			ag		bc		<del>-</del>	Sampled By CNJ				
<b>#</b>		g	<u>L</u>	<u> </u>	_	%	gr.		est			
5	(ft)	<u>ا</u> ا		no	nsi	(e)	Syl		ĹΤ			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>`è</u>	ер	ğ	au	<u>δ</u>	≥	<u>   </u>	SC		ype			
Ш	a	ပ	S	Ω		Σ		DESCRIPTION	Τ			
	0 _			-				<ul> <li>@0' to 2.5' <u>Artificial Fill - Undocumented</u></li> <li>@0' - Silty SAND: brown, dry, loose; scattered grass</li> </ul>				
755-	_		SPT-1	-  3		5.7	SM	and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye)				
	_		SF 1-11	3 5 5		3.7	Sivi	@2.5' - Silty SAND: gray brown, slightly moist, medium				
	_		-					dense				
	5 —		R-1	8 8 11	101.9	10.7	ML	@5' - SILT with Sand: olive brown, moist, stiff; roots;	-#200			
750-				11				wood fragments	CO			
750-			SPT-2	 8		5.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium				
	_			8 9 11				dense				
	10 —		R-2	9	111.4	2.5	SP	@10' - SAND: gray brown, slightly moist, medium				
	_		11-2	9 15 21	' ' ' ' '	2.5	01	dense				
745-	_			-								
	_			-								
	-		-	-								
	15 —		SPT-3	3		15.0	ML	@15' - Sandy SILT: olive gray, very moist, very stiff				
	_			3 6 9								
740-	_		-	-								
	_			-								
	-		-	-								
	20 —		R-3	3 9 14	99.6	12.6	SM	@20' - Silty SAND: olive brown, moist, medium dense;				
735-				14				white root casts				
735								Total Depth = 21.5'				
	_			_				Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019				
	25 —			_								
				_								
730-	_			-								
	_			-								
	-		-	-								
	30 —			-								
				<u>'</u>				LIV AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IF TIME OF DRILLING B BULK SAMPLE DS DIRECT SHEAR				
	>		~	1	SUBS	SURFACE C	CONDITIONS	IE TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSIT           IGE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	Υ			



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole HS-4											
Date:	6/21/	/201	9					Drilling Company: Cal Pac				
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS				
			e <b>r</b> : 161					Drop: 30" Hole Diameter:	6"			
					~757' N			Drive Weight: 140 pounds				
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1 c	of 1			
			_		<u>_</u>			Logged By CNJ				
			ag		bc		<del>-</del>	Sampled By CNJ				
(#)		go	Lin	۲		%	qι		əst			
L C	(ft)	ا ا		Count	nsi	e	Syl		f T			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	l Ó	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>e</u>	eb	a	an	Blow	≥	<u>  0</u>	SC		yp(			
Ш		Θ	S	a		2		DESCRIPTION	$\vdash$			
0 @0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass												
755-	_			-	400.0		SM	and rootlets	ΕI			
	R-1 9 108.3 4.9							@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, medium	MD			
		╎╙║		10				dense; white rootlets	CR			
	5 —	ш ш	SPT-1	4 4		3.9	SM	@5' - Silty SAND: olive gray, slightly moist, loose				
	_			<u> </u>								
750-	_		R-2	- 5	88.9	3.6	ML	@7.5' - Sandy Silt: gray, slightly moist, very stiff				
			``	5 10 15	00.0	0.0	'''-	grio cana) cha gray, chighaly moles, very can				
	10 —		CDT OF			1.5	SM	@10' Silty SAND; gray brown dry madium dance				
	_		SPT-2	7 10		1.5	SIVI	@10' -Silty SAND: gray brown, dry, medium dense				
745-	_			-								
	_			-								
	_			-								
	15 —		R-3	8	99.9	10.2	SM	@15' - Silty SAND: brown, moist, medium dense				
	_			8 9 13				, , ,				
740-	_			-								
	_			-								
	-			-								
	20 —		SPT-3	12		1.8	SP	@20' - SAND with Gravel: gray brown, dry, medium				
725	_			<b>/</b> \ 1ŏ				dense				
735-								Total Depth = 21.5'				
								Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019				
25—								Backinica with Catalings on 0/21/2010				
				_								
730-	_			-								
	-			-								
	-			-								
	30 —			-								
	THIS SUMMARY APPLIES ONLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  OF THIS BORING AND AT THE TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR											
	>	1	-		SUBS	SURFACE C	CONDITIONS	E TIME OF DRILLING.  B BULK SAMPLE  BUS SAMPLE  DIS DIRECT SPIEAR  MAXIMUM DENSITY  GE AT THIS LOCATION  G GRAB SAMPLE  SA SIEVE ANALYSIS	′			



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole HS-5											
Date:	6/21	/201	9					Drilling Company: Cal Pac				
Proje	ct Na	me:	Colon	ial				Type of Rig: Limited Access HS				
Proje	ct Nu	mbe	er: 161	63-01				Drop: 30" Hole Diameter:	6"			
					~757' N			Drive Weight: 140 pounds				
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 c	of 1			
			<u> </u>		<u>_</u>			Logged By CNJ				
			Sample Number		Dry Density (pcf)		<del>-</del>	Sampled By CNJ				
(#)		go	L	۲		%	qu		əst			
5	(ft)	ا ا		no	nsi	(e	Syl		ſΤ			
Elevation (ft)	Depth (ft)	Graphic Log	<u> </u>	Blow Count	De	Moisture (%)	USCS Symbol		Type of Test			
<u>`è</u>	ер	ā	a⊔	<u>8</u>	≥	<u>  0</u>	SC		ype			
Ш	a	ပ	S	Δ		Σ		DESCRIPTION	-			
0 @0' to 2.5' <u>Artificial Fill - Undocumented</u> @0' - Silty SAND: brown, dry, loose; scattered grass												
755-	R-1 5 101.3 2							and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye)	ΕI			
	_	<u>-</u>	12-1	5 8 9	101.5	2.5	SP	@2.5' - SAND: gray brown, slightly moist, medium dense	MD			
	_											
	5 —		SPT-1	3 4 4		4.5	SP	@5' - SAND: gray brown, slightly moist, loose				
750-				<u>7\</u> 4								
730	_		R-2	8	106.8	7.7	SM	@7.5' - Silty SAND: olive brown, moist, medium dense				
	_			8 9 10								
	10 —		SPT-2	4		5.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium				
	_			4 6 8		0.1	Oivi	dense				
745-	_			-								
	_			-								
	_			-								
	15 —		R-3	9	130.6	1.8	SP	@15' - SAND: gray brown, dry, medium dense				
	_			9 14 19								
740-	_			-								
	_			-								
	-			-								
	20 —		SPT-3	√ 8 10		4.9	SP	@20' - SAND: gray brown, slightly moist, medium				
735-	_			7\ 9 -				dense				
135	_		[	_				Total Depth = 21.5' Groundwater Not Encountered				
								Backfilled with Cuttings on 6/21/2019				
25 —  -								3				
	_			-								
730-	_			-								
	_			-								
	_			-								
	30 —			-								
	THIS SUMMARY APPLIES ONLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  OF THIS BORING AND AT THE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR											
		1	-		SUBS	SURFACE C	CONDITIONS	IE TIME OF DRILLING.  B BULK SAMPLE  BY SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION  G GRAB SAMPLE  SA SIEVE ANALYSIS	,			



G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE

GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-6											
Date:	6/21/	<u>/2</u> 01						Drilling Company: Cal Pac				
			Color					Type of Rig: Limited Access HS				
			er: 161					Drop: 30" Hole Diameter:	6"			
					~763' N			Drive Weight: 140 pounds				
Hole	Locat	ion	: See (	Geote	chnical	Map		Page 1 of 2				
			ا		Œ.			Logged By CNJ				
			Sample Number		Dry Density (pcf)		0	Sampled By CNJ				
Elevation (ft)		og	<u>u</u> n	nt	-\$	Moisture (%)	USCS Symbol	, ,	Type of Test			
o	(ft)	Graphic Log	Z	Blow Count	ISI	<u></u> <u></u>	Sy		ĹΤ			
'ati	Depth (ft)	phi	ald	0	De	stul	S		0			
<u>ē</u>	ер	īal	an	<u>  0</u>	<u>&gt;</u>	10 <u>i</u> s	SC	DECODIDE	yp			
Ш		9	S	В		2		DESCRIPTION	_			
	0 _							@0' to 2.5' Artificial Fill - Undocumented				
	_			_				@0' - Silty SAND: brown, dry, loose; scattered grass and rootlets	MD			
760-	_	_	R-1	5 6 10	103.4	4.0	SP	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)	EI			
, 00	_	B-1		10				@2.5' - SAND: olive brown, slightly moist, medium				
	5 —		CDT 4			40.7	00	dense				
	_	-	SPT-1	4 5 6		12.7	SC	@5' - Clayey SAND: brown, moist, medium dense				
	_	-		- 0								
755-	_	-	R-2	5 9 12	97.5	9.0	SM	@7.5' - Silty SAND: light olive brown, moist, medium	-#200			
	_			12				dense; white root casts	CO			
	10 —		SPT-2			8.7	SM	@10' Silty SAND, alive brown maint lease				
	_		SP1-2	$A = \begin{pmatrix} 4 \\ 4 \\ 4 \end{pmatrix}$		0.7	SIVI	@10' - Silty SAND: olive brown, moist, loose				
	_			-								
750-	_			_								
	_			_								
	15 —		R-3		102.6	8.5	SM	@15' - Silty SAND: gray brown, moist, medium dense				
	_		K-3	4 8 12	102.6	0.5	SIVI	@15 - Silly SAND. gray brown, moist, medium dense				
	_			- '2								
745-	_	-		_								
	_			-								
	20 —		SPT-3	√ 6		8.5	SP	@20' - SAND: gray brown, moist, medium dense				
	_		01 1-3	M 6 6 9		0.5	01	620 - SAND. gray brown, moist, medium dense				
	_			-								
740-	_	-		-								
	_			-								
	25 —		R-4	3	93.9	10.7	SM	@25' - Silty SAND: gray brown, moist, medium dense;				
	_		'\	3 6 9	30.3	10.7	CIVI	trace gravel				
				-								
735-	_			-								
	-			-								
	30 —			-								
	THIS SUMMARY APPLIES ONLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:											
								E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y			



GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
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CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
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% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-6											
Date:	6/21	/201	9						Drilling Company: Cal Pac			
Proje	ct Na	me:	Color	nial					Type of Rig: Limited Access HS			
			<b>er:</b> 161						Drop: 30" Hole Diameter:	6"		
			•			√763' N			Drive Weight: 140 pounds			
Hole	Locat	tion:	See	Ge	otec	hnical	Мар		Page 2 c	of 2		
			_			<u>_</u>			Logged By CNJ			
			Sample Number			Dry Density (pcf)		0	Sampled By CNJ			
(#)		go	lπ		۱	<u>\$</u>	Moisture (%)	USCS Symbol	,	Type of Test		
LC C	Œ	ا ا	Z		no	nsi	е.	Syl		Ĺ		
atji	E)	ij	) bld		$\circ$	De	stur	တ္သ		O O		
Elevation (ft)	Depth (ft)	Graphic Log	ап		Blow Count	≥	lois	SC		ά		
Ш		-				Δ			DESCRIPTION	⊢		
	30 _		SPT-4	М	5 6 10		15.4	ML	@30' - SILT: brown with reddish brown mottled, very			
	_			H	10				moist, very stiff			
730-	_			ĻГ								
	_			H								
	35 —		R-5		13	114.2	8.5	SC	@35' - Clayey SAND: reddish brown and brown			
	_		11-5		13 18 50	114.2	0.5	30	mottled, moist, very dense			
	_			F					, ,			
725-	-			H								
	_			H								
	40 —		SPT-5	Н	12		5.4	SP	@40' - SAND: brown, slightly moist, dense			
	_			A	12 15 20				, , ,			
	_			H								
720-	-			H								
	_	-		H								
	45 <del></del>		R-6		17 27 27	123.6	6.3	SP	@45' - SAND: brown, slightly moist, dense; trace			
	_				27				amounts of clay			
_,_	_	1		Ħ								
715-	_											
	- -											
	50 —	1	SPT-6	М	8 23 26		2.4	SP	@50' - SAND: reddish brown, slightly moist, very dense			
				<u> </u>	26							
710-									Total Depth = 51.5'			
710	_			Ll					Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019			
	55 —			Ll					Baskimoa with Sattings on 5/21/2010			
	_			$\Box$								
	_			$  \cdot  $								
705-	_			$  \cdot  $								
	_			$\vdash$								
	60 —			$ \cdot $								
									LUY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR			
	>				-	SUBS	SURFACE C	ONDITIONS I	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler) MD         MAXIMUM DENSITY           GE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	′		



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
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R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

# LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

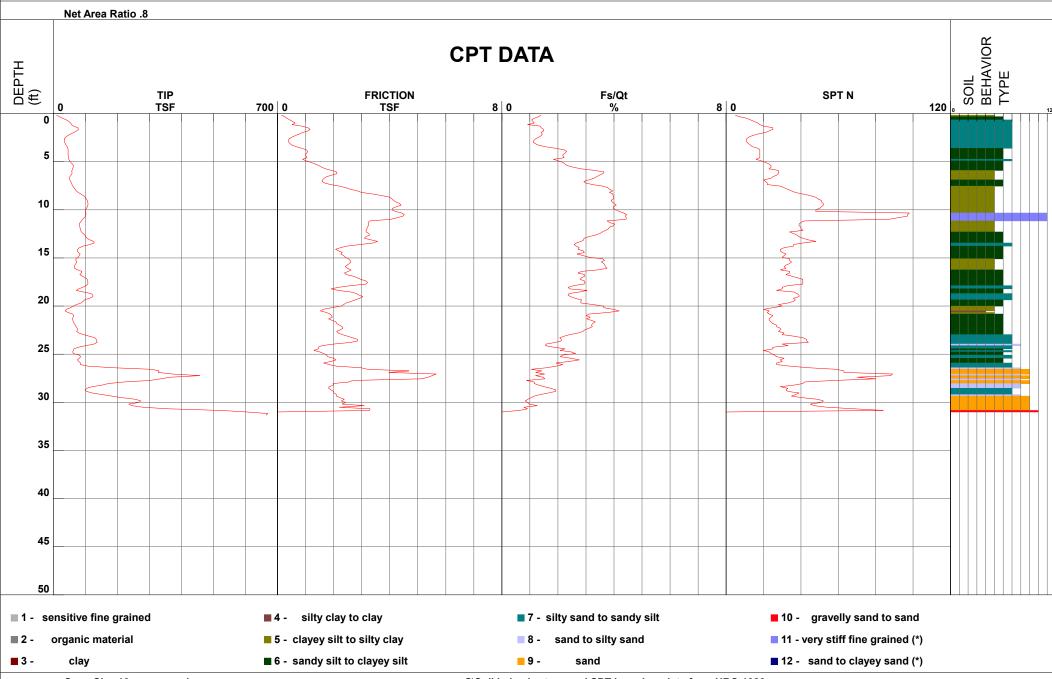
 Hole Number
 CPT-01

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 12:32:28 PM Filename SDF(768).cpt

GPS

Maximum Depth 31.33 ft



# LGC Geotechnical, Inc.



 Project
 Colonial

 Job Number
 16163-01

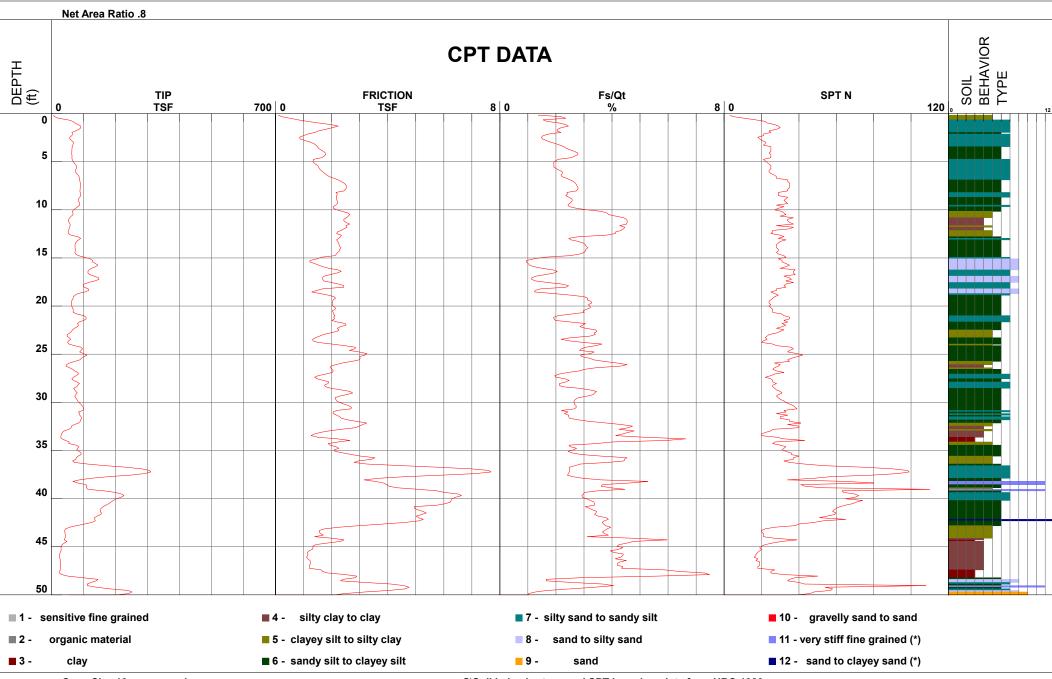
 Hole Number
 CPT-02

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 1:15:36 PM Filename SDF(769).cpt

GPS

Maximum Depth 50.52 ft



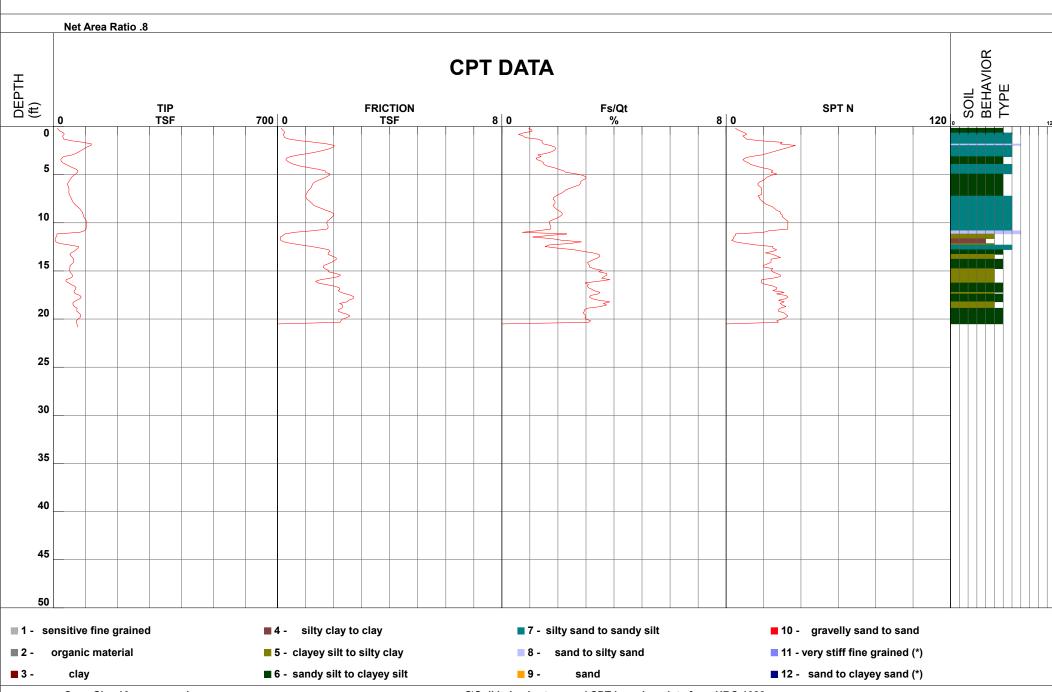
# LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

 Hole Number
 CPT-03

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:00:43 PM 

# LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

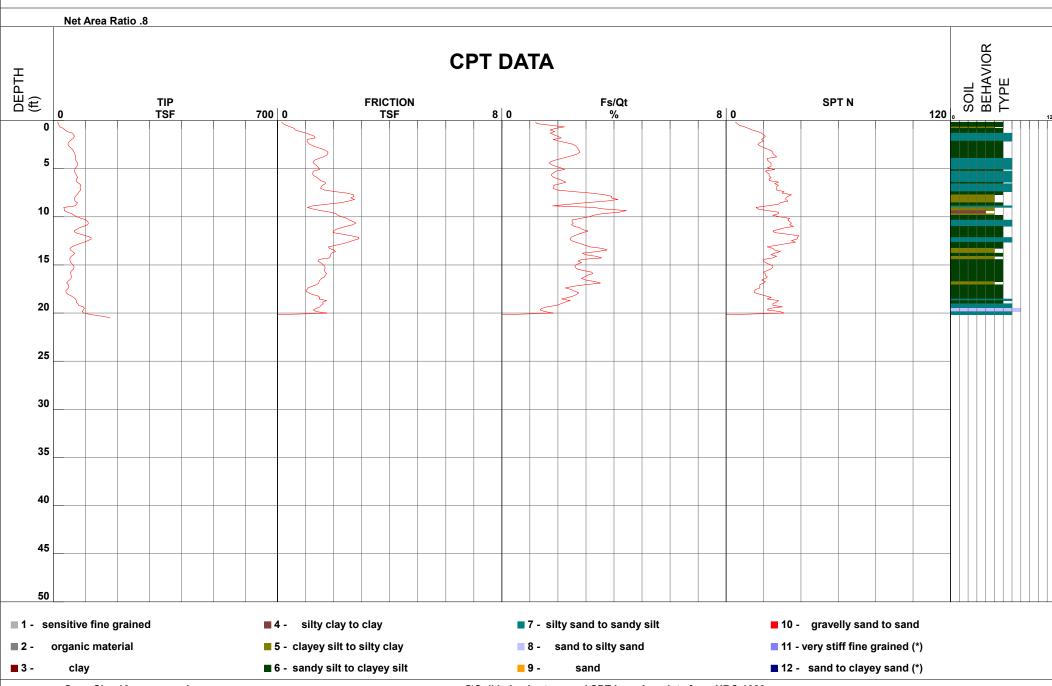
 Hole Number
 CPT-04

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:19:06 PM Filename SDF(771).cpt

GPS

Maximum Depth 20.51 ft



# LGC Geotechnical, Inc.

 Project
 Colonial

 Job Number
 16163-01

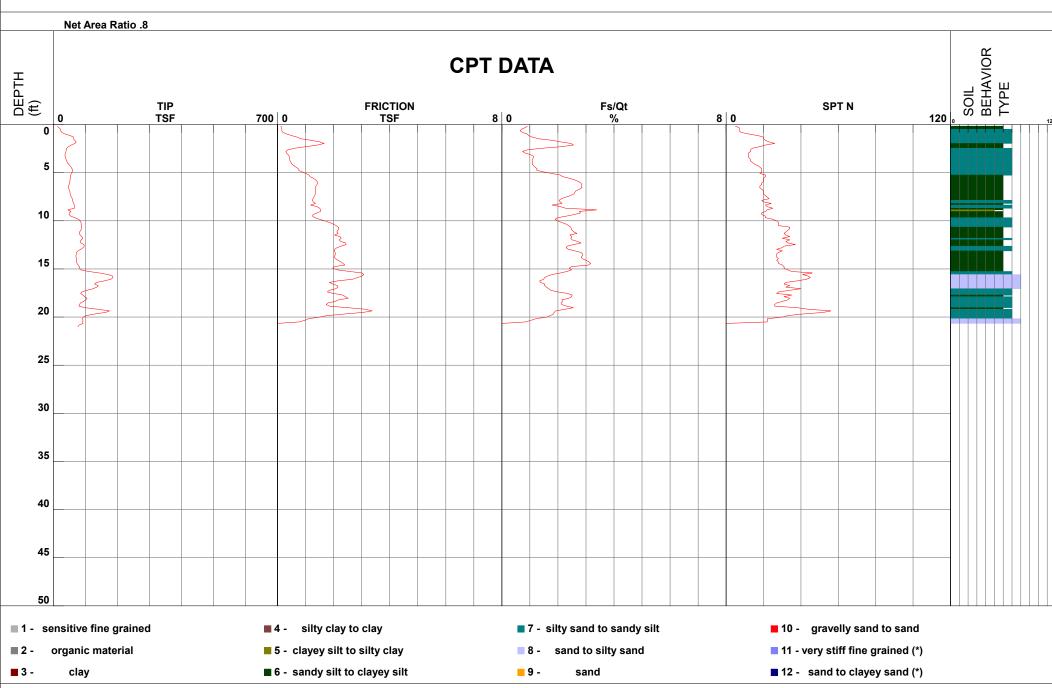
 Hole Number
 CPT-05

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:38:10 PM Filename SDF(772).cpt

GPS

Maximum Depth 21.00 ft



# LGC Geotechnical, Inc.



 Project
 Colonial

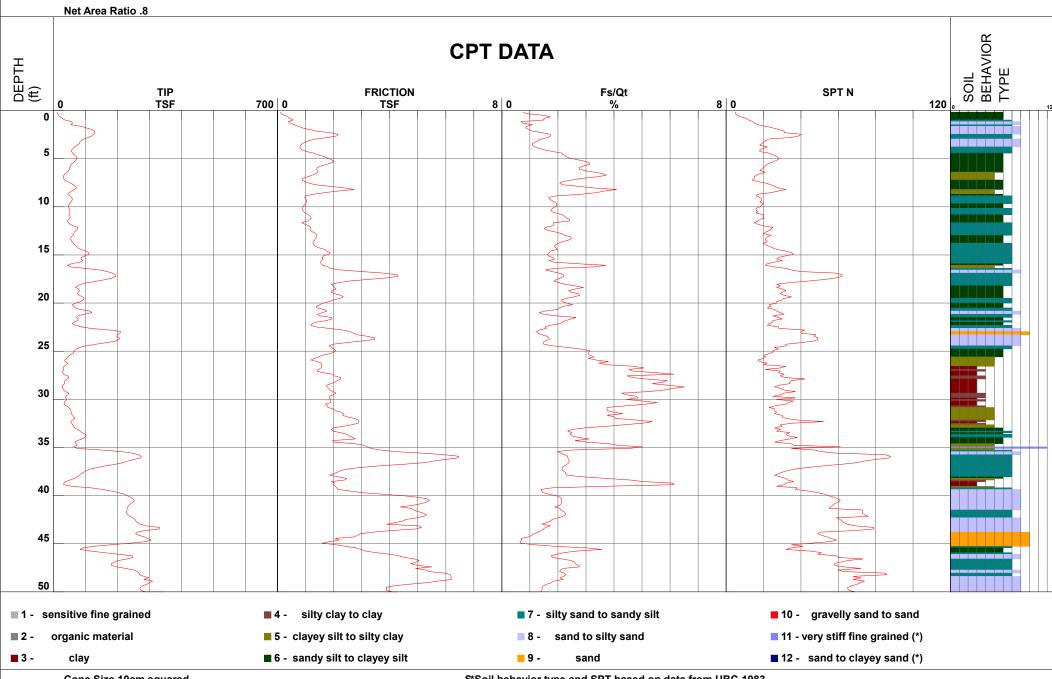
 Job Number
 16163-01

 Hole Number
 CPT-06

 EST GW Depth During Test

Operator Cone Number Date and Time 100.00 ft RC AS DDG1471 6/20/2019 2:56:46 PM Filename
GPS
Maximum Depth

SDF(773).cpt 50.69 ft



Project Na	ame:	Colonial	Logged By: ARN	Trench N	No: TP-1			
Project N	ımbe	r : 16163-01	Date: 6/20/2019				LC	16
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map		ing Proper	ties:	Geotech	nical, Ind
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a b	Artificial Fill - Undocumented @0'-1' Sandy SILT to Silty SANI loose/soft; abundant rootlets Quaternary Young Eolian Depo @1'-T.D. Silty SAND and SAND: moist, medium dense; increasi occasional root; masssive	osits medium to tan brown, slightly	afu Qye	SM/ML			
3RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 758 'MSL Su	rface Slope:	0 deg.		Trend: N	I-S
						Ground	Depth: 6' dwater: None led: 6/20/201	

scale : 1 in = 5 ft

Project Na	ame:	Colonial	Logged By: ARN	Trench N	lo: TP-2			
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019	F	<b>D</b>		LC	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ng Proper	iles:	Geotech	nical, Inc.
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	loose/soft; abundant rootlets in Quaternary Young Eolian Depo	o <u>sits</u> ND: medium to tan brown, slightly	afu Qye	SM/ML	B-1		
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 756 'MSL Surfa	ace Slope:	0 deg.	-	Trend: N	I-S
					+ + + +	Ground Backfill	Depth: 6.2' dwater: None led: 6/20/201	

Project Na	Project Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-3			
Project No	umbe	er : 16163-01	Date: 6/20/2019					
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	– Engineeri	ng Propert	Geotechnical, In		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	abundant rootlets; occasional Quaternary Young Eolian Depo	o <u>sits</u> D: medium to tan brown, slightly ent roots and old decaying	afu Qye	SM/ML			
GRAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 754 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	I-S
						Ground	Pepth: 5.1' Iwater: None ed: 6/20/20	

Project Na	Project Name: Colonial		Logged By: ARN	Trench N	No: TP-4				
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019	<b>-</b>	· <b>P</b>		LC		
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineering Propertie		ties:	es: Geotechnical, Inc		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	a b	Artificial Fill - Undocumented @0'-2' Silty SAND to Sandy SIL'soft/loose; abundant rootlets; a Quaternary Young Eolian Depo @2'-T.D. Silty SAND: medium be dense; some small zones of sa depth	scattered refuse osits	afu Qye	SM/ML			()	
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 755 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	-S	
	-			-		Ground Backfil	Depth: 5.5' dwater: None led: 6/20/201		

Project Na	ame:	Colonial	Logged By: ARN	Trench N	lo: TP-5				
Project N	umbe	er : 16163-01	Date: 6/20/2019	<b>P</b>	<b>D</b>		LC	16	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Ma		Engineering Propertie		Geotechnical, Ir		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	b	stiff; roots; scattered gravel	T: dusky brown, dry, loose/mediu tan brown, dry to slightly moist, ot; iron oxide stained burrow	afu Qye	SM/ML SM SM				
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 758 ' MSL S	Surface Slope:	0 deg.	-	Trend: N	I-S	
+ + + +				-		Total D	Depth: 6'	-	

scale : 1 in = 5 ft

Project Na	ame:	Colonial	Logged By: ARN	Trench N	No: TP-6				
Project Nu	ımbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	· <b>D</b>		LC	16	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Maj		Engineering Properti		Geotechnical, In		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	a b	Artificial Fill - Undocumented  @0'-1.5' Silty SAND to Sandy S loose/medium stiff; roots; scate Quaternary Young Eolian Depot @1.5'-T.D. Silty SAND: tan to remedium dense; some stainings homogeneous coloration	tered gravel osits nedium brown, slightly moist,	afu Qye	SM/ML			(* 5.)	
RAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 764 ' MSL Su	rface Slope:	0 deg.		Trend: N	I-S	
+ + + + +						Groun	Depth: 6' dwater: None led: 6/20/201		

scale : 1 in = 5 ft

roject Name: Colonial	me: Colonial Logged By: ARN			No: TP-7			
umbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	·		LC	
nt: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	ing Propert	Geotechnical, I		
Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
b	loose/soft, abundant rootlets; Quaternary Young Eolian Depo @1.5'-T.D. Sandy SILT and Silty	occasional gravel o <u>sits</u> y SAND: medium brown to tan,	afu Qye	SM/ML SM			
AL RI	EPRESENTATION BELOW:	Elevation: 762 ' MSL Surfa	ace Slope:	0 deg.		Trend: N	I-S
		( · · · · · /					
1	Unit a	a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SIL loose/soft, abundant rootlets; b Quaternary Young Eolian Depo @1.5'-T.D. Sandy SILT and Silty slightly moist, medium dense/s	Unit SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel B Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Control of the c	Int: Cat 420F Excavator  Unit SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel b Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Slope:	Int: Cat 420F Excavator    Unit   SOIL DESCRIPTION:   GEOLOGIC UNIT   Uscs	Int: Cat 420F Excavator    Unit   SOIL DESCRIPTION:   GEOLOGIC   USCS   SAMPLE   No	nt: Cat 420F Excavator  Location: See Geotechnical Map  SOIL DESCRIPTION:  a Artificial Fill - Undocumented @0·-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel b Quaternary Young Eolian Deposits @1.5'-T.D. Sandy SILT and Silty SAND: medium brown to tan, slightly moist, medium dense/stiff, occasional root; some zones of coarse sand  AL REPRESENTATION BELOW: Elevation: 762 ' MSL Surface Slope: 0 deg. Trend: N

Project Na	Project Name: Colonial	Colonial	Logged By: ARN	Trench I	No: TP-8	TP-8			
Project Nu	ımbe	r : 16163-01	Date: 6/20/2019						
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineer	Engineering Properties		Geotechnical, Inc		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	a b	abundant rootlets; minor refus Quaternary Young Eolian Depo @2'-T.D. Silty SAND: tan to medium dense; occasional roothe formation; massive	osits dium brown, slightly moist, tlets; burrows in upper portions of	afu Qye	SM/ML				
GRAPIIIO	-	EPRESENTATION BELOW:	Elevation: 768 'MSL Surfa	ace Slope:	o deg.		Trend: N		
			B						
	-			+ + + + + + + + + + + + + + + + + + + +		Ground	epth: 7' dwater: None ed: 6/20/201		
			+ +	-		scale :	1 in = 5 ft		

Project Na	me:	Colonial	Logged By: ARN		Trench	No: TP-9				
roject Nu	ımbe	r : 16163-01	Date: 6/20/2019		<b>-</b>	<b>D</b>				
quipmen	t: Ca	t 420F Excavator	Location: See Geotechnica	I Мар	Engineer	Engineering Properties:		Geotechnic		
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	b	Artificial Fill - Undocumented  @0' - 1' Silty SAND to Sandy SI abundant rootlets; scarce gray Quaternary Young Eolian Depo @1'-2.5' Silty SAND: medium bi to medium dense @2.5'-T.D. Silty SAND and San moist, medium dense/stiff; not	vel o <u>sits</u> rown, dry to slightly moist, lo dy SILT: medium brown, sligh	ose	afu Qye	SM/ML SM SM-ML			(* 0.7)	
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 760 ' MSL	Surfa	ace Slope:	o deg.	-	Trend: N	<b> -S</b>	
			B	-			Groun	Depth: 6.5' dwater: None led: 6/20/201		

scale : 1 in = 5 ft

Project Na	Project Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-10				
Project N	ımbe	er : 16163-01	Date: 6/20/2019	<b>F</b>	· <b>P</b>			16	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	Engineeri	Engineering Properties		Geotechnical, Inc		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	a b	Artificial Fill - Undocumented  @0'-1.5' Silty SAND to Sandy solves abundant rootlets; Quaternary Young Eolian Dep @1.5'-T.D. Silty SAND: medium medium dense; massive; occa	SILT: dusky to medium brown, dry, scattered gravel. osits to tan brown, slightly moist,	afu Qye	SM/ML SM				
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 755 ' MSL Surf	ace Slope:	0 deg.	-	Trend: N	I-S	
						Ground	Depth: 5.5' dwater: None led: 6/20/20		

scale : 1 in = 5 ft

Project Na	oject Name: Colonial	Colonial	Logged By: ARN	Trench N	No: TP-11	P-11		
Project Nu	ımbe	er : 16163-01	Date: 6/20/2019	Engineering Prop		ies:	LC	
Equipmen	t: Ca	t 420F Excavator	Location: See Geotechnical Map	_		Geotechnical, in		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	b	abundant rootlets Quaternary Young Eolian Depo	o Sandy SILT: tan brown, slightly	afu Qye	SM/ML			
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 766 'MSL Surf	ace Slope:	0 deg.		Trend: N	-S
						Ground Backfill	Depth: 5.5' dwater: None led: 6/20/201	

Project Na	roject Name: Colonial	Colonial	Logged By: ARN	Trench I	No: TP-12				
-		r : 16163-01	Date: 6/20/2019	Engineer	ing Propert	ies:	Geotech	nnical, Inc.	
Geologic	Т	t 420F Excavator	Location: See Geotechnical Map	GEOLOGIC	liece	SAMPLE	MOISTURE	DRY DENSITY	
Attitudes	b	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SI loose/soft; abundant rootlets; so Quaternary Young Eolian Depo	<u>esits</u> brown, slightly moist, medium	afu Qye	SM/ML	No	(%)	(PCF)	
GRAPHICA	AL RI	EPRESENTATION BELOW:	Elevation: 766 'MSL Surfa	ace Slope:	0 deg.		Trend: N	I- <b>S</b>	
						Ground Backfill	Depth: 5' dwater: None led: 6/20/201		

### **Infiltration Test Data Sheet**

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: MCBC North
Project Number: 20246-01
Date: 12/22/2020

Boring Number: |-1

# Test hole dimensions (if circular) Boring Depth (feet)\*: 16 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test	pit	dimensions	(if	rectangular)

Pit Depth (feet):
Pit Length (feet):
Pit Breadth (feet):

### Pre-Test (Sandy Soil Criteria)\*

	Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
I	1	9:34	9:59	25.0	12.20	14.10	1.9	Yes
	2	10:03	10:28	25.0	11.80	13.91	2.11	Yes

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Observed Infiltration Rate(in/hr)
1	11:49	12:00	11.0	11.92	13.02	1.1	3.2
2	12:02	12:14	12.0	12.05	13.01	0.96	2.6
3	12:18	12:28	10.0	12.43	12.88	0.45	1.5
4	12:31	12:41	10.0	12.31	12.85	0.54	1.8
5	12:44	12:56	12.0	11.9	12.72	0.82	2.1
6	12:58	13:10	12.0	11.87	12.71	0.84	2.2

Calculated Infiltration Rate (No factors of safety)

Factor of Safety

Calculated Infiltration Rate (With Factor of Safety)

I	Sketch:			

Notes:

Egeotechnical. Inc

Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 6/29/18

<sup>\*</sup>measured at time of test

### **Infiltration Test Data Sheet**

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: MCBC North
Project Number: 20246-01
Date: 12/22/2020
Boring Number: I-2

Test hole dimensions (if circular)						
Boring Depth (feet)*:	22					
Boring Diameter (inches):	8					
Pipe Diameter (inches):	3					

<sup>\*</sup>measured at time of test

Test	pit	dimen	sions	(if r	ectangular	)
		55				

Pit Depth (feet):
Pit Length (feet):
Pit Breadth (feet):

### Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to
1	9:48	10:13	25.0	18.65	19.30	0.65	0.5 feet (yes/no) Yes
2	10:18	10:43	25.0	17.80	18.8	1.00	Yes

#### **Main Test Data**

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Observed Infiltration Rate(in/hr)
1	11:58	12:08	10.0	17.85	18.27	0.42	1.2
2	12:12	12:22	10.0	18.15	18.45	0.30	0.9
3	12:25	12:35	10.0	18.05	18.33	0.28	0.8
4	12:38	12:49	11.0	18.04	18.39	0.35	1.0
5	12:53	13:03	10.0	18.11	18.42	0.31	1.0
6	13:08	13:18	10.0	17.63	18.1	0.47	1.3

Calculated Infiltration Rate (No factors of safety)

ety) 1.3

Calculated Infiltration Rate (With Factor of Safety)

Sketch:			

Notes:

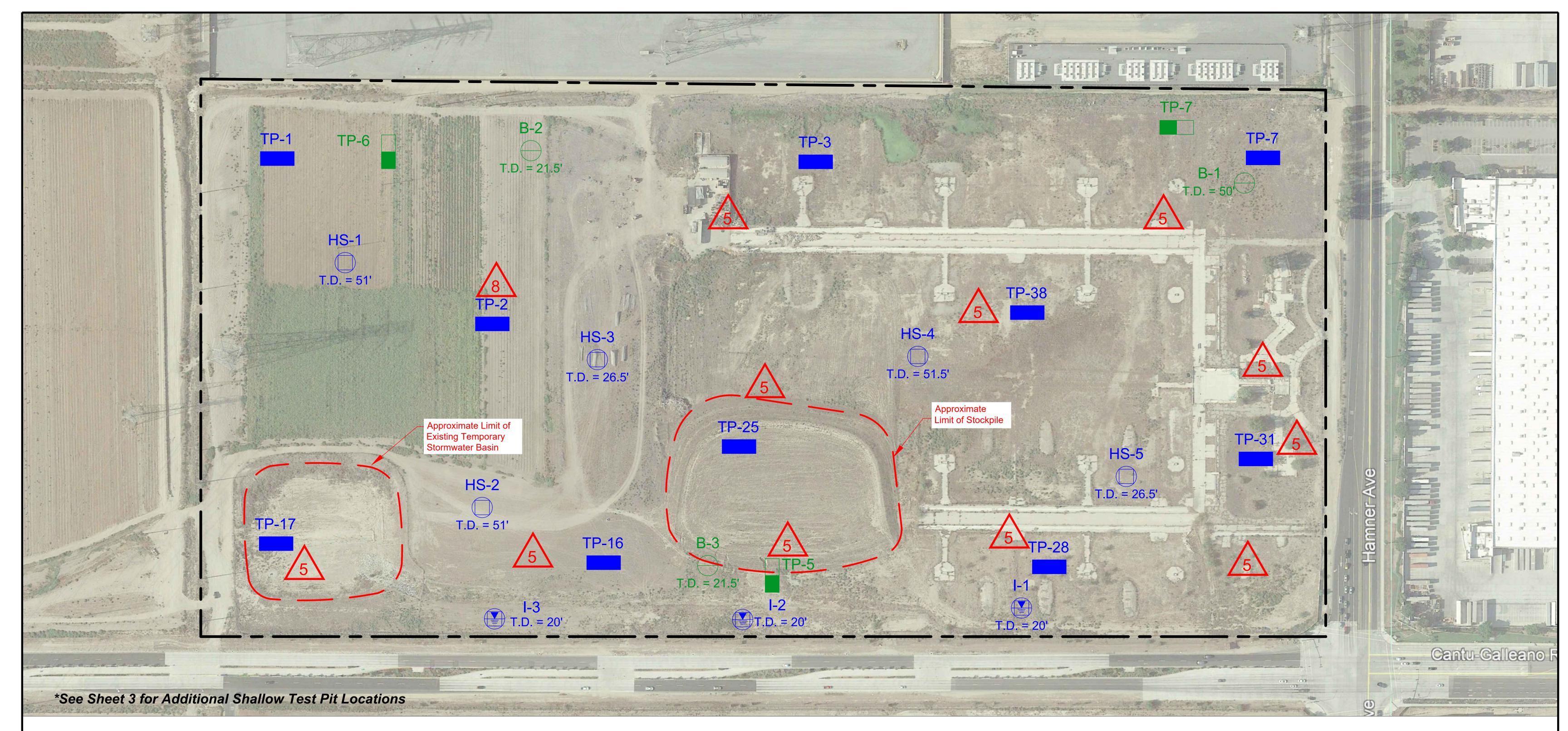
**Factor of Safety** 



Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 6/29/18

## Appendix E Geotechnical Subsurface Evaluation Data – Visser (20179-01)



HS-5 T.D. = 26.5'

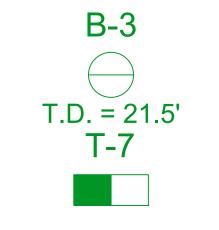
T.D. = 20' TP-38

**LEGEND** 

Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Geotechnical and Organics Exploratory Trench by LGC Geotechnical

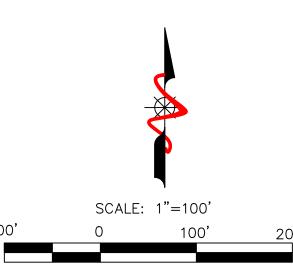


Approximate Location of Boring by Others, With Total Depth in Feet (Petra, 2005)

Approximate Location of Exploratory Test Pit by Others (Petra, 2005)

Approximate Limits of This Report

Approximate Depth of Removal and Recompaction Below Existing Grade in Feet

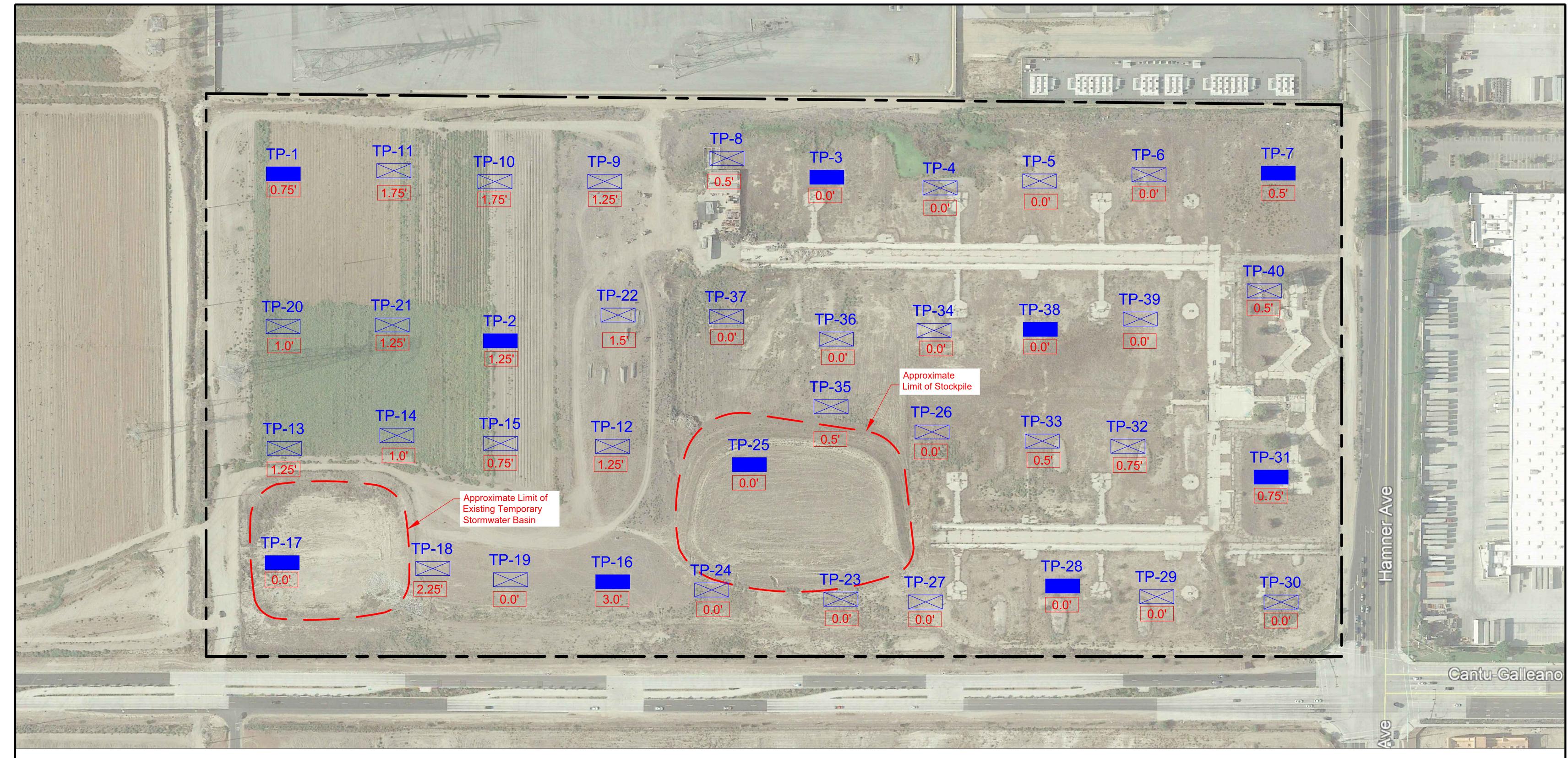




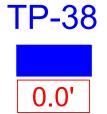
LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Exploration Location Map With Satellite Image

PROJECT NAME	Richland - Visser, Ontario	
PROJECT NO.	20179-01	
ENG. / GEOL.	RLD	SHEET
SCALE	1" = 100'	
DATE	December 2020	1 of 3



# **LEGEND**

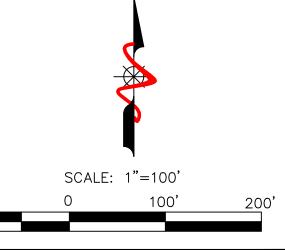


Approximate Location of Geotechnical and Organics Exploratory
Trench by LGC Geotechnical with Estimated Minimum Depth of High
Organic "Soil" to be Exported From the Site, in Feet



Approximate Location of Organics Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet







LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Recommended High Organic "Soil" Export Map

# CLIENT:

Richland Communities, Inc.
3161 Michelson Drive, Suite 425
Irvine, CA 92626

OJECT NAME	Richland - Visser, Ontario	
OJECT NO.	20179-01	
G. / GEOL.	RLD	SHEET
ALE	1" = 100'	_
TE	December 2020	3 of 3

#### APPENDIX C

### **Laboratory Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution/Fines Content</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140). Where applicable, the portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D6913 (sieve).

Sample Location	Description	% Passing # 200 Sieve
HS-1 @ 1-5 ft	Silty Sand	28
HS-1 @ 7.5 ft	Silty Sand	36
HS-4 @ 5 ft	Silty Sand	35
HS-4 @ 15 ft	Silt with Sand	79

Atterberg Limits: The liquid and plastic limits ("Atterberg Limits") were determined per ASTM D4318 for engineering classification of fine-grained material and presented in the table below. The USCS soil classification indicated in the table below is based on the portion of sample passing the No. 40 sieve and may not necessarily be representative of the entire sample. The plot is provided in this Appendix.

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Soil Classification
HS-4 @ 35 ft	27	18	9	CL

#### APPENDIX C

### **Laboratory Test Results (Continued)**

<u>Consolidation</u>: One consolidation tests were performed per ASTM D2435. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under "double drainage" and total deformation for each loading step were recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height. The consolidation pressure curve is provided in this Appendix.

<u>Collapse/Swell Potential</u>: Two collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The curves are presented in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-1 @ 1-5 ft	Silty Sand	123.5	9.5
HS-5 @ 1-5 ft	Silty Sand	120.0	5.5

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-1 @ 1-5 ft	1	Very Low
HS-4 @ 1-5 ft	0	Very Low

<sup>\*</sup> Per ASTM D4829

<u>Soluble Sulfates</u>: The soluble sulfate content of select samples was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

Sample Location	Sulfate Content, %
HS-1 @ 1-5 ft	< 0.02%
HS-4 @ 1-5 ft	< 0.02%

### APPENDIX C

## **Laboratory Test Results (Continued)**

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-1 @ 1-5 ft	193
HS-4 @ 1-5 ft	64

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	рН	Minimum Resistivity (ohms- cm)
HS-1 @ 1-5 ft	7.91	3998
HS-4 @ 1-5 ft	8.11	1700

 $\underline{Organic\ Matter\ Content\ of\ Soils} : Organic\ matter\ content\ tests\ were\ performed\ in\ general\ accordance\ with\ ASTM\ D\ 2974\ (Test\ Methods\ A\ \&\ C).$  The results are presented in Table 9.

TP-1	(0.75')*	TP-2	(1.25')*	TP-3	(0.0')*	TP-4	(0.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.25'	7.1	0.25'	13.2	0.17'	1.6	0.25'	0.5
0.75'	3.9	0.67'	10.1	0.5'	0.5	0.67'	0.5
1.0'	0.8	2.0'	1.0	-	-	0.83'	2.7
	(0.0')*		(0.0')*	TP-7 (0.5')*		TP-8 (0.5')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.083'	0.7	0.083'	1.5	0.17'	4.4	0.25'	12.2
0.67'	0.3	0.33'	0.5	1.0'	2.1	0.5'	4.1
-	-	-	-	1.5'	0.6	2.0'	0.6
TP-9	(1.25')*	TP-10	(1.75')*		(1.75')*	TP-12	(1.25')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.25'	16.0	0.67'	10.8	0.5'	7.6	0.33'	14.8
0.83'	19.6	1.33'	36.4	1.17'	13.7	0.83'	6.1
1.5'	0.7	2.0'	0.8	2.0'	0.8	1.5'	0.6
	(1.25')*		(1.0')*		(0.75')*		(3.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.58'	6.5	0.25'	9.7	0.5'	10.3	1.33'	12.3
1.25'	3.8	0.67'	9.2	1.0'	0.8	2.67'	9.6
1.67'	0.7	1.33'	1.1	-	-	3.33'	0.5
TP-17	(0.0')*	TP-18	(2.25')*	TP-19	(0.0')*	TP-20	(1.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.17'	0.7	0.83'	8.4	1.92'	2.4	0.5'	7.3
1.0'	0.1	1.67'	9.2	2.67'	2.2	1.5'	0.9
-	-	2.58'	1.0	3.33'	0.4	2.08'	0.5
TP-21	(1.25')*	TP-22	(1.5')*	TP-23	(0.0')*	TP-24	(0.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.33'	7.2	0.33'	15.0	0.17'	0.6	0.04'	1.5
0.83'	6.6	0.75'	22.3	0.67'	0.6	0.17'	0.5
1.5'	0.6	-	-	-	-	-	-
	(0.0')* Stockpile		(0.0')*		(0.0')*	TP-28	(0.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.5'	1.0	0.08'	2.8	0.08'	1.0	0.17'	0.0
5.25'	11.4	0.25'	0.4	0.25'	0.9	0.42'	0.3
9.7'	8.5	-	-	-	-	-	-
10.1'	0.6	-	-	-	-	-	-
10.5'	1.4	-	-	-	-	-	-
	(0.0')*		(0.0')*		(0.75')*		(0.75')*
Depth (ft)	% Organics	Depth (ft)	% Organics		% Organics	Depth (ft)	% Organics
0.17'	1.2	0.17'	1.3	0.08'	4.3	0.08'	8.6
0.67'	0.3	0.33'	1.2	0.33'	5.4	0.42'	15.0
	-	0.67'	0.3	1.0'	0.5	1.0'	0.2
	(0.5')*		(0.0')*		(0.5')*		(0.0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.17'	25.6	0.17'	0.8	0.25'	6.2	0.17'	3.0
0.5'	0.4	1.0'	0.5	0.67'	1.9	0.58'	2.2
-	-	-	-	1.08'	0.5	1.08'	0.6
	(0.0')*		(0.0')*		(0.0')*		(0.5')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.25'	1.0	0.25'	0.4	0.17'	1.5	0.25'	6.9
0.67'	0.3	0.5'	1.1	0.33'	0.5	0.67'	0.8
-	-	1.0'	0.4	0.5'	0.5	1.5'	2.2
-	-	-	-	-	-	2.0'	0.4

## <u>Legend</u>

> 5% 2 to 5% < 2%

"High" Organic Content "Soils" Recommended for Export from Site "Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils

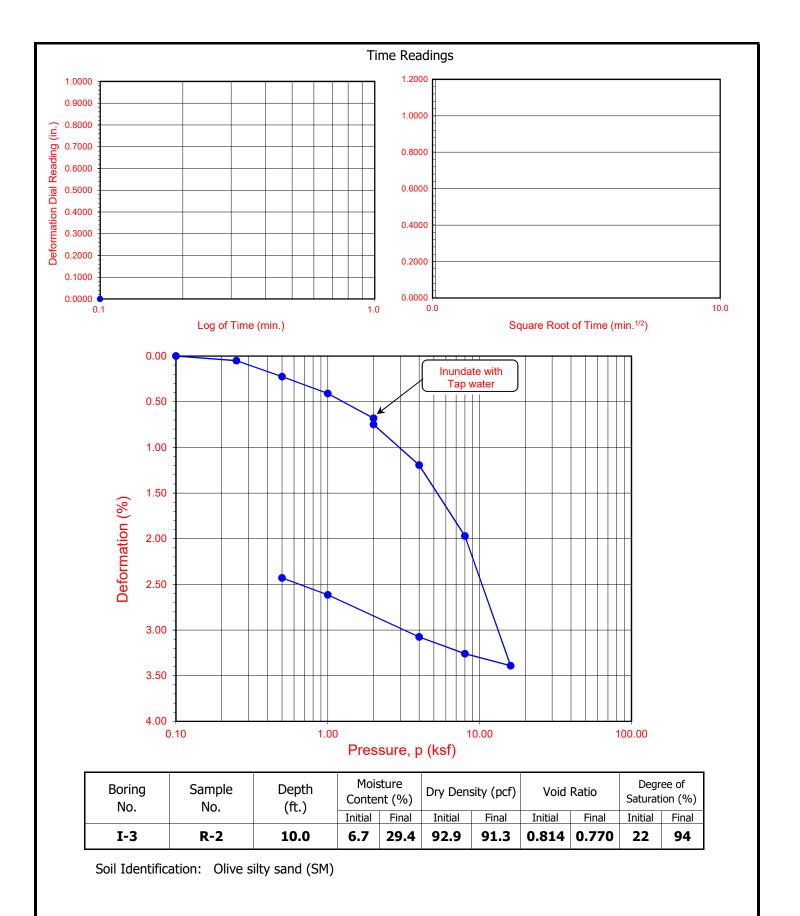
"Clean" Soils

Note: (#')\* Indicates Recommended Organic Export Depth in Feet. Export depth may exceed the depths highlighted boxes.



Table 9 - Summary of Organic Content - Organic Removal & Export Depths

	•	
Project Name		Richland - Visser, Ontario
Project Number	,	20179-01
ENG./GEOL.		RLD
Date		Nov-20



ONE-DIMENSIONAL CONSOLIDATION
PROPERTIES of SOILS
ASTM D 2435

Project No.: 20179-01

Ontario

10-20

# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Ontario Tested By: G. Bathala Date: 10/04/20
Project No.: 20179-01 Checked By: A. Santos Date: 10/07/20

Boring No.: HS-1 Sample Type: Ring Depth (ft.) 7.5

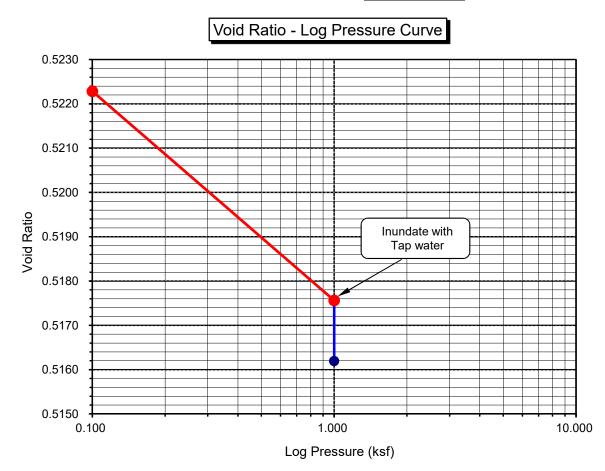
Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	110.7
Initial Moisture (%):	9.09
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2700
Diameter(in):	2.415

Final Dry Density (pcf):	111.2
Final Moisture (%) :	16.4
Initial Void Ratio:	0.5226
Specific Gravity(assumed):	2.70
Initial Saturation (%)	46.9

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2698	0.9998	0.00	-0.02	0.5223	-0.02
1.000	0.2649	0.9949	0.18	-0.51	0.5176	-0.33
H2O	0.2640	0.9940	0.18	-0.60	0.5162	-0.42

Percent Swell (+) / Settlement (-) After Inundation = -0.09



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Ontario Tested By: G. Bathala Date: 10/04/20
Project No.: 20179-01 Checked By: A. Santos Date: 10/07/20

Boring No.: HS-4 Sample Type: Ring Sample No.: R-2 Depth (ft.) 5.0

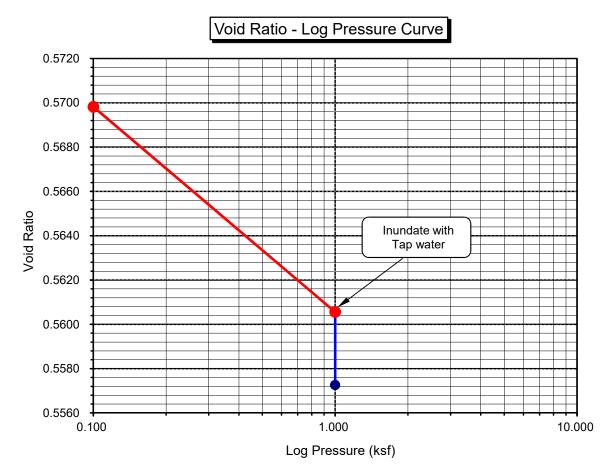
Sample Description: Olive silty sand (SM)

Initial Dry Density (pcf):	107.3
Initial Moisture (%):	5.44
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3032
Diameter(in):	2.415

Final Dry Density (pcf):	108.2
Final Moisture (%) :	18.2
Initial Void Ratio:	0.5703
Specific Gravity(assumed):	2.70
Initial Saturation (%)	25.7

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3029	0.9997	0.00	-0.03	0.5698	-0.03
1.000	0.2963	0.9931	0.07	-0.69	0.5606	-0.62
H2O	0.2942	0.9910	0.07	-0.90	0.5573	-0.83

Percent Swell (+) / Settlement (-) After Inundation = -0.21



### LABORATORY TEST DATA

IN SITU MOISTURE AND DRY DENSITY 12

Test Pit Number			Moisture (%).	Dry Density (pel)	
TP-1	1	Silty Sand	3.3	95.6	
TP-2	2	Silty Sand	1,5	104.0	
TP-4	3	Silty Sand	7.5	98.5	
TP-5	4	Gravelly Sand	3.9	104.3	
TP-6	5	Silty Sand	10.4	108.3	
TP-7	2	Silty Sand	11.1	109.6	
TP-8	3	Silty Sand	7.5	109.6	
TP-9	4	Sand with Silt	4.2	101.3	
TP-10	4	Sand	6.6	106.9	
TP-11	2	Silt	8.4	102.8	
TP-12	3	Silt	3.6	104.8	
TP-13	3	Silty Sand	14.6	111.2	
TP-14	4	Silty Sand	12.8	106.0	

### LABORATORY MAXIMUM DRY DENSITY 3

Boding or	Depth (Bet)	Spil Type	Optimum	Maximum Dry Density (pcf)
B-1	0-5	Silty Sand	13	114
B-9	0-5	Silty Sand	10	116
B-12	0-5	Sand	11	113
TP-1	0-5	Silty Sand	11	110

### EXPANSION INDEX TEST DATA 4

Boring Number	Depthy (feet)	Soil Type	Expansion Index	Expansion Potential 5
B-1	0-5	Sand	1	Very Low
B-9	0-5	Silty Sand	21	Low
B-12	0-5	Sand	9	Very Low
TP-I	0-5	Sand	11	Very Low

### SOLUBLE SULFATES AND CHLORIDES 6

Boring	Depth :		Sulfate	Chloride
Number	(feet)	Soil Type	: Content (%)	Content (ppm)
B-1	0-5	Sand	0.0162	170
B-9	0-5	Silty Sand	0.00405	118
B-12	0-5	Sand	0.28755	122
TP-1	0-5	Sand	0.28755	138

PLATE B-1 (Sheet 1 of 2)



### LABORATORY TEST DATA

### ph and minimum resistivity 7

Boring: Number	Depth (feet)	Soil Type	pH.	Minimum Resistivity (ohm-em)
B-1	0-5	Sand	6.9	3,000
B-9	0-5	Silty Sand	6.3	3,200
B-12	0-5	Sand	7.7	3,400
TP-1	0-5	Sand	7.8	3,700

IN PLACE ORGANIC CONTENT 8

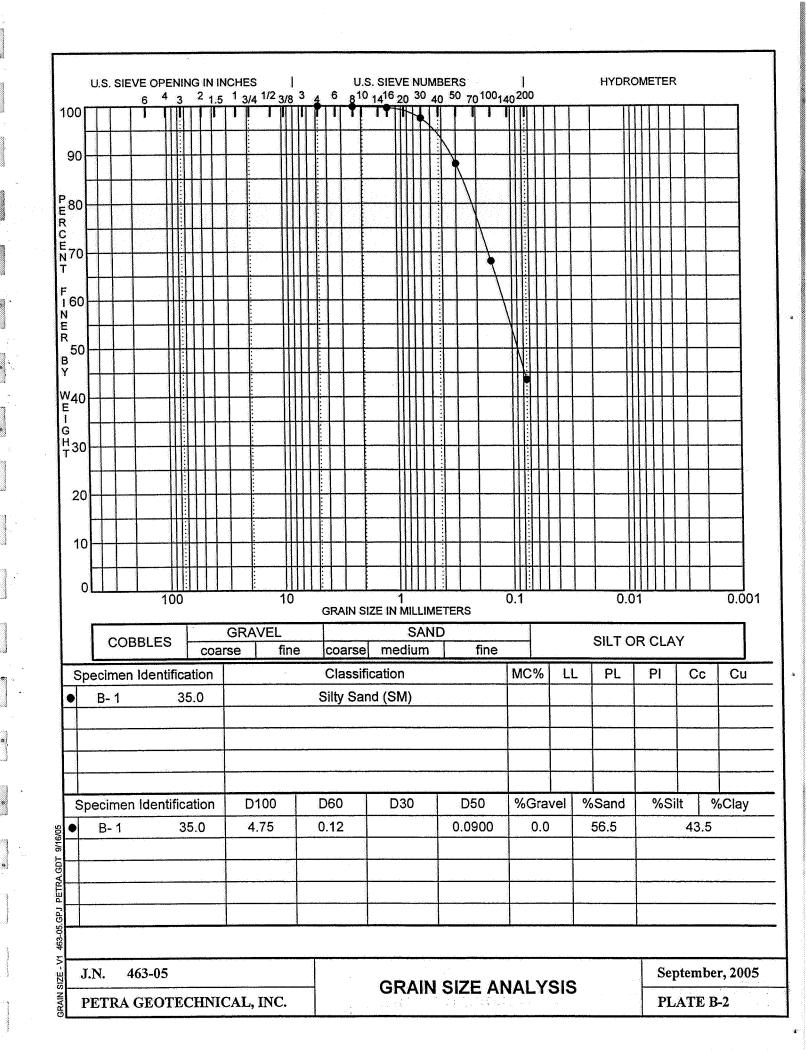
IN PLACE ORGANIC CONTENT 8							
Test Pit Number	Depth (feet)	Organic Content (%)	Test Pit Number	Depth (feet)	Organic Content (%)		
TP-1	1	1.08	TP-9	0.5	2.61		
	2	0.45		1.5	0.28		
	2 3	0.81					
	4	0.56					
TP-2	1	1.04	TP-10	0.5	0.47		
	2	1.13		1.5	0.30		
	2 3	0.60		3	0.32		
	4	0.35					
TP-4	0.5	0.52	TP-11	0.5	1.83		
	1.5	0.43		1.5	1.63		
	.3	0.40		3	0.51		
	4.5	0.50					
TP-5	1.5	0.29	TP-12	0.5	(6.61)		
	3	0.29		1.5	0.73		
	4.5	0.82		3	0.18		
TP-6	1	0.80	TP-13	0.5	0.58		
	2	0.59		1.5	0.49		
	3	0.39		3	0.88		
	4	0.80					
TP-7	1.5	0.51	TP-14	0.5	(6.12		
	2	0.52		1.5	0.86		
	3	0.90		3	0.98		
TP-8	1	1.27					
	2	0.38		1	<u></u>		

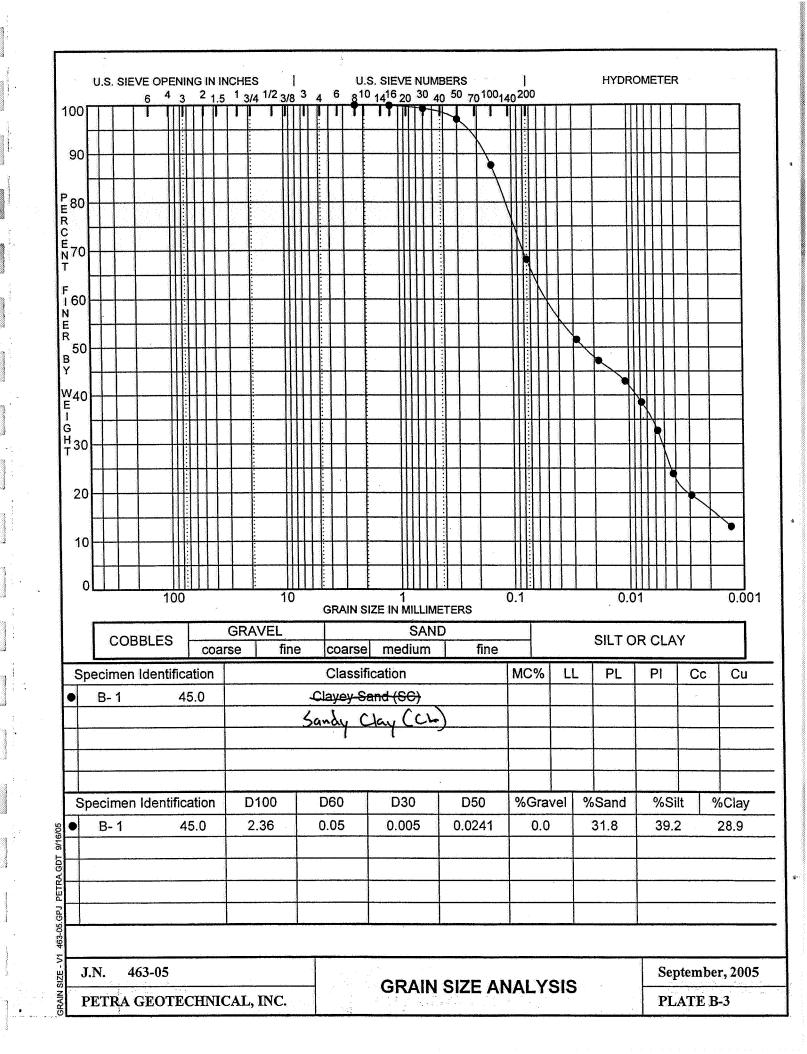
- (1) Per ASTM Test Method D 2216-98
- (2) Refer to boring logs in Appendix A for additional in-situ moisture content and dry density data
- (3) Per Test Method ASTM D 1557-02
- (4) Per ASTM Test Method D 4829-03
- (5) Per CBC (2001) Table 18-I-B
- (6) Per California Test Method Nos. 417 and 422
- (7) Per California Test Method Nos. 532 and 643
- 8) Per ASTM Test Method D 2974-00

PLATE B-1 (Sheet 2 of 2)

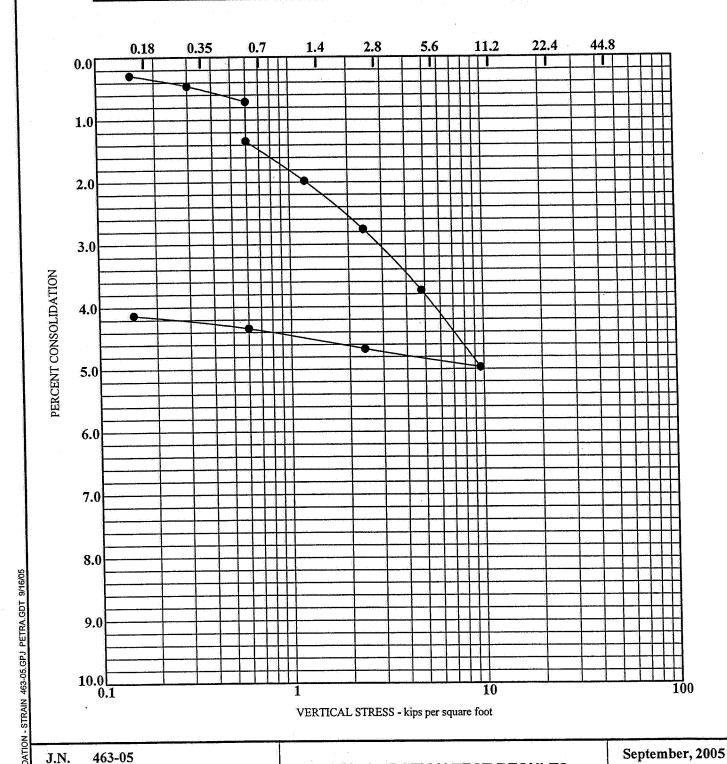
PETRA GEOTECHNICAL, INC. J.N. 463-05







SAMPLE	MATERIAL	INITIAL			INUNDATED	
LOCATION DESCRIPTION		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)	
● B-1@5.0	Silty Sand (SM)	103.6	6.1	26	0.60	
<u></u>						
<del>yaya da aja a da da ga aya aya aya aya aya ada ga a</del>				:		



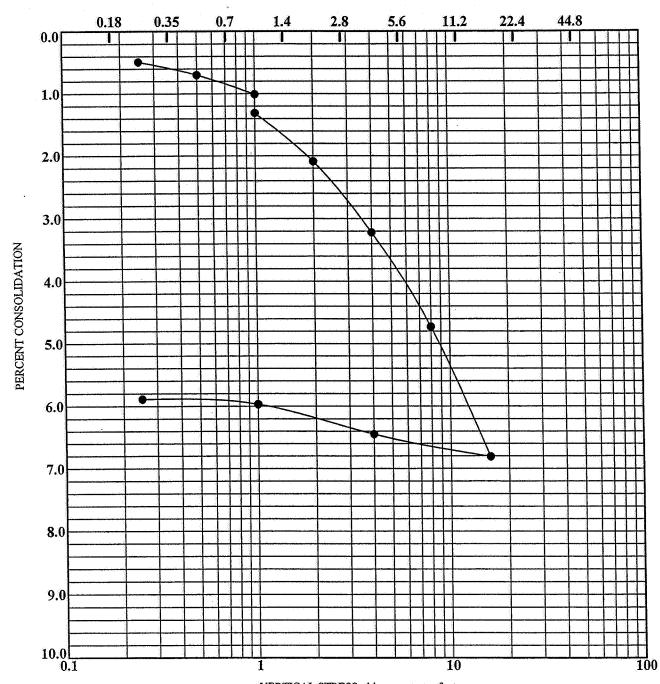
**CONSOLIDATION TEST RESULTS** 

PLATE B-7

J.N.

PETRA GEOTECHNICAL, INC.

SAMPLE	MATERIAL		INUNDATED			
LOCATION	DESCRIPTION	DENSITY (pef)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)	
● B-2@9.0	Silty Sand (SM)	100.3	10.6	42	1.00	
i <u>ta ing kanganan kana</u> ing kalang ing kangan ing pangan ing pangan ing pangan ing pangan ing pangan ing pangan						
ing the second of the second o						



VERTICAL STRESS - kips per square foot

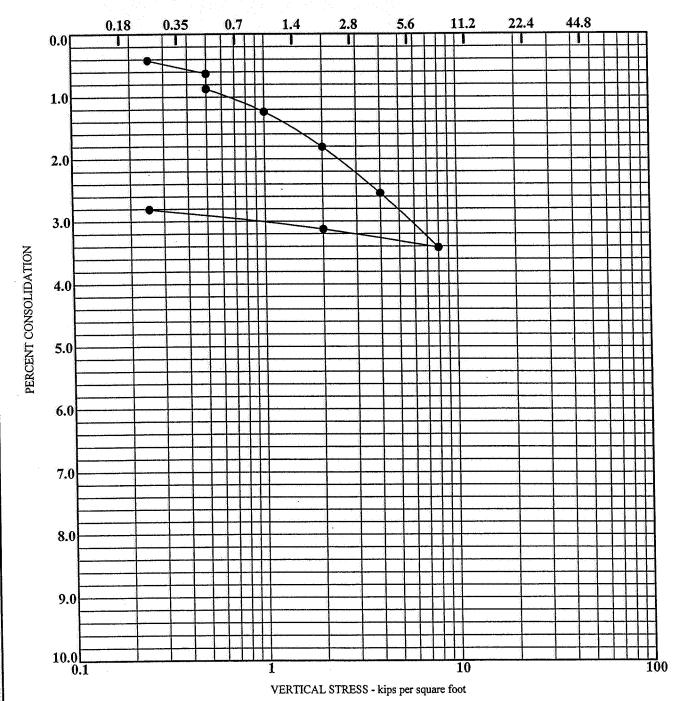
J.N. 463-05
PETRA GEOTECHNICAL, INC.

CONSOLIDATION TEST RESULTS

September, 2005

PLATE B-8

SAMPLE	MATERIAL	INITIAL		INUNDATED		
LOCATION	DESCRIPTION	DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)	
● TP-5@4.0	Sand w/ Silt (SP-SM)	100.5	5.2	21	0.50	



ON - STRAIN 463-05.GPJ PETRA GDT

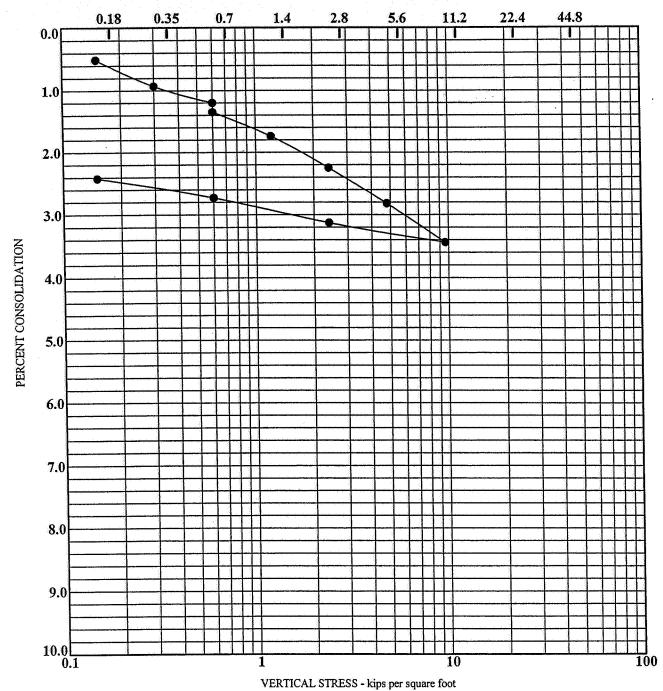
J.N. 463-05
PETRA GEOTECHNICAL, INC.

**CONSOLIDATION TEST RESULTS** 

September, 2005

PLATE B-15

SAMPLE	MATERIAL			INUNDATED		
LOCATION	DESCRIPTION	DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)	
● TP-6@5.0	Silty Sand (SM)	104.6	9.8	43	0.60	



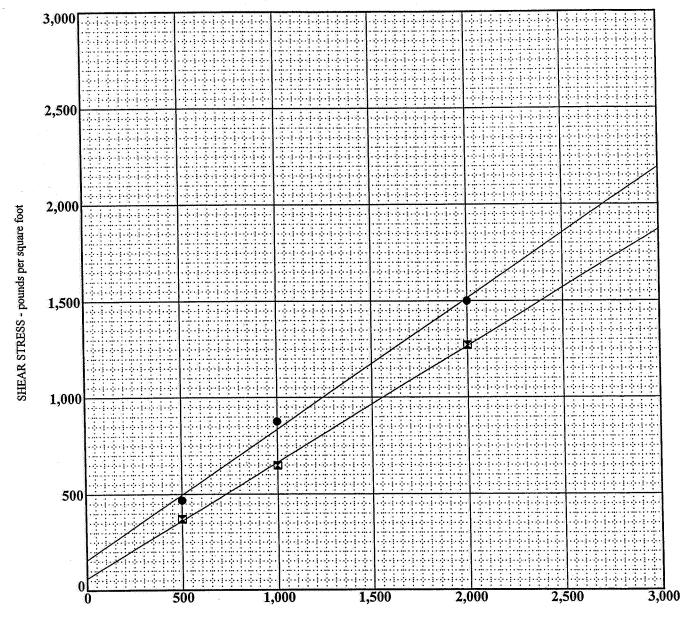
J.N. 463-05

PETRA GEOTECHNICAL, INC.

