



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.

A handwritten signature in blue ink, appearing to read "D Boratynec".

Dennis Boratynec, GE 2770
Vice President



A handwritten signature in blue ink, appearing to read "Branden Petersen".

Branden Petersen, EIT
Senior Staff Engineer

DJB/BPP/amm

Distribution: (1) Addressee (electronic copy)

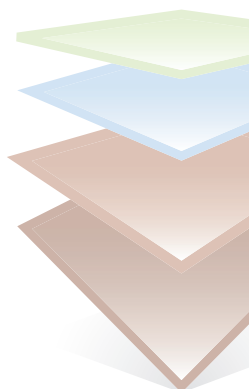


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1.0 INTRODUCTION

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

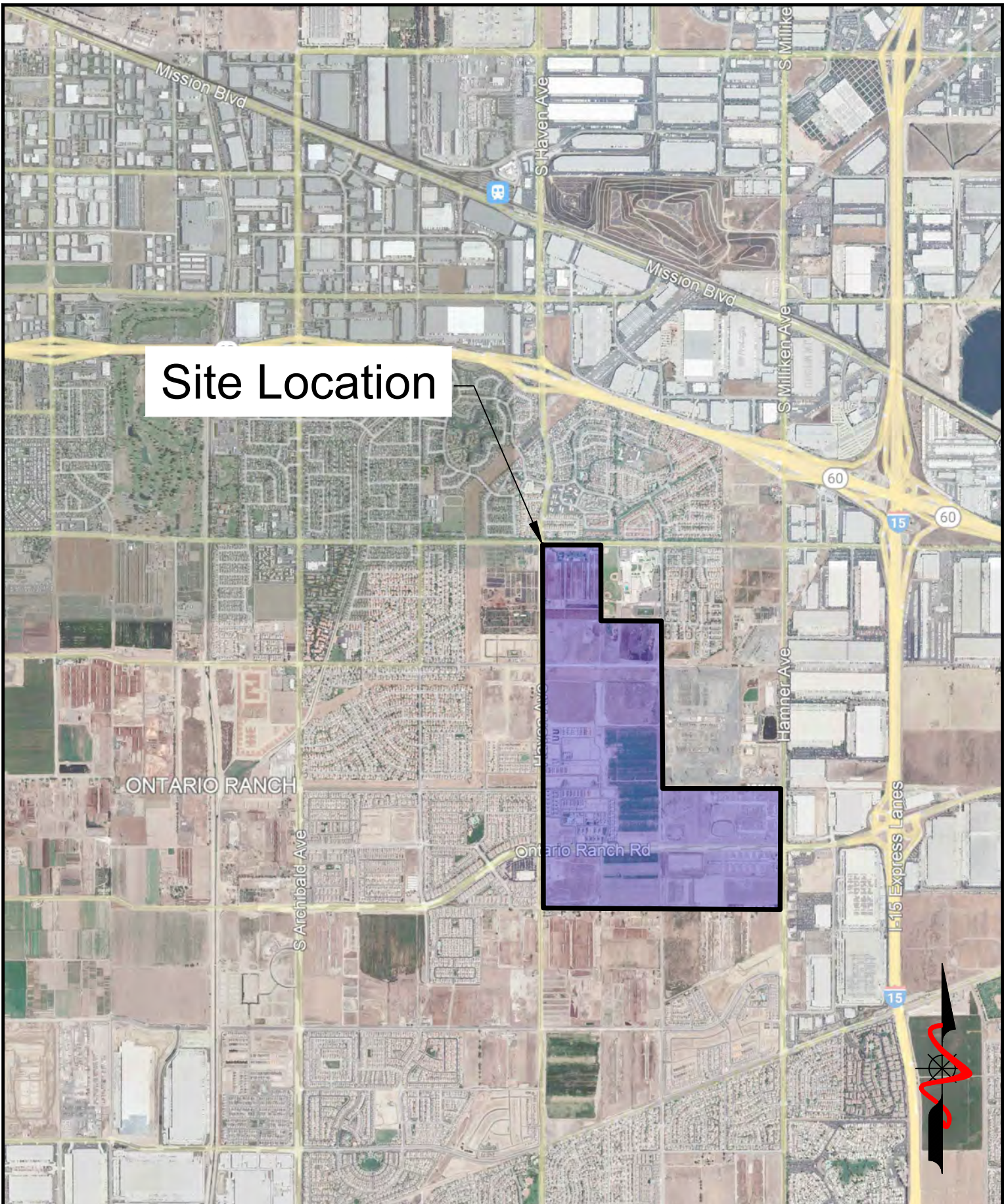
150 kips and 10 kips per linear foot, respectively.

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.



Site Location

ONTARIO RANCH



FIGURE 1
Site Location Map

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

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 Site Geology and Generalized Subsurface Conditions

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 non-cohesive (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 Lateral Spreading

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 site-specific ground motions.

TABLE 1

Seismic Design Parameters

Selected Parameters from 2019 CBC, Section 1613 - Earthquake Loads	Seismic Design Values	Notes/Exceptions
Distance to applicable faults classifies the site as a "Near-Fault" site.		Section 11.4.1 of ASCE 7
Site Class	D*	Chapter 20 of ASCE 7
S _s (Risk-Targeted Spectral Acceleration for Short Periods)	1.612g	From SEAOC, 2022
S ₁ (Risk-Targeted Spectral Accelerations for 1-Second Periods)	0.585g	From SEAOC, 2022
F _a (per Table 1613.2.3(1))	1.000	For Simplified Design Procedure of Section 12.14 of ASCE 7, F _a shall be taken as 1.4 (Section 12.14.8.1)
F _v (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 _a S _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 _{RS} (Mapped Risk Coefficient at 0.2 sec)	0.940	ASCE 7 Chapter 22
C _{R1} (Mapped Risk Coefficient at 1 sec)	0.917	ASCE 7 Chapter 22
*Since site soils are Site Class D and S ₁ is greater than or equal to 0.2, the seismic response coefficient C _s is determined by Eq. 12.8-2 for values of T ≤ 1.5T _s and taken equal to 1.5 times the value calculated in accordance with either Eq. 12.8-3 for T _L ≥ 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_G) Peak Ground Acceleration (PGA) should be used for liquefaction potential. The PGA_M for the site is equal to 0.739g (SEAOC, 2022).

2.7 Near Surface Organic Rich Soils

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 LIMITATIONS

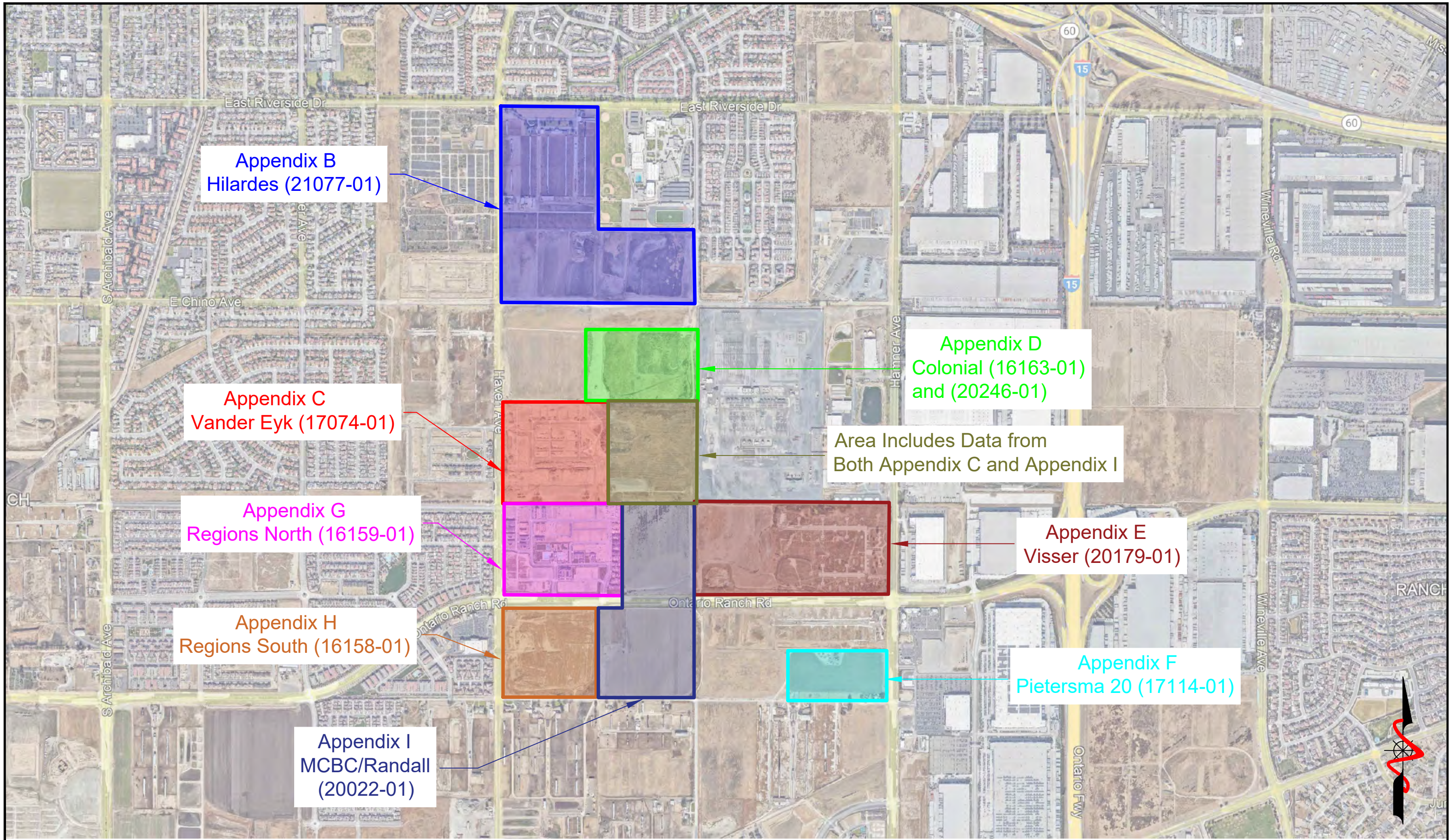
Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included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

- American Concrete Institute (ACI), 2013, Guide for the Design and Construction of Concrete Parking Lots (ACI 330R-08), fifteenth printing, November 2013.
- _____, 2014, Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14).
- American Society of Civil Engineers (ASCE), 2017, Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-16, 2017.
- _____, 2018, Standard 7-16, Minimum Design Loads for Buildings and Associated Criteria for Buildings and Other Structures, Supplement 1, effective: December 12, 2018.
- ASTM International, Annual Book of ASTM Standards, Volume 04.08.
- California Building Standards Commission, 2019, California Building Code, California Code of Regulations Title 24, Volumes 1 and 2, dated July 2019.
- California Department of Conservation, Division of Mines and Geology, 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CDMG Special Publication 117.
- _____, 2000, Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Southern Region, CDMG CD 2000-03.
- California Department of Transportation (Caltrans), 2008, Highway Design Manual, Chapter 630, dated July 2008.
- _____, 2021, Corrosion Guidelines, Version 3.2, dated May 2021.
- California Department of Water Resources, 2018, Historic Data Map Interface, Website Address: <http://wdl.water.ca.gov>
- _____, 2009, The Ontario Plan, Environmental Impact Report, website address: <http://www.ontarioplan.org/environmental-impact-report/>
- California Geological Survey, 2007, Fault-Rupture Hazard Zones in California, Special Publication 42, Interim Revision 2007.
- County of San Bernardino, 2013, Technical Guidance Document for Water Quality Management Plans, Infiltration Guidelines, dated June 21, 2013.
- Earth Consultants International (ECI), 2006, Technical Background Report to the Safety Element, City of Ontario, California, dated October 11, 2006.

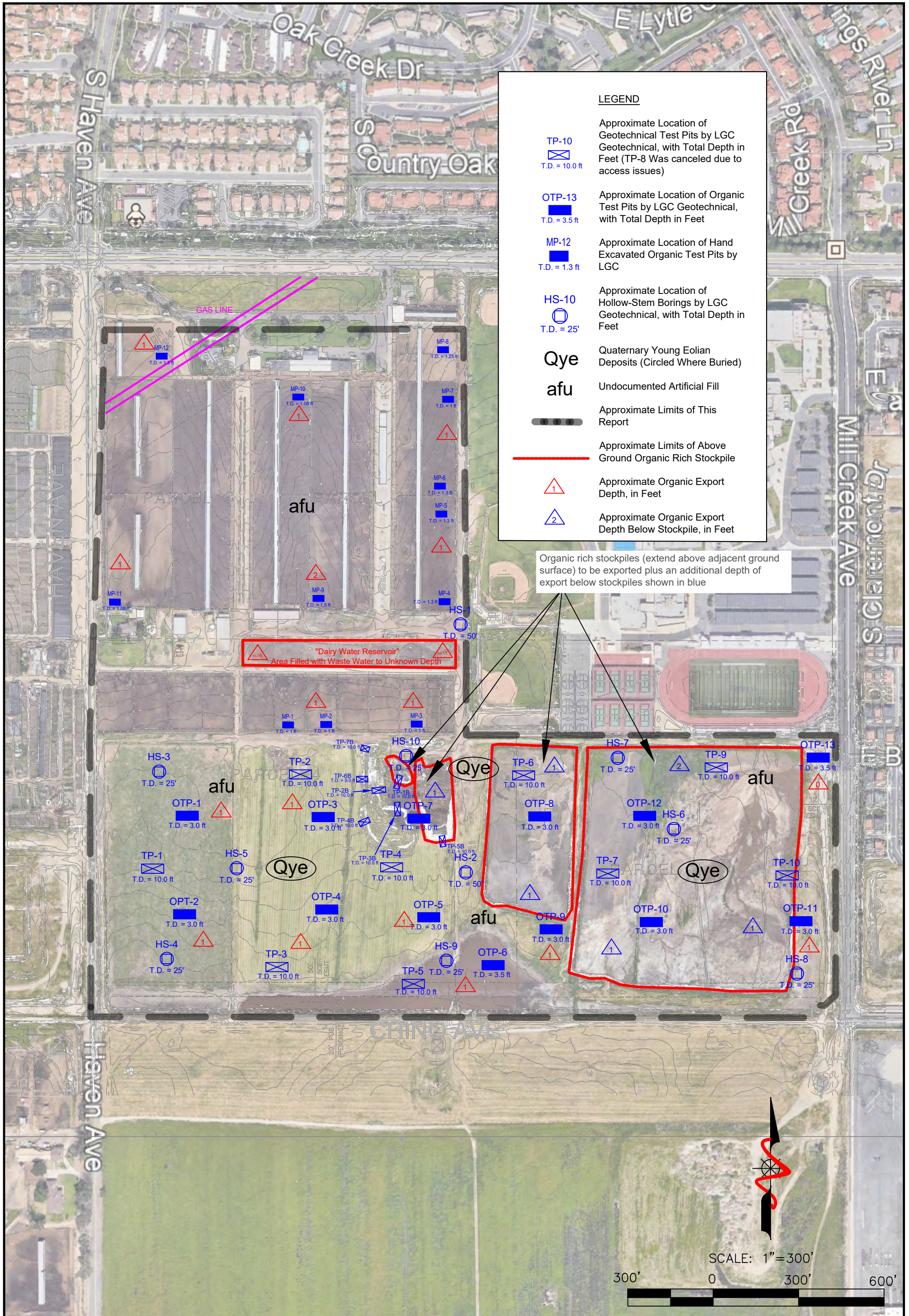
- LGC Geotechnical, Inc., 2017a, Geotechnical Evaluation for the Development of the Proposed 45-Acre “Regions North” Residential Community, City of Ontario, California, Project No. 16159-01, dated April 7, 2017.
- _____, 2017b, Geotechnical Evaluation for the Development of the Proposed Approximately 35-Acre “Regions South” Residential Community, Tract 18922-4, City of Ontario, California, Project No. 16158-01, dated June 22, 2017.
- _____, 2017c, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed Approximately 80-Acre “VanderEyck” Residential Development, City of Ontario, California, Project No. 17074-01, dated August 31, 2017.
- _____, 2018, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed Approximately 100-Acre “Esperanza & Pietersma” Residential Development, City of Ontario, California, Project No. 17114-01, dated March 16, 2018.
- _____, 2019, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed “Colonial” Residential Development, Tract No. 18925, City of Ontario, California, Project No. 16163-01, dated August 15, 2019.
- _____, 2020, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for Proposed “Visser” Industrial and Commercial Development, Ontario Ranch Road, City of Ontario, California, Project No. 20179-01, dated December 1, 2020.
- _____, 2021a, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed Mill Creek Business Center Industrial and Commercial Development, Ontario Ranch Road, City of Ontario, California, Project No. 20220-01, dated June 10, 2021.
- _____, 2021b, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed Mill Creek Business Center North Industrial and Commercial Development, Ontario Ranch Road, City of Ontario, Project No. 20246-01, dated August 10, 2021.
- _____, 2021c, Preliminary Geotechnical Evaluation Including Near Surface Organic Content for the Proposed Rich Haven PA-1, Tentative Tract Map 20256, City of Ontario, California, Project No. 21077-01, dated December 30, 2021.
- Pradel, Daniel, 1998, Procedure to evaluate earthquake-induced settlement in dry sandy soils, *Journal of Geotechnical and Geoenvironmental Engineering*, Volume 124(4), pp. 364-368, dated April and October 1998.
- Southern California Earthquake Center (SCEC), 1999, “Recommended Procedure for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigation Liquefaction Hazards in California”, Edited by Martin, G.R., and Lew, M., dated March 1999.
- Structural Engineers Association of California (SEAOC), 2022, Seismic Design Maps, Retrieved September 12, 2022, from <https://seismicmaps.org/>
- United States Geological Survey (USGS), 2002, Geologic Map of the Corona North 7.5 Minute

Quadrangle, Southern California, Version 1.0, Open File Report 02-22, Prepared in Cooperation with the California Geological Survey; Compiled by D.M. Morton and C.H. Gray, Jr.

_____, 2003, Preliminary Geologic Map of the Santa Ana 30 x 60 Quadrangle, Southern California, Version 2.0, Compiled by Douglas M. Morton, 2004, Open File Report 99-172, Sheet 1 of 2.

_____, 2014, Unified Hazard Tool, Dynamic: Conterminous U.S. 2014 (update) (v4.2.0), Retrieved September 12, 2022, from <https://earthquake.usgs.gov/hazards/interactive/>

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



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

FIGURE 2
Geotechnical Map

PROJECT NAME	Richland - Hilarides
PROJECT NO.	21077-01
ENG. / GEOL.	DJB
SCALE	1" = 300'
DATE	December 2021

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.

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 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

* ASTM D4829

Grain Size Distribution/Fines Content: 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).

APPENDIX C (Cont'd)

Laboratory Testing Procedures and Test Results

Sample Location	Description	% Passing # 200 Sieve
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

Consolidation: 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.

Maximum Density Tests: 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

*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

Chloride Content: 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

Soluble Sulfates: 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 Class *
HS-1 @ 1-5 feet	128	S0

*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	pH	Minimum Resistivity (ohms-cm)
HS-1 @ 1-5 feet	7.85	1,280

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 6.

TP-1		TP-2		TP-3		TP-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
TP-5		TP-6		TP-7		TP-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		OTP-1		OTP-2		OTP-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
OTP-4		OTP-5		OTP-6		OTP-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
OTP-8		OTP-9		OTP-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
OTP-12		OTP-13		TP-1B		TP-2B	
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				
TP-3B		TP-7B		MP-1		MP-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						

MP-3	
Depth (ft)	% Organics
0-0.5	42.5

Legend

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


Note: * Indicates Depth from top of stockpile, where 0' is existing ground surface



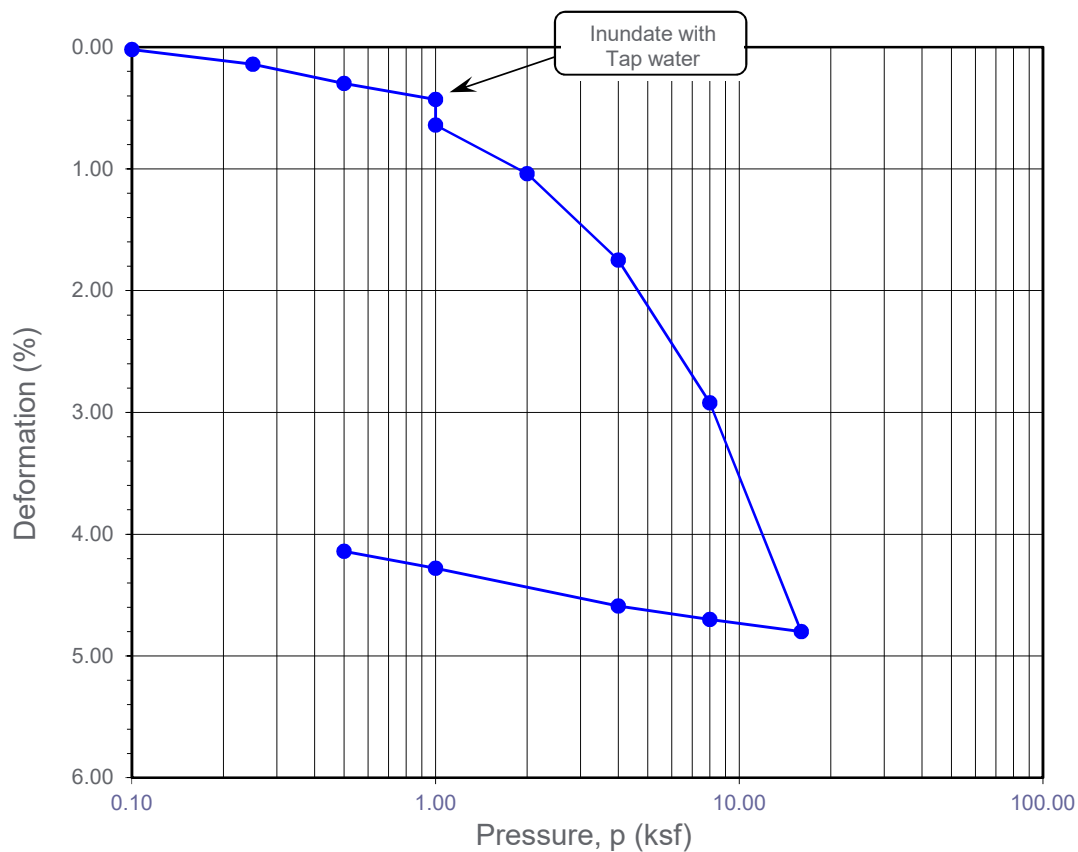
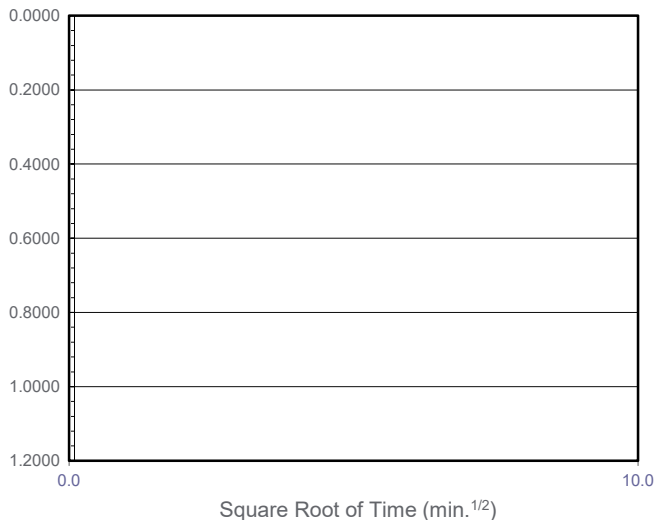
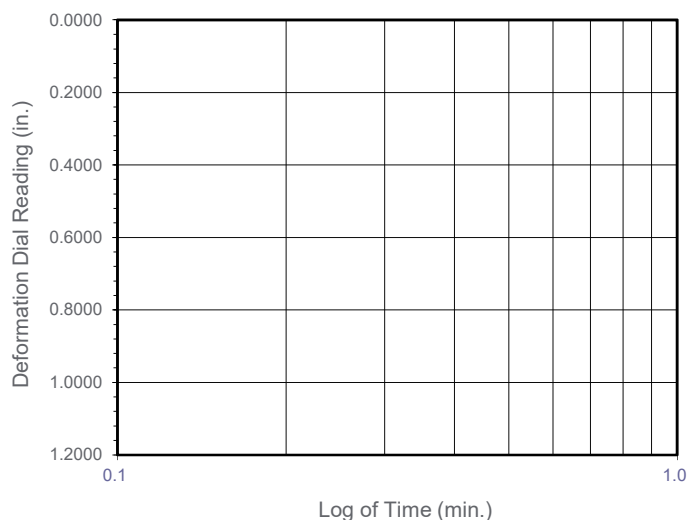
Table 6 Summary of Measured Organic Content vs Depth of Sample		Project Name Richland - Hilardes	
		Project Number 21077-01	
		ENG./GEOL. DJB	
		Date Dec-21	

MP-4		MP-5		MP-6		MP-7	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	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						
MP-8		MP-9		MP-10		MP-11	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	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				
MP-12							
Depth (ft)	% Organics						
0-0.5	46.9						

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

	Table 6	Project Name	Richland - Hilardes
	Summary of Measured	Project Number	21077-01
	Organic Content vs Depth of	ENG./GEOL.	DJB
	Sample	Date	Dec-21

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-1	R-4	10	8.7	21.3	98.1	102.9	0.719	0.648	33	90

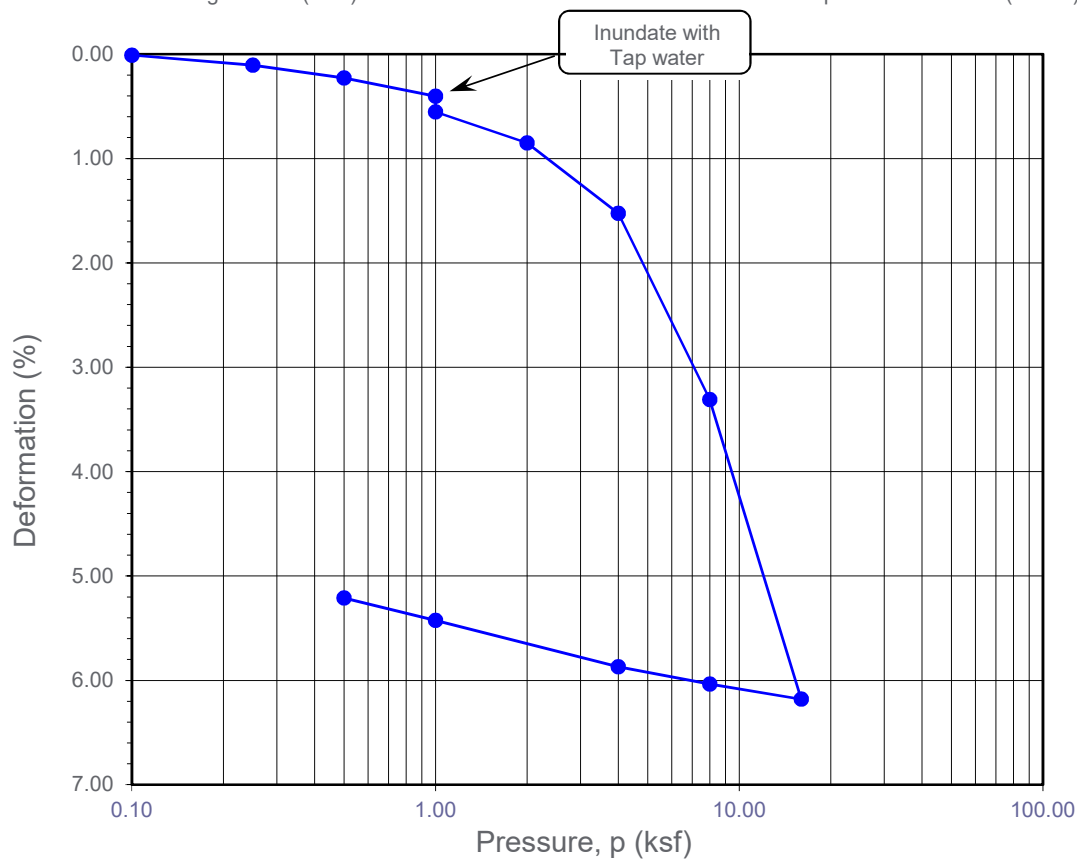
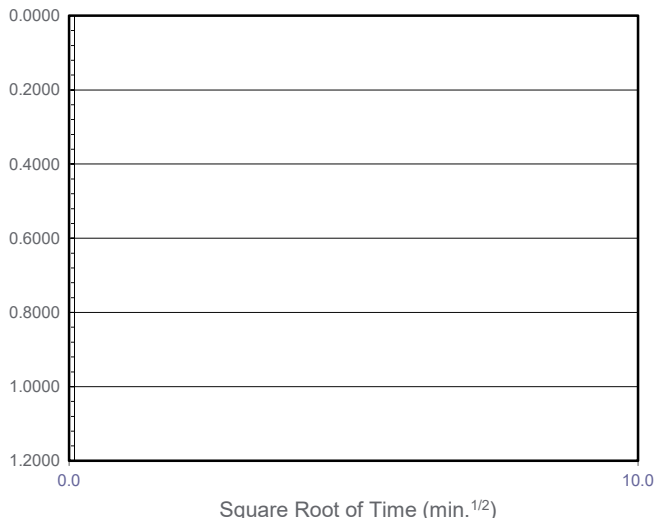
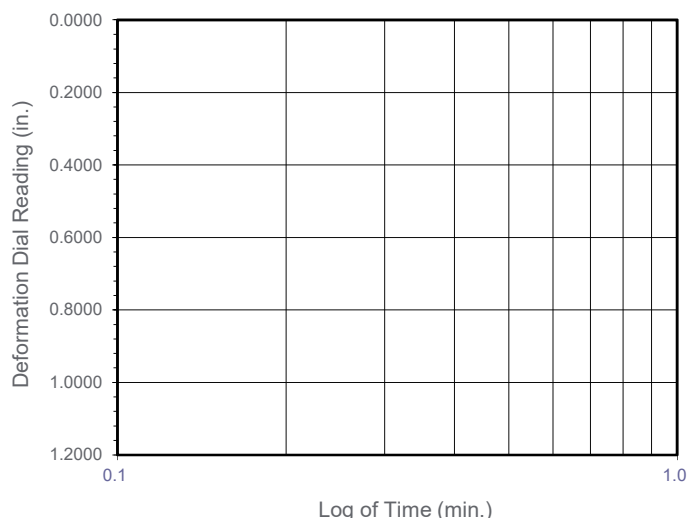
Soil Identification: Olive brown silt (ML)

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

Project No.: 21077-01

Ontario

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-2	R-4	10	9.7	20.0	101.0	105.3	0.669	0.582	39	90

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

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


Project No.: 21077-01

Ontario

Geotechnical Boring Log Borehole HS-1

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~776' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2



Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
775	0	B-1	R-1	9 10 10	103.8	6.9	SM	@0' to 1.5' - Undocumented Artificial Fill (afu): @1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: brown, slightly moist, medium dense	MD EI CR #200
770	5		R-2	8 9 12	94.5	8.9	ML		
			R-3	8 8 13	99.5	9.2	SM	@7.5'- Silty SAND: dusky brown, moist, medium dense	
765	10		R-4	4 7 9	98.1	8.7	ML	@10'- SILT: olive brown, slightly moist, stiff	CN
760	15		SPT-1	3 4 4			ML	@15'- Sandy SILT: olive gray, wet, stiff	
755	20	R-5	5 9 13	82.6	39.4	ML/CL	@20'- SILT/CLAY: olive brown, wet, very stiff		
750	25	SPT-2	6 9 12			SP	@25'- SAND with Gravel: rusty brown, slightly moist, medium dense		
	30								

	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.	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">SAMPLE TYPES:</td> <td style="width: 50%;">TEST TYPES:</td> </tr> <tr> <td>B BULK SAMPLE</td> <td>DS DIRECT SHEAR</td> </tr> <tr> <td>R RING SAMPLE (CA Modified Sampler)</td> <td>MD MAXIMUM DENSITY</td> </tr> <tr> <td>G GRAB SAMPLE</td> <td>SA SIEVE ANALYSIS</td> </tr> <tr> <td>SPT STANDARD PENETRATION TEST SAMPLE</td> <td>S&H SIEVE AND HYDROMETER</td> </tr> <tr> <td></td> <td>EI EXPANSION INDEX</td> </tr> <tr> <td></td> <td>CN CONSOLIDATION</td> </tr> <tr> <td></td> <td>CR CORROSION</td> </tr> <tr> <td></td> <td>AL ATTERBERG LIMITS</td> </tr> <tr> <td></td> <td>CO COLLAPSE/SWELL</td> </tr> <tr> <td></td> <td>RV R-VALUE</td> </tr> <tr> <td></td> <td>#200 % PASSING # 200 SIEVE</td> </tr> </table>	SAMPLE TYPES:	TEST TYPES:	B BULK SAMPLE	DS DIRECT SHEAR	R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY	G GRAB SAMPLE	SA SIEVE ANALYSIS	SPT STANDARD PENETRATION TEST SAMPLE	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
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Geotechnical Boring Log Borehole HS-1

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~776' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2


Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
745	30		R-6	12 18 21	105.5	12.2	SM	@30'- Silty SAND: rusty olive brown, moist, dense	
740	35		SPT-3	10 11 15		13.5	SM/ML	@35'- Silty SAND/Sandy SILT: rusty brown, very moist/moist, dense/hard	
735	40		R-7	15 19 30	110.1	2.5	SP	@40'- SAND: light brown, dry, dense	
730	45		SPT-4	5 9 13		23.9	ML	@45'- Sandy SILT: dusky brown, wet, very stiff	
725	50		R-8	10 11 20	110.8	17.2	SM/ML	@50'- Silty SAND/Sandy SILT: brown, wet/very moist, medium dense/very stiff	
								Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
720	55								
	60								