**CONSOLIDATION TEST RESULTS** 

September, 2005

PLATE B-16



NORMAL STRESS - pounds per square foot

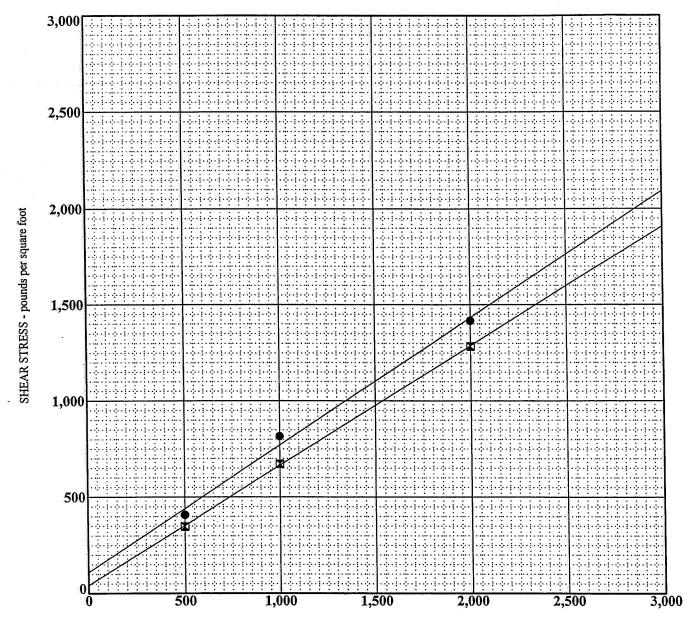
SAMPLE LOCATION	DESCRIPTION	FRICTION ANGLE (°)	COHESION (PSF)
● B-12 @ 0.0 - 5.0	Poorly Graded Sand (SP) - Peak	34	160
■ B-12 @ 0.0 - 5.0	Poorly Graded Sand (SP) - Ultimate	31	60
angan an			

## **NOTES:**

Samples Remolded to 90% of Maximum Dry Density All Samples Were Inundated Prior to Shearing

HEAR	J.N. 463-05	DIRECT SHEAR TEST DATA	September, 2005
Ëŀ	PETRA GEOTECHNICAL, INC.	REMOLDED TEST SAMPLES	PLATE B-20

DIRECT SHEAR 463-05.GPJ PETRA.GDT 9/16/05



NORMAL STRESS - pounds per square foot

SAMPLE LOCATION	DESCRIPTION	FRICTION ANGLE (°)	COHESION (PSF)
● TP-1 @ 0.0 - 5.0	Silty Sand (SM) - Peak	35	110
TP-1@0.0-5.0	Silty Sand (SM) - Ultimate	32	40

## NOTES:

Samples Remolded to 90% of Maximum Dry Density All Samples Were Inundated Prior to Shearing

J.N. 463-05	DIRECT SHEAR TEST DATA	September, 2005
PETRA GEOTECHNICAL, INC.	REMOLDED TEST SAMPLES	PLATE B-21

				Geo	techi	nica	l Bor	ing Log Borehole HS-1		
Date:	9/14	/202						Drilling Company: Choice Drilling		
			Visse					Type of Rig: CME 75		
Proje	ect Nu	ımbe	er: 201	79-01				Drop: 30" Hole Diameter: 8"		
					~739' N			Drive Weight: 140 pounds		
Hole	Locat	tion	See C	Seote	chnical	Мар		Page 1	of 2	
			_		l)			Logged By SHH		
			pe		bc		<u> </u>	Sampled By SHH		
		g	Sample Number	+=	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test	
Elevation (ft)	Œ	Graphic Log	Z	Blow Count	nsi	) e	Syl	Chocked by NEB	Ľ	
atic	Depth (ft)	ặ	<u> </u>	Q	Del	tur	က္လ		o l	
e e	ebt	<u> </u>	a	<u>ŏ</u>	<u> </u>	ois	SC		) ype	
	Ŏ	വ	S			Σ	Ď	DESCRIPTION	É'	
	0 _			_				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	-#200	
	_								CR EI	
	_		R-1	16	112.6	5.9	SM	@2.5' - Silty SAND: gray brown, slightly moist, medium	MD	
735-	_			16 18 19				dense		
'00	5 —	│ Щ	R-2		107.9	10.2		@EL Cilty CAND, brown majet madium dans		
	_	<u>`</u>	R-2	6 8 9	107.9	10.2		@5' - Silty SAND: brown, moist, medium dense		
	_			-						
	_		R-3	6 8 11	111.5	9.1		@7.5' - Silty SAND: light brown, moist, medium dense	-#200	
730-	_			11					CO	
	10 —		R-4	14	106.3	10.9		   @10' - Silty SAND: brown, moist, medium dense		
	_		1 7	14 16 19	100.0	10.0		Sity of the stown, most, mediam dense		
	_			-						
	_			-						
725-	_			-						
	15 —		SPT-1	7		5.1	SP-SM	@15' - SAND with Silt: gray brown, slightly moist,		
	_			7 9 10				medium dense		
	-			-						
	_			-						
720-	_			-						
	20 —		R-5	32 50/4"	124.9	2.5	SP	@20' - SAND with Gravel: gray brown, dry, very dense		
	_			30/4						
	-			-						
<u>-</u>	_			-						
715-				-						
	25 —		SPT-2	20 32 40		3.6		@25' - SAND with Gravel: gray brown, dry, very dense		
	_			<u>4</u> 46						
	_			1						
	_			-						
710-	20 -			-						
	30 —									
					OF TI	HIS BORIN	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR  DS DIRECT SHEAR  MAYIMUM MENCIL	rv	
				7				MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	11	



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B BULK SAMPLE
R RING SAMPLE (CA Modified Sampler)
G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE

GROUNDWATER TABLE

ed Sampler) MD SA SA SA SA SA CR CR AL CO RV -#200

ES:
DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

			Geotechnical Boring Log Borehole HS-1										
Date:	9/14/	/202						Drilling Company: Choice Drilling					
			Visser	, Onta	ario			Type of Rig: CME 75					
Proje	ct Nu	ımbe	er: 201	79-01				Drop: 30" Hole Diameter:	8"				
					~739' N			Drive Weight: 140 pounds					
Hole Location: See Geotechnical Map								Page 2 d	of 2				
			_		(J			Logged By SHH					
			<u>pe</u>		bc		<del>_</del>	Sampled By SHH					
<b>E</b>		og	l l	l t	ty (	(%	dπ	Checked By RLD	est				
u	( <del>L</del>	ر ا		no	nsi	re (	Syl	J. 1.25	f T				
ati	<del>‡</del>	jhc	혍	O >	De	stui	S		0				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DECODIDEION	Type of Test				
Ш		0			_			DESCRIPTION					
	30 _		R-6	40 50/3"	116.1	2.4	SP	@30' - SAND with Gravel: gray brown, dry, very dense					
	_												
	_		_										
705-	_												
	35 —		SPT-3	1 15		9.9	SM	@35' - Silty SAND: brown, moist, very dense					
	_			15 18 32		9.9	Olvi	W33 - Only OAND. Blown, moist, very defise					
	-												
	_		_	-									
700-	-												
	40 —		R-7	29 50/5"	112.6	17.4	ML	@40' - Sandy SILT: gray brown, very moist, hard					
	_			50/5"									
	-		_										
	_		_										
695-	_		-										
	45 —		SPT-4	11 14		15.8		@45' - Sandy SILT: brown, very moist, hard					
	_			18									
	-			•									
	_			•									
690-	-		_	•									
	50 —		R-8	42 50/4"	128.0	7.5	SM	@50' - Silty SAND with Gravel: gray brown, moist, very					
	_							dense					
								Total Depth = 51'					
685-								Groundwater Not Encountered Backfilled with Cuttings on 9/14/2020					
003	55 —							Dackinied with Cuttings on 9/14/2020					
	JJ _												
	_												
	_			.									
680-	_			.									
	60 —			.									
		I		1	THIS	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:					
					SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GE AT THIS LOCATION  G GRAB SAMPLE  SA SIEVE ANALYSIS	′				
								GE AT THIS LOCATION SPT STANDARD PENETRATION S&H SIEVE ANALYSIS  E. THE DATA  G GRAB SAMPLE SA SIEVE ANALYSIS STANDARD PENETRATION TEST SAMPLE FI EXPANSION INDEX					



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

				Geo	techi	nica	Bor	ing Log Borehole HS-2			
Date:	9/14	/202						Drilling Company: Choice Drilling			
Proje	ct Na	me:	Vissei	r, Onta	ario			Type of Rig: CME 75			
Proje	ct Nu	ımbe	er: 201	79-01				Drop: 30" Hole Diameter: 8"			
Eleva	tion	of To	op of H	Hole:	~737' N	ИSL		Drive Weight: 140 pounds			
Hole	Loca	tion:	See C	Geote	chnical	Мар		Page 1 c	of 2		
			_		<u> </u>			Logged By SHH			
			Sample Number		Dry Density (pcf)		<del>-</del>	Sampled By SHH			
<b> </b> (#)		go	<u>L</u>	<del> </del>	ty (	(%	qι	Checked By RLD	əst		
Elevation (ft)	(H)	Graphic Log		Blow Count	nsi	Moisture (%)	USCS Symbol	Chocked by NEB	Type of Test		
atic	Depth (ft)	) jë	월	0	Del	tur	Ś		0		
<u>6</u>	ер	ğ	au	<u>ŏ</u>		lois	SC		ype		
Ш		O.	S	m		Σ	$\supset$	DESCRIPTION	Ĺ.		
	0 _	.		-				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)			
735-	-	·		-	4400	0.0	0.5	COST, CAND			
	_	1	R-1	26 32 35	110.3	2.2	SP	@2.5' - SAND: gray brown, dry, very dense			
	_	1									
	5 —	B 4	R-2	20 32 40	104.3	4.2		@5' - SAND: gray brown, slightly moist, very dense			
730-	_			40							
''00	_		R-3	18 26 35	101.6	3.0		@7.5' - SAND: light brown, dry, dense			
	_			35							
	10 —		R-4	30	107.6	2.3		@10' - SAND with Gravel: gray brown, dry, very dense			
	_			30 38 50/5"							
725-	_			-							
	_	-		-							
	15	1		-							
	15 —		SPT-1	7 6 7		15.5	SM	@15' - Silty SAND: brown, very moist, medium dense			
720-	_			10 10							
120	_			-							
	_			-							
	20 —		R-5	36	119.8	1.4	SP	@20' - SAND with Gravel: gray and light gray, dry, very			
	_			36 50/6"	110.0		O,	dense			
715-	-	-		-							
	_	1		-							
	_	1		-							
	25 —	-	SPT-2	7 9 10		3.9	SM	@25' - Silty SAND with Gravel: brown, dry, medium			
740	=	-		10				dense			
710-	_	]									
	_		[	_							
	30 —		[	_							
				1	THIS	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:			
	<b>&gt;</b>				OF TI	HIS BORING	AND AT TH	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,		



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-2										
Date:	9/14	/202	0					Drilling Company: Choice Drilling			
			Visse					Type of Rig: CME 75			
			<b>r</b> : 201					Drop: 30" Hole Diameter:	8"		
Elevation of Top of Hole: ~737' MSL								Drive Weight: 140 pounds			
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 2 c	of 2		
			ايا		(£			Logged By SHH			
			-qι		od)	(	0	Sampled By SHH			
Elevation (ft)		Graphic Log	Sample Number	<u>±</u>	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test		
loi	( <del>II</del> )	<u>                                      </u>	e e	) 2	sus	<u>r</u> e	Sy	·	of T		
vat	)t	hd	ldu		۵	stu	S		e e		
<u>ė</u>	Depth (ft)	<u>a</u>	Sar	Blow Count	)ry	Лоі	)S(	DESCRIPTION	\ <u>S</u>		
					114.3	8.5	SM				
	30 _	-	R-6	30 50/6"	114.3	6.5	SIVI	@30' Silty SAND: dusky brown, moist, very dense			
705-	-	-		-							
	_	-	-	-							
	-	-		-							
	35 —	-	SPT-3	6		20.3	ML	@35' Sandy SILT: gray and dusky brown, very moist,			
	_			∆ 11 ×				very stiff			
700-	-	1		-							
	_	-		-							
	-	•		-							
	40 —	1	R-7	20 32 40	119.4	14.3		@40' Sandy SILT: dusky brown, very moist, hard			
005	_			40							
695-	_			-							
	_		Ī	-							
	45 —		[								
	<del>-</del> -5		SPT-4	7 9 12		29.8	CL	@45' CLAY: light brown, very moist, very stiff			
690-	_			12							
	_			-							
	_			-							
	50 —		R-8	40	124.1	9.2	SM	@50' Silty SAND: light brown, moist, very dense			
	_	_	110	40 50/5"	124.1	9.2	Olvi	<b>3</b>			
685-	-	-		-				Total Depth = 51' Groundwater Not Encountered			
	_		-	-				Backfilled with Cuttings on 9/14/2020			
	-	-	<del> </del>	-							
	55 <del></del>	-		-							
	_	-		-							
680-	-	-		-							
	_			-							
	-	1		-							
	60 —			-							
					OF TI	HIS BORING	AND AT TH	LLY AT THE LOCATION  SAMPLE TYPES:  E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR  DIRECT SHEAR	,		
				7				MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO			



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

□ GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Geo	techr	nica	l Bor	ing Log Borehole HS-3			
Date:	9/14/	/202						Drilling Company: Choice Drilling			
			Visser					Type of Rig: CME 75			
Proje	ct Nu	mb	er: 201	79-01				Drop: 30" Hole Diameter: 8"			
	Elevation of Top of Hole: ~738' MSL							Drive Weight: 140 pounds			
Hole	Locat	tion	: See C	Geote	chnical	Мар		Page 1	of 1		
					<u>_</u>			Logged By SHH			
			<u>pe</u>		bc		<del>-</del>	Sampled By SHH			
		go	<u>L</u>	<u> </u>	<u> </u>	(%	dr dr	Checked By RLD	est		
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test		
ati	Depth (ft)	jh	월	0		stuı	တွ		0		
<u> </u>	eb	g	an	<u>ŏ</u>		lois	SC	7-7-7-1-1-1	yp		
Ш		Θ_	S	<u> </u>		2		DESCRIPTION			
	0 _			_				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)			
	_			-							
735-	_		R-1	50/5"	104.1	3.8	SP	@2.5' - SAND: gray brown, dry, very dense			
	_			-							
	5 —	Ī	R-2	35	118.3	3.6		@5' - SAND with Gravel: gray brown, dry, very dense			
	_	4	) 11-2	35 50/6"	110.5	0.0		Wo - Shirth with Graver, gray brown, dry, very defise			
	_			-							
730-	_		R-3	25 40	110.6	6.3		@7.5' - SAND: gray brown, slightly moist, very dense			
	_			50/5"							
	10 —		R-4	18	107.8	3.6		@10' - SAND: gray brown, dry, dense			
	_			18 26 32							
	-			-							
725-	-			-							
				-							
	15 —		SPT-1	10 15 19		5.1		@15' - SAND: gray brown, slightly moist, dense			
	_			19							
720-											
1/207											
	20 —				400.0	0.0	0.4				
	_		R-5	24 30 50/5"	106.3	3.2	SM	@20' - Silty SAND: gray brown, dry, very dense			
	_			- 30/5							
715-	_			-							
	_			-							
	25 —		SPT-2	15		8.4		@25' - Silty SAND: dusky brown, moist, very dense			
	_			15 19 30		0.7		Sity Of the duoty brown, moist, very defise			
	_		F					Total Depth = 26.5'			
710-	_		-	-				Groundwater Not Encountered			
	_			-				Backfilled with Cuttings on 9/14/2020			
	30 —										
								IN AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR			
	>	1	2		SUBS LOCA	SURFACE C	CONDITIONS O MAY CHAN	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT' GE AT THIS LOCATION GG GRAB SAMPLE SA SIEVE ANALYSIS STANDARD DENISTRATION SEL SIEVE AND LYDDE			
1					WITH	THE PASS	AGE OF TIM	E. THE DATA  TEST SAMPLE  EI EXPANSION INDEX			



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

				Geo	techi	nica	l Bor	ring Log Borehole HS-4	
Date:	9/17	/202	0					Drilling Company: Choice Drilling	
			Visse					Type of Rig: Limited Access Track Rig	
			<b>er:</b> 201					Drop: 30" Hole Diameter:	8"
					~737' N			Drive Weight: 140 pounds	
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1	of 2
			_		E C			Logged By ARN	
					<u>a</u>		<u> </u>	Sampled By ARN	
<b>#</b>		l g	lun	nt	_ <u>₹</u>	(%)	g d d	Checked By RLD	est
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	,	Type of Test
/ati	Depth (ft)	phi	ldι	) ×		stu	တ္သ		e 0
<u> </u>	ер	<u>ra</u>	an	<u> </u>	<u>\</u>	10is	)S(	DECODIDATION	yp.
Ш		0_	S	В		2	$\supset$	DESCRIPTION	
	0 _	À À		-				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	CR EI
735-	_			_					_'
	_	. 11	R-1	6 9 11	117.3	6.8	SM	@2.5' - Silty SAND: dusky brown, slightly moist, medium	
	_	! <b>  </b>		11				dense	
	5 —	Ш	R-2	8	108.0	5.4		@5' - Silty SAND: dusky brown, slightly moist, medium	-#200
	_			8 10 12				dense	CO
730-	_								
	_		R-3	9 15 18	103.1	3.9		@7.5' - Silty SAND: dusky brown, dry, medium dense	
	_			18					
	10 —		R-4	9 16 19	99.6	2.8	SP	@10' - SAND: reddish brown, dry, medium dense	
	_			19					
725-	_			-					
	_			=					
	15	1		-					
	15 —	]	SPT-1	4 5 6		13.2	ML	@15' - SILT with Sand: gray, moist, stiff	-#200
720-	_			Z\ 6 _					
120	_								
	_			_					
	20 —		R-5		104.1	2.0	SP	©201 CAND, gray brown dry madium dance	
			G-71	9 11 15	104.1	2.0	) SP	@20' - SAND: gray brown, dry, medium dense	
715-	_			-					
	_			-					
	_			-					
	25 —		SPT-2	11		14.3	SM	@25' - Silty SAND: dusky brown, very moist, medium	
	_		_	11 9 11				dense	
710-	_			-					
	_			-					
	_			-					
	30 —			-					
								NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
						SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

SA S&H EI CN CR AL CO RV -#200

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

GROUNDWATER TABLE

				Geo	techr	nica	Bor	ing Log Borehole HS-4	
Date:	9/17	/202	0					Drilling Company: Choice Drilling	
			Visse					Type of Rig: Limited Access Track Rig	
			<b>er:</b> 201					Drop: 30" Hole Diameter:	8"
			•		~737' N			Drive Weight: 140 pounds	
Hole	Loca	tion:	See (	Seote	chnical	Мар		Page 2 c	of 2
			_		Œ.			Logged By ARN	
			<del> </del>		) (bd	(	<u>0</u>	Sampled By ARN	,
#)	_	   00-	ļ ļ	l ti	iŧy	%)	Ä	Checked By RLD	es
ioi	(H)	ic I	<u>e</u>	ਲ਼	sue	Ire	S		of 1
vat	oth	hdı	dμ		Ğ	istu	CS		96
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6		110.5	18.7	ML	@30' - Sandy SILT: gray, very moist, hard	AL
	-		11-0	6 22 24	110.0	10.7	IVIL	gov - Gandy Gier, gray, very moist, nard	/\L
705-	_			-					
	_		-	-					
	<b>-</b>			•					
	35 —		SPT-3	4		19.3	CL	@35' - Sandy CLAY: reddish brown, very moist, very	
700	_		Į Ž	8				stiff	
700-	_								
	40 —		[			440	014		
	-		R-7	23 50/5"	118.2	14.3	SM	@40' - Silty SAND: brown, very moist, very dense	
695-	_								
	_			-					
	_			.					
	45 —		SPT-4	7 9		9.5		@45' - Silty SAND: brown, moist, dense	
	_			9 17 19		0.0		Sincy of the stown, moiot, donor	
690-	_			.]					
	_			-					
	_								
	50 —		R-8	16 20 41	107.6	7.2		@50' - Silty SAND: brown, slightly moist, dense; iron	
	_			41				oxide weathering	
685-	_							Total Depth = 51.5'	
	_			1				Groundwater Not Encountered	
	55 —							Backfilled with Cuttings on 9/17/2020	
	- 55								
680-	_								
	_								
	_								
	60 —			.					
		I		1				ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
	>				SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSITY           GE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	′



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

 B
 BULK SAMPLE
 D

 B
 BULK SAMPLE
 D

 C
 RING SAMPLE (CA Modified Sampler)
 N

 G
 GRAB SAMPLE
 S

 SPT
 STANDARD PENETRATION
 S

 TEST SAMPLE
 C

□ GROUNDWATER TABLE

ampler) MD SA S&H EI CN CR AL CO RV -#200 DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

			(	Geo	techr	nica	l Bor	ing Log Borehole HS-5	
Date:	9/17	/202	0					Drilling Company: Choice Drilling	
			Visse					Type of Rig: Limited Access Track Rig	
			er: 201					Drop: 30" Hole Diameter:	8"
					~741' N			Drive Weight: 140 pounds	
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1	of 1
			<u>_</u>		Œ.			Logged By ARN	
			qu		(bc		<del>-</del>	Sampled By ARN	
<b> </b>		go	l un	l t	ty	8	g Q	Checked By RLD	est
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	,	Type of Test
'ati	Depth (ft)	phi	)   dc	0	De	stu	တ္သ		O
<u>e</u>	ер	<u>ra</u>	lan.	<u>§</u>	)ry	<u>Jōi</u>	)S(	DECODIDATION	y
Ш		0	(C)	<u> </u>				DESCRIPTION	
740-	0 _			-				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	MD
	_		R-1	5 5 5 5	109.7	5.6	SM	@2.5' - Silty SAND: brown, slightly moist, loose	
	_			5					
	5 —		R-2	7	123.7	5.1		@5' - Silty SAND: brown, slightly moist, medium dense	
735-	_			7 9 13					
	_		R-3	11 31 33	122.8	1.4	GP	@7.5' - Sandy GRAVEL: gray, dry, very dense	
	_			33					
700	10 —		R-4	33 29 43	122.0	1.3	SP	@10' - SAND with Gravel: gray, dry, very dense	
730-	_			43					
	_			-					
	_			-					
705	15 —		R-5	12 13 17	120.4	1.8		@15' - SAND with Gravel: gray, dry, mdeium dense	
725-	_			17					
	_		-						
	_			-					
700	20 —		SPT-1	10		2.4		@20' - SAND with Gravel: gray brown, dry, dense	
720-	_			<b>7</b> \ 18 −					
	_			_					
	_			-					
715-	25 —		R-6	11 23 30	109.2	8.4	SM	@25' - Silty SAND: gray brown, moist, dense	
1157	_			30				Total Depth = 26.5'	
	_			-				Groundwater Not Encountered	
	-			-				Backfilled with Cuttings on 9/17/2020	
	30 —			-					
	<b>—</b>	1. 3			OF TH	HIS BORING	AND AT TH	ALY AT THE LOCATION SAMPLE TYPES: TEST TYPES: ET IMBE OF DRILLING.  MAY DIFFER AT OTHER RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y
	2					TIONS AND	MAY CHAN	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	



COADTIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Ge	otecl	nnic	al Bo	oring Log Borehole I-1	
Date:	9/17/	/202	0					Drilling Company: Choice Drilling	
Proje	ct Na	me:	Visse	r, Ont	ario			Type of Rig: Limited Access Track Rig	
	ct Nu							Drop: 30" Hole Diameter:	8"
					~737' <b>N</b>			Drive Weight: 140 pounds	
Hole	Locat	tion:	See	Geote	chnical	Мар		Page 1	of 1
			_					Logged By ARN	
			pe		bc		_	Sampled By ARN	
(#)		go	uμ	)t	<u> </u>	(%	qu	Checked By RLD	əst
Elevation (ft)	ſft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	Chocked By NEB	Type of Test
atic	Depth (ft)	ij	eldi	C		stur	တ္သ		0
<u>e</u>	eb	ğ	aп	<u>                                     </u>		lois	SC		ype
Ш		Θ	S	В		2	$\bigcap$	DESCRIPTION	
	0 _			-				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	
735-	_			-					
	_			-					
	_			-					
	5 —		R-1	8 8 9	112.8	10.4	SM	@5' - Silty SAND: brown, moist, medium dense	
730-				9					
7 30	_			_					
	_			-					
	10 —		R-2	6	102.3	16.8	ML	@10' - Sandy SILT: brown, very moist, stiff	
	_			6 8 11	102.0	10.0		Gro Sanay Siziri Sisirii, Yery melek, san	
725-	_			-					
	_			-					
	- 15 —			-					
	15 —								
720-	_			_					
'-"	_		SPT-1	5		13.1	SM	@18' - Silty SAND: dusky brown, very moist, medium	
	_		OF 1-1	5 6 7		13.1	JIVI	dense	
	20 —								
	_			-				Total Depth = 20' Groundwater Not Encountered	
715-	_			-				3" Perforated Pipe Surrounded by Gravel Installed and	
	_			-				Presoaked on 9/17/2020	
	25 —							Backfilled with Cuttings on 9/18/2020	
710-	_			-					
	_			-					
	-			-					
	30 —								
					OF T	HIS BORING	AND AT TH	NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
	>	6						MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT' GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

				Ge	otech	nnic	al Bo	oring Log Borehole I-2	
Date:	9/17/	202	0					Drilling Company: Choice Drilling	
Proje	ct Na	me:	Visse	r, Onta	ario			Type of Rig: Limited Access Track Rig	
Proje	ct Nu	mbe	er: 201	79-01				Drop: 30" Hole Diameter:	8"
					~734' N			Drive Weight: 140 pounds	
Hole	Locat	ion:	See (	Geote	chnical	Мар		Page 1	of 1
			پ		l (j			Logged By ARN	
			equ		bc		<del>-</del>	Sampled By ARN	
IŒ		og	Sample Number	<u> </u>	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test
Elevation (ft)	(ft)	Graphic Log	Z	Blow Count	nsi	<u>.</u> و (	Syl		ĮΤ
atje	Depth (ft)	hi	ıρle	O S	De	stui	တွ		0 0
<u> </u>	ер	la	an	<u>δ</u>	Σ.	lois	SC		ype
Ш		Θ	S	B		2		DESCRIPTION	
	0 _			_				@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	
	_			_					
	_			_					
730-	_			_					
	5 —		R-1	13	114.2	2.0	SM	@5' - Silty SAND: brown, dry, medium dense	
	_		17-1	13 15 21	114.2	2.0	Sivi	W3 - Silty SAND. Blown, dry, medium dense	
	_								
	_			-					
725-	_			-					
	10 —		R-2	7	101.7	2.3	SP	@10' - SAND: gray brown, dry, dense	
	_			7 19 24				grown, any, and	
	_			-					
	-			-					
720-	_			-					
	15 —			-					
	_			-					
	_			-					
	_		SPT-1	9 15		1.7		@18' - SAND with Gravel: gray brown, dry, dense	
715-	_			<u>18</u> 18					
	20 —							Total Depth = 20'	
				-				Groundwater Not Encountered	
	-			-				3" Perforated Pipe Surrounded by Gravel Installed and	
710								Presoaked on 9/17/2020	
710-	25 —							Backfilled with Cuttings on 9/18/2020	
	25								
				_					
705-				_					
	30 —			_					
					THIS	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
	>	1			OF TI SUBS	HIS BORING SURFACE C	G AND AT TH CONDITIONS	IE TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  COMPARAMENTS.	Y
								GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA SPI STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE EI EXPANSION INDEX	



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

TEST SAMPLE

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

				Ge	otech	nnic	al Bo	oring Log Borehole I-3	
Date:	9/17/	/202	0					Drilling Company: Choice Drilling	
Proje	ct Na	me:	Visse	r, Onta	ario			Type of Rig: Limited Access Track Rig	
Proje	ct Nu	mbe	er: 201	79-01				Drop: 30" Hole Diameter:	8"
					~733' N	ИSL		Drive Weight: 140 pounds	
					chnical			Page 1 (	of 1
					[)			Logged By ARN	
			pe		bcl		<u> </u>	Sampled By ARN	
Œ		g	톡	+=	.y (	(%	ď	Checked By RLD	est
٦	ft)	ێٳ	Ž	] Ju	  sit	е (	Š	Checked by NED	Te
I ∺ ∣	)	ij	음	Ŭ	)er	tur	S		of of
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
i iii	Ď	ত	ၓိ	<u> </u>	_ <u>_</u>	Š	Ď	DESCRIPTION	🗀
	0							@0' to T.D Quaternary Alluvial Fan Deposits (Qyf)	
				]					
730-									
730	_			_					
	5 —				400.0	0.0	014	051 071 0410	
	_		R-1	7 11 13	102.3	9.8	SM	@5' - Silty SAND: gray brown, moist, medium dense	
	_			- 13					
725-	_			_					
	_			-					
	10 —		R-2	6	95.4	6.7		@10' - Silty SAND: gray brown, slightly moist, medium	CN
	_		11-2	6 7 10	95.4	0.7		dense; mottled	CIV
	_			-					
720-	_			-					
	_			-					
	15 —			-					
	_			-					
	_			-					
715-	_		SPT-1	8 13		2.0	SP	@18' - SAND with Gravel: gray brown, dry, dense	
	_			13					
	20 —			-				Total Depth = 20'	
	_			-				Total Depth = 20' Groundwater Not Encountered	
	-			-				3" Perforated Pipe Surrounded by Gravel Installed and	
710-	_			-				Presoaked on 9/17/2020	
	25			-				Backfilled with Cuttings on 9/18/2020	
	25 —	1		-					
				_					
705-									
705			[	_					
	30 —			_					
	00				тше	SHMMADV	APPLIES OF	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					OF TI	HIS BORING	3 AND AT TH	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y
					LOCA	ATIONS ANI	MAY CHAN	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA  SPT STANDARD PENETRATION SAH SIEVE AND HODE  E. TEST SAMPLE SAM	METER



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	lo.: TP-1				
Project N	ımbe	r: 20179-01	Date: 9/22/2020		_		LC		
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	Engineering Proper		Geotech	Geotechnical, Ir	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	В	iron oxide staining; infrequer blocky excavation @4'-5' Slightly harder, increas @5'-9' tan-brown, trace pea g @9'-T.D. SAND with Gravel le	osits own, dry, medium dense; scattere nt rootlets; trace pinhole pores; sed moisture	n	SM				
RAPHIC	AL RE	EPRESENTATION BELOW:	Elevation: 740' MSL	Surface Slope:	0 deg.		Trend: N	<b> -S</b>	
+	+					-	-		

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	o.: TP-2				
Project Nu	ımbe	er: 20179-01	Date: 9/22/2020		_			16	
quipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineerii	Engineering Proper		Geotech	hnical, Inc	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	В	dead vegetation @6" Transition zone, moist to Quaternary Alluvial Fan Depo @10"-6' Silty SAND: olive gray scattered rootlets	v, moist, loose to medium dense; brown, moist, stiff; slightly claye	Qyf	SM ML	GB-1 @ 3" GB-2 @ 8" GB-3 @ 24' GB-4 @ 6'			
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 740' MSL	Surface Slope:	0 deg.	. <b>I</b>	Trend: E	-W	
+ + + + +									

roject Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	o.: TP-3			
roject N	umbe	er: 20179-01	Date: 9/22/2020				LC	16
quipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineerir	ng Proper	Geotechnical,		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT' (PCF)
	В	grass, sticks, dried and dead Quaternary Alluvial Fan Dept @4"-7' Silty SAND: light brow trace gravel; blocky excavat @7' - Silty fine SAND: brown, dense @8'-9' SAND with trace Grav medium dense; coarse to me	osits on, dry, medium dense; scattered to tion; slightly moist by 2' slightly moist to moist, medium el: gray, dry to slightly moist, edium-grained sand otly moist, medium dense; scatter	Qyf	SM	GB-1 @ 2" GB-2 @ 6"		,
RAPHIC	AL RI	EPRESENTATION BELOW:	Elevation: 741' MSL	Surface Slope: (	0 deg.		Trend: E	- <b>W</b>

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	lo.: <b>TP</b> -7	4		
Project Nu	umbe	r: 20179-01	Date: 9/22/2020		_			
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:		G
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMP	LE N	10
	Α	Topsoil			SM	GB-1 @	2"	_
		@0'-1' Silty SAND: medium br rootlets; scattered gravel	own, dry, medium dense; scattered			GB-2 @	- 1	



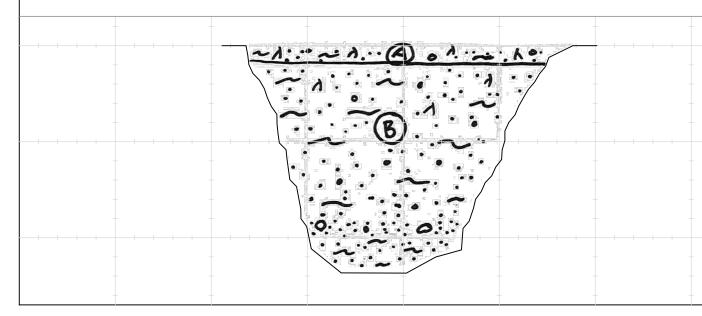
Geologic Attitudes	nit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
В	В	Topsoil @0'-1' Silty SAND: medium brown, dry, medium dense; scattered rootlets; scattered gravel Quaternary Alluvial Fan Deposits @1'-8' Silty SAND: medium orangish brown, dry to slightly moist, medium dense, blocky excavation; scatterd gravel; minor rootlets to 4' @8'-9' SAND with Silt: brown, dry to slightly moist, medium dense; scattered gravel; medium grained sand @9'-10' SAND: gray, dry, medium dense; coarse-grained sand with gravel; subrounded clasts 3/4-inch in maximum dimension @10'-T.D. Silty SAND: brown, slightly moist, medium dense	Qyf	SM SP-SM SP SM	GB-1 @ 2" GB-2 @ 1' GB-3 @ 1.5		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 741' MSL

Surface Slope: 0 deg.

Trend: E-W



Total Depth: 12' Groundwater: None Backfilled: 9/22/20

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	lo.: TP-10	6			
Project Nu	ımbe	er: 20179-01	Date: 9/22/2020	<b>F</b>	D		LC	jC	
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	Engineering Propert		Geotech	Geotechnical, In	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)	
	В	moist, medium dense; brown 19" <i>Quaternary Alluvial Fan Dep</i> @3'-5.5' SAND with SILT: gradense; 2-inch thick gravel be	y SAND: reddish brown, slightly n organic staining; gray mottle by	Afu Qyf	SM SP-SM SP	GB-1 @ 16 GB-2 @ 32 GB-3 @ 40 B-1 @ 1'-5'	•		
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 737' MSL Sui	face Slope:	0 deg.	-	Trend: N	I-S	
						Groun	Depth: 11.5' dwater: Non lled: 9/22/20		

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	lo.: TP-17	7			
Project N	umbe	er: 20179-01	Date: 9/22/2020		_				
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:	Geotechnie		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT		uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	excavation  Quaternary Alluvial Fan D  @1'-T.D. SAND with SILT	rown, dry, dense material, blocky Deposits to Silty SAND: gray and brown, dry to ense to dense; several gravel interbeds	Qyf	SM SP-SM	GB-1 @ 2" GB-2 @ 12'			
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 723' MSL Surf	ace Slope:	0 deg.		Trend: N	I-S	
	-					Groun	epth: 5.5' dwater: Non lled: 9/22/20		

Project Na	ame:	Visser - Ontario	Logged By: ARN	Trench N	lo.: TP-2	5		
Project Nu	ımbe	er: 20179-01	Date: 9/22/2020	Engineeri	Engineering Proper			16
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:	Geotech	nnical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPI	LE MOISTURE (%)	DRY DENSIT (PCF)
	В	in upper 1'; slightly moist by @5'-6' Silty SAND: brown and lenses of brown organic silt @6'-9.5' Silty SAND: brown, sl scattered gravel  Topsoil @9.5'-10' Silty to Clayey SANI dense; organic staining  Quaternary Alluvial Fan Depo	, medium dense; minor vegetation 2'; scattered gravel gray mottle, moist, medium dense, lightly moist, medium dense; D: dark brown, moist, medium		SM/SC	GB-1 @ 0 GB-2 @ GB-3 @ GB-4 @ 1 GB-5 @ 1	9-5' 5.5' 9.7' 10.1'	
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 747' MSL Su	urface Slope:	0 deg.		Trend: I	N-S
	-		*:\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			Gro	al Depth: 15.3' oundwater: Nor ckfilled: 9/22/20	

Project Na	ame:	Visser - Ontario	Logged By: ARN		Trench N	No.: TP-28	3		
Project Nu	ımbe	er: 20179-01	Date: 9/22/2020		Engineering Propert				jC
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:	Geotechnical, I		
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	©1.5' - 3.5' SAND with Sil slightly moist, medium de interbeds	brown, dry, medium dense; ve nics; blocky excavation t and trace Gravel: medium bro ense; scattered gravel and col and Gravel beds; medium rou	own, oble	Qyf	SM SP-SM GW-GM	GB-1 @ 2"		
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 739' MSL	Surfac	ce Slope:	0 deg.	-	Trend: N	I-S
			.O. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9.	i also			Tatal	Depth: 6'	

Project Na	ame:	Visser - Ontario	Logged	d By: ARN		Trench N	lo.: TP-3	1		
Project Nu	ımbe	r: 20179-01	Date: 9	Date: 9/22/2020  Location: Ontario					LC	jC
Equipmen	t: JC	B 3CX Excavator	Location			Engineeri	ng Proper	ties:	es: Geotechnica	
Geologic Attitudes	Unit	SOIL DESCRIPTION:				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	Topsoil @0'-0.5' Silty SAND: me  Quaternary Alluvial Far @0.5'-2' Silty SAND: ligh @4'-TD Silty SAND with	n <i>Deposits</i> nt brown, dry, m	nedium dense; roots	to 4'	Qyf	SM	GB-1 @ 1" GB-2 @ 4" GB-2 @ 12' B-1 @ 1'-5'	•	( 3.1)
RAPHICA	AL RE	EPRESENTATION BELOV	V: Ele	evation: 745' MSL		ace Slope:	0 deg.		Trend: E	-W
	-				+ -	+ + + +		Groun	epth: 10.5' dwater: None led: 9/22/20	

Project Na	me:	Visser - Ontario	Logged By: ARN	Trench N	lo.: TP-38	3		
roject Nu	ımbe	r: 20179-01	Date: 9/22/2020					
quipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:	Geotech	nical, lı
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	Quaternary Alluvial Fan Dej	own, dry, medium dense; coarse	Qyf	SM	GB-1 @ 3" GB-2 @ 6" GB-2 @ 12'		( 33,
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 740' MSL Surf	ace Slope:	0 deg.		Trend: E	- <b>W</b>
	+ + + + + + + + + + + + + + + + + + + +						epth: 10.5' dwater: Non	

# **Infiltration Test Data Sheet**

## LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Visser, Ontario
Project Number: 20179-01
Date: 9/18/2020

**Boring Number:** I-1

# Test hole dimensions (if circular)

Boring Depth (feet)\*: 20
Boring Diameter (inches): 8
Pipe Diameter (inches): 3

Test pit dimensions (	if rectangular)
Pit Depth (feet):	
Pit Length (feet):	

Pit Breadth (feet):

# Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)		Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	7:47	8:12	25.0	17.97	18.72	0.75	Yes
2	8:13	8:38	25.0	17.97	18.70	0.73	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

# Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, Dt (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, DD (feet)	Measured Infiltration Rate(in/hr)
1	8:40	8:50	10.0	17.88	18.20	0.32	1.8
2	8:51	9:01	10.0	17.75	18.07	0.32	1.7
3	9:02	9:12	10.0	17.86	18.20	0.34	1.9
4	9:13	9:23	10.0	17.86	18.18	0.32	1.8
5	9:24	9:34	10.0	17.87	18.19	0.32	1.8
6	9:35	9:45	10.0	17.90	18.22	0.32	1.8
7							
8							
9							
10							
11							
12							
			Mea	sured Infiltration	Rate (No Fa	ctor of Safety)	1.8

Sketch:			

**Notes:** Pipe is 3 inches above Ground (correction already accounted for)



Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 10/30/2019

<sup>\*</sup>measured at time of test

# **Infiltration Test Data Sheet**

## LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Visser, Ontario
Project Number: 20179-01
Date: 9/18/2020

**Boring Number:** I-2

# Test hole dimensions (if circular)

Boring Depth (feet)\*: 20
Boring Diameter (inches): 8
Pipe Diameter (inches): 3

Test pit dimensions (	if rectangular)
Pit Depth (feet):	
Pit Length (feet)	

Pit Breadth (feet):

# Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	7:55	8:20	25.0	17.70	19.09	1.39	Yes
2	8:21	8:46	25.0	17.68	19.11	1.43	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

# Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, Dt (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, DD (feet)	Measured Infiltration Rate(in/hr)
1	9:50	10:00	10.0	17.75	18.6	0.85	5.1
2	10:01	10:11	10.0	17.75	18.62	0.87	5.3
3	10:12	10:22	10.0	17.73	18.64	0.91	5.5
4	10:23	10:33	10.0	17.76	18.64	0.88	5.4
5	10:34	10:44	10.0	17.75	18.62	0.87	5.3
6	10:45	10:55	10.0	17.71	18.64	0.93	5.6
7							
8							
9							
10							
11							
12							

5.6

Sketch:

**Notes:** Pipe is 6 inches above Ground (correction already accounted for)



Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 10/30/2019

<sup>\*</sup>measured at time of test

# **Infiltration Test Data Sheet**

## LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Visser, Ontario
Project Number: 20179-01
Date: 9/18/2020

**Boring Number:** I-3

# Test hole dimensions (if circular)

Boring Depth (feet)\*: 20
Boring Diameter (inches): 8
Pipe Diameter (inches): 3

\*measured at time of test

Test pit dimensions (	if rectangular)
Pit Depth (feet):	
Pit Length (feet):	

Pit Breadth (feet):

# Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)		Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	11:01	11:26	25.0	17.30	18.26	0.96	Yes
2	11:27	11:52	25.0	17.35	18.29	0.94	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, Dt (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, DD (feet)	Measured Infiltration Rate(in/hr)
1	11:53	12:03	10.0	17.59	17.87	0.28	1.4
2	12:04	12:14	10.0	17.45	17.80	0.35	1.7
3	12:15	12:25	10.0	17.48	17.88	0.40	1.9
4	12:26	12:36	10.0	17.48	17.90	0.42	2.0
5	12:37	12:47	10.0	17.49	17.87	0.38	1.8
6	12:48	12:58	10.0	17.50	17.89	0.39	1.9
7							
8							
9							
10							
11							
12							
			Mea	sured Infiltration	Rate (No Fa	ctor of Safety)	1.9

Sketch:		

**Notes:** Pipe is 6 inches above Ground (correction already accounted for)



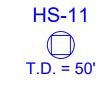
Based on Guidelines from: San Bernardino County (2013)

Spreadsheet Revised on: 10/30/2019

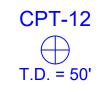
# Appendix F Geotechnical Subsurface Evaluation Data – Pietersma 20 (17114-01)



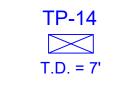
# LEGEND



Approximate Location of Proposed Hollow Stem Boring (With Proposed Depth Indicated)



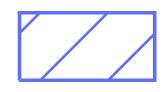
Approximate Location of Proposed Cone Penetration Test (With Proposed Depth Indicated)



Approximate Location of Proposed Geotechnical Trench (With Proposed Depth Indicated)



Approximate Limits of This Project



Approximate Area of Active Dairy Farm (NO ACCESS)

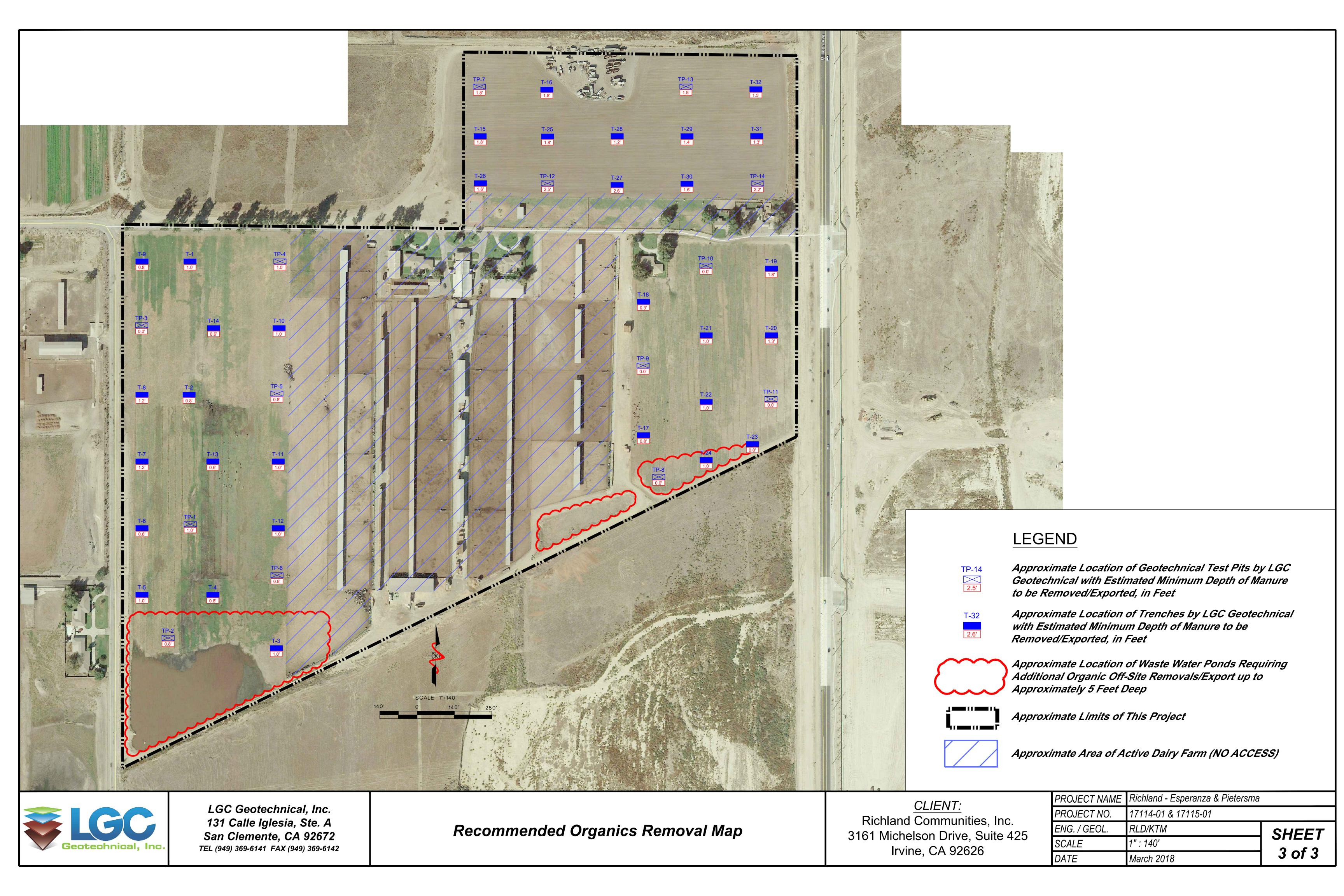


LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. A San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Exploration Location Map With Satellite Image

CLIENT:
Richland Communities, Inc.
3161 Michelson Drive, Suite 425
Irvine, CA 92626

PROJECT NAME	Richland - Esperanza & Pietersma	
PROJECT NO.	17114-01 & 17115-01	
ENG. / GEOL.	RLD/KTM	SHEET
SCALE	1": 140'	
DATE	March 2018	1 of 3



#### APPENDIX C

## **Laboratory Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution/Fines Content</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140). Where applicable, the portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D6913 (sieve).

Sample Location	Description	% Passing # 200 Sieve
HS-1 @ 7.5 ft	Sand with Silt	8
HS-2 @ 0-5 ft	Sandy Silt	63
HS-3 @ 7.5 ft	Sand	2
HS-4 @ 0-5 ft	Silty Sand	40
HS-10 @ 0-5 ft	Silty Sand	38
HS-10 @ 7.5 ft	Silty Sand	17

Atterberg Limits: The liquid and plastic limits ("Atterberg Limits") were determined per ASTM D4318 for engineering classification of fine-grained material and presented in the table below. The USCS soil classification indicated in the table below is based on the portion of sample passing the No. 40 sieve and may not necessarily be representative of the entire sample. The plot is provided in this Appendix.

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Soil Classification
HS-4 @ 7.5 ft	22	19	3	ML
HS-6 @ 7.5 ft	35	32	3	ML

### APPENDIX C

#### Laboratory Test Results (Continued)

<u>Consolidation</u>: Two consolidation tests were performed per ASTM D2435. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under "double drainage" and total deformation for each loading step were recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height. The consolidation pressure curves are provided in this Appendix.

<u>Collapse/Swell Potential</u>: Three collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate insitu effective stress. The curves are presented in this Appendix.

<u>Direct Shear</u>: Two direct shear test were performed on driven samples. The ring samples were soaked for a minimum of 24 hours prior to testing. The samples were tested under various normal loads using a motor-driven, strain-controlled, direct-shear testing apparatus (ASTM D3080). The plots are provided in this Appendix.

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-2 @ 2-5 ft	Sandy Silt	121.0	10.5
HS-4 @ 2-5 ft	Silty Sand	120.5	11.5
HS-10 @ 2-5 ft	Silty Sand	129.0	7.0

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-2 @ 0-5 ft	15	Very Low
HS-4 @ 0-5 ft	14	Very Low
HS-10 @ 0-5 ft	6	Very Low

<sup>\*</sup> Per ASTM D4829

## APPENDIX C

## **Laboratory Test Results (Continued)**

<u>R-value Test</u>: R-value test was performed in general accordance with California Test Method 301. The plot is included in the Appendix.

Sample Location	R-value
HS-7 @ 0-5 ft	61

<u>Soluble Sulfates</u>: The soluble sulfate content of select samples was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

Sample Location	Sulfate Content, %
HS-2 @ 0-5 ft	< 0.02%
HS-4 @ 0-5 ft	< 0.01%
HS-10 @ 0-5 ft	< 0.01%

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-2 @ 0-5 ft	21
HS-4 @ 0-5 ft	43
HS-10 @ 0-5 ft	62

<u>Minimum Resistivity and pH Tests</u>: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	pН	Minimum Resistivity (ohms-cm)
HS-2 @ 0-5 ft	7.66	3700
HS-4 @ 0-5 ft	6.98	3000
HS-10 @ 0-5 ft	7.77	5950

<u>Organic Matter Content of Soils</u>: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in this Table 5.

# **ATTERBERG LIMITS**

#### **ASTM D 4318**

Project Name: Esperanza Tested By: R. Manning Date: 09/26/17

Project No.: 17114-01 Input By: G. Bathala Date: 10/11/17

Boring No.: HS-4 Checked By: J. Ward

Sample No.: R-3 Depth (ft.) 7.5

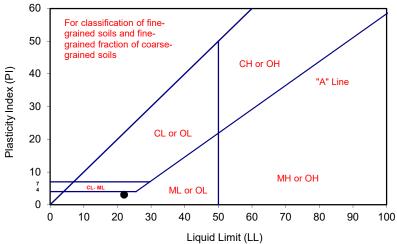
Soil Identification: Olive brown silt with sand (ML)

TEST	PLAS <sup>-</sup>	TIC LIMIT	LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			35	26	18	
Wet Wt. of Soil + Cont. (g)	13.80	14.19	23.51	22.47	28.44	
Dry Wt. of Soil + Cont. (g)	12.72	13.05	21.80	20.88	25.71	
Wt. of Container (g)	7.00	7.04	13.66	13.58	13.65	
Moisture Content (%) [Wn]	18.88	18.97	21.01	21.78	22.64	

Liquid Limit	22
Plastic Limit	19
Plasticity Index	3
Classification	ML

PI at "A" - Line = 0.73(LL-20) 1.46

One - Point Liquid Limit Calculation LL =Wn(N/25)



#### **PROCEDURES USED**

Wet Preparation

Multipoint - Wet

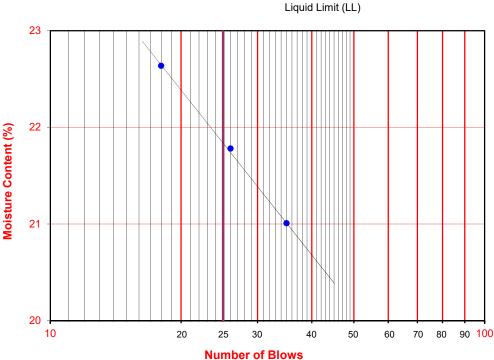
X Dry Preparation

Multipoint - Dry

X Procedure A

Multipoint Test

Procedure B
One-point Test



# **ATTERBERG LIMITS**

#### **ASTM D 4318**

Project Name: Esperanza Tested By: R. Manning Date: 09/26/17

Project No.: 17114-01 Input By: G. Bathala Date: 10/11/17

Boring No.: HS-6 Checked By: J. Ward

Sample No.: R-3 Depth (ft.) 7.5

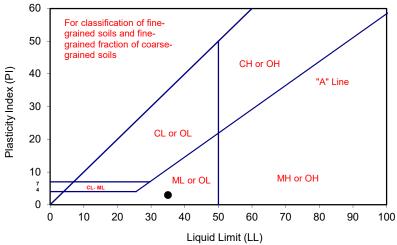
Soil Identification: Olive brown/green silt (ML)

TEST	PLAST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4	
Number of Blows [N]			35	28	18		
Wet Wt. of Soil + Cont. (g)	13.52	13.49	23.32	23.91	25.74		
Dry Wt. of Soil + Cont. (g)	11.96	11.94	20.83	21.26	22.47		
Wt. of Container (g)	7.06	7.14	13.50	13.67	13.54		
Moisture Content (%) [Wn]	31.84	32.29	33.97	34.91	36.62		

Liquid Limit	35
Plastic Limit	32
Plasticity Index	3
Classification	ML

PI at "A" - Line = 0.73(LL-20) 10.95

One - Point Liquid Limit Calculation LL = Wn (N/25)



#### **PROCEDURES USED**

Wet Preparation

Multipoint - Wet

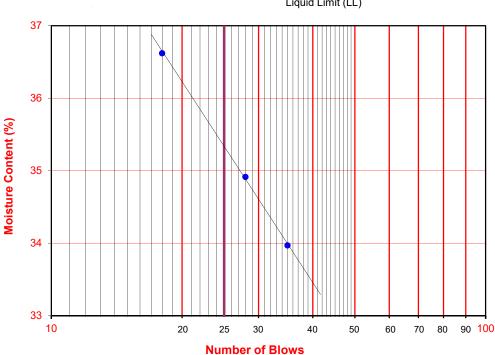
X Dry Preparation

Multipoint - Dry

X Procedure A

Multipoint Test

Procedure B
One-point Test



# ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435

Project Name: Esperanza Tested By: G. Bathala Date: 09/21/17

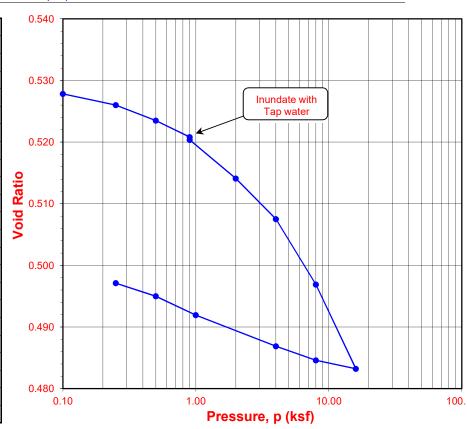
 Project No.:
 17114-01
 Checked By:
 J. Ward
 Date:
 10/11/17

 Boring No.:
 HS-4
 Depth (ft.): 7.5

 Sample No.:
 R-3
 Sample Type:

Soil Identification: Olive brown silt with sand (ML)

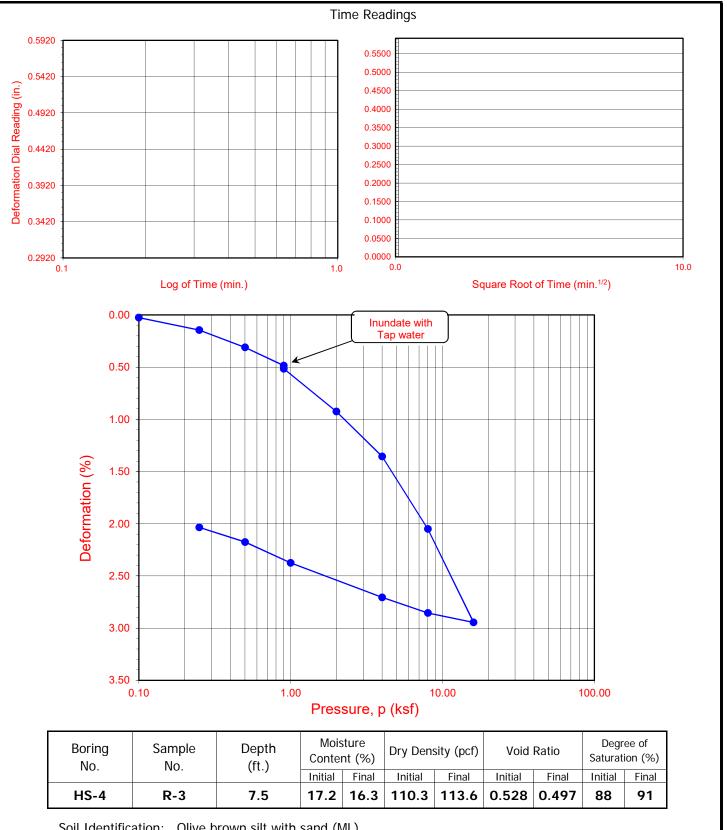
Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	200.26
Weight of Ring (g)	44.76
Height after consol. (in.)	0.9797
Before Test	
Wt.Wet Sample+Cont. (g)	349.11
Wt.of Dry Sample+Cont. (g)	303.46
Weight of Container (g)	38.79
Initial Moisture Content (%)	17.2
Initial Dry Density (pcf)	110.3
Initial Saturation (%)	88
Initial Vertical Reading (in.)	0.2968
After Test	
Wt.of Wet Sample+Cont. (g)	266.15
Wt. of Dry Sample+Cont. (g)	244.27
Weight of Container (g)	65.67
Final Moisture Content (%)	16.35
Final Dry Density (pcf)	113.6
Final Saturation (%)	91
Final Vertical Reading (in.)	0.2731
Specific Gravity (assumed)	2.70
Water Density (pcf)	62.43



Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma- tion (%)
0.10	0.2965	0.9998	0.00	0.03	0.528	0.03
0.25	0.2951	0.9984	0.02	0.17	0.526	0.15
0.50	0.2930	0.9962	0.07	0.38	0.523	0.31
0.90	0.2904	0.9937	0.15	0.64	0.521	0.49
0.90	0.2901	0.9934	0.15	0.67	0.520	0.52
2.00	0.2848	0.9881	0.27	1.20	0.514	0.93
4.00	0.2790	0.9823	0.42	1.77	0.508	1.35
8.00	0.2704	0.9736	0.59	2.64	0.497	2.05
16.00	0.2595	0.9628	0.78	3.73	0.483	2.95
8.00	0.2616	0.9649	0.66	3.52	0.485	2.86
4.00	0.2640	0.9673	0.57	3.28	0.487	2.71
1.00	0.2687	0.9720	0.43	2.81	0.492	2.38
0.50	0.2712	0.9745	0.38	2.56	0.495	2.18
0.25	0.2731	0.9764	0.33	2.36	0.497	2.03

Time Readings							
Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)			

Ring



Soil Identification: Olive brown silt with sand (ML)

**ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435** 

Project No.: 17114-01

Esperanza

10-17

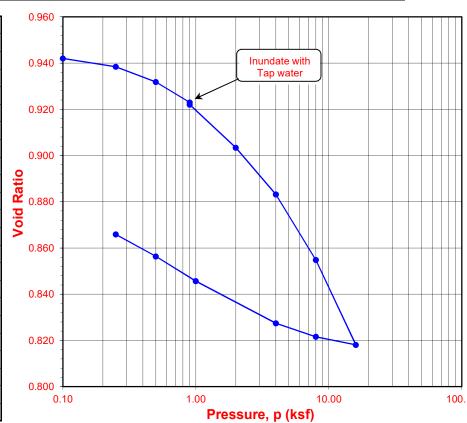
# ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435

Project Name: Esperanza Tested By: G. Bathala Date: 09/21/17

 Project No.:
 17114-01
 Checked By:
 J. Ward
 Date:
 10/11/17

Soil Identification: Olive brown/green silt (ML)

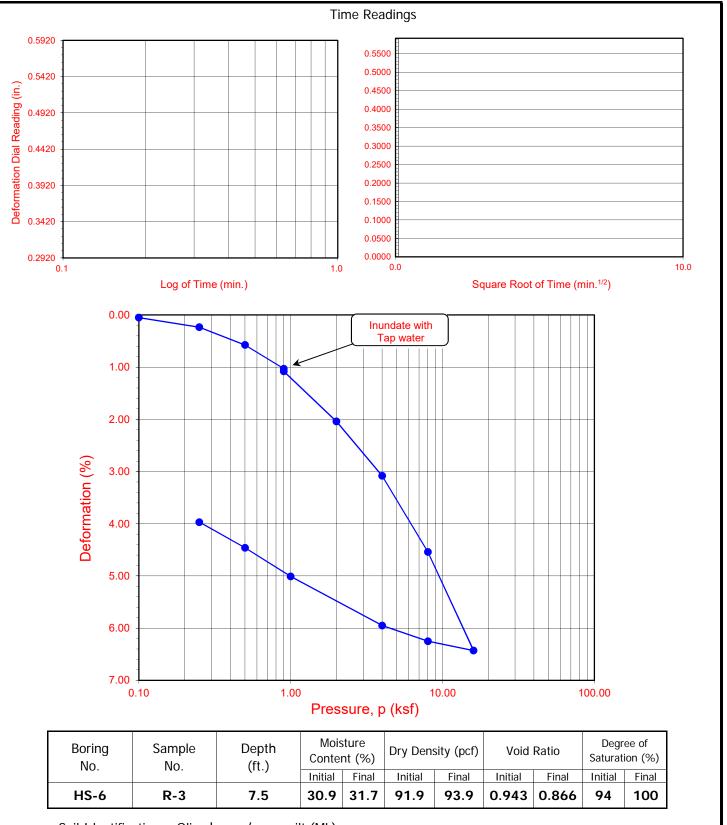
Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	190.79
Weight of Ring (g)	46.20
Height after consol. (in.)	0.9603
Before Test	
Wt.Wet Sample+Cont. (g)	303.92
Wt.of Dry Sample+Cont. (g)	246.88
Weight of Container (g)	62.03
Initial Moisture Content (%)	30.9
Initial Dry Density (pcf)	91.9
Initial Saturation (%)	94
Initial Vertical Reading (in.)	0.3283
After Test	
Wt.of Wet Sample+Cont. (g)	233.97
Wt. of Dry Sample+Cont. (g)	199.65
Weight of Container (g)	45.08
Final Moisture Content (%)	31.67
Final Dry Density (pcf)	93.9
Final Saturation (%)	100
Final Vertical Reading (in.)	0.2853
Specific Gravity (assumed)	2.86
Water Density (pcf)	62.43



Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma- tion (%)
0.10	0.0070	0.0005	0.00	0.05	0.040	0.05
0.10	0.3278	0.9995	0.00	0.05	0.942	0.05
0.25	0.3257	0.9974	0.03	0.27	0.938	0.24
0.50	0.3219	0.9936	0.07	0.64	0.932	0.57
0.90	0.3165	0.9882	0.15	1.18	0.923	1.03
0.90	0.3160	0.9877	0.15	1.23	0.922	1.08
2.00	0.3049	0.9766	0.30	2.34	0.903	2.04
4.00	0.2930	0.9647	0.45	3.53	0.883	3.08
8.00	0.2763	0.9480	0.66	5.20	0.855	4.54
16.00	0.2548	0.9265	0.92	7.35	0.818	6.43
8.00	0.2581	0.9298	0.77	7.02	0.822	6.25
4.00	0.2625	0.9342	0.63	6.58	0.827	5.95
1.00	0.2739	0.9456	0.43	5.44	0.846	5.01
0.50	0.2800	0.9517	0.37	4.83	0.856	4.46
0.25	0.2853	0.9570	0.33	4.30	0.866	3.97

Time Readings							
Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)			

Ring



Soil Identification: Olive brown/green silt (ML)

ONE-DIMENSIONAL CONSOLIDATION
PROPERTIES of SOILS
ASTM D 2435

Project No.: 17114-01

Esperanza

10-17

# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

 Project Name:
 Esperanza
 Tested By:
 G. Bathala
 Date:
 09/21/17

 Project No.:
 17114-01
 Checked By:
 J. Ward
 Date:
 10/11/17

Boring No.: HS-1 Sample Type: Ring Sample No.: R-3 Depth (ft.) 7.5

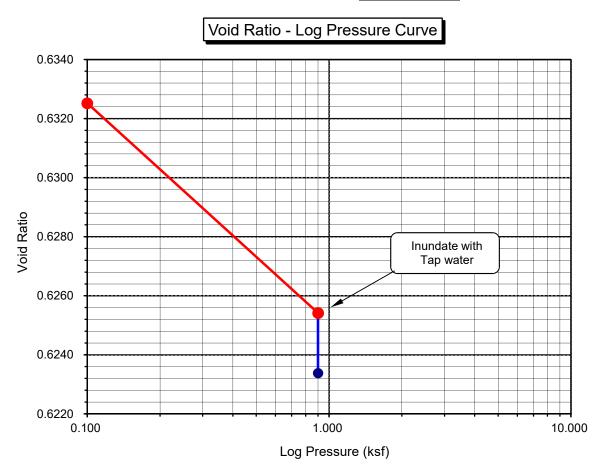
Sample Description: Olive brown and green sand with silt (SP-SM)

Note: Loads were applied incrementally up to the inundation load

Initial Dry Density (pcf):	103.2	Final Dry Density (pcf):	103.8
Initial Moisture (%):	3.99	Final Moisture (%) :	18.2
Initial Length (in.):	1.0000	Initial Void Ratio:	0.6326
Initial Dial Reading:	0.2587	Specific Gravity(assumed):	2.70
Diameter(in):	2.415	Initial Saturation (%)	17.0

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2587	1.0000	0.00	0.00	0.6325	0.00
0.900	0.2521	0.9934	0.22	-0.66	0.6254	-0.44
H2O	0.2509	0.9922	0.22	-0.78	0.6234	-0.56

Percent Swell (+) / Settlement (-) After Inundation = -0.13



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name: Esperanza Tested By: G. Bathala Date: 09/21/17
Project No.: 17114-01 Checked By: J. Ward Date: 10/11/17

Boring No.: HS-3 Sample Type: Ring Depth (ft.) 7.5

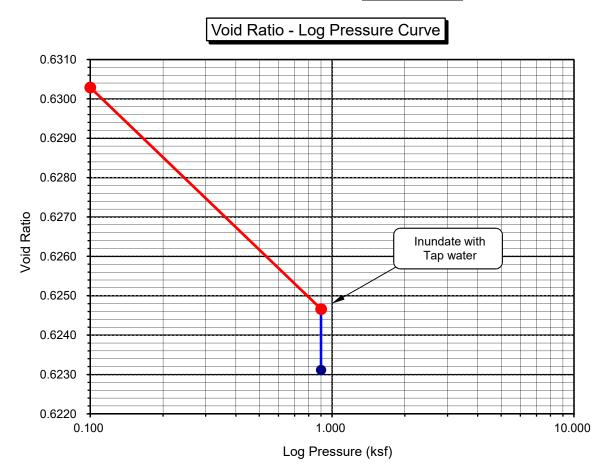
Sample Description: Gray/brown poorly-graded sand (SP)

Note: Loads were applied incrementally up to the inundation load

Initial Dry Density (pcf):	103.4	Final Dry Density (pcf):	103.9
Initial Moisture (%):	3.34	Final Moisture (%) :	20.3
Initial Length (in.):	1.0000	Initial Void Ratio:	0.6308
Initial Dial Reading:	0.2785	Specific Gravity(assumed):	2.70
Diameter(in):	2.415	Initial Saturation (%)	14.3

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2782	0.9997	0.00	-0.03	0.6303	-0.03
0.900	0.2727	0.9942	0.21	-0.59	0.6247	-0.38
H2O	0.2717	0.9932	0.21	-0.68	0.6231	-0.47

Percent Swell (+) / Settlement (-) After Inundation = -0.10



# ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name:EsperanzaTested By:G. BathalaDate:09/21/17Project No.:17114-01Checked By:J. WardDate:10/11/17

Boring No.: HS-10 Sample Type: Ring Sample No.: R-3 Depth (ft.) 7.5

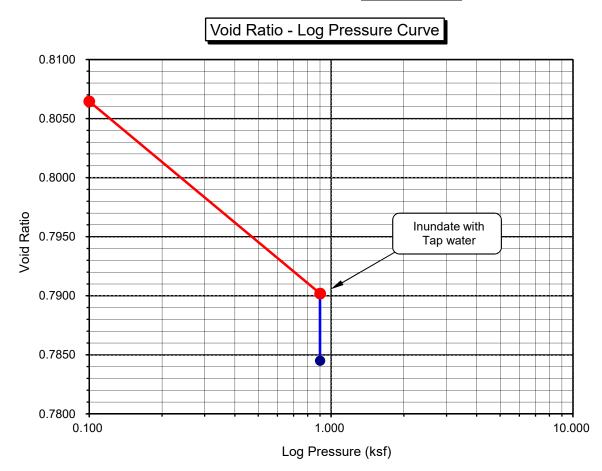
Sample Description: Brown/gray silty sand (SM)

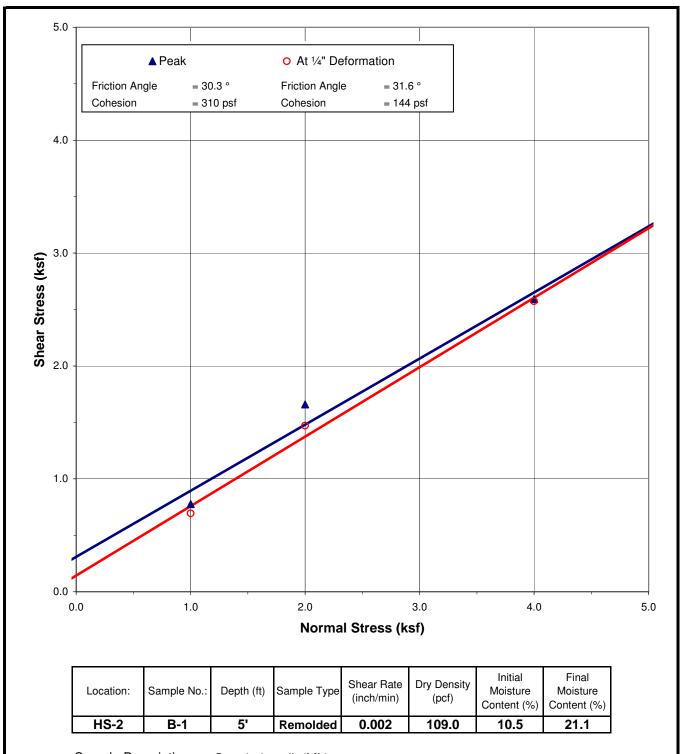
Note: Loads were applied incrementally up to the inundation load

Initial Dry Density (pcf):	93.3	Final Dry Density (pcf):	94.5
Initial Moisture (%):	6.04	Final Moisture (%) :	26.8
Initial Length (in.):	1.0000	Initial Void Ratio:	0.8066
Initial Dial Reading:	0.3008	Specific Gravity(assumed):	2.70
Diameter(in):	2.415	Initial Saturation (%)	20.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3007	0.9999	0.00	-0.01	0.8065	-0.01
0.900	0.2891	0.9883	0.26	-1.17	0.7902	-0.91
H2O	0.2860	0.9852	0.26	-1.49	0.7845	-1.23

Percent Swell (+) / Settlement (-) After Inundation = -0.32





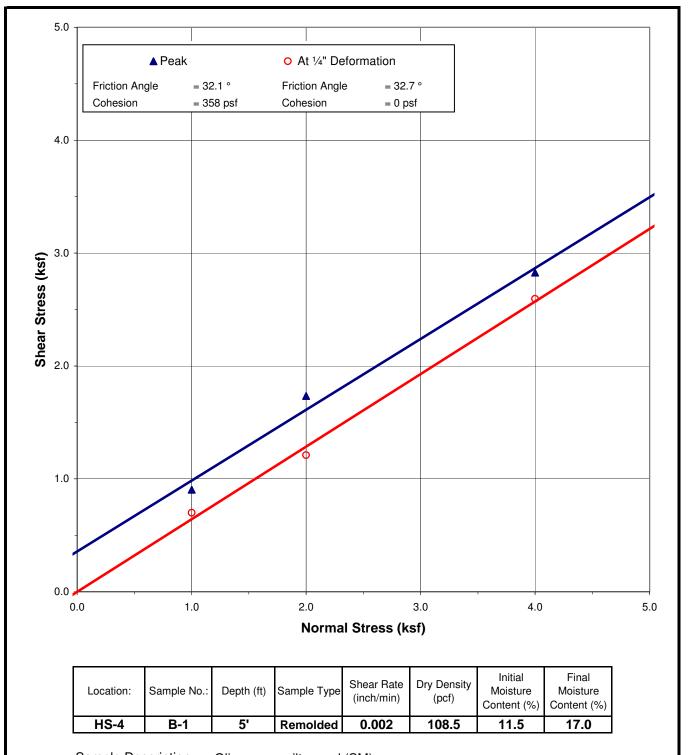
Sample Description: Gray beige silt (ML)



**DIRECT SHEAR PLOT** 

Project Number: 17114-01

Date: Sep-17



Sample Description: Olive green silty sand (SM)



**DIRECT SHEAR PLOT** 

Project Number: 17114-01

Date: Sep-17

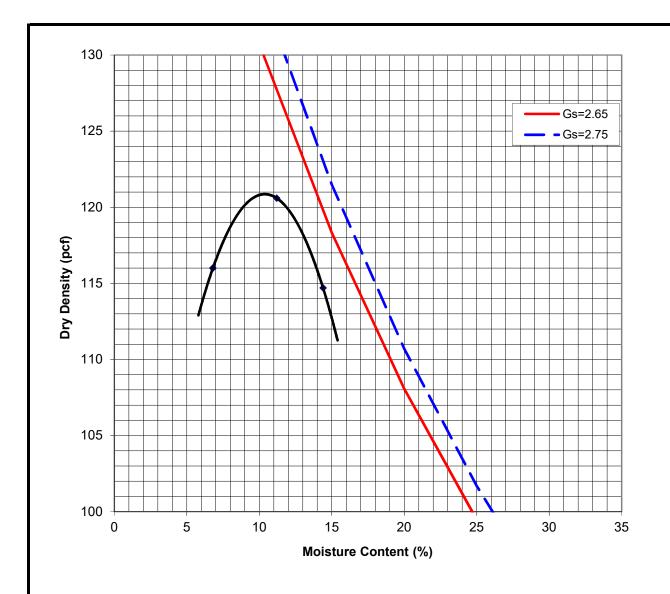
Location	Sample No.	Depth (ft)	Molding Moisture Content (%)	Initial Dry Density (pcf)	Final Moisture Content (%)	Expansion Index	Expansion Classification <sup>1</sup>
HS-2	B-1	0-5'	11.4	111.3	23.3	15	Very Low
HS-4	B-1	0-5'	10.5	114.4	15.8	14	Very Low
HS-10	B-1	0-5'	7.0	118.4	12.6	6	Very Low



**EXPANSION INDEX** (ASTM D 4829)

 Project Number:
 17114-01

 Date:
 Sep-17

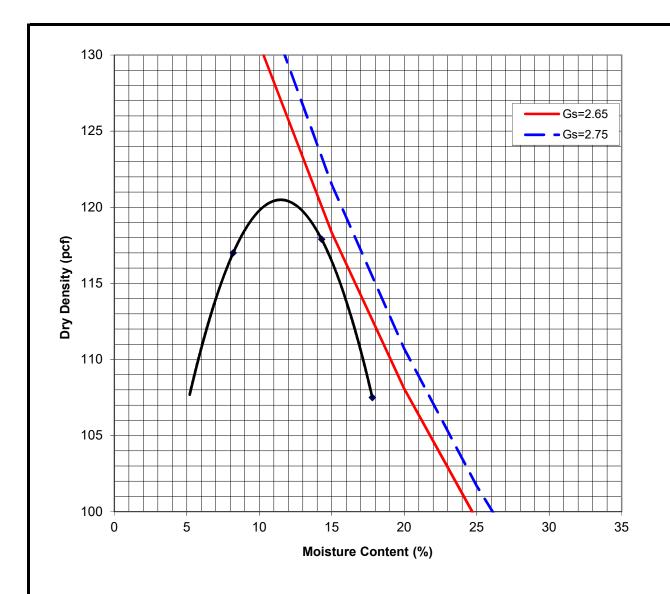


Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-2	B-1	0-5'	Gray beige sandy silt	121.0	10.5



LABORATORY COMPACTION (ASTM D 1557) Project Number: 17114-01

Date: Sep-17

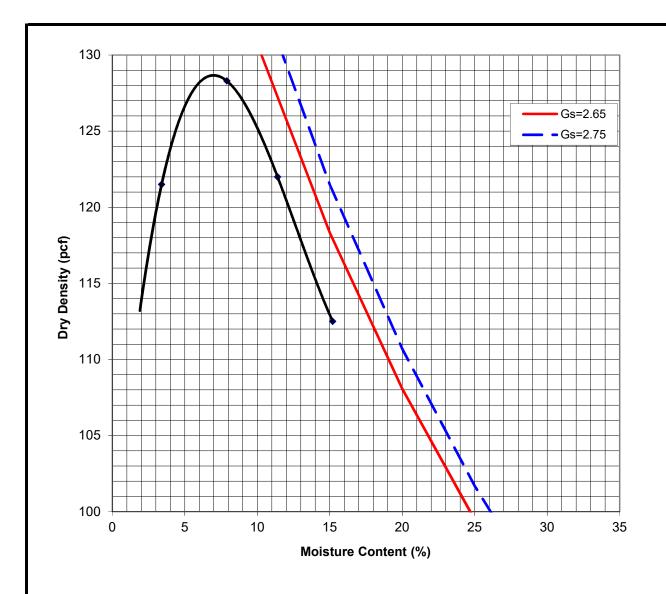


Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-4	B-1	0-5'	Olive green/brown silty sand	120.5	11.5



LABORATORY COMPACTION (ASTM D 1557) Project Number: 17114-01

Date: Sep-17



Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-10	B-1	0-5'	Olive brown silty sand	129.0	7.0



LABORATORY COMPACTION (ASTM D 1557) Project Number: 17114-01

Date: Sep-17

# **R-VALUE TEST RESULTS**

DOT CA Test 301

PROJECT NAME: Esperanza PROJECT NUMBER: 17114-01

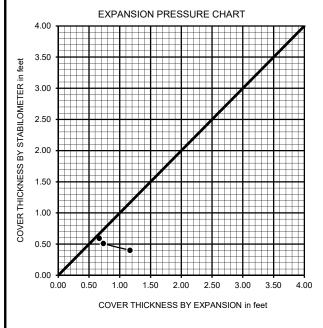
 BORING NUMBER:
 HS-7
 DEPTH (FT.):
 0-5

 SAMPLE NUMBER:
 B-1
 TECHNICIAN:
 S. Felter

SAMPLE DESCRIPTION: Yellowish brown silty sand (SM) DATE COMPLETED: 9/25/2017

	-		
TEST SPECIMEN	а	b	С
MOISTURE AT COMPACTION %	10.7	11.1	12.0
HEIGHT OF SAMPLE, Inches	2.58	2.49	2.49
DRY DENSITY, pcf	121.9	121.2	121.6
COMPACTOR PRESSURE, psi	350	350	300
EXUDATION PRESSURE, psi	499	295	170
EXPANSION, Inches x 10exp-4	35	22	20
STABILITY Ph 2,000 lbs (160 psi)	24	30	34
TURNS DISPLACEMENT	5.01	5.04	5.44
R-VALUE UNCORRECTED	74	68	63
R-VALUE CORRECTED	75	68	63

DESIGN CALCULATION DATA	а	b	С
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.40	0.51	0.59
EXPANSION PRESSURE THICKNESS, ft.	1.17	0.73	0.67



EXUDATION PRESSURE (psi)

R-VALUE BY EXPANSION: R-VALUE BY EXUDATION: EQUILIBRIUM R-VALUE:

61
68
61

# TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: Esperanza Tested By: G. Berdy Date: 09/21/17

Project No.: 17114-01 Data Input By: G. Bathala Date: 10/11/17

Boring No.	HS-2	HS-4	HS-10	
Sample No.	B-1	B-1	B-1	
Sample Depth (ft)	0-5	0-5	0-5	
Soil Identification:	Gray/beige ML	Olive green SM	Olive brown SM	
Wet Weight of Soil + Container (g)	199.19	200.64	212.80	
Dry Weight of Soil + Container (g)	190.63	191.23	206.82	
Weight of Container (g)	59.94	66.79	54.33	
Moisture Content (%)	6.55	7.56	3.92	
Weight of Soaked Soil (g)	100.09	100.73	100.16	

# SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	200A	94	15	
Crucible No.	26	10	5	
Furnace Temperature (°C)	860	860	860	
Time In / Time Out	8:15/9:00	8:15/9:00	8:15/9:00	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	20.9381	22.3561	22.2090	
Wt. of Crucible (g)	20.9352	22.3540	22.2068	
Wt. of Residue (g) (A)	0.0029	0.0021	0.0022	
PPM of Sulfate (A) x 41150	119.34	86.42	90.53	
PPM of Sulfate, Dry Weight Basis	128	93	94	

## CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15	15	
ml of AgNO3 Soln. Used in Titration (C)	0.3	0.4	0.5	
PPM of Chloride (C -0.2) * 100 * 30 / B	20	40	60	
PPM of Chloride, Dry Wt. Basis	21	43	62	

## pH TEST, DOT California Test 643

pH Value	7.66	6.98	7.77	
Temperature °C	20.1	20.1	20.1	

# SOIL RESISTIVITY TEST DOT CA TEST 643

Project Name:	Esperanza	Tested By:	G. Berdy	Date:	09/21/17
Project No.:	17114-01	Data Input By:	G. Bathala	Date:	10/11/17
Boring No.:	HS-2	Depth (ft.):	0-5		

Sample No. : B-1

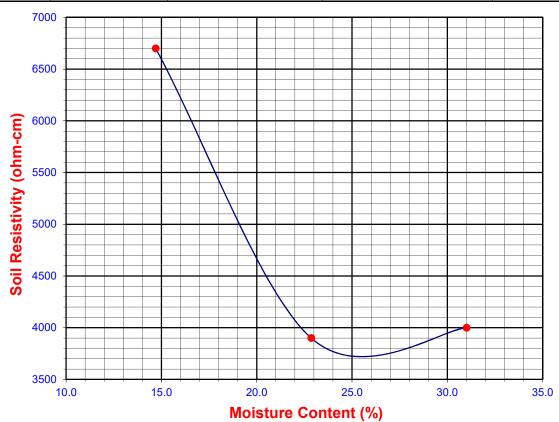
Soil Identification:\* Green/beige ML

\*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	14.70	6700	6700
2	20	22.86	3900	3900
3	30	31.01	4000	4000
4				
5				

6.55				
199.19				
190.63				
59.94				
130.67				
1.000				
MC = (((1+Mci/100)x(Wa/Wt+1))-1)x100				

Min. Resistivity	Moisture Content	Sulfate Content	Chloride Content	So	il pH
(ohm-cm)	(%)	(ppm)	(ppm)	рН	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA	Test 643
3700	25.5	128	21	7.66 20.1	



# SOIL RESISTIVITY TEST DOT CA TEST 643

Project Name:	Esperanza	Tested By:	G. Berdy	Date:	09/21/17
Project No. :	17114-01	Data Input By:	G. Bathala	Date:	10/11/17
Borina No.:	HS-4	Depth (ft.):	0-5		

Sample No.: B-1

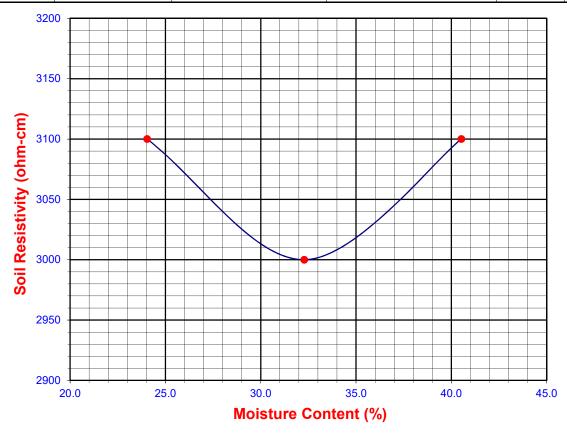
Soil Identification:\* Olive green SM

\*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

	,	•		
Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	24.04	3100	3100
2	30	32.28	3000	3000
3	40	40.52	3100	3100
4				
5				

1				
7.56				
200.64				
191.23				
66.79				
130.54				
1.000				
MC = (((1+Mci/100)x(Wa/Wt+1))-1)x100				

3000	32.3	93	43	6.98	20.1	
DOT CA	Test 643	DOT CA Test 417 Part II DOT CA Test 422		DOT CA Test 643		
(ohm-cm)	(%)	(ppm)	(ppm)	рН	Temp. (°C)	
Min. Resistivity	Moisture Content	Sulfate Content	Chloride Content	Soil pH		



# SOIL RESISTIVITY TEST DOT CA TEST 643

Project Name:	Esperanza	Tested By:	G. Berdy	Date:	09/21/17
Project No. :	17114-01	Data Input By:	G. Bathala	Date:	10/11/17

Boring No.: HS-10 Depth (ft.) : 0-5

Sample No. : B-1

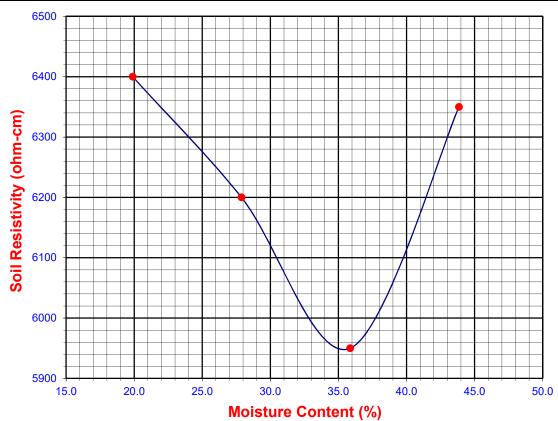
Soil Identification:\* Olive brown SM

\*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)	
1	1 20		6400	6400	
2	30	27.88	6200	6200	
3	40	35.87	5950	5950	
4	50	43.85	6350	6350	
5					

Moisture Content (%) (MCi)	3.92
Wet Wt. of Soil + Cont. (g)	212.80
Dry Wt. of Soil + Cont. (g)	206.82
Wt. of Container (g)	54.33
Container No.	
Initial Soil Wt. (g) (Wt)	130.13
Box Constant	1.000
MC = (((1+Mci/100)x(Wa/Wt+1))	))-1)x100

Min. Resistivity	Moisture Content	Sulfate Content	Chloride Content	Soil pH		
(ohm-cm)	(%)	(ppm)	(ppm)	рН	Temp. (°C)	
DOT CA Test 643		DOT CA Test 417 Part II DOT CA Test 422		DOT CA Test 643		
5950	35.5	94	62	7.77	20.1	



TP-1 (1.0')*		TP-2	(0.8')*	TP-3	(0.0')*	TP-4 (1.0')*		
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.8'	30.2	0.6'	8.8	0.6'	2.1	0.8'	9.8	
1.5'	1.3	1.3'	1.7	1.3'	1.3	1.8'	1.3	
2.5'	0.9	2.5'	1.1	2.0'	1.3	2.5'	1.0	
TP-5 (0.8')*			(0.8')*		(1.8')*	TP-8 (0.0')*		
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.5'	8.9	0.4'	13.6	1.5'	8.0	0.4'	5.0	
1.3'	1.3	1.3'	1.7	2.0'	3.0	2.0'	3.0	
2.8'	1.3	2.0'	1.2	2.5'	0.9	3.0'	1.2	
	(0.0')*	TP-10	(0.0')*		(0.0')*	TP-12	(2.5')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.5'	3.0	0.6'	3.0	0.4'	2.9	1.0'	15.5	
1.2'	1.5	1.5'	1.2	1.3'	1.8	1.8'	9.4	
2.5'	1.3	2.0'	0.8	2.0'	1.8	2.8'	1.3	
TP-13	(1.5')*	TP-14	(2.2')*	T-1	(1.0')*	T-2	(0.8')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.8'	10.7	1.0'	11.9	0.8'	10.3	0.5'	12.0	
1.5'	4.5	2.2'	3.5	2.2'	0.8	1.5'	1.6	
2.2'	1.4	3.0'	1.8	3.0'	1.7	2.2'	1.3	
	(1.0')*		(0.8')*		(1.0')*		(0.6')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.8'	7.4	0.5'	8.7	0.5'	13.1	0.5'	15.0	
1.5'	1.4	1.5'	1.4	1.5'	1.4	1.5'	1.8	
2.2'	1.3	2.3'	1.3	2.3'	1.4	2.3'	1.5	
	(1.2')*		(1.2')*		(0.8')*		(1.0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
1.0'	38.6	1.0'	17.4	0.6'	7.2	0.8'	6.5	
1.5'	1.8	1.5'	1.7	1.2'	1.4	1.5'	1.0	
2.5'	1.7	2.2'	1.6	2.0'	1.3	2.5'	1.1	
	(1.0')*		(1.0')*		(0.6')*		(0.6')*	
Depth (ft) 0.8'	% Organics 55.5	Depth (ft) 0.8'	% Organics 62.9	Depth (ft) 0.4'	% Organics 20.4	Depth (ft) 0.4'	% Organics 6.6	
2.0'	1.4	1.5'	1.4	1.2'	1.2	1.2'	1.4	
2.8'	1.3	2.2'	1.6	2.0'	1.0	2.5'	1.1	
	(1.8')*		(1.8')*		(0.8')*		(0.3')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.4'	12.6	0.8'	12.6	0.5'	5.2	0.2'	20.8	
1.6'	7.7	1.8'	5.0	1.2'	2.8	1.0'	0.7	
2.2'	1.6	2.3'	1.5	1.8'	1.6	1.5'	0.8	
T-19	(1.8')*	T-20 (1.3')*		T-21	(1.0')*	T-22	(1.0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.4'	6.1	0.5'	6.3	0.5'	6.3	0.5'	6.6	
1.8'	3.1	1.3'	4.4	1.0'	4.6	1.2'	1.0	
2.2'	1.3	2.3'	1.0	1.6'	0.8	1.8'	1.2	
	(0.0')*		(1.0')*		(1.8')*		(1.6')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.8'	4.3	0.8'	5.8	1.0'	17.4	0.8'	14.1	
1.5'	3.2	1.6'	3.0	2.0'	4.6	1.8'	5.0	
2.6'	1.4	2.3'	1.2	2.8'	1.3	2.6'	1.2	
	(2.6')*		(1.2')*		(1.4')*		(1.6')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	
0.8'	16.0	0.8'	8.8	0.8'	12.2	0.8'	8.4	
1.6'	10.9	1.4'	2.5	1.4'	4.7	1.8'	4.2	
2.8'	1.7	2.2'	0.8	2.2'	1.4	2.4'	1.6	
	(1.3')*		(1.5')*	Legend				
	_				Possesses and de	for Offician Dawn		
Depth (ft)	% Organics	Depth (ft)	% Organics					
1.0'	13.4	1.0'	18.6	2 to 5%	Recommended "Clean" Soils	ior Mix/Blend w/	Clean" Soils	
1.5'	4.4	1.8'	3.3	< 2%	l	d Ouesair D	I Danah in E	
2.0'	2.8	2.2'	2.1		tes Recommende		•	
	20	Tabl		Project Name	-	Richland - Esperanza & Pietersma		
	56	•	f Measured	Project Number		17114-01 & 17115-01		
Gente	chnical, Inc.	_	nt vs Depth of	ENG./GEOL.		RLD/KTM		
- Deduc	an moon, mor	Sam	nple	Date		Feb-18		

Geotechnical Boring Log Borehole HS-1											
	9/11							Drilling Company: Cal Pac Drilling			
			Espera			sma		Type of Rig: CME 61			
			er: 171					Drop: 30" Hole Diameter: 6"			
Elevation of Top of Hole: ~722' MSL								Drive Weight: 140 pounds			
Hole Location: See Geotechnical Map				chnical	Мар	ı	Page 1	of 1			
			l ë l		cf)			Logged By LJH			
			[ 윤		g)		log	Sampled By LJH	ا پر ا		
E)	$\overline{}$	Š		l ur	sity	%)	/m/	Checked By RLD	<u> </u>		
l ig	<u>#</u>	<u>.ප</u>	<u>a</u>	Count	ens	ıre	S		ا ب ا		
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test		
≝	De	ű	Sa	음	Dn	Mo	- NS	DESCRIPTION	<u>\</u>		
	0							@ 0' to TD - Quaternary Young Eolian Deposits			
720-	_	<b>│</b>						(Qye):			
120	-	B-(	R-1	7 6 8	111.0	8.5	SM	@ 2.5' Silty SAND: olive green/brown, slightly moist, medium dense			
	5 — -		R-2	6 10 13	104.0	4.5	SP-SM	@ 5.0' SAND with Silt: olive green/brown, dry, medium dense			
715-	-							0.7 5LOAND '(LOY, I'			
	-		R-3	7 9 10	105.5	4.0		@ 7.5' SAND with Silt: olive green/brown, dry, medium dense	CO -#200		
	10 <del></del>		R-4	3 5 10	108.7	16.6	SM	@ 10' Silty SAND: olive green/brown, very moist, medium dense			
710-	- - -		  -  -								
705-	15 — - -		SPT-1	7 4 5 7		13.7		@ 15' Silty SAND: olive green/brown, moist, medium dense; fine sand			
	20 —		R-5	4 6 11	105.9	18.3	ML	@ 20' Sandy SILT: olive green/brown, very moist, stiff			
700-	- - 25 —		  -    SPT-2	8 7		2.9		@ 25' Sandy SILT, olive green/brown, dry, stiff			
695-	-			6		2.9					
	30 —		  -  -					Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/11/2017			
	THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA  TEST SAMPLE  SAMPLE TYPES:  B BULK SAMPLE DS DIRECT SHEAR R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY SAMPLE SA SIEVE AND HYDROMETER TEST SAMPLE EI EXPANSION INDEX										



WITH THE PASSAGE OF TIME. THE DATA
PRESENTED IS A SIMPLIFICATION OF THE ACTUAL
CONDITIONS ENCOUNTERED. THE DESCRIPTIONS
PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS
AND ARE NOT BASED ON QUANTITATIVE
ENGINEERING ANALYSIS.

TEST SAMPLE

S&H EI CN CR AL CO RV #200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-2  Date: 9/11/2017 Drilling Company: Cal Pac Drilling												
								Drilling Company: Cal Pac Drilling					
			Esper			sma		Type of Rig: CME 61					
			er: 171					Drop: 30" Hole Diameter:	6"				
			op of F					Drive Weight: 140 pounds					
Hole	Loca	tion	See C	eote	chnica	Мар		Page 1	of 1				
			_		Œ.			Logged By LJH					
			Sample Number		Dry Density (pcf)	_	<del>-</del>	Sampled By LJH					
∄		go		=		%	<del>일</del>	Checked By RLD	est				
l o	(#)	;		Count	nsi	<u>9</u>	Sy		<del> </del>				
Elevation (ft)	Depth (ft)	Graphic Log	출	0		Moisture (%)	USCS Symbol		Type of Test				
<u>ĕ</u>	ер	la	an	Blow	≥	100	SC		ŏ				
Ш		ω	S	<u> </u>		2		DESCRIPTION	· .				
	0 _							@ 0' to TD - Quaternary Young Eolian Deposits (Qye):	DS MD EI				
705-	-	B-1	R-1	16 26 30	99.1	3.4	ML	@ 2.5' Sandy SILT: gray/light brown, dry, hard; rootlets	CR RV -#200				
	5 — -		R-2	8 13 18	106.1	1.8		@ 5.0' Sandy SILT: gray/light brown, dry, very stiff; few fine gravel					
700-	- -		R-3	5 8 9	97.8	3.3	SM	@ 7.5' Silty SAND: light brown-brown, dry, medium dense; rootlets					
	10 <del></del>		R-4	6 6 10	99.4	7.6		@ 10' Silty SAND: olive green/brown, slightly moist, medium dense					
695-	_												
	15 — -		R-5	6 10 16	108.4	11.1	ML	@ 15' Sandy SILT: brown with a bit of olive green/grey, moist, very stiff					
690-	-		-										
	20 —		SPT-1	6 9 15		19.5		@ 20' Sandy SILT: olive green/brown, very moist, very stiff					
685-	-												
	25 — -		R-6	10 14 22	98.4	11.2	SM	@ 25' Silty SAND: olive green/grey with small pockets of red/orange, moist, medium dense					
680-	30 —							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/11/2017					
					OF T SUBS LOCA	HIS BORING SURFACE C ATIONS ANI	G AND AT TH CONDITIONS D MAY CHAN	NLY AT THE LOCATION	OMETER				



SAME	PLE TYPES:	Т
В	BULK SAMPLE	С
R	RING SAMPLE (CA Modified Sampler)	Ν
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Е
		C

GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE S&H EI CN CR AL CO RV #200

	Geotechnical Boring Log Borehole HS-3												
Date:	9/11/	201						Drilling Company: Cal Pac Drilling					
			Esper			ma		Type of Rig: CME 61					
			er: 171					Drop: 30" Hole Diameter:	6"				
			op of H					Drive Weight: 140 pounds					
Hole	Locat	ion	: See (	Seote	chnical	Мар		Page 1	of 1				
			5		cf)			Logged By LJH					
		_	å		od)	(	00	Sampled By LJH	ا با				
Elevation (ft)		Graphic Log	Sample Number	nt	Dry Density (pcf)	Moisture (%)	m	Checked By RLD	_es				
	(ft.)	<u> </u>	<u>e</u>	So	ens	ıre	S		of 1				
vaf	Depth (ft)	hde	d	Blow Count	, D	istı	CS		) e				
	De	Gra	Sal	   B	Dry	Mo	USCS Symbol	DESCRIPTION	Type of Test				
	0							@ 0' to TD - Quaternary Young Eolian Deposits					
725-				-				(Qye):					
123	_	B-1	R-1	3 4 5	110.5	12.8	SM	@ 2.5' Silty SAND: medium brown/olive green, very					
	_			5				moist, loose; scattered fine gravel					
	5 —	Ш	R-2	4	108.3	3.6	SP-SM	@ 5.0' Silty SAND: brown with mottled gray, dry,					
	_			4 7 13	100.5	0.0		medium dense; some fine gravel					
720-	_		R-3	- 6		2.0	SP	   @ 7.5' SAND: gray/brown, dry, medium dense	co				
	_		11-5	6 9 14	106.1	3.3	35	W 7.5 SAND. gray/brown, dry, mediam dense	-#200				
	10 —					0.0	CD CM	@ 401 CAND with Cilt. has one day and divine demand					
	_		R-4	6 7 7	107.4	3.2	SP-SM	@ 10' SAND with Silt: brown, dry, medium dense; scattered fine gravel					
715-	_			-				graver					
	_			-									
	=			-									
	15 —		SPT-1	2 2 3		23.3	SM	@ 15' Sandy SILT: olive brown/green, very moist, loose;					
710	_			<u>^</u> 5				scattered fine gravel					
710-				_									
	_			-									
	20 —		R-5	17	130.0	2.5	SP	@ 20' SAND with Gravel: olive green/brown, dry,					
	_			17 17 17	100.0	2.0	0,	medium dense; coarse gravel					
705-	_			-									
	-			-									
	25			-									
	25 —		SPT-2	8 16		3.4	SM	@ 25' Silty SAND: brown, green, black mottled, dry,					
700-				16 18 -				dense; scattered gravel					
	_			-				Total Depth = 25' Groundwater Not Encountered					
	_			-				Backfilled with Cuttings on 9/11/2017					
	30 —			-									
								LLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR					
	$\geq$	1	2		SUBS LOCA	SURFACE O	CONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	OMETER				



TEST SAMPLE

S&H EI CN CR AL CO RV #200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-4													
Date:	9/11	/201	7					Drilling Company: Cal Pac Drilling						
			Esper			sma		Type of Rig: CME 61						
			er: 171					Drop: 30" Hole Diameter:	6"					
			op of F					Drive Weight: 140 pounds						
Hole	Loca	tion	See C	<u>Seote</u>	chnica	Мар		Page 1	of 1					
					Ę.			Logged By LJH						
			aqr		මු		0	Sampled By LJH						
(H)		6-		<u> </u>	<u> <u>\$</u></u>	8	l dm	Checked By RLD	esi					
Elevation (ft)	( <del>II</del> )	Graphic Log	Sample Number	Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	·	Type of Test					
/ati	Depth (ft)	hd	힡	~	<u> </u>	stu	SS		e l					
	Эер	ia Jia	San	Blow	) Jy	Joi	  S(	DESCRIPTION	& <b> </b>					
			0)	₩	<u> </u>			DESCRIPTION						
720-	0 _	.						@ 0' to TD - Quaternary Young Eolian Deposits	DS					
	_	H-H	l					(Qye):	MD					
	-	ŀ "III	R-1	5 4 7	124.7	3.3	SM	@ 2.5' Silty SAND: olive green/brown, dry, loose	EI CR					
	_		•	′					-#200					
	5 —		R-2	5 7 9	92.3	6.7		@ 5.0' Silty SAND: olive green/brown, slightly moist,						
715-	_			9				medium dense						
	_		R-3	5	109.9	17.2	ML	@ 7.5' SILT with Sand: olive brown, very moist, very	CN					
	_			5 9 13	100.0			stiff	ÄL					
	10 —			10	00.7	0.4	0.14	0 401 011 - 0 A A ID - 11 11 - 1						
710-	-		R-4	10 13 10	99.7	8.4	SM	@ 10' Silty SAND: olive green/brown, slightly moist, medium dense						
	_			. 10				This diam dense						
	_													
	_													
	15 —		R-5	4	116.8	15.0	SM-ML	@ 15' Silty SAND to Sandy SILT: olive green/brown,						
705-	_			4 8 14	11010			very moist, medium dense to very stiff; scattered fine						
	_							gravel						
	-													
	-													
700	20 —	1	SPT-1	11 21 21		3.6	SM	@ 20' Silty SAND with Gravel: gray, dry, dense						
700-				21										
	_													
	_													
	25 —		R-6											
695	_		K-0	5 14 25	108.2	11.3		@ 25' Silty SAND: olive green/brown, very moist, dense						
	_			25				T. 1.15. 11. 051						
	_							Total Depth = 25' Groundwater Not Encountered						
	_							Backfilled with Cuttings on 9/11/2017						
	30 —		-											
				•				LLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR						
	>		2		SUBS	SURFACE (	CONDITIONS	MAY DIFFER AT OTHER RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT GF AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS						
					WITH		SAGE OF TIME	SPT STANDARD PENETRATION S&H SIEVE AND HYDRO						



SAMI	PLE TYPES:	т
В	BULK SAMPLE	D
R	RING SAMPLE (CA Modified Sampler)	Ν
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Ε
		С
	B R G	R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION

EI CN CR AL CO RV #200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-5												
Date:	Date: 9/12/2017Drilling Company: Cal Pac DrillingProject Name: Esperanza/PietersmaType of Rig: CME 61												
						sma		Type of Rig: CME 61					
			er: 171					Drop: 30" Hole Diameter:	6"				
			op of F					Drive Weight: 140 pounds					
Hole	Loca	tion:	See C	<u> eote</u>	<u>chnica</u>	l Map		Page 1	of 2				
			5		<del> </del>			Logged By LJH					
		_	흩		<u>@</u>		loc	Sampled By LJH	ا ــ ا				
(H)		6	<u> </u>	⊒	<u> </u>	%)	mk	Checked By RLD	es				
<u>6</u>	( <del> </del>	<u>  2</u>	<del> </del>	Count	Sus	re	Sy		<u>F</u>				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number		Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test				
<u>ê</u>	Эек	G.	Sar	Blow		Лоi	)S(	DESCRIPTION	≧				
			0)	"	┞			DESCRIPTION					
	0 _	.						@ 0' to TD - Quaternary Young Eolian Deposits					
725-	_	B-1	l E					(Qye):					
	-	- "	R-1	11 14 20	111.6	3.0	SM	@ 2.5' Silty SAND with Gravel: light brown/gray, dry, medium dense					
	-	·		20				mediam dense					
	5 —	┧	R-2	11 14 18	109.3	2.6		@ 5.0' Silty SAND with Gravel: light brown/gray, dry,					
	-	-		18				medium dense					
720-	_	1	R-3	·   ■ 7	107.6	4.9	SP	@ 7.5' SAND with Gravel: light brown/gray, slightly					
	_	1	115	7 10 12	107.0	7.5	01	moist, medium dense					
	10 —	]											
	10		R-4	10 17 26	109.9	4.6	SM	@ 10' Silty SAND with Gravel: light brown/gray, slightly					
715-	_			26				moist, dense					
'   3	_												
	_												
	15 —		  SPT-1			40.5	N 41	@ 15! Sandy SILT: alive brown, year, majet, year, etiff					
	_		SF1-1	4 6 7		18.5	ML	@ 15' Sandy SILT: olive brown, very moist, very stiff					
710-	_	-											
	_												
	_												
	20 —		R-5	5	112.8	16.1		@ 20' Sandy SILT: olive brown/green, very moist, very					
	-			5 8 14	112.0	10.1		stiff					
705-	_	1											
	_	-											
	_	1											
	25 —	1	SPT-2	11 14 26		3.3	SM	@ 25' Silty SAND: white/light brown/brown, dry, dense					
	_	-		26									
700-	_	†		-									
	_	1		-									
	30 – –												
	30 —					OLINA 4 S S S	ADDUSES ST	HAVAT THE LOCATION AND THE					
	>				OF T	HIS BORING	AND AT TH	ALY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  BE TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR  MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y				



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAME	PLE TYPES:	TE
В	BULK SAMPLE	DS
R	RING SAMPLE (CA Modified Sampler)	MI
G	GRAB SAMPLE	SA
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	ΕI
		CI

GROUNDWATER TABLE

ES:
DIRECT SHEAR
MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-5												
Date:	9/12/	/201	7					Drilling Company: Cal Pac Drilling					
					a/Pieters	sma		Type of Rig: CME 61					
			er: 171					Drop: 30" Hole Diameter:	6"				
					~727' [			Drive Weight: 140 pounds					
Hole	Locat	tion:	See	Geot	echnica	Мар		Page 2 c	of 2				
			<u>_</u>		<del>E</del>			Logged By LJH					
		_	l upe		<u>@</u>		00	Sampled By LJH	<b>ا</b> با				
≝	_	8	<u> </u>	Count	<u>.</u>	%)	'n	Checked By RLD	_es				
<u>.</u> 6	(ft)	<u>.</u>	<u>e</u>	荗	- Sue	ILE	S		ր Մ				
vat	oth	l de	dπ	≥	ļŎ	str	CS		) e (				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test				
	30	<u> </u>	R-6				SP	@ 30' Gravelly SAND: brown, moist, very dense; fine to					
	-			35 50/6	113.4	9.3	51	coarse gravel					
695-	_			-									
	-			-									
	-			-									
	35 —		SPT-3	17 37 41		4.3	SM	@ 35' Silty SAND: brown/gray, slightly moist, very					
690-	_	1		41				dense; few fine and coarse gravel					
0907		H		_									
				_									
	40 —		D 7		116.9	16.7	N/I	@ 40! Candy SILT alive breams wet bond					
	_		R-7	9 19 24	110.9	10.7	ML	@ 40' Sandy SILT, olive brown, wet, hard					
685-	_			- 27									
	_			-									
	_			-									
	45 <del></del>		SPT-4	7 10		19.1	CL	@ 45' Silty CLAY: olive brown/green, wet, hard					
	_			10									
680-	_			-									
	-			-									
	-			-									
	50 —		R-8	11 24 33	122.7	12.3	SM	@ 50' Silty SAND: red brown/olive brown,very moist,					
675-		]		33				dense					
0/37				_				Total Depth = 50'					
	_			_				Groundwater Encountered at Approximately 37.5' Backfilled with Cuttings on 9/12/2017					
	55 —			_				Backined with outlings on 5/12/2517					
	-			-									
670-	_			-									
	-			-									
	_			-									
	60 —			-									
								LILY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING, B BULK SAMPLE DS DIRECT SHEAR					
			-		SUBS	SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	′				



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING, SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GROUNDWATER TABLE

 DS
 DIRECT SHEAR

 / MD
 MAXIMUM DENSITY

 SA
 SIEVE ANALYSIS

 S&H
 SIEVE AND HYDROMETER

 EI
 EXPANSION INDEX

 CN
 CONSOLIDATION

 CR
 CORROSION

 AL
 ATTERBERG LIMITS

 CO
 COLLAPSE/SWELL

 RV
 R-VALUE

 #200
 % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-6													
	9/12							Drilling Company: Cal Pac Drilling						
			Espera			sma		Type of Rig: CME 61						
			er: 171					Drop: 30" Hole Diameter:	6"					
			p of H					Drive Weight: 140 pounds						
Hole	Locat	tion:	See G	eote	chnical	Map		Page 1 c	of 2					
			_		<del></del>			Logged By LJH						
		_	pe		<u>a</u>		00	Sampled By LJH	<b>ا</b> ہا					
(ft	_	8	l j	<u>t</u>	<u> </u>	%)	m,	Checked By RLD	_es					
loi	(ff.)	<u>.</u>	<u>e</u>	중	ens	<u>le</u>	S		الح ا					
vat	oth	l de	dι		Ŏ	stı	CS		) e (					
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test					
	0							@ 0' to TD - Quaternary Young Eolian Deposits						
	_							(Qye):						
	_	<del> </del>	R-1	7 8 10	112.6	7.0	ML	@ 2.5' Sandy SILT: brown, slightly moist, stiff, some						
710-	_			10				rootlets						
	5 —	Ш	R-2	5 7 9	109.8	4.7	SM	@ 5.0' Silty SAND: brown, slightly moist, medium dense						
	_			9										
	_		R-3	5	93.6	30.9	ML	@ 7.5' SILT: olive brown/green, wet, stiff	ÇŅ					
705-	_			5 5 6	00.0				ÅL					
	10 —		R-4	5	400.0	44.0		@ 10' Sandy SILT: brown/ red, moist, stiff						
	_		., .	5 5 11	100.2	11.3		ge 10 candy ciet. Brown, 10d, moist, can						
	_		 											
700-	_													
700-	15 —		D =		400.4		CNA	@ 45LCity CAND bearing /alice branch assist lands						
	_		R-5	5 7 4	103.4	8.8	SM	@ 15' Silty SAND: brown/olive brown, moist, loose						
	_		-											
	_		-											
695-	-													
	20 —		SPT-1	5 7		22.5	CL	@ 20' Silty CLAY: olive brown/green, very moist, very						
	_		<u> </u>	9				stiff						
	_		-											
690-	_		-											
	25 —		R-6	7 17 25	112.2	2.2	SM	@ 25' Silty SAND: olive brown/green, red/brown, dry,						
	_			25				dense						
	_													
685-	_		[											
	30 —													
		<u> </u>		1				ILLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	$\neg$					
	2							E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  G GRAP SAMPLE  G GRAP SAMPLE  SA SIEVE ANALYSIS	′					



OF THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING, SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAME	PLE TYPES:	T
В	BULK SAMPLE	Е
R	RING SAMPLE (CA Modified Sampler)	Λ
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Е
		C

GROUNDWATER TABLE

ES:
DIRECT SHEAR
MAXIMUM DENSITY
SIEVE AND HYDROMETER
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CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-6												
Date:	9/12	/201	7					Drilling Company: Cal Pac Drilling					
					Pieters	ma		Type of Rig: CME 61					
			er: 171					Drop: 30" Hole Diameter:	6"				
					~714' N			Drive Weight: 140 pounds					
Hole	Locat	tion:	See (	<u>Geote</u>	chnical	Мар		Page 2 o	of 2				
			<u> </u>		) J			Logged By LJH					
		_	- qu		(bd	(	00	Sampled By LJH	<b>ا</b> ہا				
(ft	_	8,	l I	ırt	ity	%)	m,	Checked By RLD	es				
ion	(Ħ)	<u>.</u>	<u>e</u>	ŏ	sue	ıre	S		ا كى ا				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	istı	USCS Symbol		Type of Test				
	De	Ü	Saı	음	Dry	Moisture (%)	NS	DESCRIPTION	<del> </del>				
	30		SPT-2	26 50/6"		7.2	SM	@ 30' Silty SAND: brown/gray, slightly moist, very					
	_			50/6"			• • • • • • • • • • • • • • • • • • • •	dense					
	_	-	-	-									
	_	1	•	-									
680-	35 —			-									
	აა — _	]	R-7	13 13 22	120.0	10.8	ML	@ 35' Sandy SILT: olive brown/green, moist, very stiff					
	_			22 -									
	_			_									
675-	_		-	-									
	40 —		SPT-3	8 1		20.6	CL	@ 40' Silty CLAY: olive brown/green, very moist, hard					
	_		01 1-3	8 12 15		20.6	CL	40 Silty OLAT. Olive blowing reen, very moist, hard					
	_	-		-									
	-		-	-									
670-	_	-	-	-									
	45 —	1	R-8	6 19 40	119.5	14.1	SM	@ 45' Silty SAND: olive brown/green, very moist, dense					
	_	-		40									
	_	1	-	-									
665-	_	]											
005-	50 —												
	JU _		SPT-4	18 23 27		13.4		@ 50' Silty SAND: red/brown/gray, very moist, very					
	_			27				dense					
	_			-				Total Depth = 50'					
660-	_	-	-	-				Groundwater Not Encountered Backfilled with Cuttings on 9/12/2017					
	55 <del></del>		-	-				Backing with cutaings on of 12/2011					
	_			-									
	_			-									
	-	-		-									
655-	-	1		-									
	60 —		-	-				_					
					OF TI	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  B BULK SAMPLE DS DIRECT SHEAR  MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,				
					LOCA	TIONS AND	MAY CHAN	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO					



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-7													
Date:	9/12	/201	7					Drilling Company: Cal Pac Drilling						
			Esper			sma		Type of Rig: CME 61						
			er: 171					Drop: 30" Hole Diameter:	6"					
			op of F					Drive Weight: 140 pounds						
Hole	Loca	tion:	See C	Seote	chnical	Мар		Page 1	of 1					
			5		£			Logged By LJH						
			Sample Number		Dry Density (pcf)	(	00	Sampled By LJH	<u> </u>					
Elevation (ft)		Graphic Log	5	<u> </u>	<u>.</u>	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test					
on	(ft)	<u>   </u>	<del> </del>	Count	Sus	re	Sy		=					
/ati	Depth (ft)	hd	면		ă	stu	SS		e l					
<u> </u>	Эер	jra	Sar	Blow		Лоі	)S(	DESCRIPTION	&					
Ш			0)	₩			<u> </u>	DESCRIPTION						
	0 -	·						@ 0' to TD - Quaternary Young Eolian Deposits						
715-	_	H-B	R-1	· ■ 21	113.3	2.1	ML	(Qye): ② 2.5' Sandy SILT with Gravel: light brown/light brown,						
	_	1 ∭	111	21 27 30	110.0	۷.۱	IVIL	dry, hard; some rootlets						
	5 —	]		] ,,			014							
	_		R-2	14 15 17	108.8	1.6	SM	@ 5.0' Silty SAND: light brown/gray, dry, medium dense; fine gravel						
710-	_			. 17				derise, fine graver						
	_	-	R-3	4 5 8	100.0	20.5	ML	@ 7.5' Sandy SILT: olive brown/green, very moist, stiff						
	_	-		8										
	10 —	1	R-4	5	95.9	8.3	SM	@ 10' Silty SAND: brown/red, moist, medium dense						
	_	1		5 7 9										
705-	_	1		•										
	_	1		•										
	15 —													
	-		SPT-1	6 4 6		11.9	ML	@ 15' Clayey SILT: brown/olive brown, moist, stiff; few gravel						
700-	_			. 0				graver						
	_													
	_	-												
	20 —		R-5	8	108.6	8.4	SM	@ 20' Silty SAND: olive brown/green, moist, medium						
	_	1		8 13 14	100.0			dense						
695-	_	1												
	_	1												
	-	1												
	25 —		SPT-2	6 9 12				@ 25' Silty SAND: olive brown/green, moist, medium						
690-	_			12				dense						
	_							Total Depth = 25'						
	_	-						Groundwater Not Encountered  Backfilled with Cuttings on 9/12/2017						
	30 —	1												
			<u>.                                    </u>					ILLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:						
	>	1		-	SUBS	SURFACE C	ONDITIONS	IE TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSIT           IGE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS						
								E. THE DATA SPT STANDARD PENETRATION S&H SIEVE AND HYDRO						



SAMI	PLE TYPES:	т
В	BULK SAMPLE	D
R	RING SAMPLE (CA Modified Sampler)	Ν
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Ε
		С

S&H EI CN CR AL CO RV #200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-8									
Date:	9/13	/201						Drilling Company: Cal Pac Drilling		
			Esper			sma		Type of Rig: B61		
			er: 171					Drop: 30" Hole Diameter:	6"	
			op of F					Drive Weight: 140 pounds		
Hole	Loca	tion:	See C	Seote	chnica '	Map		Page 1	of 1	
			5		<del> </del>			Logged By LJH		
			ğ		<u>ä</u>		00	Sampled By LJH	ا با	
<u>#</u>	_	ဝို	j	Count	<u>i</u>	%)	/mk	Checked By RLD	es	
l iöi	$(\mathbf{H})$	<u>.</u>	<u>a</u>	ਨੁ	l sue	ıre	S		<del> </del>	
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	>	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test	
	)el	Sig	Sar	Blow	\ <u>C</u>	Мо	JS	DESCRIPTION	斉	
				+-	_	_			·	
745	_	1		•				@ 0' to TD - Quaternary Young Eolian Deposits (Qye):		
715-	_	] <u></u>	R-1	4	106.1	9.7	SM	@ 2.5' Silty SAND: olive brown, moist, loose; rootlets		
	_	<b>↓ Ⅲ</b>		4 4 6						
	5 —	↓ Ш	R-2	2	102.4	19.7	SM	@ 5.0' Silty SAND: olive brown, very moist, loose		
	-	1	112	2 3 9	102.4	19.7	Sivi	W 3.0 Silty SAND. Olive Brown, Very Moist, loose		
710-	_	1								
	_	1	R-3	3 5 6	94.0	17.5	ML	@ 7.5' Sandy SILT with Gravel: olive brown/green, very moist, stiff; small pockets of FeO2 staining		
	_	1		6				Thoist, Still, Sitial pockets of PeO2 staining		
	10 —	1	R-4	3 5 8	120.4	13.9	SM	@ 10' Silty SAND with Gravel: olive brown/green, very		
705-	_			8				moist, medium dense; fine gravel		
1057	_									
	_									
	15 —		R-5			40.4		@ 15! Silty SAND, alive brown/groon, year, maint		
	_		K-3	4 7 10	107.7	13.1		@ 15' Silty SAND: olive brown/green, very moist, medium dense		
700-	_	-	l							
	_	1								
	_	1								
	20 —	1	SPT-1	3 17 12				@ 20' Silty SAND: olive brown/green, very moist,		
	-	1	⊭	12				dense; some fine gravel		
695-	_	1								
	_									
	25 —									
	20 _		R-6	4 6 10	99.4	24.7	CL	@ 25' Sandy CLAY: olive green, very moist, stiff		
690-	_			. 10				Total Depth = 25'		
	-	-						Total Depth = 25' Groundwater Not Encountered		
	_	-						Backfilled with Cuttings on 9/13/2017		
	30 —	1	-							
				•				NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR		
	>		-	~	SUBS	SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT IGE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS		
					WITH	THE PASS	AGE OF TIM	E. THE DATA  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE  EXPANSION INDEX		



SAME	PLE TYPES:	Т
В	BULK SAMPLE	С
R	RING SAMPLE (CA Modified Sampler)	Ν
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Е
		C

S&H EI CN CR AL CO RV #200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-9										
	9/13							Drilling Company: Cal Pac Drilling			
			Esper			sma		Type of Rig: B61			
			er: 171					Drop: 30" Hole Diameter:	6"		
			op of F					Drive Weight: 140 pounds			
Hole	Loca	tion	See C	Seote	chnical	Мар		Page 1 c	of 2		
					Ę.			Logged By LJH			
			Sample Number		Dry Density (pcf)		<u> </u>	Sampled By LJH	l I		
Elevation (ft)		Graphic Log	<u> </u>	t	<u>.</u> ≥	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test		
l o	(ff)	C	0	Blow Count	SI	ē	Sy	,	<u>+</u>		
/ati	Depth (ft)	phi	[ 현	>	<u> </u>	stu	တ္သ		6 G		
<u> </u>	Эер	) ra	jan	6	<u>\</u>	101	<u>  S(</u>	DECODIDATION	<u>S</u>		
Ш		·	0)	<u> </u>		2	ر	DESCRIPTION			
710-	0 -	-		-				@ 0' to TD - Quaternary Young Eolian Deposits (Qye):			
	_	B-1	R-1	10 13 15	122.6	6.7	SM	@ 2.5' Silty SAND: brown, moist, medium dense; some			
	_	<b>∤ ∭</b>		15				rootlets			
	5 —	Ш	R-2	5	113.3	3.9		@ 5.0' Silty SAND: brown, dry, medium dense			
705-	_	1		5 7 10							
	_		R-3	- ■ 5	100.9	3.6		@ 7.5' Silty SAND: brown, dry, medium dense			
	_			5 8 11							
	10 —		R-4	6 7 11	108.4	16.2	ML	@ 10' SILT: olive brown/green, very moist, stiff; some			
700-	_			11				fine gravel			
	_										
	_		_								
	15 —		SPT-1	7 4				@ 15' Sandy SILT: olive brown/green, moist, stiff			
695-	_			4 4 7				to sainly sizer, silve brown groom, moles, sum			
	_	-		-							
	_										
	20 —		R-5		97.5	25.0		@ 20' SILT: olive brown/green, gray, very moist, stiff			
690-	_		K-3	4 4 8	97.5	25.0		@ 20 SILT. olive brown/green, gray, very moist, still			
	_										
	_										
	25 —	1		-							
685-	25 —		SPT-2	2 2 2 2			CL	@ 25' Silty CLAY: olive green/gray, very moist, medium stiff			
003	_			<u>)</u> 2 -				Sun			
	_										
	_		-								
	30 —	<u> </u>	<u> </u>	-							
								NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING, B BULK SAMPLE DS DIRECT SHEAR			
								MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y		



OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAME	PLE TYPES:	Т
В	BULK SAMPLE	D
R	RING SAMPLE (CA Modified Sampler)	Ν
G	GRAB SAMPLE	S
SPT	STANDARD PENETRATION	S
	TEST SAMPLE	Ε
		С

MD SA S&H EI CN CR AL CO RV #200 GROUNDWATER TABLE

DIRECT SHEAR
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COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-9									
Date:								Drilling Company: Cal Pac Drilling		
					a/Pieters	sma		Type of Rig: B61		
			er: 171					Drop: 30" Hole Diameter:	6"	
					~711' [			Drive Weight: 140 pounds		
Hole	Locat	lion:	See	eo <u>ا</u>	echnica	Мар	1	Page 2 o	of 2	
			Je l		<del>E</del>			Logged By LJH		
			qu		<u>d</u>			Sampled By LJH	ا په ا	
🗒	_	၀ှိ	ı b	- tallo	<u>;</u>   <u>;</u>	8)	<u>E</u>	Checked By RLD	es	
lior	(ft	   <u>:</u>	<u>e</u>	5	eus	<u>l</u> e	S		ot l	
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	}	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test	
	De	Gr	Sa	S S	6	8	l SN	DESCRIPTION	<u>⋝</u>	
	30		R-6			28.1	CL-ML	@ 30' Silty CLAY: olive green/brown, very moist, stiff		
680-	-		( )	4 7 11	94.0	20.1	CL-IVIL	g oo only out to groot watering the sain		
	-			-						
	-			-						
				-						
	35 —		SPT-3	3 5 7				@ 35' Silty CLAY: olive green/brown, very moist, stiff		
675-	_			<u>7</u> 7						
	_			-						
				_						
	40 —									
670-	40 —		R-7	7 14 27	109.6	19.4	SC	@ 40' Clayey SAND: olive brown, very moist, dense		
070				27 -						
	_			_						
	_			_						
	45 —		SPT-4				0.14	@ 45! Silty SAND, alive green/brown, year, maiet		
665-	_		SP 1-4	4 6 9			SM	@ 45' Silty SAND: olive green/brown, very moist, medium dense		
	_			-				modium dense		
	_			-						
	_			-						
	50 —		R-8	6	105.6	24.0	ML			
660-	_			6 12 19		21.9	IVIL	@ 50' Sandy SILT: olive brown/green, very moist, very stiff		
	_			-	<u>'</u>					
	-			-				Total Depth = 50' Groundwater Not Encountered		
	-			-				Backfilled with Cuttings on 9/13/2017		
	55 <del></del>			-						
655-	_			-						
	-			-						
	-			-						
	60			-						
	60 —						(100: := : :			
					OF T	HIS BORIN	G AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  MAXIMUM DENSITY	, I	
	2				LOCA	ATIONS AN		GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS		



STANDARD PENETRATION TEST SAMPLE

SA S&H EI CN CR AL CO RV #200 GROUNDWATER TABLE

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R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-10										
	9/13/		7					Drilling Company: Cal Pac Drilling			
			Esper			sma		Type of Rig: B61			
			er: 171					Drop: 30" Hole Diameter:	6"		
			op of F					Drive Weight: 140 pounds			
Hole	Loca	ion:	See C	eote	chnica T	ı Map	<u> </u>	Page 1	of 1		
			<u>.</u>		<del> </del>			Logged By LJH			
			qu		<u>ĕ</u>		00	Sampled By LJH	ا پر ا		
Elevation (ft)		Graphic Log	Sample Number	<u>t</u>	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test		
l ioi	Depth (ft)	<u>.</u> 2	<u>e</u>	Blow Count	eus	re	Ś		of		
, sa	pth	ap	E	≥		İstı	SS		) e		
	De	Gr	Sal	음	ام	Mo	ns	DESCRIPTION	<del> </del>		
715-	0 _			-				@ 0' to TD - Quaternary Young Eolian Deposits	MD		
	_	F-H		-			0.4	(Qye):	EI		
	_		R-1	4 5 8	113.4	6.3	SM	@ 2.5' Silty SAND: olive brown/brown, slightly moist, medium dense; rootlets	CR -#200		
	5 —		R-2	1	109.0	2.3		@ 5.0' Silty SAND: brown, dry, medium dense			
710-	_		112	4 8 11	109.0	2.3		(a) 3.0 Silty SAND. Blown, dry, medium dense			
	_		R-3	- 5	95.1	6.0		@ 7 5! Silty SAND, brown/gray, alightly maist madium	co		
	_ _		K-3	5 6 9	95.1	6.0		@ 7.5' Silty SAND: brown/gray, slightly moist, medium dense	<del>-</del> #200		
	10 —		R-4	3	105.9	21.0		@ 10' Silty SAND with Gravel: olive green/brown, very			
705-	_			3 5 9				moist, medium dense			
	_			-							
	_										
	15 —		R-5	5	101.4	14.0		@ 15' Silty SAND: olive brown/green, moist, medium			
700-	_			5 5 12				dense			
	_			-							
	_			-							
	20 —		SPT-1	3			ML	@ 20' Clayey SILT: olive brown/green, very moist, stiff			
695-	_			4 4			""	G 20 Cityo, Ci21, Cinc troning.com, Con, moist, Can			
	_										
	_ _			-							
	25 —		R-6	6	96.6	28.4		@ 25' Sandy SII Ti alive groon/brown wat stiff			
690-	_			6 8 10	90.0	20.4		@ 25' Sandy SILT: olive green/brown, wet, stiff			
	_							Total Depth = 25'			
	_			-				Groundwater Not Encountered  Backfilled with Cuttings on 9/13/2017			
	30 —			-				Bushimou with Outtings on 3/10/2017			
								ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES: IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR			
	$\geq$		2		SUB:	SURFACE C ATIONS AND	ONDITIONS  MAY CHAN	MAY DIFFER AT OTHER   R RING SAMPLE (CA Modified Sampler)   MD   MAXIMUM DENSIT			



SAMI	PLE TYPES:	TE
В	BULK SAMPLE	DS
R	RING SAMPLE (CA Modified Sampler)	M
G	GRAB SAMPLE	SA
SPT	STANDARD PENETRATION	S8
	TEST SAMPLE	ΕI
		C

CN CR AL CO RV #200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-11									
Date:	9/13	/201						Drilling Company: Cal Pac Drilling		
			Espera			sma		Type of Rig: B61		
			er: 171					Drop: 30" Hole Diameter:	6"	
			op of F					Drive Weight: 140 pounds		
Hole Location: See Geotechnical Map								Page 1	of 1	
					<del> </del>			Logged By LJH		
			Sample Number		Dry Density (pcf)		00	Sampled By LJH	<u> </u>	
Elevation (ft)		Graphic Log		<u> </u>	<u>.</u>	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test	
l o	( <del>II</del> )	<u>                                   </u>	<del> </del>	Count	Sus	<u>e</u>	Sy		<del> </del>	
/ati	Depth (ft)	hd	ᅙ	~	🋎	stu	SS		e	
	Эер	)ra	) San	Blow		/loi	)S(	DESCRIPTION	&	
			0)	┞ <u>₩</u>			<u> </u>			
710-	0 _	1						@ 0' to TD - Quaternary Young Eolian Deposits (Qye):		
	_	B-1	R-1	9 12 14	116.1	5.6	SM	@ 2.5' Silty SAND: brown-olive brown, slightly moist,		
	_	-		14				medium dense		
705-	5 — -	] <b>"</b>	R-2	6 7 11	109.6	6.8		@ 5.0' Silty SAND: brown/olive brown, slightly moist, medium dense		
100	_			11				mediam dense		
	-		R-3	5 6 10	108.7	9.6	ML	@ 7.5' Sandy SILT: brown/olive brown, moist, stiff; few fine gravel		
	10 —		R-4	5 9 12	102.6	1.9	SM	@ 10' Silty SAND: brown/olive, dry, medium dense		
700-	_			12						
	_									
	- 15 —			_						
695-	-		SPT-1	5 8 10				@ 15' Silty SAND: olive brown/green, slightly moist, medium dense		
	_	_	F							
	_									
	20 —		R-5	9 12 17	108.4	6.7		@ 20' Silty SAND: olive brown/green, slightly moist,		
690-	_			17				medium dense		
	_									
	25 —		-							
685-		-	SPT-2	9 12 13			ML	@ 25' Clayey SILT: olive green/brown, moist, very stiff		
	-	1						Total Depth = 25'		
	_		[					Groundwater Not Encountered Backfilled with Cuttings on 9/13/2017		
	30 —							<b>J</b>		
		<u> </u>	<u> </u>					NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:		
					SUBS	SURFACE C	ONDITIONS	IE TIME OF DRILLING. B BULK SAMPLE  MAY DIFFER AT OTHER R RINO SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT  IGE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS		
								E. THE DATA SPT STANDARD PENETRATION S&H SIEVE AND HYDRO		



TEST SAMPLE

S&H EI CN CR AL CO RV #200

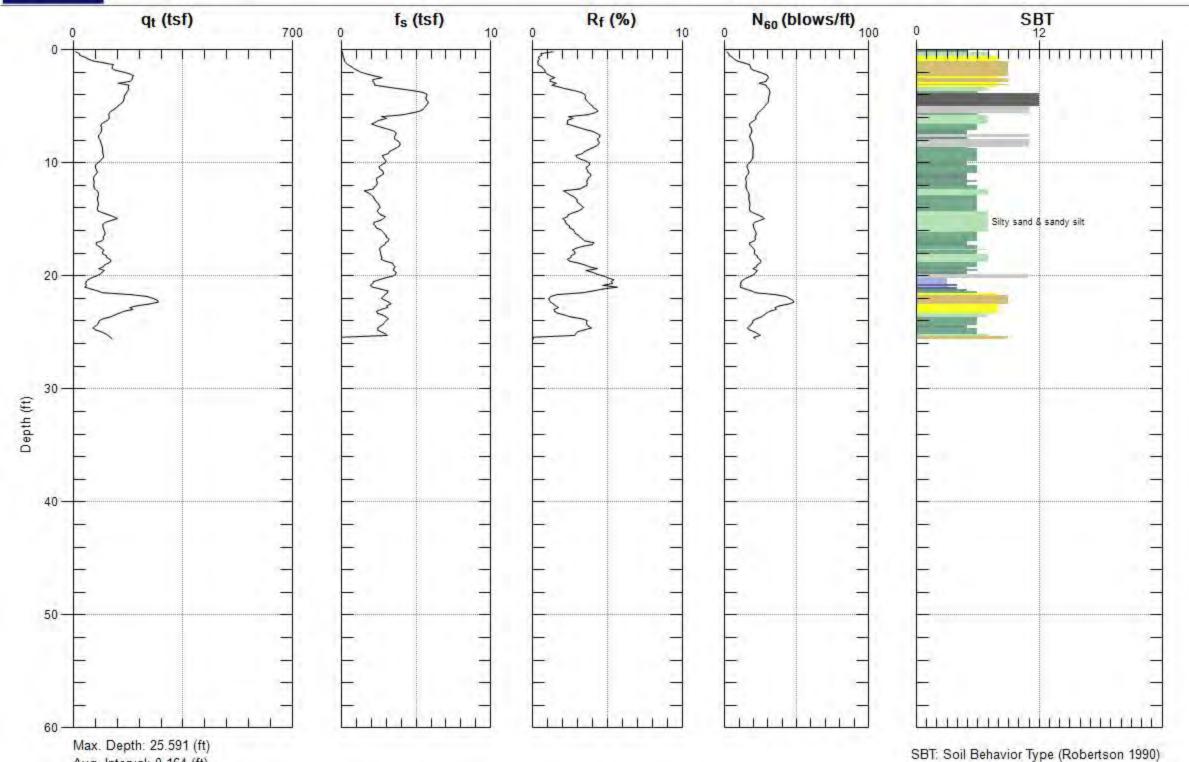
SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