	<p style="font-size: small;">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.</p>	<p style="font-size: x-small;">SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p style="text-align: center;"> GROUNDWATER TABLE</p>	<p style="font-size: x-small;">TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-2

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~768' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' to 1.5' - Undocumented Artificial Fill (afu):	#200
765			R-1	4 4 8	100.2	2.7	SM	@1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: gray/brown, dry, loose	EI MD RV
	5	B-1	R-2	7 9 13	103.0	3.4	SM	@5'- Silty SAND: gray/brown, dry, medium dense	#200
760			R-3	9 10 10	107.1	10.3	SM/ML	@7.5'- Silty SAND/Sandy SILT: olive brown, moist, medium dense/very stiff	
	10		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	4 5 5		11.3	SM/ML	@15'- Silty SAND/Sandy SILT: olive gray/brown, moist, medium dense/stiff	
750									
	20		R-5	9 12 18	100.6	2.5	SM	@20'- Silty SAND: dusky gray, dry, medium dense	
745									
	25		SPT-2	9 9 12		26.5	ML	@25'- Sandy SILT: olive gray, wet, very stiff	
740									
	30								

	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.	<table style="width: 100%; border: none;"> <tr> <td>SAMPLE TYPES:</td> <td>TEST TYPES:</td> </tr> <tr> <td>B BULK SAMPLE</td> <td>DS DIRECT SHEAR</td> </tr> <tr> <td>R RING SAMPLE (CA Modified Sampler)</td> <td>MD MAXIMUM DENSITY</td> </tr> <tr> <td>G GRAB SAMPLE</td> <td>SA SIEVE ANALYSIS</td> </tr> <tr> <td>SPT STANDARD PENETRATION TEST SAMPLE</td> <td>S&H SIEVE AND HYDROMETER</td> </tr> <tr> <td></td> <td>EI EXPANSION INDEX</td> </tr> <tr> <td></td> <td>CN CONSOLIDATION</td> </tr> <tr> <td></td> <td>CR CORROSION</td> </tr> <tr> <td></td> <td>AL ATTERBERG LIMITS</td> </tr> <tr> <td></td> <td>CO COLLAPSE/SWELL</td> </tr> <tr> <td></td> <td>RV R-VALUE</td> </tr> <tr> <td></td> <td>#200 % PASSING # 200 SIEVE</td> </tr> </table>	SAMPLE TYPES:	TEST TYPES:	B BULK SAMPLE	DS DIRECT SHEAR	R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY	G GRAB SAMPLE	SA SIEVE ANALYSIS	SPT STANDARD PENETRATION TEST SAMPLE	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
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	RV R-VALUE																									
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Geotechnical Boring Log Borehole HS-2

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~768' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	30		R-6	9 12 15	101.2	11.5	SM/ML	@30'- Silty SAND/Sandy SILT: olive gray, moist, medium dense/very stiff	
730	35		SPT-3	10 12 13		7.6	SP	@35'- SAND: brown, moist, dense	
725	40		R-7	15 18 21	102.2	8.3	SM	@40'- Silty SAND: rusty gray/brown, moist, dense	
720	45		SPT-4	14 17 20		14.5	SM/ML	@45'- Silty SAND/Sandy SILT: dusky brown, very moist/moist, dense/hard	
715	50		R-8	12 15 19	99.9	21.3	ML	@50'- Sandy SILT: rusty gray/brown, wet, very stiff	
710	55							Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
60									



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

TEST TYPES:
 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-3

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~772' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
770	0							@0' to 1.5' - Undocumented Artificial Fill (afu): @1.5' to T.D. - Young Eolian Deposits (Qye) @2.5'- Silty SAND: dusky gray, dry, medium dense	
765	5		R-1	12 18 20	108.4	2.6	SM		
			R-2	12 15 19	94.8	1.2		@5'- Silty SAND: gray, dry, medium dense	#200
			R-3	7 9 11	101.7	3.6		@7.5'- Silty SAND: olive brown, dry, medium dense	
			R-4	8 9 9	96.1	8.5		@10'- Silty SAND: dusky brown, moist, medium dense	
755	15		SPT-1	2 3 7		18.2	ML	@15'- Sandy SILT: gray, wet, stiff	
750	20		R-5	10 15 17	80.8	34.5		@20'- Sandy SILT: brown, wet, very stiff	
745	25		SPT-2	5 5 9		10.8	SM	@25'- Silty SAND: rusty brown, moist, medium dense	
								Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	



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 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	TEST TYPES: 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
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Last Edited: 9/9/2021

Geotechnical Boring Log Borehole HS-4

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~767' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
765	0							@0' to 1.5' - Undocumented Artificial Fill (afu): @1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: dusky brown, dry, medium dense	
760	5	█	R-1	9 12 18	111.9	2.1	SM		
760	5	█	R-2	5 8 9	101.4	0.9		@5'- Silty SAND: gray/brown, dry, medium dense	-#200
760	10	█	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	
750	15	X	SPT-1	11 15 17		26.8	ML	@15'- Sandy SILT: olive gray, wet, hard	
745	20	█	R-5	15 19 21	116.9	10.1	SM	@20'- Silty SAND: dark olive gray, moist, dense	
740	25	X	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	



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

TEST TYPES:
 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-5

Date: 7/9/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~772' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
770	0							@0' to 1.5' - Undocumented Artificial Fill (afu):	
			R-1	6 7	112.9	4.9	SM	@1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: dark gray, slightly moist, medium dense	
765	5		R-2	8 12 15	109.3	8.1		@5'- Silty SAND: olive brown, moist, medium dense	-#200
			R-3	10 10 13	106.8	6.2	SP	@7.5'- SAND: gray/brown, slightly moist, medium dense	
760	10		R-4	9 10 15	101.9	4.7		@10'- SAND: gray/brown, slightly moist, medium dense	
755	15		SPT-1	4 4 7		16.1	SM	@15'- Silty SAND: brown, wet, medium dense	
750	20		R-5	16 18 25	95.3	26.0	ML	@20'- SILT: gray/brown, wet, hard	
745	25		SPT-2	5 8 9		12.6	SM	@25'- Silty SAND: gray/brown, moist, medium dense	
	30							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	



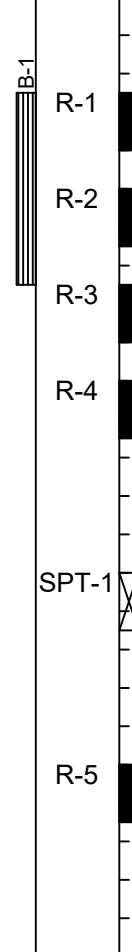
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE 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	TEST TYPES: 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
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Last Edited: 9/9/2021

Geotechnical Boring Log Borehole HS-6

Date: 7/16/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~771' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
770	0	B-1 	R-1	4 4 5	106.5	9.8	SM	<p>@0' to 2.5' - Undocumented Artificial Fill (afu): @0'- Organics: brown @2.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: dark gray, moist, loose</p> <p>@5'- No Recovery</p> <p>@7.5'- Silty SAND: olive brown, very moist, medium dense</p> <p>@10'- Silty SAND/Sandy SILT: dark olive brown, wet, medium dense, very stiff</p> <p>@15'- Silty SAND: brown, very moist, loose</p> <p>@20'- SILT: gray/brown, wet, stiff</p> <p>@25'- Silty SAND/Sandy SILT: rusty gray/brown, wet/very moist, loose/medium stiff</p>	-#200 EI MD
765	5		R-2	3 4 5					
			R-3	5 6 9	111.3	14.6			
760	10		R-4	8 10 10	110.6	20.0	SM/ML		
755	15		SPT-1	2 3 3		14.3	SM		
750	20	R-5	6 9 9	101.4	18.1				
745	25	SPT-2	2 2 3		16.4				
	30						Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021		



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 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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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

 GROUNDWATER TABLE

Geotechnical Boring Log Borehole HS-7

Date: 7/16/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~771' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
770	0		R-1	9 10 12	98.6	12.3	SP	@0' to 2.5' - Undocumented Artificial Fill (afu): @0'- Organics: brown @2.5' to T.D. - Young Eolian Deposits (Qye) @2.5'- SAND: dark gray/brown, very moist, medium dense	
			R-2	3 4 4	101.2	25.3	SM		@5'- Silty SAND: olive brown, wet, loose
	5		R-3	9 9 13	101.4	19.5		@7.5'- Silty SAND: olive brown, wet, medium dense	
			R-4	3 3 5	99.4	23.1		@10'- Silty SAND: olive brown, wet, loose	
765			SPT-1	11 7 9		22.0	SM/ML	@15'- Silty SAND/Sandy SILT: olive gray, wet, medium dense/very stiff	
	10		R-5	12 18 21	95.2	23.0	SM	@20'- Silty SAND: olive brown, wet, dense	
760			SPT-2	9 10 10		25.8	SP	@25'- SAND: gray/brown, wet, medium dense	
755	15								
750	20								
745	25								
								Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	
	30								



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

TEST TYPES:
 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

GROUNDWATER TABLE

Geotechnical Boring Log Borehole HS-8

Date: 7/16/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~768' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
765	0	B-1	R-1	4 4 5	95.0	14.4	SP	@0' to 1.5' - Undocumented Artificial Fill (afu): @0'- Silty SAND: gray, dry @1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- SAND: gray/brown, wet, loose	
760	5		R-2	5 6 9	95.7	15.7		@5'- SAND: dark gray/brown, wet, medium dense	
760	10		R-3	10 12 15	99.0	16.0		@7.5'- SAND with Gravel: dark gray/brown, wet, medium dense	
755	15		R-4	4 4 8	82.1	28.3		@10'- SAND: brown, wet, loose	
750	20		SPT-1	5 7 9		7.1		@15'- SAND: gray, moist, medium dense	
745	25		R-5	27 50/4"	110.3	2.1		@20'- SAND: gray/brown, dry, very dense	
740	30		SPT-2	12 18 26		2.3		@25'- SAND with Gravel: gray/brown, dry, very dense	
Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021									

Last Edited: 9/9/2021



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 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

TEST TYPES:
 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-9

Date: 7/16/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~767' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
765	0		R-1	3 5	101.2	1.4	SP	@0' to 1.5' - Undocumented Artificial Fill (afu): @0'- Silty SAND: gray, slightly moist @1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- SAND: gray, dry, loose	
760	5		R-2	11 9 11	93.1	4.5	SM	@5'- Silty SAND: light gray/brown, slightly moist, medium dense	
760			R-3	8 8 12	98.4	10.7	SM/ML	@7.5'- Silty SAND/Sandy SILT: dusky brown, moist, medium dense/very stiff	
755	10		R-4	9 10 15	100.4	12.4		@10'- Silty SAND/Sandy SILT: dusky brown, moist, medium dense/very stiff	
750	15		SPT-1	4 5 5		10.0	SM	@15'- Silty SAND: olive gray/brown, moist, medium dense	
745	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	
740	25		SPT-2	3 4 4		11.1	SM	@25'- Silty SAND: rusty brown, moist, medium dense	
740	30							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	



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 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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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-10


Date: 7/16/2021	Drilling Company: Choice Drilling
Project Name: Richland - Hilardes	Type of Rig: CME 75
Project Number: 21077-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~769' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to 1.5' - Undocumented Artificial Fill (afu): @0'- Silty SAND: brown, dry @1.5' to T.D. - Young Eolian Deposits (Qye): @2.5'- Silty SAND: dusky brown, slightly moist, medium dense	
765	5		R-1	5 12 15	102.7	6.8	SM		
			R-2	12 15 19	103.9	4.6		@5'- Silty SAND: dusky gray, slightly moist, medium dense	
760			R-3	8 8 12	99.4	12.5		@7.5'- Silty SAND: dusky brown, moist, medium dense	
	10		R-4	8 10 10	95.5	14.1	SM/ML	@10'- Silty SAND/Sandy SILT: dusky brown, very moist/moist, medium dense/very stiff	
755	15		SPT-1	10 7 7		21.6	ML	@15'- Sandy SILT: olive gray, wet, very stiff	
750	20		R-5	12 18 24	96.4	3.6	SP	@20'- SAND: gray/brown, dry, dense	
745	25		SPT-2	9 9 11		5.4		@25'- SAND: gray/brown, slightly moist, medium dense	
740	30							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/9/2021	



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 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	TEST TYPES: 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
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Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-1	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

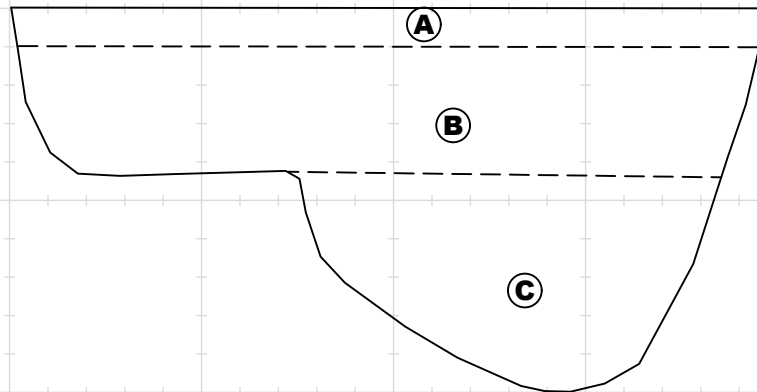
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation and roots	afu	ML	G-1 @ 0'-1'	3.4	
	B	@ 1.5' to 4.5' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 4.5' - Sandy SILT: light gray, dry, loose to medium dense, trace rootlets	Qye		G-2 @ 1'-2' G-3 @ 2'-3'	2.1 2.5	
	C	@ 4.5' to T.D. - SAND: gray, dry to slightly moist, loose/friable in some areas, "stream deposits" of slightly rounded granitic gravel, cobbles < or equal to 1" to 2" in diameter		SP	G-4 @ 3'-4' B-1 @ 5'-8'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~759' MSL


Surface Slope: 0 deg.

Trend: N 85 E



Total Depth: 10'
Groundwater: n/a
Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-2	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

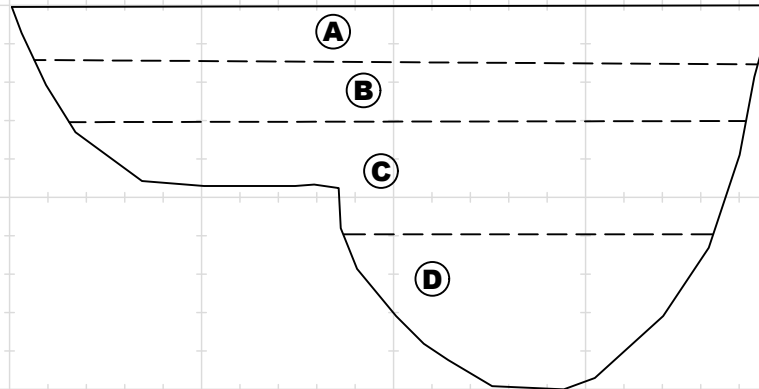
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, rootlets, dead vegetation	afu	ML	G-1 @ 0'-1'	5.0	
	B	@ 1.5' to T.D. - Quaternary Young Eolian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

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~762' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10'
Groundwater: n/a
Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-3	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

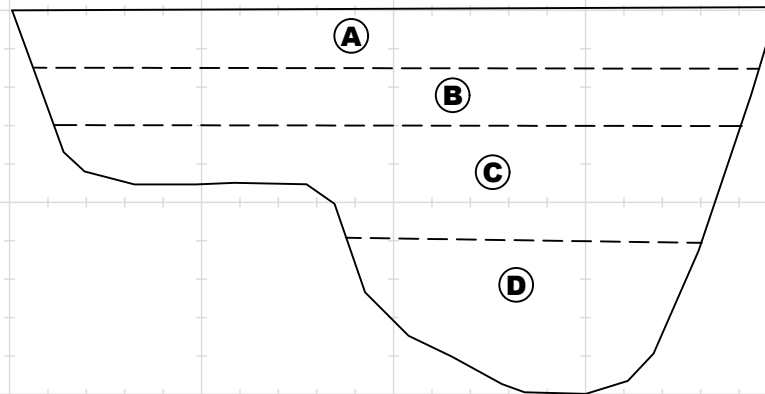
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	8.0	
		@ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets			@ 0'-1'		
	B	@ 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	3.5	
		@ 1.5' to 2.5' Sandy SILT: light gray, dry, medium dense, minor rootlets			@ 1'-2'		
	C	@ 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	G-3	19.5	
					@ 2'-3'		
	D	@ 6' to T.D. - SILT: light olive gray, slightly moist, medium dense		ML	G-4		
					@ 3'-4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~757' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 7/20/2021

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-4	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

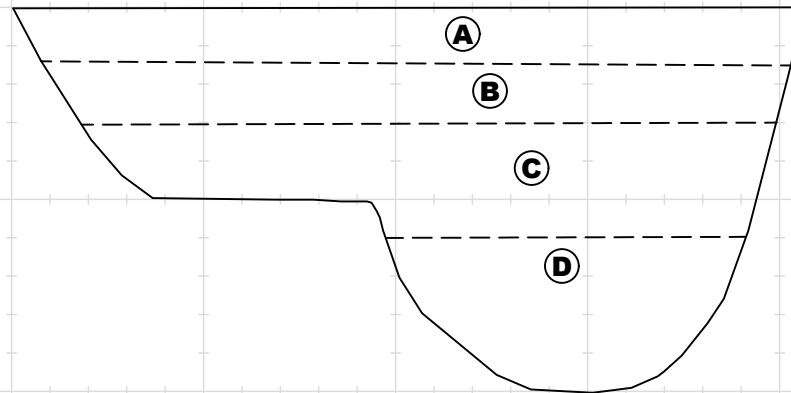
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	7.2	
	B	@ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation/rootlets			@ 0'-1'		
	B	@ 1.5' to T.D.' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	4.3	
	B	@ 1.5' to 3' Sandy SILT: light olive gray, dry, medium dense, rootlets			@ 1'-2'		
	C	@ 3' to 6' - Fine SAND: white/light gray, dry, loose		SP	G-3		
	C				@ 2'-3'		
	D	@ 6' to T.D. - SILT: gray/olive gray, slightly moist, medium dense		ML	G-4		
	D				@ 3'-4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~759' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-5	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

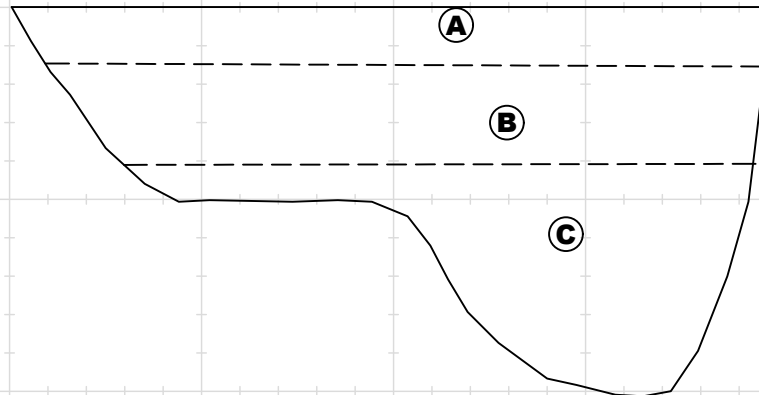
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1 @ 0'-1'	11.9	
	B	@ 0' to 1.5' Sandy SILT: light brown, dry, loose, dead vegetation/roots			G-2 @ 2'-3'	2.3	
		@ 1.5' to T.D. - Quaternary Young Eolian Deposits (Qye)	Qye	SP			
	C	@ 1.5' to 4' - Fine SAND: gray/white, loose, dry			G-3 @ 3'-4'	3.8	
		@ 4' to T.D. - SILT: white grade to a dark gray, slightly moist, meidum dense		ML			

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~755' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-6	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

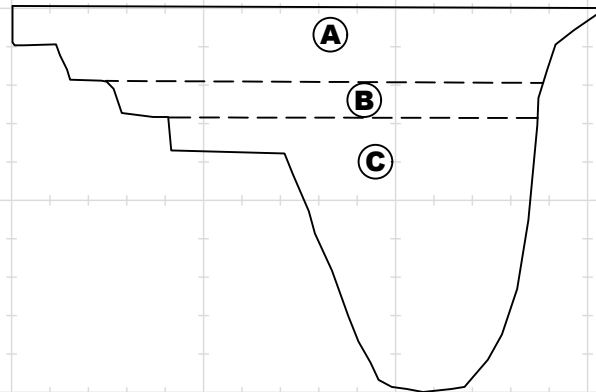
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1		
		@ 0.5' to 1' - Puffy grass followed by loose organics, looks like old manure, soil is dark brown, heavy vegetation/roots			@ 0'-1'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

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~761' MSL


Surface Slope: 0 deg.

Trend: N25E



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis		Logged By: MJG		Trench No.: TP-7			
Project Number: 21077-01		Date: 7/22/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

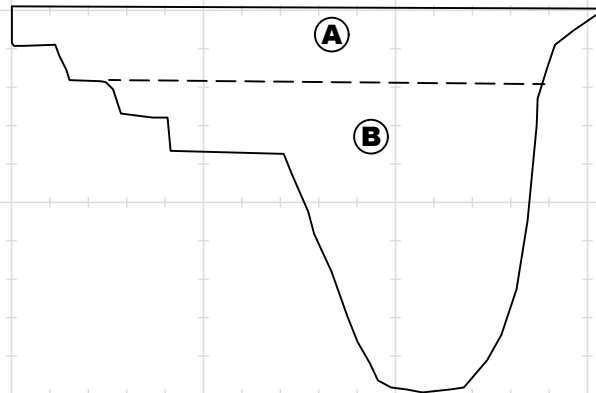
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' Cow Manure: some dark brown Silt, loose, slightly moist, some vegetation	afu	ML	G-1 @ 0'-1'	149.2	
	B	@ 1.5' to T.D. - Quaternary Young Eolian Deposits (Qye) @ 1.5' to T.D. - Sandy SILT: olive gray, moist, medium dense	Qye		G-2 @ 1'-2' G-3 @ 2'-3' G-4 @ 3'-4'	43.5 30.0	

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~759' MSL


Surface Slope: 0 deg.

Trend: N51E



Total Depth: 10'
Groundwater: n/a
Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-9	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

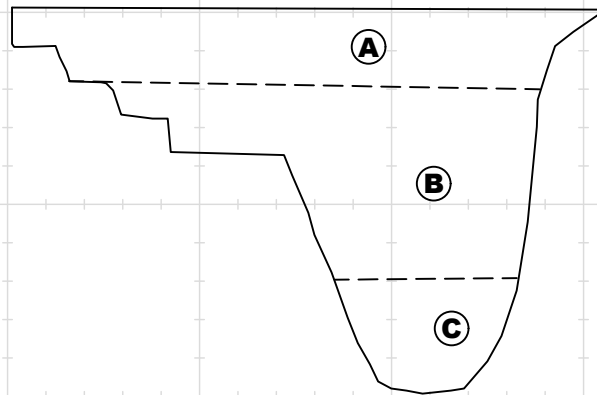
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	123.2	
		@ 0' to 1.5' - Cow Manure: some dark brown Silt, loose, very moist			@ 0'-1'		
	B	@ 1.5' to T.D. - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	32.7	
		@ 1.5' to 7' - Sandy SILT to Silty SAND - dark gray, moist grades to slightly moist at depth, medium dense			@ 1'-2'		
	C	@ 7' to T.D. - SILT (Visual Inspection): light gray/brown, slightly moist, medium dense			G-3	26.0	
					@ 2'-3'		
					G-4		
					@ 3'-4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~763' MSL


Surface Slope: 0 deg.

Trend: S70W



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richland - Hilardis	Logged By: MJG	Trench No.: TP-10	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

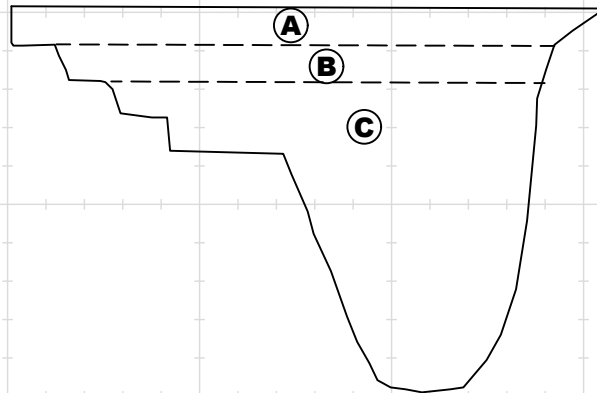
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Artificial Undocumented Fill (afu)	afu		G-1 @0-1'	114.9	
	B	@ 1' to T.D. - Quaternary Young Eolian Deposits (Qye) @ 1' to 2' - Sandy SILT: olive gray with slight brown mottle, loose, slightly moist	Qye	ML	G-2 @1-2'	30.2	
	C	@ 2' to T.D. - Sandy SILT: olive gray, slightly moist, medium dense			G-3 @2-3'	23.7	

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~761' MSL


Surface Slope: 0 deg.

Trend: N20E



Total Depth: 10'
Groundwater: n/a
Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-1	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

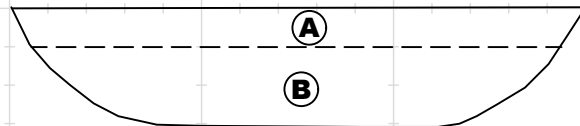
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Artificial Undocumented Fill (afu)	afu	ML	G-1	2.2	
		@ 0' to 1' - Sandy SILT: light brown, dry, loose, rootlets and dead vegetation			@ 0'-1'		
	B	@ 1' to 3' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	3.2	
		@ 1' to 3' - Sandy SILT: light olive gray/tan, loose to medium dense, trace rootlets			@ 1'-2'		
					G-3	2.4	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 762' MSL


Surface Slope: 0 deg.

Trend: N60W



Total Depth: 3'
 Groundwater: N/A
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-2	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

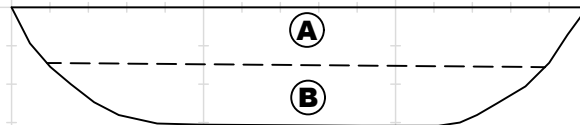
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, some dead vegetation, rootlets	afu	ML	G-1 @ 0'-1'	7.2	
	B	@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 3' - Sandy SILT: light gray/brown, dry, loose to medium dense, minor rootlets	Qye		G-2 @ 1'-2'	3.1	
					G-3 @ 2'-3'	0.6	

GRAPHICAL REPRESENTATION BELOW:

Elevation: 758' MSL


Surface Slope: 0 deg.

Trend: S80W



Total Depth: 3'
Groundwater: N/A
Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-3	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

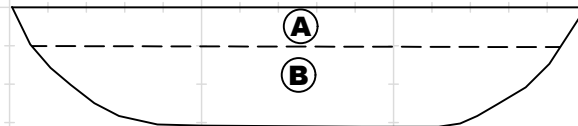
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Artificial Undocumented Fill (afu)	afu	ML	G-1	5.7	
		@ 0' to 1' - SILT with Sand: light brown, dry, loose, dead vegetations and rootlets			@ 0'-1'		
	B	@ 1' to 3' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	11	
		@ 1' to 3' - SILT: light brown, gray, slightly moist, loose to medium dense, disturbed/bioturbation			@ 1'-2'		
					G-3	12.4	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 762' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard- Hilardes	Logged By: MJG	Trench No.: OTP-4	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

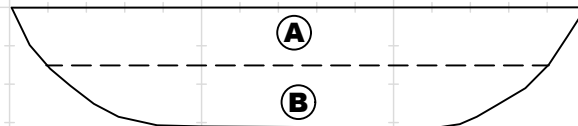
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	6.9	
		@ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation			@ 0'-1'		
		@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye)			G-2	3.9	
	B	@ 1.5' to 3' - Sandy SILT: light gray, dry, loose to medium dense	Qye		@ 1'-2'		
					G-3	1.7	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 759' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes		Logged By: MJG		Trench No.: OTP-5			
Project Number: 21077-01		Date: 7/20/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

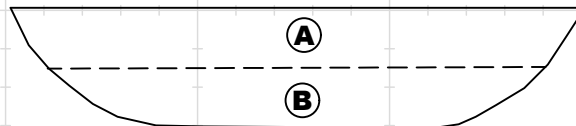
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	7.9	
		@ 0' to 1.5' - Sandy SILT: light brown, dry, loose, roots and dead vegetation, plastic trash			@ 0'-1'		
		@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	3.7	
	B	@ 1.5' to 3' - Sandy SILT: light gray, dry, medium dense, some rootlets, clean			@ 1'-2'		
					G-3	2.4	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 758' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-6	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

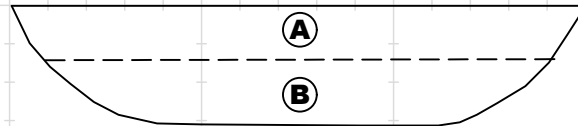
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	ML	G-1	4.9	-
		@ 0' to 1.5' - Sandy SILT: light gray to dark brown, dry, loose, dead vegetation and rootlets			@ 0'-1'		-
		@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye)			G-2	4.0	
	B	@ 1.5' to 3' - Silty SAND: light olive gray, slightly moist, medium dense	Qye		@ 1'-2'		
					G-3	6	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 755' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard- Hilardes	Logged By: MJG	Trench No.: OTP-7	
Project Number: 21077-01	Date: 7/20/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

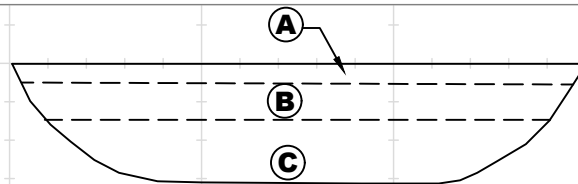
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu)	afu	SM	G-1 @0-1'	1.3	
	B	@ 0' to 0.5' - Cow Dung			G-1 @1-2'	2.2	
	C	@ 0.5' to 1.5' Silty SAND: light brown, dry, loose			G-1 @2-3'	8.9	
		@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye)	Qye				
		@ 1.5' to 3' - Silty SAND: olive gray, slightly moist, medium dense					

GRAPHICAL REPRESENTATION BELOW:

Elevation: 760' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/20/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes		Logged By: MJG		Trench No.: OTP-8			
Project Number: 21077-01		Date: 7/22/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

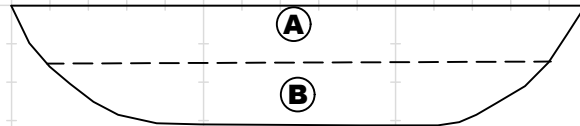
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0 to 1.5' - Artificial Undocumented Fill (afu) @ 0 to 1.5' - Organics grading into Silty SAND: light gray/brown, cow manure and dead vegetation	afu	ML	G-1 @ 0'-1'	18.3	
	B	@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 3' - Sandy SILT: gray, dry, medium dense	Qye		G-2 @ 1'-2'	14.2	
					G-3 @ 2'-3'	7.8	

GRAPHICAL REPRESENTATION BELOW:

Elevation: 762' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 3'
Groundwater: n/a
Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes		Logged By: MJG		Trench No.: OTP-9		
Project Number: 21077-01		Date: 7/22/2021		Engineering Properties:		
Equipment: Backhoe		Location: See Geotechnical Map				

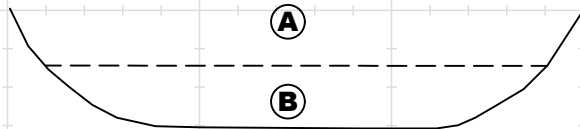
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1.5' - Artificial Undocumented Fill (afu) @ 0' to 1.5' - Sandy SILT: light brown, dry, loose, dead vegetation and rootlets	afu	SM	G-1 @ 0'-1'	3.2	
	B	@ 1.5' to 3' - Quaternary Young Eolian Deposits (Qye) @ 1.5' to 3' - Silty SAND to SILT: light gray, dry, medium dense	Qye		G-2 @ 1'-2'	2.8	
					G-3 @ 2'-3'	3.0	

GRAPHICAL REPRESENTATION BELOW:

Elevation: 757' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 3'
Groundwater: n/a
Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-10	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

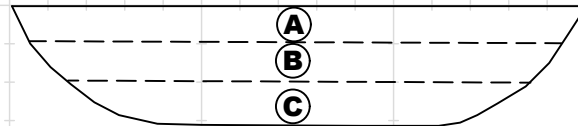
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Artificial Undocumented Fill (afu)	afu	ML	G-1 @ 0'-1'	71.9	
	B	@ 0' to 1' - SILT: brown, loose, slightly moist, very high organics (cow manure) content			G-2 @ 1'-2'	33.8	
	C	@ 1' to 2' Sandy SILT: light brown, slightly moist, medium dense to loose		SM	G-3 @ 2'-3'	11.0	
		@ 2' to 3' - Quaternary Young Eolian Deposits (Qye)	Qye		B-1 @ 1'-3'		
		@ 2' to 3' - Silty SAND: olive gray, slightly moist, medium dense to loose					

GRAPHICAL REPRESENTATION BELOW:

Elevation: 760' MSL


Surface Slope: 0 deg.

Trend: S70E



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-11	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

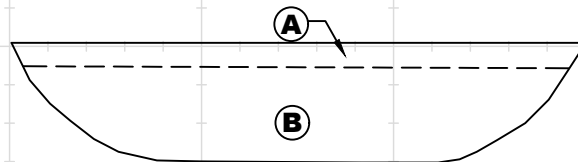
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 0.5' - Artificial Undocumented Fill (afu) @ 0' to 0.5' - Silty SAND with Organics: light brown to gray, dry, loose, dead vegetation and cow manure	afu	SM	G-1 @ 0'-1'	4.0	
	B	@ 0.5' to 3' - Quaternary Young Eolian Deposits (Qye) @ 0.5' to 3' - Silty SAND: gray, dry, medium dense, clean overall, trace rootlets	Qye		G-2 @ 1'-2'	4.4	
					G-3 @ 2'-3'	2.6	

GRAPHICAL REPRESENTATION BELOW:

Elevation: 760' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 3'
Groundwater: n/a
Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes	Logged By: MJG	Trench No.: OTP-12	
Project Number: 21077-01	Date: 7/22/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

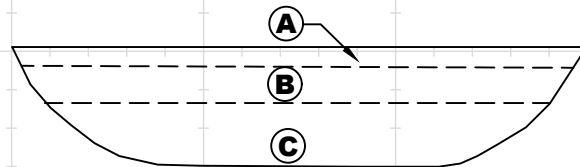
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 1' - Artificial Undocumented Fill (afu)	afu		G-1	90.5	
		@ 0' to 1' - Cow Manure (Organics): loose, slightly moist, some dead vegetation and roots			@ 0'-1'		
	B	@ 1' to 2' - Quaternary Young Eolian Deposits (Qye)	Qye		G-2	26.6	
		@ 1' to 2' - Sandy SILT: light brown/gray, slightly moist, medium dense to loose, roots		SM	@ 1'-2'		
	C	@ 2' to 3' - SILT: olive gray, slightly moist, medium dense		ML	G-3	28.5	
					@ 2'-3'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 761' MSL


Surface Slope: 0 deg.

Trend: N65E



Total Depth: 3'
 Groundwater: n/a
 Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Richard - Hilardes		Logged By: MJG		Trench No.: OTP-13		
Project Number: 21077-01		Date: 7/22/2021		Engineering Properties:		
Equipment: Backhoe		Location: See Geotechnical Map				

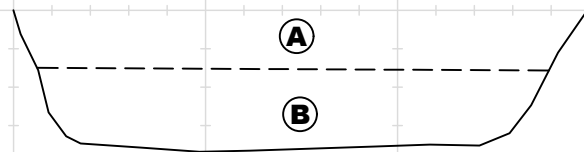
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0 to 1.5' Artificial Undocumented Fill (afu)	afu	SM	G-1	1.4	
	B	@ 0 to 1.5' Silty SAND with Gravel - light gray/brown, dry, medium dense			G-2		
		@ 1.5' to 3.5' - Quaternary Young Eolian Deposits (Qye)	Qye		G-3	5.2	
		@ 1.5' to 3.5' - Silty SAND: light gray, dry to slightly moist, clean overall			@ 2'-3'	4.6	

GRAPHICAL REPRESENTATION BELOW:

Elevation: 762' MSL


Surface Slope: 0 deg.

Trend: N05W



Total Depth: 3.5'
 Groundwater: n/a
 Backfilled: 7/22/21

scale: 1 in = 5 ft

Project Name: Hilardes		Logged By: MJG	Trench No.: TP-1B	
Project Number: 21077-01		Date: 10/7/2021		
Equipment: Backhoe		Location: See Geotechnical Map		

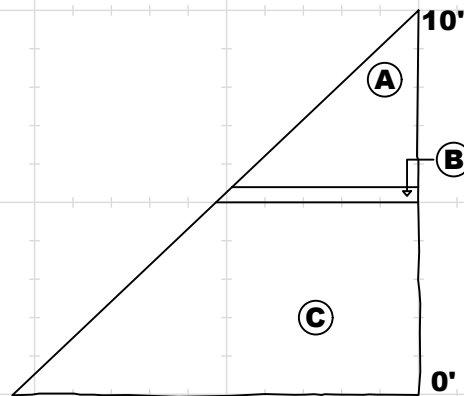
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 10' to 0' - <u>Artificial Fill (Af)</u>	Af				
	C	@ 10' to 6.5' - Silty SAND: light gray, some gravel, 0' is approximate ground surface, 10' is approximate top of stockpile		SM	G-1 @ 8-7'		
	B	@ 6.5' to 5' - Manure/mulch decayed organics, dark brown, woodchips, hay & gravel		OL			
	A	@ 5' to 0' - Silty SAND: gray overall, slightly moist to dry, loose, misc gravel, woodchips & trash, gray to light brown		SM	G-2 @ 5-4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~780' MSL


Surface Slope: 35 deg.

Trend: N22E



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 10/7/21

scale: 1in = 5 ft

Project Name: Hilardes		Logged By: MJG		Trench No.: TP-2B			
Project Number: 21077-01		Date: 10/7/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

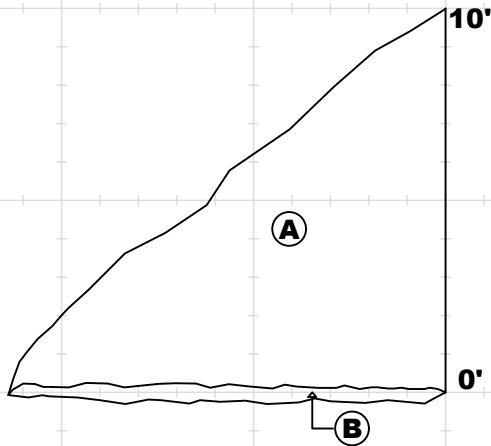
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 10' to 0' - <u>Artificial Fill (Af)</u>	Af				
	A	@ 10' to 0' - SAND: yellow-light brown, dry, loose, gravel		SP	G-1 @ 6-5'		
	B	@ 0' - Sandy SILT: light brown/gray, traces of manure, dry, loose		SM	G-2 @ 0'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~775' MSL


Surface Slope: 35 deg.

Trend: N85E



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 10/7/21

scale: 1 in = 5 ft

Project Name: Hilardes		Logged By: MJG		Trench No.: TP-3B			
Project Number: 21077-01		Date: 10/7/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

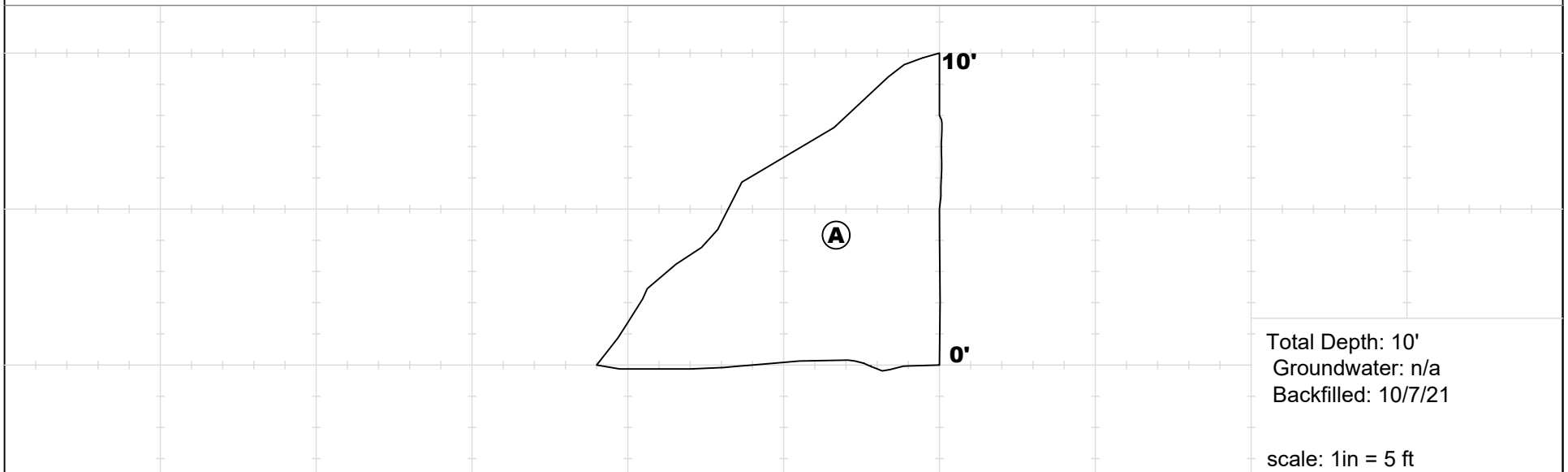
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 10' to 0' - <u>Artificial Fill (Af)</u> @ 10' to 0' - Mixed Silty SAND (dark brown) & Clay (dark gray to light gray) slightly moist overall, gravel throughout	Af	SM	G-1 @ 6-5' G-2 @ 3-2' G-3 @ 0'		


GRAPHICAL REPRESENTATION BELOW:

Elevation: ~780' MSL

Surface Slope: 35 deg.

Trend: S20W



Project Name: Hilardes	Logged By: MJG	Trench No.: TP-4B	
Project Number: 21077-01	Date: 10/7/2021	Engineering Properties:	
Equipment: Backhoe	Location: See Geotechnical Map		

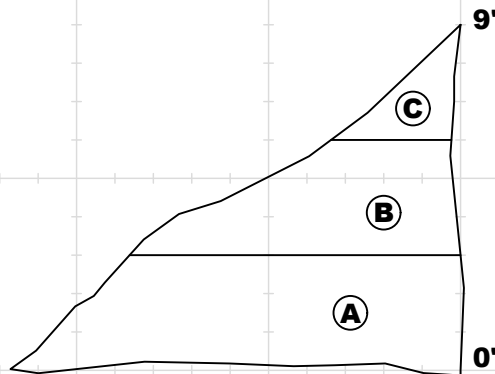
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 9' to 0' - <u>Artificial Fill (Af)</u>	Af				
	C	@ 9' to 6' - CLAY: dark brown, ground surface		CL	G-1 @ 6-5'		
	B	@ 6' to 3' - SILT: gray, slightly moist, layer of pure silt		ML			
	A	@ 3' to 0' - Silty SAND: Grades (top to bottom) gray, gray brown, red brown, slightly moist to dry		SM	G-2 @ 3-2' G-3 @ 0'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~775' MSL


Surface Slope: 45 deg.

Trend: N85E



Total Depth: 9'
Groundwater: n/a
Backfilled: 10/7/21

scale: 1 in = 5 ft

Project Name: Hilardes		Logged By: MJG	Trench No.: TP-5B	
Project Number: 21077-01		Date: 10/7/2021	Engineering Properties: 	
Equipment: Backhoe		Location: See Geotechnical Map		

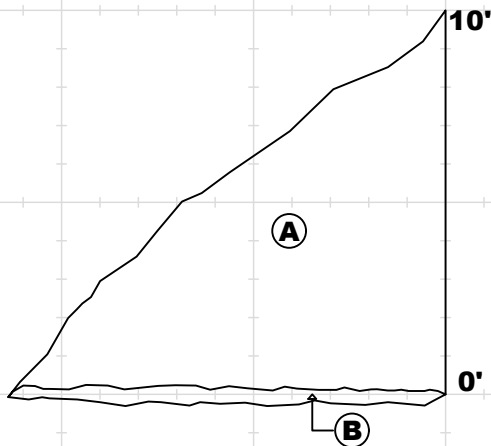
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 10' to 0' - <u>Artificial Fill (Af)</u>	Af				
	A	@ 10' to 0' - Pure cow manure		OL	G-1 @ 0'		
	B	@ 0' - SILT: gray, moist, directly below manure pile		ML			

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~780' MSL


Surface Slope: 45 deg.

Trend: N5W



Total Depth: 10'
 Groundwater: n/a
 Backfilled: 10/7/21

scale: 1 in = 5 ft

Project Name: Hilardes		Logged By: MJG		Trench No.: TP-6B			
Project Number: 21077-01		Date: 10/7/2021		Engineering Properties:			
Equipment: Backhoe		Location: See Geotechnical Map					

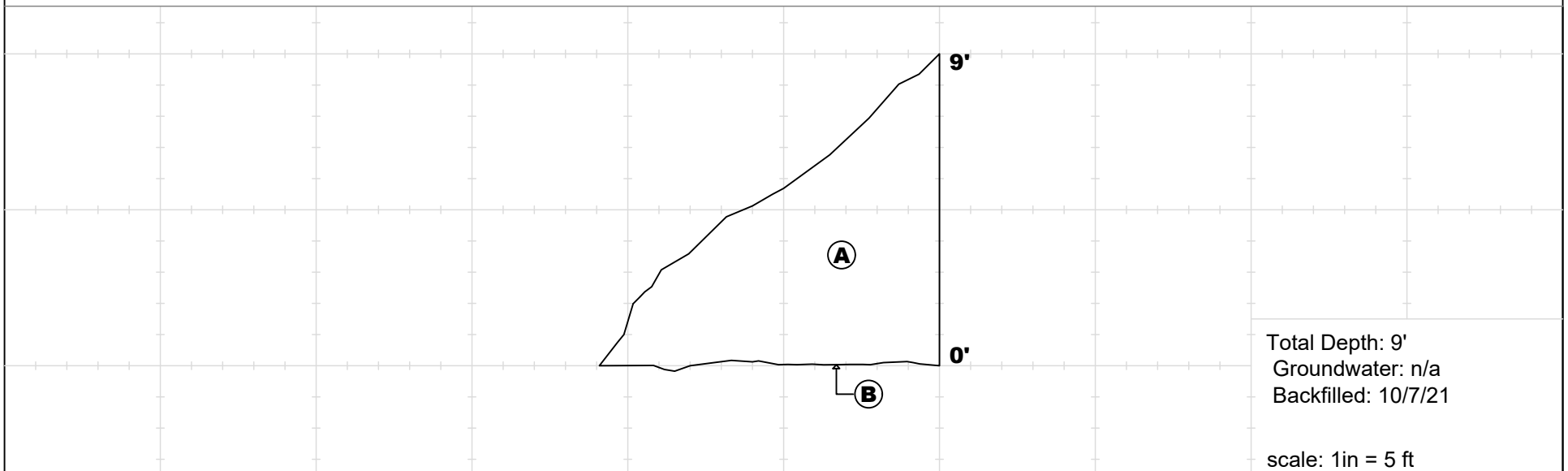
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 9' to 0' - <u>Artificial Fill (Af)</u>	Af				
	A	@ 9' to 0' - Silty SAND: tan overall, some gray & brown patches, dry, loose		SM	G-1 @ 5-4'		
	B	@ 0' - Silty SAND, light gray, dry, below stockpile			G-2 @ 0'		


GRAPHICAL REPRESENTATION BELOW:

Elevation: ~775' MSL

Surface Slope: 35 deg.

Trend: E-W



Project Name: Hilardes		Logged By: MJG	Trench No.: TP-7B	
Project Number: 21077-01		Date: 10/7/2021		
Equipment: Backhoes		Location: See Geotechnical Map		

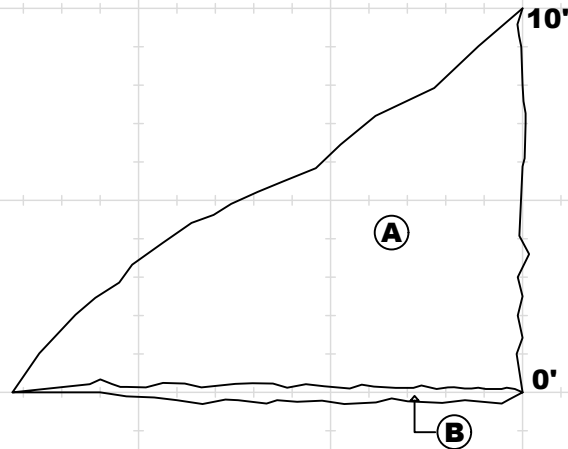
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		@ 10' to 0' - <u>Artificial Fill (Af)</u>	Af				
	A	@ 10' to 0' - Silty SAND with gravel: light tan overall with some gray patches & brown patches		SM	G-1@ 6-5'		
	B	@ 0' - SILT: gray, dry, below stockpile		ML	G-2@ 3-2'		
					G-3@ 0'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: ~780' MSL

Surface Slope: 35 deg.

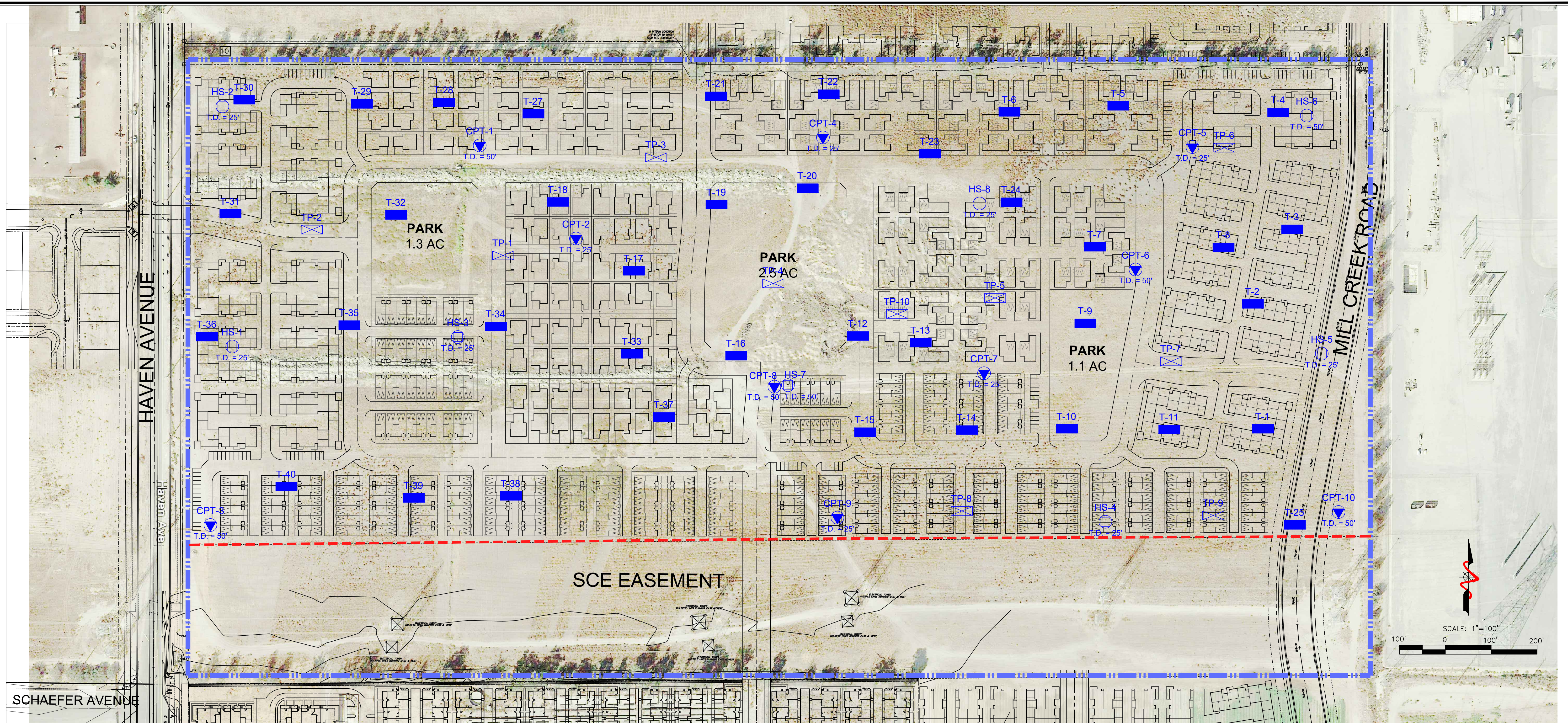
Trend: S65E



Total Depth: 10'
Groundwater: n/a
Backfilled: 10/7/21

scale: 1 in = 5 ft

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



LEGEND

- HS-8
○
T.D. = 50'

CPT-10
●
T.D. = 50'

TP-10
⊠
- T-39
■

⏏
- 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

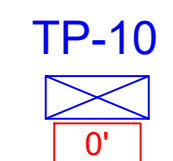
CLIENT:
 Richland Communities, Inc.
 3161 Michelson Drive, Suite 425
 Irvine, CA 92626

PROJECT NAME	Richland - VanderEyck
PROJECT NO.	17074-01
ENG. / GEOL.	RLD/KTM
SCALE	1" = 100'
DATE	August 2017

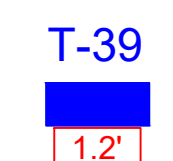
SHEET
1 of 2



LEGEND



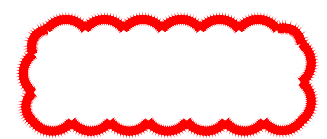
Approximate Location of Geotechnical Trenches with Estimated Minimum Depth of Manure to be Removed, in Feet



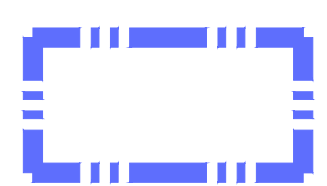
Approximate Location of Trenches with Estimated Minimum Depth of Manure to be Removed, in Feet



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
SCALE	1" = 100'
DATE	August 2017

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.

Grain Size Distribution/Fines Content: 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

Consolidation: 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.

Collapse/Swell Potential: 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.

Direct Shear: 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.

Maximum Density Tests: 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

Expansion Index: 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

* Per ASTM D4829

Soluble Sulfates: 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

Chloride Content: Chloride content was tested per CTM 422. The results are presented below.

Sample Location	Chloride Content, ppm
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	pH	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
TP-5 (0.8')*		TP-6 (1')*		TP-7 (1')		TP-8 (1.2')	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	9.8	0.8'	15.8	0.8'	13.7	0.8'	10.8
1.2'	0.6	1.2'	0.6	1.2'	0.9	1.2'	3.9
2'	0.5	2.2'	0.6	2.2'	0.4	2.2'	0.9
TP-9 (0')*		TP-10 (0')*		T-1 (1.2')*		T-2 (1.5')*	
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
T-3 (1')*		T-4 (1')*		T-5 (1.2')*		T-6 (0.8')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	11.4	1'	20.7	0.8'	6.8	0.8'	9.4
1.2'	1.3	1.5'	1.4	1.5'	0.3	1.5'	0.7
2.2'	0.8	2.5'	0.5			2.5'	0.5
T-7 (1')*		T-8 (0.8')*		T-9 (1')*		T-10 (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			2.5'	0.3	2.0	1.1
T-11 (0.8')*		T-12 (0')*		T-13 (0')*		T-14 (1.5')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	13.3	0.5'	0.7	0.5'	0.7	1'	9.3
1.2'	1.1	1.2'	0.4	1'	0.5	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')*		T-17 (0.8')*		T-18 (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			2'	0.6	2'	0.5
T-19 (1.5')*		T-20 (0.5')*		T-21 (0.8')*		T-22 (1')*	
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
T-23 (1')*		T-24 (1')*		T-25 (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
		2'	0.7			2'	0.7
T-28 (0.8')*		T-29 (0')*		T-30 (0')*		T-31 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	5.8	0.5'	2.1	0.5'	0.2	0.8'	2.6
1.2'	0.6	1'	0.6	1.2'	0.5	1.2'	1.1
		1.5'	0.3			2'	0.3
T-32 (0')*		T-33 (0.8')*		T-34 (1')*		T-35 (0')*	
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
T-36 (0')*		T-37 (1.2')*		T-38 (1.5')*		T-39 (1.2')*	
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'	3.5	1.5'	0.8	1.5'	1.0
		2'	0.7			2'	1.4
T-40 (1')*		Legend					
Depth (ft)	% Organics	> 5%		Recommended for Offsite Removal			
1'	13.1	2 to 5%		Recommended for Mixing/Blending with "Clean" Soils			
1.2'	1.1	< 2%		"Clean" Soils			
Note: (#)*)* Indicates Recommended Organic Removal Depth in Feet.							
		Table 5 Summary of Measured Organic Content vs Depth of Sample		Project Name		Richland - VanderEyk	
				Project Number		17074-01	
				ENG./GEOL.		RLD/KTM	
				Date		Aug-17	

Geotechnical Boring Log Borehole HS-1

Date: 7/5/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	8 9	106.6	4.5	SP	@0' to T.D. Quaternary Young Eolian Deposits (Qye): @2.5' SAND: light brown, slightly moist, medium dense	
750	5		SPT-1	6 8 11		3.5	SM	@5' Silty SAND: grayish brown, slightly moist, medium dense	
			R-2	6 10 14	103.9	3.3	SP	@7.5' SAND: grayish brown, slightly moist, medium dense	
745	10		SPT-2	3 5 6		8.3	SM	@10' Silty Fine SAND: light brown, moist, medium dense	
740	15		R-3	5 7 16	105.1	14.6	ML	@15' Sandy SILT: light brown, moist, stiff	
735	20		SPT-3	5 6 7		9.4	SM	@20' Silty Fine SAND: olive gray, moist, medium dense	
730	25		R-4	8 16 20	113.7	5.3		@25' Silty SAND: light brown, slightly moist, dense	
	30							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017	



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 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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-2

Date: 7/5/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By SHH Sampled By SHH Checked By RLD	
								DESCRIPTION	
								@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
755	0	B-1	R-1	3 8	107.0	5.5	SP	@2.5' SAND with Gravel: brown, slightly moist, medium dense	
	5		SPT-1	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									
								Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017	
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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-3

Date: 7/5/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By SHH Sampled By SHH Checked By RLD	
								DESCRIPTION	
								@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
755	0	B-1	R-1	6 8	103.8	2.7	SP	@2.5' SAND: dark brown, dry, medium dense	MD EI CR
	5		SPT-1	2 2 2		3.9	SP-SM	@5' SAND with Silt: olive brown, slightly moist, loose	
750			R-2	5 6 7	108.3	6.5	SM	@7.5' Silty SAND: dusky gray, slightly moist, medium dense	CO #200
	10		SPT-2	3 3 3		11.3	ML	@10' Sandy SILT: light brown, moist, medium stiff	
745									
	15		R-3	10 7 10	106.5	6.6	SM	@15' Silty SAND: light brown, slightly moist, medium dense	
740									
	20		SPT-3	3 6 8		4.7		@20' Silty SAND with Gravel: light brown to gray, slightly moist, medium dense	
735									
	25		R-4	10 13 21	100.2	2.2	SP	@25' SAND: gray, dry, medium dense	
730								Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017	
	30								

	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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-4

Date: 7/5/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1 	SPT-1	3 5		2.9	SP	@0' to T.D. Quaternary Young Eolian Deposits (Qye): @2.5' SAND: grayish brown, dry, loose	MD EI CR SA CO
750	5		R-1	6 7 9	105.3	5.8	SM	@5' Silty SAND: light olive brown, slightly moist, medium dense	
			SPT-2	4 5		7.0		@7.5' Silty fine SAND: olive brown, slightly moist, loose	
745	10		R-2	5 7 11	104.2	12.5		@10' Silty SAND: olive brown, moist, medium dense	
740	15		SPT-3	4 5 6		7.9		@15' Silty SAND: grayish brown, slightly moist, medium dense	
735	20	R-3	14 16 12	104.5	0.7	SP	@20' SAND: brown, dry, medium dense		
730	25	SPT-4	7 7 11		20.7	SM	@25' Silty SAND: olive gray, very moist, medium dense		
	30						Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017		



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 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

TEST TYPES:
 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-5

Date: 7/5/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test	
755	0							@0' to T.D. Quaternary Young Eolian Deposits (Qye):		
			SPT-1	3 3 4		3.5	SP-SM	@2.5' SAND with Silt: olive brown, slightly moist, loose		
750	5		R-1	4 6 8	107.2	4.6	SP	@5' SAND with Gravel: brown, slightly moist, medium dense		
			SPT-2	4 7 8		3.7		@7.5' SAND: brown, slightly moist, medium dense		
745	10		R-2	8 12 12	109.6	3.0	SM	@10' Silty SAND: brown, dry, medium dense		
740	15		SPT-3	5 5 9		5.1	SP-SM	@15' SAND with Silt: brown, slightly moist, medium dense		
735	20		R-3	12 19 21	104.8	1.1	SP	@20' SAND with Gravel: light brown, dry, dense		
730	25		SPT-4	4 5 7		12.9	SM	@25' Silty SAND: olive gray, moist, medium dense		
									Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/5/2017	



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 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	TEST TYPES: 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
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Last Edited: 7/12/2017

Geotechnical Boring Log Borehole HS-6

Date: 7/6/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	5 3 1	103.0	6.9	SP	@2.5' SAND: dark brown, slightly moist, very loose	EI
750	5		SPT-1	2 4 4		5.2	SP-SM	@5' SAND with Silt: brown, slightly moist, loose	
			R-2	6 7 9	102.7	4.5		@7.5' SAND with Silt: brown, slightly moist, medium dense	
745	10		SPT-2	3 4 5		9.4	SP	@10' SAND: brown, moist, loose	
740	15		R-3	3 8 20	100.6	3.9		@15' SAND with Gravel: brown to grayish brown, slightly moist, medium dense	
735	20		SPT-3	4 8 10		5.5		@20' SAND: light brown, slightly moist, medium dense	
730	25		R-4	7 9 13	111.4	9.4	ML	@25' Sandy SILT: mottled gray and brown, slightly moist, stiff	
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-6

Date: 7/6/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	30		SPT-4	6 8		14.6	SM	@30' Silty SAND: olive brown, moist, medium dense	
720	35		R-5	8 10 23	114.5	14.3		@35' Silty SAND: dark brown, moist, medium dense	
715	40		SPT-5	12 17 14		5.2		@40' Silty SAND: light brown, slightly moist, dense	
710	45		R-6	5 10 14	100.7	21.0		@45' Silty SAND: light brown, very moist, medium dense	
705	50		SPT-6	5 9 13		23.2	ML	@50' Sandy SILT: olive brown, very moist, very stiff	
								Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 7/6/2017	
	55								
	700								
	60								



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

TEST TYPES:
 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-7

Date: 7/6/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1 	R-1	10 8 11	109.2	11.6	SM	@0' to T.D. Quaternary Young Eolian Deposits (Qye): @2.5' Silty SAND: olive brown, moist, medium dense	CN AL
750	5		SPT-1	4 4 7		2.8	SP	@5' SAND: grayish brown, dry, medium dense	
			R-2	7 11 15	99.1	2.1		@7.5' SAND: grayish brown, dry, medium dense	
745	10		SPT-2	7 8 8		3.8		@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		
735	20	SPT-3	3 5 5		9.6	SM	@20' Silty SAND: olive brown, moist, loose		
730	25	R-4	8 8 12	102.1	21.4	ML	@25' Sandy SILT: dark brown, very moist, stiff		
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-7

Date: 7/6/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	30		SPT-4	4 5 6		14.3	SM	@30' Silty SAND: orange brown, moist, medium dense	
720	35		R-5	15 26 34	108.0	3.9	SP	@35' SAND: orangish brown, slightly moist, very dense	
715	40		SPT-5	10 15 20		3.4		@40' SAND with Gravel: brown, slightly moist, dense	
710	45		R-6	15 23 33	106.0	3.8		@45' SAND: light brown, slightly moist, dense	
705	50		SPT-6	14 17 15	115.9	6.9		@50' SAND: orangish brown, slightly moist, dense	
								Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 7/6/2017	
700	55								
	60								



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

TEST TYPES:
 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-8

Date: 7/6/2017	Drilling Company: Cal Pac
Project Name: VanderEyk	Type of Rig: Limited Access Tracked Rig
Project Number: 17074-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~756' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1 	SPT-1	4 6 8		2.6	SP	@0' to T.D. Quaternary Young Eolian Deposits (Qye): @2.5' SAND: grayish brown, dry, medium dense	
750	5		R-1	4 4 6	103.4	5.5	ML	@5' SILT with Sand: olive brown, slightly moist, stiff	DS
			SPT-2	2 3 4		8.4	SM	@7.5' Silty SAND: olive brown, moist, loose	
745	10		R-2	4 6 7	95.7	5.0	ML	@10' Sandy SILT: olive brown, slightly moist, stiff	CO #200
740	15		SPT-3	3 5 6		8.6		@15' Sandy SILT: light brown, slightly moist, stiff	
735	20	R-3	6 11 17	98.9	4.2	SM	@20' Silty SAND: light brown, slightly moist, medium dense		
730	25	SPT-4	4 6 7		6.9		@25' Silty SAND: light brown, slightly moist, medium dense		
	30						Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 7/6/2017		



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 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	TEST TYPES: 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
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Last Edited: 7/12/2017