GROUNDWATER TABLE



### LGC GEOTECHNICAL

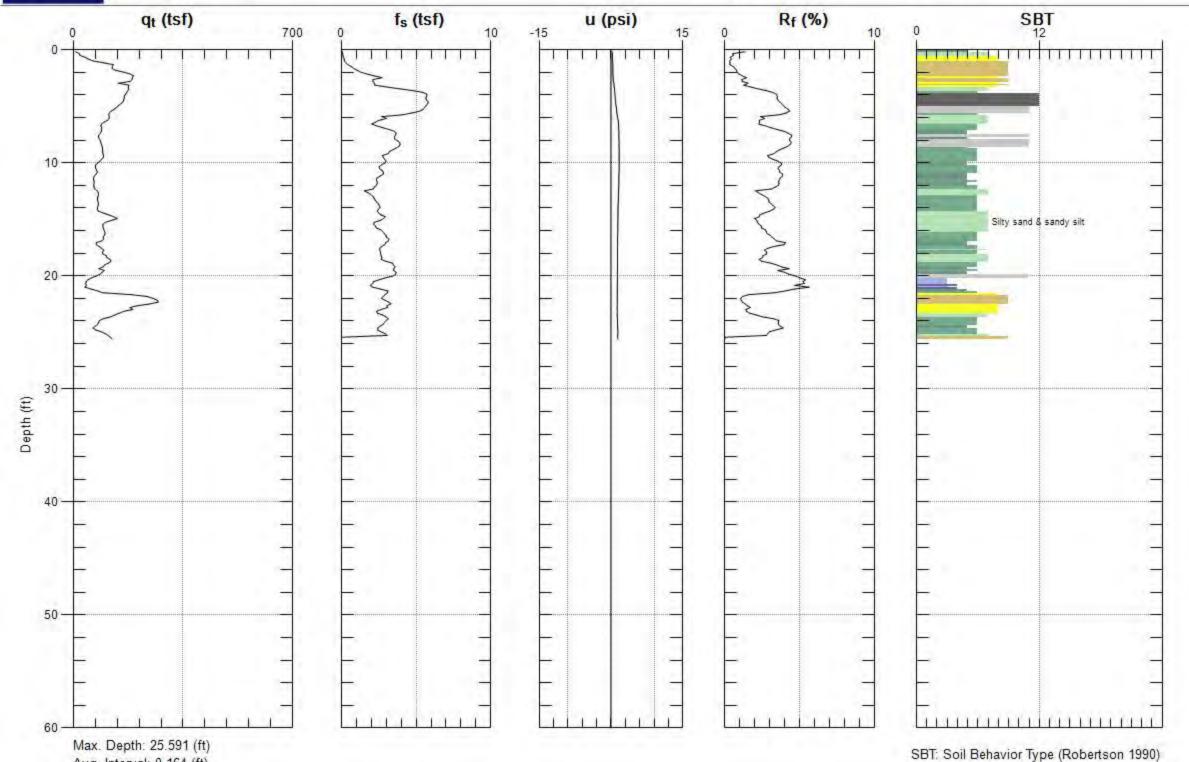
Site: EXPERANZA Sounding: CPT-1





# LGC GEOTECHNICAL

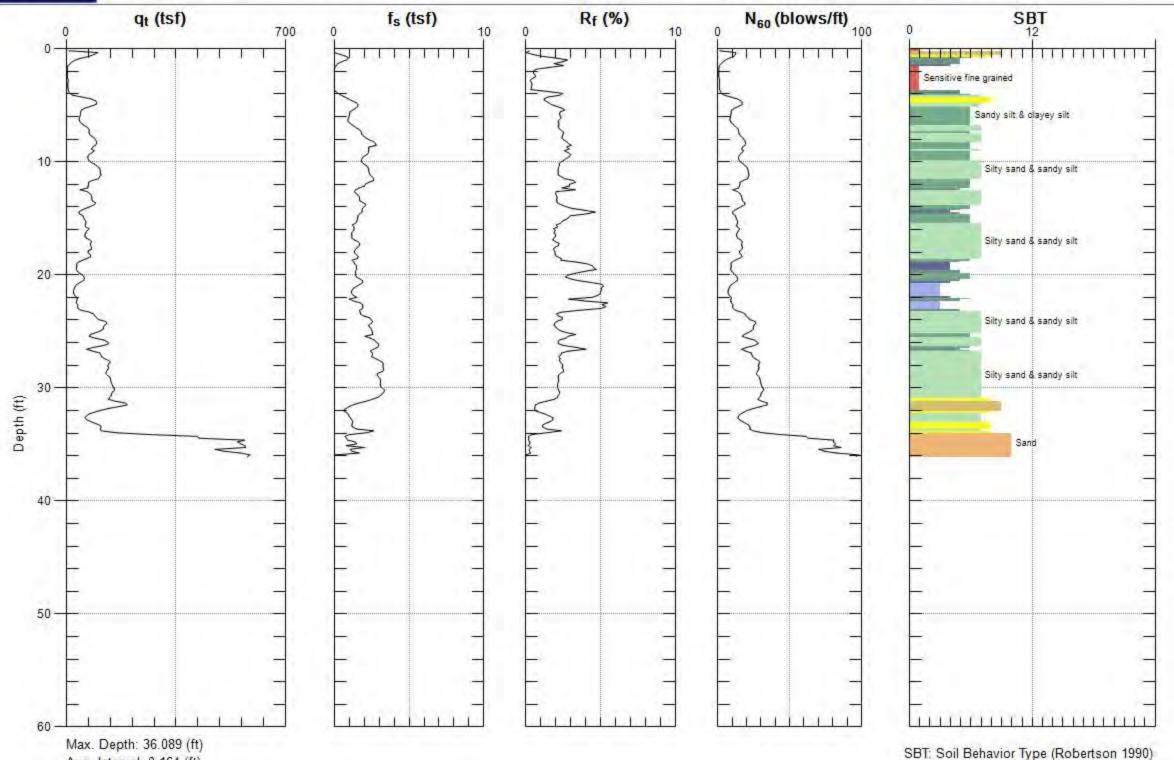
Site: EXPERANZA Sounding: CPT-1





### LGC GEOTECHNICAL

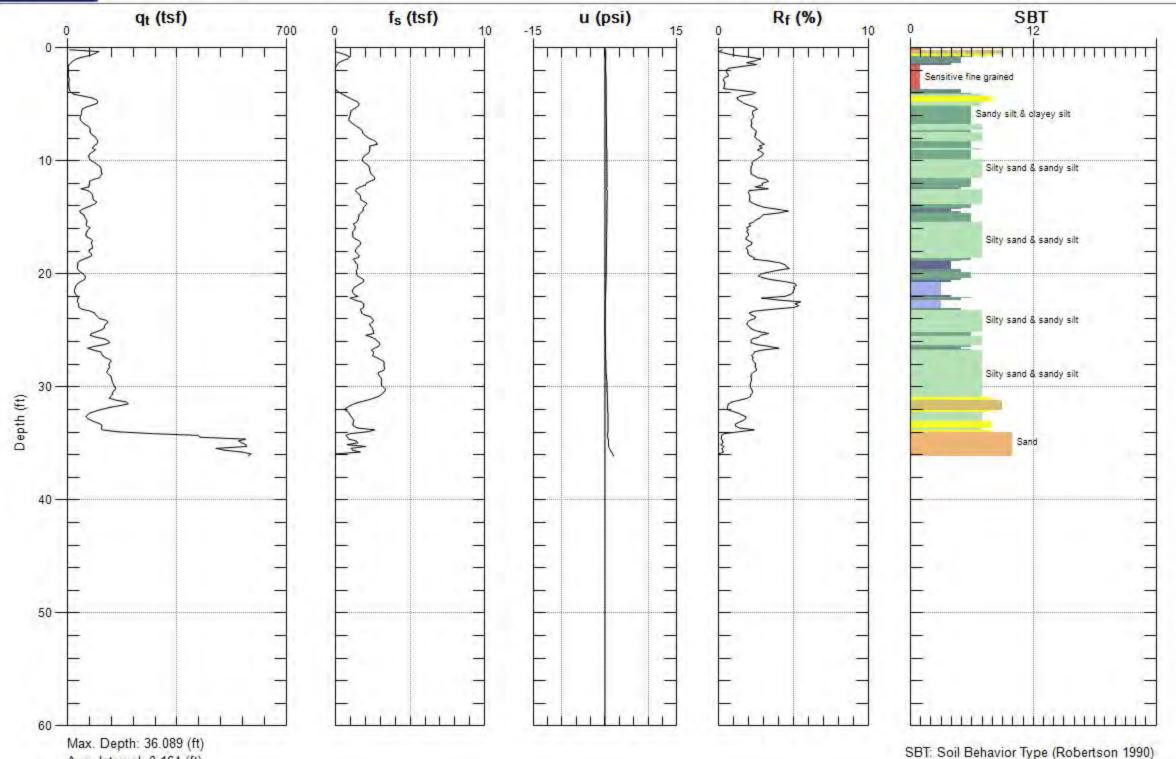
Site: EXPERANZA Sounding: CPT-2





#### LGC GEOTECHNICAL

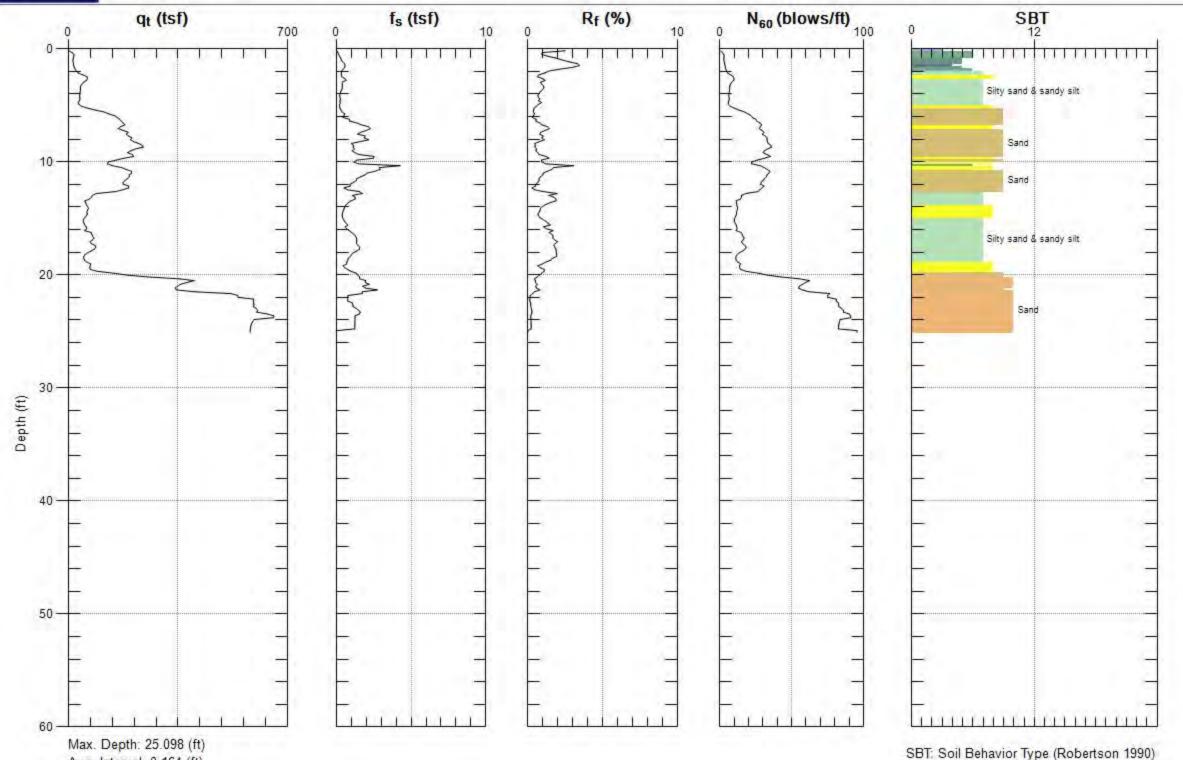
Site: EXPERANZA Sounding: CPT-2





# LGC GEOTECHNICAL

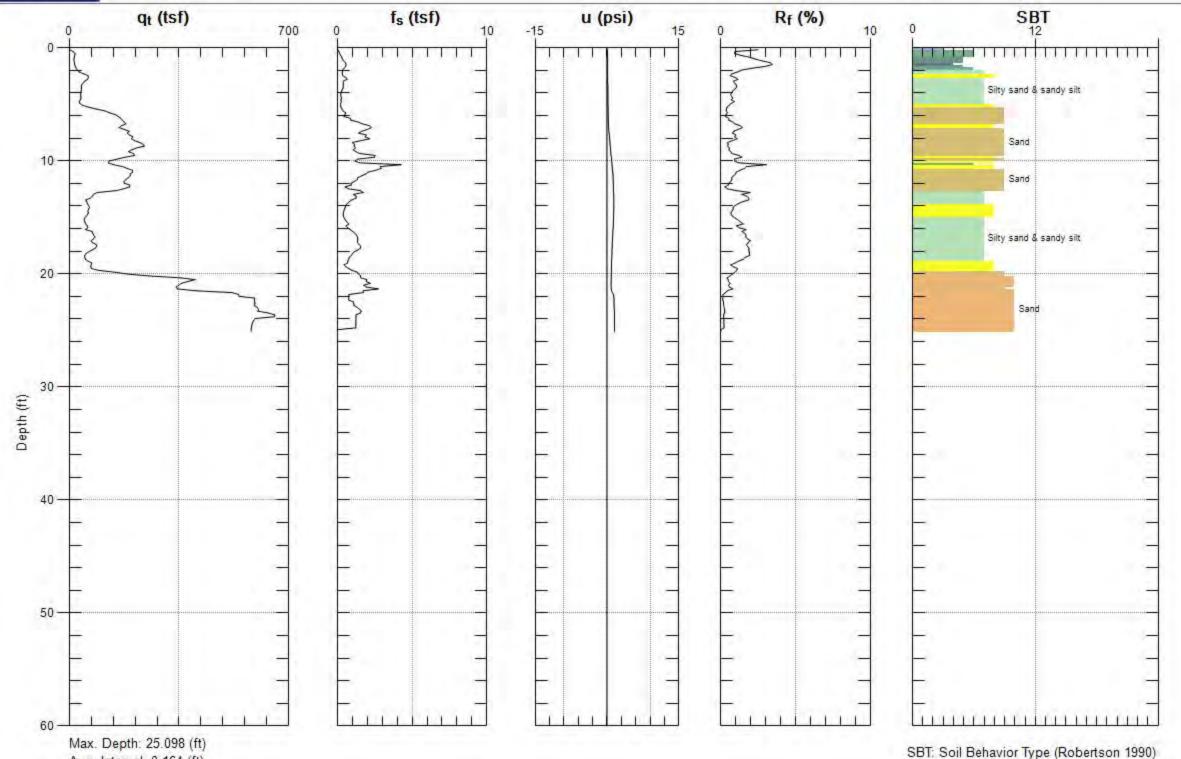
Site: EXPERANZA Sounding: CPT-3





# LGC GEOTECHNICAL

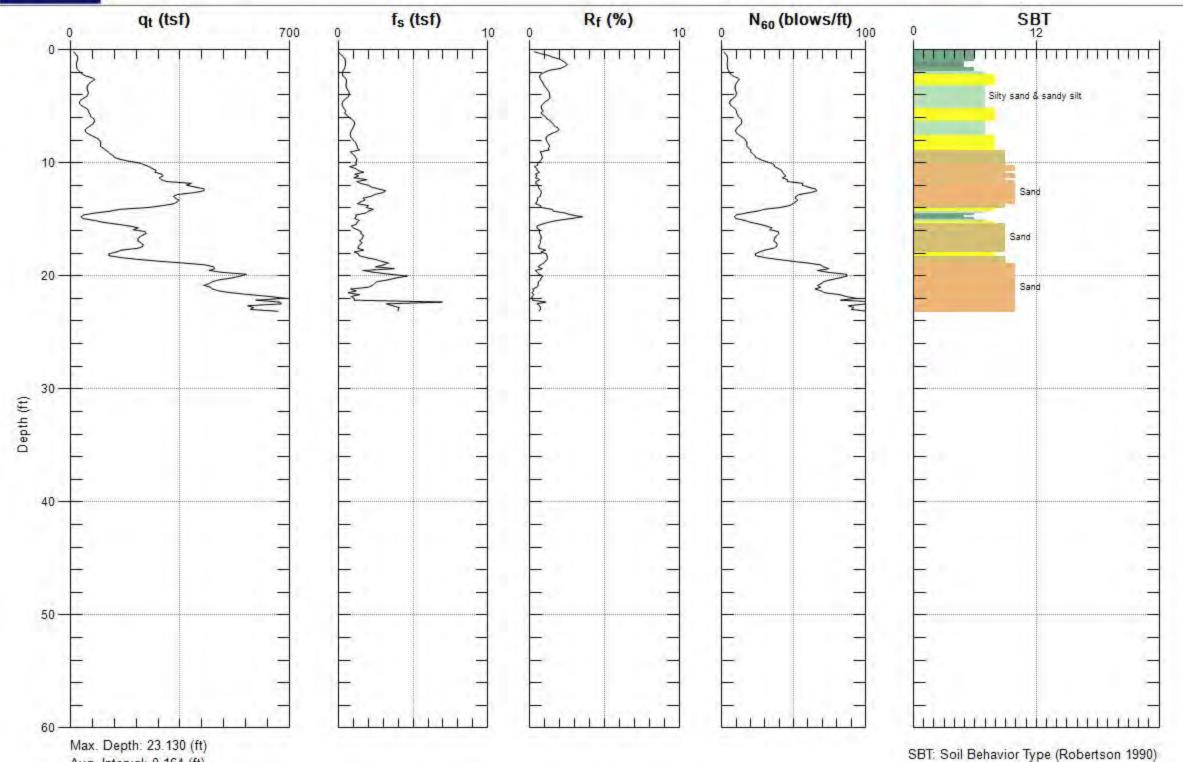
Site: EXPERANZA Sounding: CPT-3





#### LGC GEOTECHNICAL

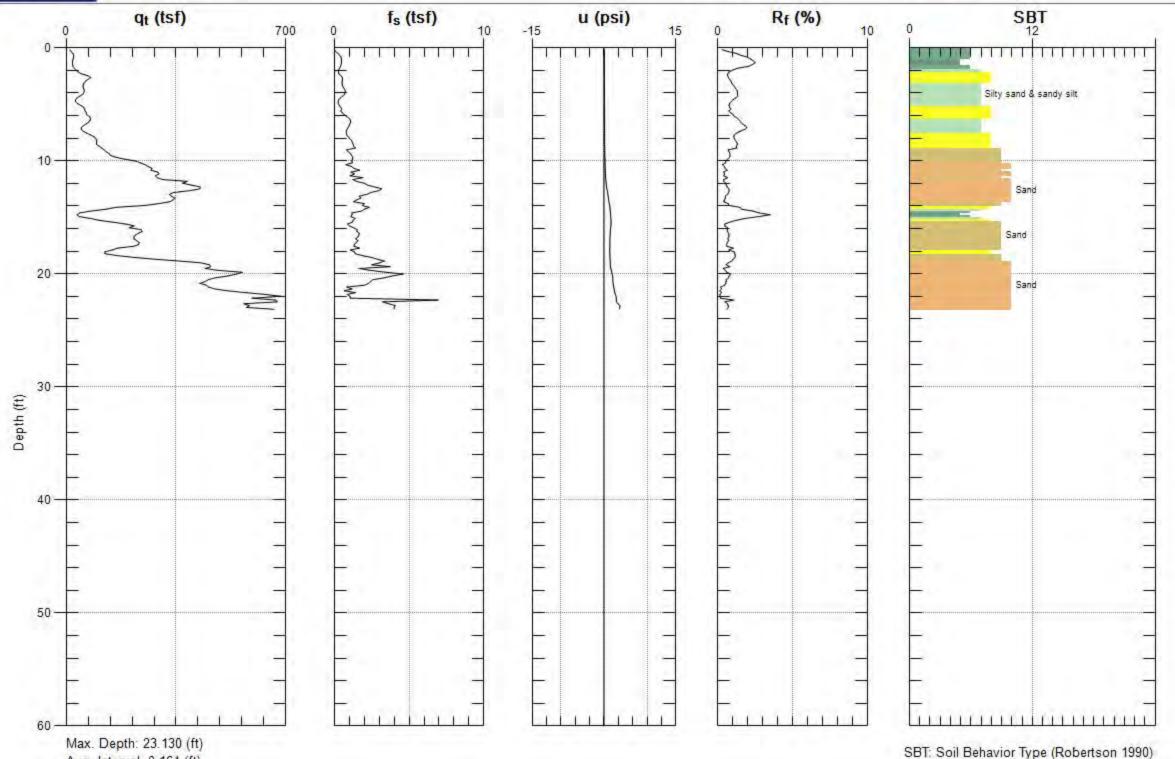
Site: EXPERANZA Sounding: CPT-4





# LGC GEOTECHNICAL

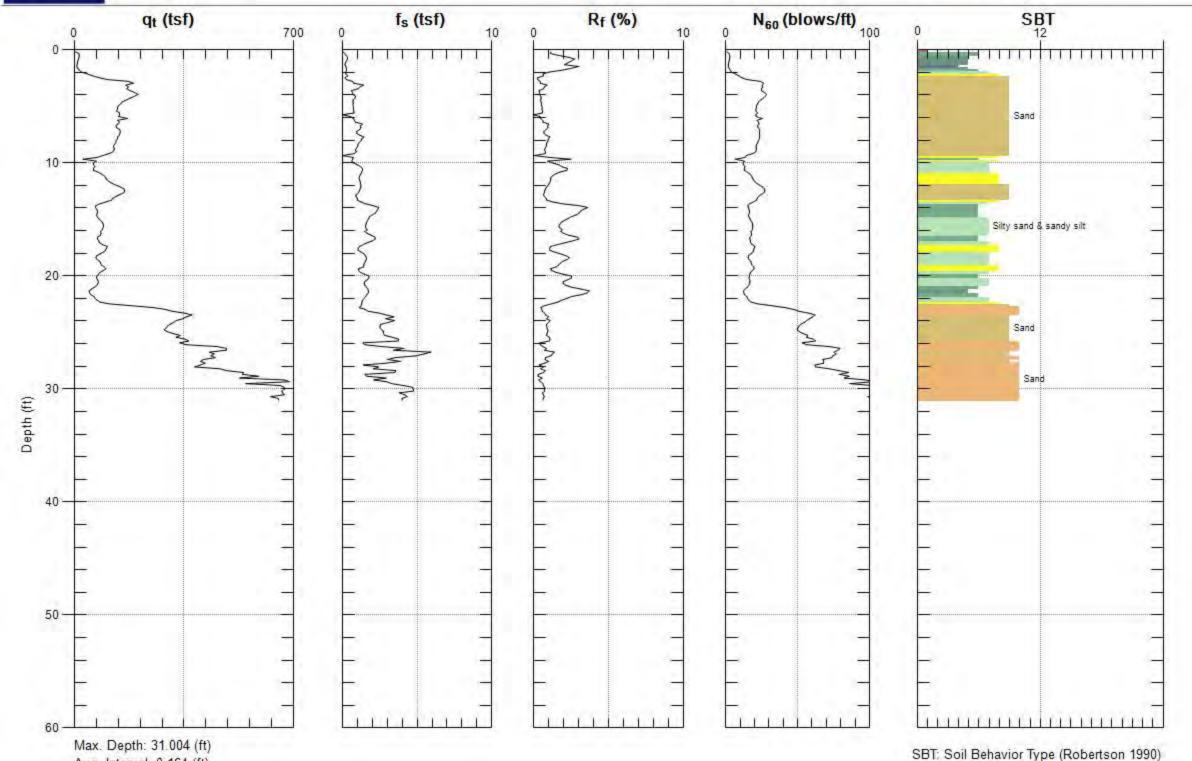
Site: EXPERANZA Sounding: CPT-4





#### LGC GEOTECHNICAL

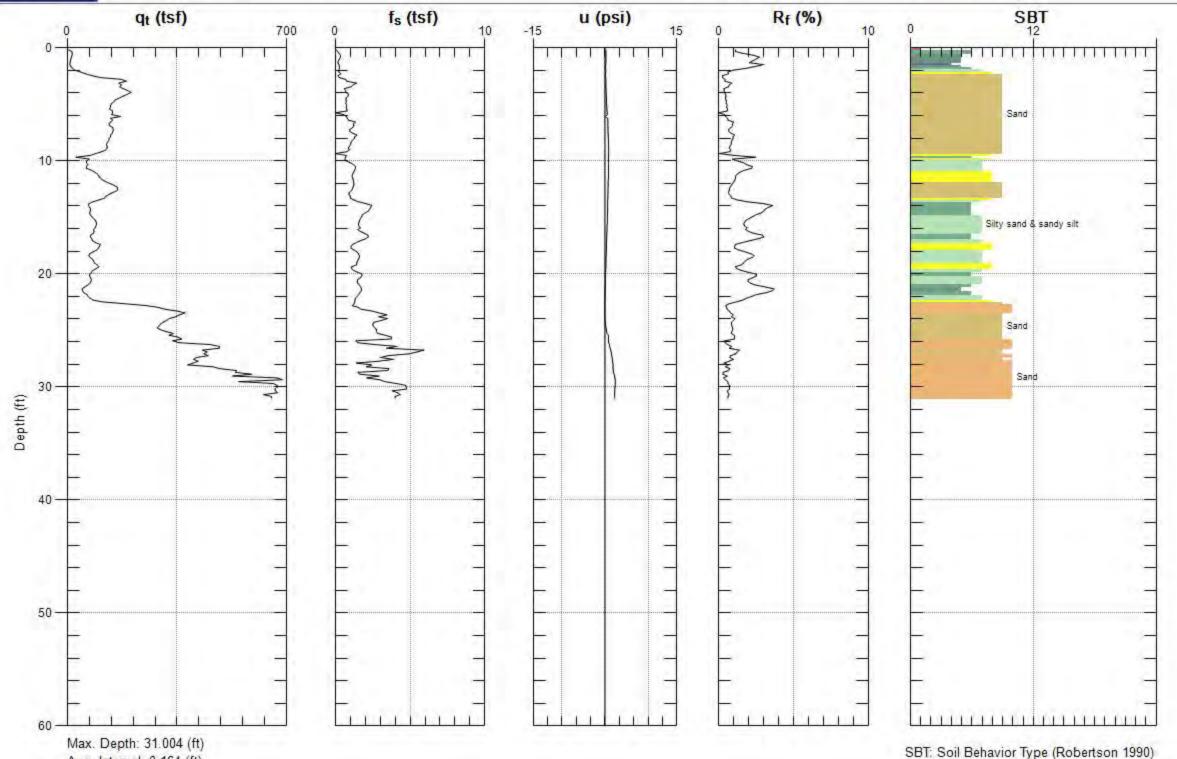
Site: EXPERANZA Sounding: CPT-5





# LGC GEOTECHNICAL

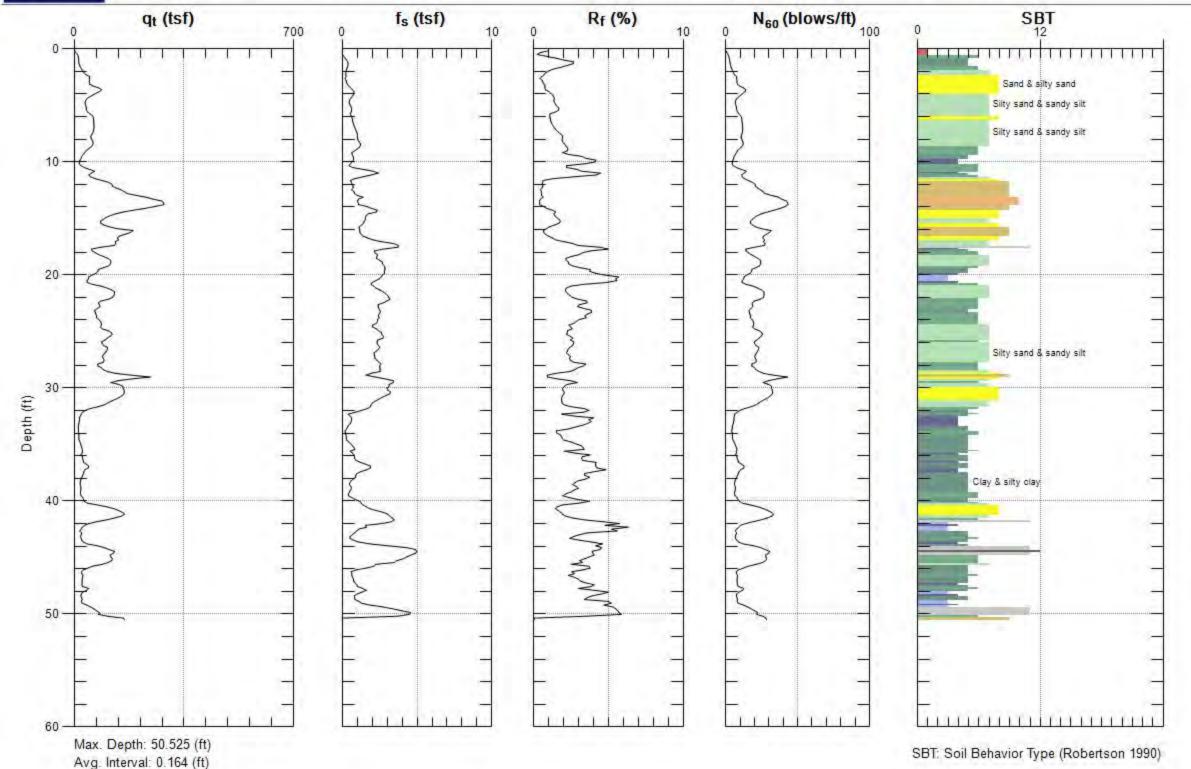
Site: EXPERANZA Sounding: CPT-5





### LGC GEOTECHNICAL

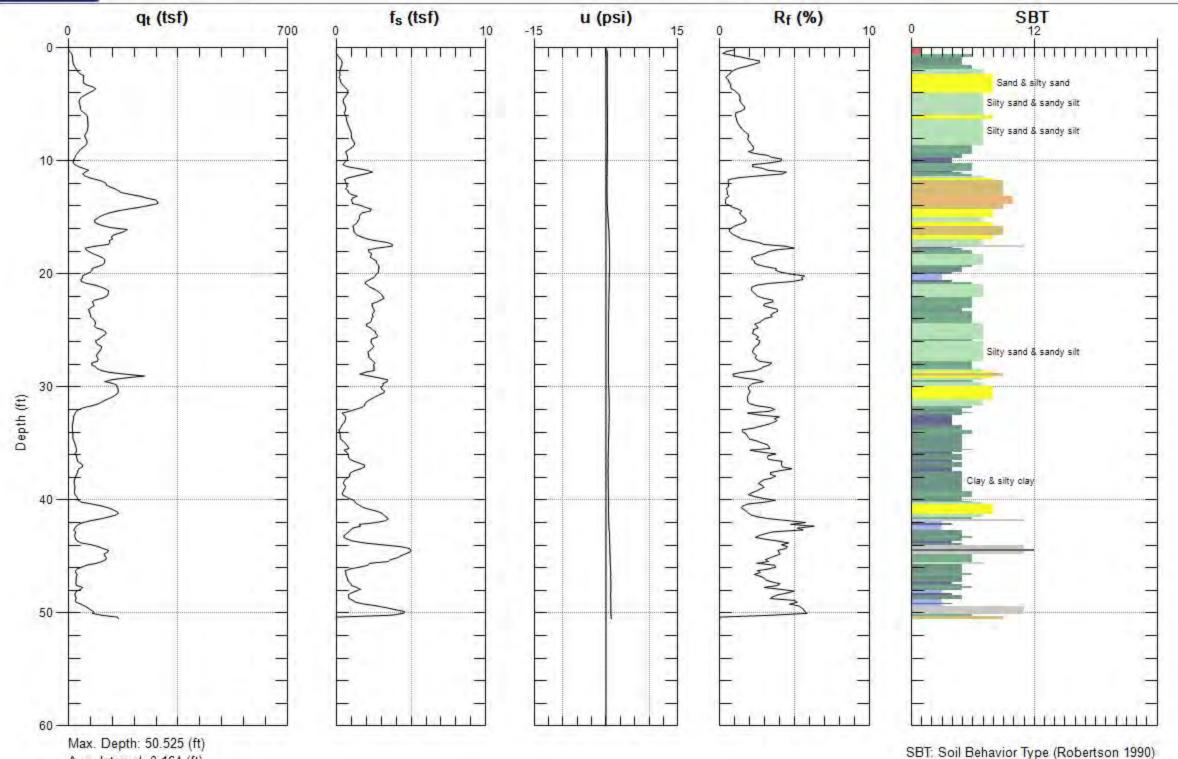
Site: EXPERANZA Sounding: CPT-6





### LGC GEOTECHNICAL

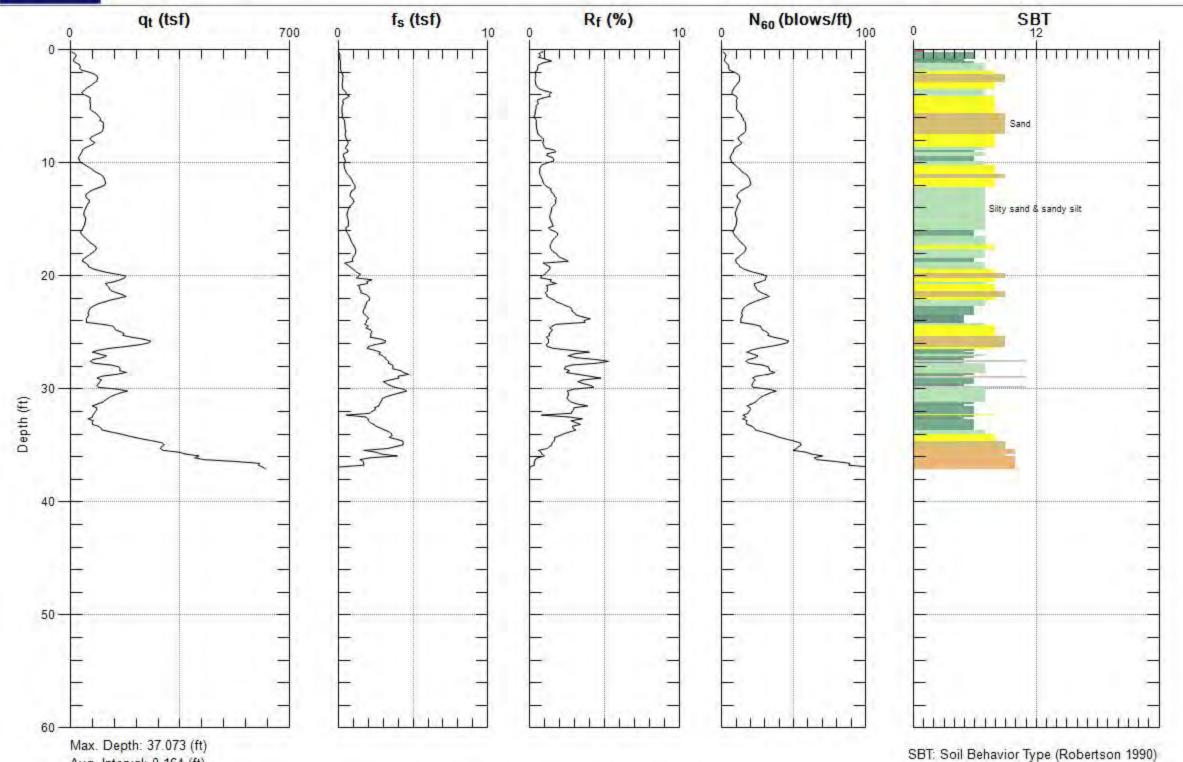
Site: EXPERANZA Sounding: CPT-6





### LGC GEOTECHNICAL

Site: EXPERANZA Sounding: CPT-7

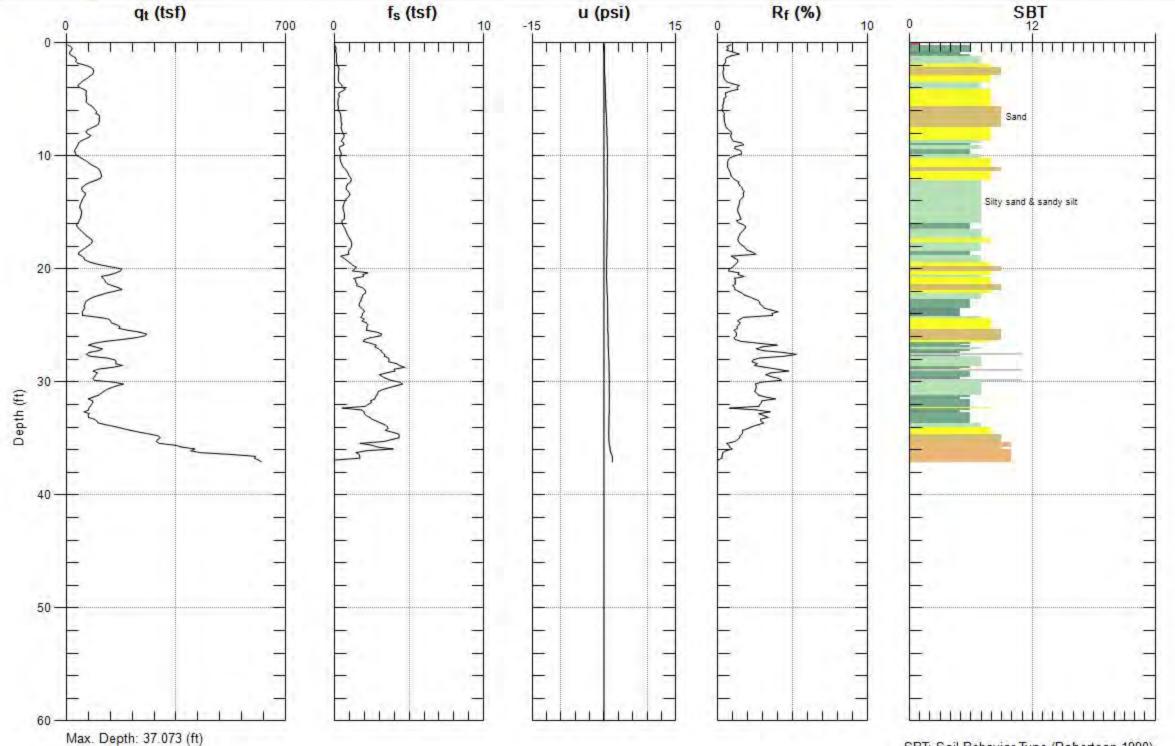




# LGC GEOTECHNICAL

Site: EXPERANZA Sounding: CPT-7

Engineer: R.DOUGLAS Date: 9/12/2017 07:40

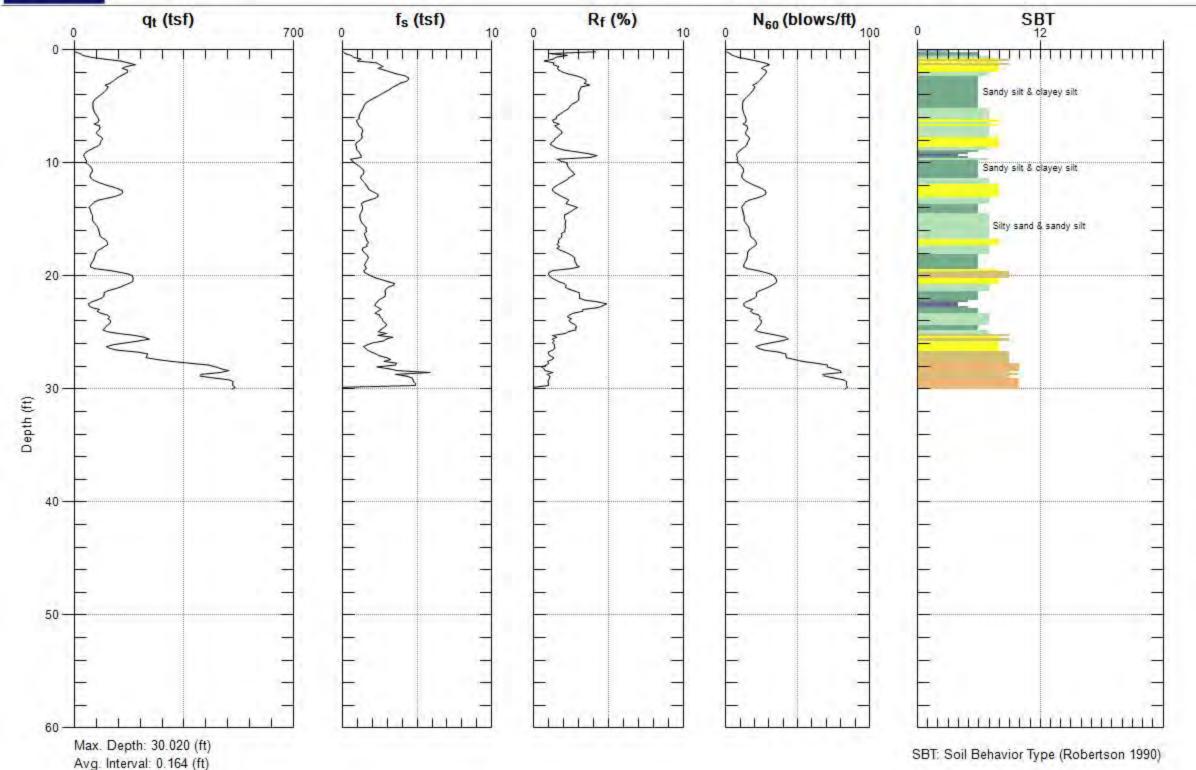


SBT: Soil Behavior Type (Robertson 1990)



# LGC GEOTECHNICAL

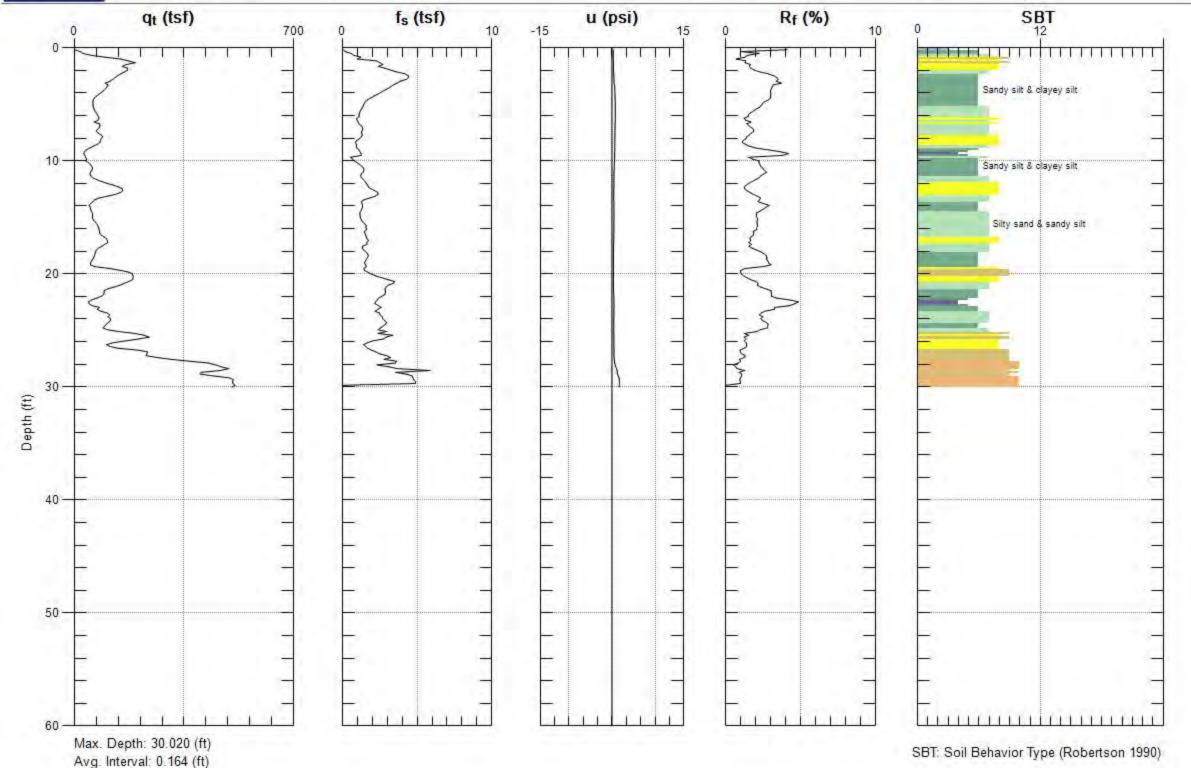
Site: EXPERANZA Sounding: CPT-8





#### LGC GEOTECHNICAL

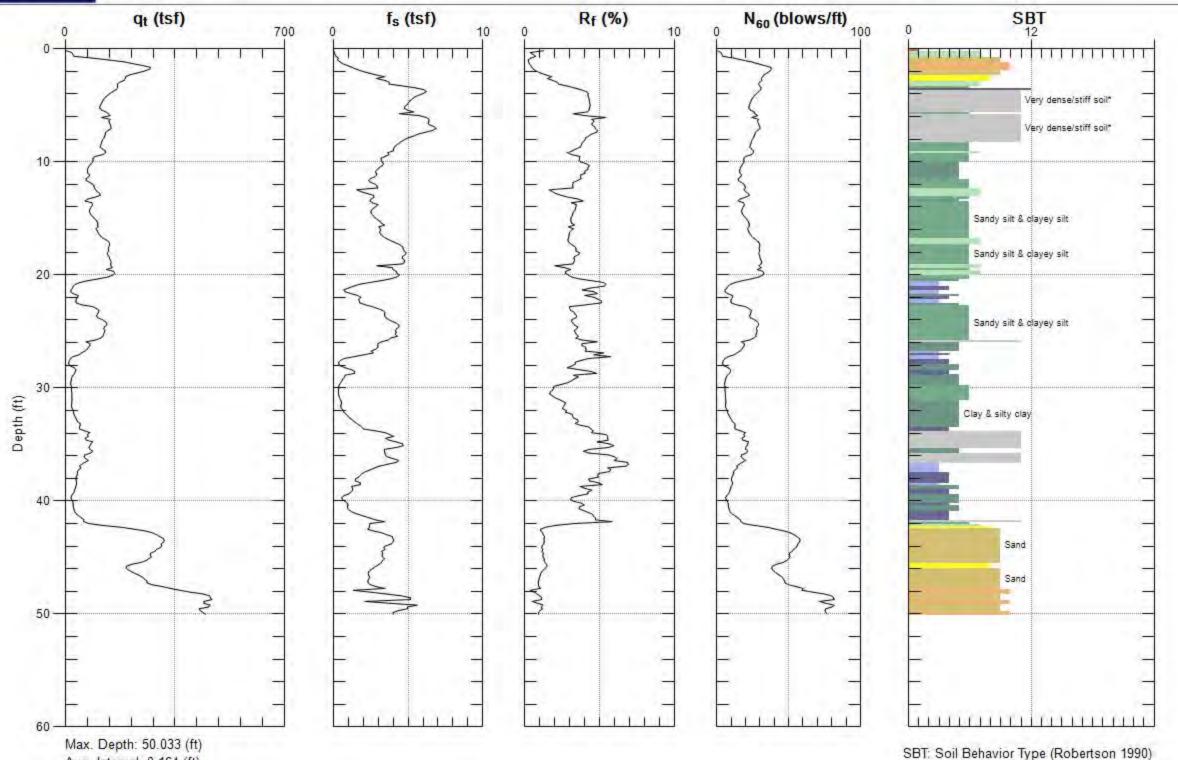
Site: EXPERANZA Sounding: CPT-8





### LGC GEOTECHNICAL

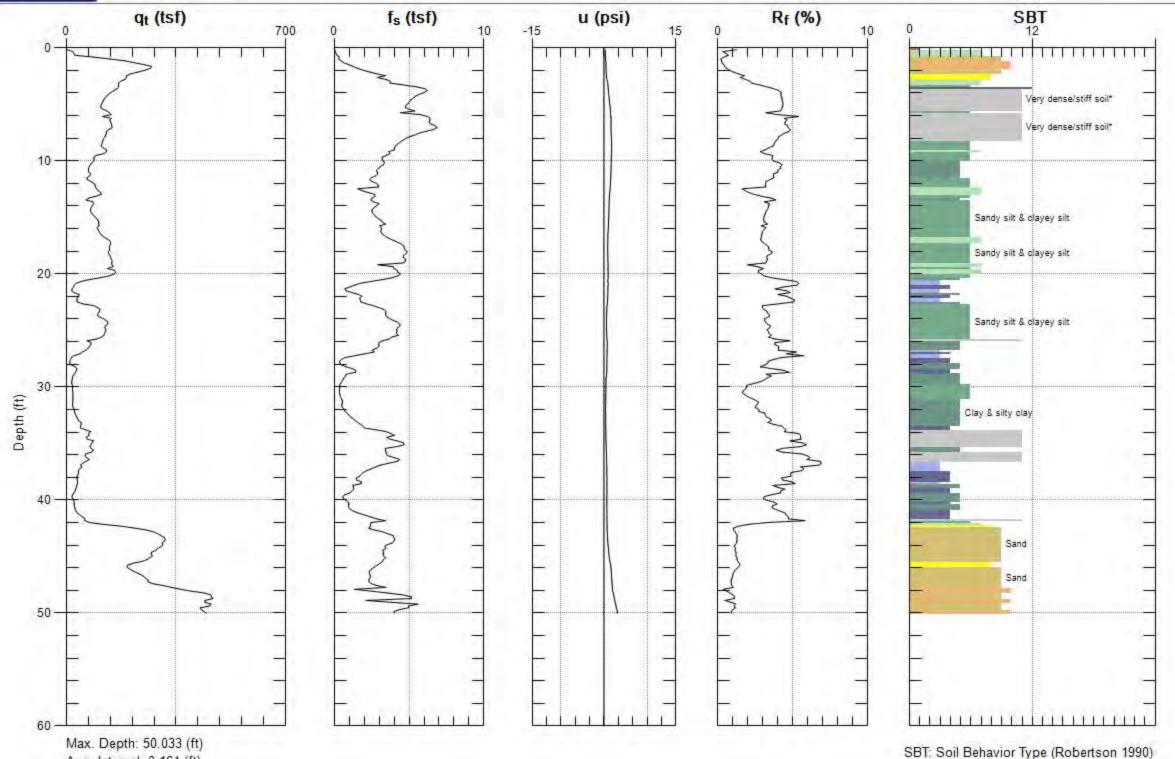
Site: EXPERANZA Sounding: CPT-9





### LGC GEOTECHNICAL

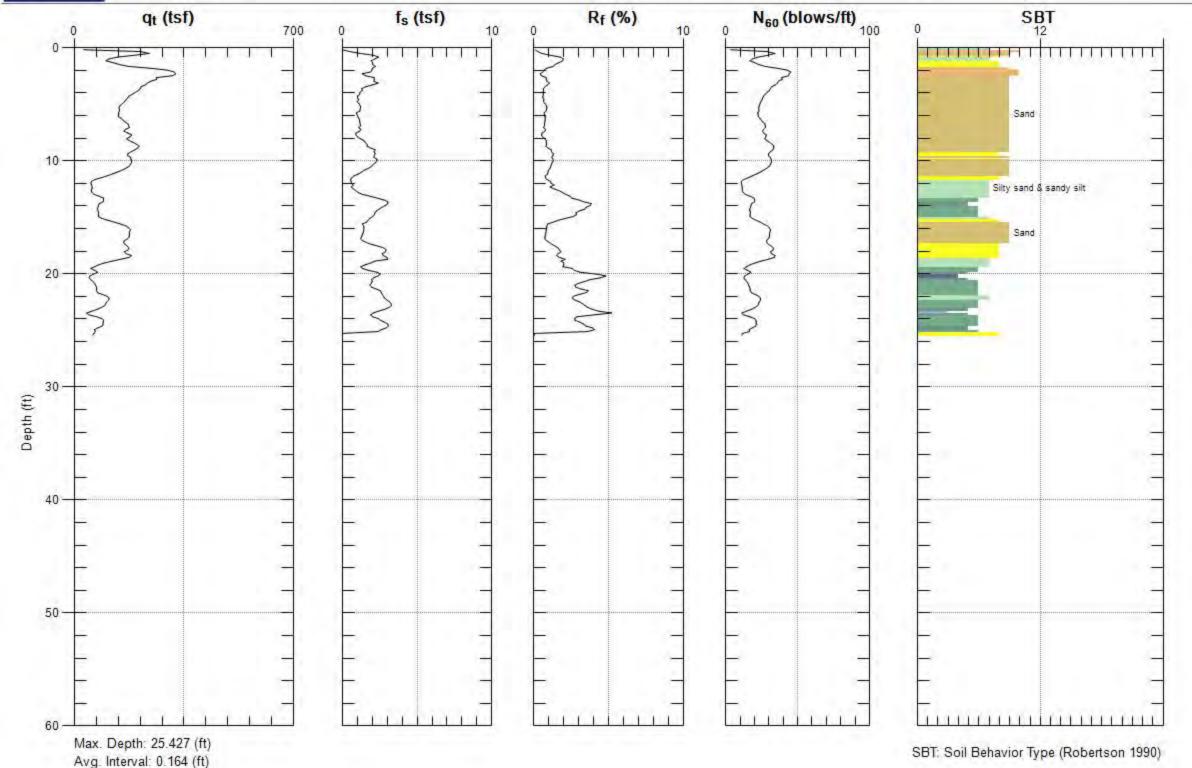
Site: EXPERANZA Sounding: CPT-9





### LGC GEOTECHNICAL

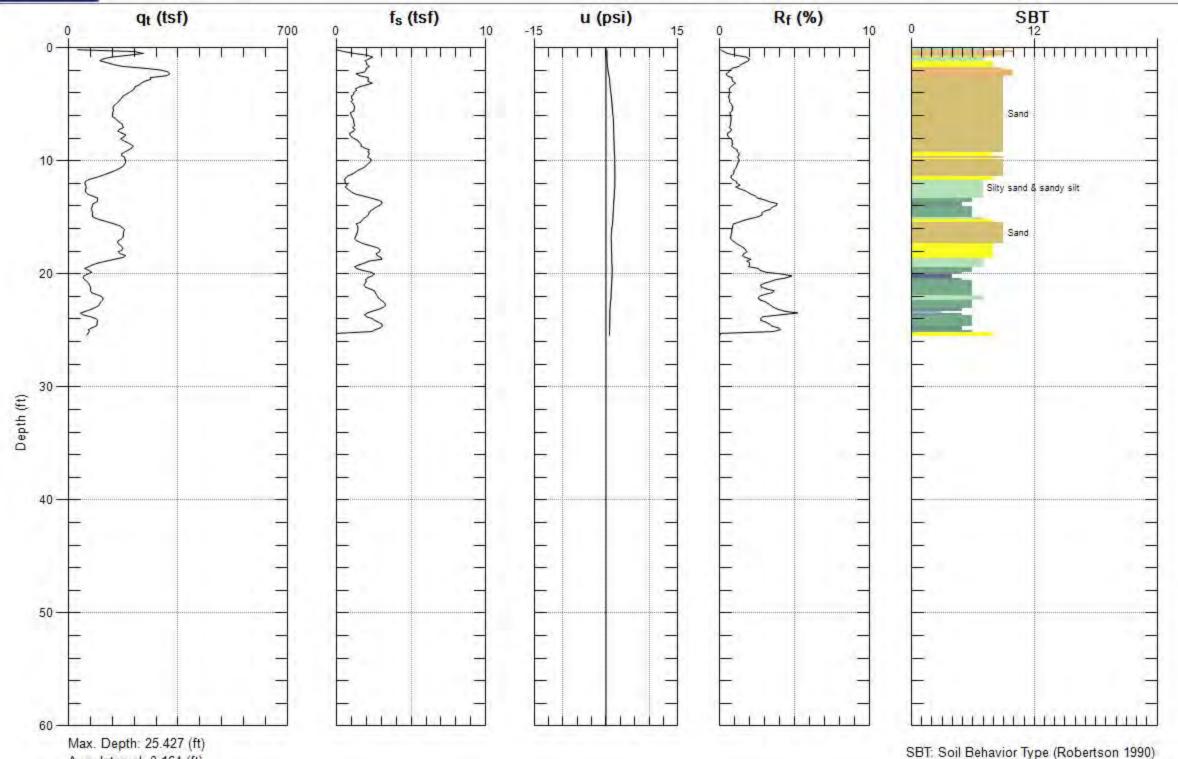
Site: EXPERANZA Sounding: CPT-10





# LGC GEOTECHNICAL

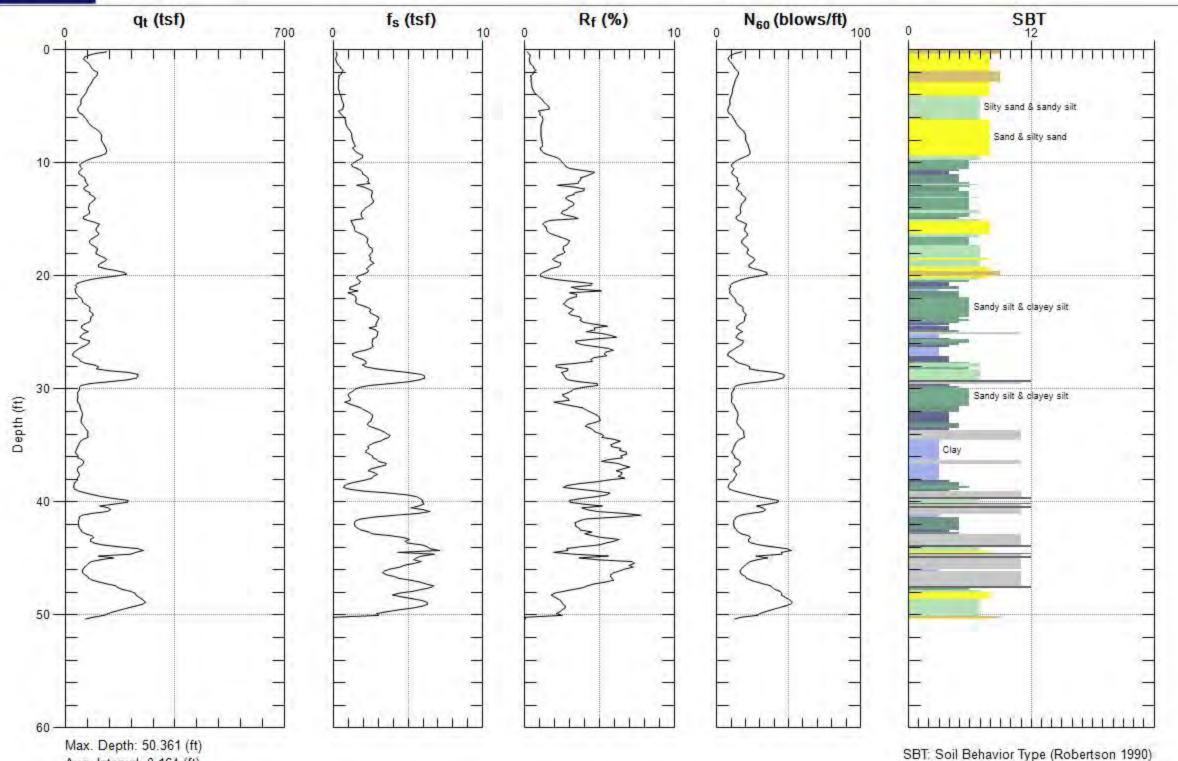
Site: EXPERANZA Sounding: CPT-10





### LGC GEOTECHNICAL

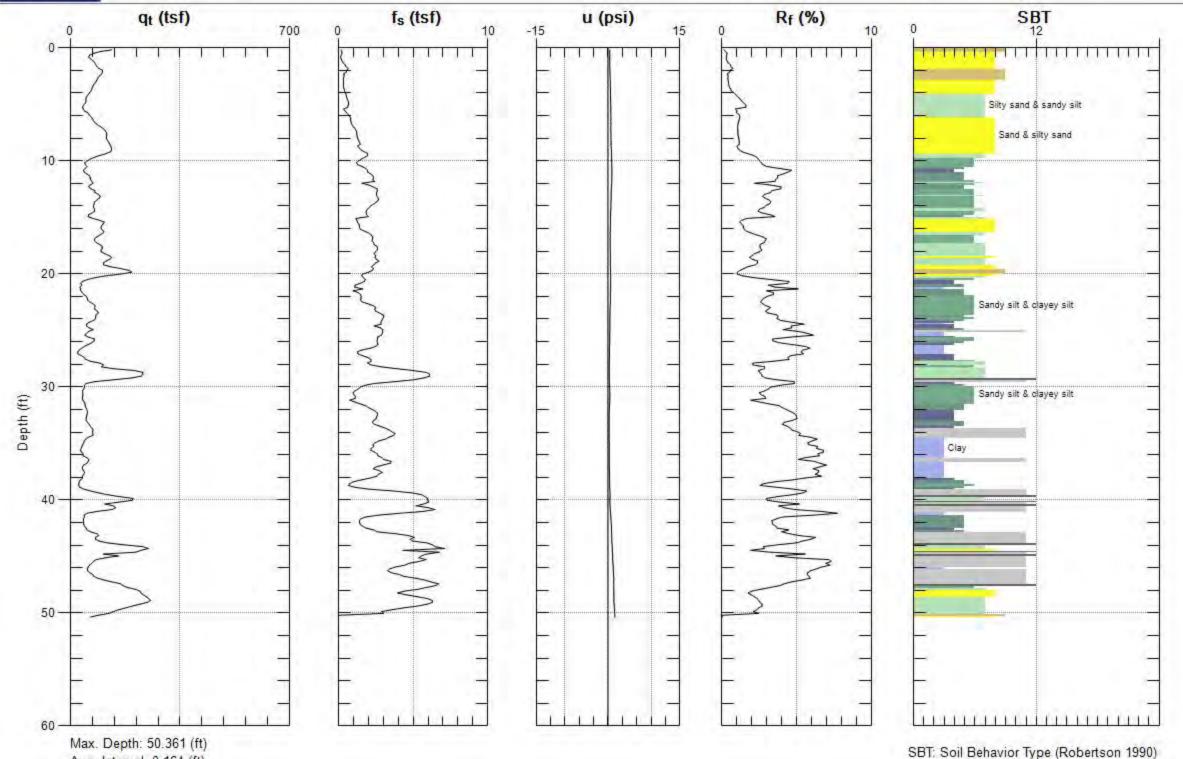
Site: EXPERANZA Sounding: CPT-11





# LGC GEOTECHNICAL

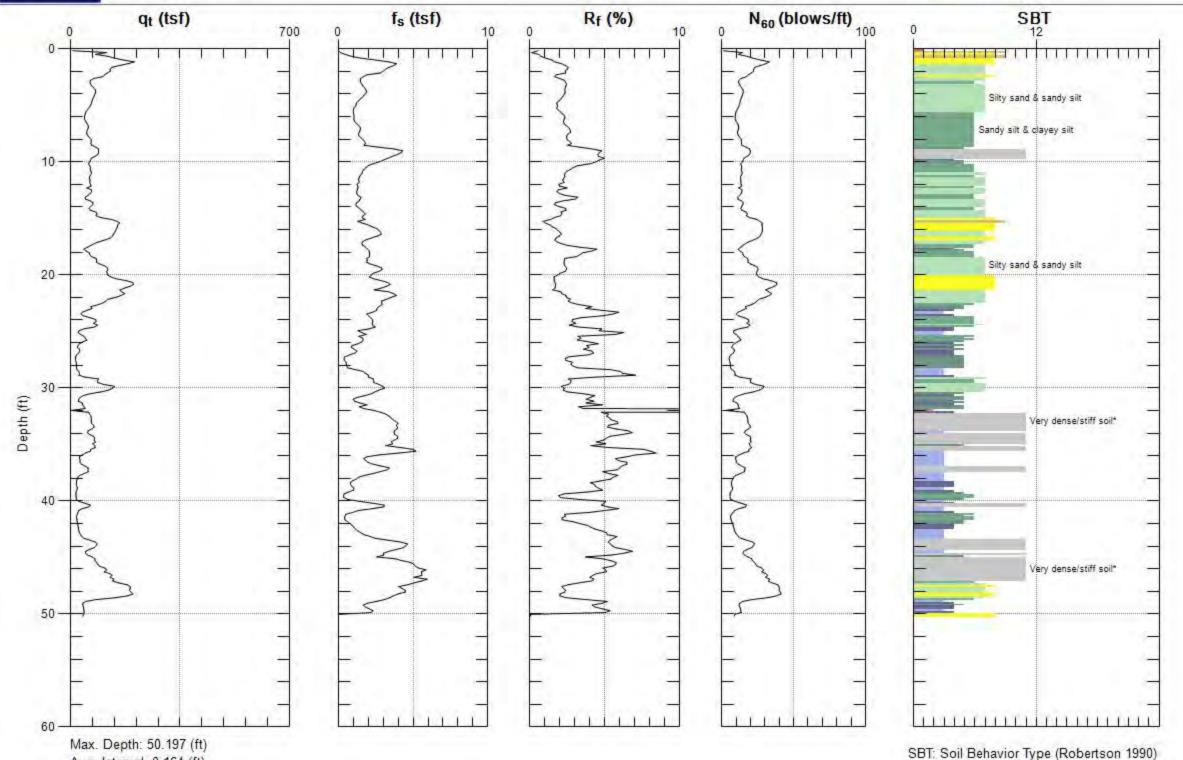
Site: EXPERANZA Sounding: CPT-11





### LGC GEOTECHNICAL

Site: EXPERANZA Sounding: CPT-12

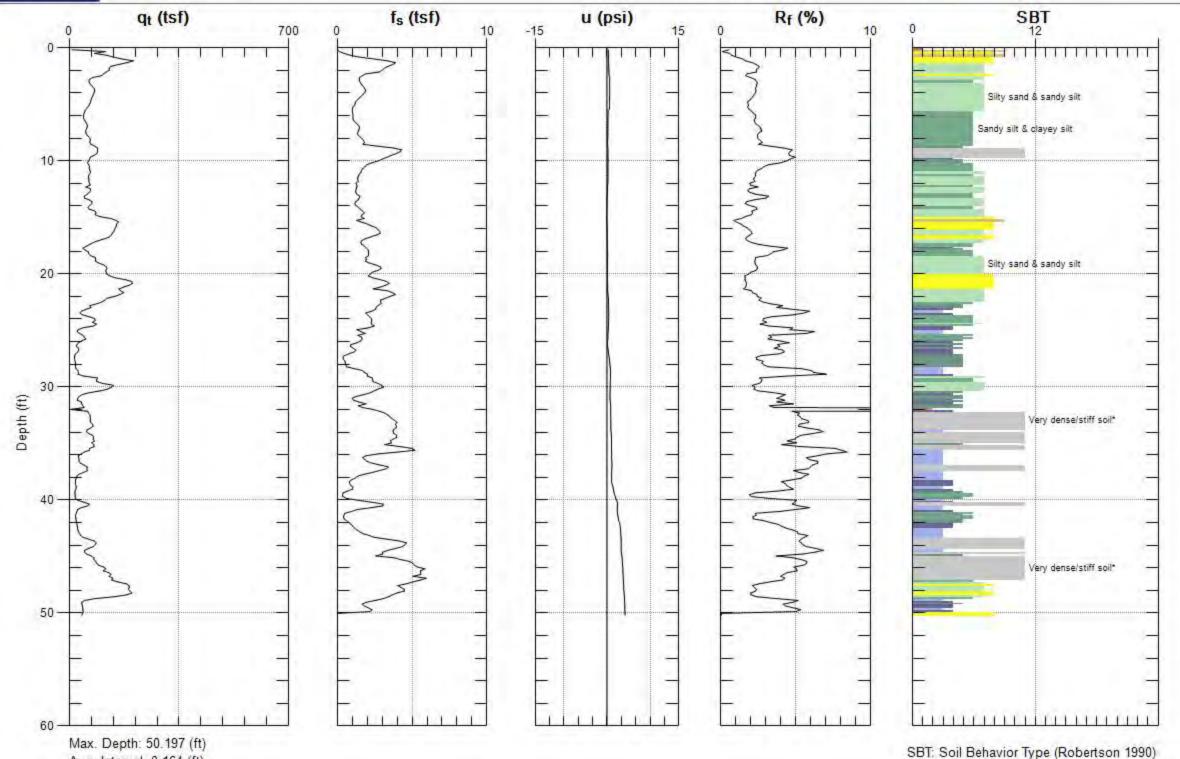




Avg. Interval: 0.164 (ft)

# LGC GEOTECHNICAL

Site: EXPERANZA Sounding: CPT-12 Engineer: R.DOUGLAS Date: 9/12/2017 10:34



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-1			
Project Number : 17114-01	Date: 9/11/2017	Engline en	na Dranautia		3
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineeri	ng Propertie	35:	
Castania		CEOL OCIC		CARADI	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 1' Clayey SAND: dark brown, dry, loose to stiff; abundant roots and manure		SC			
	В	@1' to TD SAND w/ Silt to SILT w/ Sand: light grayish brown, dry grades to slightly moist, dense; moderately well indurated, very fine grained sand, scattered rootlets, and iron oxide		SM			

GRAPHICAI	L REPRESENT	ATION BELOW:	Elevation : 711 ' MSL	Surface Slope: none	Trend: EW
	+			+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +
	-	<b>B</b>			
	-				Total Depth: 5' Groundwater: None Backfilled: 9/11/2017
	+	+ +	+ +	† †	scale : 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-2				
Project Number : 17114-01	Date: 9/11/2017	Engineeri	Engineering Properties:			
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineeri	ng Propert	ies:		



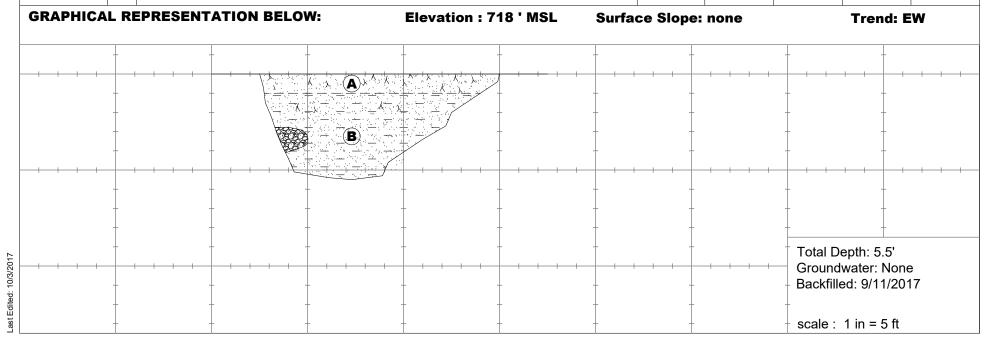
Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	@0' to TD Quaternary Young Eolian Deposits	Qye				
A	@0' to 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"		sc			
В	@0.8' to 4.5' SILT w/ fine Sand: light brown to grayish brown, dry grades to slightly moist, very dense; moderately well indurated, scattered fine rootlets, roots casts at 2'		SM			
С	@4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist, medium dense; decrease in induration		SM			
	A	<ul> <li>@0' to TD Quaternary Young Eolian Deposits</li> <li>A @0' to 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"</li> <li>B @0.8' to 4.5' SILT w/ fine Sand: light brown to grayish brown, dry grades to slightly moist, very dense; moderately well indurated, scattered fine rootlets, roots casts at 2'</li> <li>C @4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist,</li> </ul>	©0' to TD Quaternary Young Eolian Deposits  Qye  A ©0' to 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"  B ©0.8' to 4.5' SILT w/ fine Sand: light brown to grayish brown, dry grades to slightly moist, very dense; moderately well indurated, scattered fine rootlets, roots casts at 2'  C ©4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist,	©0' to TD Quaternary Young Eolian Deposits  Qye  A ©0' to 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"  B ©0.8' to 4.5' SILT w/ fine Sand: light brown to grayish brown, dry grades to slightly moist, very dense; moderately well indurated, scattered fine rootlets, roots casts at 2'  C ©4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist,  SM	©0' to TD Quaternary Young Eolian Deposits  A ©0' to 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"  B ©0.8' to 4.5' SILT w/ fine Sand: light brown to grayish brown, dry grades to slightly moist, very dense; moderately well indurated, scattered fine rootlets, roots casts at 2'  C ©4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist,  SM	### Coll Description:  ### Out to TD Quaternary Young Eolian Deposits  ### Quaternary Young Eolian Deposits

GRAPHICAL REPRESENTATION BELOW:		Elevation : 708 ' MSL	Surface Slope: none	e Trend: EW	
	-	<b>A</b>			
· · · · · · · · · · · · · · · · · · ·	-	(B)			
·	-		+ + + + + + + + + + + + + + + + + + + +		Total Depth: 6' Groundwater: None Backfilled: 9/11/2017
	+	† †	† †	† †	scale : 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-3	
Project Number : 17114-01	Date: 9/11/2017	Engineering Drenerties	
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 1' SAND w/ Clay: dark brown, dry, loose; abundant roots, old manure layer		sc			
	В	@1' to TD Silty SAND: light yellowish brown, dry to slightly moist, dense; moderately well indurated, nested gravelly sand pocket at 3', decrease in induration at 5', minor iron oxide, few root casts at 2'		SM			



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-4	
Project Number : 17114-01	Date: 9/12/2017	Engineering Drenewties	
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Geologic Attitudes	Illnit SAII NE	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@0' to TD Quaternary Young Eo	lian Deposits	Qye				
	A	@0' to 1' SAND w/ Clay: medium abundant roots, grass and man	brown, dry, loose; organic rich, ure layer		SC			
	В	@1' to 2' Silty SAND: light grayi rootlets, possible agricultural t	• • • • • • • • • • • • • • • • • • • •		SM			
	С	@2' to 3.6' SAND w/ Silt: light ye slightly moist, medium dense to indurated, bottom of rootlets	, , ,		SM			
	D	@3.6' to TD SAND: brown, mois	, medium dense; "beach sand"		SW			

GRAPHICAL	REPRESENT	ATION BELOW:	:	Elevation: 72	21 ' MSL	Surface Slop	e: none	Tren	d: EW
+			(C)						
	- - - - -		-					Total Depth: 4. Groundwater: N Backfilled: 9/12	None /2017

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-5	
Project Number : 17114-01	Date: 9/12/2017	Engine aving Dyonaytica.	1
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 0.8' SAND w/ Clay: medium brown, dry, loose; organic rich, roots, grasses, old manure layer		sc			
	В	@0.8' to 3' SAND w/ Silt: light brown, dry, grades to slightly moist, dense; scattered fine rootlets, micropores, moderately well indurated		SM			
	С	@3' to TD Silty SAND: light yellowish brown, dry to slightly moist, dense; slightly indurated, very fine sands		SM			

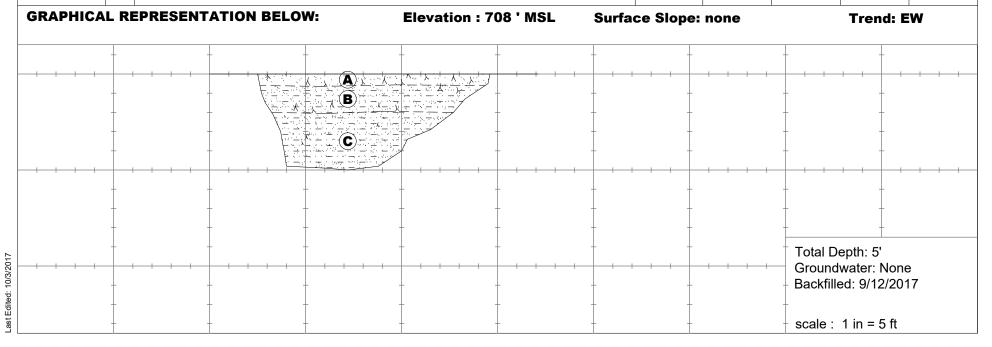
GRAPHICAL REPRESENTATION BELOW: Elevation : 716 ' MSL Surface Slope: none Trend: EW

Total Depth: 5'
Groundwater: None
Backfilled: 9/12/2017
scale : 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-6	
Project Number : 17114-01	Date: 9/12/2017	Engineering Preparties	<b>***</b>
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 0.6' SAND w/ Clay: medium brown, dry, loose; organic rich, roots, grass, old manure		SC			
	В	@0.6' to 2' SAND w/ Silt: light grayish brown, dry, slightly dense; medium grained, scattered rootlets, moderately well indurated		SM			
	С	@2' to TD SAND w/ Silt: light yellowish brown, slightly moist, medium dense; slightly indurated, few scattered rootlets, few micropores, caliche stringers at 4', very fine sand		SM			



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-7	
Project Number : 17114-01	Date: 9/12/2017	Engine suing Dresenties	1
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 2' SAND w/ Silt: grayish brown, moist, medium dense; organic rich, thin zone of old manure at top, agricultural till to 2' deep, iron oxide staining, scattered rootlets		SM			
	В	@2' to TD SAND w/ Clay: light yellowish brown, very moist, loose to medium dense; scattered gravels, lacks visible rootlets		sc			

GRAPHICA	L REPRESENT	TATION BELOW:	Elevation : 730	'MSL	Surface Slope: none	Trend: EW
		A				
	-	B	**************************************		+ + + + + + + + + + + + + + + + + + + +	
						Total Depth: 5' Groundwater: None Backfilled: 9/12/2017
	+	+ +			+ +	scale : 1 in = 5 ft

Project Number : 17114-01	Trench No: TP-8	<b>S</b>
	Engineering Dresenties	1
Equipment: CAT 420F Backhoe Location: See Geotechnica	ical Map	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 0.5' Layer of CLAY, SAND, and manure, dark brown, dry, loose					
	В	@0.5' to 1.8' Silty SAND: mottled brown, moist, medium dense; organic rich, scattered gravels, scattered fine rootlets and root casts with dark mineral inclusions		SM			
	С	@1.8' to 3.5' Silty SAND: light yellowish brown, moist, medium dense; few gravels, lacks organic micropores		SM			
	D	@3.5' to TD SAND w/ Silt: light yellowish brown, very moist, medium dense		SM			

GRAPHICAL	REPRESENTA	ATION BELOW:	Elevation: 712 'MSL	Surface Slope: none	Trend: EW
		A B		+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +
- - - -		<b>6</b>			
- - -		+		+ + + + + + + + + + + + + + + + + + + +	Total Depth: 6' Groundwater: None Backfilled: 9/13/2017
-		+	† †	† †	scale : 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-9	
Project Number : 17114-01	Date: 9/13/2017	Engine suina Dranautica	
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



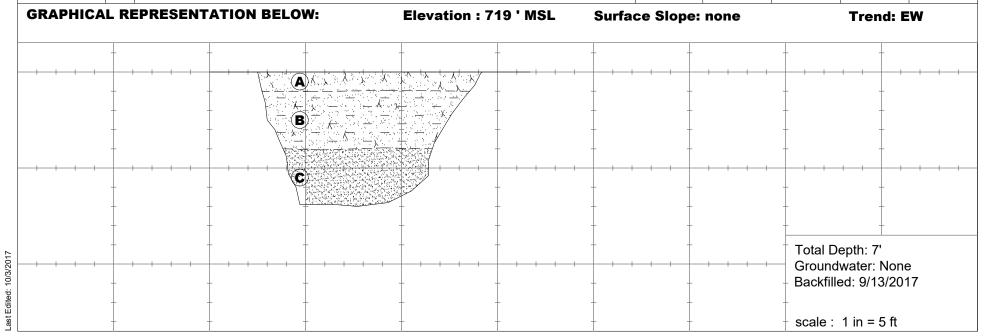
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOG UNIT	-	scs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian De	oosits					
	A	@0' to 1' SAND w/ Silt: moderate brown at top, variable thickness	, dry, loose; clods, grass	8	SM			
	В	@1' to 3' Silty SAND: light yellowish bromoist, medium dense to dense; decreadepth, rootlets to 3'		\$	SM			
	С	@3' to TD SAND w/ Silt: yellowish brow medium dense; scattered gravels, lack		\$	SM			

GRAPHICAL	REPRESENT	ATION BELOW:	Elevation : 716 ' MSL	Surface Slope: none	Trend: EW
-	-	(A) (B)		+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +
-	-	•			
-	-			+ + + + + + + + + + + + + + + + + + + +	Total Depth: 7' Groundwater: None Backfilled: 9/13/2017
-	-	Ī Ī	Ī	Ī	scale : 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-10	
Project Number : 17114-01	Date: 9/13/2017	Engineering Properties:	<b>**</b>
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	Ge



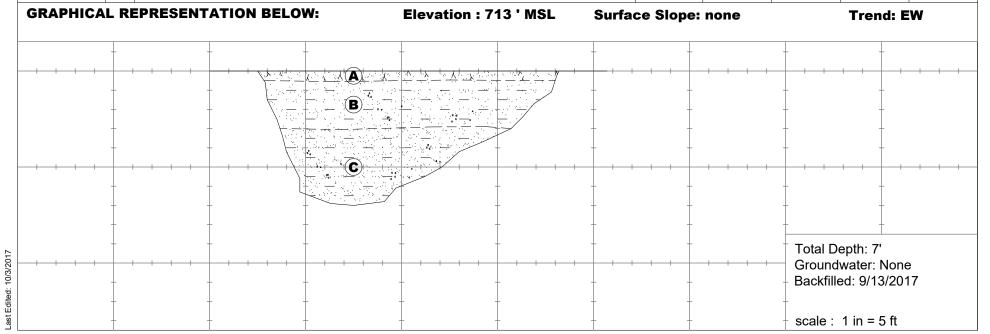
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 1' SAND w/ Clay: mottled dark to medium brown, dry, loose; organic rich		sc			
	В	@1' to 4' Silty SAND: light yellowish brown, moist, medium dense; slightly indurated, scattered root casts and fine roots to 3'		SM	B-2 @1' to 4'		
	С	@4' to TD SAND w/ trace Silt: yellowish brown, moist to very moist, medium dense; lacks induration, lacks organics, increase in moisture with depth, "dirty beach sand" appearance		SW			



Project Number: 17114-01 Date: 9/13/2017  Equipment CAT 4205 Backback Date: 9/13/2017	Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-11	
	Project Number : 17114-01	Date: 9/13/2017	Engineering Dropoutio	
Equipment: CAT 420F Backnoe Location: See Geotechnical Map	Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	- Engineering Propertie	Si



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 0.5' SAND & SILT: light grayish brown, dry, loose; organics		SM			
	В	@0.5' to 3' SAND w/ Silt: light grayish brown, dry to slightly moist with depth, medium dense to dense; indurated		SM			
	c	@3' to TD SAND w/ Silt: light yellowish brown, moist, slightly to moderately dense, lacks organics, lacks induration		SM			



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench N	No: TP-12		
Project Number : 17114-01	Date: 9/13/2017	Engineeri	na Dranari		<b>**</b>
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineeri	ng Propert	ies:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 1' SAND w/ Clay: dark brown, moist, loose; abundant organics, roots, old manure; grades to B (agricultural till)		SC			
	В	@1' to 2.7' Silty SAND w/ Clay: dark brown mottled, very moist, medium dense; few rootlets, organic rich		SM			
	С	@2.7' to 3.5' SAND w/ Silt: light yellowish brown, moist, medium dense; few gravels sub-rounded to 2" diameter		SM			
	D	@3.5' to TD Silty SAND: grayish brown, medium dense; scattered oxidation pods		SM			

GRAPHICA	L REPRESENT	ATION BELOW:	Elevation: 726 ' MSL	Surface Slope: none	Trend: EW
	-	X X A	<u> </u>	+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +
		C			
					Total Depth: 5' Groundwater: None
					Backfilled: 9/13/2017 scale: 1 in = 5 ft

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-13	}	
Project Number : 17114-01	Date: 9/13/2017	Engineering Braner	4:	1
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Proper	ties:	



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
	A	@0' to 2' Silty SAND: dark brown mottled, very moist, loose to medium dense; scattered gravels, agricultrual till, organic content decreases with depth		SM			
	В	@2' to 4' SAND w/ Silt: yellowish brown, moist, medium dense; few gravels, few roots casts at 3' but generally lacks organics		SM			
	С	@4' to TD Gravelly SAND: grayish brown, very moist, medium dense; lacks induration, friable		sw			

GRAPHICAI	L REPRESENT	TATION BELOW:	Elevation : 728 ' MS	L Surface Slope: none	Trend: EW
1 1 1	+			+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +
		<b>B</b>			
	+				Total Depth: 6' Groundwater: None Backfilled: 9/13/2017
	+	† †	† †	† †	scale : 1 in = 5 ft

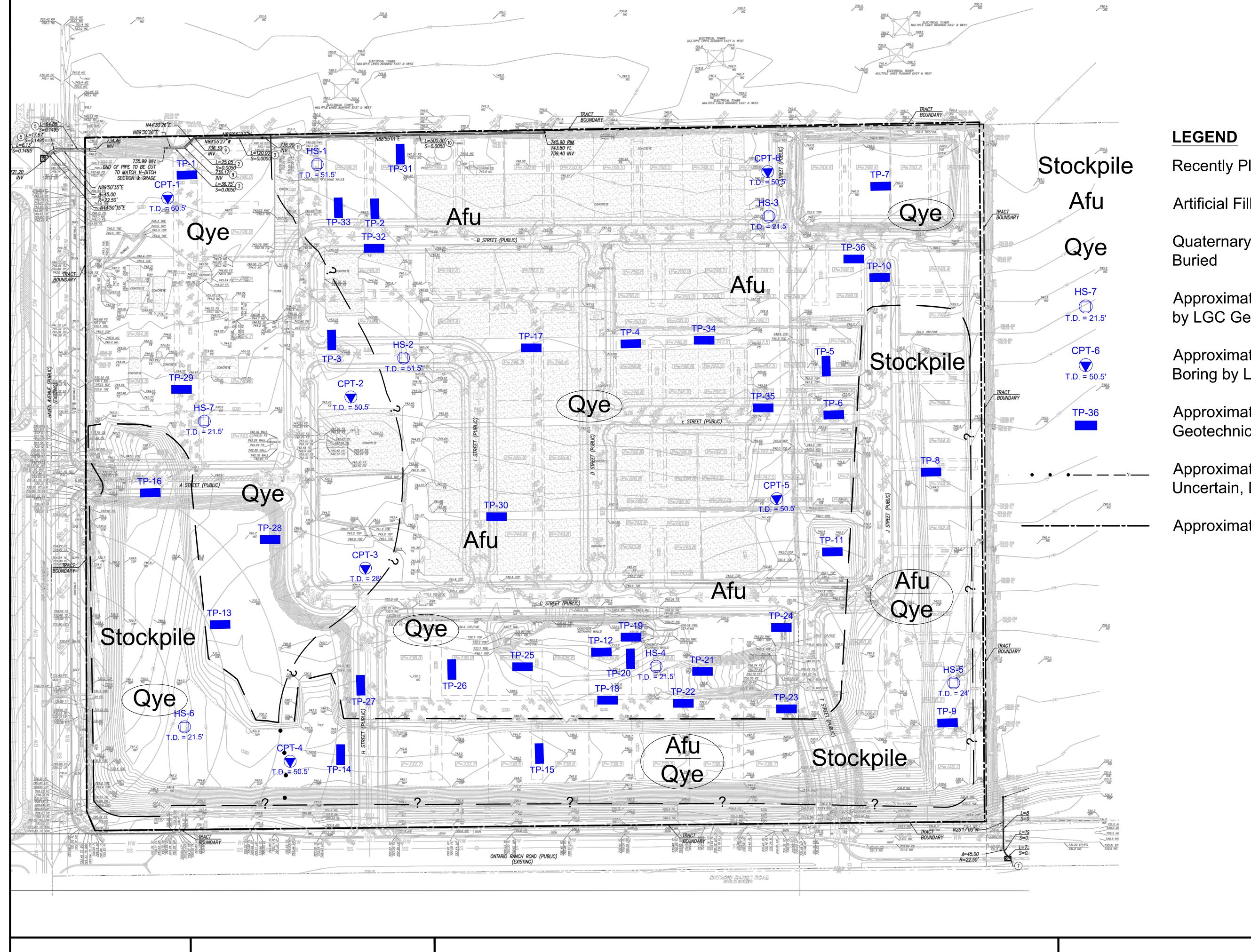
Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-14	<b>S</b>
Project Number : 17114-01	Date: 9/13/2017	Engineering Preparties	1
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map	Engineering Properties:	



Beologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
		@0' to TD Quaternary Young Eolian Deposits	Qye				
		@0' to 1.5' SAND w/ Clay: dark brown, very moist, soft; organic rich, old manure, roots, scattered gravel		sc			
	В	@1.5' to 3.5' Silty SAND: medium to dark brown, moist, slightly to moderately dense; scattered gravels, variable organics, krotovina (old in-filled gopher holes)		SM			
	С	@4' to TD Silty SAND: yellowish brown, very moist, medium dense; lacks induration, lacks organics		SM			

GRAPHICAL REPRESENTATION BELOW:		AL REPRESENTATION BELOW: Elevation: 720 ' MSL		Surface Slope: none	Trend: EW		
-	-	A		+ + + + + + + + + + + + + + + + + + + +			
-		<b>B</b> -					
					Total Depth: 7' Groundwater: None Backfilled: 9/13/2017		
-	_	+	-	+ +	- scale : 1 in = 5 ft		

# Appendix G Geotechnical Subsurface Evaluation Data -Regions North (16159-01)



Recently Placed Soil

Artificial Fill Undocumented, Circled Where Buried

Quaternary Young Eolian Deposits, Circled Where

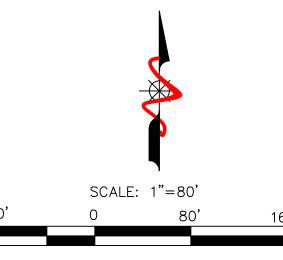
Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

Approximate Location of Exploratory Test Pit by LGC Geotechnical

Approximate Geologic Contact, Queried Where Uncertain, Dotted Where Buried

Approximate Limits of This Report





LGC Geotechnical, Inc. 131 Calle Iglesia, Ste. 200 San Clemente, CA 92672 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Map

CLIENT: **Brookfield Homes** 3200 Park Center Drive, Suite 1000 Costa Mesa, CA 92626

Regions North PROJECT NAME PROJECT NO. 16159-01 ENG. / GEOL. BJE/KTM SCALE 1" = 80' April 2017 DATE

SHEET 1 of 2

#### <u>APPENDIX C</u>

#### **Laboratory Testing Procedures and Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Atterberg Limits</u>: The liquid and plastic limits ("Atterberg Limits") were determined in accordance with ASTM Test Method D4318 for engineering classification of fine-grained material and presented in the table below:

			Plasticity	USCS
Sample Location	Liquid Limit (%)	Plastic Limit (%)	Index (%)	Soil Classification
HS-1 @ 45 feet	27	16	11	CL
HS-2 @ 15 feet	20	19	1	ML
HS-2 @ 30 feet	30	22	8	CL
HS-2 @ 45 feet	31	25	6	ML
HS-4 @ 10 feet	NP	NP	NP	NP
HS-6 @ 15 feet	NP	NP	NP	NP

Grain Size Distribution: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve. The portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D422 (CTM 202). Where an appreciable amount of fines were encountered (greater than 20 percent passing the No. 200 sieve) a hydrometer analysis was done to determine the distribution of soil particles passing the No. 200 sieve.

Sample Location	Description	% Passing # 200 Sieve
HS-2 @ 15 feet	Sandy Silt	73
HS-2 @ 30 feet	Sandy Silt	60
HS-2 @ 45 feet	Sandy Clay	77
HS-6 @ 15 feet	Sandy Silt	71
HS-7 @ 15 feet	Sandy Silt	88

Expansion Index: The expansion potential of selected samples were evaluated by the Expansion Index Test, Standard ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to

#### APPENDIX C

#### Laboratory Testing Procedures and Test Results (Continued)

an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the table below.

Sample Location	Expansion Index	Expansion Potential*
HS-2 @ 15-20 feet	5	Very Low

<sup>\*</sup>Per Chapter 18 of the 2007 C.B.C.; ASTM D 4829 Section 5.3

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample	Sample	Maximum Dry	Optimum Moisture
Location	Description	Density (pcf)	Content (%)
HS-1 @ 0-5 feet	Brown Silty Sand	121.0	8.5

<u>Collapse /Swell Potential:</u> Collapse test were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The Curves are presented in this Appendix.

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring and/or trench logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

Organic Matter Content of Soils: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in the table below:

Sample Location	Organic Content (%)
TP-1 @ 1-2 feet	1.0
TP-1 @ 2-3 feet	0.9
TP-1 @ 5-7 feet	0.9
TP-1 @ 9-10 feet	0.8
TP-2 @ 1-3 feet	2.2
TP-2 @ 5-6 feet	1.1
TP-3 @ 2-3 feet	0.5
TP-3 @ 4-5 feet	1.1
TP-3 @ 8-9 feet	1.0

### APPENDIX C

## Laboratory Testing Procedures and Test Results (Continued)

TP-4 @ 3-4 feet	0.6
TP-4 @ 5-7 feet	0.2
TP-5 @ 0-1 feet	4.6
TP-5 @ 1-2 feet	2.3
TP-5 @ 3-4 feet	0.6
TP-5 @ 6-7 feet	0.6
TP-6 @ 0-1 feet	55.3
TP-6 @ 2-3 feet	0.9
TP-6 @ 4-5 feet	0.6
TP-7 @ 0-1 feet	7.3
TP-7 @ 1-3 feet	0.8
TP-7 @ 3-4 feet	0.5
TP-8 @ 3-4 feet	0.5
TP-8 @ 6-8 feet	0.4
TP-9 @ 2-3 feet	1.1
TP-9 @ 6 feet	8.3
TP-9 @ 7-9 feet	0.9
TP-9 @ 18 feet	0.6
TP-10 @ 0-2 feet	3.2
TP-10 @ 2-4 feet	2.1
TP-10 @ 7-9 feet	0.5
TP-11 @ 0-1 feet	1.6
TP-11 @ 2-3 feet	3.2
TP-12 @ 0-3 feet	3.1
TP-12 @ 4-5 feet	1.2
TP-13 @ 2-3 feet	1.2
TP-14 @ 6-8 feet	4.4
TP-14 @ 9-10 feet	1.0
TP-16 @ 2-3 feet	0.8
TP-16 @ 8-9 feet	1.0

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Project No.: 16159-01 Input By: J. Ward Date: 02/24/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-1	TP-1	TP-1	TP-1	TP-2
Sample No.	GB-1	GB-2	GB-3	GB-4	GB-1
Depth (ft)	1-2	2-3	5-7	9-10	1-3
Soil Description	Yellowish brown poorly- graded sand with silt (SP- SM)	Yellowish brown poorly- graded sand with silt (SP- SM)	Yellowish brown silty sand (SM)	Olive clayey sand (SC)	Yellowish brown silty sand with gravel (SM)g
Wt. of Moist Soil + Container (gm)	1468.48	1919.56	905.29	1534.52	1501.68
Wt. of Dried Soil + Container (gm)	1394.07	1765.60	838.30	1455.69	1424.86
Wt. Container (gm)	108.59	110.83	108.66	109.11	108.64
Crucible No.	3, 9	6, 11	1, 10	26, 13	8, 17
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.83	3.83	3.83	3.33	3.33
Wt. of Dried Soil + Crucible (gm)	102.71	99.66	98.88	94.21	96.78
Wt. of Ash + Crucible (gm)	102.14	99.16	98.38	93.78	95.61
Wt. of Crucible (gm)	42.84	45.49	42.66	43.03	42.60
Moisture Content @ 105 °C (%) "as received"	5.8	9.3	9.2	5.9	5.8
Dry wt. of Soil (gm) (1)	59.87	54.17	56.22	51.18	54.18
Wt. of Ash (gm) (2)	59.30	53.67	55.72	50.75	53.01
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	99.0	99.1	99.1	99.2	97.8
<b>Organic Matter (%)</b> = 100 - (3)	1.0	0.9	0.9	0.8	2.2

Project Name:	Regions North	Tested By:	G. Berdy	Date:	02/17/17

Project No.: 16159-01 Input By: J. Ward Date: 02/24/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-2	TP-3	TP-3	TP-3	TP-4
Sample No.	GB-2	GB-1	GB-2	GB-3	GB-1
Depth (ft)	5-6	2-3	4-5	8-9	3-4
Soil Description	Yellowish brown silty sand (SM)	Yellowish brown poorly- graded sand with silt (SP- SM)	Olive lean clay (CL)	Olive lean clay (CL)	Olive poorly- graded sand with silt (SP- SM)
Wt. of Moist Soil + Container (gm)	1938.34	2410.85	1769.43	2307.49	1907.81
Wt. of Dried Soil + Container (gm)	1806.11	2271.45	1553.07	1998.12	1794.69
Wt. Container (gm)	161.02	109.83	110.99	106.95	107.48
Crucible No.	2, 4	3, 9	6, 11	8, 17	2, 4
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.83	3.33	3.33	3.33	3.28
Wt. of Dried Soil + Crucible (gm)	93.95	95.53	87.19	89.12	98.14
Wt. of Ash + Crucible (gm)	93.36	95.26	86.74	88.67	97.82
Wt. of Crucible (gm)	42.09	42.84	45.49	42.60	42.09
Moisture Content @ 105 °C (%) "as received"	8.0	6.4	15.0	16.4	6.7
Dry wt. of Soil (gm) (1)	51.86	52.69	41.70	46.52	56.05
Wt. of Ash (gm) (2)	51.27	52.42	41.25	46.07	55.73
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	98.9	99.5	98.9	99.0	99.4
<b>Organic Matter (%)</b> = 100 - (3)	1.1	0.5	1.1	1.0	0.6

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Project No.: 16159-01 Input By: J. Ward Date: 02/24/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-4	TP-5	TP-5	TP-5	TP-5
Sample No.	GB-2	GB-1	GB-2	GB-3	GB-4
Depth (ft)	5-7	0-1	1-2	3-4	6-7
Soil Description	Olive poorly- graded sand (SP)	Olive silt with sand (ML)s	Olive silt with sand (ML)s	Yellowish brown poorly- graded sand with silt (SP- SM)	Olive silty sand (SM)
Wt. of Moist Soil + Container (gm)	2063.80	1158.81	1548.98	1729.82	2112.88
Wt. of Dried Soil + Container (gm)	1995.34	1027.75	1511.30	1648.43	2021.19
Wt. Container (gm)	108.80	106.95	109.11	108.80	110.33
Crucible No.	1, 10	5, 7	3, 9	1, 10	3, 9
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.33	3.57	3.87	3.33	3.33
Wt. of Dried Soil + Crucible (gm)	100.78	89.43	102.27	98.66	102.49
Wt. of Ash + Crucible (gm)	100.68	87.11	100.91	98.32	102.13
Wt. of Crucible (gm)	42.66	38.99	42.84	42.66	42.84
Moisture Content @ 105 °C (%) "as received"	3.6	14.2	2.7	5.3	4.8
Dry wt. of Soil (gm) (1)	58.12	50.44	59.43	56.00	59.65
Wt. of Ash (gm) (2)	58.02	48.12	58.07	55.66	59.29
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	99.8	95.4	97.7	99.4	99.4
<b>Organic Matter (%)</b> = 100 - (3)	0.2	4.6	2.3	0.6	0.6

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-6	TP-6	TP-6	TP-7	TP-7
Sample No.	GB-1	GB-2	GB-3	GB-1	GB-2
Depth (ft)	0-1	2-3	4-5	0-1	1-3
Soil Description	Dark brown silty sand (SM)	Olive lean clay (CL)	Gray poorly- graded sand (SP)	Olive silt with sand (ML)s	Olive silt with sand (ML)s
Wt. of Moist Soil + Container (gm)	1077.18	2132.29	1661.86	1243.92	1628.43
Wt. of Dried Soil + Container (gm)	692.76	1842.69	1575.66	1056.57	1549.23
Wt. Container (gm)	107.48	110.99	109.83	109.59	300.21
Crucible No.	12, 24	12, 24	6, 11	13, 26	2, 4
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.57	3.17	3.33	3.57	3.33
Wt. of Dried Soil + Crucible (gm)	67.10	80.32	106.13	86.48	100.24
Wt. of Ash + Crucible (gm)	51.99	79.95	105.79	83.31	99.80
Wt. of Crucible (gm)	39.77	39.77	45.49	43.03	42.09
Moisture Content @ 105 °C (%) "as received"	65.7	16.7	5.9	19.8	6.3
Dry wt. of Soil (gm) (1)	27.33	40.55	60.64	43.45	58.15
Wt. of Ash (gm) (2)	12.22	40.18	60.30	40.28	57.71
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	44.7	99.1	99.4	92.7	99.2
<b>Organic Matter (%)</b> = 100 - (3)	55.3	0.9	0.6	7.3	0.8

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-7	TP-8	TP-8	TP-9	TP-9
Sample No.	GB-3	GB-1	GB-2	GB-1	GB-2
Depth (ft)	3-4	3-4	6-8	2-3	6.0
Soil Description	Olive silt (ML)	Olive silt (ML)	Olive silt with sand (ML)s	Olive silt (ML)	Dark brown silty sand (SM)
Wt. of Moist Soil + Container (gm)	1906.89	2288.30	962.48	1204.29	819.98
Wt. of Dried Soil + Container (gm)	1721.64	2065.16	939.50	1110.78	728.90
Wt. Container (gm)	108.69	109.18	106.97	107.02	109.02
Crucible No.	13, 26	5, 7	8, 17	5, 7	8, 17
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.17	3.17	3.17	3.33	3.57
Wt. of Dried Soil + Crucible (gm)	90.85	90.78	104.98	92.04	89.94
Wt. of Ash + Crucible (gm)	90.60	90.50	104.70	91.47	86.03
Wt. of Crucible (gm)	43.03	38.99	42.60	38.99	42.60
Moisture Content @ 105 °C (%) "as received"	11.5	11.4	2.8	9.3	14.7
Dry wt. of Soil (gm) (1)	47.82	51.79	62.38	53.05	47.34
Wt. of Ash (gm) (2)	47.57	51.51	62.10	52.48	43.43
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	99.5	99.5	99.6	98.9	91.7
<b>Organic Matter (%)</b> = 100 - (3)	0.5	0.5	0.4	1.1	8.3

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-9	TP-9	TP-10	TP-10	TP-10
Sample No.	GB-3	GB-4	GB-1	GB-2	GB-3
Depth (ft)	7-9	18.0	0-2	2-4	7-9
Soil Description	Olive silt (ML)	Olive silt (ML)	Yellowish brown silty sand (SM)	Olive silt with sand (ML)s	Olive silt (ML)
Wt. of Moist Soil + Container (gm)	825.12	644.17	1349.26	2009.58	1757.57
Wt. of Dried Soil + Container (gm)	757.49	621.41	1196.03	1862.34	1530.51
Wt. Container (gm)	76.43	72.51	109.83	108.80	110.33
Crucible No.	12, 24	13, 26	6, 11	12, 24	5, 7
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.33	3.33	3.87	3.33	3.33
Wt. of Dried Soil + Crucible (gm)	93.42	103.84	94.66	88.91	86.80
Wt. of Ash + Crucible (gm)	92.95	103.49	93.09	87.87	86.56
Wt. of Crucible (gm)	39.77	43.03	45.49	39.77	38.99
Moisture Content @ 105 °C (%) "as received"	9.9	4.1	14.1	8.4	16.0
Dry wt. of Soil (gm) (1)	53.65	60.81	49.17	49.14	47.81
Wt. of Ash (gm) (2)	53.18	60.46	47.60	48.10	47.57
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	99.1	99.4	96.8	97.9	99.5
<b>Organic Matter (%)</b> = 100 - (3)	0.9	0.6	3.2	2.1	0.5

Project Name:	Regions North	Tested By:	G. Berdy	Date:	02/17/17

Client: LGC Geotechnical, Inc.