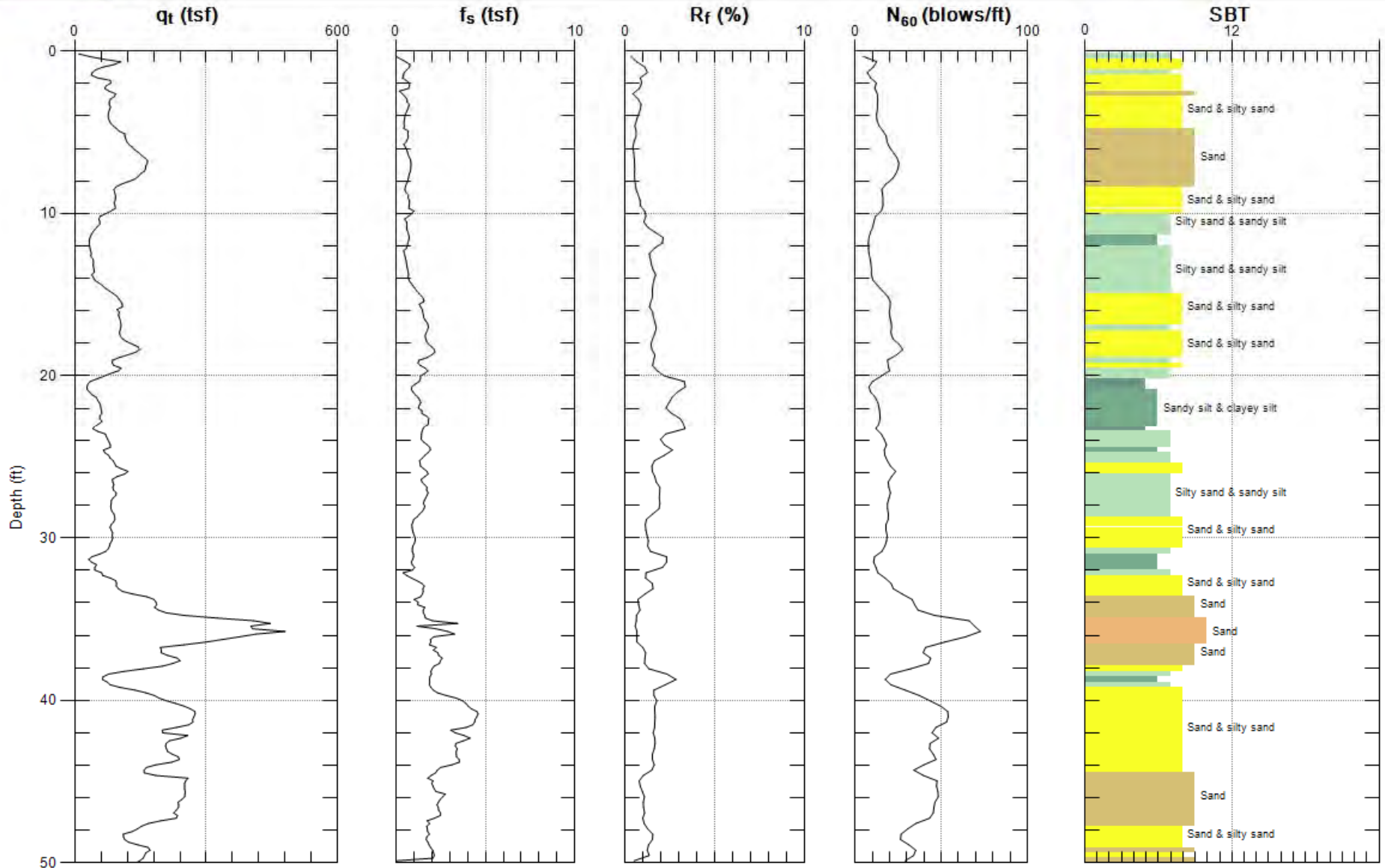


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-1

Date: 7/5/17 12:24



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

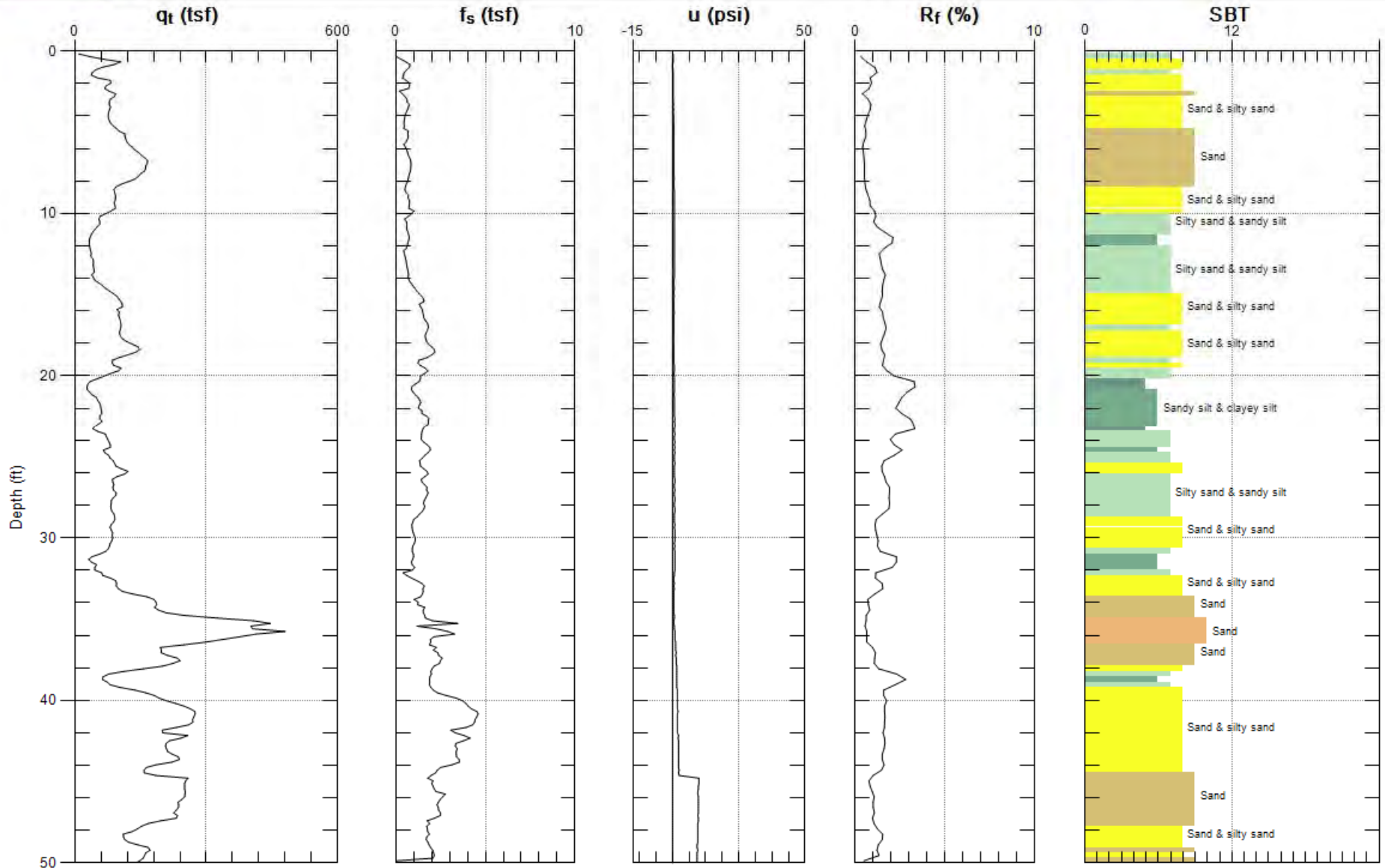


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-1

Date: 7/5/17 12:24



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

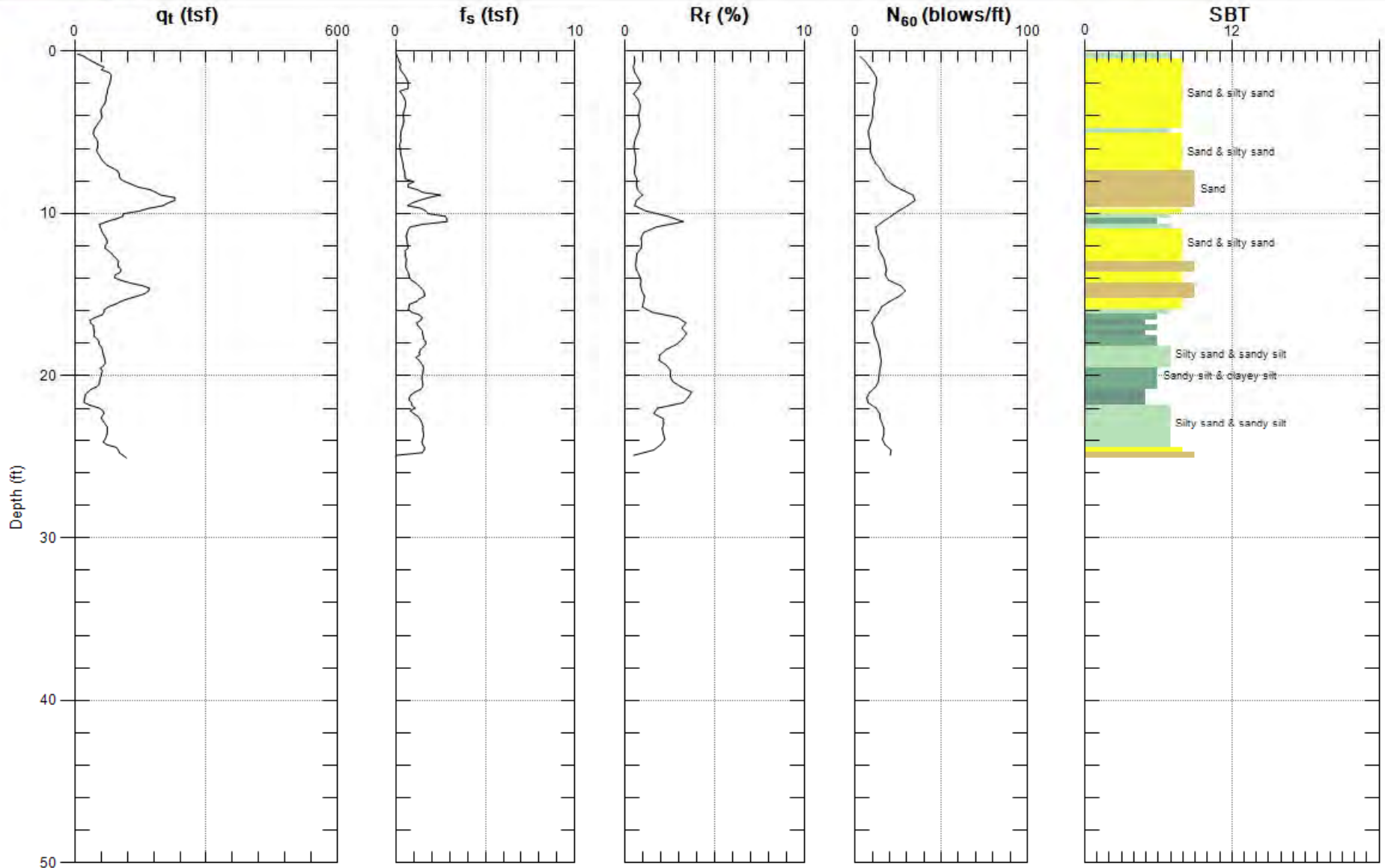


LGC GEOTECHNICAL

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)

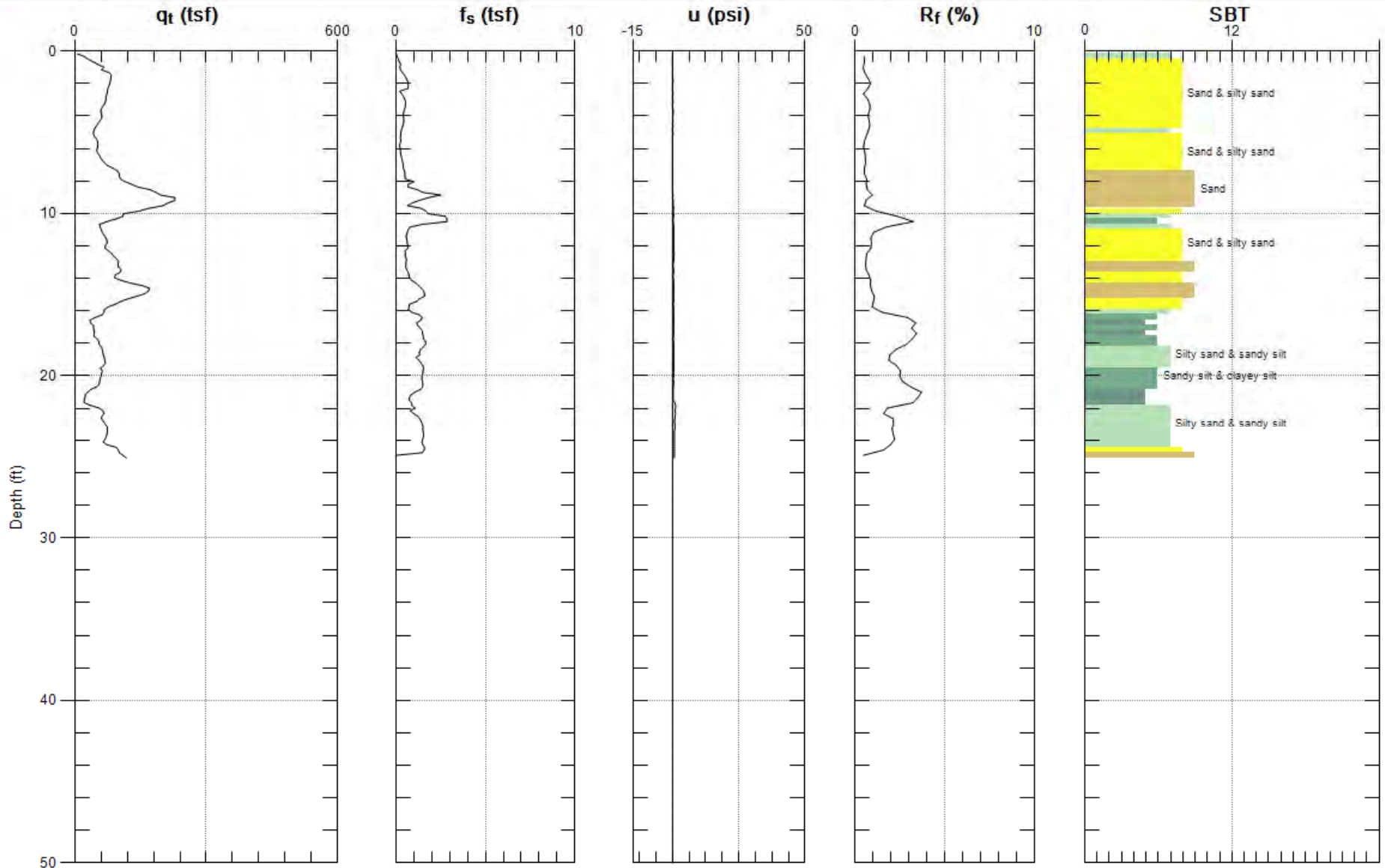


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-2

Date: 7/5/17 11:14



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

SBT: Soil Behavior Type (Robertson 1990)

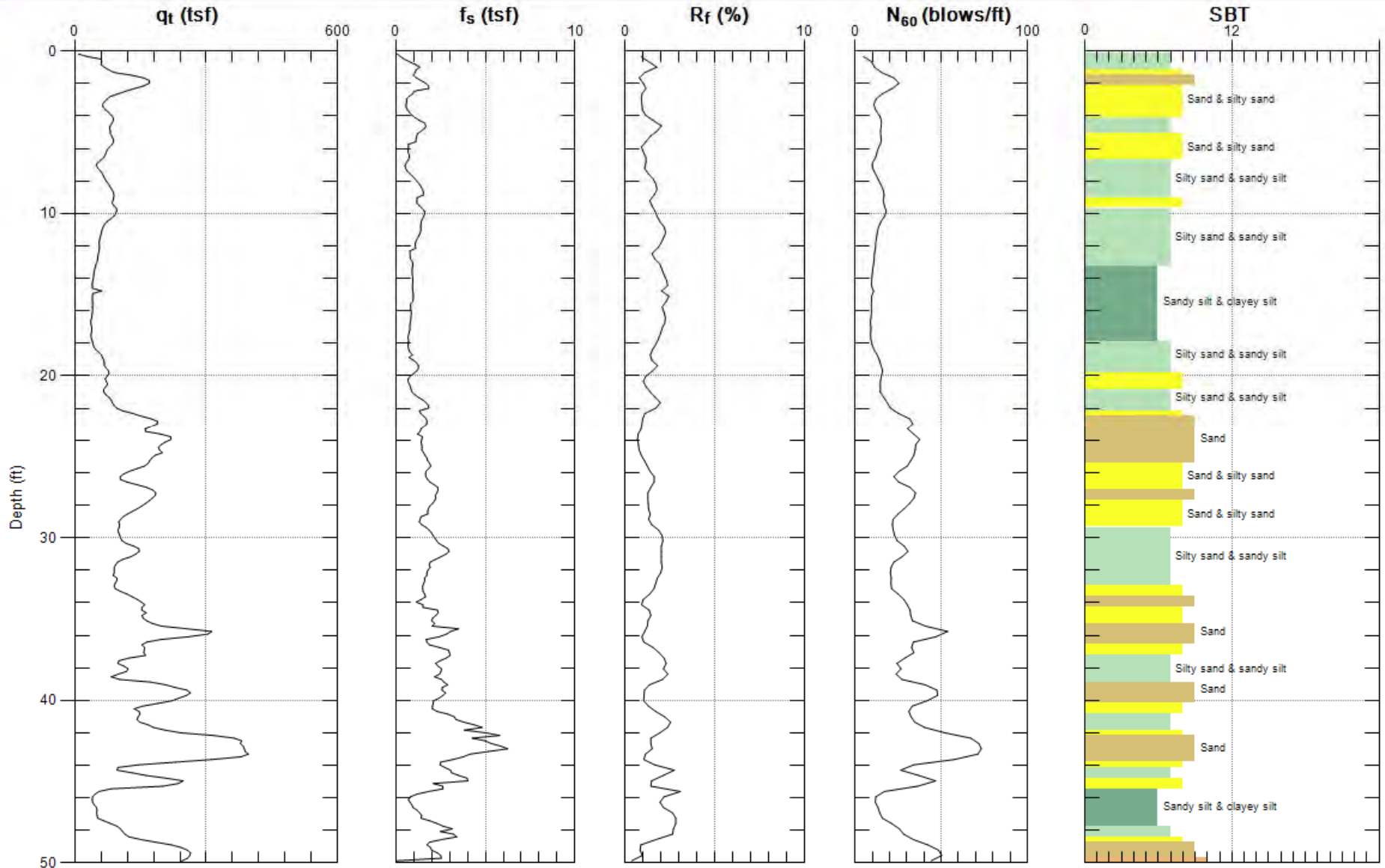


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-3

Date: 7/5/17 01:10



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

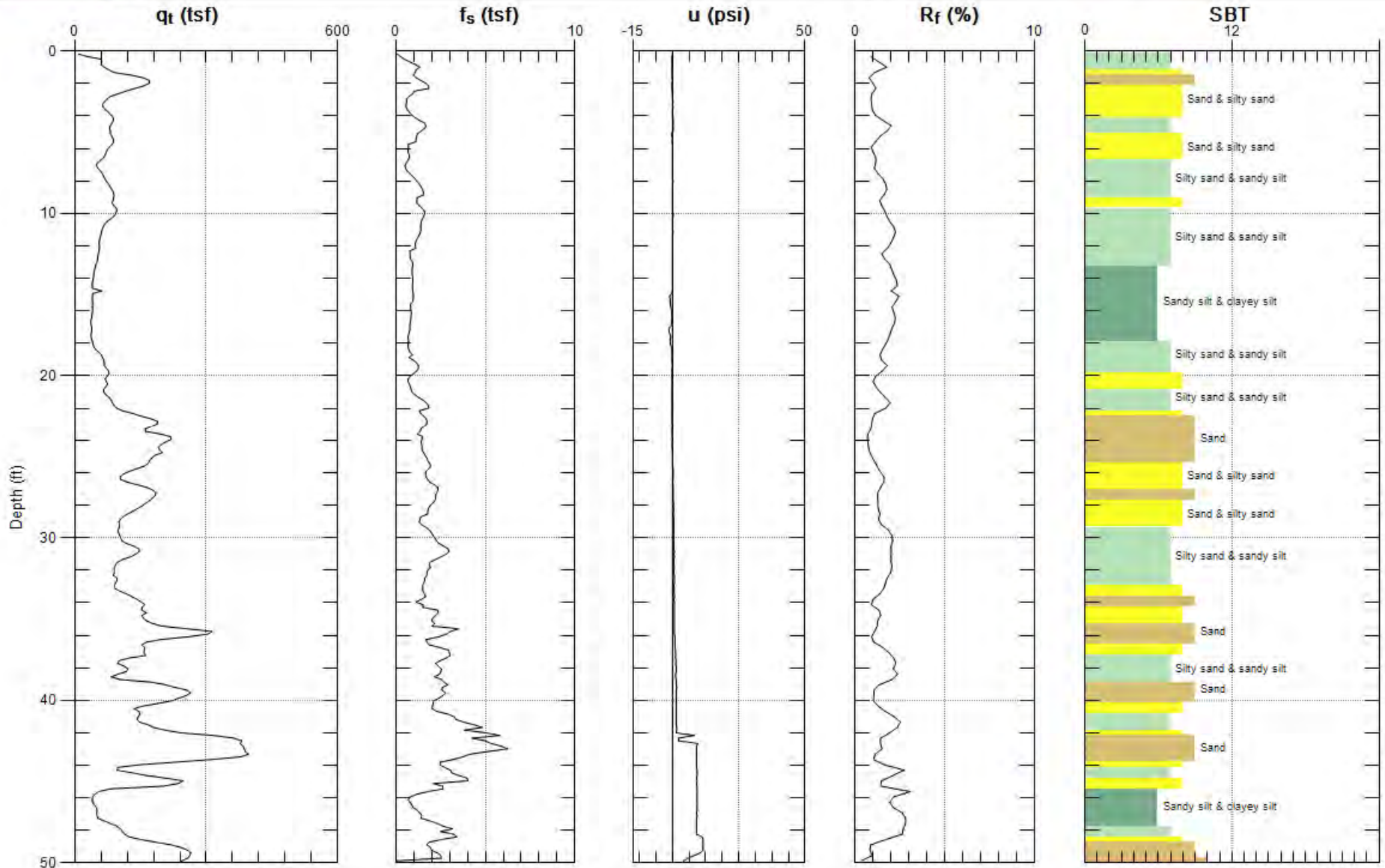


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-3

Date: 7/5/17 01:10



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

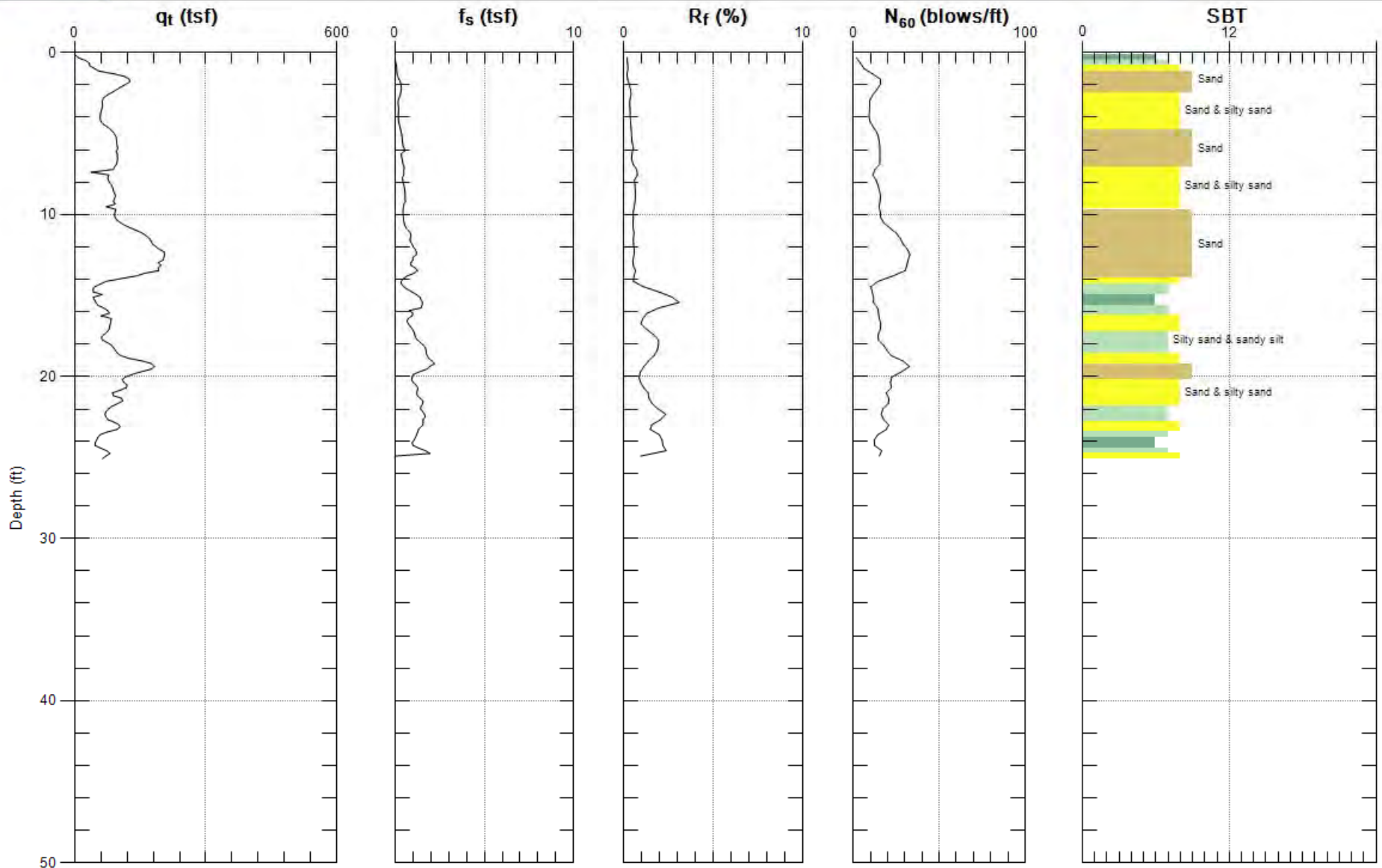


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-4

Date: 7/5/17 11:59



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

SBT: Soil Behavior Type (Robertson 1990)

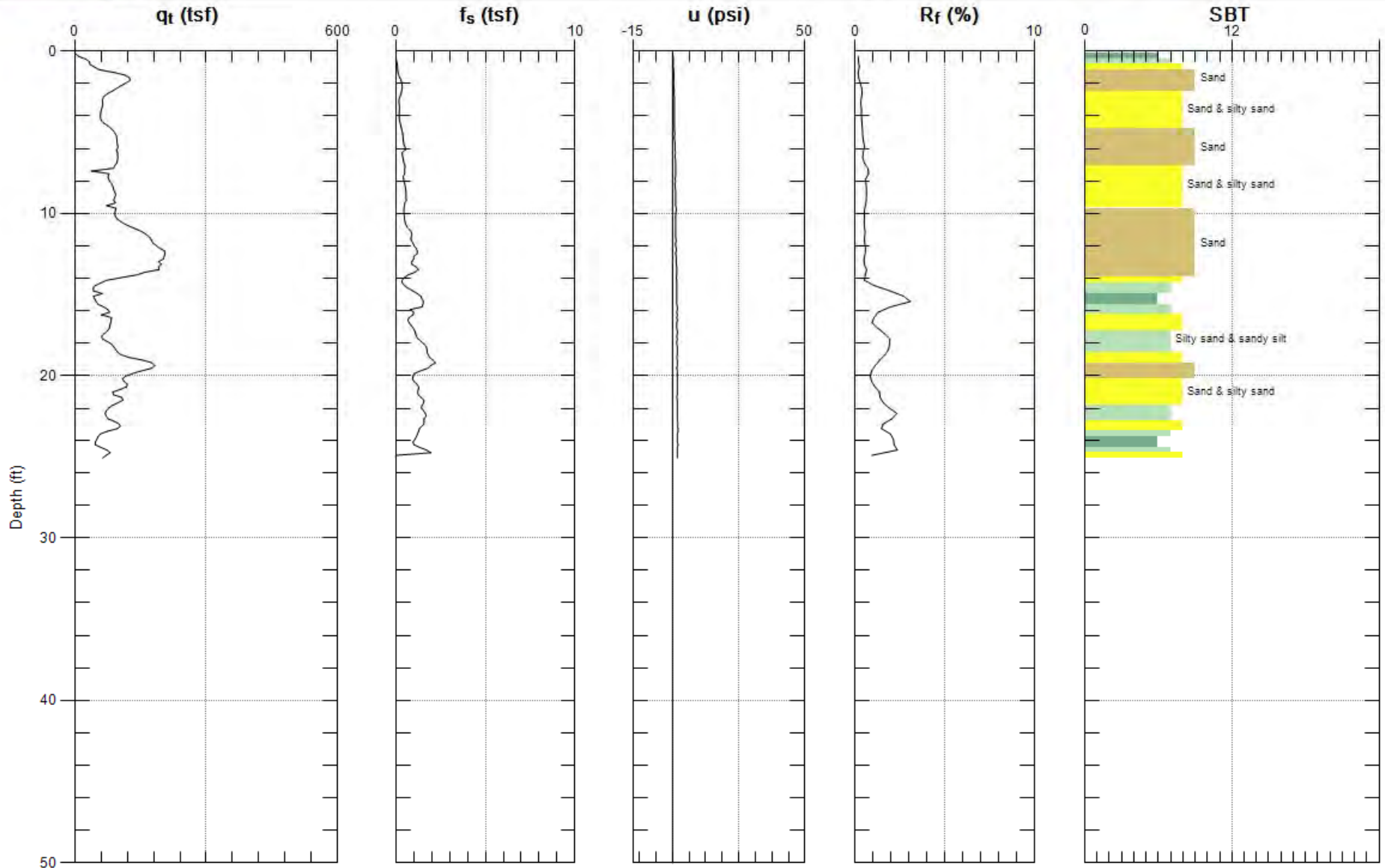


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-4

Date: 7/5/17 11:59



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

SBT: Soil Behavior Type (Robertson 1990)

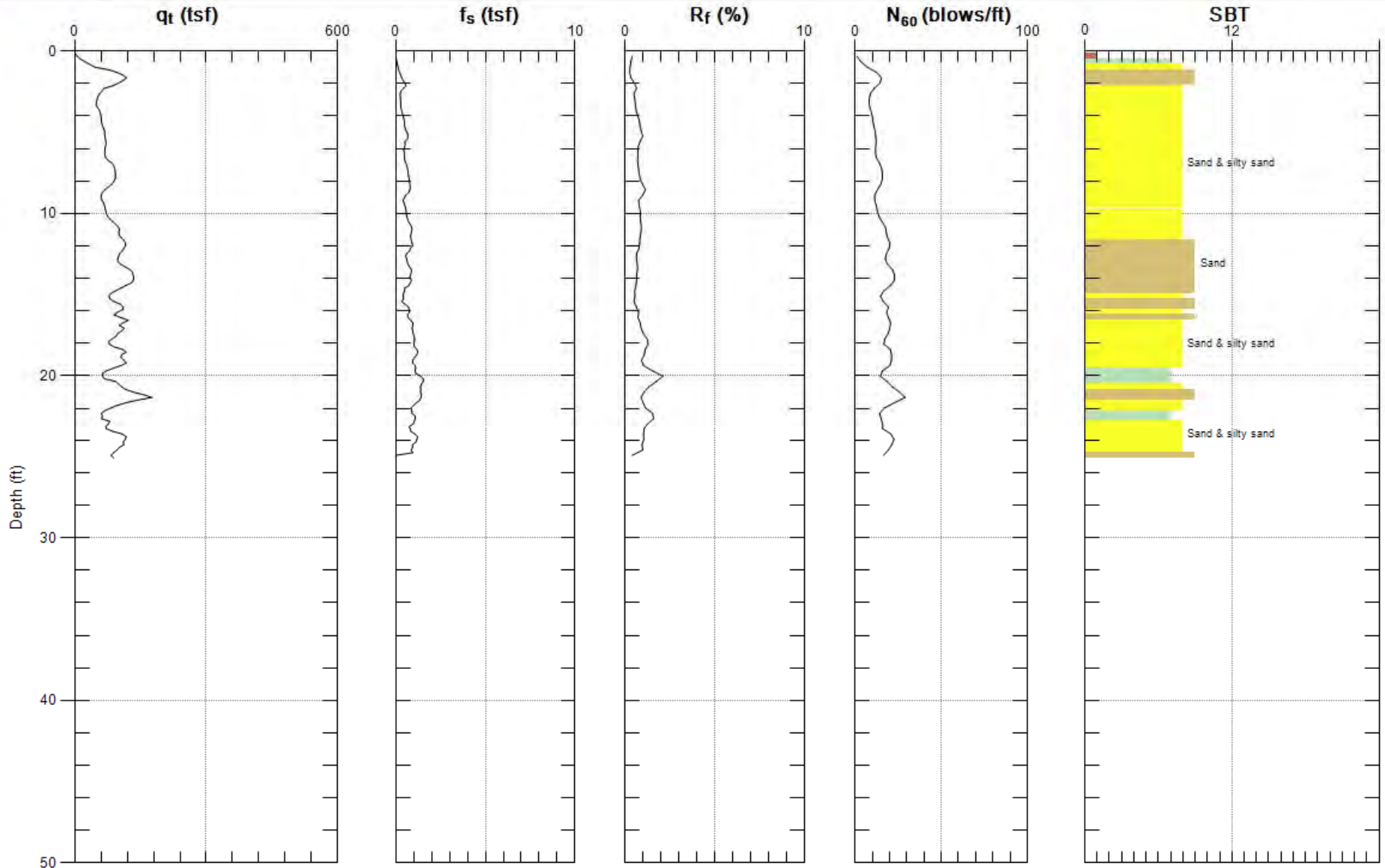


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-5

Date: 7/5/17 09:40



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

SBT: Soil Behavior Type (Robertson 1990)

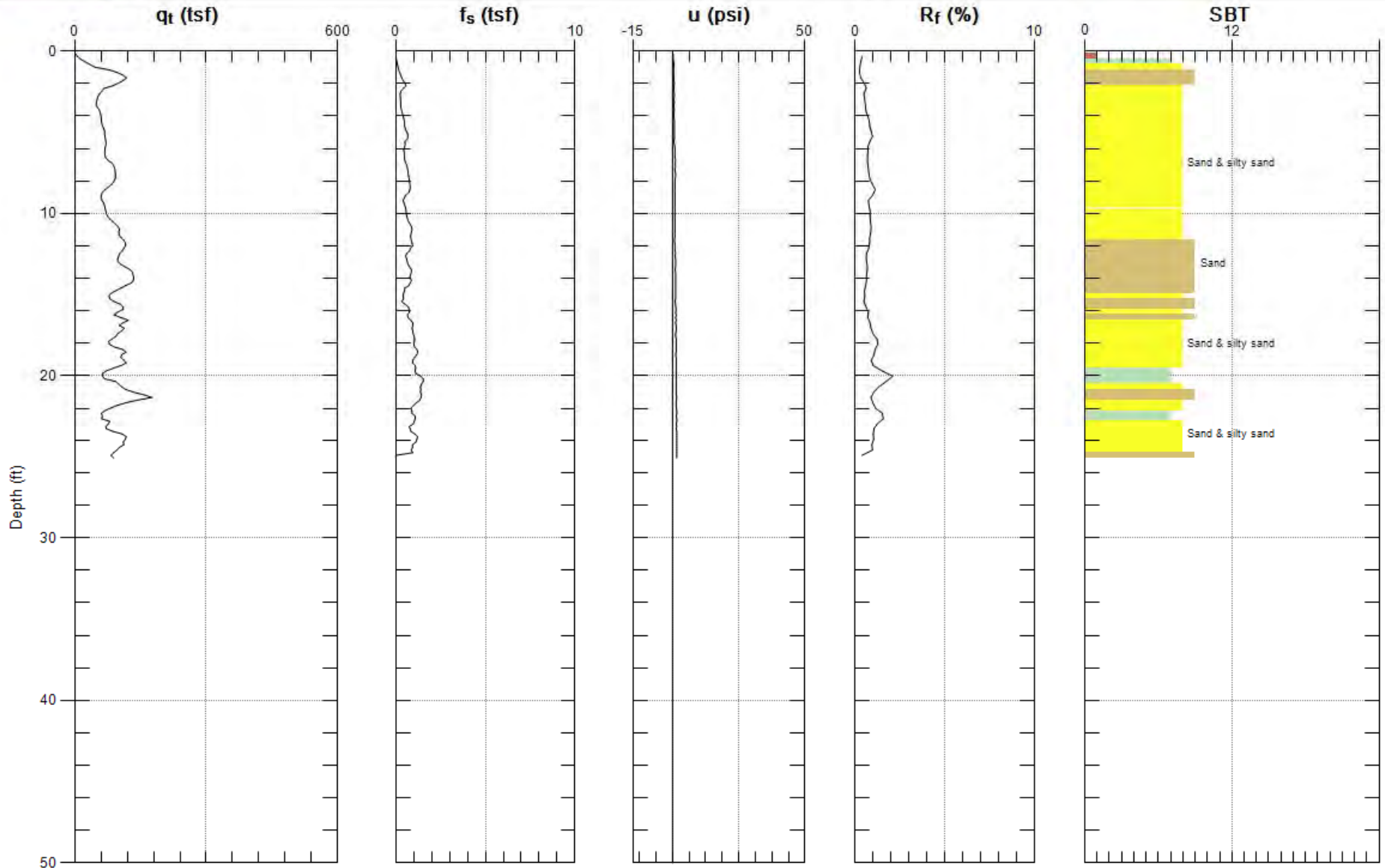


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-5

Date: 7/5/17 09:40



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

SBT: Soil Behavior Type (Robertson 1990)

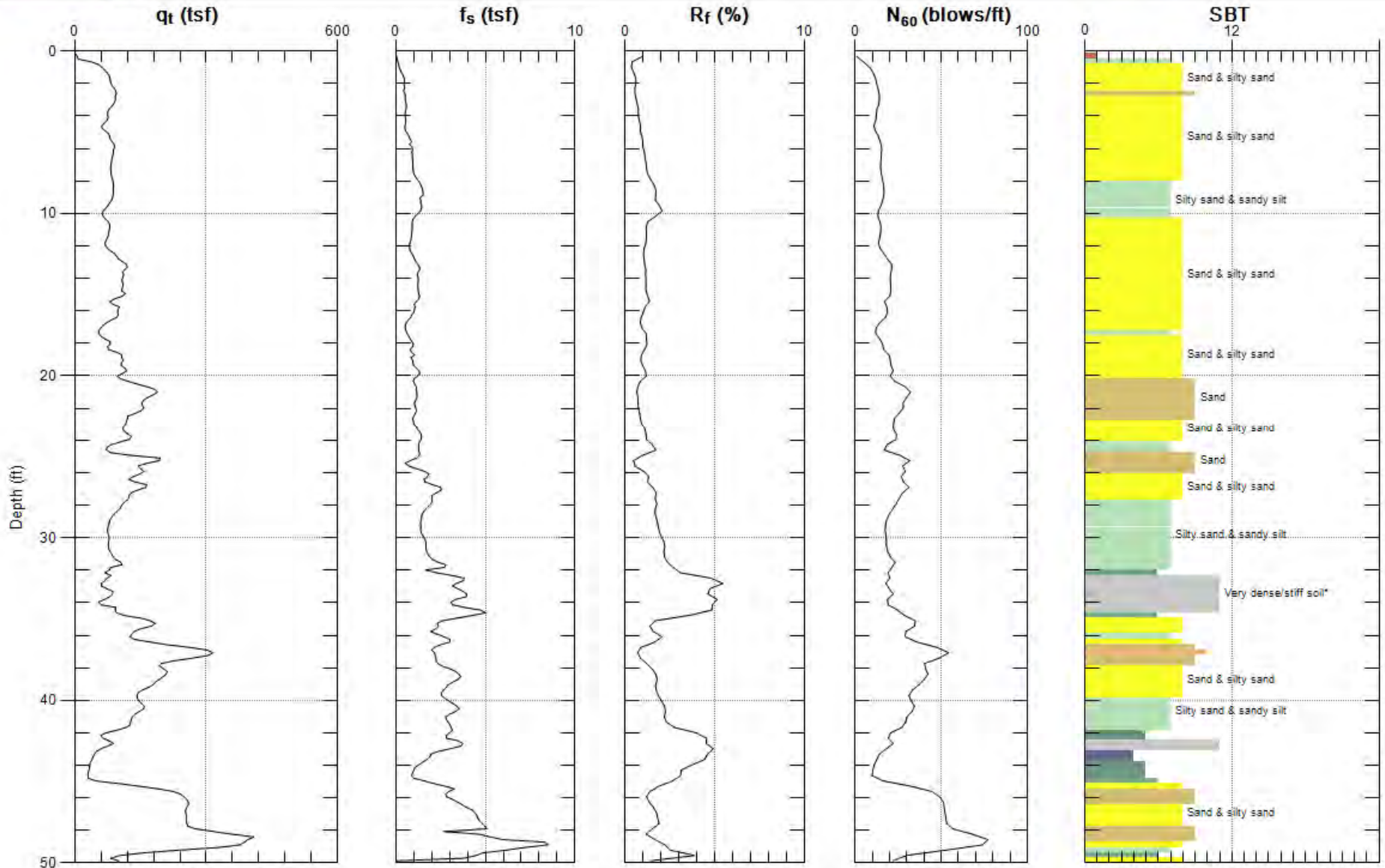


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-6

Date: 7/5/17 09:03



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

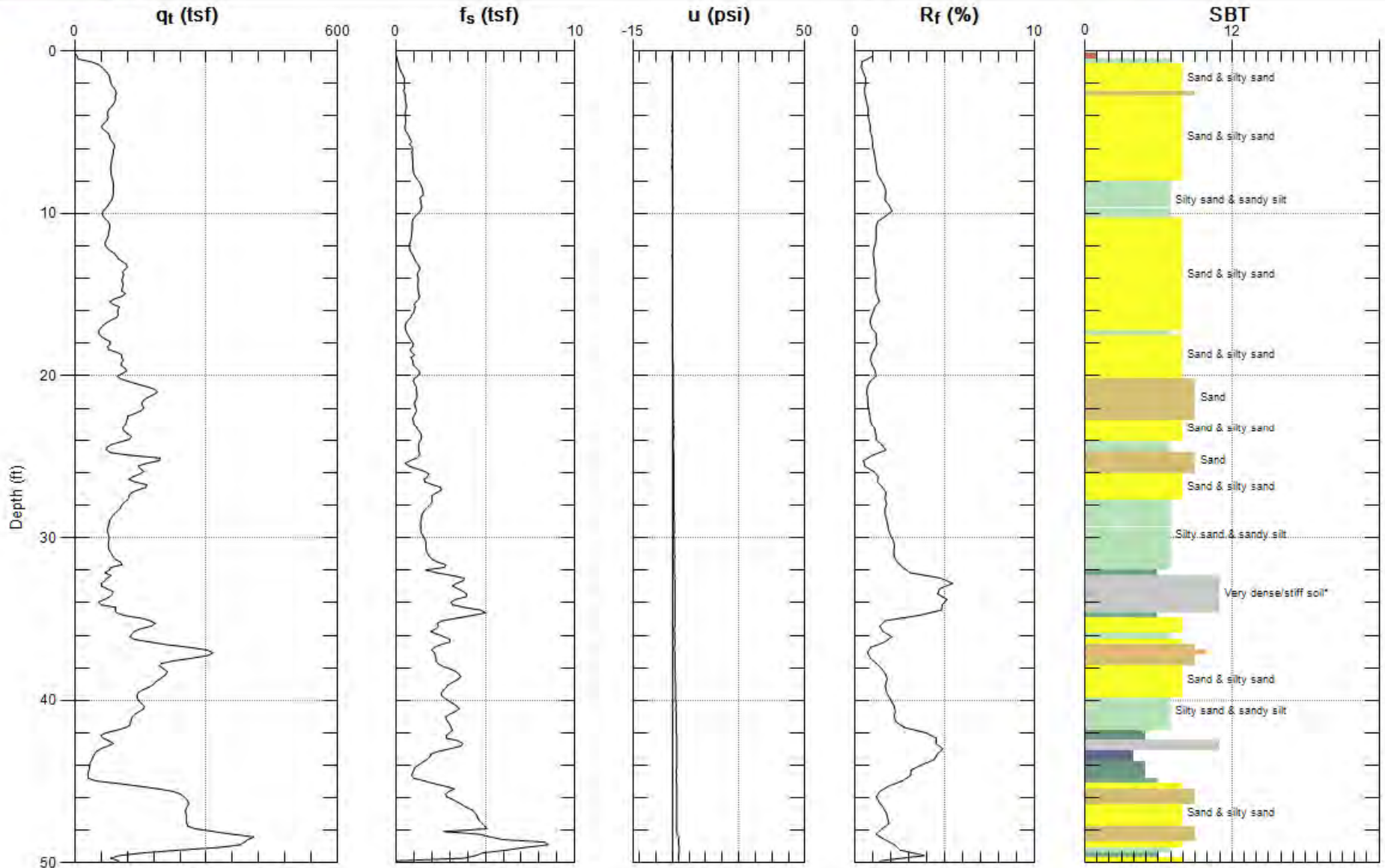


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-6

Date: 7/5/17 09:03



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

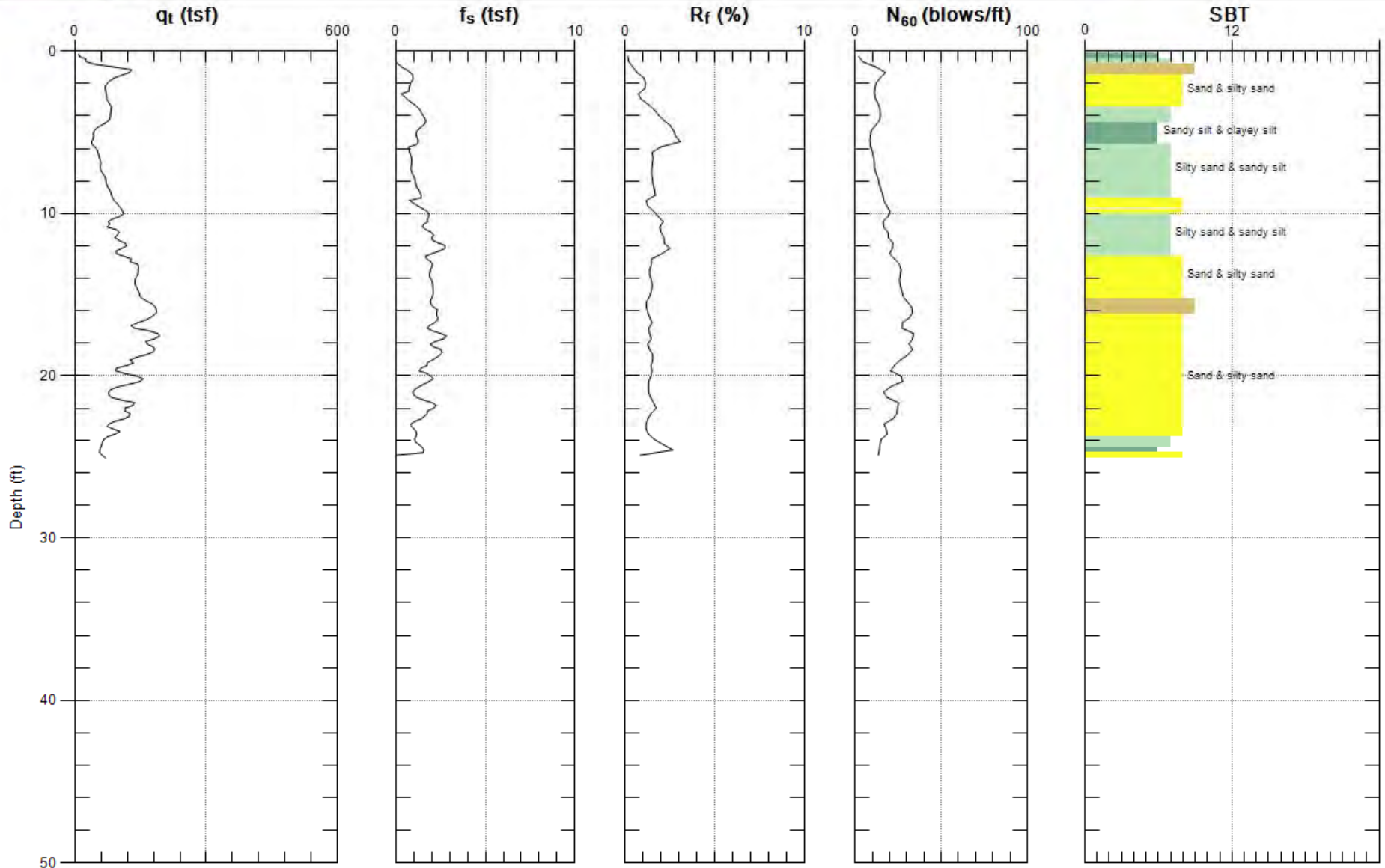


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-7

Date: 7/5/17 10:05



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

SBT: Soil Behavior Type (Robertson 1990)

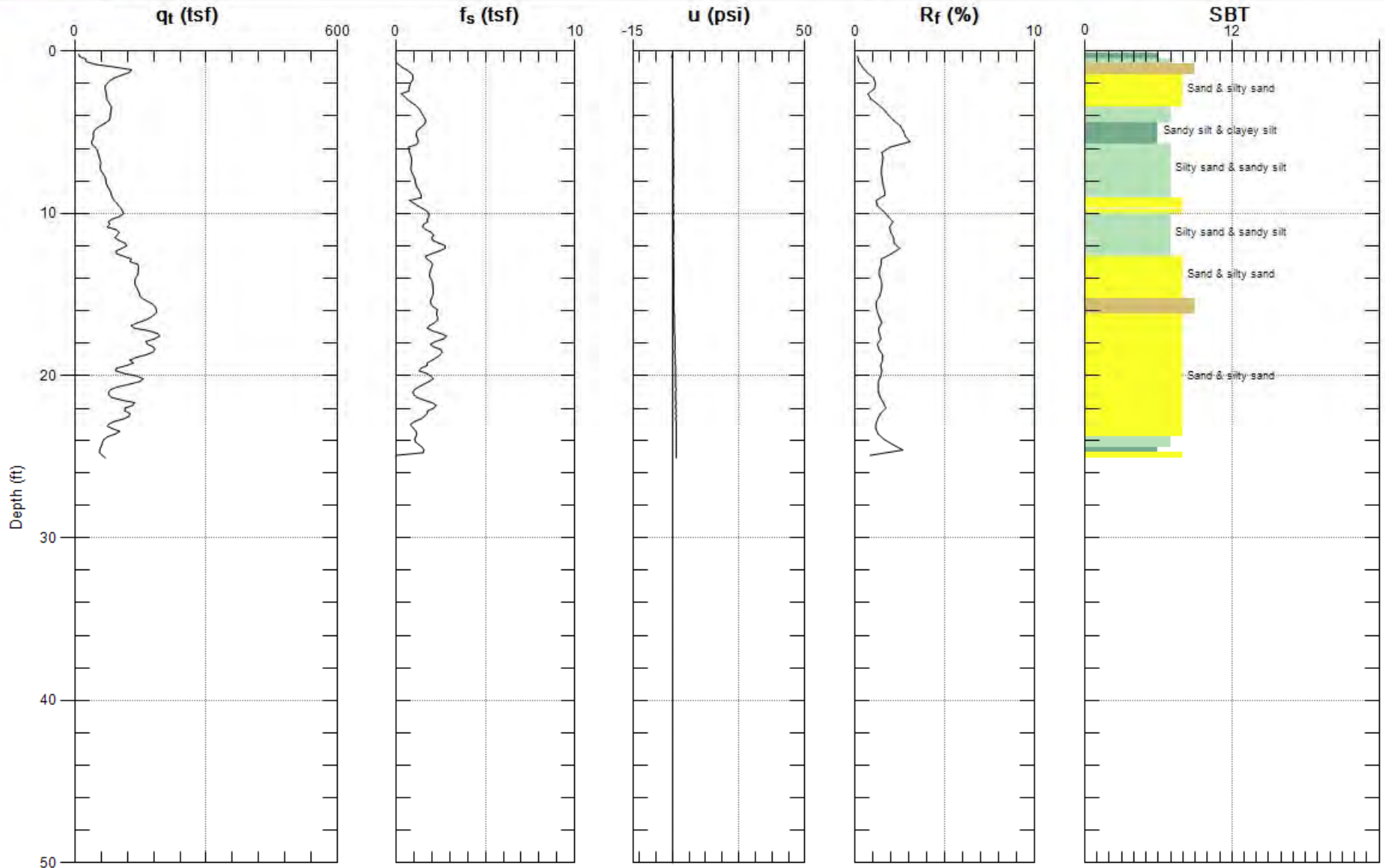


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-7

Date: 7/5/17 10:05



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

SBT: Soil Behavior Type (Robertson 1990)

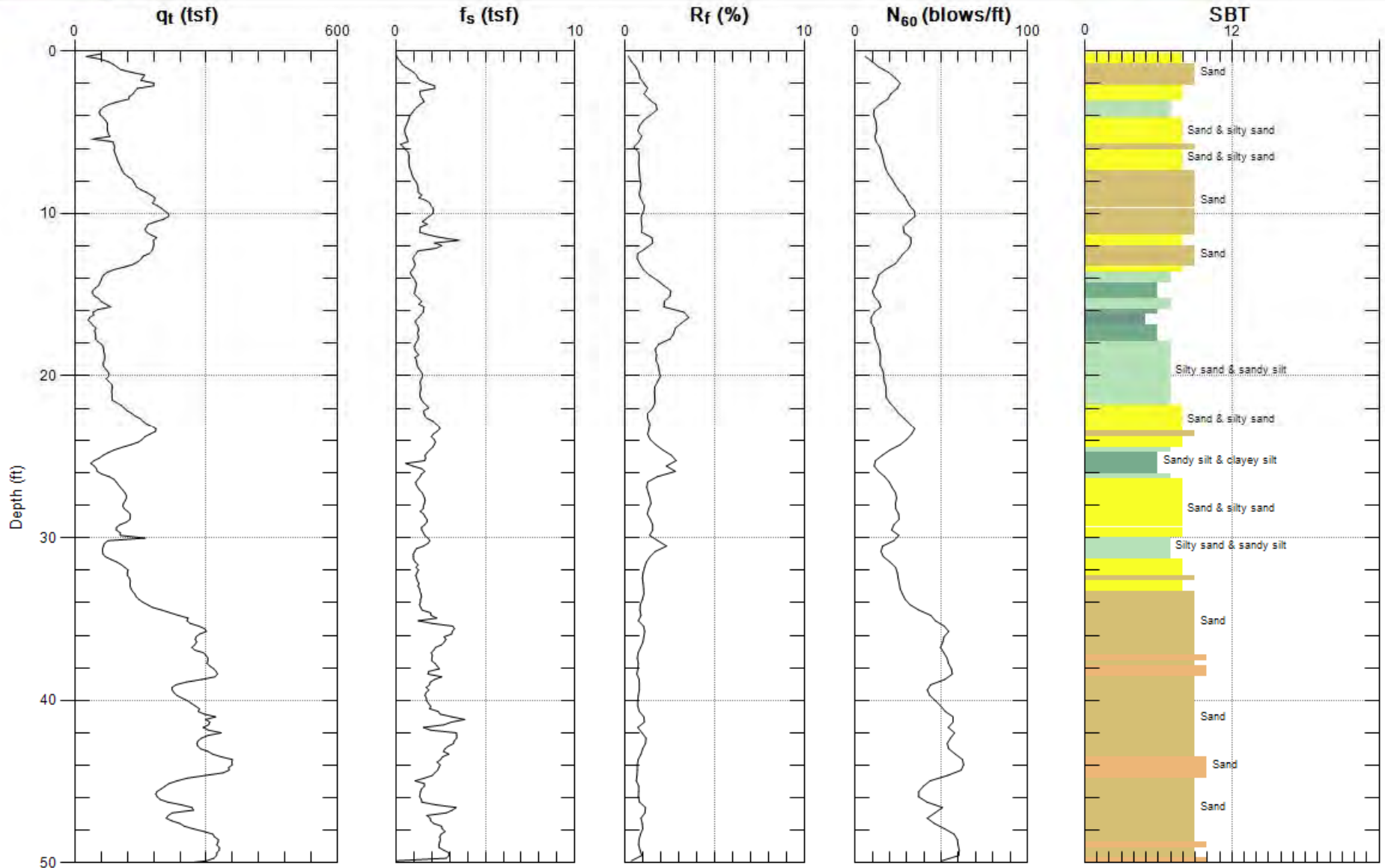


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-8

Date: 7/5/17 10:30



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

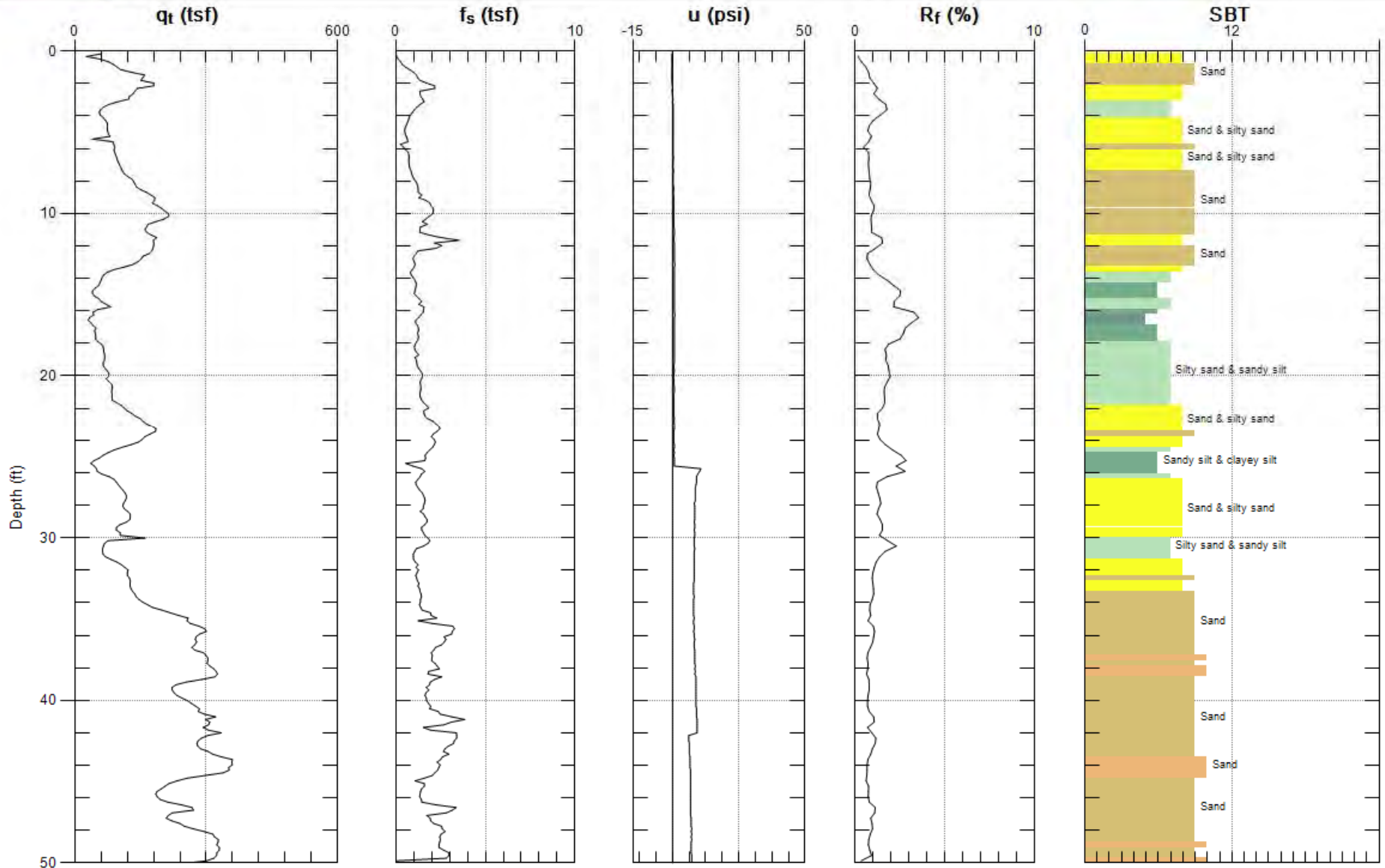


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-8

Date: 7/5/17 10:30



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

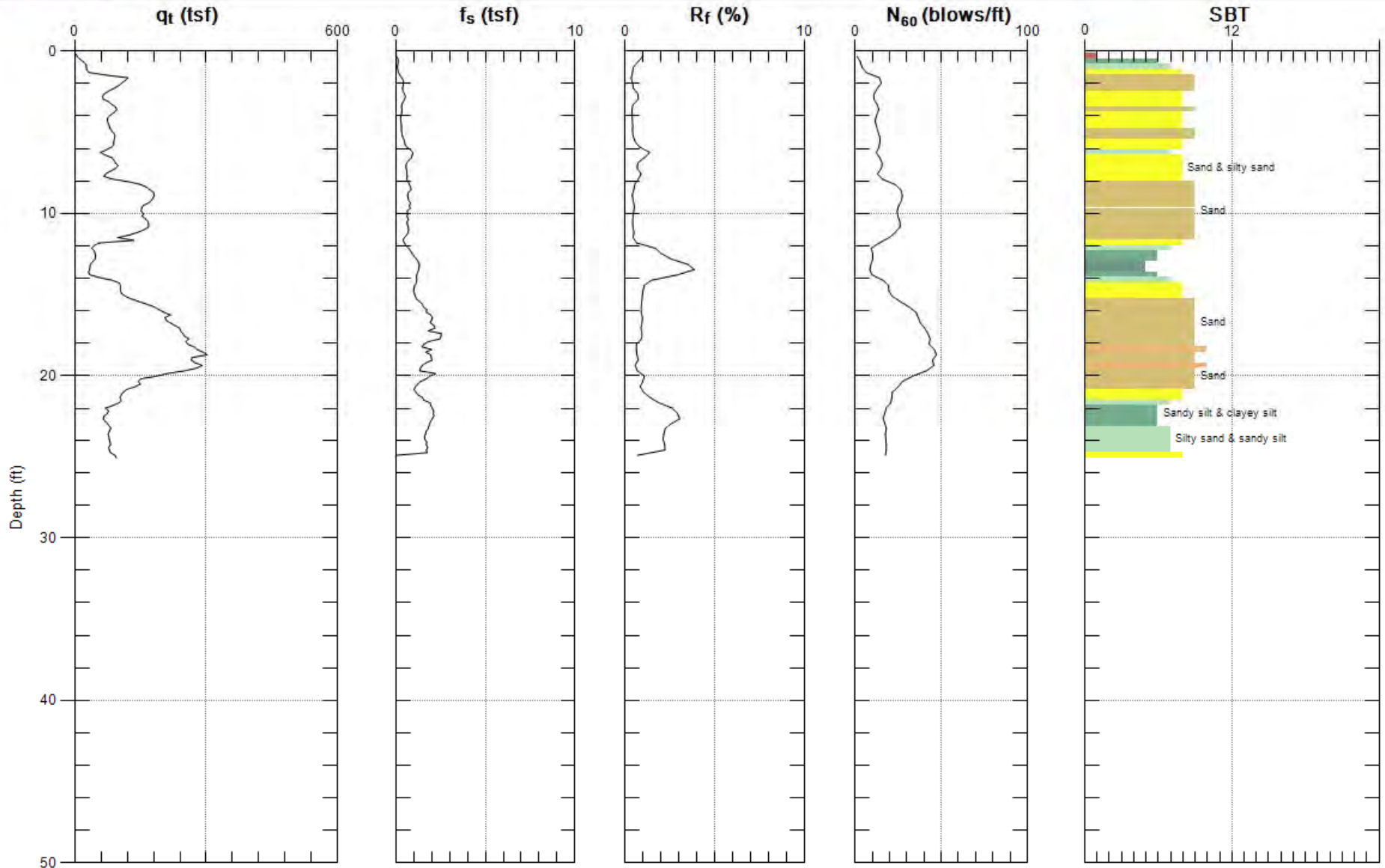


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-9

Date: 7/5/17 07:39



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

SBT: Soil Behavior Type (Robertson 1990)

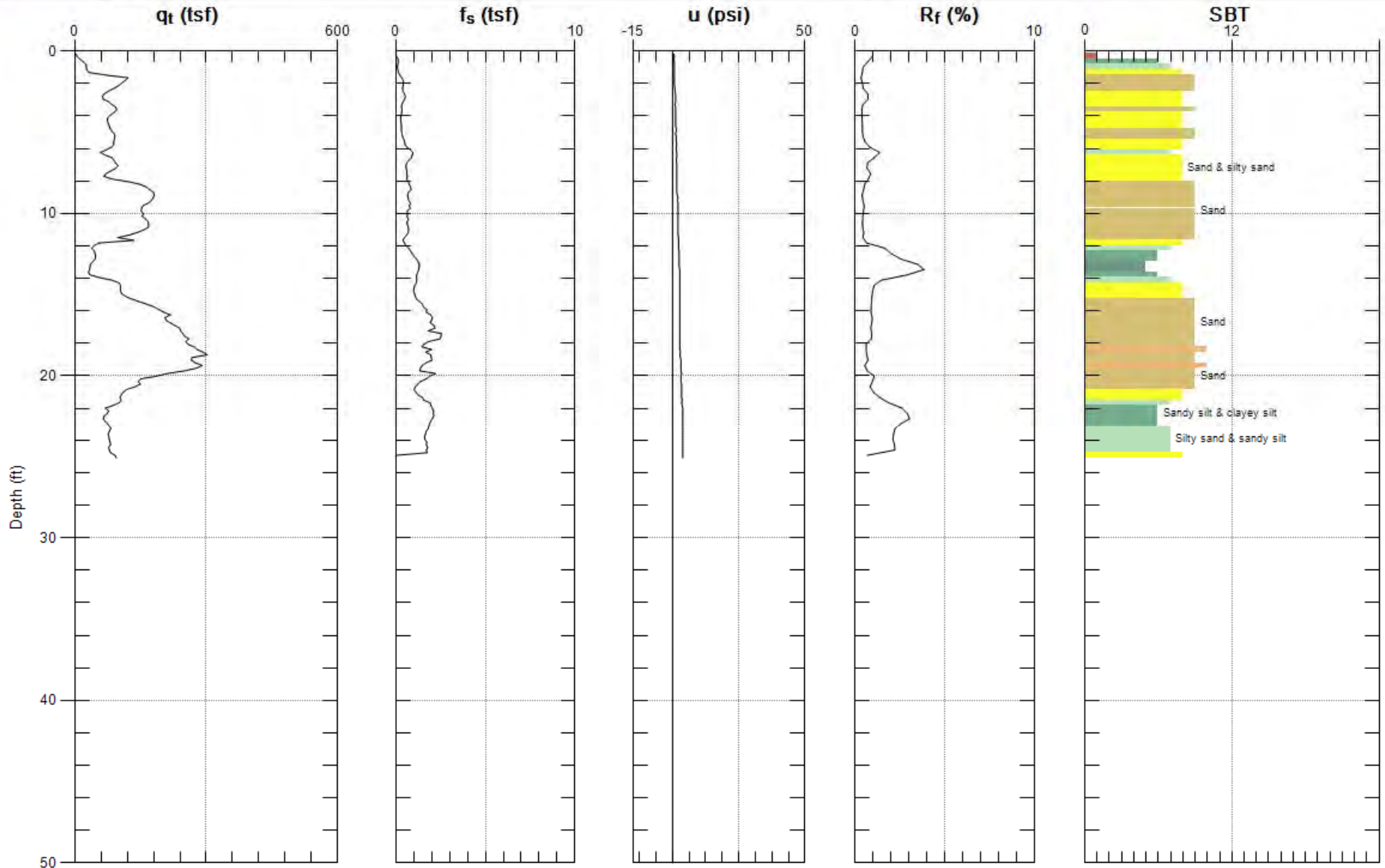


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-9

Date: 7/5/17 07:39



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

SBT: Soil Behavior Type (Robertson 1990)