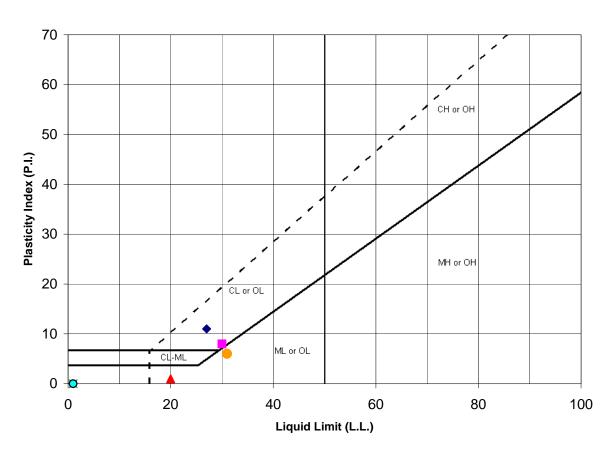
Boring No.	TP-11	TP-11	TP-12	TP-12	TP-13
Sample No.	GB-1	GB-2	GB-1	GB-2	GB-1
Depth (ft)	0-1	2-3	0-3	4-5	2-3
Soil Description	Olive silt with sand (ML)s	Olive silt (ML)	Olive silt (ML)	Olive silt (ML)	Olive lean clay (CL)
Wt. of Moist Soil + Container (gm)	1412.25	1478.96	1381.43	1879.09	2021.67
Wt. of Dried Soil + Container (gm)	1289.45	1365.19	1221.11	1710.10	1769.03
Wt. Container (gm)	110.99	109.18	108.69	106.97	108.66
Crucible No.	6, 11	12, 26	2, 4	5, 7	3, 9
Furnace Temperature ( °C)	440	440	440	440	440
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	Timer used
Duration of Combustion (hr)	3.20	3.33	3.33	3.22	3.20
Wt. of Dried Soil + Crucible (gm)	96.57	94.44	94.68	89.21	87.24
Wt. of Ash + Crucible (gm)	95.77	92.82	93.06	88.59	86.69
Wt. of Crucible (gm)	45.49	43.03	42.09	38.99	42.84
Moisture Content @ 105 °C (%) "as received"	10.4	9.1	14.4	10.5	15.2
Dry wt. of Soil (gm) (1)	51.08	51.41	52.59	50.22	44.40
Wt. of Ash (gm) (2)	50.28	49.79	50.97	49.60	43.85
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	98.4	96.8	96.9	98.8	98.8
<b>Organic Matter (%)</b> = 100 - (3)	1.6	3.2	3.1	1.2	1.2

Project Name: Regions North Tested By: G. Berdy Date: 02/17/17

Client: LGC Geotechnical, Inc.

Boring No.	TP-14	TP-14	TP-16	TP-16	
Sample No.	GB-1	GB-2	GB-1	GB-2	
Depth (ft)	6-8	9-10	2-3	8-9	
Soil Description	Olive silt with sand (ML)s	Olive silt (ML)	Olive brown silt with sand (ML)s	Olive brown silt with sand (ML)s	
Wt. of Moist Soil + Container (gm)	1535.53	568.54	2017.73	2110.93	
Wt. of Dried Soil + Container (gm)	1442.83	546.35	1926.68	2046.45	
Wt. Container (gm)	110.83	108.64	107.02	300.21	
Crucible No.	1, 10	8, 17	2, 4	1, 10	
Furnace Temperature ( °C)	440	440	440	440	
Time In / Time Out	Timer used	Timer used	Timer used	Timer used	
Duration of Combustion (hr)	3.33	3.33	3.20	3.20	
Wt. of Dried Soil + Crucible (gm)	96.35	97.78	93.32	94.10	
Wt. of Ash + Crucible (gm)	93.98	97.23	92.89	93.60	
Wt. of Crucible (gm)	42.66	42.60	42.09	42.66	
Moisture Content @ 105 °C (%) "as received"	7.0	5.1	5.0	3.7	
Dry wt. of Soil (gm) (1)	53.69	55.18	51.23	51.44	
Wt. of Ash (gm) (2)	51.32	54.63	50.80	50.94	
Ash Content (%) = $[(2) / (1)] \times 100$ (3)	95.6	99.0	99.2	99.0	
<b>Organic Matter (%)</b> = 100 - (3)	4.4	1.0	0.8	1.0	

#### PLASTICITY CHART - CLASSIFICATION OF FINE-GRAINED SOILS



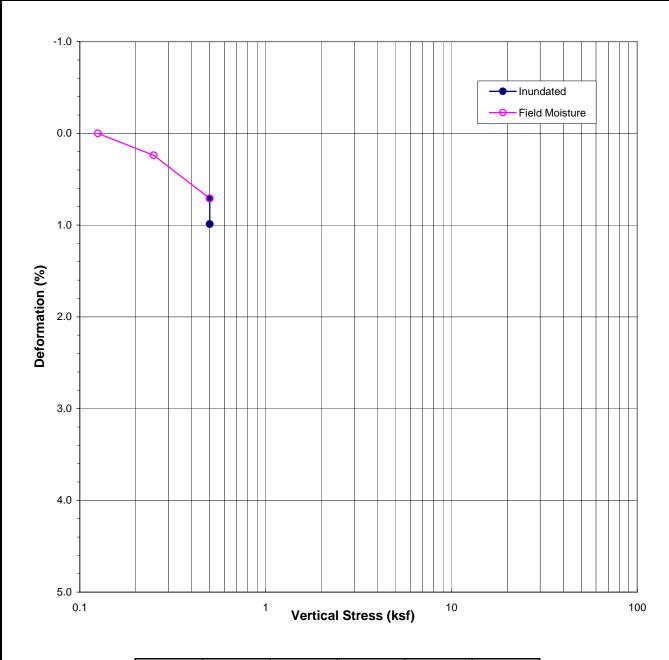
Symbol	Location.:	Sample No.:	Depth (ft)	Passing No. 200 Sieve (%)	Liquid Limit (%) LL	Plastic Limit (%) PL	Plasticity Index (%) Pl	USCS
•	HS-1	SPT-4	45'	-	<b>27</b>	16	11	CL
	HS-2	SPT-2	<b>30'</b>	-	30	22	8	CL
<u> </u>	HS-2	R-5	15'	-	20	19	1	ML
•	HS-2	R-8	45'	-	31	<b>25</b>	6	ML
	HS-4	R-4	10'	-	NP	NP	NP	NP
	HS-6	R-5	15'	-	NP	NP	NP	NP

**NP = Non Plastic** 



ATTERBERG LIMITS (ASTM D 4318) Project Number: 16159-01

Date: Feb-17



Location:	Sample No.:	-1. ( )	Dry Density (pcf)	` '	Final Moisture Content (%)
HS-1	R-2	5'	105.3	10.5	21.0

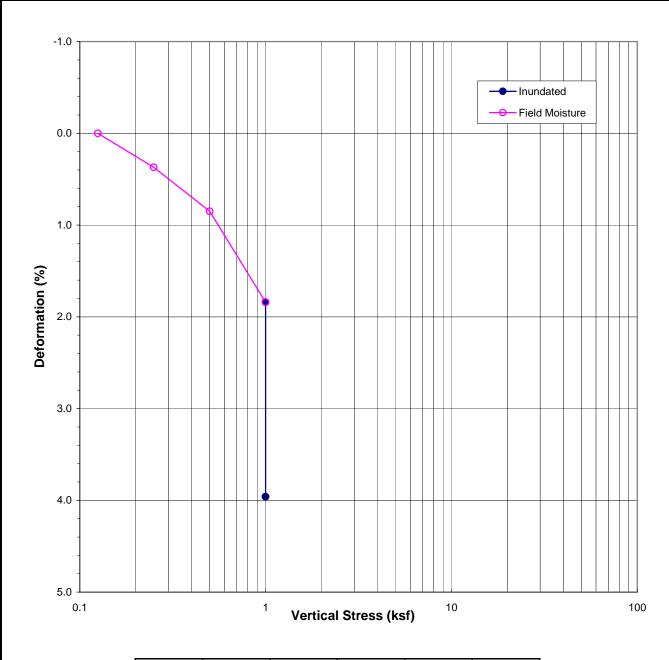
Sample Description: SM



**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



Location:	Sample No.:	. ,	Dry Density (pcf)	` '	Final Moisture Content (%)
HS-1	R-4	10'	104.1	11.1	22.0

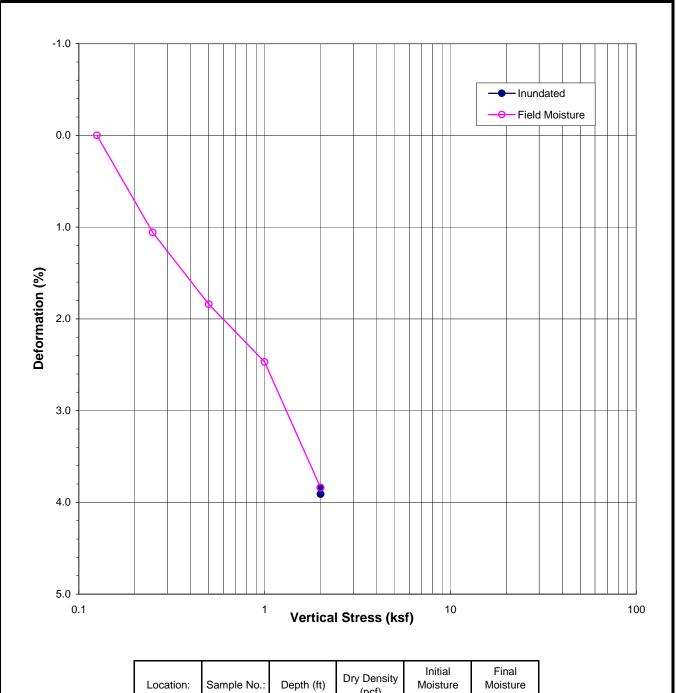
Sample Description: SM



**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



HS-2	R-5	15'	106.5	15.8	24.2
Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)

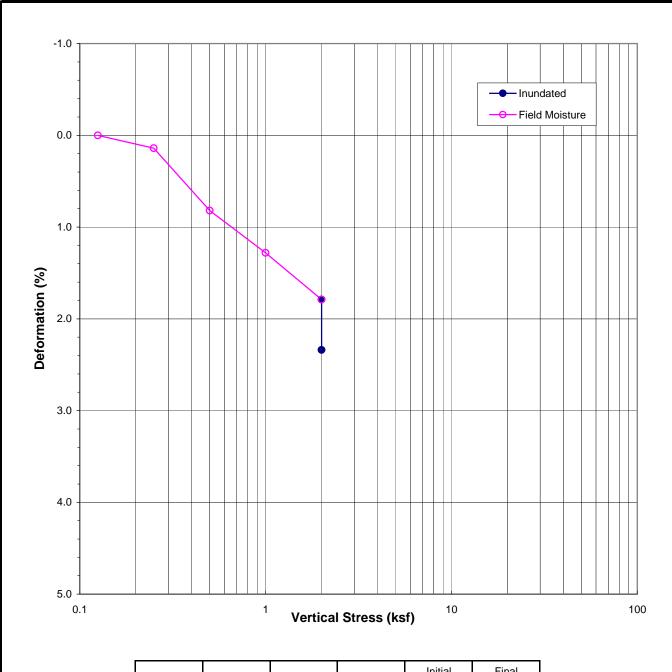
Sample Description: ML

FLGC Geotechnical, Inc.

**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



	Sample No.:	. ,	Dry Density (pcf)	` '	Final Moisture Content (%)
HS-3	R-5	20'	101.0	2.9	23.4

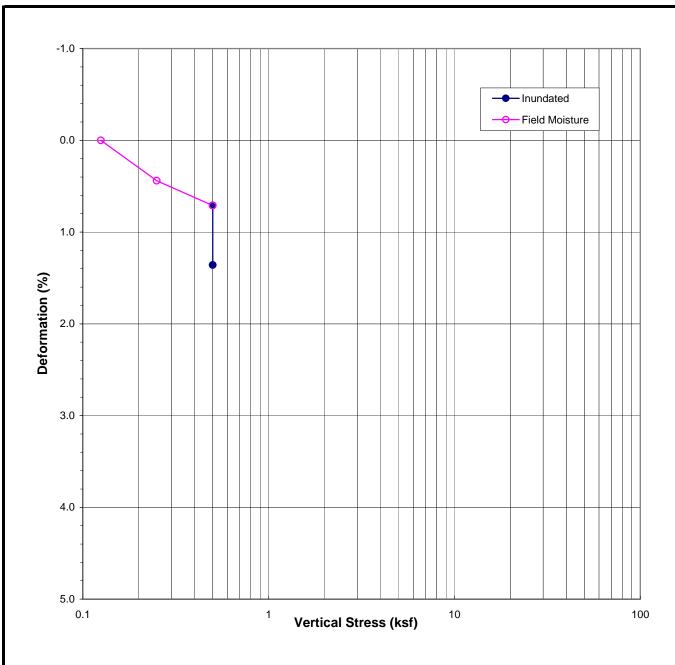
Sample Description: SM



**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



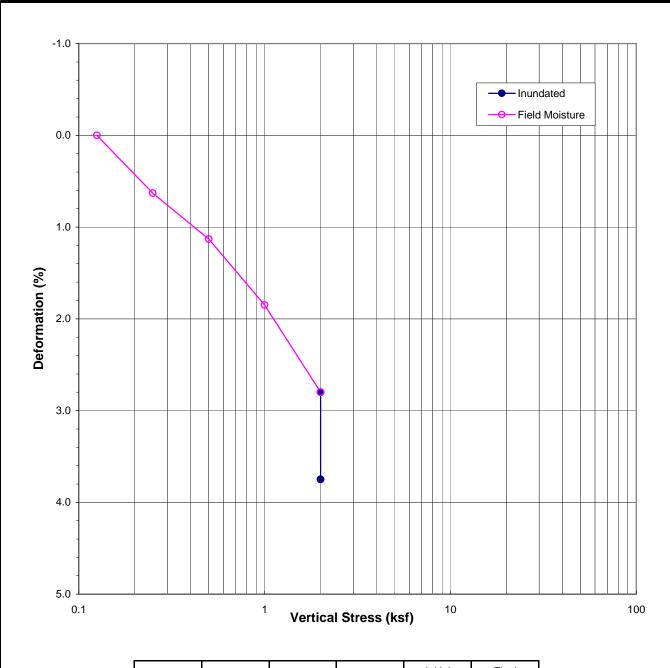
Location: Sample No.	: Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
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Sample Description: SM

**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



HS-6	R-5	15'	105.5	11.1	24.1
Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)

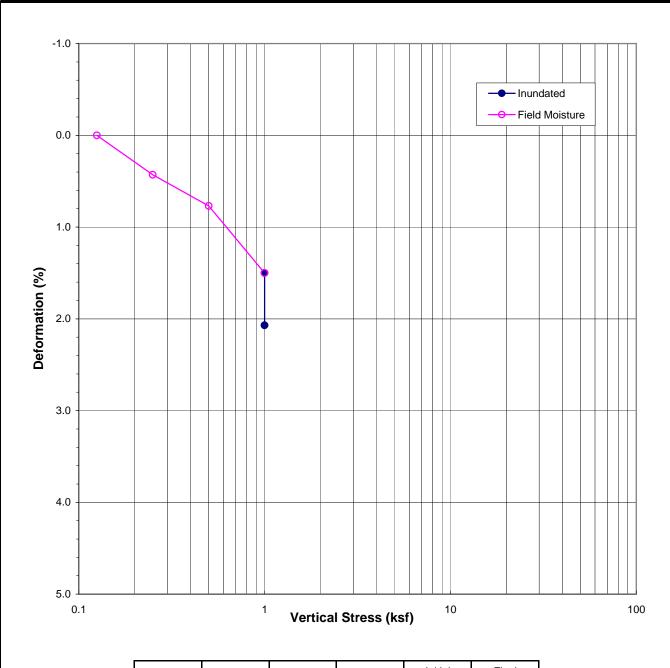
Sample Description: ML



**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17



HS-7	R-3	7.5'	101.0	13.4	24.4
Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)

Sample Description: ML



**COLLAPSE TEST** 

Project Number: 16159-01

Date: Feb-17

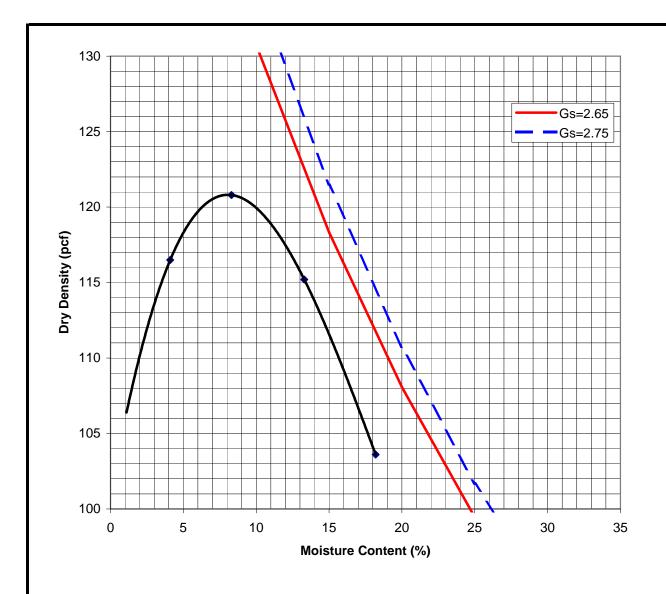
Location	Sample No.	Depth (ft)	Molding Moisture Content (%)	Initial Dry Density (pcf)	Final Moisture Content (%)	Expansion Index	Expansion Classification <sup>1</sup>
HS-2	B-1	15'-20'	9.7	117.7	14.4	5	Very Low



**EXPANSION INDEX** (ASTM D 4829)

 Project Number:
 16159-01

 Date:
 Feb-17

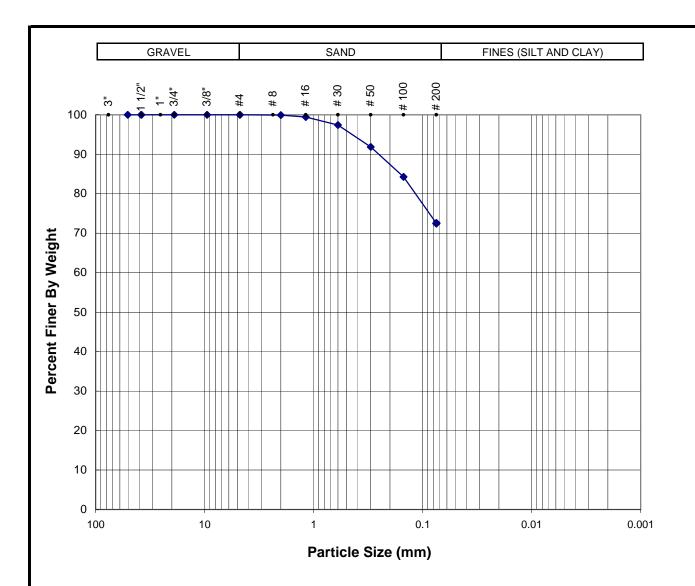


Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-1	B-1	0-5'	Brown Silty Sand	121.0	8.5



LABORATORY COMPACTION (ASTM D 1557) Project Number: 16159-01

Date: Feb-17



Location:	Sample	Depth	Soil	Gravel	Sand	Fines
Location.	No.:	(ft.)	Type	(%)	(%)	(%)
HS-2	R-5	15'	ML	0	27	73

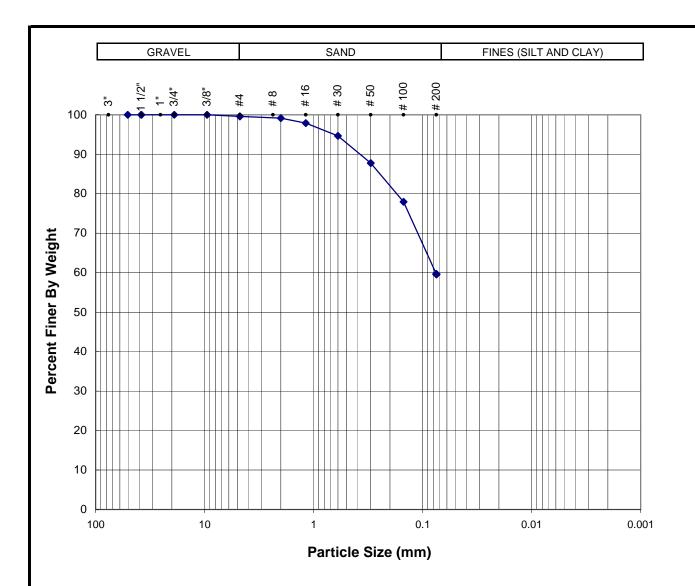
Sample Description: Sandy Silt



**PARTICLE SIZE ANALYSIS** 

(ASTM D 422)

Project Number: 16159-01 Date: Feb-17



HS-2	SPT-2	30'	ML	0	40	60
Location.	No.:	(ft.)	Type	(%)	(%)	(%)
Location:	Sample	Depth	Soil	Gravel	Sand	Fines

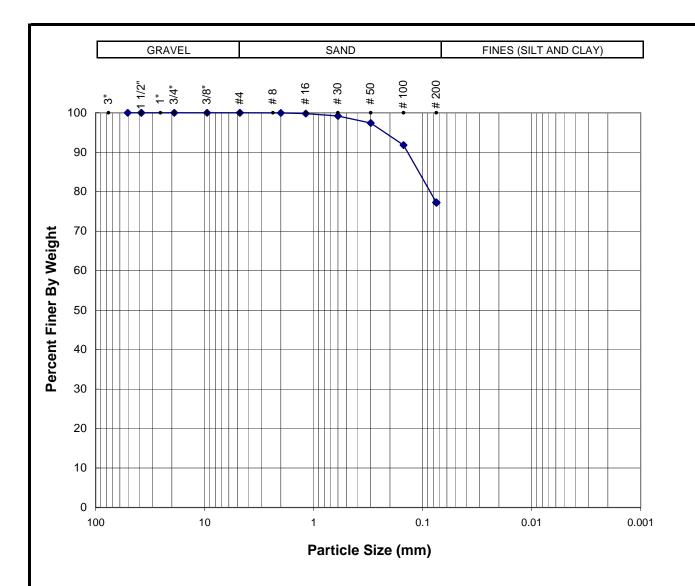
Sample Description: Sandy Silt



**PARTICLE SIZE ANALYSIS** 

(ASTM D 422)

Project Number: 16159-01 Date: Feb-17



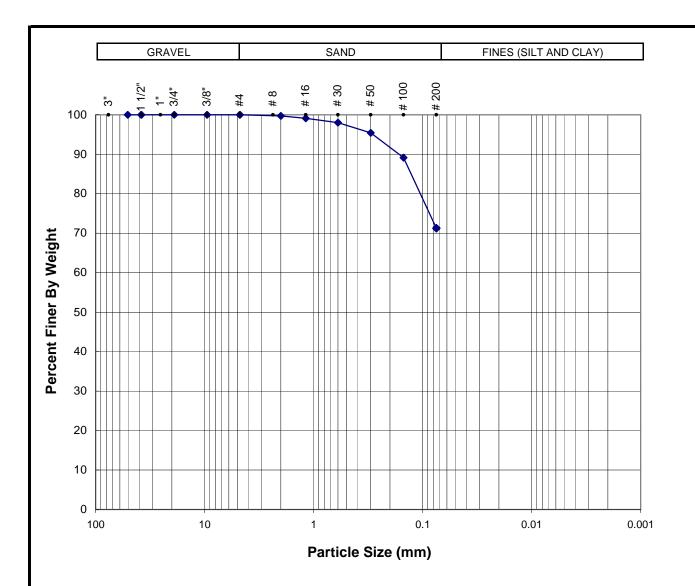
Location:	Sample	Depth	Soil	Gravel	Sand	Fines
Location.	No.:	(ft.)	Type	(%)	(%)	(%)
HS-2	R-8	45'	CL	0	23	77

Sample Description: Sandy Clay



PARTICLE SIZE ANALYSIS (ASTM D 422) 
 Project Number:
 16159-01

 Date:
 Feb-17



Location:	Sample	Depth	Soil	Gravel	Sand	Fines
Location.	No.:	(ft.)	Type	(%)	(%)	(%)
HS-6	R-5	15'	ML	0	29	71

Sample Description: Sandy Silt

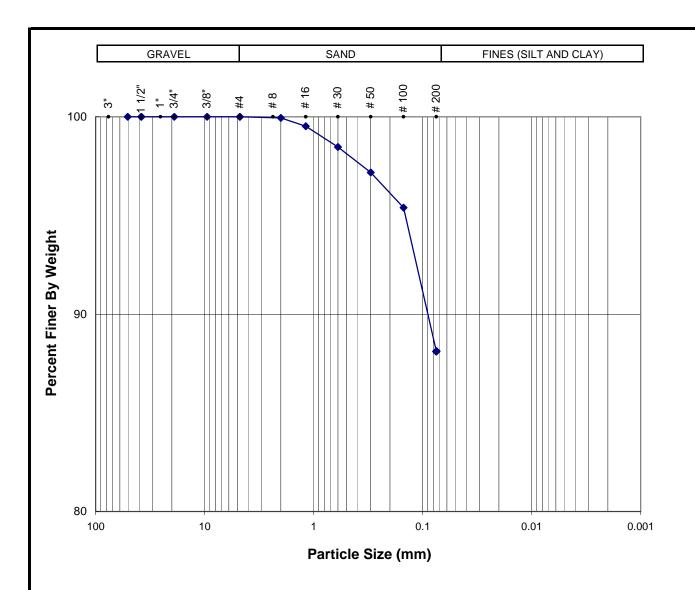


PARTICLE SIZE ANALYSIS

(ASTM D 422)

 Project Number:
 16159-01

 Date:
 Feb-17



Location:	Sample	Depth	Soil	Gravel	Sand	Fines
Location.	No.:	(ft.)	Type	(%)	(%)	(%)
HS-7	SPT-1	15'	ML	0	12	88

Sample Description: Sandy Silt



PARTICLE SIZE ANALYSIS

(ASTM D 422)

 Project Number:
 16159-01

 Date:
 Feb-17

				Geo	techi	nical	Bor	ing Log Borehole HS-1	
	2/9/2							Drilling Company: Cal Pac	
			Regio					Type of Rig: Hollow Stem	
			<b>∍r</b> : 161					Drop: 30" Hole Diameter:	8"
			-		~747' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See C	Seote	chnical	Map		Page 1	of 2
			_		Ę.			Logged By CNJ	
			  -  -		<u>od</u>		0	Sampled By CNJ	
(H)		og-	<u> </u>	⊒	<u>i</u>	8	mb	Checked By BJE	es
on O	(ft)	C	<del> </del>	Count	Sus	<u>ə</u>	Sy		of T
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number		Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
<u>e</u>	Эер	Gra	Sar	Blow (		۸oi	)S(	DESCRIPTION	Ŋ
Ш		P-1	0,	┼╨				Undocumented Artificial Fill (Afu):	'
	U -		-	-			SM	@0.5' - Grass and scattered hay remnants	
745-	_		l _ ,	· <u> </u>				@1' - Silty SAND: light brown, wet (recent rain), dense.	MD
	_		R-1	1 1 5	99.9	7.5	SP	@2.5' - SAND : light brown, moist, loose, bits of plastic and rootlets.	
				3				Quaternary Young Eolian Depostis (Qye):	
	5 —	ш	R-2	4 5 7	105.3	10.5	SM	@5' - Silty SAND: light brown, moist, medium dense,	co
740	_			7				rootlets.	
740-			R-3	2	110.1	17.0	SC	@7.5' - Clayey SAND: light brown, very moist, medium	
				2 4 6				Dense, few root casts.	
	10 —						014	OAOL CIII OAND II da barra di	
	_		R-4	3 3 8	104.1	11.1	SM	@10' - Silty SAND: light brown, slightly moist, medium Dense, fine grained sand.	CO
735-	_							Bones, mie grames eans.	
	_			.					
	_	-5	-	-					
	15 —	Ė	SPT-1	1 4		14.5	ML	SILT with some SAND: light brown, dry, stiff.	
	_			4 5 7					
730-	_			•					
	_			1					
	-			1					
	20 —		R-5	7 12 18	99.6	2.2	SP	SAND: light brown, dry, dense, micaceous.	
725-				18					
125	_								
	_								
	25 —		SPT-2	1 5		,	SM	Silty SAND: brown, slightly moist, medium dense, iron	
	_		SF 1-2 \	5 6 11		4.9	SIVI	oxide, some gravel.	
720-	_			-				3	
	-			-					
	_		-	-					
	30 —			-					
								LIV AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
								MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y



OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

□ GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-1  Date: 2/9/2017 Drilling Company: Cal Pac											
									Drilling Company: Cal Pac			
			Regio						Type of Rig: Hollow Stem			
			<b>:</b> 161						Drop: 30" Hole Diameter:	8"		
			•			~747' N			Drive Weight: 140 pounds			
Hole	Locat	tion:	See (	G	eote	chnical	Мар		Page 2 c	of 2		
			_ L			(F)			Logged By CNJ			
			βqι			)   	(	0	Sampled By CNJ			
Elevation (ft)	_	Graphic Log	Sample Number		II	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test		
ion	(ft)	<u>                                      </u>	\( \rac{1}{2} \)		Blow Count	sus	ľe	S	•	of T		
vat	Depth (ft)	lph	ldu		>	ا ص	stu	SS		9		
<u> </u>	Эер	Gra	Sar		30	)ry	Лoi	)S(	DESCRIPTION	Ŋ		
Ш						Ш						
	30 _		R-6		4 10 15	113.6	16.5	SM	Silty SAND: grayish brown to reddish brown, mottled, moist, medium dense, iron oxide, some small gravels			
715-	_				13	113.0	10.5		miciot, modium dense, non oxide, come andii gravole			
	_			$\vdash$								
	_			H								
	35 —		SPT-3	Н	7		7.2	ML-SP	Silt with SAND: light brown, slightly moist, medium			
	_			М	7 9 14				dense.			
710-	_			$\vdash$								
	_			$\vdash$								
	-											
	40 —	1	R-7		5 14 24	113.4	7.5	sc	Clayey SAND: brown, moist, dense.			
705	_				24							
705-	_											
	_											
	45 <del></del>											
	45 _		SPT-4	M	9 12 14		20.3	CL-SP	CLAY with SAND: brown, moist, hard.	AL		
700-	_			H	14							
700	_			Ll								
	_			Ll								
	50		R-8		7	447.0	45.7	CL-SP	Clay with CAND brown maint hard missessus			
	_		K-0		7 15 26	117.9	15.7	CL-SP	Clay with SAND, brown, moist, hard, micaceous, manganese oxide, fine grain sand.			
695-	_			-					Total Depth = 51.5'			
	_			H					Groundwater Not Encountered			
	_			$\vdash$					Backfilled with Cuttings on 2/9/2017			
	55 —			$\vdash$								
	_			$\vdash$								
690-	_			$\vdash$								
	-			$\vdash$								
	_			$ \cdot $								
	60 —											
						OF TH	HIS BORING	G AND AT TH	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR			
					-				MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	′		



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

Date: 2/9/2017   Project Name: Regions North   Type of Rig: Hollow Stem   Project Number: 16:159-01   Drop: 30"   Hole Diameter: 8"   Hole Location: See Geotechnical Map   Page 1 of 2					Geo	techi	nica	l Bor	ing Log Borehole HS-2	
Project Number: 16:159-01 Elevation of Top of Hole: ~743' MSL Hole Location: See Geotechnical Map Page 1 of 2  Logged By CNJ Sampled By CNJ Checked By BJE  DESCRIPTION  R-1 R-1 R-1 R-2 R-3 R-3 R-3 R-4 R-5 R-5 R-5 R-5 R-5 R-5 R-6 R-5 R-6 R-7 R-6 R-7 R-6 R-7	Date:	2/9/2	017							
Bility Sampled By CNJ   Checked By BJE   Sampled By CNJ   Checked By BJE									Type of Rig: Hollow Stem	
Hole Location: See Geotechnical Map   Page 1 of 2										8"
Logged By CNJ Sampled By CNJ Checked By BJE  Logged By CNJ Sampled By CNJ Checked By BJE  Logged By Checked By BJE  Logged B									- :	
Sampled By CNJ Checked By BJE  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  Indocumented Artificial Fill (Afu): (20: - Graval / old asphalt. Counternary Young Eoilan Deposits (Qye): SAND: brown, moist, medium dense.  R-2	Hole	Locat	ion:	See (	Geote	chnical	Map		Page 1 c	of 2
Undocumented Artificial Fill (Afty):  @0' - Gravel / old asphalt. Quatermary Young Eolian Deposits (Que): SAND: brown, moist, medium dense.  R-2  6 107.9 18.1 ML SILT: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-3  10 - R-5  R-4  7 112.1 9.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  EI  R-5  R-7  15 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6  SPT-1 7 7 8 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.				ايرا		Ę.			Logged By CNJ	
Undocumented Artificial Fill (Afty):  @0' - Gravel / old asphalt. Quatermary Young Eolian Deposits (Que): SAND: brown, moist, medium dense.  R-2  6 107.9 18.1 ML SILT: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-3  10 - R-5  R-4  7 112.1 9.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  EI  R-5  R-7  15 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6  SPT-1 7 7 8 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.				- eqι		<u>  @</u>		<u> </u>	Sampled By CNJ	
Undocumented Artificial Fill (Afty):  @0' - Gravel / old asphalt. Quatermary Young Eolian Deposits (Que): SAND: brown, moist, medium dense.  R-2  6 107.9 18.1 ML SILT: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-3  10 - R-5  R-4  7 112.1 9.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  EI  R-5  R-7  15 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6  SPT-1 7 7 8 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.	<b>#</b>		og.	lun	l t	_ <u>≥</u>	8	g H	Checked By BJE	est
Undocumented Artificial Fill (Afty):  @0' - Gravel / old asphalt. Quatermary Young Eolian Deposits (Que): SAND: brown, moist, medium dense.  R-2  6 107.9 18.1 ML SILT: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-3  10 - R-5  R-4  7 112.1 9.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  EI  R-5  R-7  15 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6  SPT-1 7 7 8 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.	o U	(ft)	c L	0)	l oʻ	SUS	ē	Sy	,	f T
Undocumented Artificial Fill (Afty):  @0' - Gravel / old asphalt. Quatermary Young Eolian Deposits (Que): SAND: brown, moist, medium dense.  R-2  6 107.9 18.1 ML SILT: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-3  10 - R-5  R-4  7 112.1 9.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  EI  R-5  R-7  15 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6  SPT-1 7 7 8 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.	/ati	ţ	phi	ηdι	>	_ De	stu	တ္သ		e o
Undocumented Artificial Fill (Afty):  (@0' - Gravel / old asphalt.  (Quatermary Young Eolian Deposits (Qye): SAND: brown, moist, medium dense.  R-2  (a) 107.9  (b) 107.9  (c) 1	<u> </u>	Эер	ira	)an	6	<u>\</u>	10 <u>i</u>	18(	DECODIDATION	yp_
R-1	Ш			0)	_ш	Ц				
R-1   6   108.6   6.5   SP		0 _		-	-					
R-2 6 107.9 18.1 ML SILT: brown, moist to very moist, stiff.  R-3 5 112.0 6.9 SM Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.  R-4 7 112.1 9.9 SM Silty SAND: grayish brown, slightly moist, medium dense, fine grains of sand.  R-5 2 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		_			-				Quaternary Young Eolian Deposits (Qye):	
R-2	740-	_		R-1	6 6	108.6	6.5	SP	SAND: brown, moist, medium dense.	
R-3		_			9					
R-3		5 —		R-2	6	107.9	18.1	ML	SILT: brown, moist to very moist, stiff.	
R-4 7 112.1 9.9 SM Silty SAND: grayish brown, slightly moist, medium dense, fine grains of sand.  R-5 7 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 2 106.5 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		_			10				, ,	
R-4 7 112.1 9.9 SM Silty SAND: grayish brown, slightly moist, medium dense, fine grains of sand.  R-5 7 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 2 106.5 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		-		D 0	-	440.0		0.4	City CAND have a sixt and live days	
R-4 7 112.1 9.9 SM Silty SAND: grayish brown, slightly moist, medium dense, fine grains of sand.  R-5 7 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 2 106.5 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.	735-	_		R-3	8 14	112.0	6.9	SIVI		
R-5 2 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 7 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		-	7-		14				angular gravers, fine grains or saird.	
R-5 2 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 7 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		10 —	Ĭ	R-4	7	112.1	9.9	SM		EI
R-5 2 3 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 7 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  THIS SUMMARY APPLIES ONLY AT THE LOCATION OXIDE, SAMPLE TYPES:  B BULK SAMPLE  TEST TYPES: DIRECT SHEAR  TEST TYPES: DIRECT SHEAR		=			16				dense, fine grains of sand.	
R-5 2 3 106.5 15.8 ML-SP Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.  SPT-1 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  R-6 5 7 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  THIS SUMMARY APPLIES ONLY AT THE LOCATION OXIDE, SAMPLE TYPES:  B BULK SAMPLE  TEST TYPES: DIRECT SHEAR  TEST TYPES: DIRECT SHEAR	720				-					
725 - SPT-1 7 7 8 9 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  This summary applies only at the Location of this bornog and at the time of prilling.  This summary applies only at the Location of this bornog and at the time of prilling.  SAMPLE TYPES:  B BULK SAMPLE TYPE	/307									
725 - SPT-1 7 7 8 9 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  This summary applies only at the Location of this bornog and at the time of prilling.  This summary applies only at the Location of this bornog and at the time of prilling.  SAMPLE TYPES:  B BULK SAMPLE TYPE		15							0. 0. 7 0.0. 5	
SA		10 _		R-5	3	106.5	15.8	ML-SP		
725 - 20 - SPT-1 7 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  720 - 25 - R-6 5 7 9 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  715 - 30 - This Summary applies only at the Location of This Borning and at the Location of This Borning and at the Location of This Borning and at the Time of Drilling.  8 SAMPLE TYPES: DISC DIRECT SHEAR.		_			- 5				moist, still, from oxide, trace rootiet, pores.	
SPT-1 7 8 9 26.6 SM Sandy SILT, brown, moist stiff, laminations.  720- 25- R-6 5 9 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  715- 30- This summary applies only at the Location of this boring and at the time of prilling.  This summary applies only at the Location of this boring and at the time of prilling.  B BULK SAMPLE TYPES: Discot shear of the principle of the prin	725-	_			-					SA
720 - R-6	1 - 2	_			-					
720 -		20 —		SDT 1	7		26.6	SM	Sandy SILT brown moist stiff laminations	
720 – 25 – R-6 5 7 103.1 16.2 CL Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  715 – 30 – This summary applies only at the location of this boring and at the time of prilling.  This summary applies only at the location of this boring and at the time of prilling.  B BULK SAMPLE DS DIRECT SHEAR		_		3F 1-1	X 8		20.0	Sivi	Januy Sier, brown, moist sun, iainmations.	
R-6 R-6 THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING.  Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.  Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.		_		-	-					
715— — THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING.  THIS SUMMARY APPLIES ONLY AT THE LOCATION B BULK SAMPLE TYPES:  B BULK SAMPLE TYPES:  B BULK SAMPLE  DS DIRECT SHEAR	720-	_			-					
715— — THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING.  THIS SUMMARY APPLIES ONLY AT THE LOCATION B BULK SAMPLE TYPES:  B BULK SAMPLE TYPES:  B BULK SAMPLE  DS DIRECT SHEAR		_		-	-					
oxide, scattered gravel, mottled.  715 –		25 —		R-6	<u>5</u>	103.1	16.2	CL	Silty CLAY: brown/gray, moist, stiff, micaceous, iron	
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING.  B BULK SAMPLE TYPES: TEST TYPES: DS DIRECT SHEAR		_			7 9					
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING.  B BULK SAMPLE TYPES: TEST TYPES: DS DIRECT SHEAR		-			-					
THIS SUMMARY APPLIES ONLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: OF THIS BORING AND AT THE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	715-	_			-					
THIS SUMMARY APPLIES ONLY AT THE LOCATION SAMPLE TYPES: TEST TYPES: OF THIS BORING AND AT THE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR					-					
OF THIS BORING AND AT THE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR		30 —			-					
						OF T	HIS BORIN	G AND AT THE	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	,



OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

RING SAMPLE (CA Modified S GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE ✓ GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

				Geo	tech	nica	l Bor	ing Log Borehole HS-2	
Date:	2/9/2	2017						Drilling Company: Cal Pac	
			Regio					Type of Rig: Hollow Stem	
			e <b>r</b> : 161					Drop: 30" Hole Diameter:	8"
			_		~743' [			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	<u>Seote</u>	chnica	Map		Page 2 o	of 2
					Ë			Logged By CNJ	
			adr		<u>&amp;</u>		0	Sampled By CNJ	
Elevation (ft)	_	Graphic Log	Sample Number	l∓	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test
ion	$(\sharp)$	<u>  :</u>	<del> </del>	Blow Count	SUE	<u>e</u>	်		) T
vat	)th	l d	du		🋎	stu	၂ လ		e e
	Depth (ft)	Great	Sar	36	) 	Moi	) SC	DESCRIPTION	₹
Ш	30		SPT-2			17.3	SM	Sandy SILT, brown, moist, stiff, laminations.	'
	30 _		SF1-2	√ 4 6 8		17.3	Sivi	Sandy SILT, brown, moist, still, laminations.	AL
	_	1	l F	-]					SA
710-	_	1		-					
	_	1		-					
	35 —	1	R-7	3 10 25	112.9	14.0	SP - GP	SAND with GRAVEL: gray and orange, mottled, moist,	
	_	1		25				dense, few scattered root pores.	
	_	1		-					
705-	_	1		-					
	40			-					
	40 —	1	SPT-3	6 11		18.2	SM	Sandy SILT: orange/brown, moist, very stiff, micaceous,	
				11				iron oxide.	
700-				_					
700	_			_					
	45 —							OLANA massish hassus masish some stiff increased	AL
	-		R-8	2 8 14	97.8	21.0	CL	CLAY: grayish brown, moist, very stiff, iron oxide, manganese oxide, woody bits, traces of pinhole porosity.	SA
	_			- 14				manganese oxide, woody bits, traces of primote porosity.	
695-	_			-					
	_			-					
	50 —		SPT-4	7		14.6	sc	Sandy CLAY: brown, moist, very stiff, iron oxide,	
	_	1		11 16		14.0		manganese oxide, fine grains of sand, pinhole porosity.	
	-	1		-					
690-	_	1		-				Total Doubh - 54 5!	
	_			-				Total Depth = 51.5' Groundwater Not Encountered	
	55 <del></del>	1		-				Backfilled with Cuttings on 2/9/2017	
	_	†		-				3	
005	_	1		-					
685-	_	1		-					
	60	1		-					
	60				<u> </u>	0.11	ADDUTE	NATTUS LOCATION - PARTY - TOTAL	
	>				OF T	HIS BORING	G AND AT TH	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	, I
	2				LOCA	ATIONS ANI		GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV

				Geo	tech	nica	Bor	ing Log Borehole HS-3	
Date:	2/9/2	2017						Drilling Company: Cal Pac	
			Regio					Type of Rig: Hollow Stem	
			e <b>r:</b> 161					Drop: 30" Hole Diameter:	8"
			•		~748' [			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnica	Map		Page 1 c	of 1
			<u>_</u>		<del>(;</del>			Logged By CNJ	
			apr		<u>&amp;</u>		0	Sampled By CNJ	ا با
Elevation (ft)	_	Graphic Log	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test
<u>o</u>	(ft)	<u>  ]                                   </u>	Z	9	Sus	<u>e</u>	Sy		)f T
vat	Depth (ft)	hd	l du	Blow Count	🋎	stu	SS		e e
<u>e</u>	Эер	<u> </u>	Sar	<u> </u>	) 	Moi	)S(	DESCRIPTION	Ŋ
	] 0	$\vdash$		+					'
	0 -			- 5 5 5				Undocumented Artificial Fill (Afu): Old asphalt turned gravel, scattered bones, broken	
	_			-			_	glass.	
735-	_		R-1	4 8 7	103.3	8.6	S	SAND: brown, moist, medium dense, roots, some	
	_			- '				organics.	
	5 —	_	R-2	4 4 6	97.2	20.4	SC	Clayey SAND: grayish brown, wet, organics, hay and	
	_			6				plastic.	
700	_		R-3	4	100.7	19.6	SC	Clayey SAND: black, wet, medium dense, approx. 30%	
730-	_		11-5	4 10 27	100.7	13.0	00	organics/plastics.	
	10 —		[						
	10 —		R-4	2 4 7	113.0	3.6	SP	SAND: brown, very moist, dense, some organics.	
	_			_				Quaternary Young Eolean Deposits (Qye):	
725-	_			_					
	_			-					
	15 —		SPT-1			26.1	SM	Silty SAND: brown, moist, dense.	
	_		01 1-1	2 4 7		20.1	OIVI	Only OAND. Brown, moist, dense.	
	_			-					
720-	_			-					
	_			-					
	20 —		R-5	4	101.0	2.9		SAND: very light brown, slightly moist, medium dense,	СО
	_			4 7 15				fine grained.	
_,_	-			-				Total Depth = 21.5'	
715-	_			-				Groundwater Not Encountered	
	25 —			-				Backfilled with Cuttings on 2/9/2017	
	20 —			[					
			[	_					
710-	_			_					
	_			_					
	30 —			-					
			ı l					ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GF AT THIS I OCATION G GRAB SAMPLE SA SIEVE ANALYSIS	Y



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE

✓ GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-4								
	2/9/2							Drilling Company: Cal Pac	
			Regio					Type of Rig: Hollow Stem	
			<b>:</b> 161					Drop: 30" Hole Diameter:	8"
			_		~738' [			Drive Weight: 140 pounds	
Hole	Hole Location: See Geotechnical Map							Page 1 o	of 1
			_					Logged By CNJ	
			pe		) DC		<del>-</del>	Sampled By CNJ	
<b>H</b>		go	l un	<del> </del>	<u> </u>	(%	qu	Checked By BJE	əst
Elevation (ft)	ſft)	Graphic Log	Sample Number	Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	Since it is a second of the se	Type of Test
atje	Depth (ft)	iğ	bld	$   \circ$		stur	လွ		0
<u>è</u>	ер	ğ	ar	Blow (	<u>&gt;</u>	lois	SC		ype
Ш		ဗ	S	Δ		2	$\cap$	DESCRIPTION	$\vdash$
	0 _			-				Undocumented Artificial Fill (Afu): Old asphalt turned gravel, scattered bones, broken	
	_		R-1	- 5	99.2	22.1	SM	glass. Quaternary Young Eolian Deposits (Qve):	
735-	_		11/-1	5 4 6			Sivi	<u>Quaternary Young Eolian Deposits (Qye):</u> Silty SAND: brown, very moist, medium dense,	
	5 —				00.0			micaceous.	
	5—		R-2	5 7 8	98.0	4.4	SP	SAND: light, brown, very moist, medium dense,	CO
				8 _				micaceous.	
730-	_		R-3	5 5 8	93.6	20.6	SM	Sandy SILT: brown, slightly moist, stiff.	
''	_			8					
	10 —		R-4	5	101.5	9.1	ML	SILT: grayish brown, slightly moist, stiff.	AL
	_			5 7 8					
	-			-					
725-	_		•	-					
	4.5			-					
	15 —		R-5	3 5 7	87.7	29.8	SM	Sandy SILT, grayish brown, moist, stiff.	
				7					
720-									
1207									
	20 —					17.0			
			SPT-1	5 7 9		17.0		Sandy SILT, grayish brown, moist, stiff, micaceous.	
	_			/ \				Total Depth = 21.5'	
715-	_			-				Groundwater Not Encountered	
	_			-				Backfilled with Cuttings on 2/9/2017	
	25 —			-					
	-			-					
	_			-					
710-	-			-					
	-			-					
	30 —			-					
					OF T	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR  DS DIRECT SHEAR	,
	5							MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	,



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE
SPT STANDARD PENETRATION
TEST SAMPLE

✓ GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Geo	tech	nica	Bor	ing Log Borehole HS-5					
	2/9/2							Drilling Company: Cal Pac					
			Regio					Type of Rig: Hollow Stem					
			e <b>r:</b> 161					Drop: 30" Hole Diameter:	8"				
					~742' [			Drive Weight: 140 pounds					
Hole Location: See Geotechnical Map							Page 1	of 1					
			<u> </u>		<del> </del>			Logged By CNJ					
			ape		<u>&amp;</u>		0	Sampled By CNJ					
(ff.	_	og-	l n	⊒	<u>₹</u>	%)	mr	Checked By BJE	es				
ion	(ft)	10	Z	9	Sus	<u>e</u>	Sy		of T				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test				
<u> </u>	Эер	3ra	Sar	<u> </u>	) 	Moi	JS	DESCRIPTION	Ŋ				
Ь—	]	$\overline{}$	0,	╀╨					'				
	0 -			-			SM	Scattered weeds					
740-	_			-]	119.3	6.8		Stockpile over Undocumented Artificial Fill (Afu):					
	_		R-1	18 27 37	119.5	0.0	SM	Silty SAND: dark brown, slightly moist, very dense,					
	_			37				strong organic odor.					
	5 —		R-2	15 18 20	106.5	9.3	SP	Fine grain SAND: dark gray, moist, very dense,					
	_			20				abundant organics @ 6'.					
735-	_		R-3	- 6	100.7	4.5	SP	SAND: gray, slightly moist, dense, decreased odor.					
				6 10 18	100.7	1.0	0.	o, ii 12. gray, ongritty molet, acrice, accidence eacr.					
	10 —												
	_		R-4	7 13 17	106.2	4.6		SAND: gray with black at base of sample, slightly moist, dense, strong organic odor.					
730-	_			-   '/				dense, strong organic odor.					
	_			-									
	_			-				Quaternary Young Eolean Deposits (Qye):					
	15 —		SPT-1	5		17.5	ML	Sandy SILT: gray, slightly moist, stiff, strong organic					
	_			5 6 6				odor.					
725-	_			-									
	_			-									
	_			-									
	20 —		R-5	5 12 19	101.4	2.7	SP	SAND: brown, slightly moist, dense, no odor.					
700	_			19									
720-	_			-									
	_			-									
	25 —		SPT-2	∑ 6 10		6.8	SM	Silty SAND: light brown, slightly moist to moist, dense,					
				7\ 11 -				no odor.					
715-	_	-		_				Total Depth = 25.5' Groundwater Not Encountered					
	_			-				Backfilled with Cuttings on 2/9/2017					
	_			-									
	30—												
								ILLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	ı				
								E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y				



OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

□ GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-6														
	2/9/2							Drilling Company: Cal Pac							
			Regio					Type of Rig: Hollow Stem							
			<b>:</b> 161					Drop: 30" Hole Diameter: 8"							
					~742' [			Drive Weight: 140 pounds							
Hole	Hole Location: See Geotechnical Map							Page 1 c	of 1						
					(E)			Logged By CNJ							
			Sample Number		Dry Density (pcf)		<u> </u>	Sampled By CNJ							
Elevation (ft)		o.	l un	l t	_ <u>₹</u>	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test						
o G	(ft)	Graphic Log	0	Blow Count	SU	ē	Sy	,							
/ati	ţħ	phi	dc		e	stu	တ္သ		6 6						
<u>  <u> </u></u>	Depth (ft)	ĭa	an	8	\ \S_{-1}	10 <u>i</u>	S(	DECODIDATION	yp.						
Ш		0	(O)	<u> </u>		2	_ ر	DESCRIPTION							
	0 _		-	-				Gravel							
740-	_			-				Stockpile:							
	_		R-1	7 17 24	122.6	7.4	SM	Silty SAND: brown, moist, dense, scattered gravel.							
	_			24											
	5 —		R-2	11	119.9	5.7	SM	Silty SAND: brown, moist, dense, scattered gravel.							
	_			11 14 28				Quaternary Young Eolean Deposits (Qye): Silty SAND: brown, moist, dense.							
735-	_		R-3	13	118.8	6.6	SM								
	_		11-5	13 17 25	110.0	0.0	JIVI	Sitty SAND. Brown, moist, dense.							
	10 —			1											
	10 —		R-4	8 11 13	108.2	4.3	SM	Silty SAND: brown, slightly moist, dense, fine grained.							
730-	_			13											
750	_		_	_											
	_		-	_											
	15 —		R-5	3	105.5	11.1	ML	SILT: brown, slightly moist, stiff, rootlets.	AL						
	_		K-5	3 4 6	103.3	' ' ' '	IVIL	SILT. BIOWII, SIIGHTLY HOIST, STIII, TOOLIETS.	CO						
725-	_			-					SA						
	_			-											
	_		-	-											
	20 —		SPT-1	5 7		11.8	ML	SILT with SAND: light brown, moist, stiff.							
	_			10				-							
720-	_		-	-				Total Depth = 21.5'							
	_			-				Groundwater Not Encountered							
	-			-				Backfilled with Cuttings on 2/9/2017							
	25 —			[											
715-				[]											
113	_			_											
	_			_											
	30 —			-											
								NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	l						
	3				SUBS	SURFACE C	CONDITIONS	IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY IGF AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	Y						



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE ✓ GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole HS-7											
Date:	2/9/2	017						Drilling Company: Cal Pac				
			Regio					Type of Rig: Hollow Stem				
			<b>er</b> : 161					rop: 30" Hole Diameter: 8"				
			•		~742' [			Drive Weight: 140 pounds				
Hole	Hole Location: See Geotechnical Map							Page 1 c	of 1			
					<del></del>			Logged By CNJ				
			ag		<u>@</u>		0	Sampled By CNJ				
(#)		og.	<u> </u>	Ιt	_ <u>≥</u>	(%)	mb	Checked By BJE	est			
on	(ft)	C L	<u> </u>		SUS	<u>e</u>	Sy	,	of T			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u> </u>	Эер	эга	San	<u>§</u>	\ \S_	/loi	)S(	DESCRIPTION	ур			
ш			0)				<u> </u>	DESCRIPTION				
	0 _			-				Grass.				
740-	_			-				Quaternary Young Eolian Deposits (Qye):				
	_		R-1	4 6 9	111.7	3.5	SM	Silty SAND: brown, moist, stiff, medium dense.				
	-			9								
	5 —	-	R-2	6	99.8	7.6		SILTY SAND: brown, moist, medium dense.				
	_			6 7 9								
735-	_		R-3	- 3	101.0	13.4	SM	Sandy SILT brown maint stiff	СО			
	_		K-3	3 3 5	101.0	13.4	SIVI	Sandy SILT, brown, moist, stiff.				
	10											
	10 —		R-4	5 7 11	97.3	8.4	ML	SILT: grayish, brown, slightly moist, stiff.				
730-				11								
730												
	_			-								
	15 —		CDT 4		105 5	24.2	SM	CAND with CILT; gravial brown alightly majet stiff	SA			
	_		SPT-1	4 5 6	105.5	21.2	SIVI	SAND with SILT: grayish brown, slightly moist, stiff.				
725-	_			-								
	_			-								
	-			-								
	20 —		SPT-2	6		4.9		Silty SAND: brown, slightly moist, dense, some gravel.				
	-			10 15				, 3 , , ,				
720-	-			-				Total Depth = 21.5'				
	-			-				Groundwater Not Encountered				
				-				Backfilled with Cuttings on 2/9/2017				
	25 —			-								
	_			-								
715-	_			-								
	30 —		[	_								
					тые	SUMMADY	APPLIES OF	JLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
					OF T	HIS BORING	AND AT TH	THE COLORION SAWPLE TYPES: TEST TYPES: BETTER STATES OF THE STATES OF TH	Y			



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE ✓ GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
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CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV



 Project
 Regions North

 Job Number
 16159-01

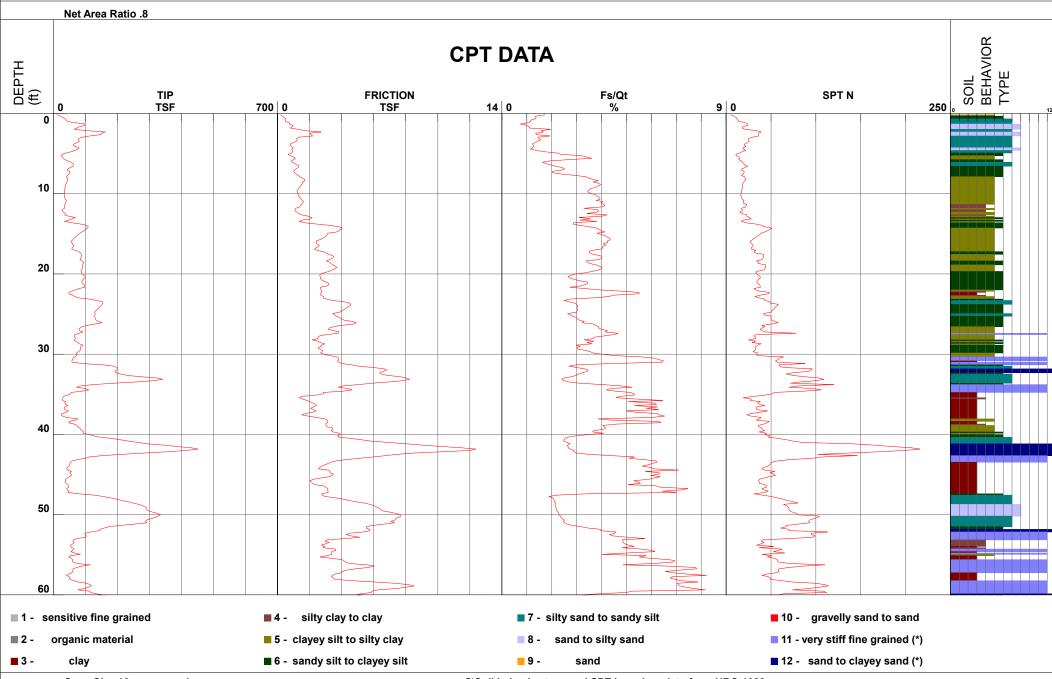
 Hole Number
 CPT-01

 EST GW Depth During Test

Operator Cone Number Date and Time 200.00 ft DG-BH DDG1350 2/9/2017 7:43:11 AM Filename SDF(494).cpt

GPS

Maximum Depth 60.53 ft





 Project
 Regions North

 Job Number
 16159-01

 Hole Number
 CPT-02

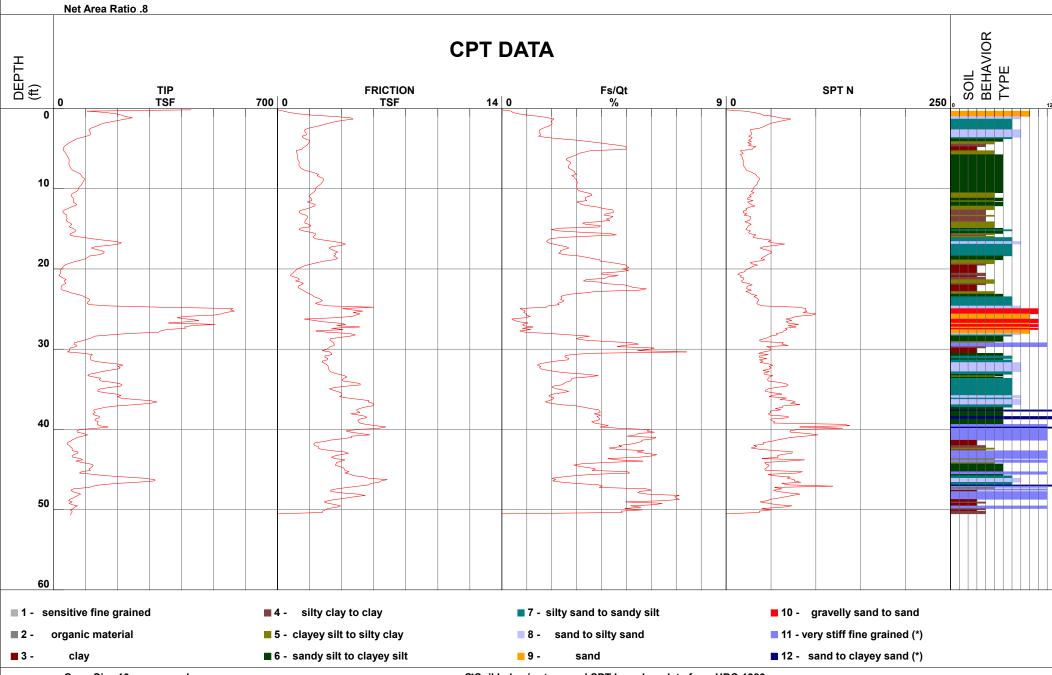
 EST GW Depth During Test

Operator
Cone Number
Date and Time
200.00 ft

DG-BH DDG1350 2/9/2017 8:33:30 AM Filename SDF(495).cpt

GPS

Maximum Depth 50.69 ft





 Project
 Regions North

 Job Number
 16159-01

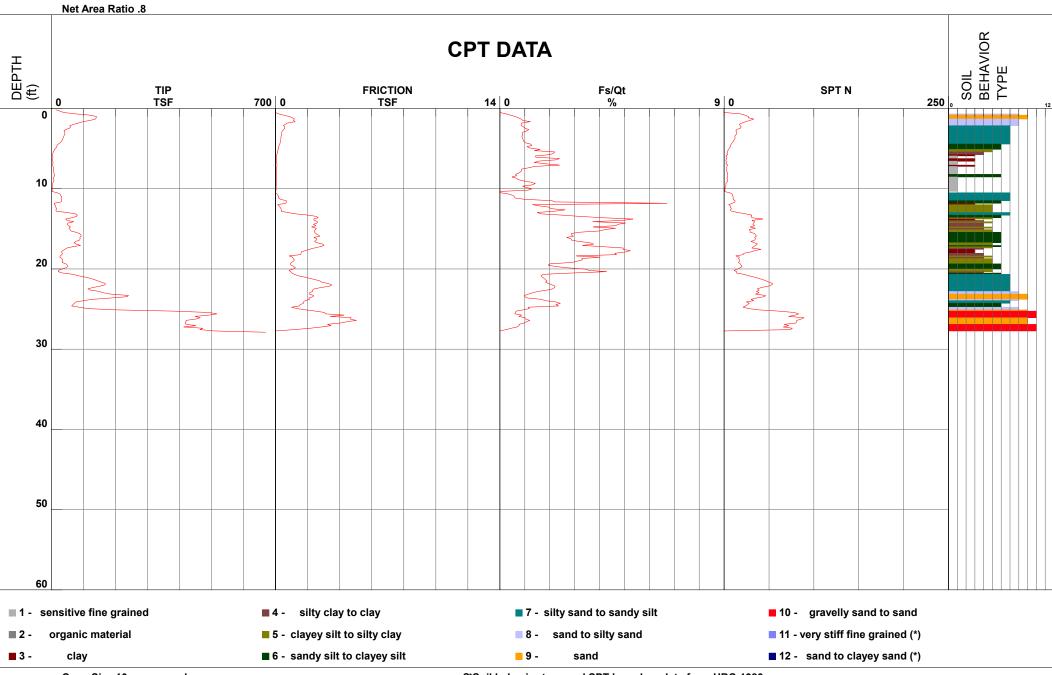
 Hole Number
 CPT-03

 EST GW Depth During Test

Operator Cone Number Date and Time 200.00 ft DG-BH DDG1350 2/9/2017 9:12:40 AM Filename SDF(496).cpt

GPS

Maximum Depth 27.89 ft





 Project
 Regions North

 Job Number
 16159-01

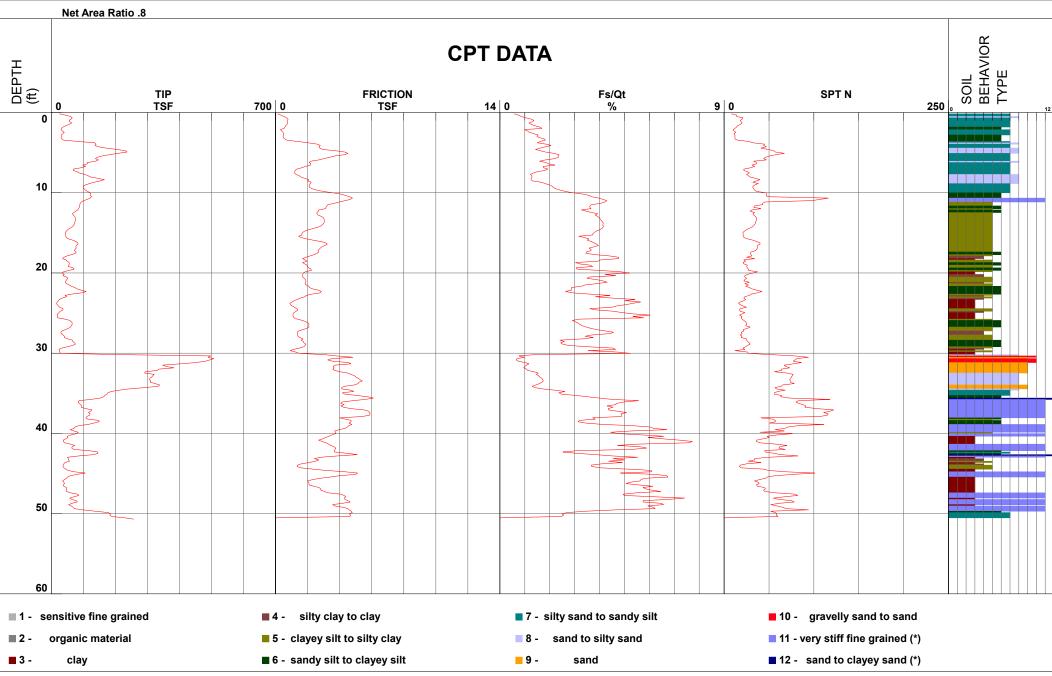
 Hole Number
 CPT-04

 EST GW Depth During Test

Operator Cone Number Date and Time 0.00 ft DG-BH DDG1350 2/9/2017 9:43:18 AM Filename SDF(497).cpt

GPS

Maximum Depth 50.69 ft





 Project
 Regions North

 Job Number
 16159-01

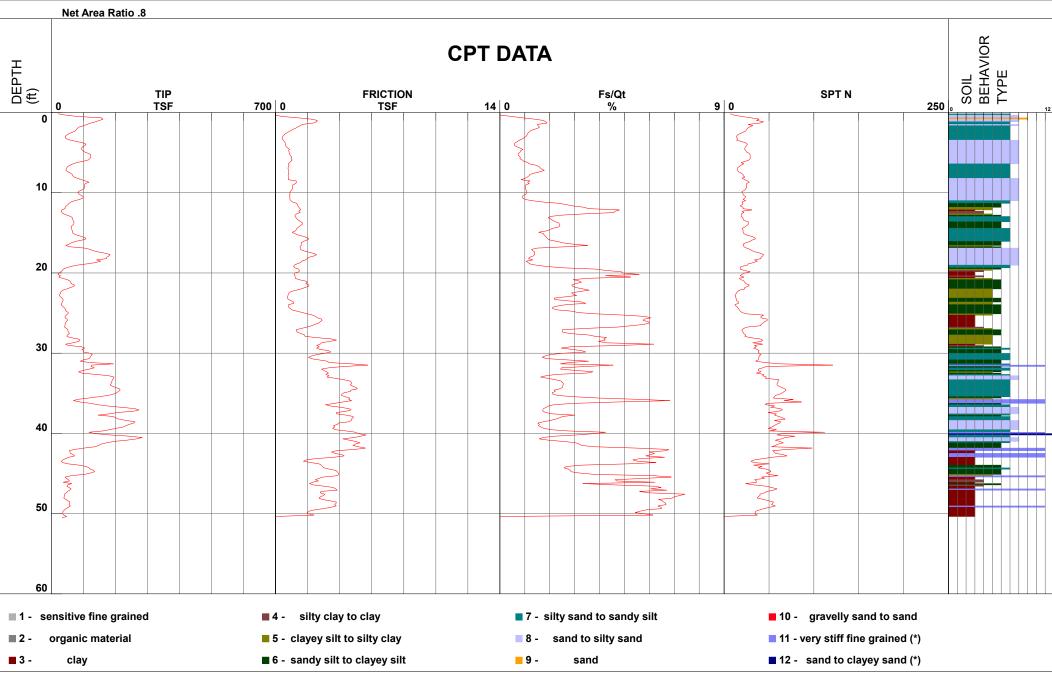
 Hole Number
 CPT-05

 EST GW Depth During Test

Operator Cone Number Date and Time 0.00 ft DG-BH DDG1350 2/9/2017 10:19:03 AM Filename SDF(498).cpt

GPS

Maximum Depth 50.52 ft





 Project
 Regions North

 Job Number
 16159-01

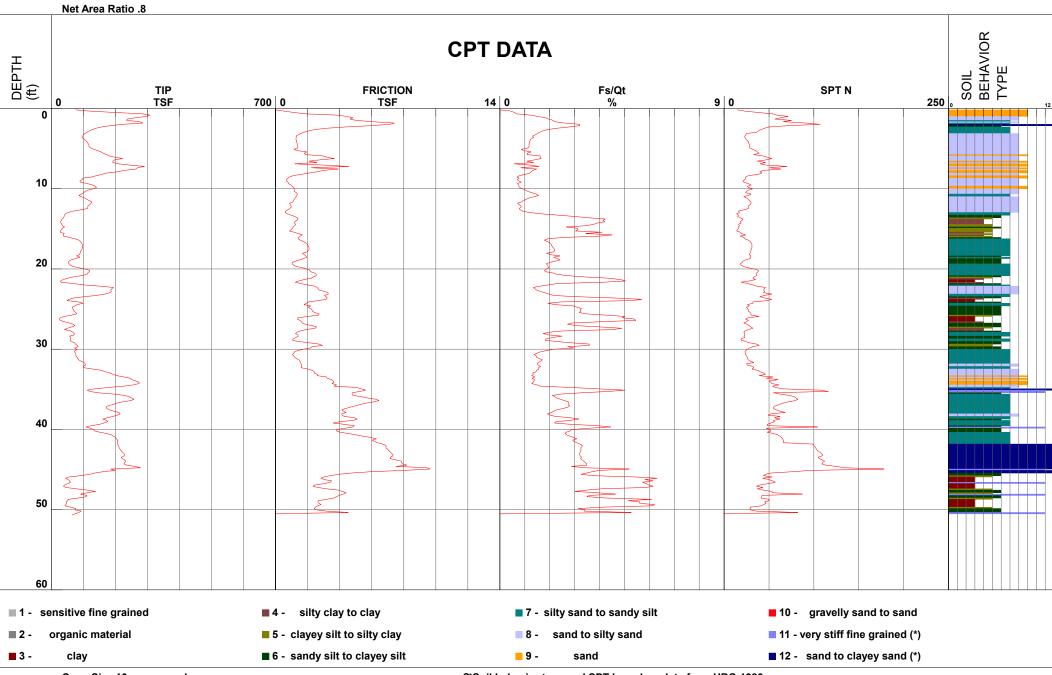
 Hole Number
 CPT-06

 EST GW Depth During Test

Operator Cone Number Date and Time 0.00 ft DG-BH DDG1350 2/9/2017 10:55:41 AM Filename SDF(499).cpt

GPS

Maximum Depth 50.69 ft

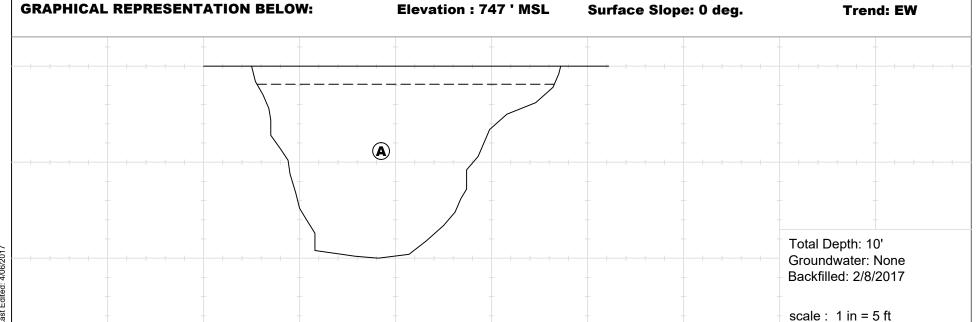


Project Name: Regions North	Logged By: CNJ	Trench No: TP-1
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Location: See Geotechnical Man



quipment: Backhoe		ckhoe	Location: See Geotechnical Map	Liiginicein	<b>J</b>		Geotechnical, Inc.		
Geologic Attitudes	nit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
		roots (Topsoil) @ 6" SAND: brown, moist, medirootlets @ 2' Increase density to dense @ 5' SAND: gray brown and light some roots	ret grading to dry, loose; abundant ium dense with loose pockets; nt brown mottled, moist, dense; ightly moist, dense to very dense;	Qye	SM SP	GB-1 @ 1-2' GB-2 @ 3-4' GB-3 @ 5-7' GB-4 @ 9-10'			



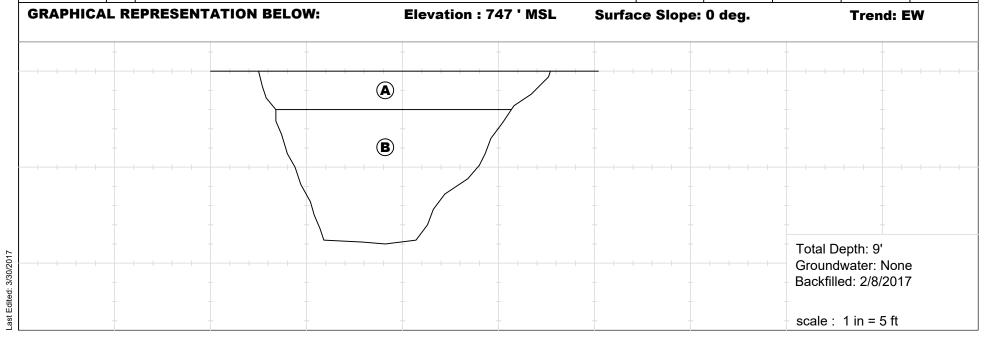
**Equipment: Backhoe** 

**Engineering Properties:** 



4a.bc	<b>–</b>	DRIIOC	=oodtioiii occ ocotcoiiiiiodi iiiap					
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No GB-1 @ 1-3'	MOISTURE (%)	DRY DENSITY (PCF)	
	A	@ 0' to 2' - Undocumented Artif @ 0' Silty SAND with scattered moist, very dense	Afu	SM				
	В	<ul> <li>② 2' to T.D Quaternary Young</li> <li>③ 2' SAND: light brown, slightly</li> <li>with some loose pockets; pinh</li> <li>③ 5' Increase density to dense</li> </ul>	moist to moist, medium dense	Qye	SP	GB-2 @ 5-6'		
		@ 8' SAND: light brown, moist t	o very moist, dense; fine grained			<b>5-6</b>		

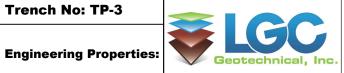
**Location: See Geotechnical Map** 



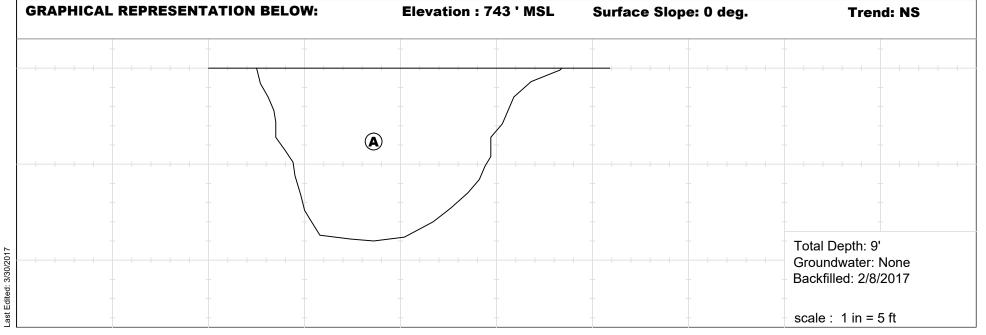
Project Name: Regions North	Logged By: CNJ	Trench No: TP-3
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**Equipment: Backhoe** 

Location: See Geotechnical Map



			•	1				
Geologic Attitudes	nit S	OIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
A	Ab @ 2 @ 4 me	O' to T.D Quaternary Young rout 2" layer of Asphalt Conc 2" SAND: light brown, moist, 4' Silty SAND: grayish light br edium dense to dense; rootle B' Silty SAND: light grayish br edium dense to dense	rete and CMB loose to medium dense rown, moist to very moist, ts and pinhole porosity	Qye	SP SM	GB-1 @ 2-3' GB-2 @ 4-5' GB-3 @ 8-9'		(FUF)



Project Name: Regions North	Logged By: CNJ	Trench No: TP-4
Project Number : 16159-01	Date: 2/8/2017	

Engineering Properties:



Equipment: Backhoe		ckhoe	Location: See Geotechnical Map	Liiginicein	ilg Flopei	ties.	Geotechnical, Inc.		
Geologic Attitudes Unit SOIL DESCRIPTION:				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A	© 0' to 3' - Undocumented Artif © 0' - Asphalt Concrete © 8" Silty SAND with Gravel: bidense; trash; bones; treated lu	rown, dark brown, and gray, moist,	Afu					
	В	@ 3' to T.D Quaternary Young @ 3' SAND: light brown, moist,	g Eolian Deposits (Qye): dense; pinhole porosity	Qye	SP	GB-1 @ 3-5'			
		@ 5' SAND: very light grayish b	rown, moist, dense			GB-2 @ 5-7'			

B

B

Total Depth: 7'
Groundwater: None
Backfilled: 2/8/2017
scale: 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-5
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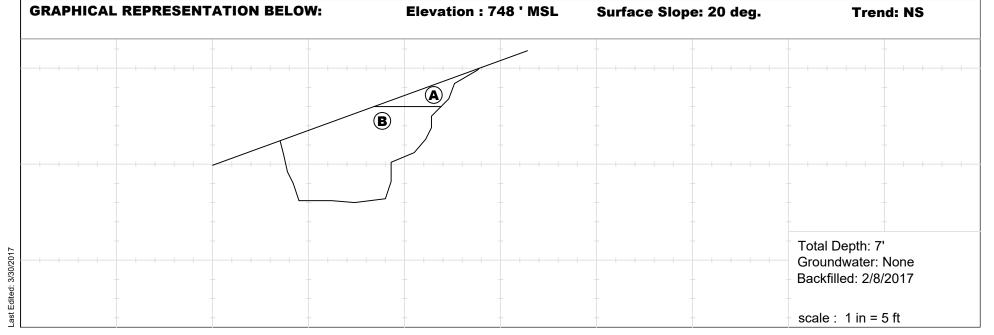
**Equipment: Backhoe** 

**Engineering Properties:** 



Geologic Attitudes	Imit  Call Description:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A	@ 0' to 2' - Undocumented Artif @ 0' Silty SAND: brown, moist t organics	<u> </u>	Afu	SM	GB-1 @ 0-1'		
	В	@ 2' to T.D Quaternary Young	ose; roots, about 50% organics  Eolian Deposits (Qye):  n, moist, loose to medium dense;	Qye	SP	GB-2 @ 1-2'		
		@ 5' SAND: grayish-brown, mois	st, dense			GB-3 @ 3-4'		
						GB-4 @ 6-7'		

**Location: See Geotechnical Map** 

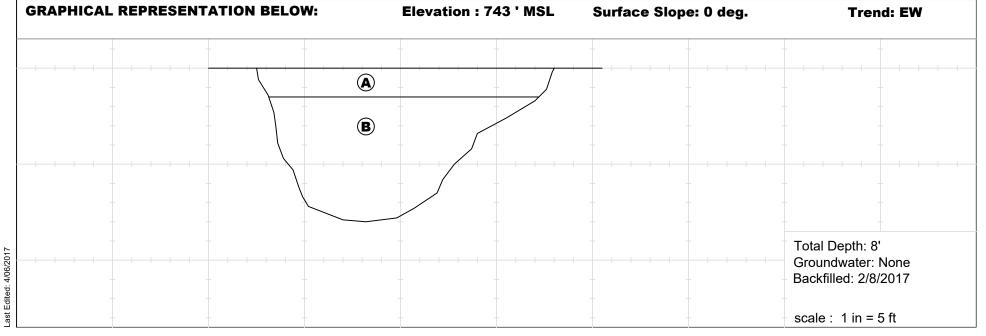


Project Name: Regions North	Logged By: CNJ	Trench No: TP-6

Engineering Properties:



Equipment	: Ba	ckhoe	Location: See Geotechnical Map		ng i iopei	Lic3i	Geotech	nical, Ind
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Undocumented Artif @ 0' SILT and CLAY: dark brow rich	ficial Fill (Afu): n, very moist to wet, stiff; organic	Afu	ML-CL	GB-1 @ 0-1'		
	В	<ul><li>@ 1' to T.D Quaternary Young</li><li>@ 1' Silty SAND to Sandy SILT: dense to stiff; porous</li></ul>	j Eolian Deposits (Qye): gray brown, very moist, medium	Qye	SM	GB-2 @ 2-3'		
		@ 4' SAND: gray brown, moist gravels	to very moist, dense; scattered		SP	GB-3 @ 4-5'		



Project Name: Regions North	Logged By: CNJ	Trench No: TP-7
Project Number : 16159-01	Date: 2/8/2017	

Engineering Properties: Geotechnical, Inc.