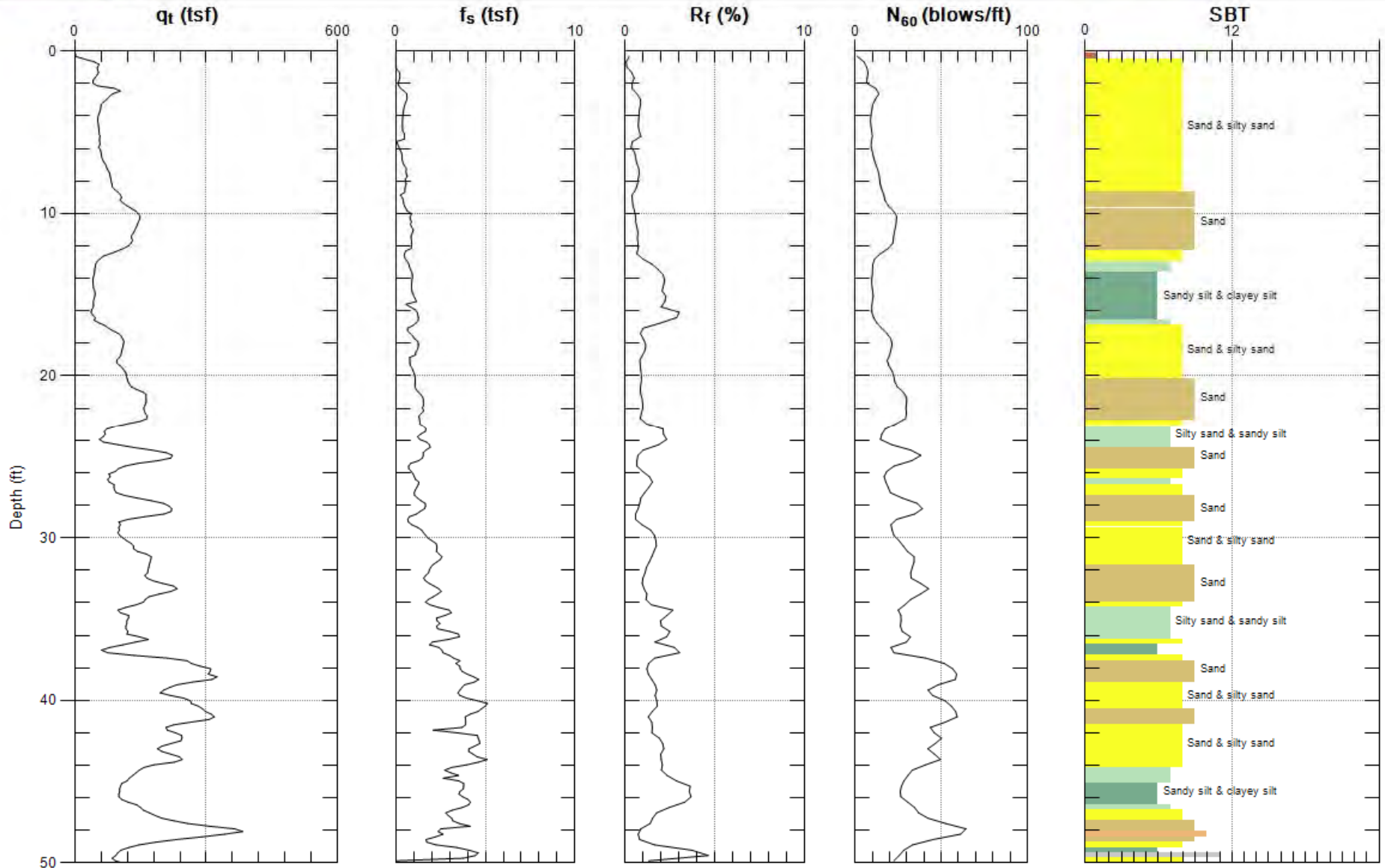


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS

Sounding: CPT-10

Date: 7/5/17 08:24



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

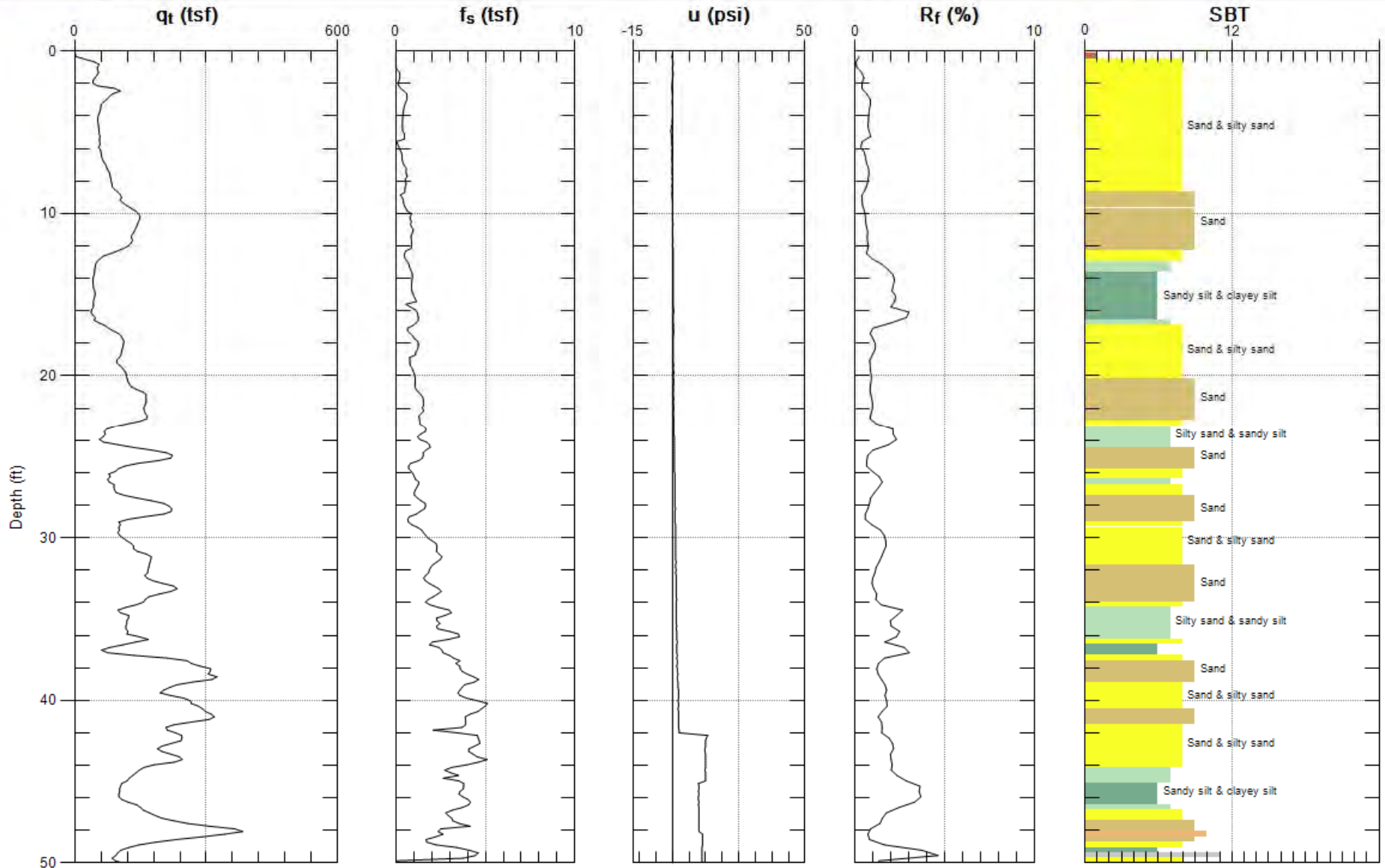


LGC GEOTECHNICAL

Site: VANDEREYK PROPERTY Engineer: R.DOUGLAS


Sounding: CPT-10

Date: 7/5/17 08:24



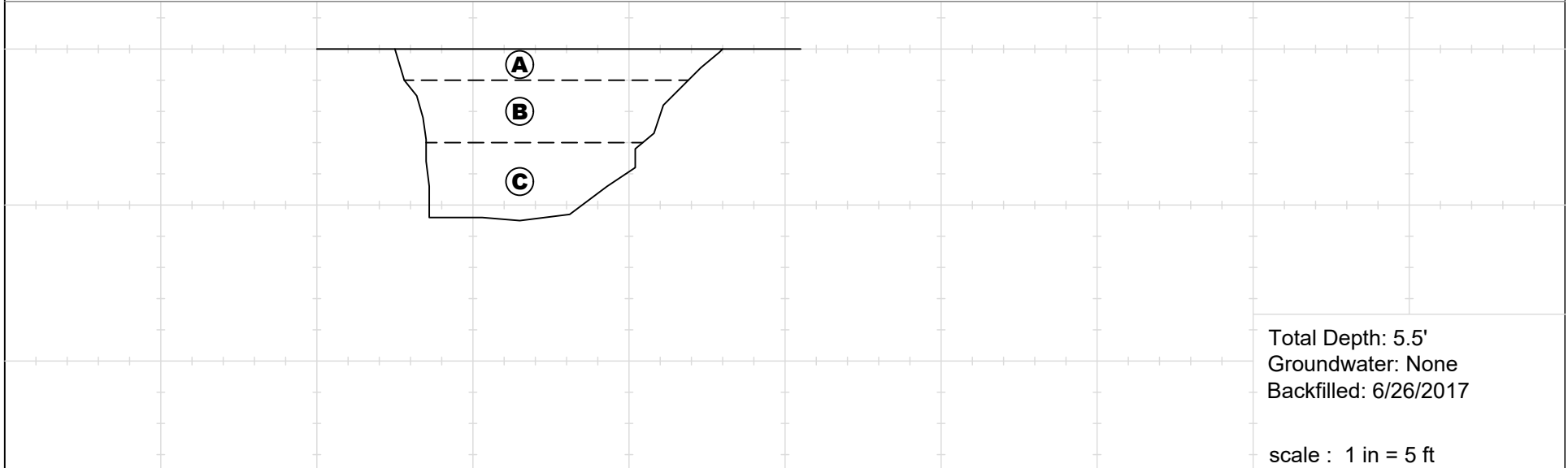
Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)


SBT: Soil Behavior Type (Robertson 1990)

Project Name: VanderEyk		Logged By: KTM	Trench No: TP-1		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		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:	Qye		B-1 @ 2' to 5'		
		@ 0' to 1' - Silty SAND to Sandy SILT: light brown, dry, loose; rootlets					
	B	@ 1' to 3' - SAND with some Silt: light brown, moist, moderately dense					
	C	@ 3' to TD - SAND with few Gravels: light to moderate brown, moist, slightly dense					

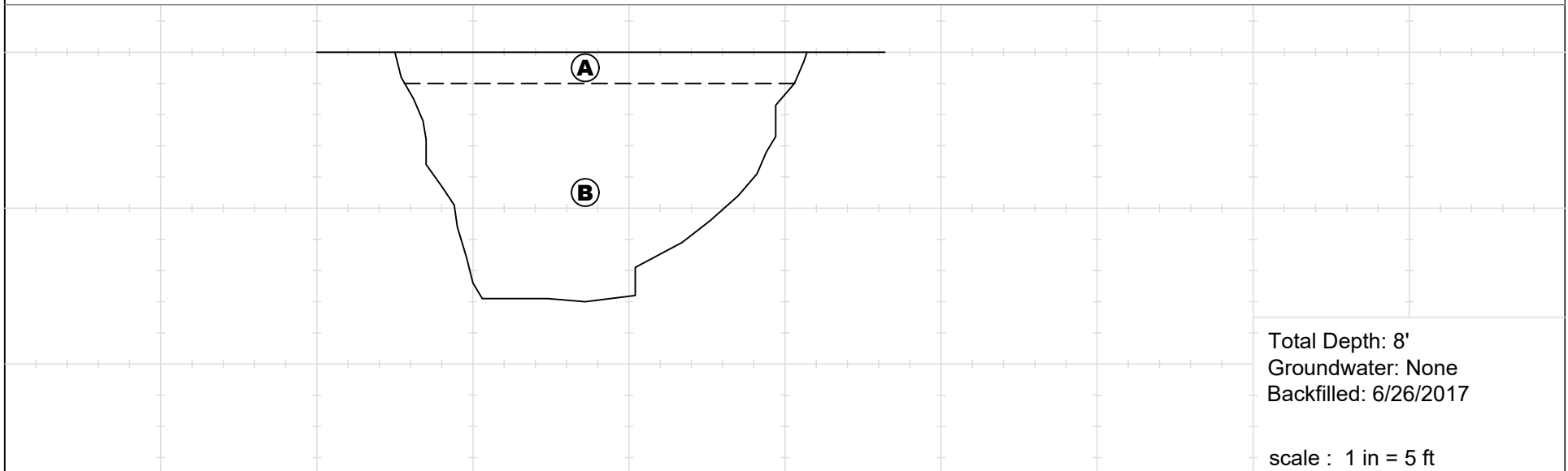
GRAPHICAL REPRESENTATION BELOW: **Elevation : 754 ' MSL** **Surface Slope: 0 deg.** **Trend: 80W**




Project Name: VanderEyk	Logged By: KTM	Trench No: TP-2	
Project Number : 17074-01	Date : 6/26/2017	Engineering Properties:	
Equipment: Case Backhoe	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:	Qye				
	B	@ 0' to 1' - SAND with some Silt: light brown, dry to slightly moist, moderately dense; rootlets; slightly indurated @ 1' to TD - Fine SAND: light brown, slightly moist grades to moist, moderately dense; friable; zone from 1' to 2' is faintly laminated; becomes very moist at depth					

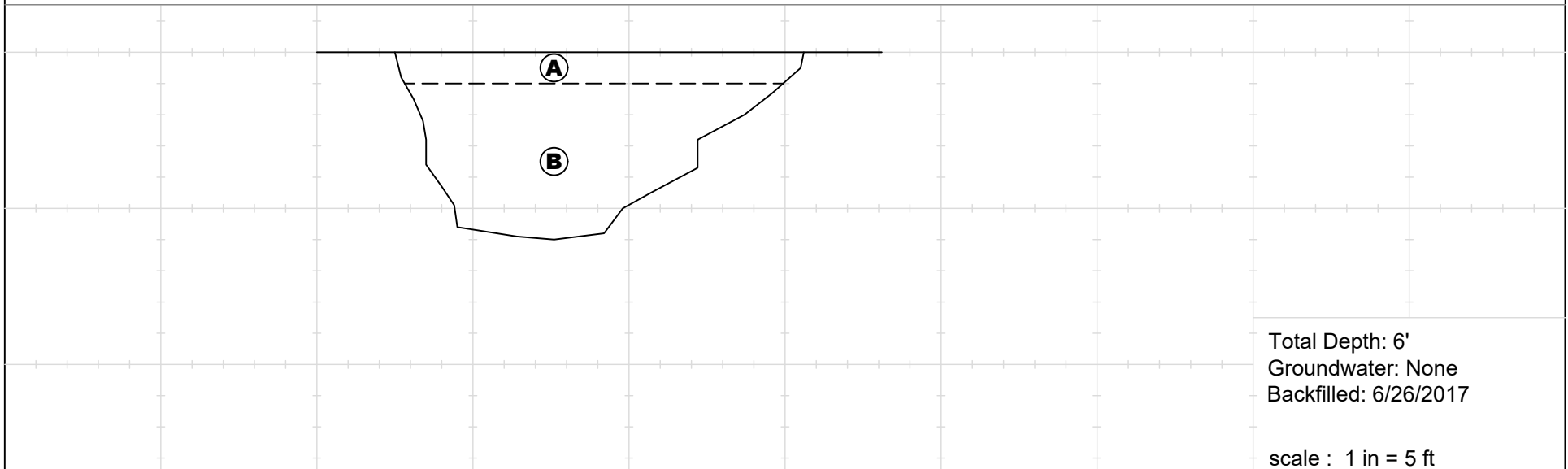
GRAPHICAL REPRESENTATION BELOW: **Elevation : 756 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**




Project Name: VanderEyk		Logged By: KTM	Trench No: TP-3		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B	@ 0' to TD - Quaternary Young Eolian Deposits: @ 0' to 1' - SAND with Silt: light brown, dry to slightly moist, loose to moderately dense; rootlets @ 1' to TD - SAND: light brown, slightly moist to moist with depth, loose to moderately dense; silty laminations from 1' to 2'; upper zone slightly indurated	Qye		B-1 @ 3' to 5'		

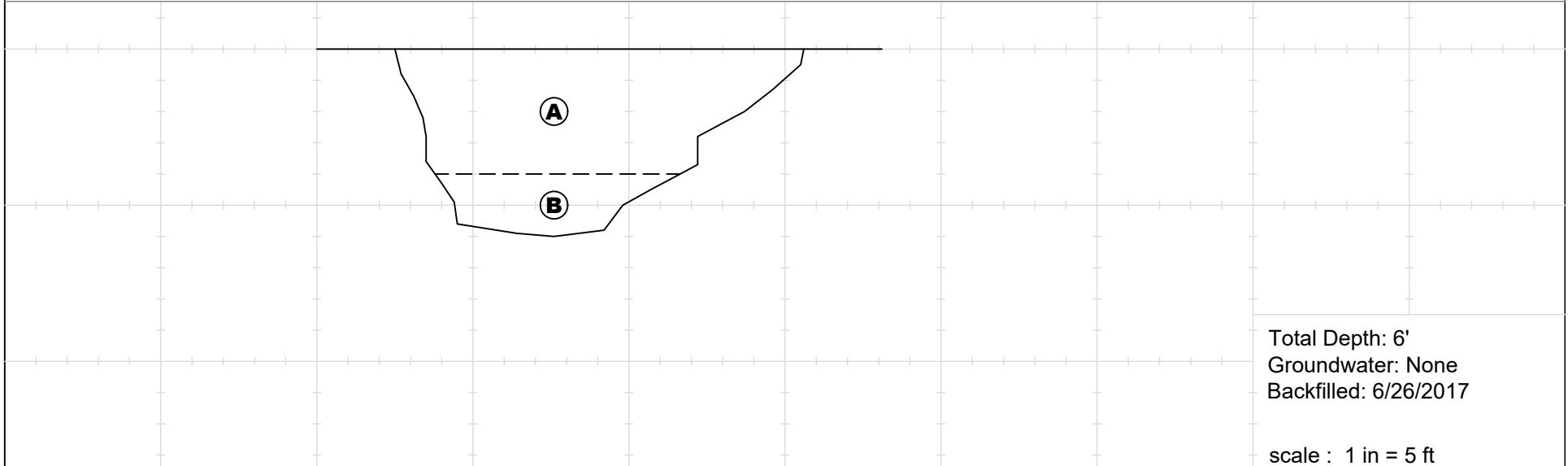
GRAPHICAL REPRESENTATION BELOW: **Elevation : 757 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**




Project Name: VanderEyk		Logged By: KTM	Trench No: TP-4		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		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 4' - SAND with some Silt: light brown, dry, loose to moderately dense; slightly indurated with rootlets to 4'; upper 1' very dry; roots	Qye				
	B	@ 4' to TD - SAND (fine): light brown, slightly moist to moist, moderately dense; friable					

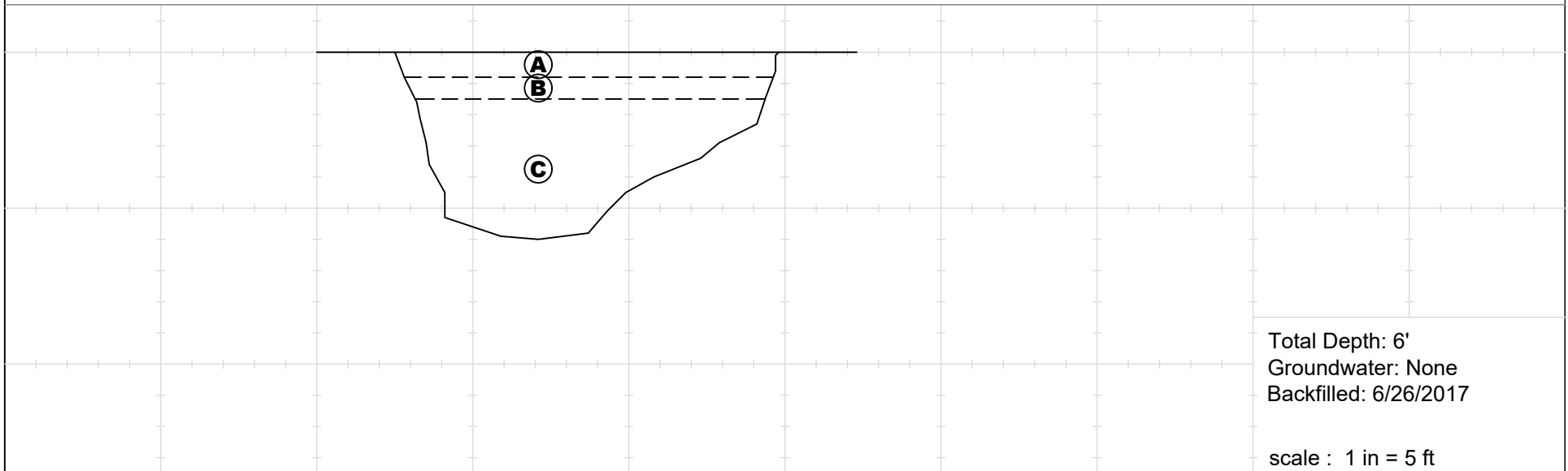
GRAPHICAL REPRESENTATION BELOW: **Elevation : 752 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**

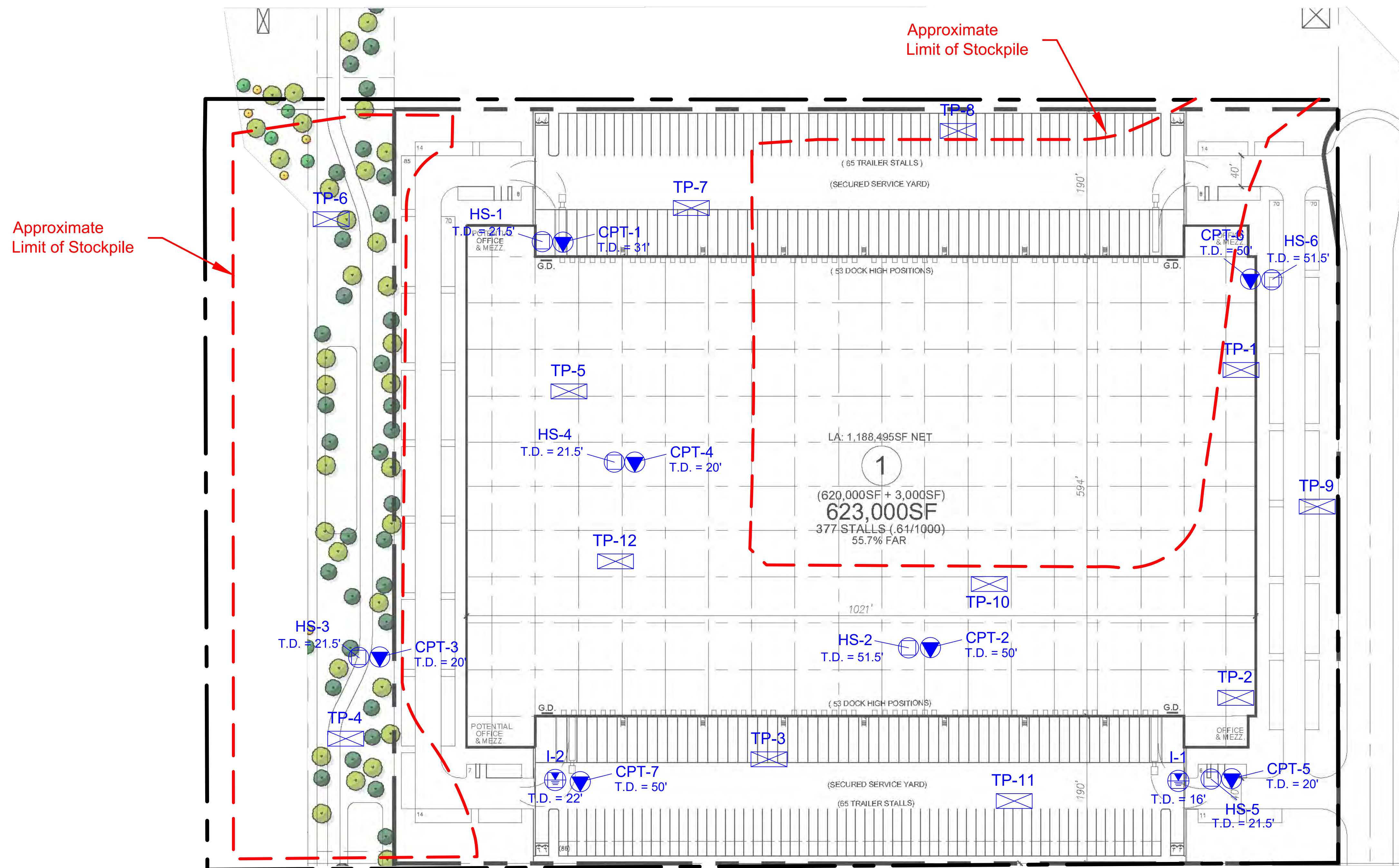


Project Name: VanderEyk		Logged By: KTM	Trench No: TP-5		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B C	@ 0' to TD - Quaternary Young Eolian Deposits: @ 0' to 0.8' - Organic layer @ 0.8' to 1.5' - SAND with some SILT: light brown; organic-rich layer @ 1.5 to TD - SAND: light brown, slightly moist to moist, loose to moderately dense; homogenous; few rootlets to 2'	Qye				




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






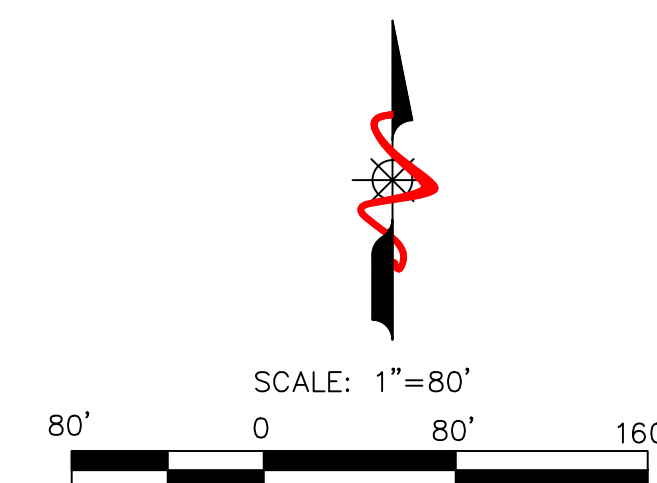
*See Sheet 3 for Additional Shallow Test Pit Locations

LEGEND

- 
HS-6
 T.D. = 21.5'
 Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet
- 
I-2
 T.D. = 22'
 Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet
- 
TP-12
 Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical

- 
CPT-7
 T.D. = 50'
 Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

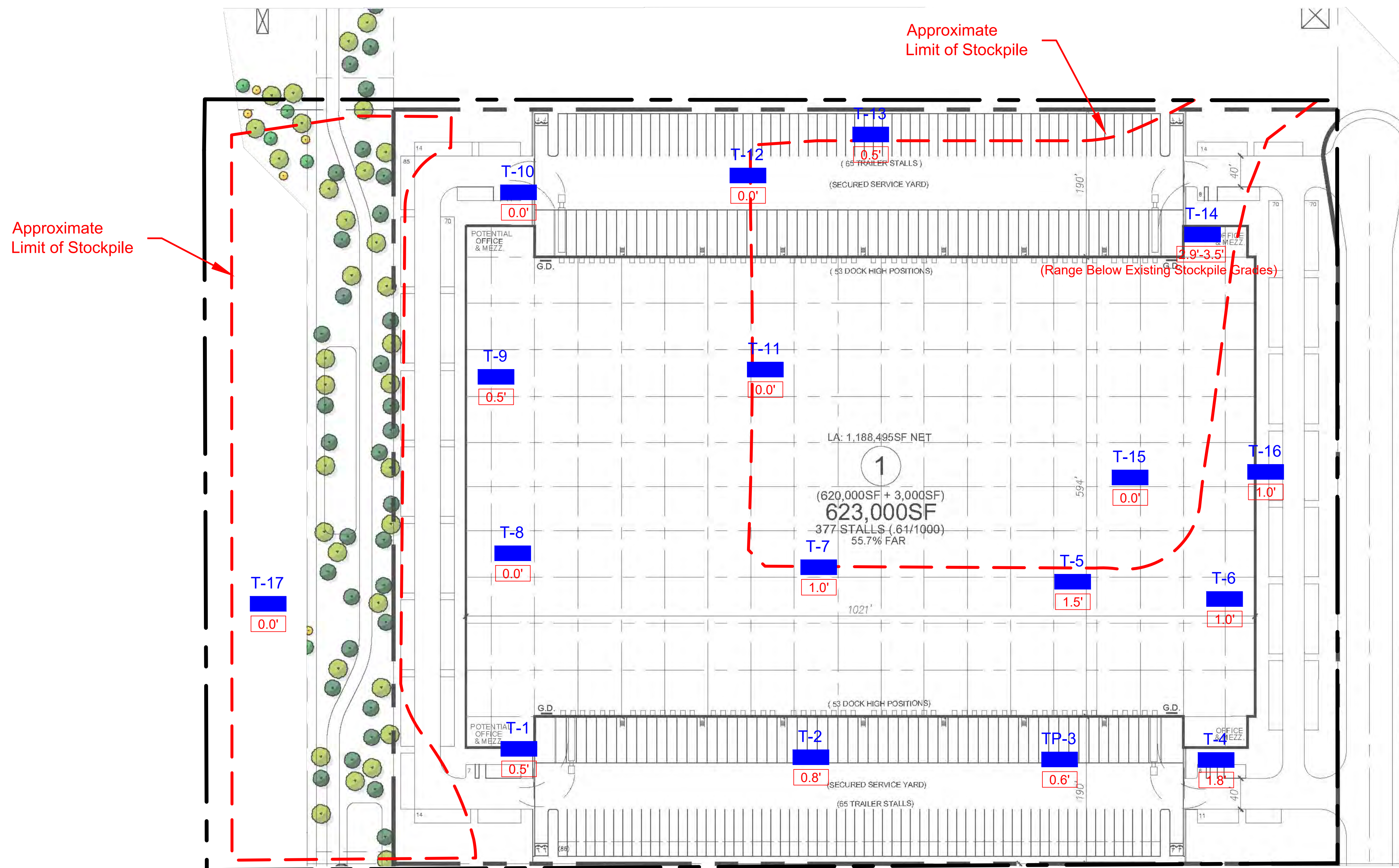
— — — — — Approximate Limits of This Report



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

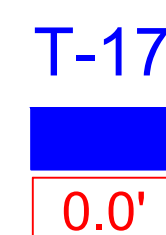
**Geotechnical Exploration Location Map
 With Conceptual Plan**

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



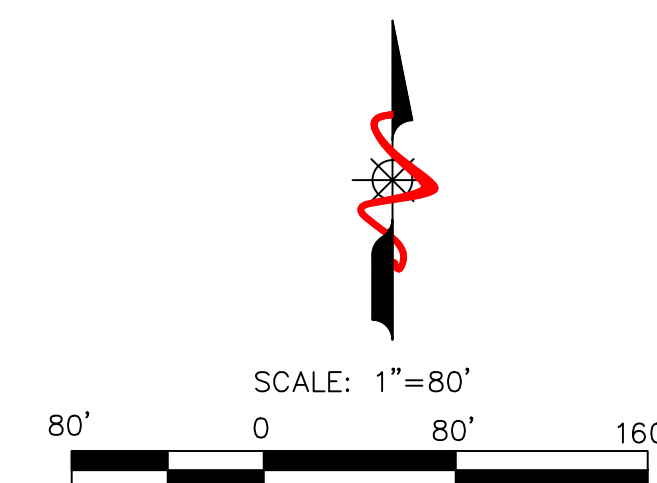
*See Sheets 1 and 2 for Boring, Infiltration Test, CPT and Geotechnical Trench Locations

LEGEND



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
SCALE	1" = 80'
DATE	August 2021

**SHEET
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.

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.

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 (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

Collapse/Swell Potential: 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.

Maximum Density Tests: 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)

Expansion Index: 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

* Per ASTM D4829

Soluble Sulfates: 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

Chloride Content: 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	pH	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)

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.

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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-6
 Sample No.: R-2
 Sample Description: Light olive brown silty sand (SM)

Tested By: G. Bathala Date: 07/16/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 7.5

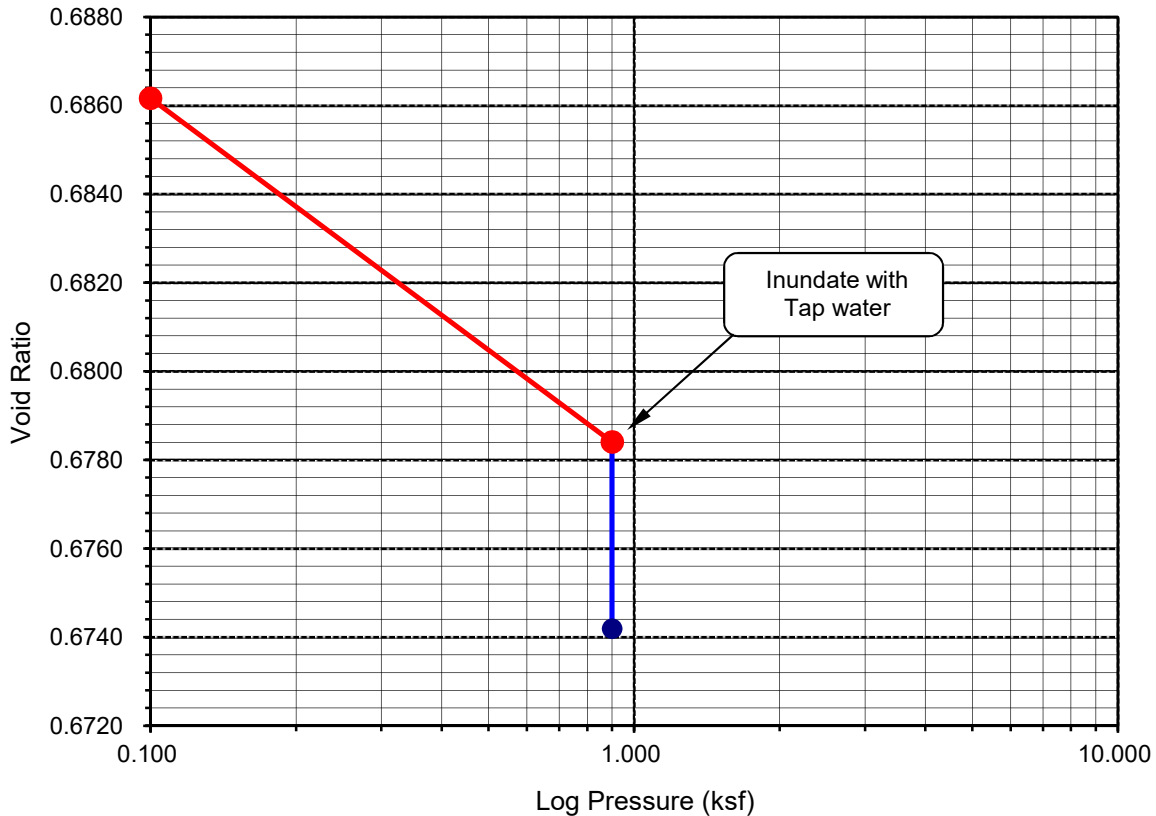
Initial Dry Density (pcf):	100.0
Initial Moisture (%):	9.04
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2702
Diameter(in):	2.415

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

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

Percent Swell (+) / Settlement (-) After Inundation = -0.25

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-2
 Sample No.: R-1
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 07/16/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 2.5

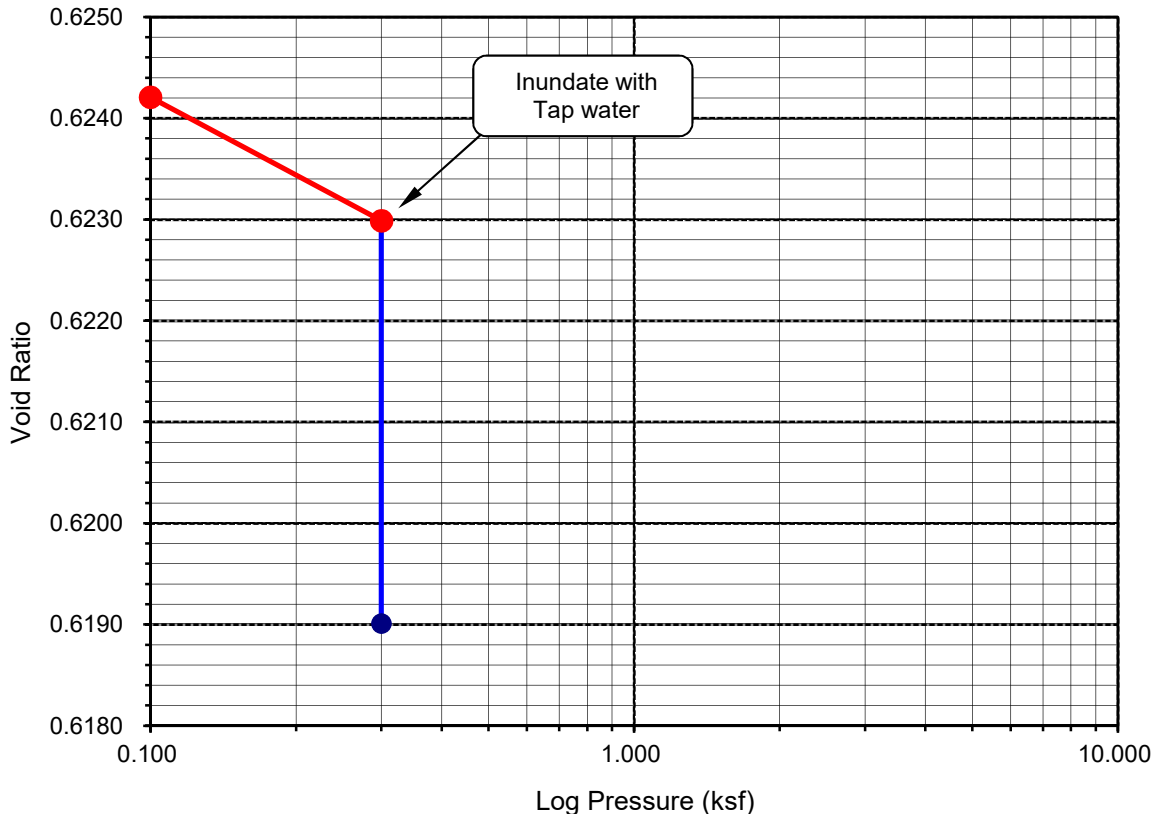
Initial Dry Density (pcf):	103.7
Initial Moisture (%):	4.44
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3294
Diameter(in):	2.415

Final Dry Density (pcf):	104.1
Final Moisture (%):	18.8
Initial Void Ratio:	0.6249
Specific Gravity(assumed):	2.70
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

Percent Swell (+) / Settlement (-) After Inundation = -0.25

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-3
 Sample No.: R-1
 Sample Description: Olive silt with sand (ML)s, organic material noted

Tested By: G. Bathala Date: 07/17/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 5.0

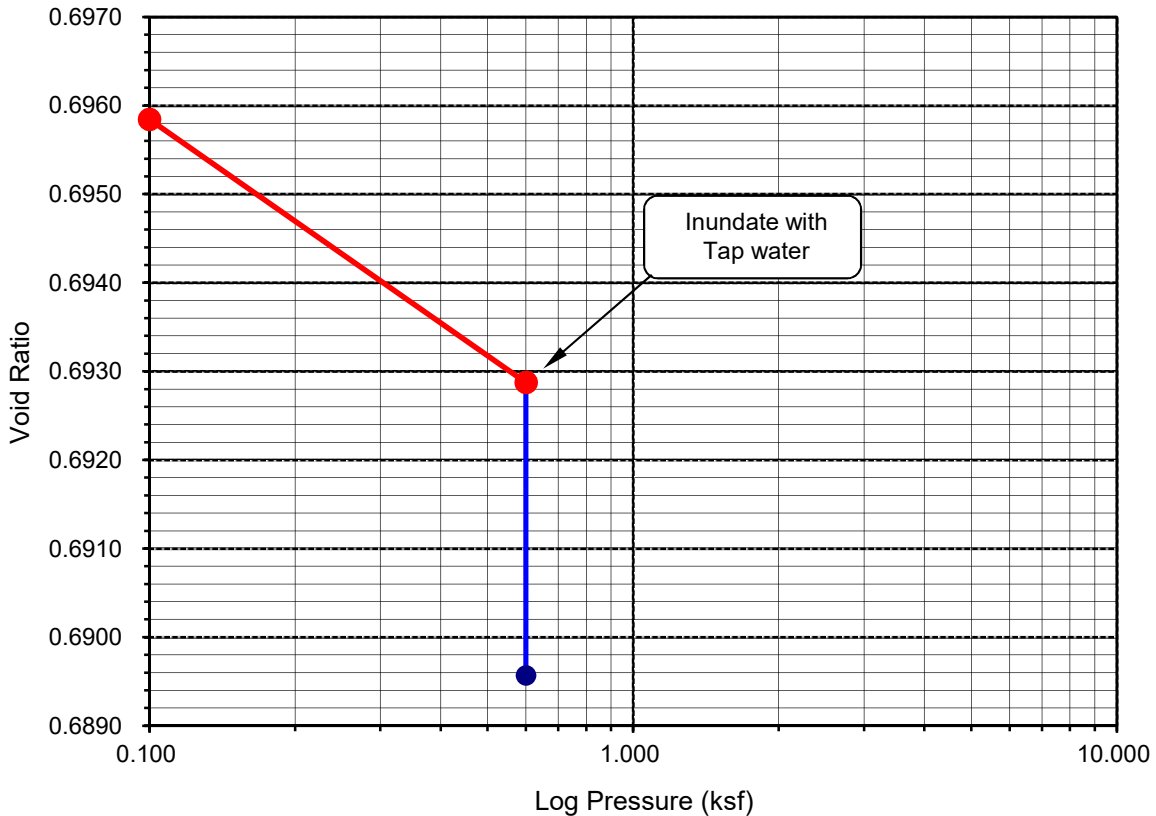
Initial Dry Density (pcf):	99.4
Initial Moisture (%):	10.70
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3151
Diameter(in):	2.415

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

Percent Swell (+) / Settlement (-) After Inundation = -0.20

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-1
 Sample No.: R-1
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 07/17/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 5.0

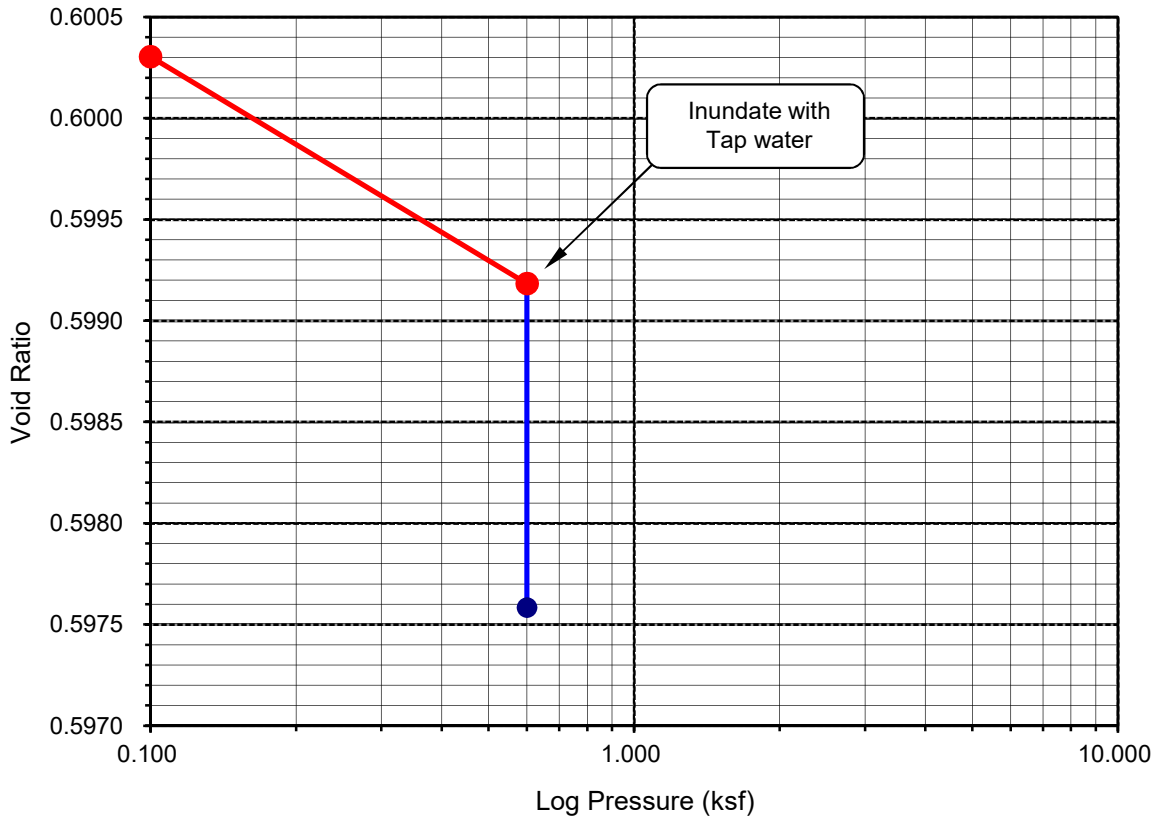
Initial Dry Density (pcf):	105.3
Initial Moisture (%):	5.30
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2910
Diameter(in):	2.415

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

Percent Swell (+) / Settlement (-) After Inundation = -0.10

Void Ratio - Log Pressure Curve



**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: Light olive brown silty sand (SM)

		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 Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

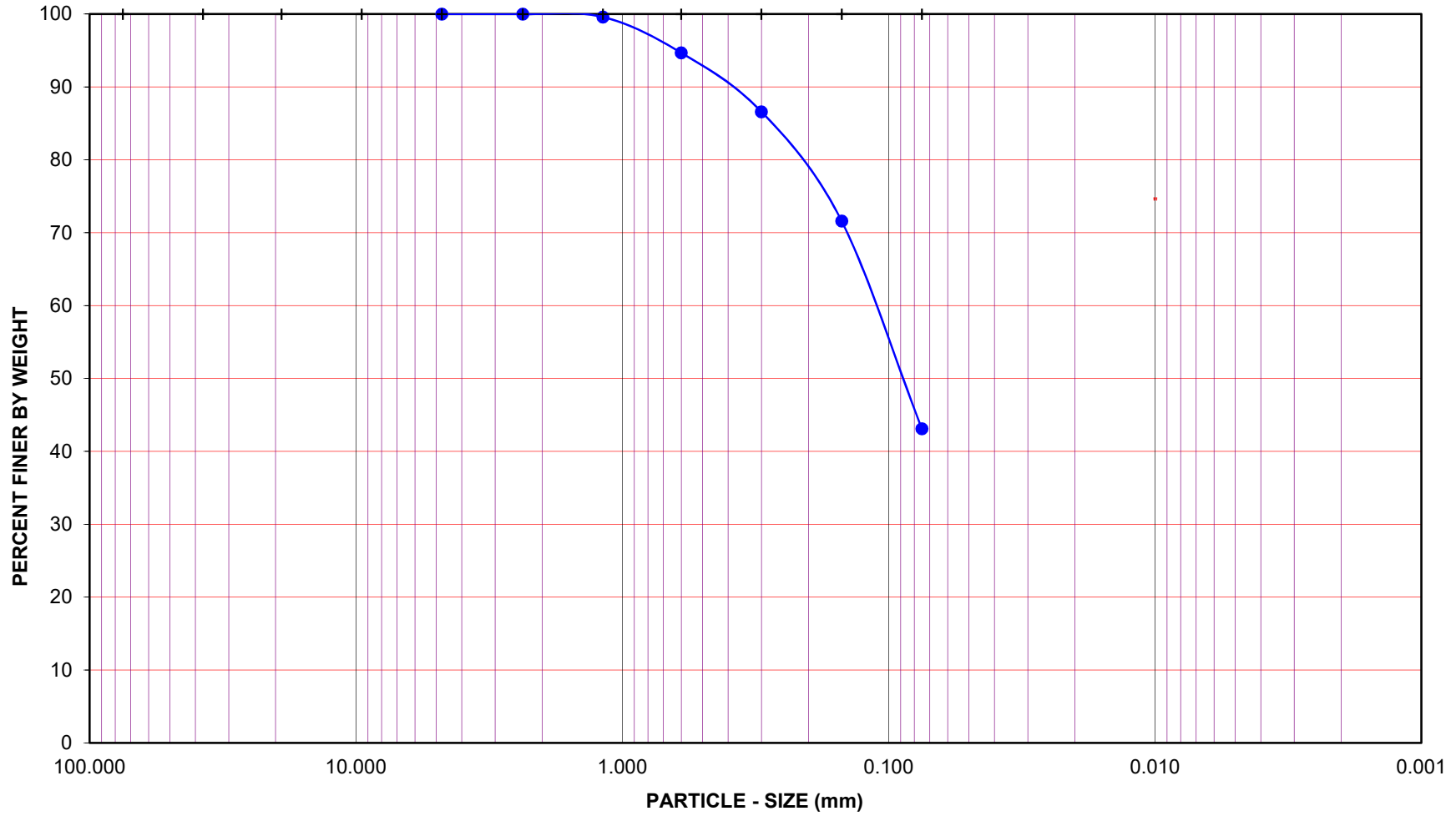
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-6

Sample No.: R-2

Depth (feet): 7.5

Soil Type : SM

Soil Identification: Light olive brown silty sand (SM)

GR:SA:FI : (%) 0 : 57 : 43

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

Jul-19

**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-2

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 + 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

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 Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

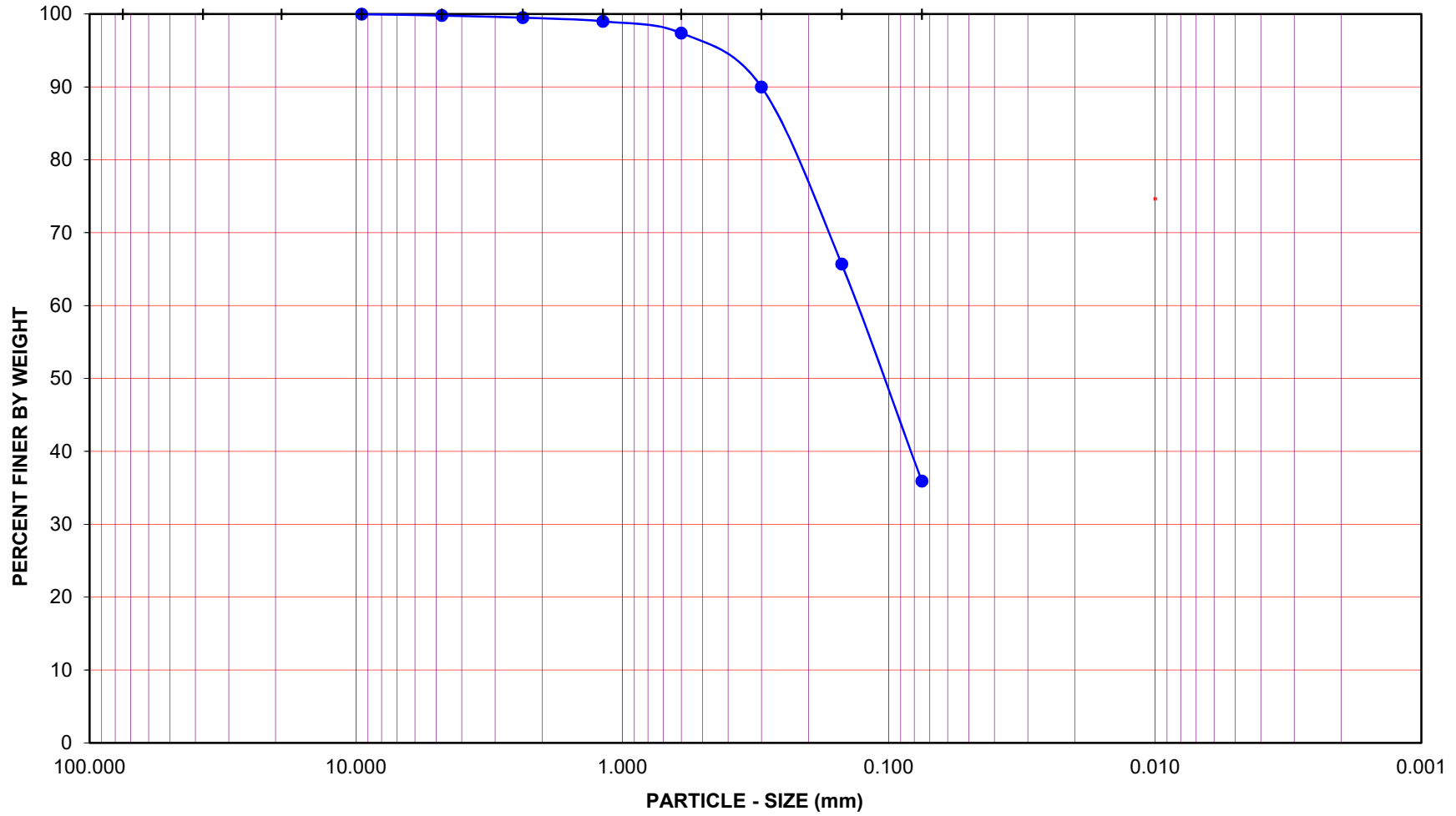
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-2

Depth (feet): 2.5

Soil Identification: Olive silty sand (SM)

GR:SA:FI : (%) **0 : 64 : 36**

Sample No.: R-1

Soil Type : SM

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

Jul-19

**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.:	HA	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

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

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

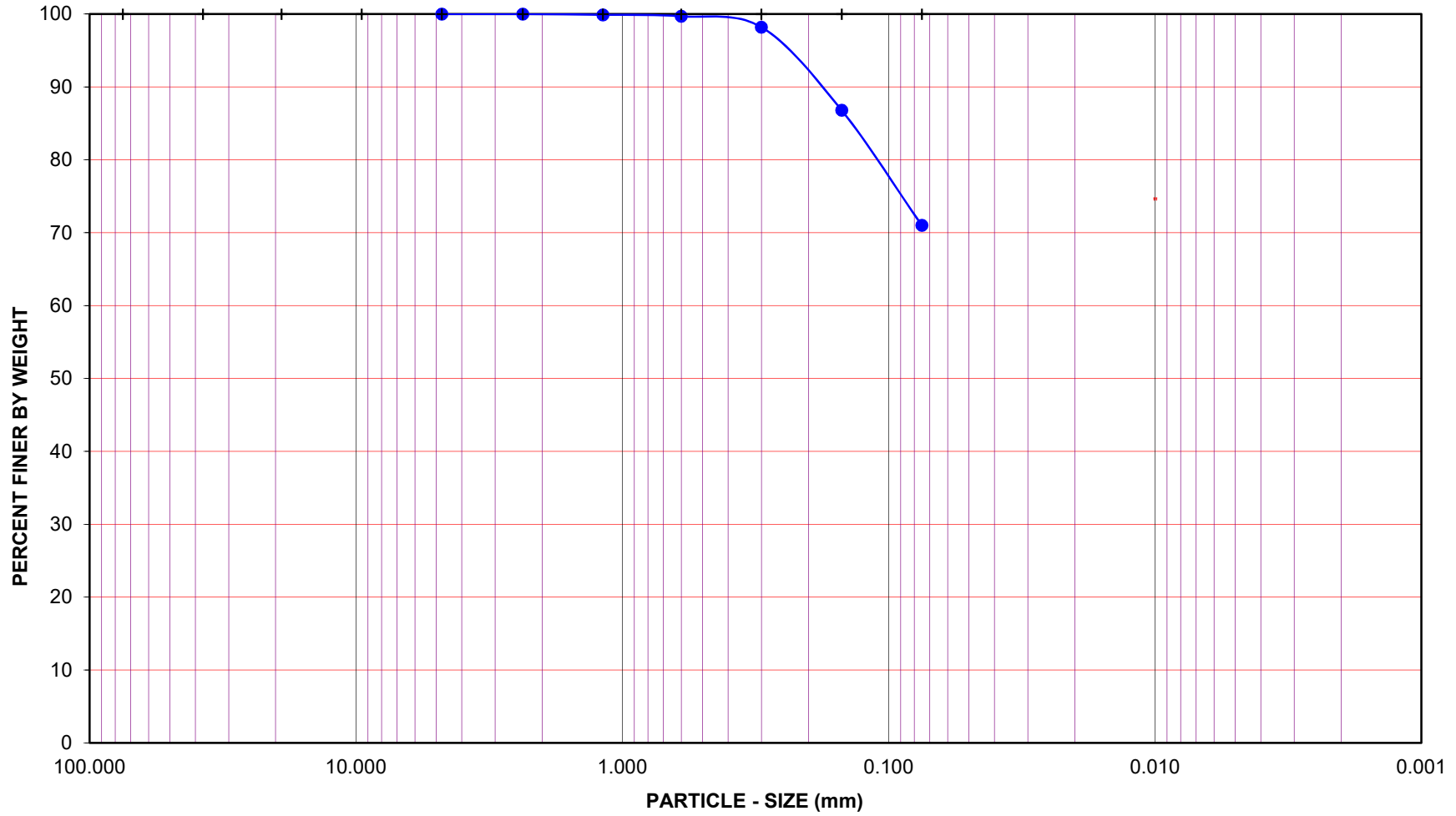
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-3

Sample No.: Depth

(feet): 5.0

Soil Type(ML)s

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

GR:SA:FI : (%) 0 : 29 : 71

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

JUL-19

**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-1

Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<u>GE</u>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<u>599.4</u>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<u>250.2</u>	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)	<u>488.4</u>
	Wt. of Container (g)	250.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.2

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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	<u>0.0</u>	100.0
#16	1.18	<u>0.1</u>	100.0
#30	0.600	<u>0.7</u>	99.8
#50	0.300	<u>14.3</u>	95.9
#100	0.150	<u>119.1</u>	65.9
#200	0.075	<u>229.4</u>	34.3
PAN			

GRAVEL: 0 %

SAND: 66 %

FINES: 34 %

GROUP SYMBOL: SM

Cu = D60/D10 = _____

Cc = (D30)²/(D60*D10) = _____

Remarks: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

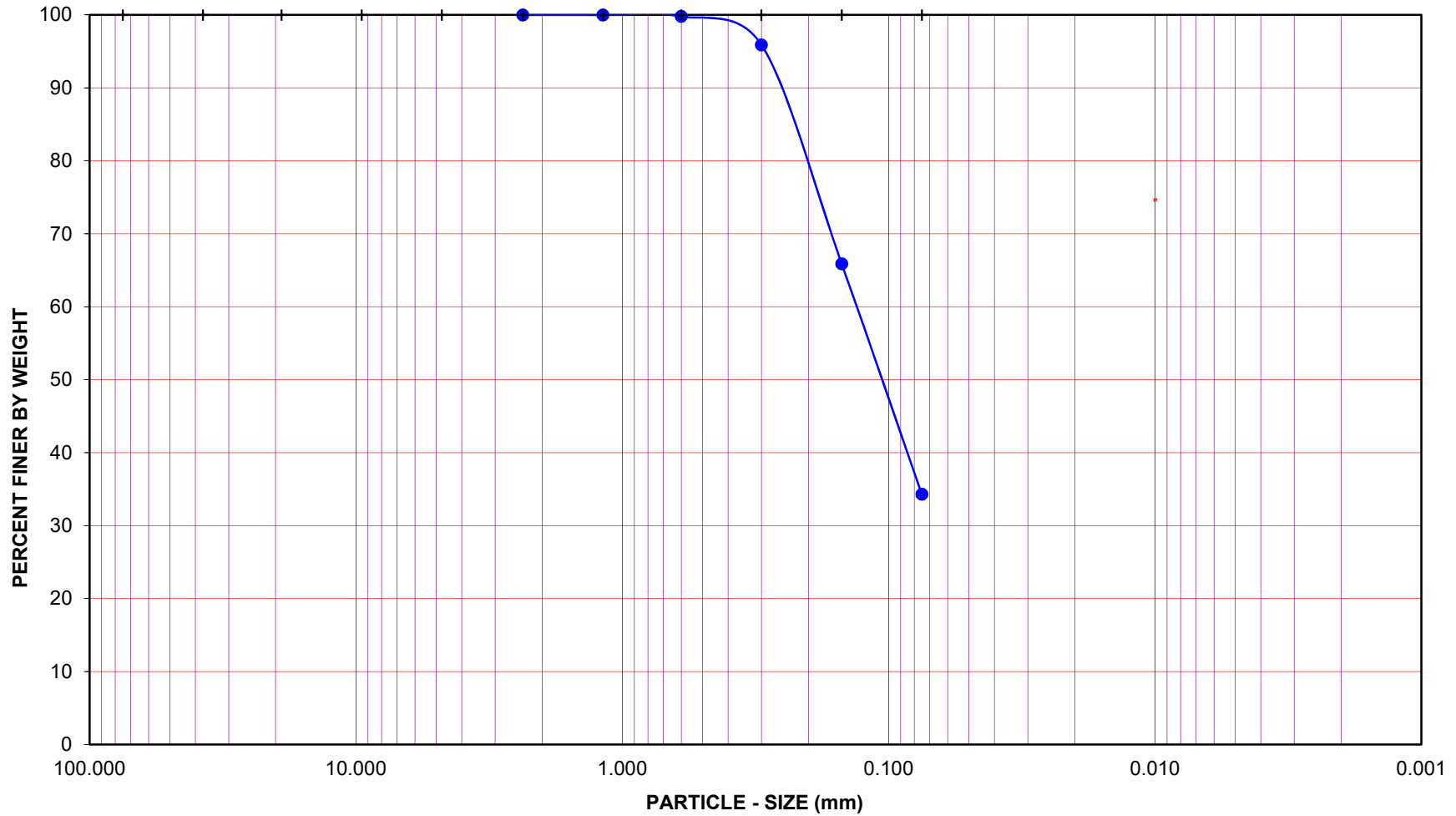
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-1

Sample No.: R-1

Depth (feet): 5.0

Soil Type : SM

Soil Identification: Olive silty sand (SM)

GR:SA:FI : (%) 0 : 66 : 34

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**


JUL-19

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 (0')*							
Depth (ft)	% Organics						
1.0	0.6						
4.0	1.1						

Legend

> 5%	"High" Organic Content "Soils" Recommended for Export from Site
2 to 5%	"Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils
< 2%	"Clean" Soils

Note: (#)'* 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: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Brookfield	Type of Rig: Track Rig
Project Number: 20246-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~755' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	5 6 7	105.7	2.1	SP-SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND with Silt: dusky brown, dry, medium dense @5' - Silty SAND: dusky brown, dry, medium dense @10' - Silty SAND: dusky brown, slightly moist, medium dense	
750	5		R-2	4 6 10	109.5	3.7	SM		
745	10		SPT-1	4 5 6		5.8			
740	15		R-3	4 8 13	101.2	8.1	ML	@14' - Sandy SILT: dusky brown slightly moist, stiff	#200
735	20							Total Depth = 16' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021	
730	25								
725	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole I-2

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Brookfield	Type of Rig: Track Rig
Project Number: 20246-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	9 11 9	105.5	3.7	SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: gray brown, dry, medium dense @5' - Silty SAND: dusky gray brown, dry, medium dense	EI CR #200
750	5		R-2	5 8 13	112.0	3.5			
745	10		SPT-1	6 5 6		5.9		@10' - Silty SAND: dusky gray brown, slightly moist, medium dense	
740	15								
735	20		R-3	7 14 9	101.2	1.9	SP-SM	@20' - SAND with Silt: dusky gray brown, dry, medium dense	#200
730	25							Total Depth = 22' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021	
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-1

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~766' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
765	0							@0' to 2.5' Artificial Fill - Undocumented (afu) @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND: gray brown, slightly moist, medium dense	
760	5		R-1	5 8 15	106.6	5.3	SM	@5' - Silty SAND: olive gray, slightly moist, medium dense	#200 CO
			SPT-2	4 5 7		6.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium dense	
755	10		R-2	4 9 15	105.6	2.3	SM	@10' - Silty SAND: gray brown, slightly moist, medium dense	
750	15		SPT-3	5 6 8		3.4	SM	@15' - Silty SAND: olive gray, slightly moist, medium dense	
745	20		R-3	13 14 16	105.7	4.1	SP	@20' - SAND: gray brown, slightly moist, medium dense	
740	25							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-2

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test	
755	0	B-1	R-1	4 5 7	102.0	4.4	SM	@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, loose	#200 CO	
750	5		SPT-1	4 5 6	101.1	2.5	SM			@5' - Silty SAND: olive brown, slightly moist, medium dense
745	10		R-2	14 15 18	111.1	3.5	SM			@7.5' - Silty fine SAND: gray brown, slightly moist, medium dense
740	15		SPT-2	3 6 7	101.1	2.5	SM			@10' - Silty Fine SAND: gray brown, slightly moist, medium dense
735	20	R-3	8 16 22	111.1	3.5	SM	@15' - Silty SAND with Gravel: gray, slightly moist, medium dense			
730	25	SPT-3	6 6 8	111.1	3.5	SM	@20' - Silty SAND: brown, moist, medium dense			
	30	R-4	8 13 15	96.0	4.2	SP	@25' - SAND: gray brown, slightly moist, 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 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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-2

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	30		SPT-4	5 6 11		10.9	SC	@30' - Clayey SAND: brown, moist, medium dense	
720	35		R-5	8 14 22	114.5	9.5	SC	@35' - Clayey SAND: gray and reddish brown mottled, moist, medium dense; iron oxide staining; pin hole porosity	
715	40		SPT-5	10 17 22		10.6	SM	@40' - Silty SAND: gray brown, moist, dense; minor iron oxide staining	
710	45		R-6	6 12 18	110.2	18.2	ML	@45' - SILT: olive brown and reddish orange mottled, very moist, very stiff; iron oxide staining	
705	50		SPT-6	13 23 25		9.5	SM	@50' - Silty SAND: gray brown, moist, very dense	
700	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
60									



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-3

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0							@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets	
			SPT-1	3 5		5.7	SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: gray brown, slightly moist, medium dense	
750	5		R-1	8 8 11	101.9	10.7	ML	@5' - SILT with Sand: olive brown, moist, stiff; roots; wood fragments	#200 CO
			SPT-2	8 9 11		5.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium dense	
745	10		R-2	9 15 21	111.4	2.5	SP	@10' - SAND: gray brown, slightly moist, medium dense	
740	15		SPT-3	3 6 9		15.0	ML	@15' - Sandy SILT: olive gray, very moist, very stiff	
735	20		R-3	3 9 14	99.6	12.6	SM	@20' - Silty SAND: olive brown, moist, medium dense; white root casts	
730	25							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
	30								



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

TEST TYPES:
 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-4

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	9 10 16	108.3	4.9	SM	<p>@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, medium dense; white rootlets @5' - Silty SAND: olive gray, slightly moist, loose</p>	EI MD CR
750	5		SPT-1	4 4 4		3.9	SM		
745	10		R-2	5 10 15	88.9	3.6	ML		
740	15		SPT-2	4 7 10		1.5	SM	@10' - Silty SAND: gray brown, dry, medium dense	
735	20		R-3	8 9 13	99.9	10.2	SM	@15' - Silty SAND: brown, moist, medium dense	
730	25		SPT-3	12 10 10		1.8	SP	@20' - SAND with Gravel: gray brown, dry, medium dense	
	30							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-5

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test	
755	0	B-1	R-1	5 9	101.3	2.5	SP	@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND: gray brown, slightly moist, medium dense	EI MD	
750	5		SPT-1	3 4 4		4.5	SP			@5' - SAND: gray brown, slightly moist, loose
745	10		R-2	8 9 10	106.8	7.7	SM			@7.5' - Silty SAND: olive brown, moist, medium dense
740	15		SPT-2	4 6 8		5.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium dense		
735	20		R-3	9 14 19	130.6	1.8	SP	@15' - SAND: gray brown, dry, medium dense		
730	25		SPT-3	8 10 9		4.9	SP	@20' - SAND: gray brown, slightly moist, medium dense		
	30	Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-6

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~763' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
760	0	B-1	R-1	5 6 10	103.4	4.0	SP	@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND: olive brown, slightly moist, medium dense @5' - Clayey SAND: brown, moist, medium dense	MD EI
755	5		SPT-1	4 5 6	97.5	9.0	SM		
750	10		R-2	5 9 12	97.5	9.0	SM	@7.5' - Silty SAND: light olive brown, moist, medium dense; white root casts @10' - Silty SAND: olive brown, moist, loose	#200 CO
745	15		SPT-2	4 4 4	102.6	8.5	SM		
740	20		R-3	4 8 12	102.6	8.5	SM	@15' - Silty SAND: gray brown, moist, medium dense @20' - SAND: gray brown, moist, medium dense	
735	25		SPT-3	6 6 9	93.9	10.7	SP		
730	30		R-4	3 6 9	93.9	10.7	SM	@25' - Silty SAND: gray brown, moist, medium dense; trace gravel	



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-6

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~763' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
730	30		SPT-4	5 6 10		15.4	ML	@30' - SILT: brown with reddish brown mottled, very moist, very stiff	
725	35		R-5	13 18 50	114.2	8.5	SC	@35' - Clayey SAND: reddish brown and brown mottled, moist, very dense	
720	40		SPT-5	12 15 20		5.4	SP	@40' - SAND: brown, slightly moist, dense	
715	45		R-6	17 27 27	123.6	6.3	SP	@45' - SAND: brown, slightly moist, dense; trace amounts of clay	
710	50		SPT-6	8 23 26		2.4	SP	@50' - SAND: reddish brown, slightly moist, very dense	
705	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
60									



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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LGC Geotechnical, Inc.