Equipment: Backhoe Location: See Geotechnical Map

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@ 0' to 1' - Undocumented Artificial Fill (afu): @ 0' SILT and CLAY: dark brown, very moist to wet, stiff @ 1' to T.D. Oudtorner, Young Felian Denosity (Ove):	Afu Qye	ML-CL	GB-1 @ 0-1'		
		<ul> <li>① 1' to T.D Quaternary Young Eolian Deposits (Qye):</li> <li>② 1' Silty SAND: gray brown, moist to very moist, medium dense with some loose pockets; scattered roots; pinhole porosity</li> <li>② 3' Sandy SILT and CLAY: gray and orange mottled, very moist,</li> </ul>		SM	GB-2 @ 2-3'		
		stiff; abundant rootlets; pinhole porosity  @ 4.5 SAND: grayish brown, moist, dense		SM-CL	GB-3 @ 3-4'		
				SP			

B Surface Slope: 0 deg. Trend: EW

Total Depth: 6'
Groundwater: None
Backfilled: 2/8/2017
scale: 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-8
Project Number : 16159-01	Date: 2/8/2017	

Engineering Properties:

Equipment: Backhoe Location: See Geotechnical Map

			1				
Geologic Attitudes Unit	Unit SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT' (PCF)
A	@ 0' - 5' - Stockpile @ 0' Silty SAND to Sandy SILT: to very moist, dense to very st	gray brown to light brown, moist	Stockpile	SM			
В	pockets; abundant roots; uppe	medium dense with some loose	Afu/Qye	SP	GB-1 @ 3-4' GB-2 @ 6-8'		

B

Total Depth: 8'
Groundwater: None
Backfilled: 2/8/2017
scale: 1 in = 5 ft

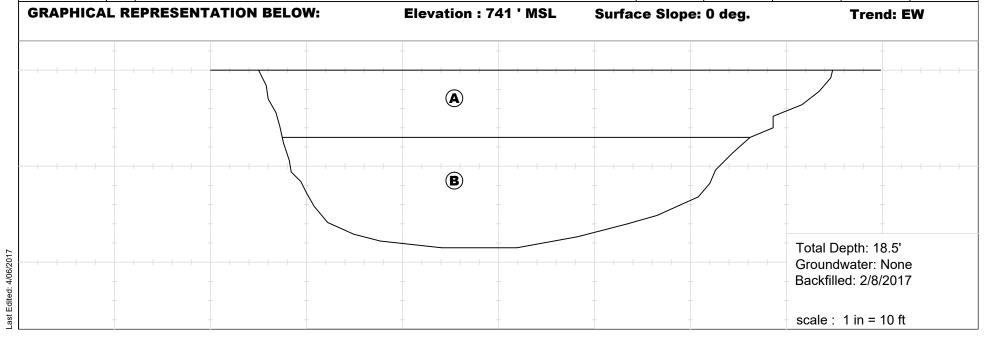
**Equipment: Backhoe** 

Location: See Geotechnical Map





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Geologic Attitudes				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 7' Undocumented Artific @ 0' Silty SAND: light brown to scattered trash visable down t	gray, moist, dense to very dense;	Stockpile /Afu	SM	GB-1 @ 2-3'		
		@ 6' SILT and CLAY: dark brow rich	n, dry, hard; indurated; organic		ML-CL	GB-2 @ 6'		
	В	@ 7' to T.D Quaternary Young @ 7' SAND: dark gray, moist, de		Qye	SP	GB-3 @ 7-9'		
						GB-4 @ 18'		



Project Name: Regions North	Logged By: CNJ	Trench No: TP-10
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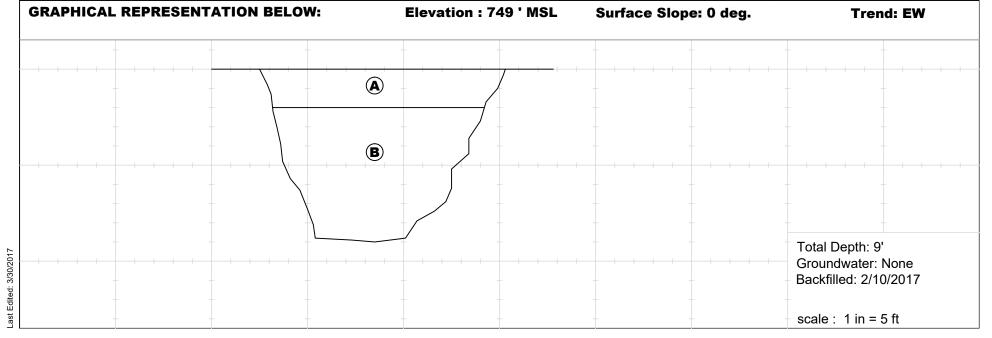
Project Number : 16159-01 Date : 2/10/2017

**Equipment: Backhoe** 

Location: See Geotechnical Map



.qa.pc		ORIIOC	Ecoationi occ occiconnicai map					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 2' - Undocumented Artif	<u> </u>	Afu				
		•	ery moist, loose; bone fragments;		SM			
		abundant trash; odoriferous; o	ganic rich			GB-1 @		
	В	@ 2' to T.D Quaternary Young	Eolian Deposits (Qye):	Qye		0-2'		
		@2' SAND: grayish brown, very dense	moist to wet, loose to medium		SP			
						GB-2 @		
		@ 7' Silty SAND: grayish brown dense to dense; iron oxide	ı, very moist to wet, medium		SM	2-4'		
						GB-3 @		
						7-9'		



Project Name: Regions North	Logged By: CNJ	Trench No: TP-11

Engineering Properties:



Equipment: Backhoe		Location: See Geotechnical Map	Linging i roperties			Geotechnical, Inc.		
Geologic Attitudes Unit SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
A	@ 0' Sandy SILT: brown, wet, s	oft; abundant roots	Afu	SM	GB-1			
В	@ 2' to T.D Quaternary Young	j Eolian Deposits (Qye):	Qye	SP	GB-2			
				SM				
	Unit	Unit SOIL DESCRIPTION:  A @ 0' to 2' - Undocumented Artif @ 0' Sandy SILT: brown, wet, s @ 1' Silty SAND: grayish brown  B @ 2' to T.D Quaternary Young @ 2' SAND: grayish brown, very	Unit SOIL DESCRIPTION:  A @ 0' to 2' - Undocumented Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots  @ 1' Silty SAND: grayish brown, very moist, medium dense  B @ 2' to T.D Quaternary Young Eolian Deposits (Qye): @ 2' SAND: grayish brown, very moist, medium dense; scattered	t: Backhoe  Location: See Geotechnical Map  GEOLOGIC UNIT  A @ 0' to 2' - Undocumented Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots @ 1' Silty SAND: grayish brown, very moist, medium dense  B @ 2' to T.D Quaternary Young Eolian Deposits (Qye): @ 2' SAND: grayish brown, very moist, medium dense; scattered	t: Backhoe  Location: See Geotechnical Map  Unit SOIL DESCRIPTION:  GEOLOGIC UNIT USCS  A @ 0' to 2' - Undocumented Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots  @ 1' Silty SAND: grayish brown, very moist, medium dense  B @ 2' to T.D Quaternary Young Eolian Deposits (Qye): @ 2' SAND: grayish brown, very moist, medium dense; scattered  SP	t: Backhoe Location: See Geotechnical Map  Unit SOIL DESCRIPTION:  A @ 0' to 2' - Undocumented Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots  @ 1' Silty SAND: grayish brown, very moist, medium dense  B @ 2' to T.D Quaternary Young Eolian Deposits (Qye): @ 2' SAND: grayish brown, very moist, medium dense; scattered gravel; iron oxide  CB-2	t: Backhoe Location: See Geotechnical Map  Unit SOIL DESCRIPTION:  A @ 0' to 2' - Undocumented Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots @ 1' Silty SAND: grayish brown, very moist, medium dense  B @ 2' to T.D Quaternary Young Eolian Deposits (Qye): @ 2' SAND: grayish brown, very moist, medium dense; scattered gravel; iron oxide  CECUMIT USCS SAMPLE MOISTURE (%)  Afu  SM  GB-1  GB-2	

B

Total Depth: 7'
Groundwater: None
Backfilled: 2/10/2017
scale: 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-12

**Project Number: 16159-01** Date: 2/10/2017

**GRAPHICAL REPRESENTATION BELOW:** 

**Engineering Properties:** 



Trend: EW

Equipmen	Attitudes  A @ 0' to 3.5' - Undocument @ 0' SILT and SAND: dark rootlets; organic rich; bo odoriferous  B @ 3.5' to T.D Quaternar	ckhoe	Location: See Geotechnical Map		Lingineering Properties.		Geotechnical, Inc		
A @ 0' to 3.5' - Undocumented		SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A	@ 0' to 3.5' - Undocumented Ar @ 0' SILT and SAND: dark brow rootlets; organic rich; bone fra odoriferous	n, very moist, soft; abundant	Afu	SM	GB-1 @ 0-3'			
B @ 3.5' to T.D Quaternary You @ 3.5' SAND with Silt: gray bro			ng Eolian Deposits (Qye): wn, very moist, medium dense to	Qye	SP	GB-2 @ 4-5'			

Surface Slope: 0 deg. A lacksquareTotal Depth: 5.5' Groundwater: None Backfilled: 2/10/2017 scale : 1 in = 5 ft

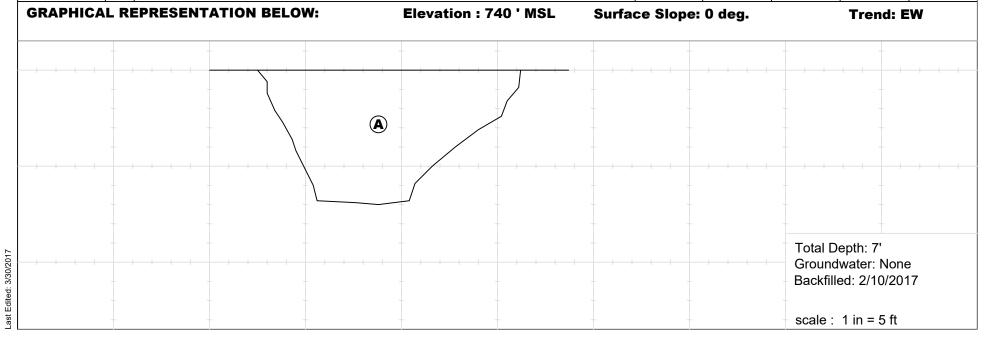
Elevation: 736 'MSL

Project Name: Regions North	Logged By: CNJ	Trench No: TP-13
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**Engineering Properties:** 



Geologic Attitudes  A @ 0' to T.D Quaternary Young @ 0' SILT with Sand: dark brown		ckhoe	Location: See Geotechnical Map		- Engineering Properties:		Geotechnical,		
		SOIL DESCRIPTION:	G		uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A			Qye	SM				
		@ 4' Silty SAND: brown, very m scattered gravels; occasional roots to 4'			SM-ML	GB-1 @ 2-3'			



Project Name: Regions North	Logged By: CNJ	Trench No: TP-14

Project Number: 16159-01 Date: 2/10/2017

**Engineering Properties:** 



Geologic Attitudes Unit SOIL DESCRIPTION:		ckhoe	Location: See Geotechnical Map		Linginicating i roperties:		Geotechnical, Inc.		
This call reconstruction		SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A B	very stiff; trace trash @ 6' to 9' - Undocumented Arti	edium dense with loose pockets; g Eolian Deposits (Qye):	Stockpile Afu Qye	SM	GB-1 @ 6-8' GB-2 @ 9-10'		(PCF)	

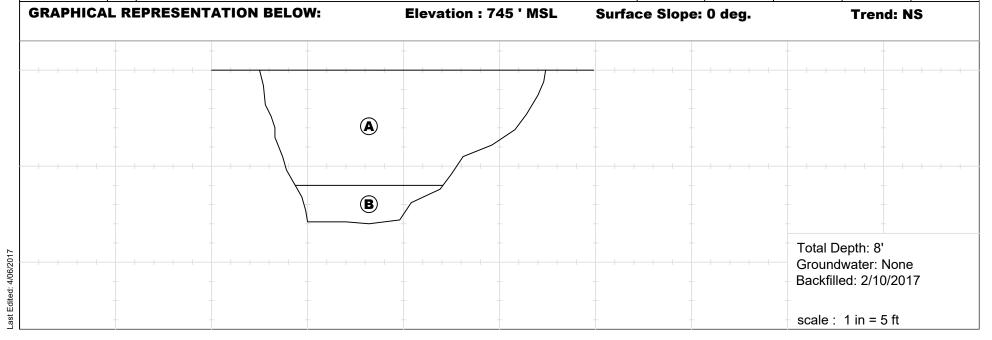
**GRAPHICAL REPRESENTATION BELOW:** Elevation: 743 'MSL Surface Slope: 0 deg. Trend: N30W (A) $lackbox{\textbf{B}}$ Total Depth: 10' (C) Groundwater: None Backfilled: 2/10/2017 scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-15

Equipment: Backhoe Location: See Geotechnical Map



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GE	EOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A B	@ 0' to 6' - Stockpile @ 0' Silty SAND: brown to gray, scattered gravel and bone frag @ 6' to T.D Undocumented Ar	moist, dense; trace trash; ments; "lifts' visible tificial Fill (afu):	tockpile Afu	SM			
		@ 6' SAND and SILT: dark brow	n, dry, loose; organic rich					

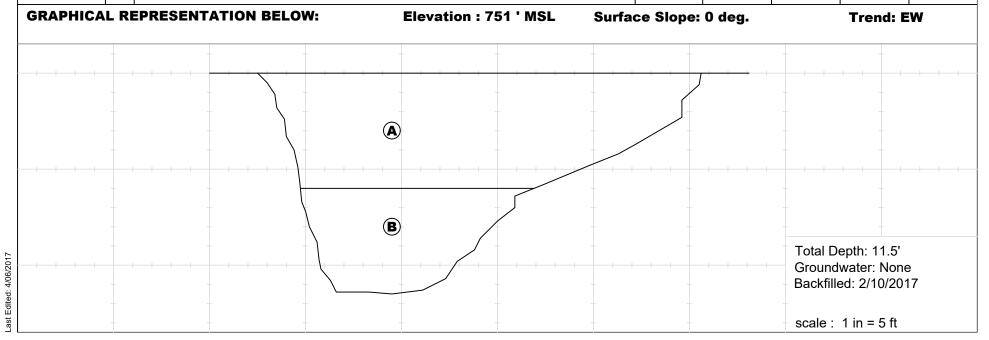


Project Name: Regions North	Logged By: CNJ	Trench No: TP-16
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**Engineering Properties:** 



Equipment	: Ba	ckhoe	Location: See Geotechnical Map	Liigiiieeiii	ig Flopei	ties.	Geotech	nical, Inc
Geologic Attitudes Unit SOIL DESCRIPTION:		SOIL DESCRIPTION:	1	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	0' to 6' - Artificial Fill (Stockpill @ 0' Silty SAND: brown, very m roots; gravel; trace rock up to	oist, dense; scattered trash;	Stockpile	SM	GB-1 @ 2-3'		, ,
	В	@ 6' to T.D Quaternary Young @ 6' Silty SAND: light brown to medium dense to dense; scatte	brown, slightly moist to moist,	Qye		GB-2 @ 8-9'		



Project Name: Regions North	Logged By: CNJ	Trench No: TP-17
Project Number : 16159-01	Date: 3/28/2017	

Engineering Properties:

Equipment: Backhoe Location: See Geotechnical Map

- Ч Р О								
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 2.5' - Undocumented Artifi @0' - Asphalt Concrete @6" - Silty SAND: brown, moist, d		Afu				
	В	@2.5' to T.D Quaternary Young	Eolian Deposits (Qye):	Qye				
		@2.5' - SAND: gray brown, moist,	medium dense					

GRAPHICAL REPRESENTATION BELOW: Elevation : 746 ' MSL Surface Slope: 0 deg. Trend: N60E

B

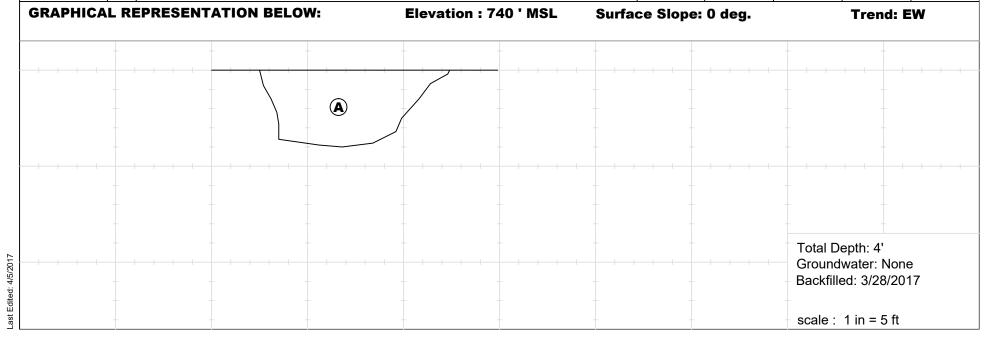
Total Depth: 4'
Groundwater: None
Backfilled: 3/28/2017
scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-18	7 7
Project Number : 16159-01	Date : 3/28/2017		4

Engineering Properties: Geotechnical, Inc.

Equipment: Backhoe Location: See Geotechnical Map

				1				
Geologic Attitudes	nit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
A		@0' to T.D <u>Undocumented Ar</u> @0' - Weeds; scattered trash @0' to T.D Silty fine SAND: lito moist; abundant trash to 4'; pockets, not homogeneous; bo organinc rish; odoriferous	ght brown to brown, slightly moist trash concentrated in certain	Afu				



Project Name: Regions North	Logged By: CNJ	Trench No: TP-19
Project Number : 16159-01	Date: 3/28/2017	

**Engineering Properties:** 



Equipment	Equipment: Backhoe		Location: See Geotechnical Map	Liigiiieeiii	ilg Froper	iles.	Geotech	nical, Inc
Geologic Attitudes Unit SOIL DESCRIPTION:		SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to T.D Undocumented Ar @0' - Weeds @0' to T.D Sandy SILT to Silt medium stiff to medium dense of black and gray; scattered be odoriferous	ty SAND: brown, moist to wet, ; trash in zones to 5.5'; splotches	Afu				

GRAPHICAL REPRESENTATION BELOW:		REPRESENTATION BELOW:		ation: 734 ' MSL Surface Slope:		n : 734 ' MSL Surface Slope: 0 deg. Trend: El		levation : 734 ' MSL Surface Slope: 0 deg. Tr		Elevation: 734 ' MSL Surface Slop		Surface Slope: 0 deg. Trend: EW		
						1 1 1								
							Total Depth: 5 Groundwater: Backfilled: 3/2	None						
							scale : 1 in =	5 ft						

Project Name: Regions North	Logged By: CNJ	Trench No: TP-20	~ 1 00
Project Number : 16159-01	Date: 3/28/2017	Engine oring Dress ortices	* LGC
Equipment: Backhoe	Location: See Geotechnical Map	Engineering Properties:	Geotechnical, I

Geologic Attitudes	Unit	nit SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to T.D Undocumented Art @0' - Weeds @0' to T.D Silty SAND: light be dense; scattered trash to 3.5'; o	rown and brown, moist, medium	Afu				

GRAPHICAL REPRESENTATION BELOW:	Elevation: 739 ' MSL	Surface Slope: 0 deg.	Trend: NS		
<b>A</b>					
			Total Depth: 3.5' Groundwater: None Backfilled: 3/28/2017  scale: 1 in = 5 ft		

Project Name: Regions North	Logged By: CNJ	Trench No: TP-21

Engineering Properties:



Equipment	Equipment: Backhoe		Location: See Geotechnical Map	Liiginiceini	.gopo	1001	Geotech	nical, Inc
Geologic Attitudes	Unit	SOIL DESCRIPTION:	1	GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to T.D Undocumented Ar @0' - Weeds @0' to 6" - SAND (Decompose @6" - Silty SAND: light brown t scattered gravel	<u>-</u>	Afu				

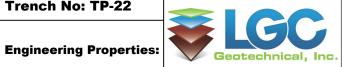
GRAPHICAL REPRESENTATION BELOW: Elevation : 746 ' MSL Surface Slope: 10 deg. Trend: EW

Total Depth: 3.5'
Groundwater: None
Backfilled: 3/28/2017

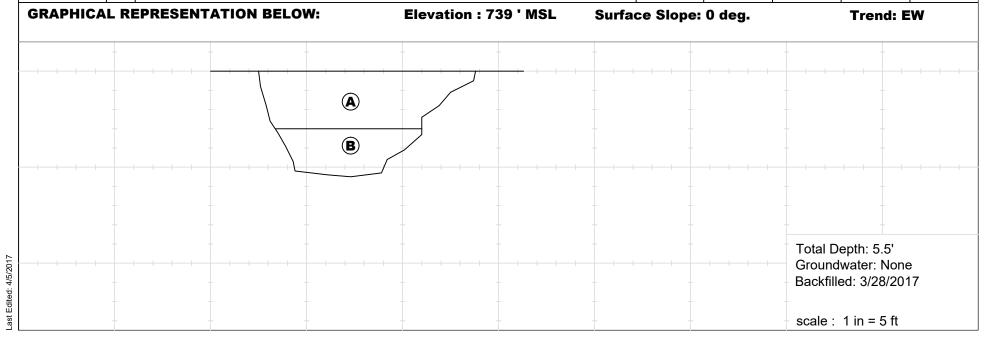
scale: 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-22
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Equipment: Backhoe Location: See Geotechnical Map



- 9 10 0								
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC USCS S		SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 3' - Undocumented Artif @0' - Weeds @0' to 3' - Silty SAND: brown to brown, moist, medium dense; a	o light brown with lifts of dark	Afu				
	В	@3' to T.D Quaternary Young @3' - Fine SAND: brown, moist some iron oxide	j Eolian Deposits (Qye): , medium dense; scattered gravel;	Qye				

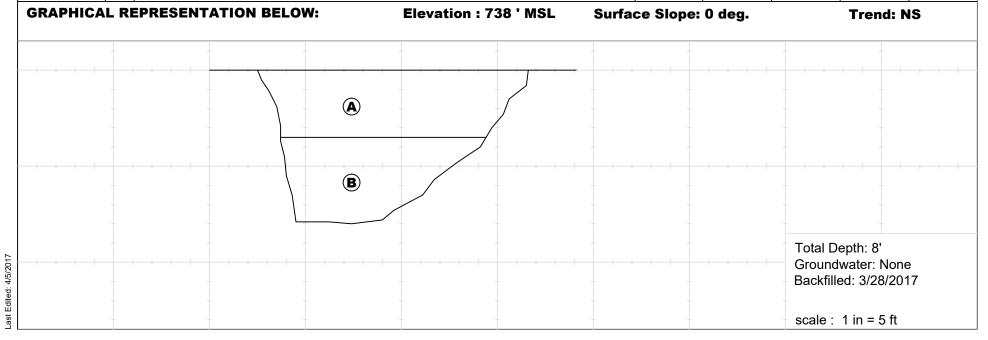


Project Name: Regions North	Logged By: CNJ	Trench No: TP-23
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**Equipment: Backhoe** 



darbinouri Backinoo			200ationi 000 000tooniiioai map					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B	@0' to 3.5' - Undocumented Ar @0' - Weeds @0' to 3.5' - SAND: brown, mo trash; organic rich; odoriferous @3.5' to T.D Quaternary You	pist, medium dense; scattered	Afu Qye				
		@3.5' - SAND: gray, moist, med	lium dense; odoriferous					

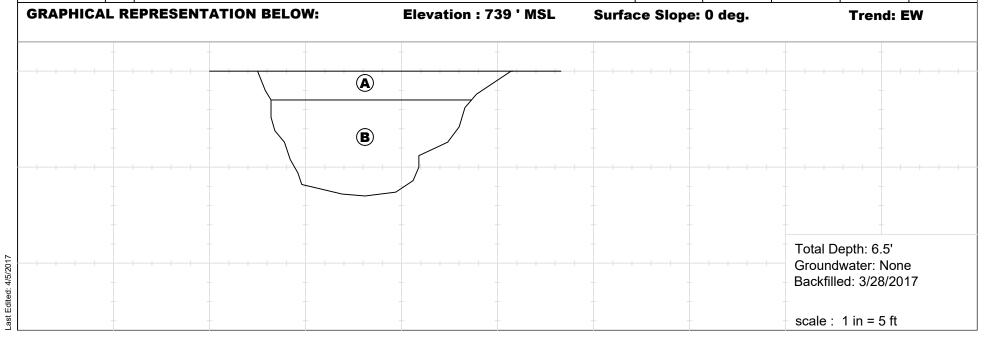


Project Name: Regions North	Logged By: CNJ	Trench No: TP-24
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Engineering Properties:



quipment	t: Backhoe Location: See Geotechnical Map  Unit SOIL DESCRIPTION:		в торого		Geotechnical, Inc			
Geologic Attitudes Unit S		SOIL DESCRIPTION:  GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)		
	A	@0' to 1.5' - Undocumented Ar @0' - SILT: dark brown, slight odoriferous; slight indurated	<u>`</u>	Afu				
	В	@1.5' to T.D Quaternary You	ng Eolian Deposits (Qye):	Qye				
		@1.5' - SAND: gray, moist, med	lium dense; odoriferous; ammonia					



Project Name: Regions North	Logged By: CNJ	Trench No: TP-25

**Equipment: Backhoe** 



			OIL DESCRIPTION.			ı		
Geologic Attitudes	Unit	nit SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	В	@0' to 4' - Undocumented Artif @0' - WeedsSILT: dark brown, so odoriferous; slight indurated @0' to 4' - Sandy SILT: brown, so trash; odor; organics @4' to T.D Quaternary Young @4' SAND: gray brown, moist, so	slight moist, soft; manure; trash; moist, stiff; bone fragments;  Eolian Deposits (Qye):	Afu Qye				

GRAPHICAL REPRESENT	ATION BELOW:	Elevation: 739 ' MSL	Surface Slope: 0 deg.	Trend: EW
	<b>A</b> B			
				Total Depth: 7' Groundwater: None Backfilled: 3/28/2017  scale: 1 in = 5 ft

Project Na	Project Name: Regions North  Logged By: CNJ  Project Number: 16159-01  Date: 3/28/2017  Equipment: Backhoe  Location: See Geotechnical Map		Trench N	lo: TP-26	A			
Project No			En alia a aul	D			jC	
Equipmen			Engineeri	ng Proper	ties:	Geotech	nical, Inc	
Geologic Attitudes	Unit	SOIL DESCRIPTION:	·	GEOLOGIC UNIT	uscs	SAMP		DRY DENSITY (PCF)
	A		Young Eolian Deposits (Qye): wn, moist, medium dense; trash;	Qye				

APHICAL REPRESENTATION BELOW:	Elevation : 739 ' MSL	Surface Slope: 0 deg.	Trend: NS

Total Depth: 3'
Groundwater: None
Backfilled: 3/28/2017
scale: 1 in = 5 ft

**Equipment: Backhoe** 



	_		•					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@0' to 4' - Undocumented Artif @0' Weeds @0' to 4' - Silty SAND: brown a dense; trash; bones; organics;	nd dark brown, moist, medium	Afu				
	В	@4' to 7' - Quaternary Young E @4' - SAND: gray brown, moist		Qye				
								I

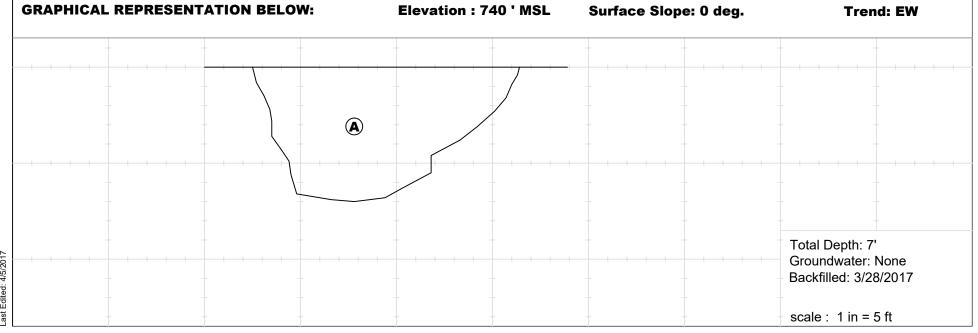
B  Total Depth: 7'	GRAPHICAL	REPRESENTAT	ION BELOW:		Elevation: 7	39 ' MSL	Surface Slope: 0 deg.		Trei	nd: NS
Total Depth: 7'	-	-		<b>A</b>			-	-	-	-
Groundwater: None	+			<b>B</b>		-				

Project Name: Regions North	Logged By: CNJ	Trench No: TP-28

**Equipment: Backhoe** 

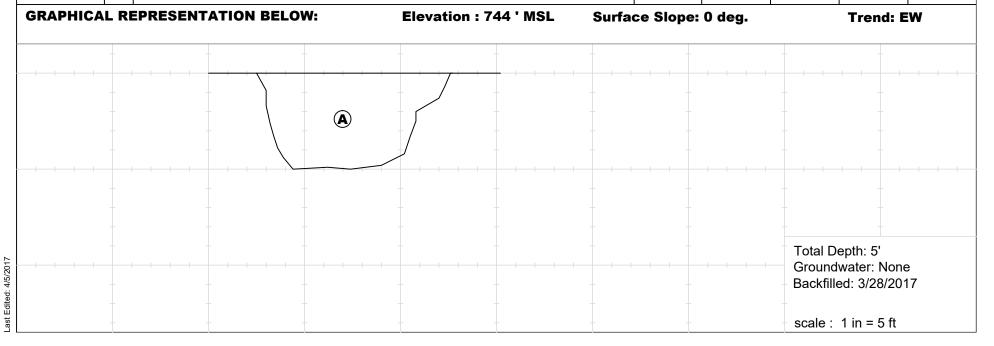


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Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to T.D Quaternary Young @0' - Grass @0' to T.D SAND with Silt: lig roots in upper 6"; pores until 2	jht brown, moist, medium dense;	Qye				



Project Name: Regions North	Logged By: CNJ	Trench No: TP-29	
Project Number : 16159-01	Date: 3/28/2017	Engine suing Dranaution	* LC
Equipment: Backhoe	Location: See Geotechnical Map	Engineering Properties:	Geotech

.qa.po			zoodtiom coo cootoomiodi map	1				
Geologic Attitudes				GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to T.D Quaternary Young @0' - SAND; light brown, slight (caving)		Qye				

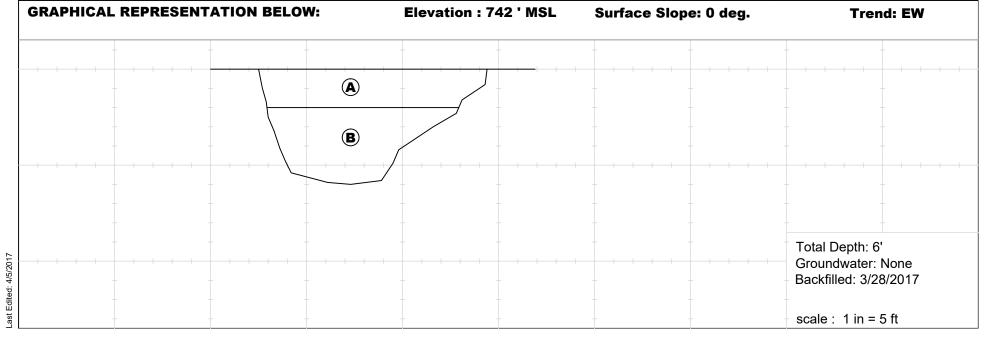


Project Name: Regions North	Logged By: CNJ	Trench No: TP-30
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**Equipment: Backhoe** 



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Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 2' - Undocumented Artif @0' - 3" Asphalt @3" - Silty SAND: brown, moist	icial Fill (afu): t, dense; trash, bone fragments	Afu				
	В	@2' to T.D Quaternary Young @2' - SAND: brown, moist, med		Qye				



Project Name: Regions North	Logged By: CNJ	Trench No: TP-31
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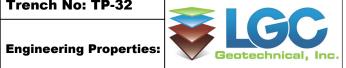
**Equipment: Backhoe** 



_4									
Geologic Attitudes Unit SOIL DESCRIPTION:		SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A	@0' to 2' - Undocumented Artif @0' - Silty SAND: light brown, s bone fragments	icial Fill (afu): slightly moist, very dense; trash;	Afu					
	В	@2' to T.D Quaternary Young @2' - SAND: light brown, moist		Qye					

GRAPHICAL REPRESENTATION BELOW:	Elevation : 748 ' MSL	Surface Slope: 0 deg.	Trend: NS
	<b>B</b>		
			Total Depth: 7' Groundwater: None Backfilled: 3/28/2017
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1		scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-32



Equipment: Backhoe	Location: See Geotechnical Map
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Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	A	@0' to 1' - Undocumented Artif @0' - Silty SAND: light brown, o		Afu				
	В	@1' to T.D Quaternary Young @1' - SAND: light brown, moist		Qye				

GRAP	GRAPHICAL REPRESENTATION BELOW:		N BELOW: Elevation: 746 'MSL			: 0 deg.	Trend: EW		
	-	-	B		-				
	-		+ + + + + + + + + + + + + + + + + + + +		-		+	-	
	-							Total Depth: 4' Groundwater: N Backfilled: 3/28	
						1		scale : 1 in = 5	i ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-33	
Project Number : 16159-01	Date: 3/28/2017		

**Engineering Properties:** 

**Equipment: Backhoe Location: See Geotechnical Map** 

I						- 1				1
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	_	MPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	A	@0' to 2' - Undocumented Artif @0' - Silty SAND: light brown,	icial Fill (afu): slightly moist, dense; trash; bones	Afu						

	•
B @2' to T.D Quaternary Young Eolean Deposits (Qye): @2' - SAND: brown, moist, medium dense	

MAI MOAL KLI KLOLK	TATION BELOW:	Lievation : 740 MoL	Surface Slope. 6 deg.	Trend: N3
-	+ + + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + + +	+ +
	<b>A</b>			
-	<b>B</b>			
+ + + + + + + + + + + + + + + + + + + +			+ + + + + + + + + + + + + + + + + + + +	
-	+ +	+		
	+ + + + + + + + + + + + + + + + + + + +			Total Depth: 5' Groundwater: None Backfilled: 3/28/2017
+	† †	+ +	† †	scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-34		

**Equipment: Backhoe** 



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Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 3' - Undocumented Artif @0' - 6" thick asphalt @6" - Silty SAND: dark brown, trash; bones; odoriferous; orga	moist, dense to medium dense;	Afu				
	В	@3' to T.D Quaternary Young @3' - SAND: brown, moist, med		Qye				

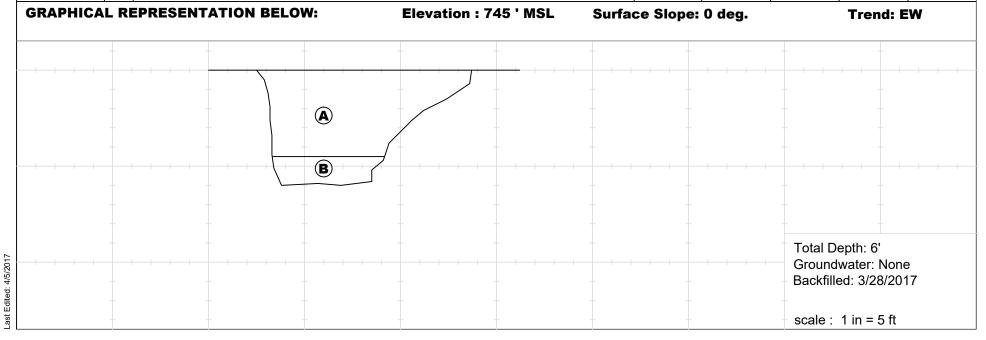
GRAPHICAL REPRESENTATION BELOW:	Elevation: 746 ' MSL	Surface Slope: 0 deg.	Trend: NS
<b>A</b>			
			Total Depth: 5' Groundwater: None Backfilled: 3/28/2017
	-	-	scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-35
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**Equipment: Backhoe** 



-quipinonti Saottioo			=coationi coc cottoninoai map					
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 4.5' - Undocumented Ar @0' - Silty SAND: brown, moist scattered bones; organic smel	, medium dense; some trash; I	Afu				
	В	@4.5' to T.D Quaternary You @4.5' - SAND with Gravel: light cementation; rounded gravels		Qye				



Project Name: Regions North	Logged By: CNJ	Trench No: TP-36
Project Number : 16159-01	Date: 3/28/2017	

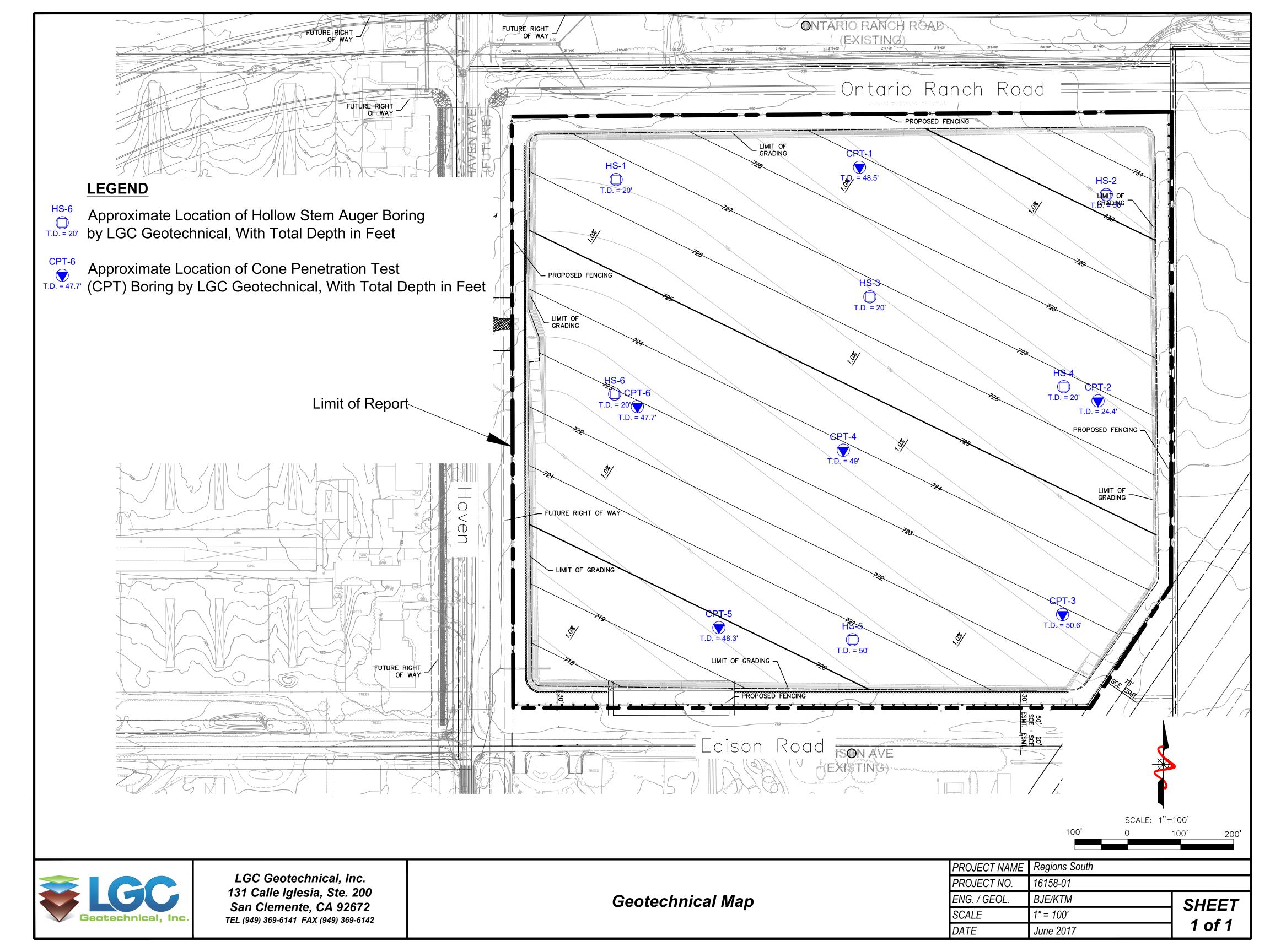
**Engineering Properties:** 

**Equipment: Backhoe Location: See Geotechnical Map** 

Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 2' - Undocumented Artific @0' - Silty SAND: dark brown, mo trash; bones; organic smell		Afu				
	В	@2' to T.D Quaternary Young E	iolean Deposits (Qye): moist, medium dense; iron oxide	Qye				

GRAPHICAL REPRESENTATION BELOW:			Elevation : 749	' MSL	Surface Slope:	0 deg.	Tren	d: EW
		<b>A</b>						-
				<del>                                     </del>		-1 1 1 -1	Total Depth: 5' Groundwater: Backfilled: 3/26' scale: 1 in = 5	None 3/2017

# Appendix H Geotechnical Subsurface Evaluation Data – Regions South (16158-01)



#### APPENDIX C

### Laboratory Testing Procedures and Test Results

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

Grain Size Distribution: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve. The portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D422 (CTM 202). Where an appreciable amount of fines were encountered (greater than 20 percent passing the No. 200 sieve) a hydrometer analysis was done to determine the distribution of soil particles passing the No. 200 sieve.

Sample Location	Description	% Passing # 200 Sieve
HS-2 @ 10 feet	Clayey Sand	61
HS-2 @ 25 feet	Sandy Silt	68
HS-3 @ 5 feet	Sandy Clay	70
HS-4 @ 20 feet	Sandy Silt	63
HS-5 @ 15 feet	Silty Sand	48
HS-5 @ 35 feet	Sandy Clay	60

Expansion Index: The expansion potential of selected samples were evaluated by the Expansion Index Test, Standard ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the table below.

Sample Location	Expansion Index	Expansion Potential*
HS-4 @ 5-7.5 feet	6	Very Low

<sup>\*</sup>Per Chapter 18 of the 2007 C.B.C.; ASTM D 4829 Section 5.3

<u>Collapse /Swell Potential:</u> Collapse test were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The Curves are presented in this Appendix.

### APPENDIX C

### Laboratory Testing Procedures and Test Results (Continued)

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring and/or trench logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Chloride Content</u>: Chloride content was tested in accordance with Caltrans Test Method (CTM) 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-4 @ 5-7.5 feet	11

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. As a result of a decrease in resistivity, the potential for corrosion increases. The results are presented in the table below.

Sample Location	pН	Minimum Resistivity (ohms-cm)
HS-4 @ 5-7.5 feet	7.43	1000

<u>Soluble Sulfates</u>: The soluble sulfate contents of selected samples were determined by standard geochemical methods (CTM 417). The soluble sulfate content is used to determine the appropriate cement type and maximum water-cement ratios. The test results are presented in the table below.

Sample Location	Sulfate Content (ppm)	Sulfate Exposure*
HS-4 @ 5-7.5 feet	84	S0

\*Per ACI 318

			Ge	otec	hnic	al B	oring	g Log Borehole LGC-HS-1	
Date:	5/8/2	2017						Drilling Company: 2R Drilling	
			Regio					Type of Rig: CME	
			er: 161					Drop: 30" Hole Diameter:	8"
					~725' N			Drive Weight: 140 pounds	
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1 c	of 1
			_					Logged By SHH	
			Sample Number		Dry Density (pcf)		0	Sampled By SHH	
(ft)		go	⊑	+		Moisture (%)	USCS Symbol	Checked By BJE	Type of Test
Elevation (ft)	ft)	Graphic Log		Blow Count	nsi	) e	Syl	Checked by Bol	ĹŢ
atic	Depth (ft)	Ϊ	월	l Ó		tur	Ś		O O
<u>e</u>	ер	ğ	au	<u>ŏ</u>	<u></u>	ois	SC		ype
Ш		ω	S	<u> </u>		Σ	n	DESCRIPTION	<u> </u>
	0 _			-				Quaternary Young Eolian Deposits (Qye):	
	_	<u> </u>	R-1	5 8 11	104.2	6.4	SP	@2.5' - SAND: brown, medium dense, moist, poorly	
	_		'   	11				graded	
720-	5 — _		SPT-1	4 4 7		20.6	SM	@5' - Sandy SILT: brownish grey, medium dense, moist	
	_			<u>/                                    </u>					
	_			-					
715-	10 —				110.0	0.0		©401 Cilty CANDs brown moditive domes maint	
	-		R-2	9 10 18	110.9	6.2		@10' - Silty SAND: brown, medium dense, moist	
	_			-				<u> </u>	
	_			_					
710-	15 —	│ Ш	SPT-2	11 10 11		6.7	SP	@15' - SAND: light brown, medium dense, moist, poorly	
	_			<u> </u>				graded	
	_			-				<u>                                     </u>	
705	20 —			_					
705-			R-3	14 19 20	111.9	15.1	SM	@20' - Silty SAND: light brown, dense, moist	
	_			-				Total Depth = 20' Groundwater Not Encountered	
				-				Backfilled with Cuttings on 5/8/2017	
700	25 —			[				- g	
700-	20 —								
				_					
			[	_					
				_					
	30 —			_					
	- *				THIS	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
					OF TI SUBS	HIS BORING SURFACE C	AND AT THOONDITIONS	IE TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  GF AT THIS I OCATION  G GRAB SAMPLE  SA SIEVE ANALYSIS	′



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

GRAB SAMPLE
STANDARD PENETRATION
TEST SAMPLE

✓ GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole LGC-HS-2											
Date:	: 5/8/2	2017	•					Drilling Company: 2R Drilling				
			Regio					Type of Rig: CME				
			er: 161					Drop: 30" Hole Diameter:	8"			
			op of H					Drive Weight: 140 pounds				
Hole	Locat	ion	: See C	Seote	chnical	Мар		Page 1	of 2			
			<u>_</u>		<del>_</del>			Logged By SHH				
			ag		(bc		<u></u>	Sampled By SHH				
(ft)		og	<u>u</u> n	l t	<u>\$</u>	(%)	d T	Checked By BJE	est			
on	(ft)	c L		no	nsi	e (	Syl		fΤ			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u>e</u>	ep	ıra	an	<u>                                     </u>		lois	SC		yp			
Ш		9	S	<u> </u>		2		DESCRIPTION	$\vdash$			
	0 _			-				Quaternary Young Eolian Deposits (Qye):				
	_ _ _	<u></u>	SPT-1	4 4 5		17.1	SM	@2.5' - Silty SAND: brown, medium dense, moist				
720-	5 — -	B.2	R-1	6 7 12	111.7	11.8	SC	@5' - Clayey SAND: olive brown, medium dense, moist	со			
715-	10 —		SPT-2\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	4 3 3		18.0		@10' - Clayey SAND: light brown, loose, moist	-#200			
710-	- 15 — - -		R-2	7 13 18	112.2	9.2	SM	@15' - Silty SAND - light brown, medium dense, moist				
705-	20 — - -		SPT-3	10 10 12		14.5		@20' - Silty SAND: dark brown, medium dense, moist				
700-	25 — - - -		R-3	9 15 15	108.4	16.5		@25' - Silty SAND: orangish brown, medium dense, moist	-#200			
	30 —											
				1				NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
	2	1	2		SUBS LOCA	SURFACE C	ONDITIONS  MAY CHAN	IE TIME OF DRILLING.				



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE ✓ GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

			Ge	otec	hnic	al B	oring	g Log Borehole LGC-HS-2	
	5/8/2							Drilling Company: 2R Drilling	
			Regio					Type of Rig: CME	
			<b>r</b> : 161					Drop: 30" Hole Diameter:	8"
					~725' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 2 c	of 2
			١		<del></del>			Logged By SHH	
			- eqι		<u>d</u>		0	Sampled By SHH	
Elevation (ft)		Graphic Log	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test
loi	(ft)	<u>  0</u>	\( \begin{array}{c} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	9	  us	<u>e</u>	S	·	of T
/at	th	b	ldu	~	🎽	stu	SS		e e
<u> </u>	Depth (ft)	ja Ja	Sar	Blow Count	) C	/loi	)S(	DESCRIPTION	Ŋ
Ш			SPT-4			10.1			
	30 _		SP1-4	13 17 24		10.1	SM	@30' - Silty SAND with gravel: brown, very dense, moist	
	_			- 24					
	_			-					
	_			-					
695-	35 —		R-4	11	121.7	10.4	SP	@35' - SAND: orangish brown, very dense, moist, poorly	
	_			11 28 37				graded	
	-			-					
	_			-					
000	40	B-3	•	-					
690-	40 —		SPT-5	7 9		17.5	ML	@40' - SILT: brown, medium dense, moist	
	_			9					
685-	45	<u>                                     </u>						0.451 0.311 0.4515	
000	-		R-5	11 33 45	123.9	12.7	SM	@45' - Silty SAND: orangish brown, very dense, moist	
	_			45					
	_			-					
	_			-					
680-	50 —		SPT-6	5		13.8		@50' - Silty SAND: orangish brown, medium dense,	
	_		01 1-0	5 8 12		10.0		moist	
	_			-				Total Depth = 50'	
	_			-				Groundwater Not Encountered	
	_			-				Backfilled with Cuttings on 5/8/2017	
675-	55			-					
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	-			-					
	60			-					
	60			-					
					OF T	HIS BORING	AND AT TH	ILY AT THE LOCATION  SAMPLE TYPES:  TEST TYPES:  B BULK SAMPLE DS DIRECT SHEAR   ,	
								MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS  CTANDARD PERUTDATION	METER



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE SA S&H EI CN CR AL CO RV

			Ge	otec	hnic	al B	oring	g Log Borehole LGC-HS-3	
	5/8/2							Drilling Company: 2R Drilling	
			Regio					Type of Rig: CME	
			<b>er:</b> 161					Drop: 30" Hole Diameter:	8"
					~723' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnical	Map		Page 1	of 1
			<u>_</u>		<u> </u>			Logged By SHH	
_			aqr		od	_	<u> </u>	Sampled By SHH	
(#)		go	un	l t	<u>\$</u>	%	윤	Checked By BJE	est
o	(ft)	<u> </u>		no	nsi	<u> </u>	Syl	,	ĮΤ
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
<u>ē</u>	ер	<u>a</u>	an	<u> </u>	<u>&gt;</u>	<u> </u>	SC	DECODIDE	y y
Ш		9	S	<u> </u>		2	$\supset$	DESCRIPTION	
	0 _		-	-				Quaternary Young Eolian Deposits (Qye):	
720-	- - -	B-1	R-1	8 8 8 11	101.5	24.2	ML	@2.5' - Sandy SILT: olive brown, medium dense, moist	
	5 — -		SPT-1	3 3 4		22.2		@5' - Sandy SILT: brown, loose, moist	-#200
715-	_			-					
	_			-					
	10 —		R-2	3	115.0	12.6		@10' - SILT with Sand: gray to orangish brown, moist,	со
	_			3 4 9				medium dense	
710	_			-					
710-				_					
	15 —		SPT-2	5		7.0	0.0	@15' - SAND: orangish brown, medium dense, moist,	
	_		SP1-2	5 8 14		7.0	SP	poorly graded	
	_		ŀ	-					
705-	_			-				<u> </u>	
	_			-					
	20 —		R-3	7 14 28	118.9	13.2	SM	@20' - Silty SAND: orangish brown, dense, moist	
	_		-	-				Total Depth = 20'	
700-	_			-				Groundwater Not Encountered	
	25			-				Backfilled with Cuttings on 5/8/2017	
	25 <del></del>			_					
			[	_					
695-	_			-					
	_			-					
	30 —			-					
								ILITY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR	
	>	1			SUBS	SURFACE C	CONDITIONS	MAX DIFFER AT OTHER   RING SAMPLE (CA Modified Sampler)   MD   MAXIMUM DENSIT	



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G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE ✓ GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV

			Ge	otec	hnic	al B	oring	g Log Borehole LGC-HS-4	
Date:	5/8/2	2017						Drilling Company: 2R Drilling	
Proje	ct Na	me:	Regio	ns So	uth			Type of Rig: CME	
			e <b>r:</b> 161					Drop: 30" Hole Diameter:	8"
			•		~725' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 1 c	of 1
			_		<del>(</del> 5			Logged By SHH	
			<del>p</del> qu		<u>d</u>		00	Sampled By SHH	ب ا
H)		6-		l ti	<u>.</u>	%)	'n	Checked By BJE	es
<u>io</u>	(ft)	<u>:</u>	o l	70	SUS	<u>e</u>	S		)f T
vat	oth	hdi	l du		🋎	stu	SS		e e
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0		0,	+				Quaternary Young Eolian Deposits (Qye):	'
	_			-				additionally roung contain beposits (aye).	
	- -	\ <del>\</del>		4 5 7		7.5	SP	@2.5' - SAND: greyish brown, medium dense, moist, poorly graded	
720-	5 —		R-1	8 9 13	90.4	31.7	SC		EI,
				13				moist	CR
		Ш		_					
	_	~		-					
715-	10 —		SPT-2	3		20.2	ML	@10' - Sandy SILT: brown, medium dense, moist	
	_			3 4 7				(	
	_			-					
				_					
710-	15 —		D 2	2	115.9	8.1	CD	@15' CAND, dark brown dance maint nearly graded	
	_		R-2	2 18 25	115.9	0.1	SP	@15' - SAND: dark brown, dense, moist, poorly graded	
	_			-					
	_			-					
	-			-					
705-	20 —		SPT-3	XI 6		23.6	ML	@20' - Sandy SILT: brown, medium dense, moist	-#200
	_			7\ 11 -				Total Depth = 20'	
	_			-				Groundwater Not Encountered	
	-			-				Backfilled with Cuttings on 5/8/2017	
700-	25 —			-					
	-			-					
				-					
	_			-					
	30 —			-					
			<u> </u>	1				ILLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	<u> </u>
	>	1			SUBS	SURFACE C	ONDITIONS	E TIME OF DRILLING,         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSIT           GE AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	
								E. THE DATA  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE EL EXPANSION INDEX	



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TEST SAMPLE ✓ GROUNDWATER TABLE

SIEVE AND HYDROMETEI EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPS/ESWELL R-VALUE % PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

	Geotechnical Boring Log Borehole LGC-HS-5											
Date:	5/8/2	2017						Drilling Company: 2R Drilling				
Proje	ct Na	me:	Regio	ns So	uth			Type of Rig: CME				
			er: 161					Drop: 30" Hole Diameter:	8"			
					~720' N			Drive Weight: 140 pounds				
Hole	Locat	tion:	: See (	Geote	chnical	Мар		Page 1	of 2			
			<u> </u>					Logged By SHH				
			<u>pe</u>		b D		<del>-</del>	Sampled By SHH				
<b>#</b>		go	L L	<del> </del>	<u> </u>	%	qιι	Checked By BJE	est			
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	Chocked by Bol	Type of Test			
atic	Depth (ft)	ΪĘ	<u> </u>	ν		) tur	S		0			
<u>e</u>	ер	ğ	au	<u>ŏ</u>	<u>&gt;</u>	l ois	SC		уре			
Ш		9	S	<u> </u>		Σ	n	DESCRIPTION	Ĺ.			
	0 _	_		-				Quaternary Young Eolian Deposits (Qye):				
	_	B-1	R-1	- 10	101.0	22.0	ML	@2.5' - Sandy SILT: grey, medium dense, moist				
	_			10 16 20								
715-	5 —	Ш	SPT-1	V 4		31.1		@5' - SILT: gray, medium dense, moist				
	_			4 4 6								
	_			<u>-</u>				<u> </u>				
	_			-								
710-	10 —		R-2	6 12 10	112.5	7.1	SP	@10' - SAND: orangish brown, medium dense, moist,				
	_	7		10				poorly graded				
	_			-								
	_			-								
705-	15 —	Ш	SPT-2	4 4 5		15.1	SM	@15' - Silty SAND: grayish brown, medium dense, moist	-#200			
	_			<u>f</u> \								
	_			-								
	_			-								
700-	20 —		R-3	10 16 23	123.5	12.2		@20' - Silty SAND: orangish brown, dense, moist				
				23								
	_			-				<u> </u>				
	_			-								
695-	25 —		SPT-3	5 9		22.9	ML	@25' - Sandy SILT: brown, medium dense, moist				
	_			7\ 14 -								
	_			-								
				-								
	30 —			-								
					OF T	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR  BULK SAMPLE OF THE SAMPLE DS DIRECT SHEAR  BULK SAMPLE DE	,			
		1			LOCA	ATIONS AND	MAY CHAN	MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT'  GE AT THIS LOCATION  G GRAB SAMPLE SA SIEVE ANALYSIS  SPT STANDARD PENETRATION S&H SIEVE AND HYDRO				



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SPT STANDARD PENETRATION TEST SAMPLE

✓ GROUNDWATER TABLE

SA S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

			Ge	otec	hnic	al B	oring	g Log Borehole LGC-HS-5	
	5/8/2							Drilling Company: 2R Drilling	
			Regio					Type of Rig: CME	
			<b>:</b> 161					Drop: 30" Hole Diameter:	8"
					~720' <b>N</b>			Drive Weight: 140 pounds	
Hole	Locat	tion:	See C	Seote	chnical	Мар		Page 2	of 2
			<u>_</u>		<u> </u>			Logged By SHH	
			Sample Number		Dry Density (pcf)		0	Sampled By SHH	l
Elevation (ft)		og	l I	l t	<b>t</b>	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test
o	(ft)	C	2	l o	USI	<u></u> <u></u>	Sy	,	<u>+</u> _
'ati	ţ	) jh	혈	O	e	stu	SS		0
<u>6</u>	Depth (ft)	Graphic Log	an	Blow Count	<u>&gt;</u>	lois	S	DECODIDE	, Š
Ш		0				-		DESCRIPTION	
	30 _		R-4	10 18 32	124.5	11.8	SP	@30' - SAND: orangish brown, dense, moist, poorly graded	
	_			. 32				graded	
	_			.				<u> </u>	
	_	-	-	-					
690-	35 —		SPT-4	4		18.0	ML	@35' - Sandy SILT: light brown, medium dense, moist	-#200
	_	1		4 8 13					
	_	1		•					
	_	-		1					i
	-			-					
685-	40 —	B3	R-5	8 18 29	117.1	15.9	SC	@40' - Clayey SAND: orange, dense, moist	
	_	1		29					
	_	]							
	_								
680-	45 <del></del>	ļ <b>Ш</b>	CDT C	11		9.9	014	GATL Cills CAND, area sich braum, damas masist	
	-		SPT-5	7 11 15 19		9.9	SM	@45' - Silty SAND: orangish brown, dense, moist	
	_			- 19					
	_			.					
	_		-	-					
675-	50		R-6	25	116.0	12.3	SP	@50' SAND: orangish brown, very dense, moist, poorly	
	_		110	25 32 40	110.0	12.0	5	graded	
	_			-				Total Depth = 50'	
	_	1		-				Groundwater Not Encountered	
	_	-		-				Backfilled with Cuttings on 5/8/2017	
670-	55 —	†							
	<del>-</del>	†		-					
	_	1							
	_	1							
	60 <del></del>	]							
	00 -				TU:0	CUMBAREN	ADDI IEO C:	UV AT THE LOCATION AND EXPER	
		-			OF T	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y
								GE AT THIS LOCATION  GE AT THIS LOCATION  GE AT SAMPLE  GE AT THIS LOCATION  SPT STANDARD PENETRATION  SPH SIEVE ANALYSIS	



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV

	Geotechnical Boring Log Borehole LGC-HS-6												
Date:	5/8/2	2017	ı					Drilling Company: 2R Drilling					
			Regio					Type of Rig: CME					
			<b>er:</b> 161					Drop: 30" Hole Diameter:	8"				
					~725' N			Drive Weight: 140 pounds					
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1 c	of 1				
			_		Ę,			Logged By SHH					
			adr		bc		00	Sampled By SHH	۰				
Elevation (ft)		Graphic Log	Sample Number	<u>±</u>	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By BJE	Type of Test				
<u>io</u>	(ft)	<u>.</u>	<del> </del>	Blow Count	Sus	<u>e</u>	Sy		of T				
vat	Depth (ft)	hd	du		<u> </u>	stu	SS		96				
<u> </u>	Эер	G.	)   	<u>%</u>	)ry	Лоі	)S(	DESCRIPTION	Ŋ				
	]			╫			<b>)</b>						
	_			-				Quaternary Young Eolian Deposits (Qye):					
	_		SPT-1	4 7 7		13.7	SM	@2.5' - Silty SAND: light brown, medium dense, moist					
720-	5 — -		R-1	4 8 9	101.9	22.3	ML	@5' - Sandy SILT: brown, medium dense, moist					
	_			-									
715-	- 10 —		SPT-2	- 7 3		11.7	SM	@10' - Silty SAND: light brown, medium dense, moist					
	<u> </u>			3 4 7									
				-									
710-	15 — –		R-2	8 11 13	110.4	16.6	ML	@15' - SILT with Sand: light brown, medium dense, moist	СО				
	_			-									
705-	20 —		SPT-3	8 12 13		5.5	SP	@20' - SAND: light brown, dense, moist, poorly graded					
	_			√\ <u>15</u> -									
	_			-				Total Depth = 20' Groundwater Not Encountered					
	-			-				Backfilled with Cuttings on 5/8/2017					
700-	25 —			-									
	-			-									
	-			-									
	30 —			_									
				1	THIS	SUMMARY	APPLIES ON	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:					
	>				OF TI SUBS	HIS BORING SURFACE C	AND AT THOONS	E TIME OF DRILLING.					



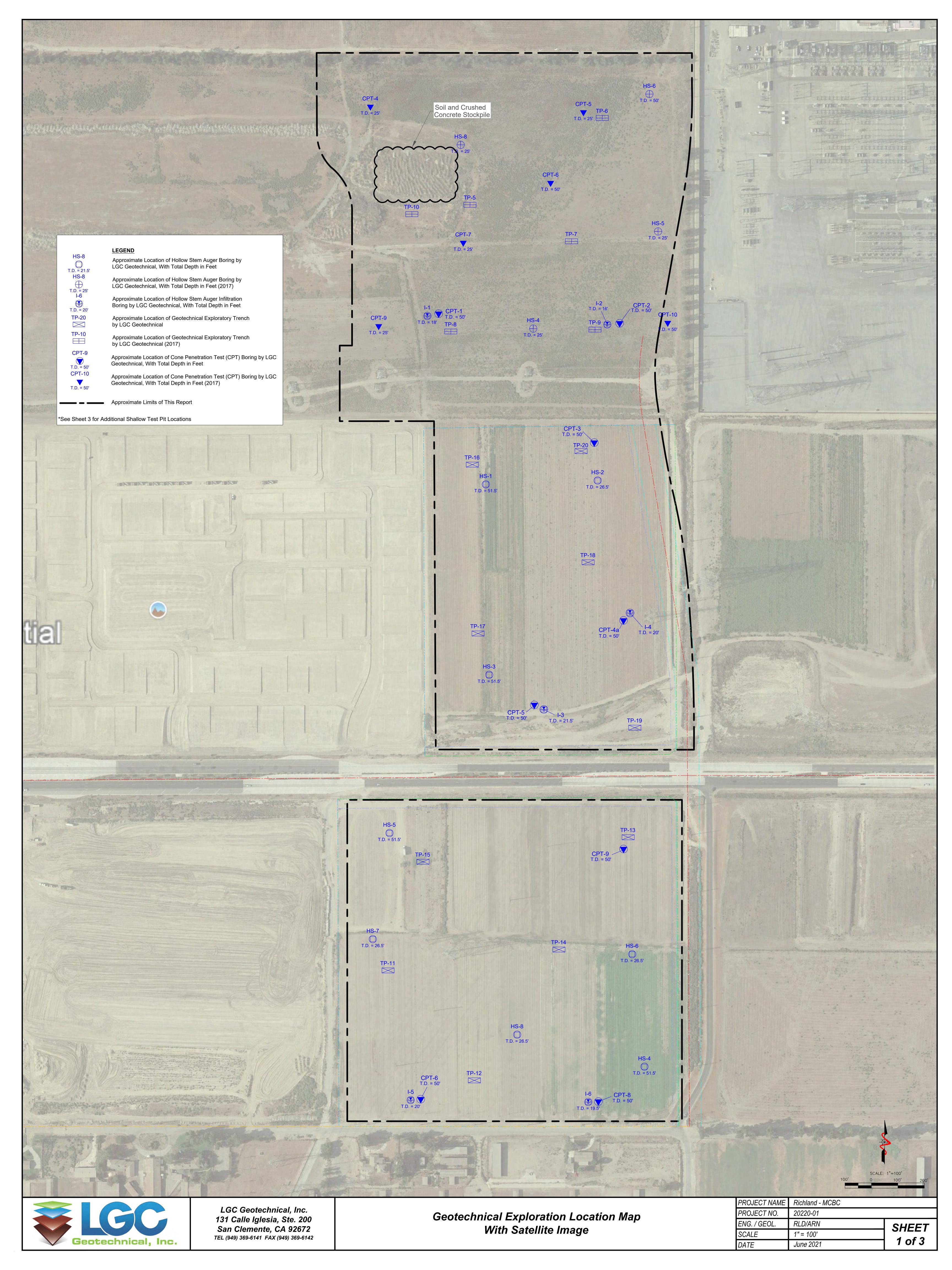
SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

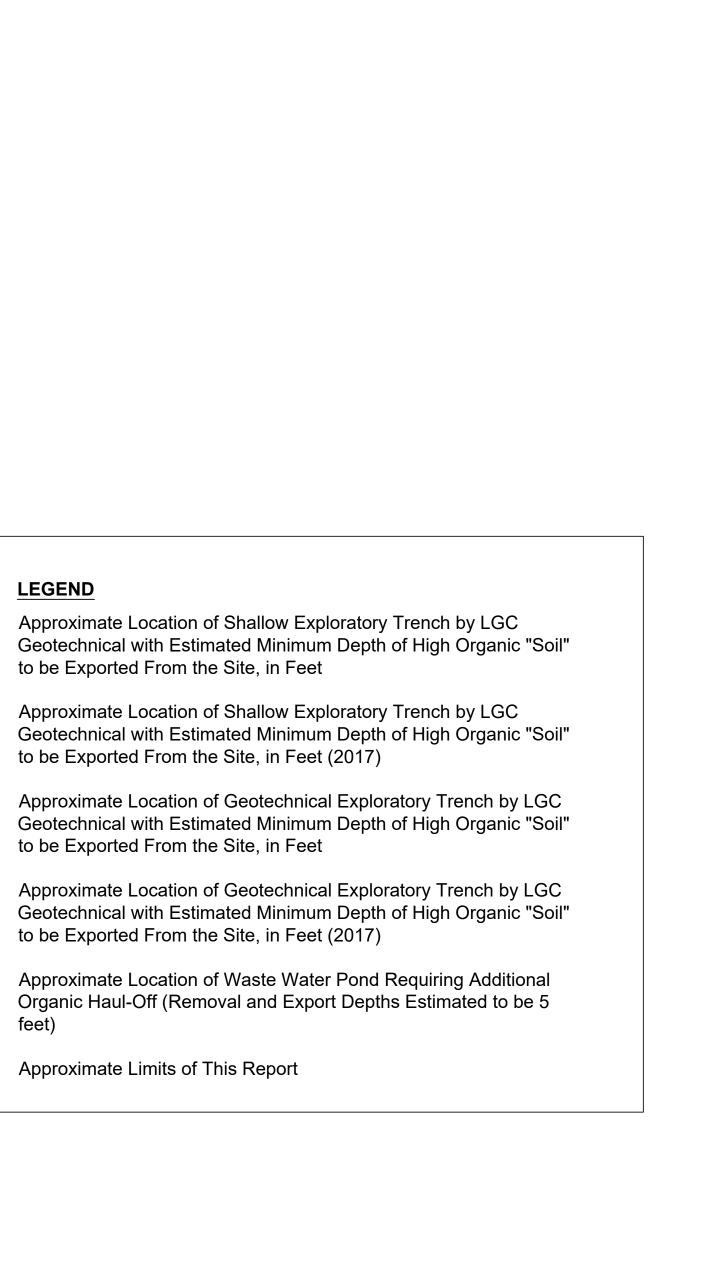
G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE

S&H EI CN CR AL CO RV ✓ GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

# Appendix I Geotechnical Subsurface Evaluation Data – Mill Creek Business Center/Randall (20220-01





**LEGEND** 

to be Exported From the Site, in Feet (2017)

to be Exported From the Site, in Feet (2017)

Approximate Limits of This Report

T-74

T-25

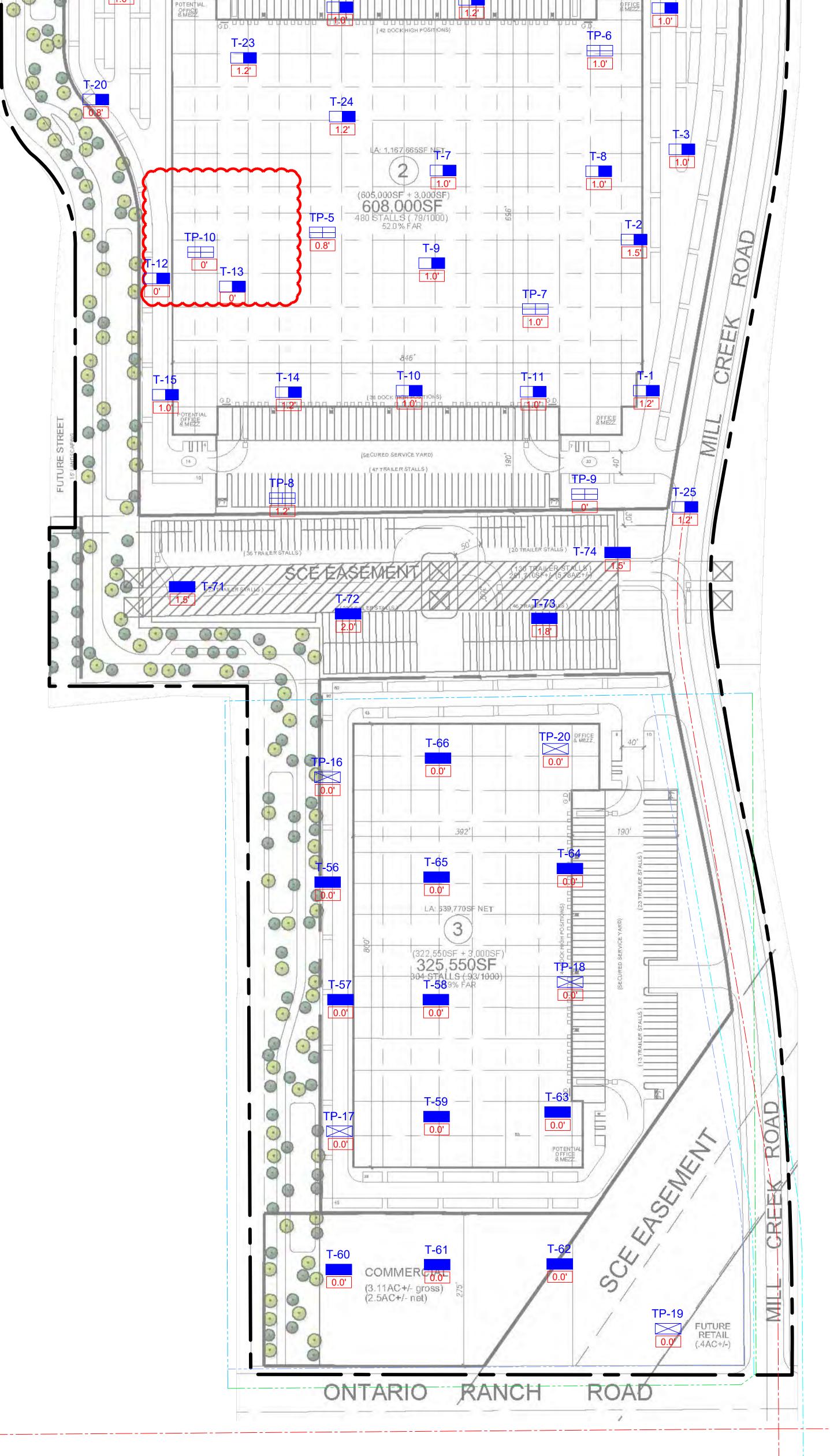
1.0'

TP-20

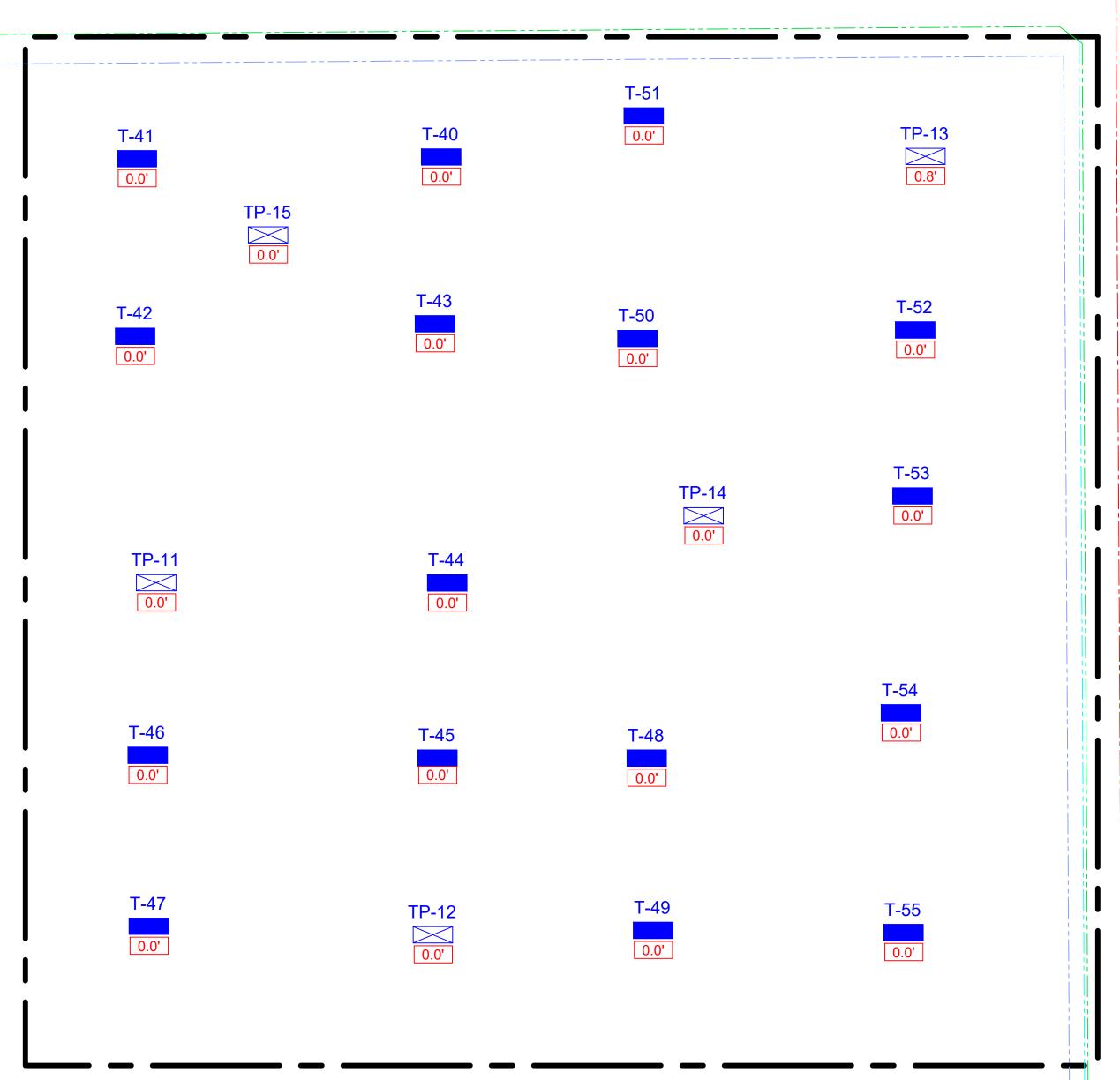
TP-10

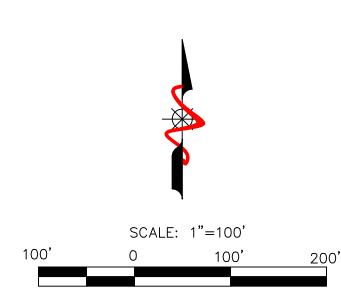
0.0'

T-22



(SECURED SERVICE YARD)







Richland - MCBC PROJECT NAME PROJECT NO. 20220-01 ENG. / GEOL. RLD/ARN SHEET SCALE 1" = 100' 3 of 3 June 2021

TP-5	(0.8')*	TP-6	(1.0')*	TP-7	(1.0')	TP-8	(1.2')
Depth (ft)		Depth (ft)		Depth (ft)			
0.8' 1.2'	9.8 0.6	0.8' 1.2'	15.8 0.6	0.8' 1.2'	13.7 0.9	0.8' 1.2'	10.8 3.9
2'	0.5	2.2'	0.6	2.2'	0.9	2.2'	0.9
	0 (0')*	TP-10	(0')*	TP-11	. (0')*	TP-12	2 (0')*
	% Organics		% Organics	Depth (ft)			% Organics
1' 1.5'	3.8 0.7	0.5' 1.2'	1.5	0.4	2.8 0.9	1.0	2.0
2.5'	0.7	<u> </u>	1.0	1.5 2.1	0.9	1.4 1.6	0.9 0.5
	(0.8')*		(0')*		6 (0')*		5 (0')*
Depth (ft)	% Organics	Depth (ft)					
0.6	6.1	0.7	2.8	0.4	2.0	0.2	2.0
1.6 2.0	1.9 0.8	1.1 1.5	2.1 0.9	1.0 1.8	2.5 0.2	1.1 1.4	1.6 0.6
7.4	0.7	2.4	0.3	3.0	0.7	-	-
TP-17	<b>7</b> (0')*	TP-18	B (0')*	TP-19	(0')*	TP-20	
	% Organics		% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.5 1.7	2.3 1.4	0.2 1.4	2.4 1.4	1.0 2.0	1.5 0.6	0.2 1.0	2.6
2 1	0.3	1.9	0.3	3.6	0.5	1.5	0.5
T-1	0.3 (1.2')*	1.9 <b>T-2</b> (	1.5')*	3.6 T-3 (	0. <u>5</u> 1.0')*	T-4 (	<u> </u>
Depth (ft)		Depth (ft)	% Organics		,	Depth (ft)	
0.8' 1.5'	6.0 0.9	1.2' 1.8'	10.1 2.0	0.8' 1.2'	11.4 1.3	1' 1.5'	20.7 1.4
2'	0.4	2.2'	1.1	2.2	0.8	2.5'	0.5
	(1.2')*		1.0')*		1.0')*	T-8 (	1.0')*
Depth (ft)			% Organics		% Organics	Depth (ft)	
0.8'	6.8	0.8'	9.4	0.8'	9.9	0.8'	7.0
1.5' -	0.3	1.5' 2.5'	0.7 0.5	1.2' 2'	0.3 0.4	1.2'	0.3
T-9	(1.0')*	Z.3		T-11		T-12	(0')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	8.0	0.8'	13.5	0.8'	13.3	0.5'	0.7
1.5' 2.5'	0.3 0.3	1.2' 2.0	1.5 1.1	1.2' 2'	1.1 0.5	1.2' 2'	0.4 0.4
	(0')*	7-14			(1.0')*		(0.8')*
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.5'	0.7	1'	9.3	0.8'	16.0	0.5'	19.2
1' 1.5'	0.5 0.5	1.8' 2.2'	1.1 0.8	1.2' 2'	0.8 0.5	1' 1.5'	0.8 0.4
	(1.0')*		(1.2')*		(1.2')*		(1.2')*
Depth (ft)	% Organics	Depth (ft)	`	Depth (ft)		Depth (ft)	% Organics
0.8'	9.8	1'	E2 0	41	407	41	10.6
0.0			52.0	1'	40.7	1'	
1.2'	2.0	1.4'	0.8	1.5'	1.9	1.5'	0.8
1.2' 2'	2.0 0.4	1.4' -	0.8	1.5' 2'	1.9 0.7	1.5' -	0.8
1.2' 2'	2.0	1.4' - <b>T-41</b> Depth (ft)	0.8 - (0')* % Organics	1.5' 2' T-42 Depth (ft)	1.9 0.7 (0')* % Organics	1.5' - <b>T-43</b> Depth (ft)	
1.2' 2' T-40 Depth (ft) 0.5	2.0 0.4 0 (0')* % Organics 2.2	1.4' - <b>T-41</b> Depth (ft) 0.5	0.8 - (0')* % Organics 2.4	1.5' 2' T-42 Depth (ft) .5'	1.9 0.7 (0')* % Organics 2.5	1.5' - <b>T-43</b> Depth (ft) .8'	0.8 - (0')* % Organics 1.8
1.2' 2' T-40 Depth (ft) 0.5 1.5	2.0 0.4 0 (0')* % Organics 2.2 1.7	1.4' - T-41 Depth (ft) 0.5 1.4	0.8 - (0')* % Organics 2.4 0.8	1.5' 2' T-42 Depth (ft) .5' 1.6'	1.9 0.7 (0')* % Organics 2.5 0.8	1.5' - T-43 Depth (ft) .8' 1.7'	0.8 - (0')* % Organics 1.8 1.0
1.2' 2' T-40 Depth (ft) 0.5 1.5	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6	1.4' - T-41 Depth (ft) 0.5 1.4 1.8	0.8 - (0')* % Organics 2.4 0.8 0.4	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8'	1.9 0.7 (0')* % Organics 2.5 0.8 0.6	1.5' - T-43 Depth (ft) .8' 1.7' 2.7'	0.8 - (0')* % Organics 1.8 1.0 0.3
1.2' 2' T-40 Depth (ft) 0.5 1.5	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6	1.4' - T-41 Depth (ft) 0.5 1.4 1.8	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')*	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8'	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')*	1.5' - T-43 Depth (ft) .8' 1.7' 2.7'	0.8 - (0')* % Organics 1.8 1.0 0.3 (0')*
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9	1.4' T-41 Depth (ft) 0.5 1.4 1.8 T-45 Depth (ft)	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5	1.5'  - T-43  Depth (ft) .8' 1.7' 2.7' T-47  Depth (ft) 0.1	0.8 - (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7	1.4'	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8	1.5' - T-43  Depth (ft) .8' 1.7' 2.7' T-47  Depth (ft) 0.1 0.8	0.8 - (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4
1.2' 2' Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3	1.4' - T-41 Depth (ft) 0.5 1.4 1.8 T-45 Depth (ft) 1.1 2.1 3.0	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5
1.2' 2' Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')*	1.4' - T-41 Depth (ft) 0.5 1.4 1.8 T-45 Depth (ft) 1.1 2.1 3.0	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')*	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')*	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8	0.8 - (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9	1.4'	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.8 1.8 T-51 Depth (ft)	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.1 1.5	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics 2.9 2.0	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8 T-51 Depth (ft) 0.8 1.3	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6	1.4'	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8 T-51 Depth (ft) 0.8 1.3 2.1	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 Depth (ft)	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6 2 (0')*	1.4' - T-41 Depth (ft) 0.5 1.4 1.8 T-45 Depth (ft) 1.1 2.1 3.0 T-49 Depth (ft) 0.5 1.7 2.2 T-53 Depth (ft)	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')*	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft)	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics 2.9 2.0 0.8 (0')* % Organics	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8 T-51 Depth (ft) 0.8 1.3 2.1 T-55 Depth (ft)	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6 2 (0')* % Organics 1.9	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft)	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics 2.9 2.0 0.8 (0')* % Organics	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.1 0.8 1.8 T-51 Depth (ft) 0.8 1.3 2.1 T-55 Depth (ft)	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')*     % Organics     1.9     1.7     0.3 0 (0')*     % Organics     2.9     2.0     0.6 0 (0')*     % Organics     1.9 1.7 2.9 2.0 2.0 3.6 3.7 3.7 3.7 4.7 5.7 5.7 5.7 5.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.8 1.5	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0	1.9 0.7 (0')* % Organics 2.5 0.8 0.6 (0')* % Organics 2.5 2.8 0.9 (0')* % Organics 2.9 2.0 0.8 (0')* % Organics 2.9 1.3	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.8 1.8 T-51 Depth (ft) 0.8 1.3 2.1 T-55 Depth (ft) 0.7 1.0	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6 2 (0')* % Organics 1.9 1.7 0.3	1.4'  T-41  Depth (ft)  0.5  1.4  1.8  T-45  Depth (ft)  1.1  2.1  3.0  T-49  Depth (ft)  0.5  1.7  2.2  T-53  Depth (ft)  0.7  1.6  1.9	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.8 1.5 0.7 (1.4 0.7	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0	1.9	1.5'  T-43  Depth (ft)  .8'  1.7'  2.7'  T-47  Depth (ft)  0.8  1.8  T-51  Depth (ft)  0.8  1.3  2.1  T-55  Depth (ft)  0.7  1.0  1.4	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.0 1.4 0.5
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')* 0 % Organics 1.9 1.7 0.3 0 (0')* 0 % Organics 2.9 2.0 0.6 0 (0')* 0 % Organics 1.9 2.9 0.6 0 (0')* 0 % Organics	1.4'  T-41  Depth (ft)  0.5  1.4  1.8  T-45  Depth (ft)  1.1  2.1  3.0  T-49  Depth (ft)  0.5  1.7  2.2  T-53  Depth (ft)  0.7  1.6  1.9	0.8 - (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')*	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0	1.9	1.5'  T-43  Depth (ft)  .8'  1.7'  2.7'  T-47  Depth (ft)  0.8  1.8  T-51  Depth (ft)  0.8  1.3  2.1  T-55  Depth (ft)  0.7  1.0  1.4	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')*     % Organics     1.9     1.7     0.3 0 (0')* 0 Organics 2.9 2.0 0.6 0 (0')* 0 W Organics 1.9 2.9 0.6 0 (0')* 0 Organics 2.9 0 Organics 3 O')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 2.7 2.9 3.9 3.9 3.9 3.9 3.9 3.9 3.9 3.9 3.9 3	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4	2.0 0.4 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 1.2 1.2 1.2 1.2 1.3
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.8 T-56 T-56 T-56 T-7-7 T-7 T	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')*     % Organics     1.9     1.7     0.3 0.3 0 (0')*     % Organics     2.9     2.0     0.6 0 (0')*     % Organics     1.9     2.9     2.0     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')* 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 0.7	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.8 T-56 T-56 T-56 T-7-7 T-7 T	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')*     % Organics     1.9     1.7     0.3 0 (0')*     % Organics     2.9     2.0     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics	1.5' 2' T-42 Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 0.8 (0')*
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6 2 (0')* % Organics 1.9 2.9 0.6 5 (0')* % Organics 1.9 2.9 0.6 5 (0')* % Organics 1.9 2.9 0.6 5 (0')* % Organics 2.7	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3	1.5' 2'  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2  Depth (ft) 0.3	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 2.4 2.5
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5	2.0 0.4 0 (0')* % Organics 2.2 1.7 0.6 (0')* % Organics 1.9 1.7 0.3 8 (0')* % Organics 2.9 2.0 0.6 2 (0')* % Organics 1.9 2.9 0.6 5 (0')* % Organics 1.9 2.9 0.6 5 (0')* % Organics 2.9 0.7 0.7 0 (0')* % Organics 2.0 1.2 0.7 0 (0')* % Organics 2.0 1.2 0.7	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics	1.5' 2'  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2  Depth (ft) 0.3 1.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 1.8
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.7 T-60 Depth (ft) 0.1 0.5 0.7	2.0 0.4 0 (0')*     % Organics     2.2     1.7     0.6 0 (0')*     % Organics     1.9     1.7     0.3 0 (0')*     % Organics     2.9     2.0     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*     % Organics     1.9     2.9     0.6 0 (0')*     % Organics     2.7     0.7 0 (0')*     % Organics     2.0     1.2     0.7 0 (0')*     % Organics     2.7     2.4     0.6	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics	1.5' 2'  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2  Depth (ft) 0.3 1.2 2.0	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.7 T-60 Depth (ft) 0.7 T-60 T-60 T-60 T-60 T-60 T-60 T-60 T-60	2.0 0.4 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')*	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2 Depth (ft) 0.3 1.2 2.0 T-66	1.9	1.5' - T-43 Depth (ft) .8' 1.7' 2.7' T-47 Depth (ft) 0.8 1.8 T-51 Depth (ft) 0.8 1.3 2.1 T-55 Depth (ft) 0.7 1.0 1.4 T-59 Depth (ft) 0.2 1.7 2.1 T-63 Depth (ft) 0.2 1.7 1.6 T-71 (	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.5 1.8 0.5
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2	2.0	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2 T-62 Depth (ft) 0.3 1.2 2.0 T-66 Depth (ft)	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 1.8 0.5 1.5')* % Organics 7.6
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5	2.0	1.4'  T-41  Depth (ft)  0.5  1.4  1.8  T-45  Depth (ft)  1.1  2.1  3.0  T-49  Depth (ft)  0.5  1.7  2.2  T-53  Depth (ft)  0.7  1.6  1.9  T-57  Depth (ft)  0.2  0.7  1.2  T-61  Depth (ft)  0.2  1.1  1.5  T-65  Depth (ft)  0.2  1.1	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2 T-62 Depth (ft) 0.3 1.2 2.0 T-66 Depth (ft)	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1')* % Organics 2.5 1.8 0.5 1.5')* % Organics 7.6 12.1
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5 2.0	2.0	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2 T-62 Depth (ft) 0.3 1.2 2.0 T-66 Depth (ft)	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1.5')* % Organics 3.6 1.8 0.5 1.5')* % Organics 7.6
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5 2.0	2.0	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3	1.5' 2' Depth (ft) .5' 1.6' 2.8' T-46 Depth (ft) 0.3 0.4 1.6 T-50 Depth (ft) 0.6 1.3 2.0 T-54 Depth (ft) 0.5 1.0 2.0 T-58 Depth (ft) 0.2 0.8 1.2 T-62 Depth (ft) 0.3 1.2 2.0 T-66 Depth (ft)	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1')* % Organics 2.5 1.8 0.5 1.5')* % Organics 7.6 12.1
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5 2.0 T-72 Depth (ft) 0.3	2.0 0.4 0 (0')*     % Organics     2.2 1.7 0.6 0 (0')*     % Organics 1.9 1.7 0.3 0 (0')*     % Organics 2.9 2.0 0.6 0 (0')*     % Organics 1.9 2.9 0.6 0 (0')*     % Organics 2.9 0.6 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (1.8)* % Organics 3.4	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1')* % Organics 2.5 1.8 0.5 1.5')* % Organics 7.6 12.1
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5 2.1 T-72 Depth (ft) 0.3 1.7	2.0	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (1.8)* % Organics 3.4 11.2	1.5' 2'	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1')* % Organics 2.5 1.8 0.5 1.5')* % Organics 7.6 12.1
1.2' 2' T-40 Depth (ft) 0.5 1.5 1.8 T-44 Depth (ft) 0.7 1.3 1.7 T-48 Depth (ft) 0.2 1.5 2.1 T-52 Depth (ft) 0.6 1.2 1.8 T-56 Depth (ft) 0.2 1.4 1.7 T-60 Depth (ft) 0.1 0.5 0.7 T-64 Depth (ft) 0.2 1.5 2.0 T-72 Depth (ft) 0.3	2.0 0.4 0 (0')*     % Organics     2.2 1.7 0.6 0 (0')*     % Organics 1.9 1.7 0.3 0 (0')*     % Organics 2.9 2.0 0.6 0 (0')*     % Organics 1.9 2.9 0.6 0 (0')*     % Organics 2.9 0.6 0 (0')*	1.4'	0.8 (0')* % Organics 2.4 0.8 0.4 (0')* % Organics 2.1 0.5 0.6 (0')* % Organics 2.8 1.5 0.7 (0')* % Organics 2.7 1.4 0.7 (0')* % Organics 2.5 1.9 0.4 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (0')* % Organics 2.3 1.9 0.3 (1.8)* % Organics 3.4	1.5' 2'  T-42  Depth (ft) .5' 1.6' 2.8'  T-46  Depth (ft) 0.3 0.4 1.6  T-50  Depth (ft) 0.6 1.3 2.0  T-54  Depth (ft) 0.5 1.0 2.0  T-58  Depth (ft) 0.2 0.8 1.2	1.9	1.5'	0.8 (0')* % Organics 1.8 1.0 0.3 (0')* % Organics 3.6 1.4 0.5 (0')* % Organics 2.0 1.4 0.5 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.7 1.2 0.8 (0')* % Organics 2.4 1.7 0.6 (0')* % Organics 2.4 1.7 0.6 (1')* % Organics 2.5 1.8 0.5 1.5')* % Organics 7.6 12.1

"High" Organic Content "Soils" Recommended for Export from Site "Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils "Clean" Soils

< 2%</p>
"Clean" Soils
Note: (#')\* Indicates Recommended Organic Export Depth in Feet. Export depth may exceed the depths highlighted boxes.



> 5% 2 to 5%

> Table 8 - Summary of Organic Content - Organic Removal & **Export Depths**

Project Name	Richland - MCBC, Ontario
Project Number	20179-01
ENG./GEOL.	RLD/ARN
Date	June 2021

#### <u>APPENDIX C</u>

### **Laboratory Test Results**

The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the site soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and a table summarizing the test results.

<u>Moisture and Density Determination Tests</u>: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on driven samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

<u>Grain Size Distribution/Fines Content</u>: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve (ASTM D1140). Where applicable, the portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D6913 (sieve).

Sample Location	Description	% Passing # 200 Sieve
HS-1 @ 1-5 ft	Silty Sand	14
HS-2 @ 1-5 ft	Silty Sand	20
HS-5 @ 1-5 ft	Silty Sand	31
HS-6 @ 1-5 ft	Silty Sand	27
HS-8 @ 5 ft	Sand with Silt	6
I-3 @ 1-5 ft	Silty Sand with Gravel	17
*HS-4 @ 5 ft	Silty Sand	29
*HS-8 @ 10 ft	Sandy Silt	65

<sup>\*</sup>testing from LGC Geotechnical (2017)

#### **APPENDIX C**

### **Laboratory Test Results (Continued)**

Atterberg Limits: The liquid and plastic limits ("Atterberg Limits") were determined per ASTM D4318 for engineering classification of fine-grained material and presented in the table below. The USCS soil classification indicated in the table below is based on the portion of sample passing the No. 40 sieve and may not necessarily be representative of the entire sample. The plots are provided in this Appendix.

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Soil Classification
HS-2 @ 7.5 ft	33	19	14	CL
HS-7 @ 7.5 ft	NP	NP	NP	ML

<u>Consolidation</u>: Two consolidation tests were performed per ASTM D2435. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under "double drainage" and total deformation for each loading step were recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height. The consolidation pressure curves are provided in this Appendix.

<u>Collapse/Swell Potential</u>: Five collapse tests were performed per ASTM D4546. Samples (2.4 inches in diameter and 1-inch in height) were placed in a consolidometer and loaded to their approximate in-situ effective stress. The curves are presented in this Appendix.

<u>Direct Shear</u>: Two direct shear test were performed, one on a driven sample and one on a 90% relative compaction remolded sample. The ring samples were soaked for a minimum of 24 hours prior to testing. The samples were tested under various normal loads using a motor-driven, strain-controlled, direct-shear testing apparatus (ASTM D3080). The plots are provided in this Appendix.

### APPENDIX C

### **Laboratory Test Results (Continued)**

<u>Maximum Density Tests</u>: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-2 @ 1-5 ft	Brown Silty Sand	112.5	7.5
HS-6 @ 1-5 ft	Olive brown Silty Sand	120.0	10.5
*HS-4 @ 2.5-5 ft	Light olive brown Silty Sand	118.5	9.0

<sup>\*</sup>testing from LGC Geotechnical (2017)

<u>Expansion Index</u>: The expansion potential of selected representative samples was evaluated by the Expansion Index Test per ASTM D4829.

Sample Location	Expansion Index	Expansion Potential*
HS-2 @ 1-5 ft	0	Very Low
HS-6 @ 1-5 ft	3	Very Low
I-3 @ 1-5 ft	0	Very Low
*HS-4 @ 2.5-5 ft	1	Very Low
*HS-6 @ 2.5-5 ft	0	Very Low

<sup>\*</sup>testing from LGC Geotechnical (2017)

<u>R-value Test</u>: R-value test was performed in general accordance with California Test Method 301. The plot is included in the Appendix.

Sample Location	R-value
HS-5 @ 1-5 ft	65

### APPENDIX C

### **Laboratory Test Results (Continued)**

<u>Soluble Sulfates</u>: The soluble sulfate content of select samples was determined by standard geochemical methods (CTM 417). The test results are presented in the table below.

Sample Location	Sulfate Content, %
HS-2 @ 1-5 ft	<0.01%
HS-6 @ 1-5 ft	<0.01%
I-3 @ 1-5 ft	<0.03%
*HS-4 @ 2.5-5 ft	<0.02%

<sup>\*</sup>testing from LGC Geotechnical (2017)

<u>Chloride Content</u>: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
HS-2 @ 1-5 ft	50
HS-6 @ 1-5 ft	260
I-3 @ 1-5 ft	110
*HS-4 @ 2.5-5 ft	104

<sup>\*</sup>testing from LGC Geotechnical (2017)

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The results are presented in the table below.

Sample Location	рН	Minimum Resistivity (ohms- cm)
HS-2 @ 1-5 ft	8.73	5798
HS-6 @ 1-5 ft	8.08	1600
I-3 @ 1-5 ft	8.57	4650
*HS-4 @ 2.5-5 ft	6.33	737

<sup>\*</sup>testing from LGC Geotechnical (2017)

<u>Organic Matter Content of Soils</u>: Organic matter content tests were performed in general accordance with ASTM D 2974 (Test Methods A & C). The results are presented in Table 9.

# PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS ASTM D 6913

Project Name: Vander Eyk Tested By: GB/JY Date: 07/21/17

Project No.: 17074-01 Checked By: J. Ward Date: 07/31/17

Boring No.: <u>HS-4</u> Depth (feet): 5.0

Sample No.: R-1

Soil Identification: <u>Light olive brown silty sand (SM)</u>

		Moisture Content of Total Air -	Dry Soil
Container No.:	K-2	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont	.(g) 474.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	75.4	Wt. of Container No (g)	1.0
Dry Wt. of Soil (g)	398.8	Moisture Content (%)	0.0

	Container No.	K-2
After Wet Sieve	Wt. of Dry Soil + Container (g)	370.9
Arter Wet Sieve	Wt. of Container (g)	75.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	295.5

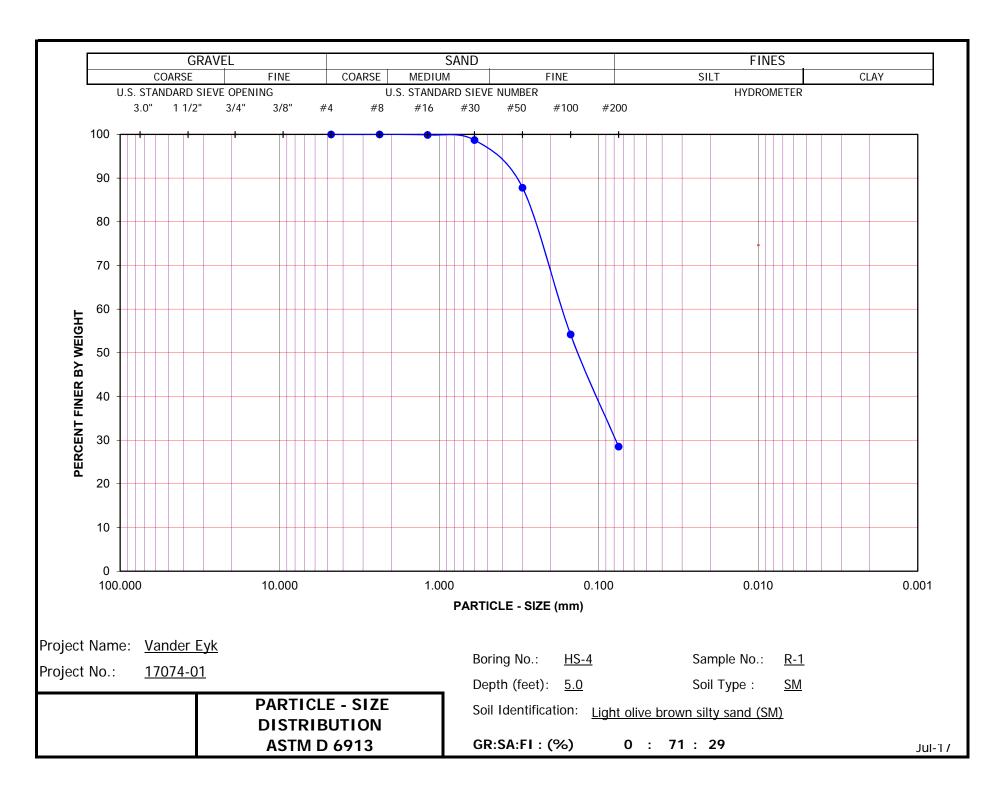
U. S. Siev	e Size	Cumulative Weight	Percent Passing (%)	
(in.)	(mm.)	Dry Soil Retained (g)	r crocite assing (70)	
6"	150.0			
3"	75.0			
1 1/2	37.5			
3/4"	19.0			
3/8"	9.5			
#4	4.75	0.0	100.0	
#8	2.36	0.1	100.0	
#16	1.18	0.5	99.9	
#30	0.600	5.1	98.7	
#50	0.300	48.5	87.8	
#100	0.150	182.6	54.2	
#200	0.075	285.2	28.5	
PAN				

GRAVEL:	0 %
SAND:	71 %
FINES:	29 %

GROUP SYMBOL: SM Cu = D60/D10 =

 $Cc = (D30)^2/(D60*D10) =$ 

Remarks:



### **ATTERBERG LIMITS**

### **ASTM D 4318**

Project Name: Ontario Tested By: Y. Nguyen Date: 01/05/21
Project No.: 20220-01 Input By: G. Bathala Date: 01/14/21

Boring No.: HS-2 Checked By: J. Ward
Sample No.: R-3 Depth (ft.) 7.5

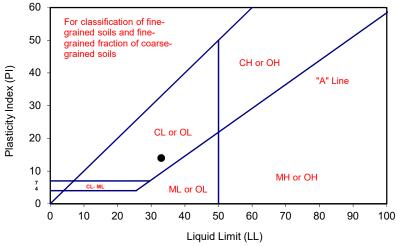
Soil Identification: Olive lean clay (CL)

TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1 2 3 4		4	
Number of Blows [N]			29	23	18	
Wet Wt. of Soil + Cont. (g)	10.04	9.95	21.28	21.31	20.91	
Dry Wt. of Soil + Cont. (g)	8.58	8.55	16.38	16.29	15.91	
Wt. of Container (g)	0.99	1.11	1.04	1.02	1.05	
Moisture Content (%) [Wn]	19.24	18.82	31.94	32.87	33.65	

Liquid Limit	33
Plastic Limit	19
Plasticity Index	14
Classification	CL

PI at "A" - Line = 0.73(LL-20) 9.49

One - Point Liquid Limit Calculation  $LL = Wn(N/25)^{0.121}$ 



### **PROCEDURES USED**

Wet Preparation

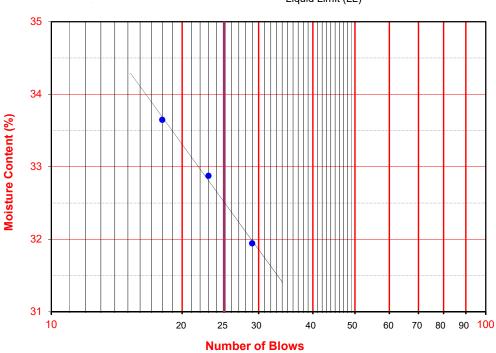
Multipoint - Wet

X Dry Preparation

Multipoint - Dry

X Procedure A
Multipoint Test

Procedure B
One-point Test



### **ATTERBERG LIMITS**

### **ASTM D 4318**

Project Name:OntarioTested By:Y. NguyenDate:01/14/21Project No.:20220-01Input By:G. BathalaDate:01/20/21

Boring No.: HS-7 Checked By: J. Ward

Sample No.: R-3 Depth (ft.) 7.5

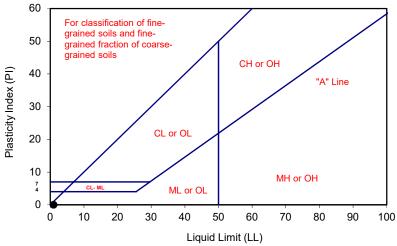
Soil Identification: Olive silt (ML)

TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1 2		1	2	3	4
Number of Blows [N]			10			
Wet Wt. of Soil + Cont. (g)	Cannot be rolled:		21.78	Cannot get	more than 1	LO blows:
Dry Wt. of Soil + Cont. (g)	NonPlastic		18.38	NonPlastic		
Wt. of Container (g)			1.05			
Moisture Content (%) [Wn]			19.62			

Liquid Limit	NP
Plastic Limit	NP
Plasticity Index	NP
Classification	NP

PI at "A" - Line = 0.73(LL-20) \_=

One - Point Liquid Limit Calculation  $LL = Wn(N/25)^{0.121}$ 



### **PROCEDURES USED**

Wet Preparation

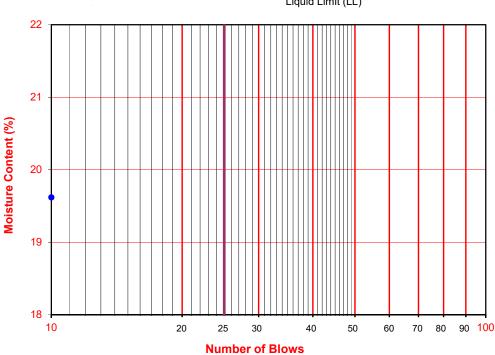
Multipoint - Wet

X Dry Preparation

Multipoint - Dry

X Procedure A
Multipoint Test

Procedure B
One-point Test



Project Name: Ontario Tested By: GB/YN Date: 01/04/21

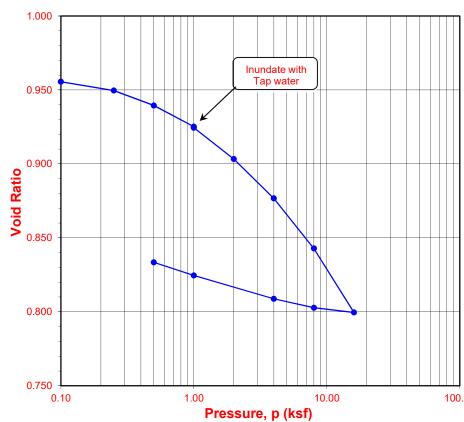
Project No.: 20220-01 Checked By: <u>J. Ward</u> Date: 01/27/21

Boring No.: HS-2 Depth (ft.): 7.5

Sample No.: R-3 Sample Type: Ring

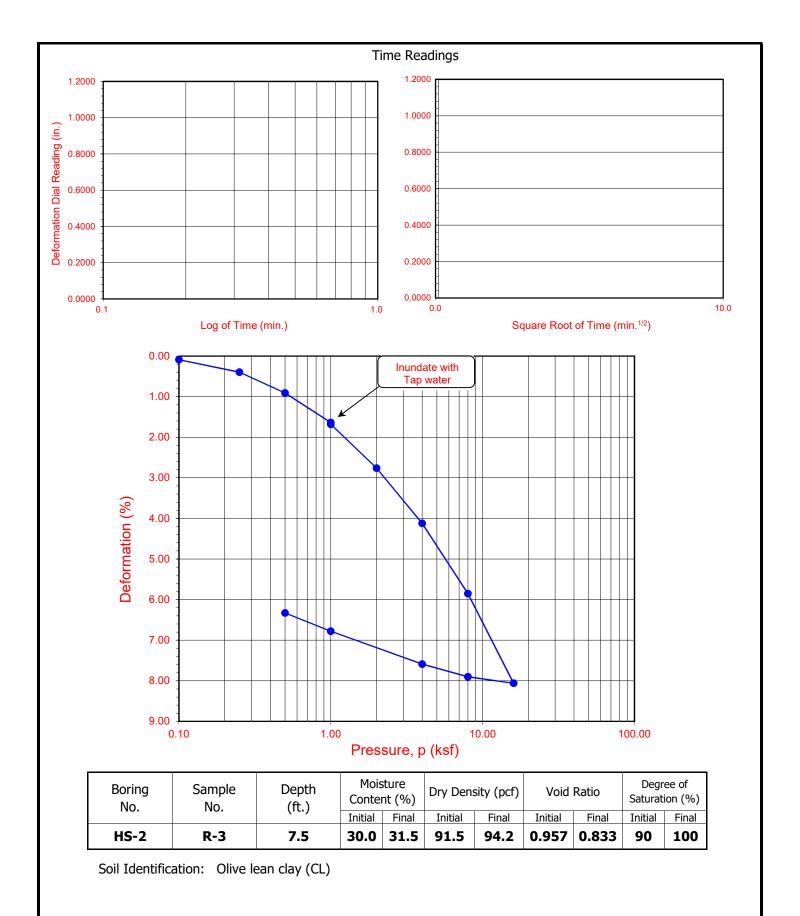
Soil Identification: Olive lean clay (CL)

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	188.60
Weight of Ring (g)	45.53
Height after consol. (in.)	0.9367
Before Test	
Wt.Wet Sample+Cont. (g)	264.45
Wt.of Dry Sample+Cont. (g)	217.19
Weight of Container (g)	59.56
Initial Moisture Content (%)	30.0
Initial Dry Density (pcf)	91.5
Initial Saturation (%)	90
Initial Vertical Reading (in.)	0.2938
After Test	
Wt.of Wet Sample+Cont. (g)	246.28
Wt. of Dry Sample+Cont. (g)	212.88
Weight of Container (g)	61.21
Final Moisture Content (%)	31.47
Final Dry Density (pcf)	94.2
Final Saturation (%)	100
Final Vertical Reading (in.)	0.2277
Specific Gravity (assumed)	2.87
Water Density (pcf)	62.43



Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma- tion (%)
0.10	0.2929	0.9991	0.00	0.09	0.956	0.09
0.25	0.2894	0.9956	0.05	0.45	0.950	0.40
0.50	0.2837	0.9899	0.10	1.01	0.940	0.91
1.00	0.2756	0.9818	0.18	1.82	0.925	1.64
1.00	0.2752	0.9814	0.18	1.86	0.924	1.68
2.00	0.2635	0.9697	0.27	3.03	0.903	2.76
4.00	0.2486	0.9548	0.40	4.52	0.877	4.12
8.00	0.2297	0.9359	0.56	6.41	0.843	5.85
16.00	0.2055	0.9117	0.77	8.83	0.800	8.06
8.00	0.2083	0.9145	0.65	8.55	0.803	7.90
4.00	0.2125	0.9187	0.54	8.13	0.809	7.59
1.00	0.2224	0.9286	0.36	7.14	0.825	6.78
0.50	0.2277	0.9339	0.28	6.61	0.833	6.33

Time Readings							
Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)			



Project No.: 20220-01

Ontario

01-21

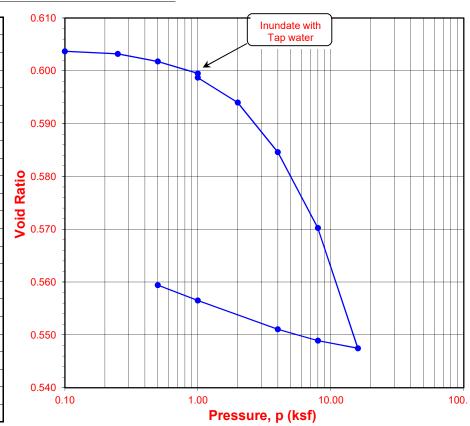
Project Name:OntarioTested By: GB/YNDate:01/12/21Project No.:20220-01Checked By: J. WardDate:01/27/21

Boring No.: HS-7 Depth (ft.): 7.5

Sample No.: R-3 Sample Type: Ring

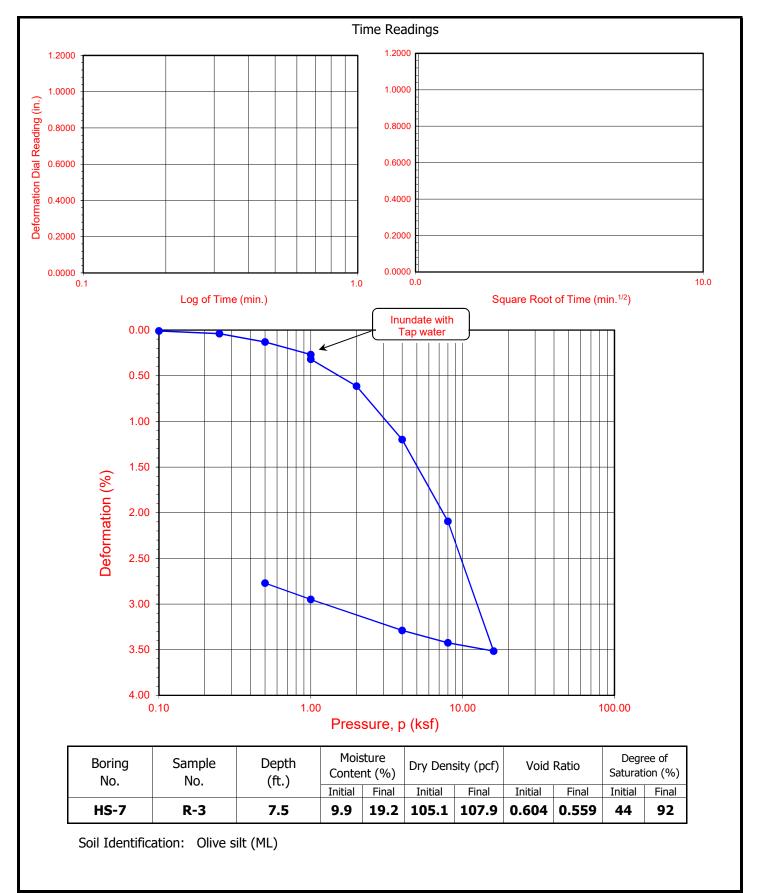
Soil Identification: Olive silt (ML)

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	181.79
Weight of Ring (g)	42.94
Height after consol. (in.)	0.9723
Before Test	
Wt.Wet Sample+Cont. (g)	295.00
Wt.of Dry Sample+Cont. (g)	274.70
Weight of Container (g)	69.12
Initial Moisture Content (%)	9.9
Initial Dry Density (pcf)	105.1
Initial Saturation (%)	44
Initial Vertical Reading (in.)	0.2750
After Test	
Wt.of Wet Sample+Cont. (g)	250.56
Wt. of Dry Sample+Cont. (g)	226.31
Weight of Container (g)	57.19
Final Moisture Content (%)	19.22
Final Dry Density (pcf)	107.9
Final Saturation (%)	92
Final Vertical Reading (in.)	0.2430
Specific Gravity (assumed)	2.70
Luci 5 " ( 6	62.43
Water Density (pcf)	02.73



Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma- tion (%)
0.10	0.2749	0.9999	0.00	0.01	0.604	0.01
0.25	0.2739	0.9989	0.07	0.11	0.603	0.04
0.50	0.2724	0.9974	0.13	0.26	0.602	0.13
1.00	0.2702	0.9952	0.21	0.48	0.600	0.27
1.00	0.2697	0.9947	0.21	0.53	0.599	0.32
2.00	0.2656	0.9906	0.33	0.94	0.594	0.61
4.00	0.2584	0.9834	0.46	1.66	0.585	1.20
8.00	0.2477	0.9727	0.64	2.74	0.570	2.10
16.00	0.2313	0.9563	0.86	4.38	0.547	3.52
8.00	0.2330	0.9580	0.78	4.21	0.549	3.43
4.00	0.2353	0.9603	0.68	3.97	0.551	3.29
1.00	0.2405	0.9655	0.50	3.45	0.557	2.95
0.50	0.2430	0.9680	0.43	3.20	0.559	2.77

Time Readings							
Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)			



Project No.: 20220-01

Ontario

01-21

### **ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546**

Project Name: Ontario

Project No.: 20220-01 HS-4

Boring No.: Sample No.: R-3

Sample Description: Olive silty clay with sand (CL-ML)s

Tested By: G. Bathala Date: 01/18/21 Checked By: J. Ward Date: 02/03/21

Sample Type: Ring

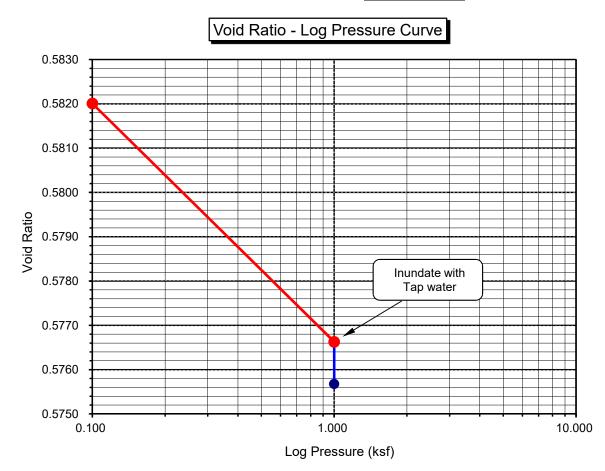
Depth (ft.) 7.5

Initial Dry Density (pcf):	106.5
Initial Moisture (%):	11.35
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2965
Diameter(in):	2.415

Final Dry Density (pcf):	107.0
Final Moisture (%) :	19.2
Initial Void Ratio:	0.5825
Specific Gravity(assumed):	2.70
Initial Saturation (%)	52.6

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2962	0.9997	0.00	-0.03	0.5820	-0.03
1.000	0.2910	0.9945	0.18	-0.55	0.5766	-0.37
H2O	0.2904	0.9939	0.18	-0.61	0.5757	-0.43

Percent Swell (+) / Settlement (-) After Inundation = -0.06



## ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546

Project Name:OntarioTested By:G. BathalaDate:01/18/21Project No.:20220-01Checked By:J. WardDate:02/03/21

Boring No.: HS-8 Sample Type: Ring Sample No.: R-2 Depth (ft.) 5.0

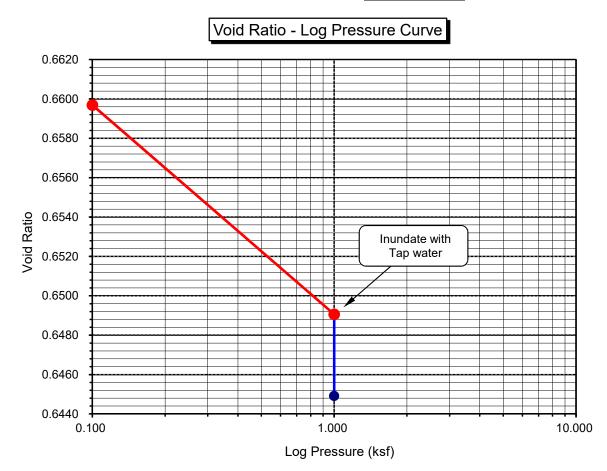
Sample Description: Olive gray poorly-graded sand with silt (SP-SM)

Initial Dry Density (pcf):	101.5
Initial Moisture (%):	2.58
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3140
Diameter(in):	2.415

Final Dry Density (pcf):	102.5
Final Moisture (%) :	18.6
Initial Void Ratio:	0.6600
Specific Gravity(assumed):	2.70
Initial Saturation (%)	10.6

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.3138	0.9998	0.00	-0.02	0.6597	-0.02
1.000	0.3067	0.9927	0.07	-0.73	0.6491	-0.66
H2O	0.3042	0.9902	0.07	-0.98	0.6449	-0.91

Percent Swell (+) / Settlement (-) After Inundation = -0.25



### **ONE-DIMENSIONAL SWELL OR SETTLEMENT POTENTIAL OF COHESIVE SOILS ASTM D 4546**

Project Name: Ontario

Boring No.: I-3 Sample No.: R-2

Sample Description: Light olive gray silty sand (SM)

Tested By: G. Bathala Date: 01/07/21 Project No.: 20220-01 Checked By: J. Ward Date: 01/27/21

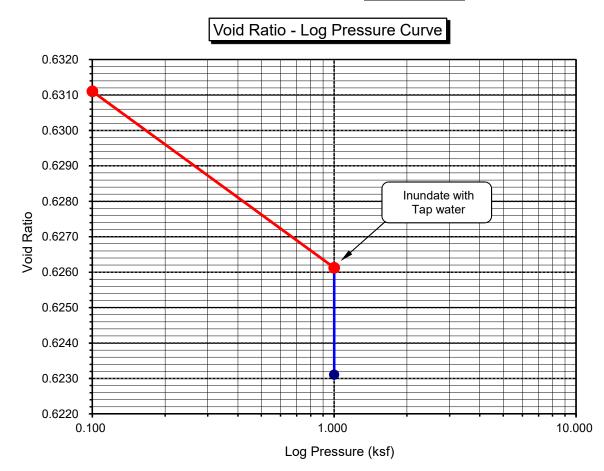
Sample Type: Ring Depth (ft.) 5.0

Initial Dry Density (pcf):	103.3
Initial Moisture (%):	2.15
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2597
Diameter(in):	2.415

Final Dry Density (pcf):	103.9
Final Moisture (%) :	20.1
Initial Void Ratio:	0.6314
Specific Gravity(assumed):	2.70
Initial Saturation (%)	9.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.2595	0.9998	0.00	-0.02	0.6311	-0.02
1.000	0.2554	0.9957	0.11	-0.43	0.6261	-0.32
H2O	0.2535	0.9938	0.11	-0.62	0.6231	-0.51

Percent Swell (+) / Settlement (-) After Inundation =



## One-Dimensional Swell or Settlement Potential of Cohesive Soils (ASTM D 4546)

Project Name: Vander Eyk
Project No.: 17074-01

17074-01 HS-4

Boring No.: HS-4
Sample No.: R-1

Sample Description:

 Tested By:
 G. Bathala
 Date:
 07/20/17

 Checked By:
 J. Ward
 Date:
 07/31/17

Sample Type: Ring

Depth (ft.) 5.0

Initial Dry Density (pcf):	105.7
Initial Moisture (%):	5.83
Initial Length (in.):	1.0000
Initial Dial Reading:	0.1924
Diameter(in):	2.415

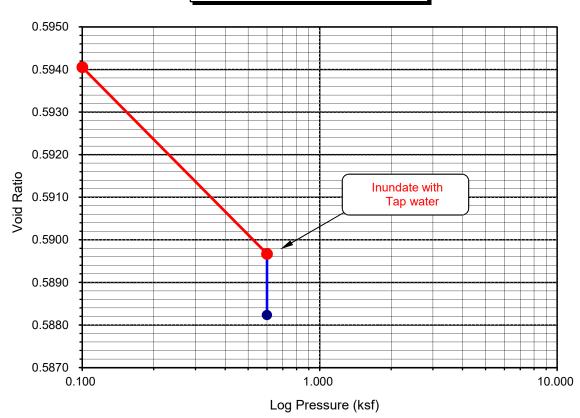
Final Dry Density (pcf):	106.2
Final Moisture (%):	15.1
Initial Void ratio:	0.5941
Specific Gravity(assumed):	2.70
Initial Saturation (%)	26.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.1924	1.0000	0.00	0.00	0.5941	0.00
0.600	0.1957	0.9968	0.05	-0.32	0.5897	-0.27
H2O	0.1966	0.9959	0.05	-0.41	0.5882	-0.36

Percent Swell (+) / Settlement (-) After Inundation = -0.09

Light olive brown silty sand (SM)

## Void Ratio - Log Pressure Curve



## One-Dimensional Swell or Settlement Potential of Cohesive Soils (ASTM D 4546)

Project Name:Vander EykTested By:G. BathalaDate:Project No.:17074-01Checked By:J. WardDate:

Boring No.: HS-8 Sample Type: Ring Sample No.: R-2 Depth (ft.) 10.0

Sample Description: Olive brown sandy silt (ML)

Initial Dry Density (pcf):	94.4
Initial Moisture (%):	4.99
Initial Length (in.):	1.0000
Initial Dial Reading:	0.1389
Diameter(in):	2.415

Final Dry Density (pcf):	95.4
Final Moisture (%) :	26.0
Initial Void ratio:	0.7851
Specific Gravity(assumed):	2.70
Initial Saturation (%)	17.2

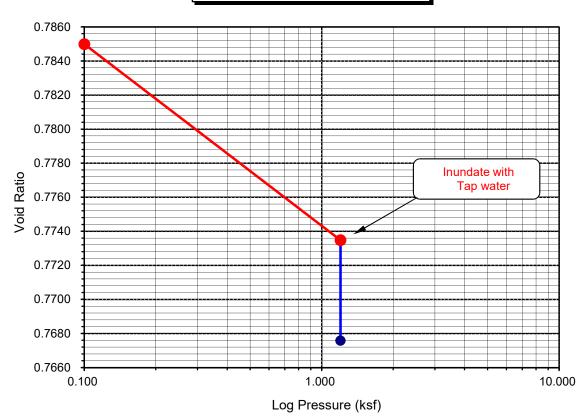
07/20/17

07/31/17

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.100	0.1389	1.0000	0.00	0.00	0.7850	0.00
1.200	0.1458	0.9931	0.04	-0.69	0.7735	-0.65
H2O	0.1491	0.9898	0.04	-1.02	0.7676	-0.98

Percent Swell (+) / Settlement (-) After Inundation = -0.33

## Void Ratio - Log Pressure Curve



## **DIRECT SHEAR TEST**

### **Consolidated Drained - ASTM D 3080**

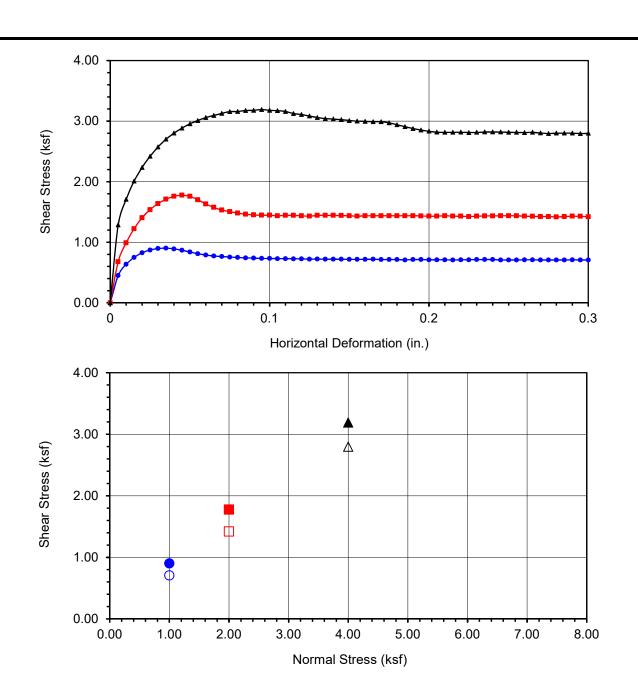
Project Name: Ontario Tested By: G. Bathala Date: 01/18/21
Project No.: 20220-01 Checked By: J. Ward Date: 02/03/21

Boring No.: HS-6 Sample Type: 90% Remold

Sample No.: <u>B-1</u> Depth (ft.): <u>1-5</u>

Soil Identification: <u>Light olive brown silty sand (SM)</u>

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	190.13	191.20	191.49
Weight of Ring(gm):	45.32	45.72	45.73
Before Shearing			
Weight of Wet Sample+Cont.(gm):	169.11	169.11	169.11
Weight of Dry Sample+Cont.(gm):	158.16	158.16	158.16
Weight of Container(gm):	57.18	57.18	57.18
Vertical Rdg.(in): Initial	0.0000	0.2644	0.2702
Vertical Rdg.(in): Final	-0.0123	0.2804	0.2941
After Shearing			
Weight of Wet Sample+Cont.(gm):	206.93	218.82	207.01
Weight of Dry Sample+Cont.(gm):	186.93	199.45	187.98
Weight of Container(gm):	57.95	69.38	57.32
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43



Boring No.	HS-6			
Sample No.	B-1			
Depth (ft)	1-5			
Sample Type:				
90% Remold				
Soil Identification:				
Light olive brown silty sand				
(SM)				

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	• 0.902	<b>1.776</b>	▲ 3.191
Shear Stress @ End of Test (ksf)	<b>o</b> 0.707	□ 1.421	△ 2.798
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	10.84	10.84	10.84
Dry Density (pcf)	108.7	109.2	109.4
Saturation (%)	53.1	53.8	54.1
Soil Height Before Shearing (in.)	0.9877	0.9840	0.9761
Final Moisture Content (%)	15.5	14.9	14.6

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.:

Ontario

01-21

20220-01

### **DIRECT SHEAR TEST**

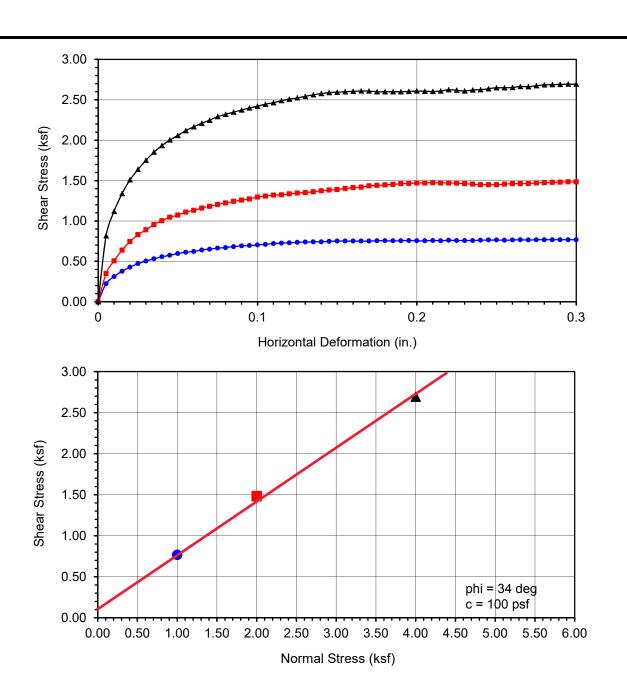
Consolidated Drained - ASTM D 3080

Project Name:Vander EykTested By:G. BathalaDate:07/19/17Project No.:17074-01Checked By:J. WardDate:07/31/17

Boring No.:  $\frac{\text{HS-8}}{\text{Sample Type:}}$  Sample Type: Ring Sample No.:  $\frac{\text{R-1}}{\text{Sol}}$  Depth (ft.):  $\frac{5.0}{\text{Sol}}$ 

Soil Identification: Olive brown silt with sand (ML)s

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	172.75	171.02	177.40
Weight of Ring(gm):	46.05	43.56	45.12
Before Shearing			
Weight of Wet Sample+Cont.(gm):	163.17	163.17	163.17
Weight of Dry Sample+Cont.(gm):	157.77	157.77	157.77
Weight of Container(gm):	60.10	60.10	60.10
Vertical Rdg.(in): Initial	0.0000	0.2720	0.2789
Vertical Rdg.(in): Final	-0.0079	0.2875	0.2956
After Shearing			
Weight of Wet Sample+Cont.(gm):	206.80	196.37	183.57
Weight of Dry Sample+Cont.(gm):	184.70	174.67	161.69
Weight of Container(gm):	69.43	57.12	39.68
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43



Boring No.	HS-8				
Sample No.	R-1				
Depth (ft)	5				
Sample Type:					
Ring					
Soil Identification:					
Olive brown silt with sand					
(ML)s					

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	• 0.767	<b>1</b> .484	▲ 2.694
Shear Stress @ End of Test (ksf)	<b>O</b> 0.767	□ 1.484	△ 2.694
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	5.53	5.53	5.53
Dry Density (pcf)	99.9	100.4	104.2
Saturation (%)	21.7	22.0	24.2
Soil Height Before Shearing (in.)	0.9921	0.9845	0.9833
Final Moisture Content (%)	19.2	18.5	17.9

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.:

17074-01

Vander Eyk

07-17

## **R-VALUE TEST RESULTS**

DATE COMPLETED: 1/15/2021

DOT CA Test 301

PROJECT NAME: Ontario PROJECT NUMBER: 20220-01

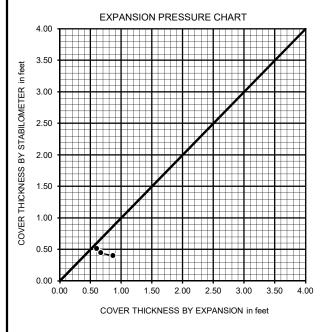
BORING NUMBER: HS-5 DEPTH (FT.): 1-5

Olive brown silty sand (SM), organics noted

SAMPLE NUMBER: B-1 TECHNICIAN: O. Figueroa

TEST SPECIMEN	а	b	С
MOISTURE AT COMPACTION %	13.6	14.0	14.9
HEIGHT OF SAMPLE, Inches	2.47	2.45	2.50
DRY DENSITY, pcf	113.9	113.1	111.1
COMPACTOR PRESSURE, psi	250	200	175
EXUDATION PRESSURE, psi	476	375	176
EXPANSION, Inches x 10exp-4	26	20	18
STABILITY Ph 2,000 lbs (160 psi)	24	26	30
TURNS DISPLACEMENT	4.75	4.95	5.20
R-VALUE UNCORRECTED	75	72	68
R-VALUE CORRECTED	75	72	68

DESIGN CALCULATION DATA	а	b	С
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.40	0.45	0.51
EXPANSION PRESSURE THICKNESS, ft.	0.87	0.67	0.60

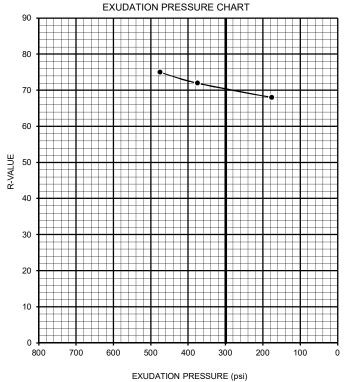


SAMPLE DESCRIPTION:

R-VALUE BY EXPANSION: 65

R-VALUE BY EXUDATION: 70

EQUILIBRIUM R-VALUE: 65



				Geo	techi	nica	l Bor	ing Log Borehole HS-1	
	12/1							Drilling Company: Cal Pac Drilling	
			MCBC					Type of Rig: Track Rig	
			er: 202					Drop: 30" Hole Diameter:	6"
			op of H					Drive Weight: 140 pounds	
Hole	Locat	tion	See C	eote	chnical	Map		Page 1	of 2
			5		<del>्रि</del>			Logged By ARN	
		_	au		<u>a</u>		0	Sampled By ARN	ا با
±		ဝို	=	ırt	iŧ	%)	l #	Checked By RLD	_es
l ö	(ff.)	<u>.</u>	<u>e</u>	정	SUE	<u>e</u>	S		J
vat	oth	d p	dr	>	Q	istu	CS		) e (
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1		<del>                                     </del>				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	<u> </u>
	_	Ī						Quaternaly roung conair beposits (Qye).	
	_		R-1	5	103.9	1.2	SM	@2.5' - Silty SAND: light brown, dry, medium dense	-#200
740-	_			5 6 8					
	5 —		R-2	5	105.1	1.1	SD_SM	@5' - SAND with Silt: gray brown, dry, medium dense	
	_		1 2	5 6 11	100.1	1	OI -OIVI	gray brown, ary, mediam dense	
	_				107.5	47		@7.51 CAND with Cilt. areas day, acadisme days	
	_		R-3	5 8 10	107.5	1.7		@7.5' - SAND with Silt: gray, dry, medium dense	
735-	10 <del></del>			7					
	10 —		R-4	5 7 10	107.0	8.6	SM	@10' - Silty SAND: brown, moist, medium dense	
	_			. 10					
	_		_						
730-	_								
	15 —		SPT-1	7 4		4.8	SP	@15' - SAND: brown, slightly moist, medium dense	
	_			7 8					
	_			•					
725-	_								
125	20 —		ا ا	7	400.0	40.0	CNA	2001 Cilta CAND. Innovers was interested and distance design	
			R-5	7 10 13	108.0	19.3	SM	@20' - Silty SAND: brown, very moist, medium dense	
	_								
	_		-						
720-	_			-					
	25 —		SPT-2	5 15 13		4.5	SP	@25' - SAND: brown, slightly moist, medium dense;	
	_			13				single gravel clast	
	_								
715-	_								
	30 —								
				1				LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING B BULK SAMPLE DS DIRECT SHEAR	
	>		2	1	SUBS	SURFACE C	CONDITIONS N	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler) MD         MAXIMUM DENSITY           3E AT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	Υ



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

SA S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-1  Date: 12/18/2021												
									Drilling Company: Cal Pac Drilling				
			MCB(						Type of Rig: Track Rig				
			r: 202						Drop: 30" Hole Diameter:	6"			
						~744' N			Drive Weight: 140 pounds				
Hole	Locat	tion:	See (	Ge	otec	chnical	Мар		Page 2 d	of 2			
			_			f)			Logged By ARN				
			pe			bc		<u> </u>	Sampled By ARN				
<b>₽</b>		og	nπ		t	ty (	(%	qι	Checked By RLD	est			
5	Œ	ر ا	Z		Count	nsi	.е (	Syl	J. 1.22	f T			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number		0	Dry Density (pcf)	Moisture (%)	JSCS Symbol		Type of Test			
<u>6</u>	eb	ā	an		Blow	Σ	lois	SC		ype			
Ш		ဗ				_			DESCRIPTION	$\perp$			
	30 <u> </u>		R-6	-	6 12 18	98.1	5.4	SP-SM	@30' - SAND with Silt: gray and rusty brown, slightly moist, medium dense; iron oxide mottle				
710-	35 — -		SPT-3	- - X	3 5 8		18.0	ML	@35' - Sandy SILT: gray with red orange, very moist, stiff; iron oxide mottle				
705-	40 —		R-7	-	11 16 21	112.6	15.0	SM	@40' - Silty SAND: olive brown, very moist, dense				
700-	- 45 — -		SPT-4	- - X	3 4 6		23.1		@45' - Sandy SILT: olive brown, very moist, stiff				
695-	50 —		R-8	-	7 17 20	113.2	17.8	CL	@50' - Sandy CLAY: dusky brown, moist to very moist, very stiff				
690-	- 55 <del>-</del> -			- - - -					Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021				
685-	- 60 —			-		THIS	SUMMARY	APPLIES ON	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
	>					OF TH SUBS	HIS BORING SURFACE C	G AND AT THE CONDITIONS I	E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	′			



G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE

SA S&H EI CN CR AL CO RV -#200 □ GROUNDWATER TABLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-2											
Date:	12/1	8/20	21					Drilling Company: Cal Pac Drilling				
Proje	ct Na	me:	MCBO	C-Rich	land			Type of Rig: Track Rig				
			er: 202					Drop: 30" Hole Diameter:	6"			
					~745' <b>N</b>			Drive Weight: 140 pounds				
Hole	Locat	tion	See (	Geote	chnical	Мар		Page 1 c	of 1			
			ایا		Œ.			Logged By ARN				
			  ape		od		0	Sampled By ARN				
≝		l o	lun	تt	<u>£</u>	%	g m	Checked By RLD	est			
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
/ati	Depth (ft)	phi	dt	⊘	De	stu	တ္သ		e 0			
<u> </u>	Эер	ä	) Jan	<u>6</u>		10 <u>i</u>	18(	DECODIDATION	<sup>y</sup>			
Ш		0	(0)	Н Ш		2		DESCRIPTION	_			
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):				
	_		R-1	3 4 6	108.4	4.5	SM	@2.5' - Silty SAND: brown, slightly moist, loose	-#200,			
	_			6					EI, MD,			
740-	5 —	<b>   </b>	R-2	5 7 11	109.8	4.6		@5' - Silty SAND: brown, slightly moist, medium dense	CR			
	_			11 -								
	_		R-3	3 4	90.1	30.0	CL	@7.5' - CLAY: olive, very moist, medium stiff	AL,			
	_			6					CR			
735-	10 —		R-4	3 6		12.6	SM	@10' - Silty SAND: brown, moist, medium dense				
				10								
	_			-								
	_			-								
730-	15 —		SPT-1	4 8		5.1	SP-SM	, , , , , , , , , , , , , , , , , , , ,				
	_			<u> 1</u> 11				medium dense				
				_								
	_			_								
725-	20 —		R-5	6	116.3	6.7	SM	@20' - Silty SAND: brown, slightly moist, medium dense;				
	_			6 17 13	110.0	0.7	OW	iron oxide mottle				
	_			-								
	_			-								
720-	25 —					4.5 =	<u></u>					
120-			SPT-2	3 6 9		19.5	ML	Sandy SILT: gray brown; very moist, very stiff; iron oxide mottle				
	_			-				Total Depth = 26.5'				
	_			-				Groundwater Not Encountered				
	30 —			-				Backfilled with Cuttings on 12/18/2021				
	>				OF T	HIS BORING	G AND AT THE	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	Y			
					LOCA	ATIONS ANI		GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS				



TEST SAMPLE

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-3												
Date:	12/18	3/20						Drilling Company: Cal Pac Drilling					
Proje	ct Na	me:	MCB(	C-Rich	land			Type of Rig: Track Rig					
			er: 202					Drop: 30" Hole Diameter:	6"				
					~736' N			Drive Weight: 140 pounds					
Hole	Locat	ion:	See (	Geote	chnical	Мар		Page 1 c	of 1				
			ایا		<del>(</del>			Logged By ARN					
			  ape		od)		0	Sampled By ARN					
<b>  =</b>		og.	lun	l t	ity	%	g m	Checked By RLD	est				
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test				
/ati	ţ	phi	dc	≥	De	stu	SS		o e				
<u> </u>	Depth (ft)	ja	) Jan	6	)ry	Joj.	18(	DESCRIPTION	yp				
Ш		<u> </u>	(0)	₩			<u> </u>	DESCRIPTION					
735-	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):					
	-		R-1	7 8	104.9	2.3	SP	@2.5' - SAND with Silt: gray brown, dry, medium dense; scattered very coarse sand					
	_			10				Scallered very coarse sand					
700	5 —	ш	R-2	7 12	103.2	1.9		@5' - SAND: gray, dry, medium dense					
730-				16									
	_		R-3	4 6 9	109.5	14.6	SM	@7.5' - Silty SAND: dusky brown, moist, medium dense;					
	-			9				micaceous					
725-	10 —		R-4	4 4 5	94.6	28.9	ML	@10' - Sandy SILT: gray, very moist, stiff					
1257				5 -									
	_			-									
	_			-									
	15 —		SPT-1	6 7		3.5	SP	@15' - SAND: brown, dry, medium dense					
720-	-			<u></u> 8									
	_			-									
				_									
	20 —		R-5	<b>8</b>	102.6	17.3	ML	@20' Sandy SILT: gray yory majet yory stiff					
715-	_		K-5	8 15 16	102.0	17.3	IVIL	@20' - Sandy SILT: gray, very moist, very stiff					
	_			-									
	_			-									
	_			-									
710	25 —		SPT-2	<u> </u>		7.1	SP-SM	@25' - SAND with SILT: brown, moist, medium dense					
710-				∱\ 9 -				Tatal Davids 00 Fl					
	_			-				Total Depth = 26.5' Groundwater Not Encountered					
	_			-				Backfilled with Cuttings on 12/18/2021					
	30 —			-									
					OF T	HIS BORING	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES: E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR B BULK SAMPLE DS DIRECT SHEAR B BULK SAMPLE DS DIRECT SHEAR	,				
					LOCA	ATIONS AND THE PASS	D MAY CHANG SAGE OF TIME	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY SE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SET AT HIS LOCATION S&H SIEVE AND HYDRO STANDARD PENETRATION S&H SIEVE AND HYDRO TION OF THE ACTUAL TEST SAMPLE	METER				



TEST SAMPLE GROUNDWATER TABLE

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE EI CN CR AL CO RV -#200

	Geotechnical Boring Log Borehole HS-4												
	12/18		21					Drilling Company: Cal Pac Drilling					
			MCB(					Type of Rig: Track Rig					
			er: 202					Drop: 30" Hole Diameter:	6"				
					~721' N			Drive Weight: 140 pounds					
Hole	Locat	ion:	See (	jeote	chnical	Мар		Page 1 c	of 2				
			<u>_</u>		<del>6</del>			Logged By ARN					
			gu		<u>ā</u>		log	Sampled By ARN	ي ا				
Ë		0	<u> </u>	l T	] jį	%)	Œ	Checked By RLD	Se				
l ë	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		of -				
.vaf	pth	aph	l m	<u> </u>	Ŏ	istı	CS		) e (				
Elevation (ft)	De	D E	Sal	유	٦	Мо	NS	DESCRIPTION	Type of Test				
720-	0			_				@0' to T.D. Quaternary Young Eolian Deposits (Qye):					
'20	_			-									
	_		R-1	7 10 12	118.6	12.0	SM	@2.5' - Silty SAND: olive brown, moist, medium dense					
				12									
715-	5 —		R-2	7 9 13	102.2	2.6	SP	@5' - SAND: olive brown, dry, medium dense					
1157				13									
	_		R-3	5 7 10	109.8	11.3	CL	@7.5' - Sandy CLAY: olive brown, slightly moist, stiff;	со				
	_			10				minor caliche					
	10 —		R-4	6 7 12	104.1	12.4	SM	@10' - Silty SAND: olive brown, moist, medium dense					
710-				12									
	_			_									
	_			-									
	15 —		SPT-1	√ <u>5</u>		16.4	ML	@15' - Sandy SILT: gray brown, very moist, very stiff					
705-	_			5 7 9									
	_		-	-									
	_		-	-									
	20 —		D. F.	10	108.5	0.5	CM	@201 City CAND, gray and red brown mariet dones					
700-			R-5	10 13 29	106.5	8.5	SM	@20' - Silty SAND: gray and red brown, moist, dense					
	_			-									
	_			-									
	25			-									
695-	25 —		SPT-2	<b>∑</b> 6 8		10.4	SM	@25' - Silty SAND: gray and red brown, moist, medium					
095	_			<u></u>				dense					
	_			-									
	_			-									
	30 —												
					OF T	HIS BORING	AND AT TH	ILLY AT THE LOCATION  SAMPLE TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	v				



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

 BULK SAMPLE
 DS

 RING SAMPLE (CA Modified Sampler)
 MD

 GRAB SAMPLE
 SA

 STANDARD PENETRATION
 S&H

 TEST SAMPLE
 EI

 CN
 CR

 GROUNDWATER TABLE
 AL

 CO
 RV

 #200
 #200

GROUNDWATER TABLE

DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-4  Date: 12/18/2021 Drilling Company: Cal Pac Drilling													
Date:	12/1	8/20	21					Drilling Company: Cal Pac Drilling						
			MCB(					Type of Rig: Track Rig						
			er: 202					Drop: 30" Hole Diameter:	6"					
					~721' N			Drive Weight: 140 pounds						
Hole	Locat	tion:	See (	Geote	chnical	Map		Page 2 o	of 2					
			<u>_</u>		<del></del>			Logged By ARN						
			-qι		d		0	Sampled By ARN						
Elevation (ft)		Graphic Log	Sample Number	⊒	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test					
loi	Œ	<u>.</u>	e e	્રિ	Sus	ē	S	·	of T					
/at	д	h	ldu	<	🎽	stu	$S_{\mathcal{S}}$		e e					
<u>ė</u>	Depth (ft)	<u>a</u>	Sar	Blow Count	) J	Лоі	)S(	DESCRIPTION	S					
L			R-6		96.0	33.4	ML		'					
690-	30 _		K-0	14 50/6"	96.0	33.4	IVIL	@30' - Sandy SILT: gray, very moist, hard						
	-		-	-										
	-		_	-										
685-	35 — -		SPT-3	25 35 50/4"		2.1	SP	@35' - SAND with Gravel, gray, dry, very dense						
	_			-										
	_			-										
	40 —		R-7	14 24 20	124.0	4.7	SM	@40' - Silty SAND: rusty brown, slightly moist, dense						
680-	_			20										
	_		-	-										
	45 —		SPT-4	7		16.8	SC	@45' - Clayey SAND: gray brown, very moist, medium						
675-	_		31 1-4	7 8 11		10.0	30	dense						
	_			-										
	_		-	-										
670-	50 <del></del>		R-8	13 50/6"	111.4	14.3	SM	@50' - Silty SAND: light brown and brown, very moist, very dense						
	-		}	-				Total Depth = 51.5'						
	_		-	-				Groundwater Not Encountered						
	_			-				Backfilled with Cuttings on 12/18/2021						
	55 —			-										
665-	_			-										
	-			-										
	_			-										
	_			-										
	60 —			-										
					OF T	HIS BORING	AND AT TH	ILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR						
			-					MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	Y					



THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

 SAMPLE TYPES:
 1

 B
 BULK SAMPLE
 0

 R
 RING SAMPLE (CA Modified Sampler)
 5

 G
 GRAB SAMPLE
 5

 SPT
 STANDARD PENETRATION
 5

 TEST SAMPLE
 6

□ GROUNDWATER TABLE

npler) MD SA S&H EI CN CR AL CO RV -#200 ES:
DIRECT SHEAR
MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-5											
	12/1		21					Drilling Company: Cal Pac Drilling			
			MCBC					Type of Rig: Track Rig			
			er: 202			101		Drop: 30" Hole Diameter:	6"		
			•		~734' N			Drive Weight: 140 pounds	of O		
поіе	Loca	.1011.	See	Jeole	chnical	I wap		Page 1	01 2		
			ē		cf)			Logged By ARN			
l 🚓		G	Sample Number		Dry Density (pcf)	(9	USCS Symbol	Sampled By ARN	) t		
<b> </b> <del>"</del>	· ·	Γοί	N	l T	sity	%)	ym	Checked By RLD	ĕ		
Elevation (ft)	Depth (ft)	Graphic Log	<u>e</u>	Blow Count	en	Moisture (%)	S		Type of Test		
) ya	ptt	apł	m	≥		oist	S		be		
E	De	Gr	Sa	B	٦	Mc	SN	DESCRIPTION	Ty		
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):			
	_ _		R-1	6 7 11	100.6	2.3	SM	@2.5' - Silty SAND: light brown, dry, medium dense	-#200,		
730-	_			11					RV		
	5 — –	Ш	R-2	5 9 15	98.4	2.0	SP	@5' - SAND: gray, dry, medium dense			
	- -		R-3	7 9 15	100.2	7.7	SM	@7.5' - Silty SAND: gray brown, moist, medium dense; minor caliche			
725-	10 —		R-4	8 11 15	106.9	8.4		@10' - Silty SAND: brown, moist, medium dense			
	_ _			15 -							
720-	_			-							
720	15 —		SPT-1	6 6 6 9		8.7		@15' - Silty SAND: gray, moist, medium dense			
	_		Z	∱\							
715-	_			-							
/ 15-	20 —		R-5	6	109.3	16.2	ML	@20' - Sandy SILT: gray brown, very moist, stiff			
	_		K-5	6 12 10	109.5	10.2	IVIL	(W20 - Sandy SiET. gray brown, very moist, still			
	_			-							
7	_			-							
710-	25 —										
	25 —		SPT-2	2 6 6		21.9		@25' - Sandy SILT: gray and red orange, very moist, stiff			
	_			-				Suii			
	_			-							
705-	_			-							
	30 —   -										
								NLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  IE TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR			
		1		-	SUBS	SURFACE C	ONDITIONS	MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSIT	Y		



GRAB SAMPLE STANDARD PENETRATION TEST SAMPLE

MAXIMUM DENSITY
SIEVE ANALYSIS
SIEVE AND HYDROMETER
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CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

GROUNDWATER TABLE

	Geotechnical Boring Log Borehole HS-5												
Date:	12/1	8/20						Drilling Company: Cal Pac Drilling					
			MCBC					Type of Rig: Track Rig					
			<b>:</b> 202					Drop: 30" Hole Diameter:	6"				
					~734' N			Drive Weight: 140 pounds					
Hole	Locat	tion:	See C	Seote	chnical	Мар		Page 2 o	of 2				
					<u>_</u>			Logged By ARN					
			l pe		bc [bc]		<del>_</del>	Sampled By ARN					
<b>E</b>		og	un	l t		(%	dπ	Checked By RLD	est				
LO	(ft)	C L	Z	no	nsi		Syl		f T				
ati	<del>‡</del>	hi	) Jdt	O		stul	လ္လ		0				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DECODIDE	Type of Test				
Ш		Θ			_			DESCRIPTION					
	30 _		R-6	32 50/6"	110.6	3.4	SP	@30' - SAND with Gravel: gray, dry, very dense					
700-	- - - 35 —		SPT-3	7 6		16.8	SC	@35' - Clayey SAND: rusty brown, very moist, medium					
695-	- - -		Z - -	6 9 14				dense					
200	40 — - -		R-7	9 17 50/6"	112.7	19.2	ML	@40' - Sandy SILT: gray and red orange, very moist, hard					
690-	45 — - -		SPT-4	7 7 11 14		20.0	SM	@45' - Silty SAND: brown and red orange: very moist, medium dense					
685-	50 <del></del>		R-8	11 13 16	104.6	20.0	CL	@50' - CLAY: dusky brown, very moist, very stiff					
680-	55 —		-					Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021					
675-	60 —		-		TUR	CLIBARA	ADDI IEO CI	UV AT THE LOCATION CAMP 5 TYPE					
	<b>E</b>		THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION MITHER PASSAGES OF TIME, THIS PASSAGES STANDARD PENETRATION S&H SIEVE AND HYDROMETER										



SPT STANDARD PENETRATION TEST SAMPLE

□ GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

			(	Geo	techi	nica	l Bor	ing Log Borehole HS-6			
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling			
			MCBC					Type of Rig: Track Rig			
			er: 202					Drop: 30" Hole Diameter:	6"		
					~727' N			Drive Weight: 140 pounds			
Hole	Locat	tion:	See C	<u>Geote</u>	chnical	Мар		Page 1 c	of 1		
			<u>_</u>		<u>_</u>			Logged By ARN			
			ခု		<u>a</u>	_	<del>-</del>	Sampled By ARN			
<b>  =</b>		go	<u> </u>	l t	<u>-</u>	8	g G	Checked By RLD	est		
Elevation (ft)	(ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test		
/ati	Depth (ft)	phi	<u> </u>	>	<u> </u>	stu	တ္သ		e 0		
<u> </u>	Эер	ä	) San	8	<u> </u>	10 <u>i</u>	)S(	DECODIDATION	_y   Yp		
ГШ		0	0)	Ш				DESCRIPTION			
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):			
725-	_ _ _		R-1	11 12 14	114.6	5.5	SM	@2.5' - Silty SAND: brown, slightly moist, medium dense	CR, DS,		
	5 — -		R-2	5 9 12	105.2	19.3		@5' - Silty SAND: dusky brown, very moist, medium dense; scattered caliche	EI, MD, -#200		
720-	_ _ _		R-3	5 6 11	107.8	9.1		@7.5' - Siilty SAND: brown, moist, medium dense			
	10 —		R-4	5 10 14	116.0	5.6		@10' - Silty SAND: gray brown, slightly moist, medium dense			
715-	- - -		-	- - -							
710-	15 — –		SPT-1	4 5 8		18.5		@15' - Silty SAND: gray brown, very moist, medium dense			
	-		<u>-</u>	-							
	20 —		R-5	10 13 13	101.1	12.3		@20' - Silty SAND: gray and red brown, moist, medium			
705-	_			13 -				dense			
	_			-							
	25 — –		SPT-2	18 26 36		2.2	SP	@25' - SAND with Gravel: gray, dry, very dense			
700-	- - 30 —		-	-   -   -				Total Depth = 26.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021			
	THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA  SAMPLE TYPES: B BULK SAMPLE DS DIRECT SHEAR BRING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY SIANDARD PENETRATION SAM BULK SAMPLE SAMP										



STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-7											
Date:	12/1	8/20	21					Drilling Company: Cal Pac Drilling				
Proje	ct Na	me:	MCBC	C-Rich	land			Type of Rig: Track Rig				
Proje	ct Nu	mbe	er: 202	20-01				Drop: 30" Hole Diameter:	6"			
			op of F					Drive Weight: 140 pounds				
Hole	Locat	ion:	See C	Geote	chnical	Мар		Page 1	of 1			
			<u>_</u>		(L)			Logged By ARN				
			ရှ		(bc		<del>-</del>	Sampled By ARN				
<b> </b>		og	l n	l t	ty	(%)	g Q	Checked By RLD	est			
l e	(ft)	c L	Z	l no	ınsi	G (	Sy	,	f T			
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test			
<u> </u>	Эер	jra	gan	8	)ry	10is	)S(	DECODIDATION	yp.			
Щ		0	0)	НШ				DESCRIPTION	_			
	0 _	e H		-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):				
	_		R-1	3 5 8	98.3	9.5	SM	@2.5' - Silty SAND: light gray, moist, medium dense				
725-	_			8								
	5 —	Ш	R-2	6	94.7	1.6	SP	@5' - SAND: gray, dry, medium dense				
	<u>-</u>			6 11 13								
	_		R-3	5 7	105.5	9.9	ML	@7.5' - SILT: olive, slightly moist, stiff	AL,			
720-	_			9					CŃ			
	10 —		R-4	4 9	102.3	6.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium				
	_			18				dense				
	_			-								
715-	_			-								
	15 —		SPT-1	5 5		16.4		@15' - Silty SAND: gray brown, very moist, medium				
	_			5 7 10				dense				
	_											
710-	_			_								
	20 —		R-5	5	99.4	17.5		@20' - Silty SAND: gray brown, very moist, medium				
	_		11-5	5 8 14	33.4	17.5		dense				
	_		F	-]								
	_			-								
705-	25 —			-								
	25 —		SPT-2	2 5 8		29.0	ML	@25' - Sandy SILT: gray with red orange, very moist, stiff				
	_		<i> </i>	-				Total Depth = 26.5'				
	_			-				Groundwater Not Encountered				
700-	30 —							Backfilled with Cuttings on 12/18/2021				
	00				РІНТ	SUMMARY	APPLIES ON	JLY AT THE LOCATION SAMPLE TYPES: TEST TYPES:				
	>				OF TI SUBS	HIS BORING SURFACE C	S AND AT THE	IE TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY  COMPARAMENTS.	Y			
								GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA STANDARD PENETRATION S&H SIEVE AND HYDRO TEST SAMPLE FI EXPANSION INDEX				



TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole HS-8											
Date:	12/18	3/20						Drilling Company: Cal Pac Drilling				
			MCBC					Type of Rig: Track Rig				
			er: 202					Drop: 30" Hole Diameter:	6"			
					~726' N			Drive Weight: 140 pounds				
Hole	Locat	ion:	See (	3eote	chnical	Мар		Page 1	of 1			
			<u>.</u>		cf)			Logged By ARN				
		_	du		od)		00	Sampled By ARN	ا با			
<u>#</u>		Graphic Log	Sample Number	l t	Dry Density (pcf)	Moisture (%)	USCS Symbol	Checked By RLD	Type of Test			
l iöi	(H)	<u>:</u>	<u>e</u>	95	sue	<u>re</u>	S		of 1			
vat	Depth (ft)	aph	dπ	Blow Count	Ŏ	istı	SS		) e			
Elevation (ft)	De	Grê	Saı	<u>@</u>	Dry	₩	NS	DESCRIPTION	<del> </del>			
	0	4		$+\overline{}$				@0' to T.D. Quaternary Young Eolian Deposits (Qye):				
725-		Ī		-				go to 1.b. <u>equaternary roung contain beposits (eye).</u>				
			R-1	2	107.9	2.3	SP	@2.5' - SAND: brown, dry, loose				
				2 3 7								
	5 —		R-2	6	102.5	2.6	SP-SM	@5' - SAND with Silt: olive gray, dry, medium dense	-#200.			
720-	4		11-2	6 9 15	102.5	2.0	OI -OIVI	With Oilt. Oilve gray, dry, medium dense	CO			
	4		[	-]								
	4		R-3	8 12	102.8	2.5	SP	@7.5' - SAND: gray, dry, medium dense				
	4.0			18								
745	10 —		R-4	12 10	113.5	1.9		@10' - SAND: gray brown, dry, medium dense				
715-				11								
				_								
	_			-								
	15 —		SPT-1	8		8.1	SP-SM	@15' - SAND with SILT: moist, medium dense				
710-	4			8 11 12		0.1	OI OIVI	With OILT: Molet, mediam defice				
	-			-								
	-		-	-								
				-								
705	20 —		R-5	5 11 29	109.7	6.9	SP	@20' - SAND: gray and brown, moist, dense				
705-				29								
				_								
	_			-								
	25 —		SPT-2	6		33.2	ML	@25' - Sandy SILT: gray with red orange, very moist,				
700-	4			14 20		55.2		hard				
	4			-				Total Depth = 26.5'				
	-			-				Groundwater Not Encountered				
				-				Backfilled with Cuttings on 12/18/2021				
	30 —			-								
	THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER  SUBSURFACE CONDITIONS MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY											
	>				LOCA	ATIONS AN I THE PASS	D MAY CHANG SAGE OF TIME	GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS	OMETER			



TEST SAMPLE

GROUNDWATER TABLE

EI CN CR AL CO RV -#200

SIEVE AND HYDROMETER EXPANSION INDEX CONSOLIDATION CORROSION ATTERBERG LIMITS COLLAPSE/SWELL R-VALUE % PASSING # 200 SIEVE

	Geotechnical Boring Log Borehole I-1												
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling					
Proje	ct Na	me:	MCB	C-Rich	nland			Type of Rig: Track Rig					
Proje	ct Nu	mbe	er: 202	220-01				Drop: 30" Hole Diameter:	8"				
					~750' N			Drive Weight: 140 pounds					
Hole	Locat	tion:	See (	Geote	chnical	Мар		Page 1 c	of 1				
			<u>_</u>		←			Logged By ARN					
			qu		bg.	_	<del> </del>	Sampled By ARN					
		go	<u>L</u>	<u> </u>		%	dπ	Checked By RLD	est				
E	(ft)	ر د ا		no	nsi	9	Syl	J. 1.22	fΤ				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test				
<u> </u>	ер	<u>a</u>	an	<u>                                     </u>	<u>&gt;</u>	<u> </u>	SC	DECODIDE	yp				
Ш		Θ	S	B		2		DESCRIPTION					
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):					
	- -		R-1	8 9 12	109.9	5.1	SM	@2.5' - Silty SAND: dusky brown, slightly moist, medium dense					
745-	5 — - -	<b>    </b>	R-2	6 8 12	110.8	1.2	SP-SM	@5' - SAND with Silt: gray, dry, medium dense					
740-	- - 10 <del></del>		SPT-1	- - - 3		5.8	SM	@10' - Silty SAND: gray brown, slightly moist, loose					
	- -		SF1-1	3 4 5 -		5.6	SIVI	@ 10 - Silly SAND. gray brown, slightly moist, loose					
735-	15 —			_									
	-		R-3	16 14 43	98.5	2.8	SP	@16' - SAND: gray brown, dry, dense					
	_			_				Total Depth = 18'					
730-	20 —			_				Groundwater Not Encountered					
	_			_				Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021					
	_			-				Backilled with Cuttings on 12/19/2021					
	_			-									
	_			-									
725-	25 —			-									
	-			-									
	-			-									
	-			-									
	20			-									
$ldsymbol{ldsymbol{ldsymbol{eta}}}$	30 —				<u> </u>								
		1 3			OF T	HIS BORIN	G AND AT THE	LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING.  B BULK SAMPLE  DS DIRECT SHEAR  MAY DIFFER AT OTHER  R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	,				
			2		LOCA	ATIONS AN	D MAY CHANG	G GRAB SAMPLE SA SIEVE ANALYSIS E. THE DATA SPT STANDARD PENETRATION S&H SIEVE AND HYDRO E. THE DATA SPT STANDARD PENETRATION S&H SIEVE AND HYDRO E. THE DATA					



STANDARD PENETRATION TEST SAMPLE

S&H EI CN CR AL CO RV -#200 GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Ge	otecl	nnic	al Bo	oring Log Borehole I-2	
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling	
			MCB(					Type of Rig: Track Rig	
			er: 202					Drop: 30" Hole Diameter:	8"
					~749' N			Drive Weight: 140 pounds	- 1
Hole	Locat	tion:	See (	3eote	chnical	Мар		Page 1 c	of 1
					<del>-</del>			Logged By ARN	
		_	l h		) d		00	Sampled By ARN	ţ
<del> </del>		8,	5	ļ ţ	ity	%)	Į į	Checked By RLD	Les
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
vaí	pth	ఠ	l m	≥	Ŏ	istı	CS		ЭС
	De	ß	Sal	%	<u>ا</u>	Mo	ns	DESCRIPTION	Ту
	0 _	■B-1		-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
	_		R-1	9	102.6	6.5	SM	@2.5' - Silty SAND: gray brown, slightly moist, medium	
745-	_			9 11 15	102.0	0.0		dense	
	5 —	Ш	R-2	4 6 11	95.7	20.5	ML	@5' - Sandy SILT: light gray brown: very moist, stiff	
	_			11					
	_		-	-					
740-	10 —		SPT-1	-		16.6		@10' - Sandy SILT: brown, very moist, medium stiff	
	_		SF 1-1	2 3 4		10.0		@10 - Sandy SIE1. Blown, Very moist, medium sun	
	_			- -					
735-	_		R-3	11 5 8	108.5	3.5	SM	@14' - Silty SAND: brown, dry, medium dense	
	15 <del></del>			8					
	_			-				Total Depth = 16' Groundwater Not Encountered	
730-	_		-	-				Infiltration Well Installed Per County Guidelines	
	20 —			-				Backfilled with Cuttings on 12/18/2021	
	_			-					
	_		-	- -					
725-	_		-	-					
	25 — _			-					
	_			-					
720-	_			-					
120	30 —			-					
					OF T	HIS BORING	AND AT TH	ILILY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  E TIME OF DRILLING. B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY	/
	2							MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDROC	



COADTIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

				Ge	otecl	nnic	al Bo	oring Log Borehole I-3	
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling	
			MCB(					Type of Rig: Track Rig	
			er: 202					Drop: 30" Hole Diameter:	8"
					~736' N			Drive Weight: 140 pounds	
Hole	Locat	tion:	See (	Geote	chnical	Map		Page 1	of 1
			<u>_</u>		<u> </u>			Logged By ARN	
			l up		<u>ä</u>		0	Sampled By ARN	_ ـ ا
# #	_	ဝို	j	ınt	<u></u>	%)	/mk	Checked By RLD	es_
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
vat	oth	hdr	μ		Ä	istu	CS		) e (
	Эер	S S	Sar	36	S	Mo	JS	DESCRIPTION	Γyρ
		7		+ "					'
735-	_	İ		-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
	_		R-1	3 9 7	112.0	3.5	SM	@2.5' - Silty SAND with Gravel: brown, dry, medium	#200,
	_	.		7				dense, dry	EI, CR
	5 —	Ш	R-2	7	105.0	2.1	SP-SM		CO
730-	_			7 9 15					
	_			-					
	10 —		SPT-1	\ \		17.1	SM	@10' - Silty SAND: brown, very moist, loose	
725-	_		SF 1-1	3 5 5		17.1	Sivi	W 10 - Silty SAND. Brown, very moist, loose	
	_								
	_			-					
	- 15 —		•	-					
720-	15 —								
120	_			_					
	_		•	-					
	_			-					
	20 —		R-3	6	107.4	16.5		@20' - Silty Sand: gray with red orange, very moist,	
715-	_			6 9 14				medium dense	
								Total Depth = 22'	
	_			_				Groundwater Not Encountered	
	25 —			-				Backfilled with Cuttings on 12/18/2021	
710-	_			-					
	_			-					
	_			-					
	30 —								
	00							LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
			2		SUBS	SURFACE (	CONDITIONS N	E TIME OF DRILLING.         B         BULK SAMPLE         DS         DIRECT SHEAR           MAY DIFFER AT OTHER         R         RING SAMPLE (CA Modified Sampler)         MD         MAXIMUM DENSIT           GEAT THIS LOCATION         G         GRAB SAMPLE         SA         SIEVE ANALYSIS	Y
								SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	METER



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
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CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Ge	otec	hnic	al Bo	oring Log Borehole I-4	
Date:	: 12/1	8/20	21					Drilling Company: Cal Pac Drilling	
			MCB	C-Ric	hland			Type of Rig: Track Rig	
Proje	ct Nu	ımbe	er: 202	220-0	1			Drop: 30" Hole Diameter:	8"
Eleva	ation o	of To	op of	Hole:	~738' [			Drive Weight: 140 pounds	
Hole	Locat	tion	: See	Geote	chnica	l Map		Page 1	of 1
			L		] (			Logged By ARN	
			pe		bc		_	Sampled By ARN	
(#)		ြည်	E	∐ ⊭	) <u>&gt;</u>	(%	) Ř	Checked By RLD	est
Elevation (ft)	Œ	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	Chocked by NEB	Type of Test
atic	Depth (ft)	ļĕ	) de	ပ		tur	ŝ		0
<u>6</u>	eb	ğ	aπ	<u> </u>	<u>&gt;</u>	0	SC		ype
Ш		٥	S	B		Σ	$\supset$	DESCRIPTION	Ĺ.
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
735-	- -		R-1	3 4 6	100.4	22.0	ML	@2.5' - Sandy SILT: gray, very moist, medium stiff	
				6					
	5—		R-2	6 12 16	108.8	1.5	SP	@5' - SAND: gray, dry, medium dense	
	_			-					
730-	_			-					
	_			-					
	10 —		SPT-1	M 3		22.9	ML	@10' - Sandy SILT: olive brown, very moist, stiff	
	_			3 3 6					
	-			-					
725-	-			-					
	_			-					
	15 —								
	_								
720-					1,04,0				
720	_		R-3	10 15 16	101.2	1.5	SP	@18' - SAND: gray brown, dry, medium dense	
	20 —			10					
	_			-				Total Depth = 20'	
	_			-				Groundwater Not Encountered	
715-	_			-				Backfilled with Cuttings on 12/18/2021	
	_			-					
	25 —			-					
	_			-					
	_			-					
710-	_			-					
	30 _								
	30 —				<u> </u>		ADD: :== :	WAAT THE LOOKTION	
	<b>—</b>	1. 2			OF T	HIS BORING	3 AND AT TH	ALY AT THE LOCATION SAMPLE TYPES: TEST TYPES:  BE TIME OF DRILLING.  BE BULK SAMPLE  BE SUMMAN SAMPLE (CA Modified Sampler) MD  MAXIMUM DENSITION   Y	
	2							GE AT THIS LOCATION G GRAB SAMPLE SA SIEVE ANALYSIS SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	METER



SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOCIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE

				Ge	otecl	nnic	al Bo	ring Log Borehole I-5	
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling	
			MCB(	C-Ric	nland			Type of Rig: Track Rig	
Proje	ct Nu	mbe	er: 202	220-0	1			Drop: 30" Hole Diameter:	8"
Eleva	tion o	of To	op of I	Hole:	~725' 1	MSL		Drive Weight: 140 pounds	
Hole	Locat	tion	: See (	Geote	chnica	I Мар		Page 1 o	of 1
			_					Logged By ARN	
			þe		bc		<u> </u>	Sampled By ARN	
		go	Wn	+	<u> </u>	(%	ďμ	Checked By RLD	əst
<u>ا</u> ج	(ft)	ر ا	Z		nsi	) e	Syl	Chocked by NEB	f T
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
<u> </u>	eb	ā	aπ	<u> </u>	<u>&gt;</u>	10is	SC	7-7-0-7-1-0-1	yp(
Ш		9	S	<u> </u>		2		DESCRIPTION	┷
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
	-		R-1	7 9 9	107.4	4.1	SP-SM	@2.5'- SAND with Silt: brown, slightly moist, medium dense	
720-	5 — –		R-2	4 7 10	101.9	7.3	SM	@5' - Silty SAND: brown, slightly moist, medium dense	
	-			- -					
715-	10 —		SPT-1	2 3 3		6.7	SP-SM	@10' - SAND with Silt: brown, moist, loose	
	-			- -					
710-	15 <del>-</del>			- -					
	_			-					
	_		R-3	6 10 13	111.7	10.0	SM	@18' - Silty SAND: gray brown, moist, medium dense	
705-	20 —							Total Depth = 20'	
	_			-				Groundwater Not Encountered	
	_			-				Backfilled with Cuttings on 12/18/2021	
700	_ 2F			_					
700-	25 — -								
	_			-					
	_								
	30 —			_					
								LY AT THE LOCATION SAMPLE TYPES: TEST TYPES:	
	$\geq$	1	2		SUBS	SURFACE ( ATIONS AN	CONDITIONS N	E TIME OF DRILLING.  B BULK SAMPLE DS DIRECT SHEAR MAY DIFFER AT OTHER R RING SAMPLE (CA Modified Sampler) MD MAXIMUM DENSITY G GRAB SAMPLE SA SIEVE ANALYSIS E THE DATA SPT STANDARD PENETRATION S&H SIEVE AND HYDRO	



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE

SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE S&H EI CN CR AL CO RV -#200

				Ge	otech	nnic	al Bo	oring Log Borehole I-6	
Date:	12/18	8/20	21					Drilling Company: Cal Pac Drilling	
			MCB(	C-Rich	nland			Type of Rig: Track Rig	
			er: 202					Drop: 30" Hole Diameter:	8"
					~723' N			Drive Weight: 140 pounds	
Hole	Locat	tion	: See (	Geote	chnical	Мар		Page 1	of 1
			_		_			Logged By ARN	
			pe		bc		<del> </del>	Sampled By ARN	
		go	Ln	<del> </del>	<u> </u>	(%	qu	Checked By RLD	əst
	Œ)	<u>                                   </u>		no	nsi	) e	Syı		ĹΤ
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol		Type of Test
<u> </u>	eb	ā	aπ	<u> </u>	<u>&gt;</u>	<u> </u>	SC		) yp(
Ш		9	S	<u> </u>		2	$\cap$	DESCRIPTION	
	0 _			-				@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
720-	_		R-1	4	108.6	10.2	SM	@2.5' - Silty SAND: dusky brown, moist, loose	
120	_			4 5 7					
	5 —		R-2	3 6 9	112.5	9.6		@5' - Silty SAND: brown, moist, medium dense	
	_			9 _]					
715-	_			_					
	_			-					
	10 —		SPT-1	3		14.6		@10' - Silty SAND: brown, very moist, loose	
	_			3 4 5					
710-									
	_			-					
	15 —			-					
	_			-					
	_			-					
705	_		R-3	4 10 14	107.5	19.2	ML	@18' - Sandy SILT: gray with red orange: very moist,	
	20 —			14				medium dense	
				-				Total Depth = 20'	
	_			-				Groundwater Not Encountered  Backfilled with Cuttings on 12/18/2021	
700-	_			-				Backing Will Callings on 12/16/2021	
	25 —								
				_					
	_			-					
695-	_			-					
	30 —								
	30 -				TUPO	CLIMANACY	ADDI IEC ON	III V AT THE LOCATION AND ETWEE	
	<b>E</b>	1			OF TO SUBS	HIS BORING SURFACE C ATIONS AND	AND AT THE ONDITIONS IN MAY CHAN	ILY AT THE LOCATION E TIME TYPES: TEST TYPES:  E TIME OF DRILLING.  MAY DIFFER AT OTHER  G RAT THIS LOCATION  F THE DATA  SAMPLE TYPES:  B BULK SAMPLE  B BULK SAMPLE  CA Modified Sampler)  B MAXIMUM DENSITY  G GRAB SAMPLE  SA SIEVE ANALYSIS  SPT STANDARD PENETRATION  S&H SIEVE AND HYDRO	



LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SPT STANDARD PENETRATION TEST SAMPLE

GROUNDWATER TABLE

S&H EI CN CR AL CO RV -#200

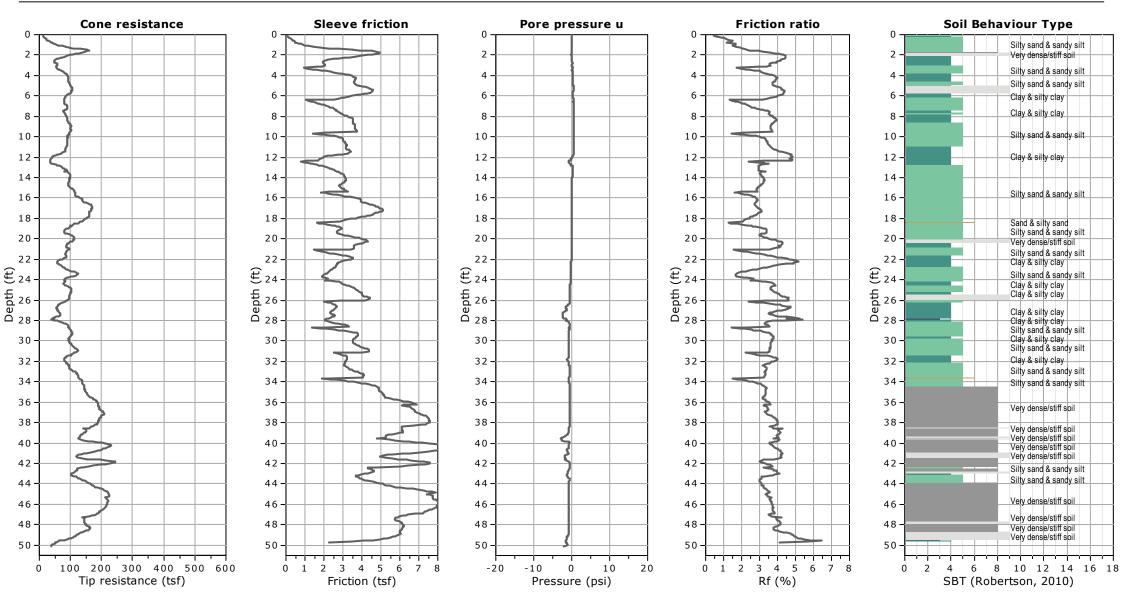
SIEVE ANALYSIS
SIEVE AND HYDROMETER
EXPANSION INDEX
CONSOLIDATION
CORROSION
ATTERBERG LIMITS
COLLAPSE/SWELL
R-VALUE
% PASSING # 200 SIEVE



714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.08 ft, Date: 12/17/2020

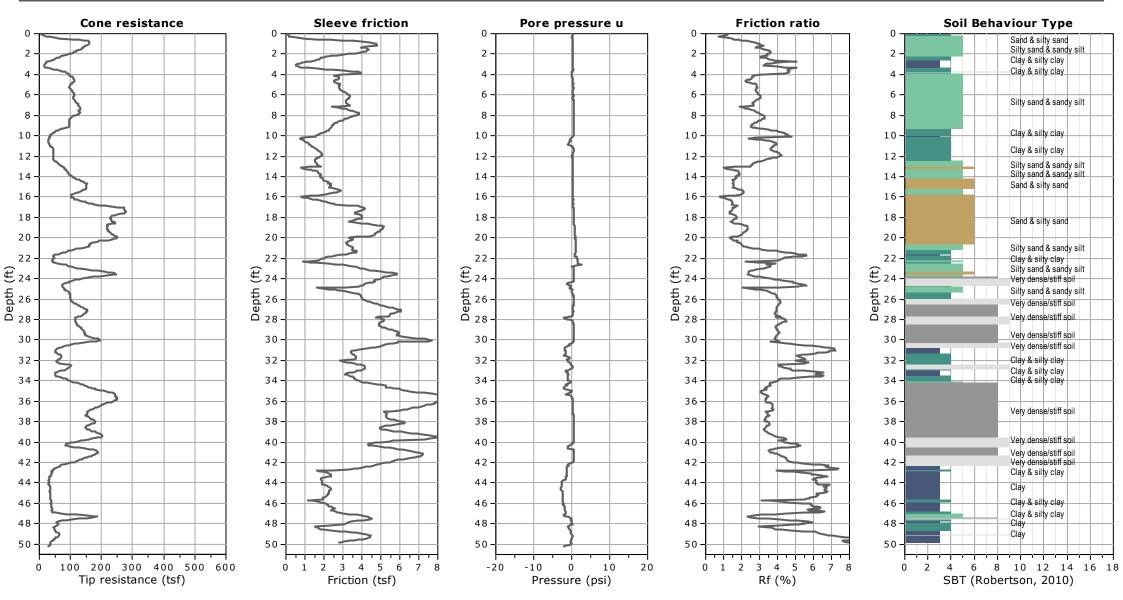




714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.24 ft, Date: 12/17/2020

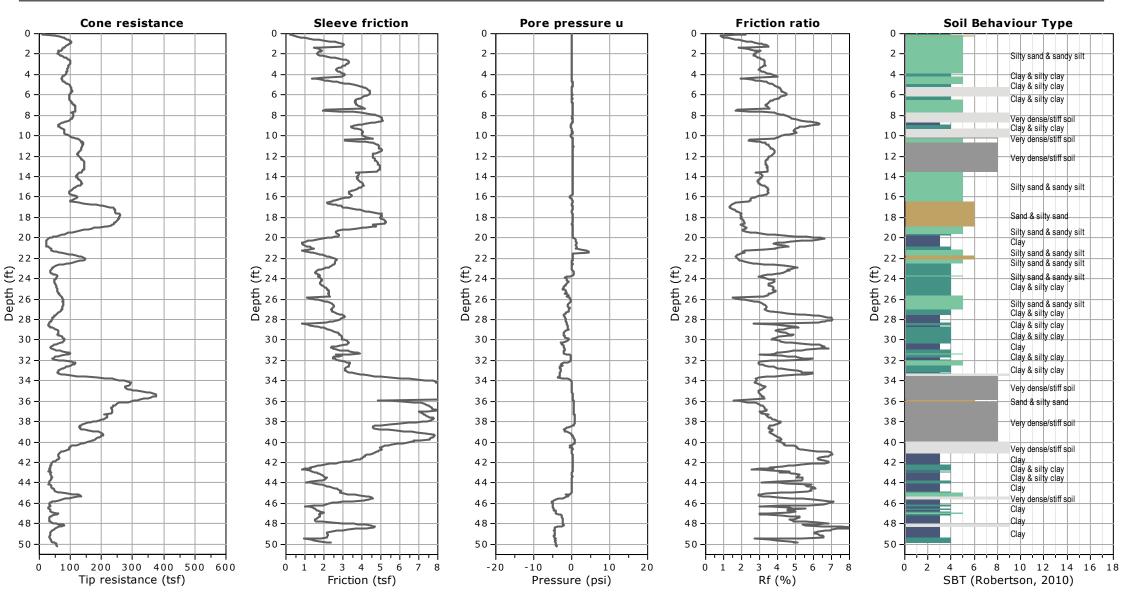




714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.23 ft, Date: 12/17/2020



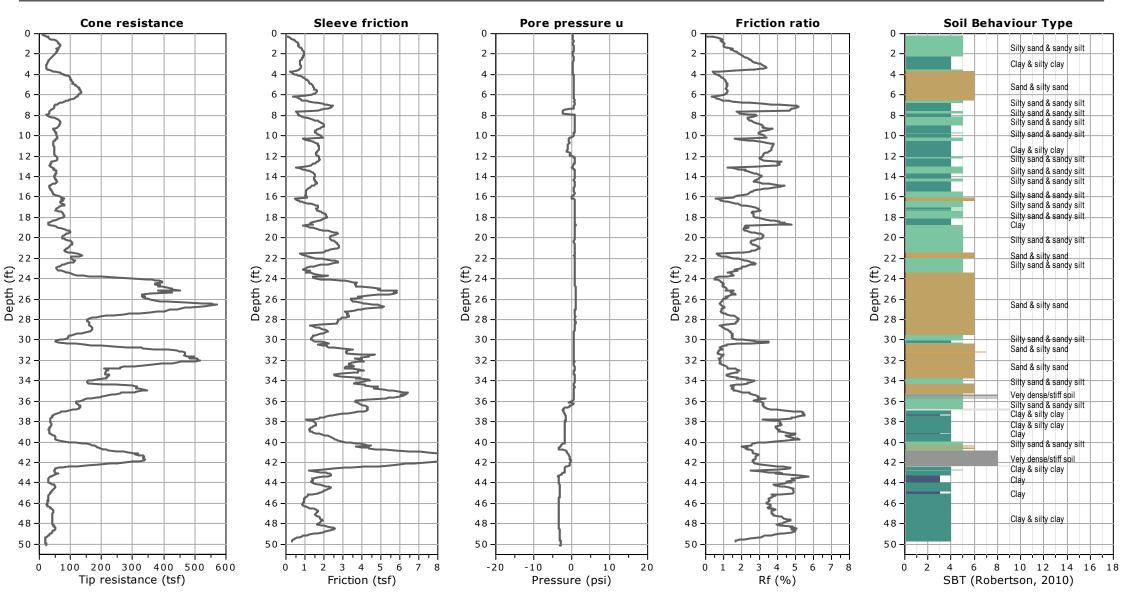
### K T E

**Kehoe Testing and Engineering** 

714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.13 ft, Date: 12/17/2020



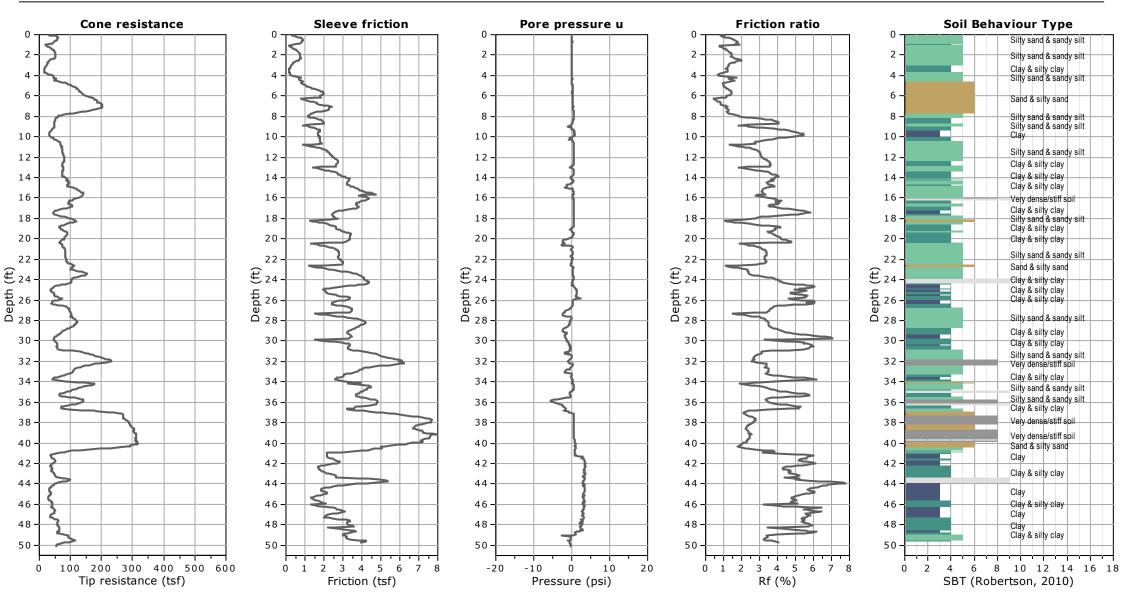
CPT-4A



714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.08 ft, Date: 12/17/2020

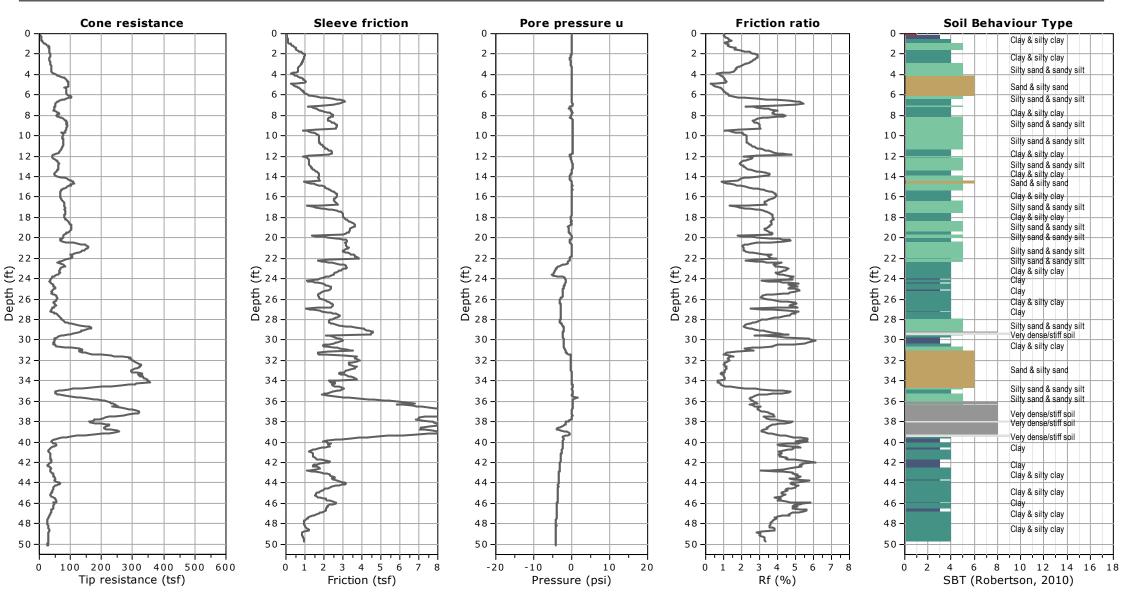




714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.15 ft, Date: 12/17/2020

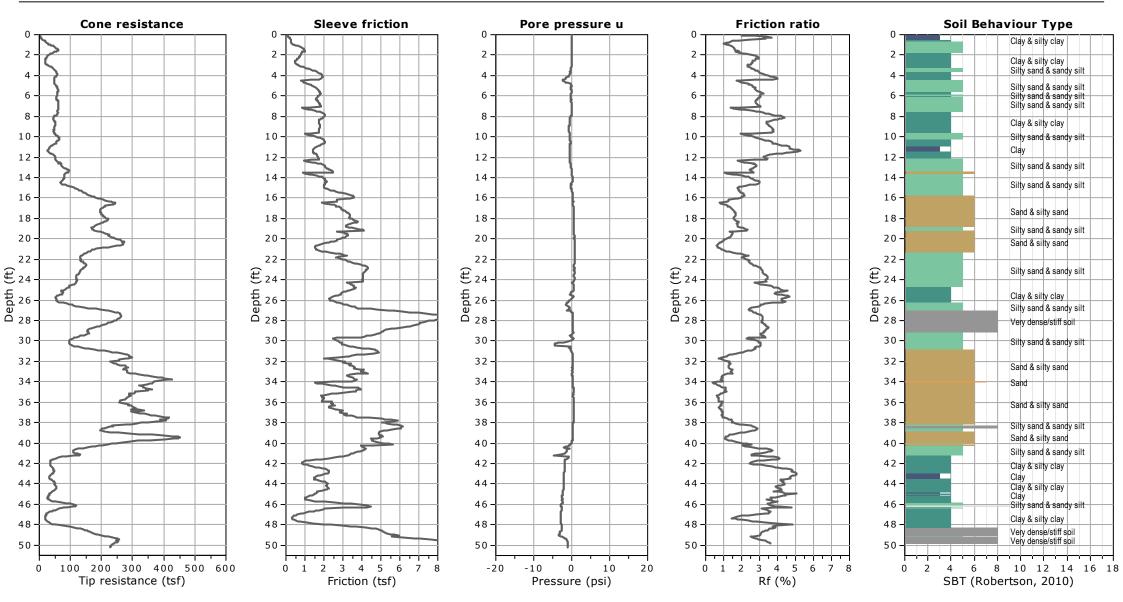




714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 50.20 ft, Date: 12/17/2020

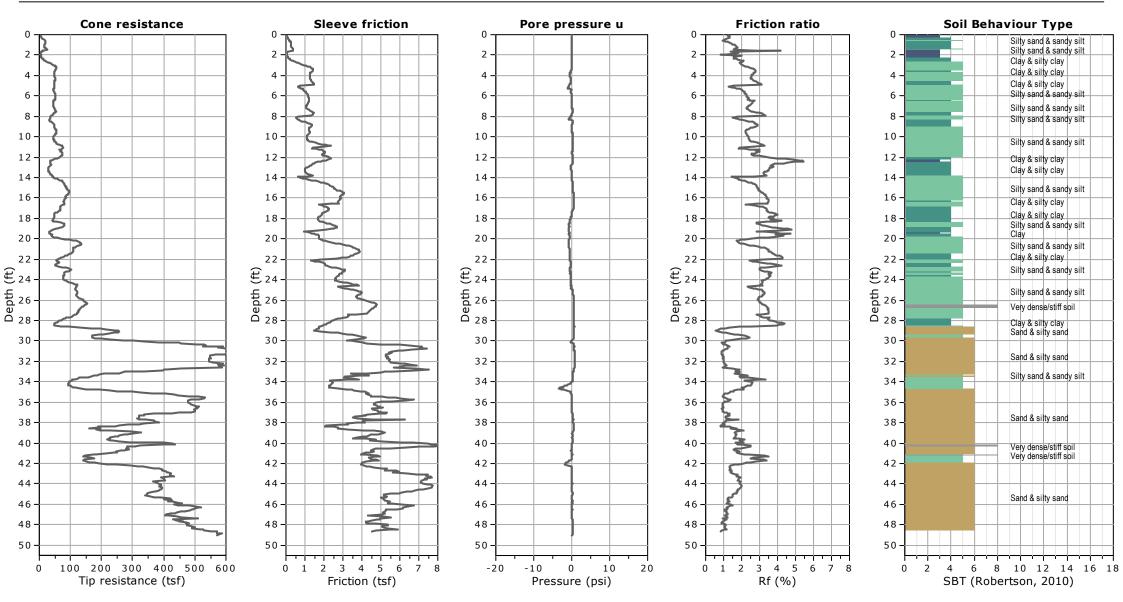




714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: LGC Geotechnical / MCBC

Location: Ontario, CA Total depth: 49.02 ft, Date: 12/17/2020



-	ame:	Richland - MCBC	Logged By: ARN	Т	rench N	o.: TP-1	1		
Project Nu	umbe	er: 20220-01	Date: 12/7/2020			_		LC	16
Equipmen	t: JC	B 3CX Excavator	Location: Ontario		ngineerir	ng Prope	rties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GI	EOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	scattered gravel @1'-1.8' Silty SAND: yellow be pinhole porosity  Quaternary Young Eolian De @1.8'-4' SAND with SILT: gramedium dense @4'-8' Silty SAND: gray brow @8'-9.5' Sandy SILT: maroon minor roots	prown, slightly moist, medium desprown; occasional rootlet; scatted eposits by brown, dry to slightly moist, and slightly moist, brown, moist, stiff; minor calicherown, slightly moist, medium dense	ered	Qye	SM SP SM ML SM	GB-1 @ 0. GB-2 @ 1. GB-3 @ 2. GB-4 @ 8.4	5° 1°	,
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 726' MSL		Slope:	0 deg.	+	Trend: N	I-S

Project Na	me:	Richland - MCBC	Logged By: ARN		Trench N	lo.: TP-1	2		
Project Nu	mbe	r: 20220-01	Date: 12/7/2020		<b>_</b>	_		LC	16
Equipment	: JC	B 3CX Excavator	Location: Ontario		Engineeri	ng Propei	ties:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	Topsoil @0'-1.3' Silty SAND: medium to dense; abundant rootlets; occips @1.3'-2' SAND with Silt: brown Quaternary Young Eolian Dep @2'-7.1' SAND: gray, dry to slig @7.1'-7.7' Silty SAND: brown, pervasive caliche; scattered @7.7'-T.D. SAND with Silt: meddense	casional gravel; scattered wo n, slightly moist, medium dens <u>osits</u> ghtly moist, medium dense moist, medium dense; abunda burrows	od se unt	Qye	SM SP SM SP	GB-1 @ 1 GB-2 @ 1. GB-3 @ 1. GB-4 @ 6. GB-5 @ 7.	4* 6* 5* 2*	
GRAPHIC <i>A</i>	L RE	EPRESENTATION BELOW:	Elevation: 725' MSL	Surfa	ce Slope:	0 deg.		Trend: N	I-S
	-		A	-		+ + +			

Total Depth: 10.4' Groundwater: None Backfilled: 12/7/20

Project Na	ame:	Richland - MCBC	Logged By: ARN		Trench N	o.: TP-13	3 .			
Project Nu	ımbe	er: 20220-01	Date: 12/8/2020			_		V	<b>IC</b>	
Equipmen	t: JC	B 3CX Excavator	Location: Ontario		<b>─</b> Engineerir	ng Proper	ties:		Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAM		MOISTURE (%)	DRY DENSITY (PCF)
	В	moist, loose; dry vegetation i @0.6'-1.8' Silty SAND: medium moist, medium dense; some Quaternary Young Eolian Dep	n to dark brown, slightly moist to content organic staining  posits moist, medium dense; occasion of the content of the conten	to	Qye	SM	GB-1 ( GB-2 ( GB-3	@ 1.6' \$ @ 2'		ζ ,
GRAPHIC/	AL RI	EPRESENTATION BELOW:	Elevation: 730' MSL	Surfa	ace Slope: (	0 deg.	+		Trend: N	-S
			B						epth: 10' lwater: Non	

Project Na	ame:	Richland - MCBC	Logged By: ARN	Trench N	o.: TP-1	4		
roject Nu	umbe	er: 20220-01	Date: 12/8/2020		_			16
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineerir	ng Propei	rties:	Geotech	nical, In
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	some organic staining; visible @1.2'-2.2' Sandy SILT: light taidense; abundant pinhole porosorganics  Quaternary Young Eolian Deporture   @2.2'-5' SAND: gray, dry, medic @5'-6' Silty SAND: brown, mois	slightly moist; abundant rootlets; porosity n brown, slightly moist, medium sity; pervasive old rootlets; some psits um dense; abundant gravel	Qye	SM ML SP SM SP	GB-1 @ 0.7 GB-2 @ 1.1 GB-3 @ 1.5		(, 0., 7
RAPHIC	AL RI	EPRESENTATION BELOW:	Elevation: 727' MSL Si	urface Slope: (	0 deg.	+	Trend: N	I-S
<del> </del>			B		+ + +		Depth: 9.5'	
							dwater: Non lled: 12/8/20	

Project Na	ame:	Richland - MCBC	Logged By: ARN	Trench	No.: TP-1	5		
Project Nu	ımbe	r: 20220-01	Date: 12/8/2020					16
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineei	ing Prope	erties:	Geotechnica	
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE	MOISTURE (%)	DRY DENSIT (PCF)
	В	scattered rootlet; dry vege moderately indurated  Quaternary Young Eolian D  @2.2'-8' SAND: gray, dry, m	n brown, dry, medium dense; tation in upper couple inches; eposits edium dense; abundant gravel slightly moist to moist, medium	Qye	SM SP SM	GB-1 @ 0 GB-2 @ 1 GB-3 @ 1 GB-4 @ 3	8. 0.	
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 733' MSL	Surface Slope	: 0 deg.		Trend: N	I-S
			B			Grou	Depth: 11' ndwater: Non filled: 12/8/20	

Project Na	ame:	Richland - MCBC	Logged By: ARN		Trench N	lo.: TP-16	5 <b>_</b>		
Project N	ımbe	er: 20220-01	Date: 12/9/2020			_			16
Equipmen	t: JC	B 3CX Excavator	Location: Ontario		Engineerii	ng Proper	ties:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	scattered rootlets in upper @1.2'-3' SAND with Silt @3'-3.4' Silty SAND: yellow   Quaternary Young Eolian De 3.4'-5.5' SAND: gray, dry, me @5.5'-7.5' SAND with Silt: gr	prown, dry, occasional rootlet eposits edium dense; occasional gravel ray, slightly moist edy SILT: gray brown, moist, me		Qye	SM SP SM	GB-1 @ 0.2 GB-2 @ 1.1 GB-3 @ 1.4	•	
GRAPHIC/	AL RI	EPRESENTATION BELOW:	Elevation: 735' MSL	Surfa	ace Slope:	0 deg.		Trend: N	I-S
			B				Total D	epth: 9.5'	

Project Na	ame:	Richland - MCBC	Logged By: ARN		Trench N	lo.: TP-17	7			
Project Nu	ımbe	er: 20220-01	Date: 12/9/2020					V	LC	
Equipmen	t: JC	B 3CX Excavator	Location: Ontario		Engineeri	ng Proper	ties:		Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs		IPLE lo	MOISTURE (%)	DRY DENSIT (PCF)
	В	Quaternary Young Eolian De @1.9'-5' SAND with Silt: brows and by 4 feet @5'-9.5' Gravelly SAND: gray	posits vn, slightly moist, medium dens	·	Qye	SM SP SP-SM	GB-1 GB-2 GB-3	@ 1.7		
RAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 737' MSL	Surfa	ace Slope:	0 deg.			Trend: N	- <b>S</b>
	-		Som o Cara DO	-	-	+ + + +	-	-	epth: 10.5'	+ +

Project Name: Richland - MCBC		Richland - MCBC	Logged By: ARN	Trench N	o.: TP-1	8			
Project N	ımbe	er: 20220-01	Date: 12/9/2020	F			LC	16	
Equipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineerii	Engineering Properties		Geotechnical,		
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)	
	В	vegitation @0.7'-1.6' Sandy SILT: mediu dense; scattered organic mo @1.6'-3.2' same as above; no Quaternary Young Eolian Del @3.2'-4.4' Silty SAND: brown, @4.4'-8' SAND: gray, dry, med	organic staining; refuse rope <u>posits</u> moist, medium dense lium dense , slightly moist; moderate gravel	afu Qye	ML SM SP	GB-1 @ 0.2 GB-2 @ 1.4 GB-3 @ 1.9			
GRAPHIC!	AL RI	EPRESENTATION BELOW:	Elevation: 738' MSL Surf	face Slope:	0 deg.		Trend: N	-S	

Backfilled: 12/9/20

Project Na	me:	Richland - MCBC	Logged By: ARN		Trench N	lo.: TP-1	9			
Project Nu	ımbe	er: 20220-01	Date: 12/9/2020 Location: Ontario		Engineering Proper				<b>IC</b>	
Equipmen	t: JC	B 3CX Excavator					rties:	Geotechn		ical, Inc
Geologic Attitudes	Unit	SOIL DESCRIPTION:			GEOLOGIC UNIT	uscs	- 1	MPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	Topsoil @0'-0.1.7' Silty SAND: medium gravel; scattered rootlets; org @1.7'-3.4' same as above; no gravel; same as above; no gravel; same as above; no gravel; same as above; no gravel; same same same same same same same same	ganic staining rootlets; no staining <i>osits</i> y moist, medium dense n brown, slightly moist to moi		Qye	SM SP SM	GB-2	@ 1.0' # @ 2.0' # @ 3.6' # @ 7.0'		
GRAPHICA	AL RE	EPRESENTATION BELOW:	Elevation: 734' MSL	Surfa	ce Slope:	0 deg.	+	+ +	Trend: N	-S
			B					Ground	epth: 9.9' dwater: None ed: 12/9/20	e

Project Name: Richland - MCBC			Logged By: ARN	Trench N	lo.: TP-20			
roject N	ımbe	er: 20220-01	Date: 12/9/2020		Engineering Properties		LC	jC
quipmen	t: JC	B 3CX Excavator	Location: Ontario	Engineeri	ng Proper	ties:	Geotech	nical, Ir
Geologic Attitudes	Unit	SOIL DESCRIPTION:		GEOLOGIC UNIT	uscs	SAMPLE No	MOISTURE (%)	DRY DENSIT (PCF)
	В	Quaternary Young Eolian Depo @3.5'-9' Silty SAND: brown, mo	organic staining um brown, slightly moist, medium osits	Qye	SM SP SM ML-SM	GB-1 @ 0.2' GB-2 @ 1.0' GB-3 @ 1.5'		(FOI)
RAPHIC	AL RI	EPRESENTATION BELOW:	Elevation: 732' MSL Sui	face Slope:	0 deg.		Trend: N	<b>-S</b>
+ + + +			A	-		-	-	

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Richland- MCBC
Project Number: 20220-01
Date: 12/21/2020

Boring Number: |-1

# Test hole dimensions (if circular) Boring Depth (feet)\*: 18 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if rectangular)						
Pit Depth (feet):						
Pit Length (feet):						
Pit Breadth (feet):						

#### Pre-Test (Sandy Soil Criteria)\*

	Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)		Total Change in Water Level	Greater Than or Equal to
Į		,	,	, ,	, ,	(feet)	(feet)	0.5 feet (yes/no)
I	1	9:30	9:55	25.0	16.20	17.82	1.62	Yes
	2	10:00	10:25	25.0	16.32	17.85	1.53	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	1:50	2:00	10.0	15.04	16.71	1.67	8.7
2	2:02	2:12	10.0	14.89	16.64	1.75	8.7
3	2:16	2:26	10.0	15.20	16.58	1.38	7.3
4	2:29	2:39	10.0	15.47	16.62	1.15	6.5
5	2:41	2:51	10.0	15.31	16.67	1.36	7.5
6	2:53	3:03	10.0	15.22	16.55	1.33	7.0
				·			
		_		·			
				·			

Calculated Infiltratio	n Rate (No fac	ctors of safety)	7.0
	F	actor of Safety	TBD
<b>Calculated Infiltration</b>	Rate (With Fa	ctor of Safety)	

Notes:



Based on Guidelines from: San Bernardino County (2013)

<sup>\*</sup>measured at time of test

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Richland- MCBC

Project Number: 20220-01

Date: 12/21/2020

Boring Number: | 1-2

# Test hole dimensions (if circular) Boring Depth (feet)\*: 16 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if	rectangular)
Pit Depth (feet):	
Pit Length (feet):	

Pit Breadth (feet):

#### Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	9:39	10:04	25.0	14.23	15.19	0.96	Yes
2	10:08	10:33	25.0	14.32	15.00	0.68	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, ∆t (min)	Initial Depth to Water, D <sub>o</sub> (feet)	to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	2:00	2:10	10.0	12.76	13.94	1.18	5.0
2	2:12	2:22	10.0	12.60	13.75	1.15	4.6
3	2:24	2:34	10.0	12.68	13.71	1.03	4.2
4	2:35	2:45	10.0	12.59	13.64	1.05	4.1
5	2:47	2:57	10.0	12.00	13.00	1.00	3.3
6	2:59	3:09	10.0	12.55	13.64	1.09	4.3

Calculated Infiltratio	n Rate (No fa	actors of safety)	4.3
		Factor of Safety	TBD
<b>Calculated Infiltration</b>	Rate (With F	actor of Safety)	

Sketch:			

Notes:



Based on Guidelines from: San Bernardino County (2013)

<sup>\*</sup>measured at time of test

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Richland- MCBC

Project Number: 20220-01

Date: 12/21/2020

Boring Number: I-3

# Test hole dimensions (if circular) Boring Depth (feet)\*: 21.5 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if rectangular)						
Pit Depth (feet):						
Pit Length (feet):						
Pit Breadth (feet):						

#### Pre-Test (Sandy Soil Criteria)\*

Ī		Start Time	Stop Time	Time Interval	Initial Depth to	Final Depth	Total Change	Greater Than or		
	Trial No.	(24:HR)	(24:HR)	(min)	(24:HP) (min)	P) (min)	Water (feet)	to Water	in Water Level	Equal to
L		(24.1111)			water (reet)	(feet)	(feet)	0.5 feet (yes/no)		
	1	8:53	9:18	25.0	17.89	18.62	0.73	Yes		
	2	9:27	9:52	25.0	17.93	18.52	0.59	Yes		

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	12:04	12:14	10.0	16.94	17.15	0.21	0.5
2	12:15	12:25	10.0	16.91	17.14	0.23	0.6
3	12:27	12:37	10.0	16.88	17.10	0.22	0.6
4	12:38	12:48	10.0	16.758	16.97	0.212	0.5
5	12:49	12:59	10.0	16.97	17.22	0.25	0.7
6	13:00	13:10	10.0	16.81	17.06	0.25	0.6

Calculated Infiltration Rate (No factors of safety)	0.6
Factor of Safety	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:			

Notes:



Based on Guidelines from: San Bernardino County (2013)

<sup>\*</sup>measured at time of test

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Richland- MCBC
Project Number: 20220-01
Date: 12/21/2020

Boring Number: 1-4

# Test hole dimensions (if circular) Boring Depth (feet)\*: 20 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if rectangular)	
Pit Depth (feet):	
Pit Length (feet):	
Pit Breadth (feet):	

#### Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	9:00	9:31	31.0	17.42	18.75	1.33	Yes
2	9:35	10:00	25.0	17.32	18.65	1.33	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	12:09	12:19	10.0	15.70	16.2	0.5	1.4
2	12:21	12:31	10.0	15.65	16.14	0.49	1.4
3	12:32	12:42	10.0	15.53	16.07	0.54	1.5
4	12:43	12:53	10.0	15.59	16.1	0.51	1.4
5	12:55	13:05	10.0	15.61	16.15	0.54	1.5
6	13:07	13:17	10.0	15.61	16.15	0.54	1.5

Calculated Infiltration Rate (No factors of safety)	1.5
Factor of Safety T	BD
Calculated Infiltration Rate (With Factor of Safety)	

Notes:



Based on Guidelines from: San Bernardino County (2013)

<sup>\*</sup>measured at time of test

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

Project Name: Richland- MCBC
Project Number: 20220-01
Date: 12/22/2020

Boring Number: 1-5

# Test hole dimensions (if circular) Boring Depth (feet)\*: 20 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if i	rectangular)
Pit Depth (feet):	
Pit Length (feet)	

Pit Breadth (feet):

#### Pre-Test (Sandy Soil Criteria)\*

	Trial No.	Start Time	Stop Time	Stop Time   Time Interval   Initial Depth to	Final Depth to Water	Total Change in Water Level	Greater Than or Equal to	
		(24:HR)	(24:HK)		water (reet)	(feet)	(feet)	0.5 feet (yes/no)
	1	8:58	9:23	25.0	16.26	18.53	2.27	Yes
I	2	9:25	9:50	25.0	17.05	18.55	1.50	Yes

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	Final Depth to Water, D <sub>f</sub> (feet)	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	9:58	10:08	10.0	17.19	17.67	0.48	2.1
2	10:09	10:19	10.0	17.29	17.65	0.36	1.6
3	10:20	10:30	10.0	17.38	17.73	0.35	1.6
4	10:31	10:41	10.0	17.25	17.64	0.39	1.7
5	10:43	10:53	10.0	17.55	17.95	0.40	2.0
6	10:56	11:06	10.0	17.42	17.79	0.37	1.7

Calculated Infiltration Rate (No factors of safety)	1.7
Factor of Safety	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:		ı		

Notes:

Based on Guidelines from: San Bernardino County (2013)



<sup>\*</sup>measured at time of test

#### LGC Geotechnical, Inc

131 Calle Iglesia Suite 200, San Clemente, CA 92672 tel. (949) 369-6141

 Project Name:
 Richland- MCBC

 Project Number:
 20220-01

 Date:
 12/22/2020

**Boring Number:** 1-6

# Test hole dimensions (if circular) Boring Depth (feet)\*: 19.5 Boring Diameter (inches): 8 Pipe Diameter (inches): 3

Test pit dimensions (if rectangular)							
Pit Depth (feet):							
Pit Length (feet):							
Pit Breadth (feet):							

#### Pre-Test (Sandy Soil Criteria)\*

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval (min)	Initial Depth to Water (feet)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	8:49	9:14	25.0	16.45	16.92	0.47	No
2	9:16	9:41	25.0	16.84	17.24	0.40	No

<sup>\*</sup>If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight, and then obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25 inches

#### Main Test Data

Trial No.	Start Time (24:HR)	Stop Time (24:HR)	Time Interval, $\Delta t$ (min)	Initial Depth to Water, D <sub>o</sub> (feet)	to Water, D <sub>f</sub>	Change in Water Level, AD (feet)	Calculated Infiltration Rate(in/hr)
1	10:04	10:34	30.0	16.51	17.00	0.49	0.7
2	10:36	11:10	34.0	16.82	17.33	0.51	0.7
3	11:13	11:43	30.0	16.61	17.09	0.48	0.7
4	11:48	12:18	30.0	16.72	17.14	0.42	0.6
5	12:20	12:50	30.0	16.73	17.09	0.36	0.5
6	12:51	13:21	30.0	16.82	17.18	0.36	0.5
7	13:24	13:54	30.0	16.73	17.12	0.39	0.6
8	13:56	14:26	30.0	16.72	17.08	0.36	0.5
9	14:31	15:01	30.0	16.9	17.24	0.34	0.5
10	15:06	15:36	30.0	16.58	17.03	0.45	0.6
11	15:39	16:09	30.0	16.73	17.06	0.33	0.5
12	16:15	16:45	30.0	16.62	17.06	0.44	0.6

Calculated Infiltration Rate (No factors of safety)

Factor of Safety TBD

Calculated Infiltration Rate (With Factor of Safety)

Sketch:			

Notes:



Based on Guidelines from: San Bernardino County (2013)

<sup>\*</sup>measured at time of test

### Appendix J General Earthwork and Grading Specifications for Rough Grading

#### General Earthwork and Grading Specifications for Rough Grading

#### 1.0 General

#### 1.1 Intent

These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

#### 1.2 The Geotechnical Consultant of Record

Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

#### 1.3 The Earthwork Contractor

The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork

contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the

Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor's sole responsibility to provide proper fill compaction.

#### 2.0 Preparation of Areas to be Filled

#### 2.1 Clearing and Grubbing

Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

#### 2.2 Processing

Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be over-excavated as specified in the following section. Scarification shall continue until soils are broken down and free of oversize material and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

#### 2.3 Over-excavation

In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by the Geotechnical Consultant during grading.

#### 2.4 Benching

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

#### 2.5 Evaluation/Acceptance of Fill Areas

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

#### 3.0 Fill Material

#### 3.1 General

Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

#### 3.2 Oversize

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

#### 3.3 Import

If importing of fill material is required for grading, proposed import material shall meet the requirements of the geotechnical consultant. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

#### 4.0 Fill Placement and Compaction

#### 4.1 Fill Layers

Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

#### 4.2 Fill Moisture Conditioning

Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557).

#### 4.3 <u>Compaction of Fill</u>

After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

#### 4.4 Compaction of Fill Slopes

In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557.

#### 4.5 Compaction Testing

Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

#### 4.6 Frequency of Compaction Testing

Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

#### 4.7 Compaction Test Locations

The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than

5 feet apart from potential test locations shall be provided.

#### 5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

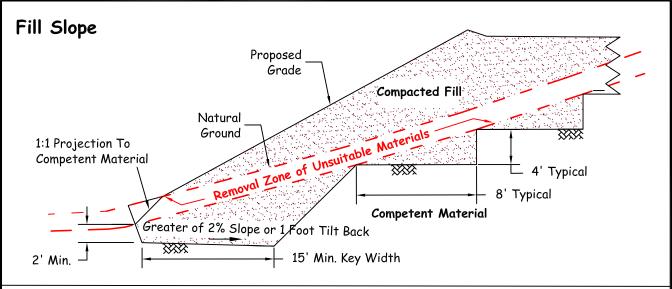
#### 6.0 Excavation

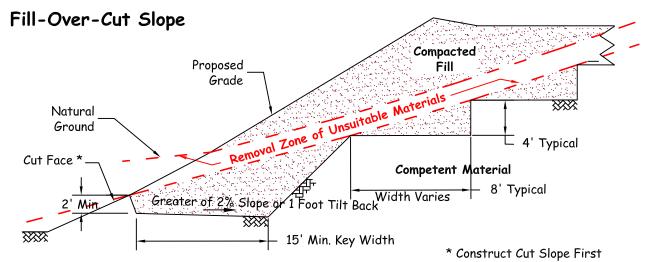
Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

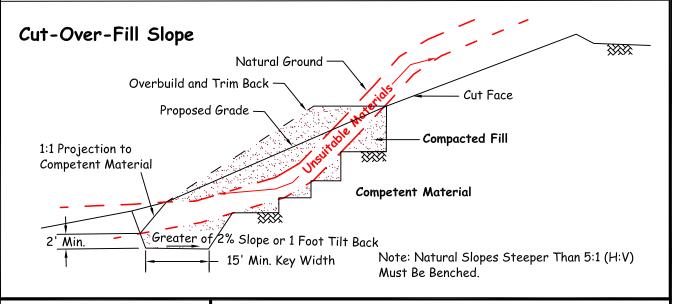
#### 7.0 Trench Backfills

- 7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.
- 7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over

- the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.
- 7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.
- 7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.
- 7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

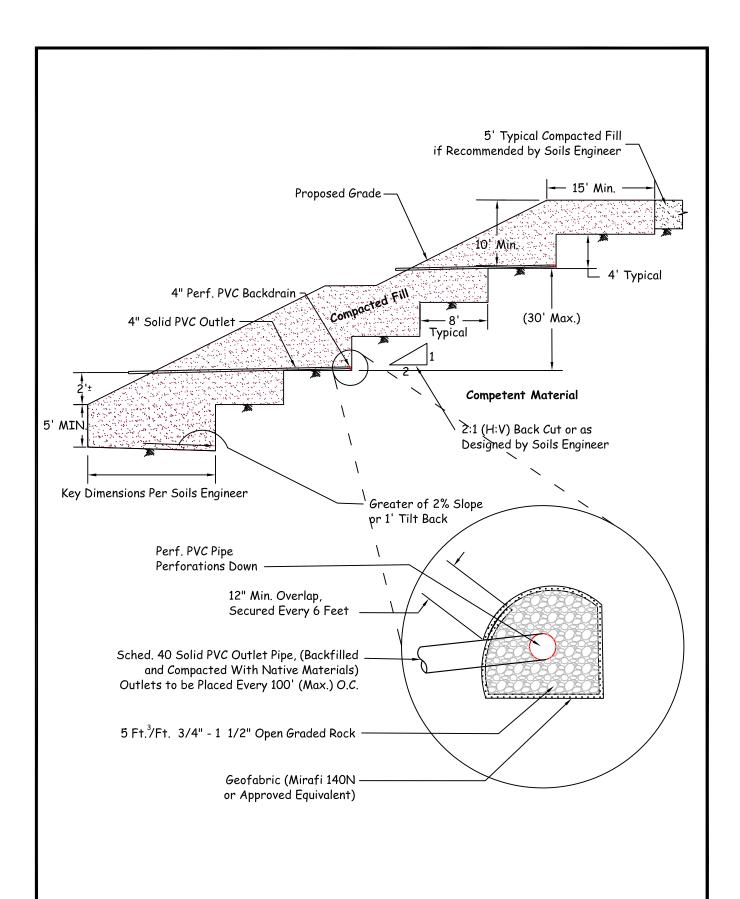






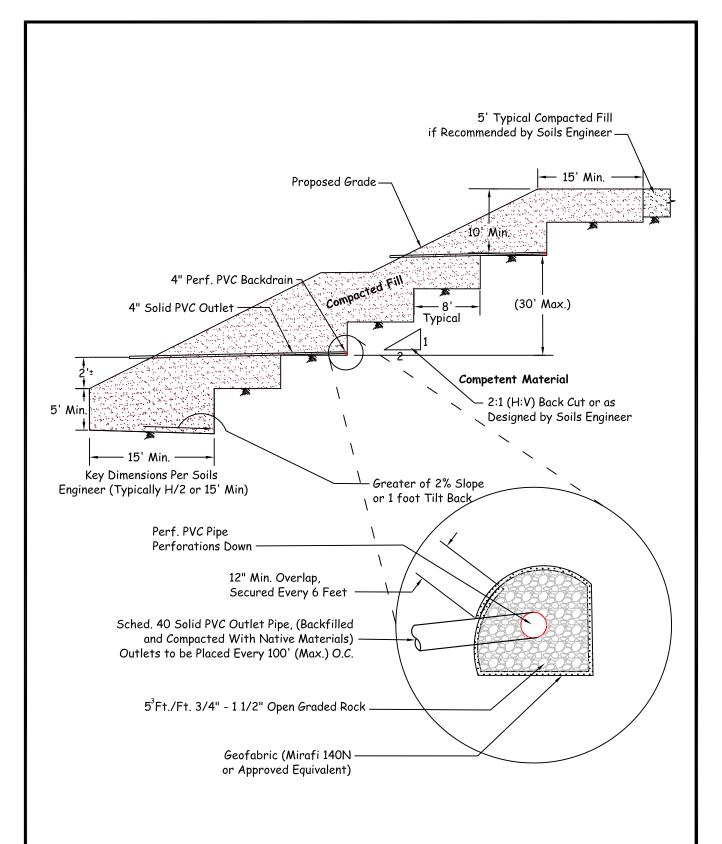


**KEYING AND BENCHING** 





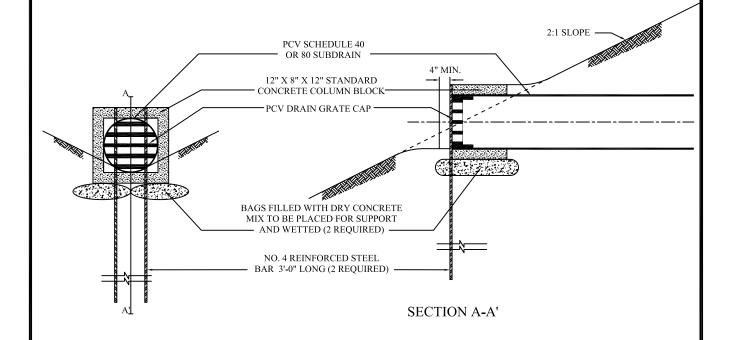
### TYPICAL BUTTRESS DETAIL



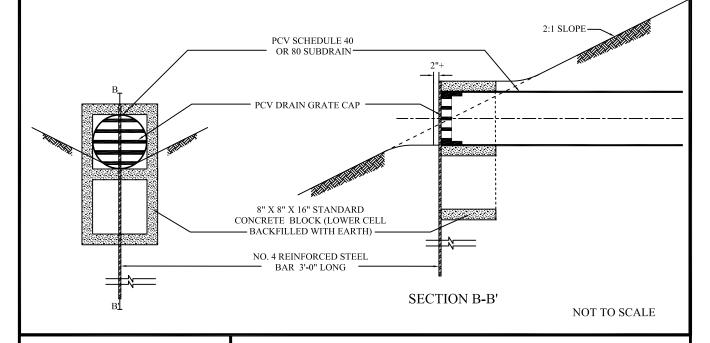


## TYPICAL STABILIZATION FILL DETAIL

### SUBDRAIN OUTLET MARKER -6" & 8" PIPE

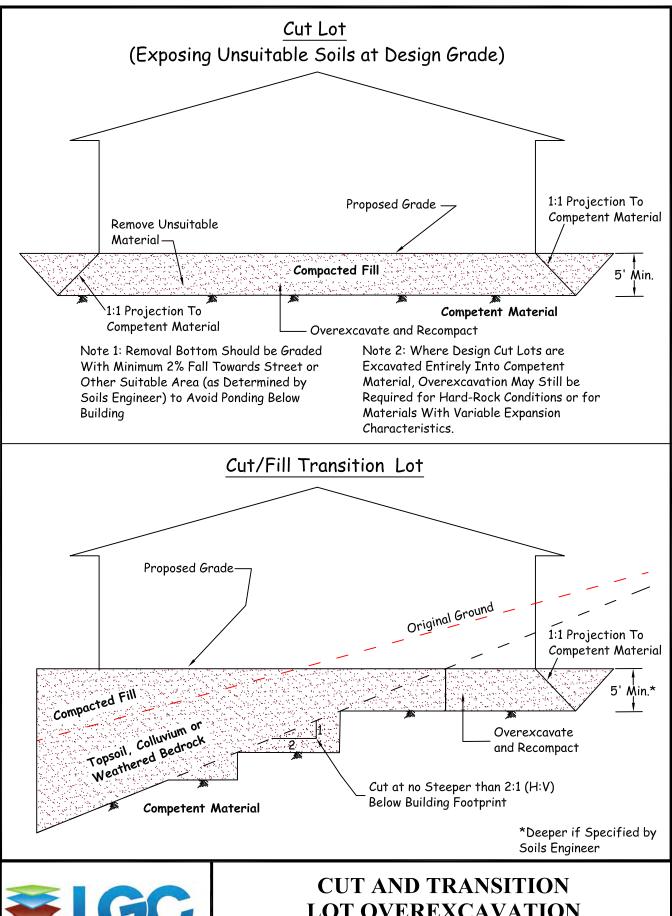


### SUBDRAIN OUTLET MARKER -4" PIPE



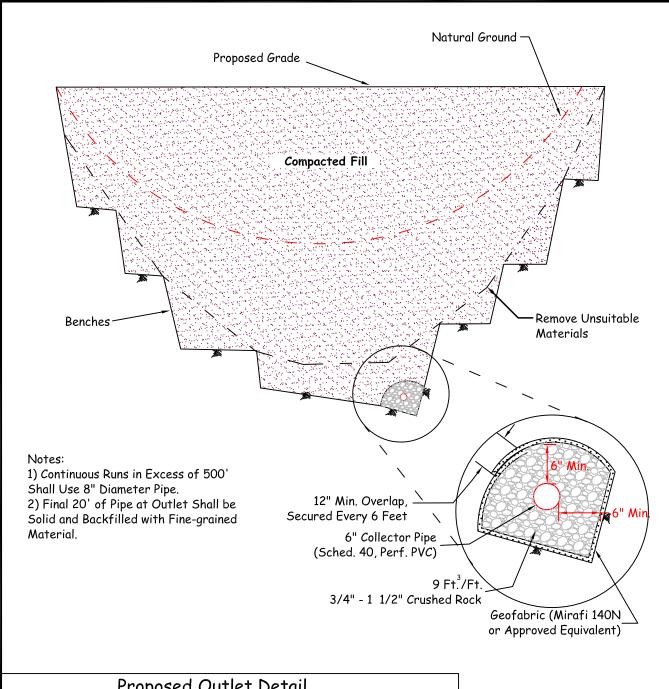


SUBDRAIN OUTLET MARKER DETAIL

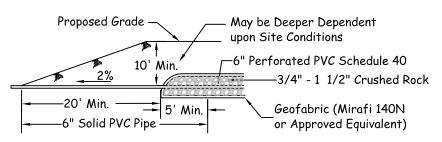




LOT OVEREXCAVATION **DETAIL** 

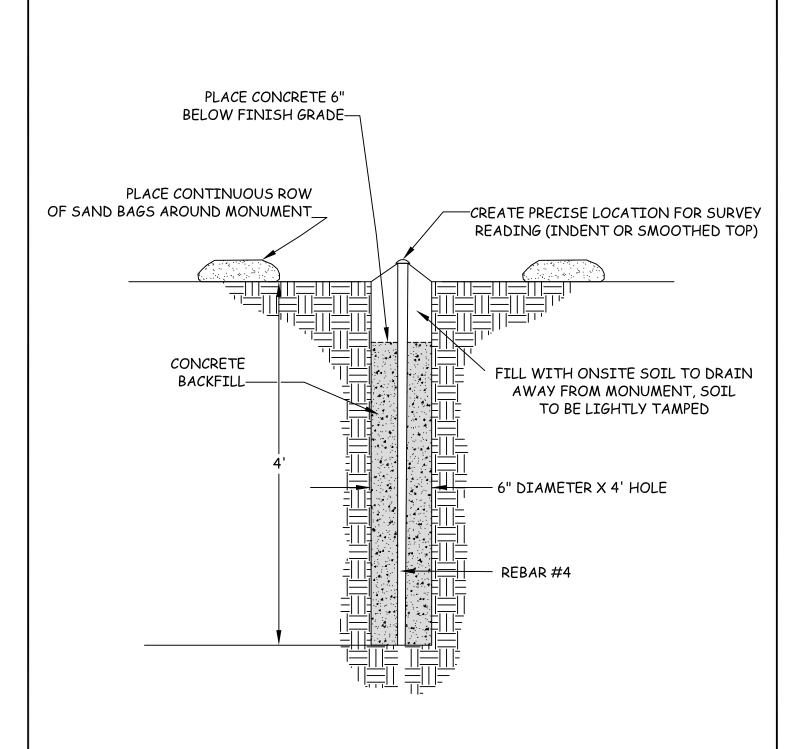








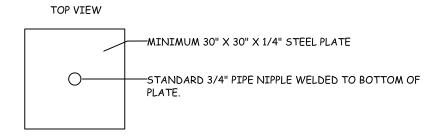
**CANYON SUBDRAINS** 

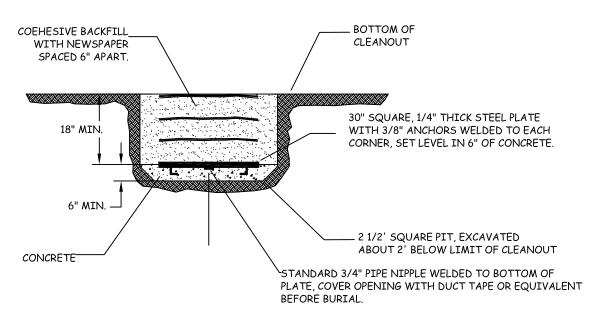


NO CONSTRUCTION EQUIPMENT WITHIN 25 FEET OF ANY INSTALLED SETTLEMENT MONUMENTS



## TYPICAL SURFACE SETTLEMENT MONUMENT

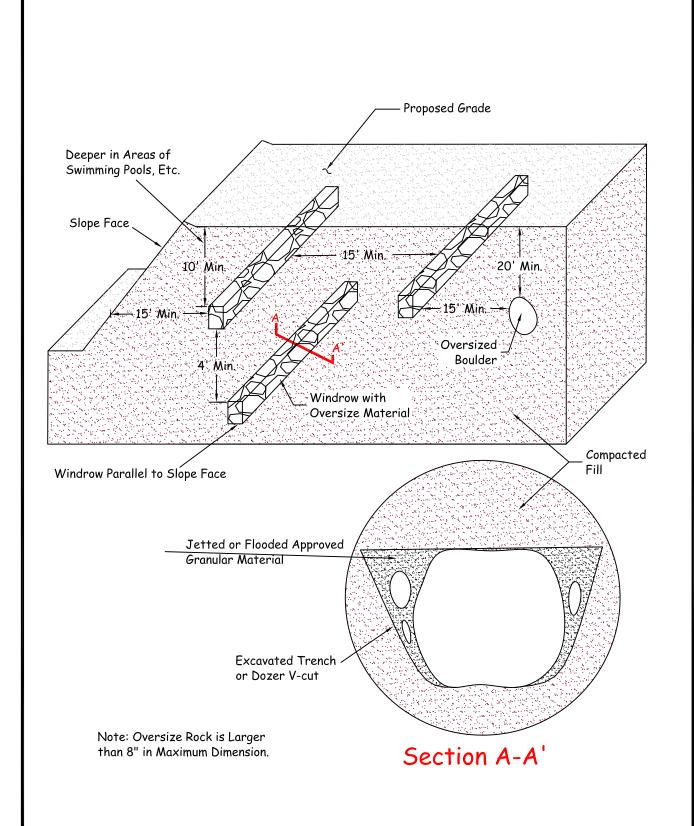




- 1. SURVEY FOR HORIZONTAL AND VERTICAL LOCATION TO NEAREST .01 INCH PRIOR TO BACKFILL USING KNOW LOCATIONS THAT WILL REMAIN INTACT DURING THE DURATION OF THE MONITORING PROGRAM. KNOW POINTS EXPLICITELY NOT ALLOWED ARE THOSE LOCATED ON FILL OR THAT WILL BE DESTROYED DURING GRADING.
- 2. IN THE EVENT OF DAMAGE TO SETTLEMENT PLATE DURING GRADING, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE GEOTECHNICAL ENGINEER AND SHALL BE RESPONSIBLE FOR RESTORING THE SETTLEMENT PLATES TO WORKING ORDER.
- 3. DRILL TO RECOVER AND ATTACH RISER PIPE.



## TYPICAL SETTLEMENT PLATE AND RISER





OVERSIZE ROCK DISPOSAL DETAIL