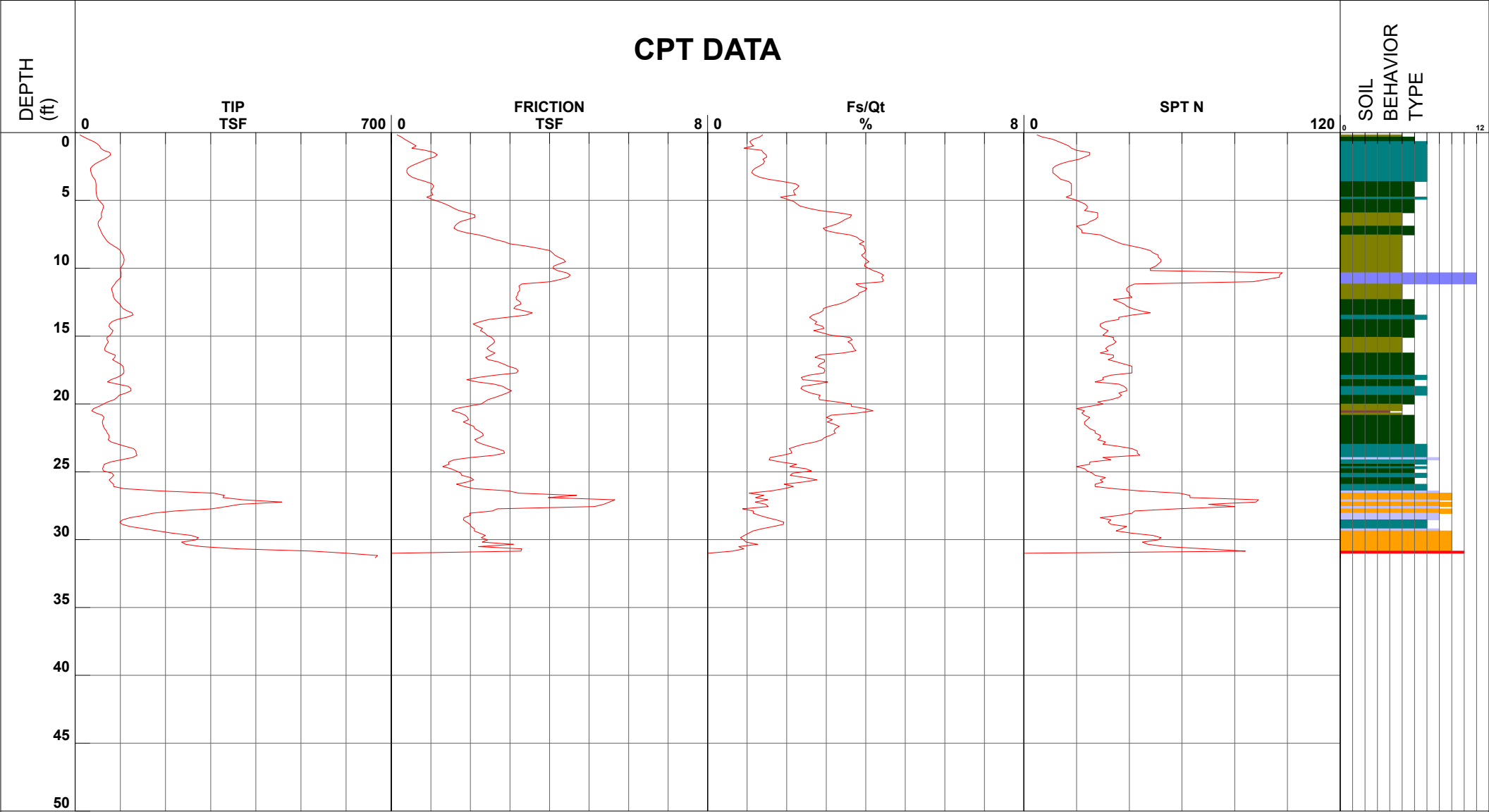
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 Hole Number CPT-01
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Filename SDF(768).cpt
 GPS _____
 Maximum Depth 31.33 ft

Net Area Ratio .8

CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

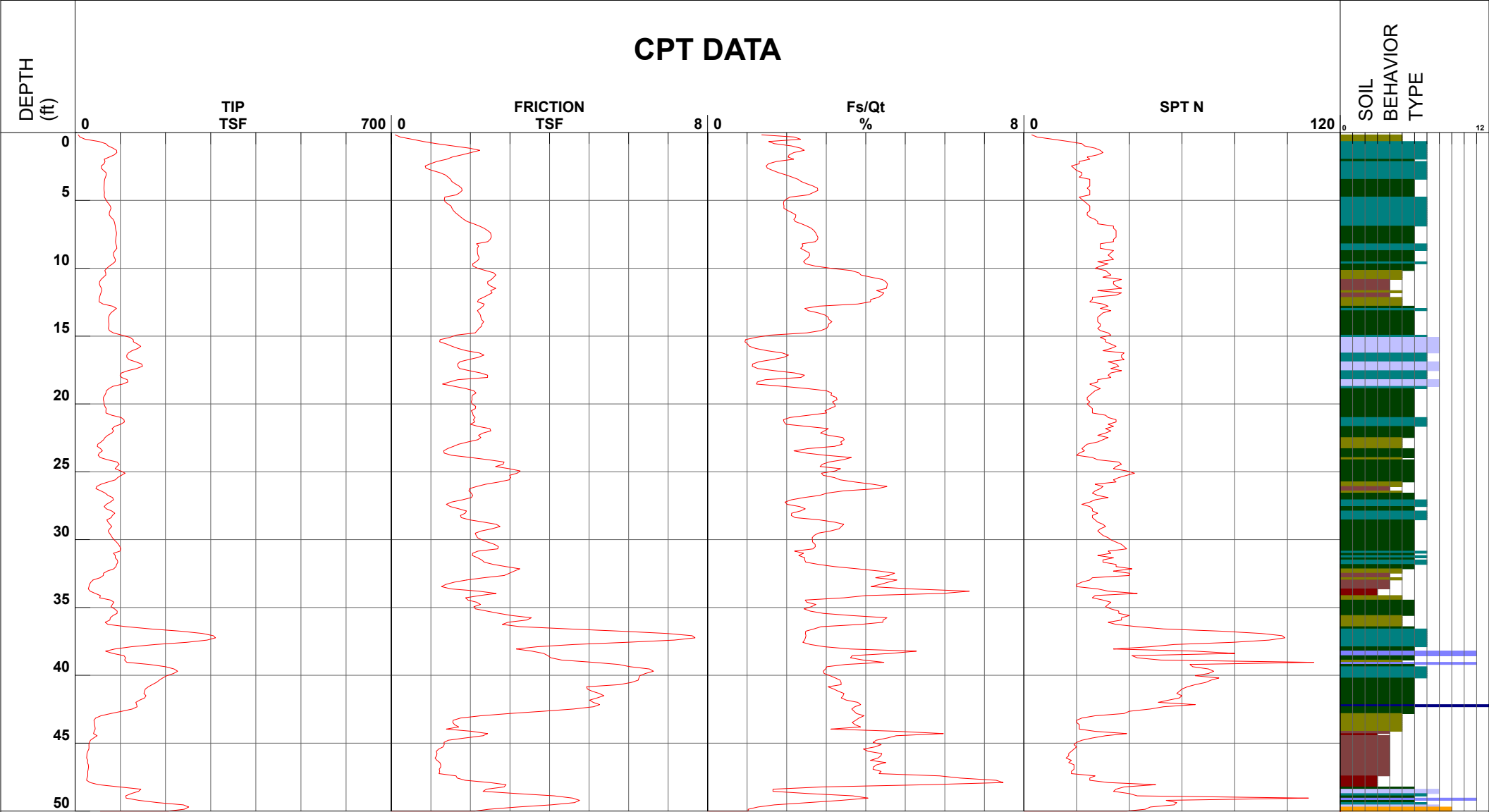
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 Job Number 16163-01
 Hole Number CPT-02
 EST GW Depth During Test _____

Operator RC AS
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Filename SDF(769).cpt
 GPS _____
 Maximum Depth 50.52 ft

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay

- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt

- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand

- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

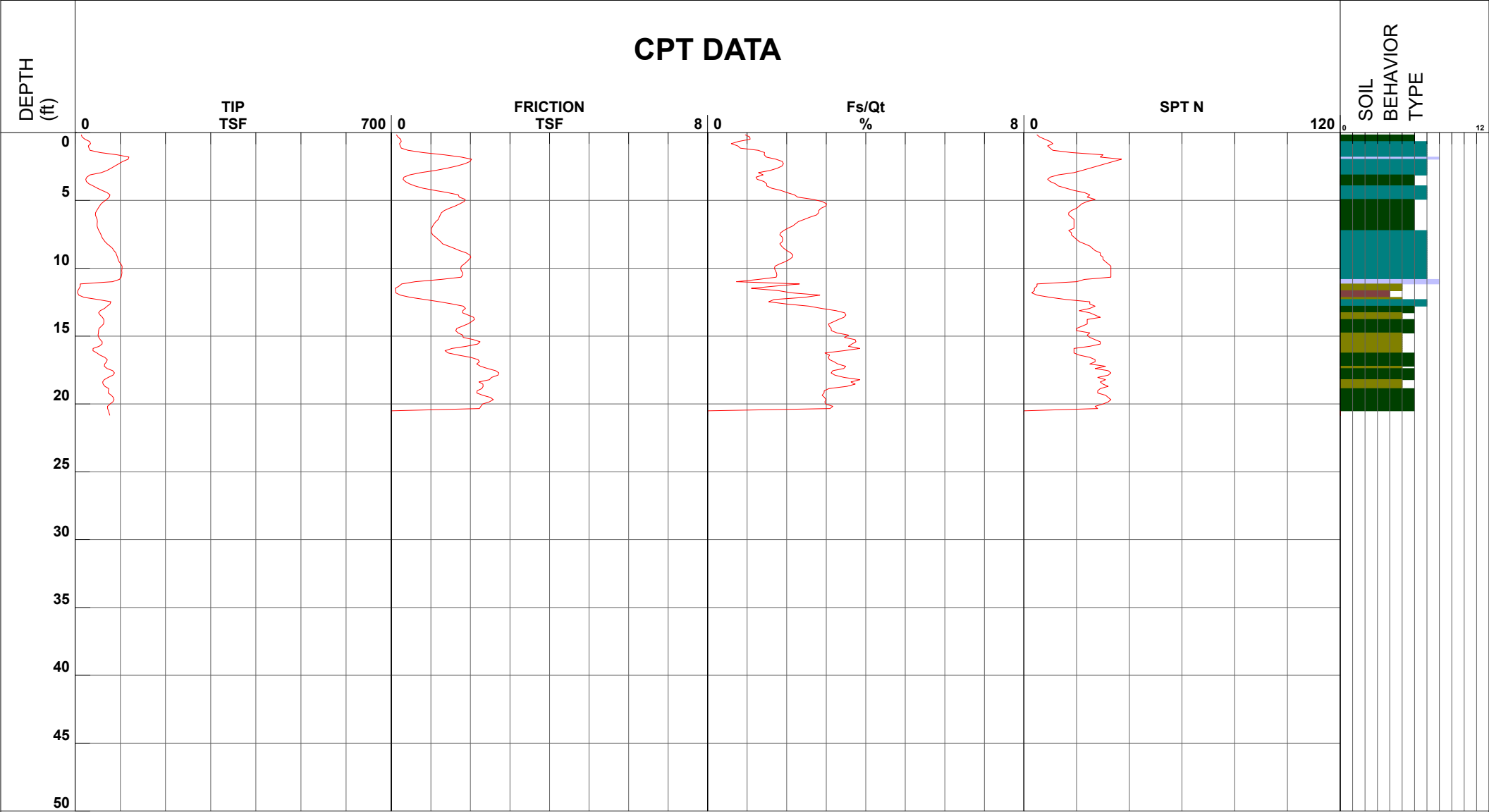
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 Job Number 16163-01
 Hole Number CPT-03
 EST GW Depth During Test _____

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

Filename SDF(770).cpt
 GPS _____
 Maximum Depth 20.83 ft

Net Area Ratio .8

CPT DATA



SOIL BEHAVIOR TYPE

- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

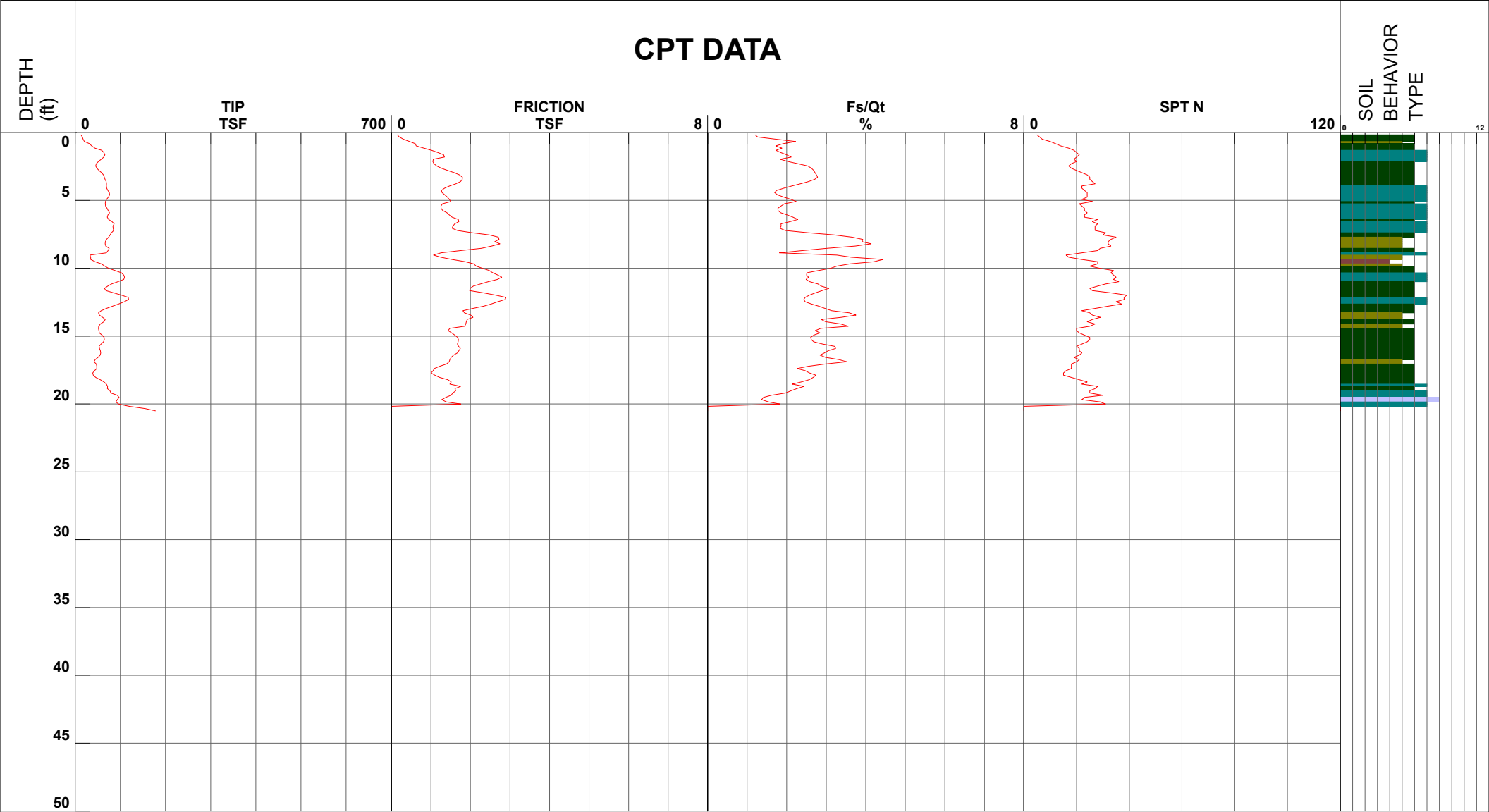
Project Colonial
 Job Number 16163-01
 Hole Number CPT-04
 EST GW Depth During Test _____

Operator RC AS
 Cone Number DDG1471
 Date and Time 6/20/2019 2:19:06 PM
 100.00 ft

Filename SDF(771).cpt
 GPS _____
 Maximum Depth 20.51 ft

Net Area Ratio .8

CPT DATA



SOIL
BEHAVIOR
TYPE

- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



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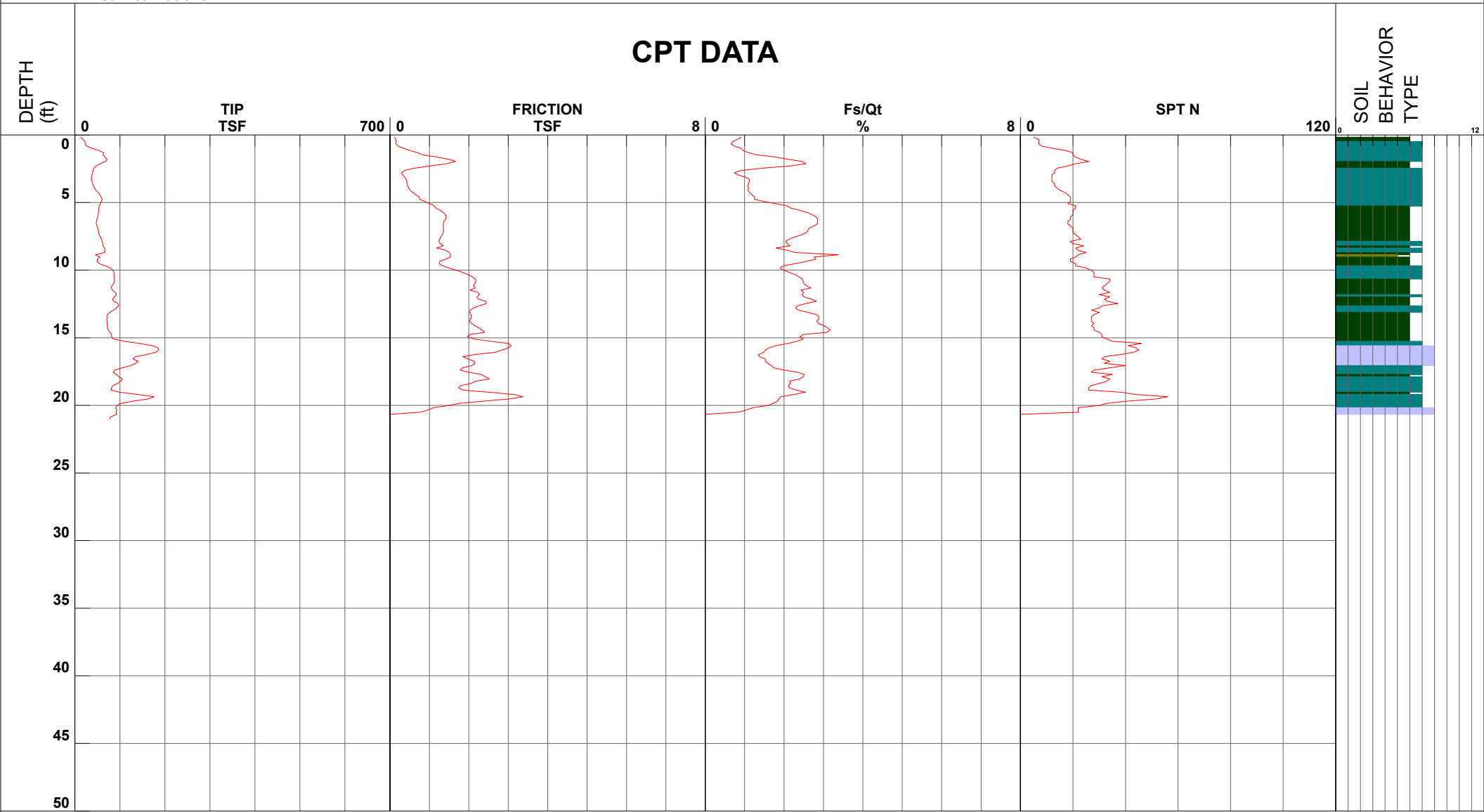
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 Hole Number CPT-05
 EST GW Depth During Test _____

Operator RC AS
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Filename SDF(772).cpt
 GPS _____
 Maximum Depth 21.00 ft

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay

- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt

- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand

- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

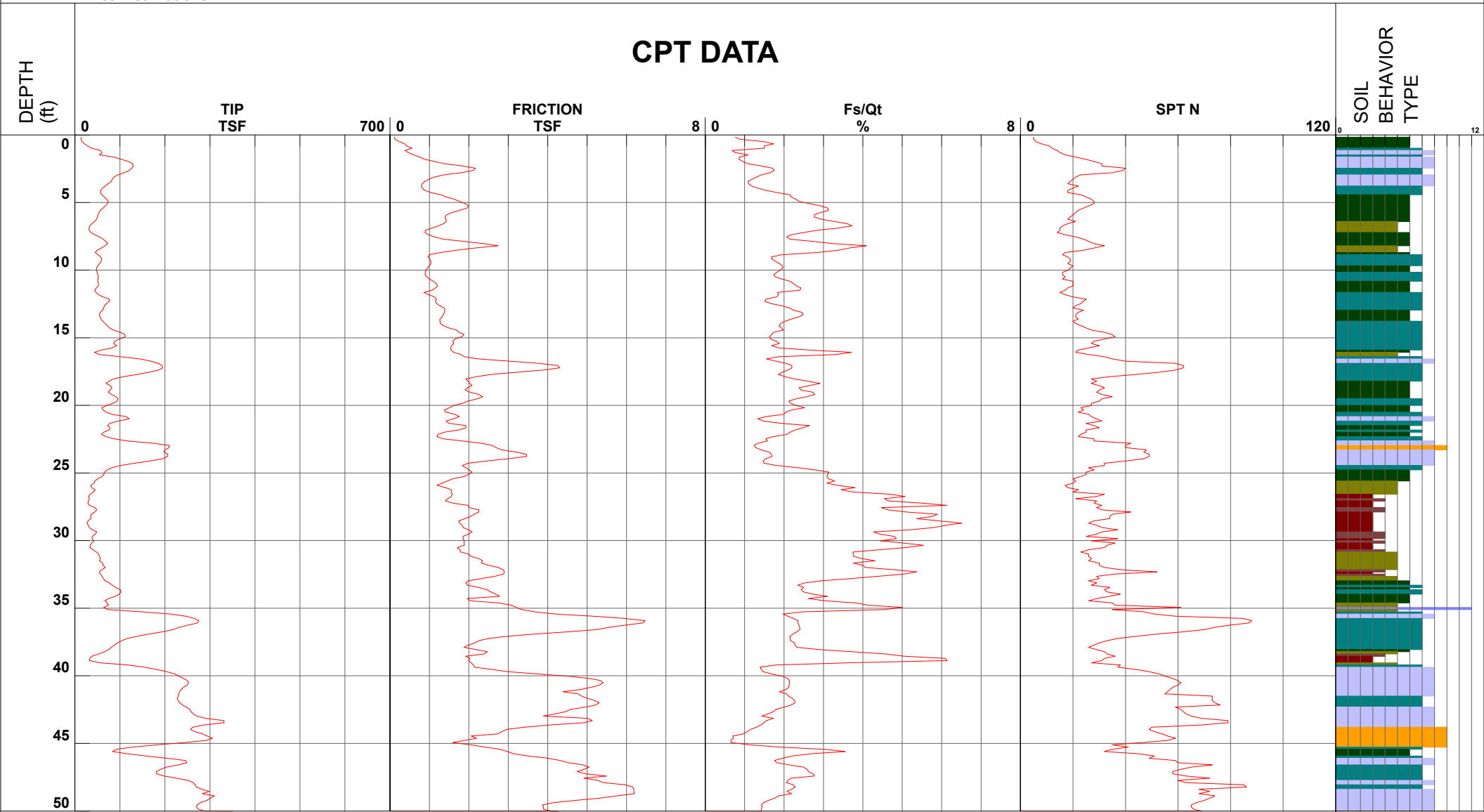
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 Job Number 16163-01
 Hole Number CPT-06
 EST GW Depth During Test _____

Operator RC AS
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 Date and Time 6/20/2019 2:56:46 PM
 100.00 ft

Filename SDF(773).cpt
 GPS _____
 Maximum Depth 50.69 ft

Net Area Ratio .8


CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

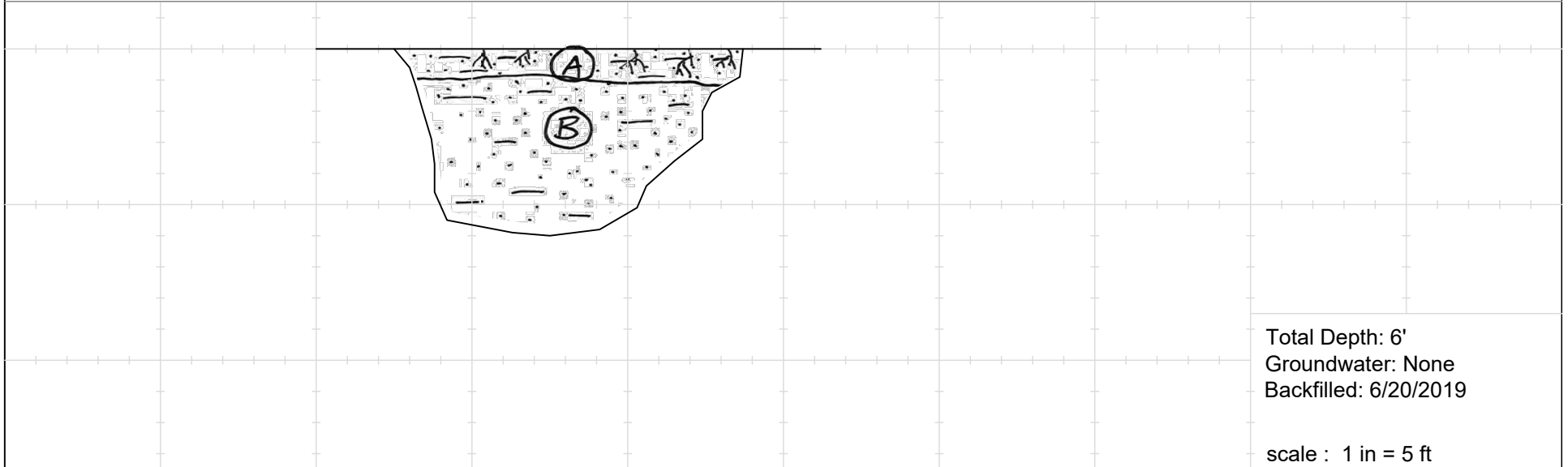
Cone Size 10cm squared


S*Soil behavior type and SPT based on data from UBC-1983

Project Name: Colonial		Logged By: ARN	Trench No: TP-1		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Sandy SILT to Silty SAND: medium to dark brown, dry, loose/soft; abundant rootlets	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; increasing moisture with depth; occasional root; massive	Qye	SM-SP			

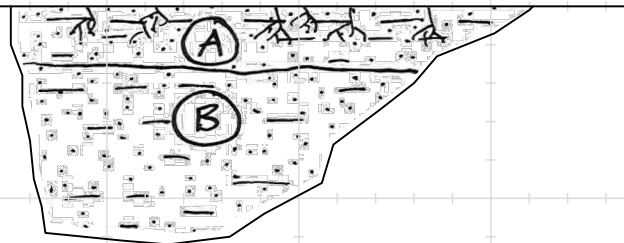
GRAPHICAL REPRESENTATION BELOW: **Elevation : 758 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



Project Name: Colonial		Logged By: ARN	Trench No: TP-2		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.75' Sandy SILT to Silty SAND: dusky to dark brown, dry, loose/soft; abundant rootlets in upper 12 inches	afu	SM/ML	B-1		
	b	Quaternary Young Eolian Deposits @1.75'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; increasing moisture with depth; occasional root; massive	Qye	SM-SP			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 756 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



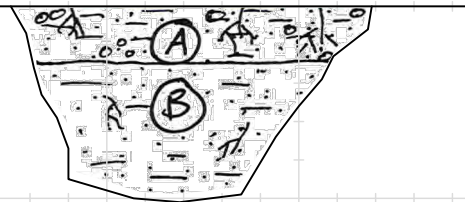
Total Depth: 6.2'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-3		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry , soft/loose; abundant rootlets; occasional gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; infrequent roots and old decaying organics; grades to moist with depth; massive	Qye	SM-SP			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 754 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



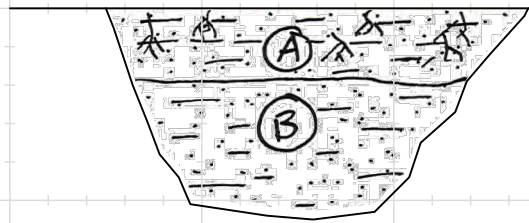
Total Depth: 5.1'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-4		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-2' Silty SAND to Sandy SILT: dusky brown to brown, dry, soft/loose; abundant rootlets; scattered refuse	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: medium brown, slightly moist, medium dense; some small zones of sandy silt; increased moisture with depth	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 755 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



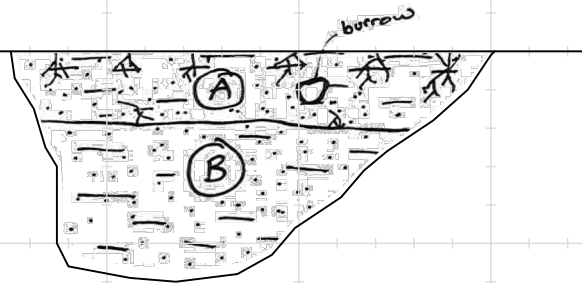
Total Depth: 5.5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-5		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: dusky brown, dry, loose/medium stiff; roots; scattered gravel @1'-2' Silty SAND: medium to tan brown, dry to slightly moist, medium dense; occasional root; iron oxide stained burrow	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: medium brown, slightly moist to moist, medium dense	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 758 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



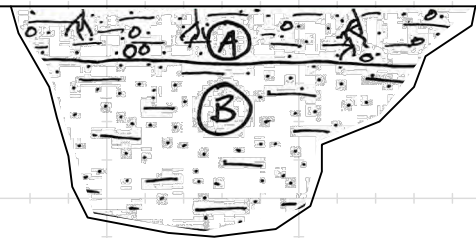
Total Depth: 6'
 Groundwater: None
 Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-6		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry, loose/medium stiff; roots; scattered gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND: tan to medium brown, slightly moist, medium dense; some staining; massive; mottled to 3' then homogeneous coloration	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 764 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



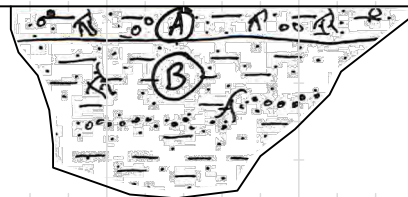
Total Depth: 6'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-7		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel	afu	SM/ML			
	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	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 762 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



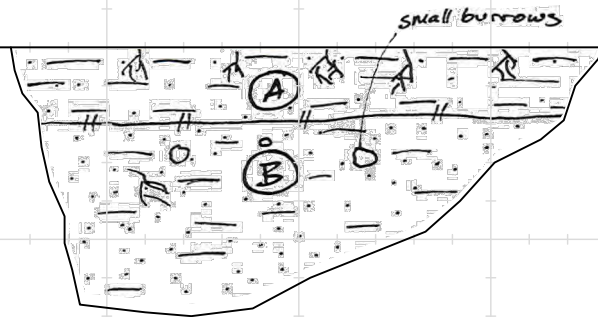
Total Depth: 5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-8		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-2' Sandy SILT: dusky brown, dry, loose/soft; scattered gravel; abundant rootlets; minor refuse; gradational contact	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: tan to medium brown, slightly moist, medium dense; occasional rootlets; burrows in upper portions of the formation; massive	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 768 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



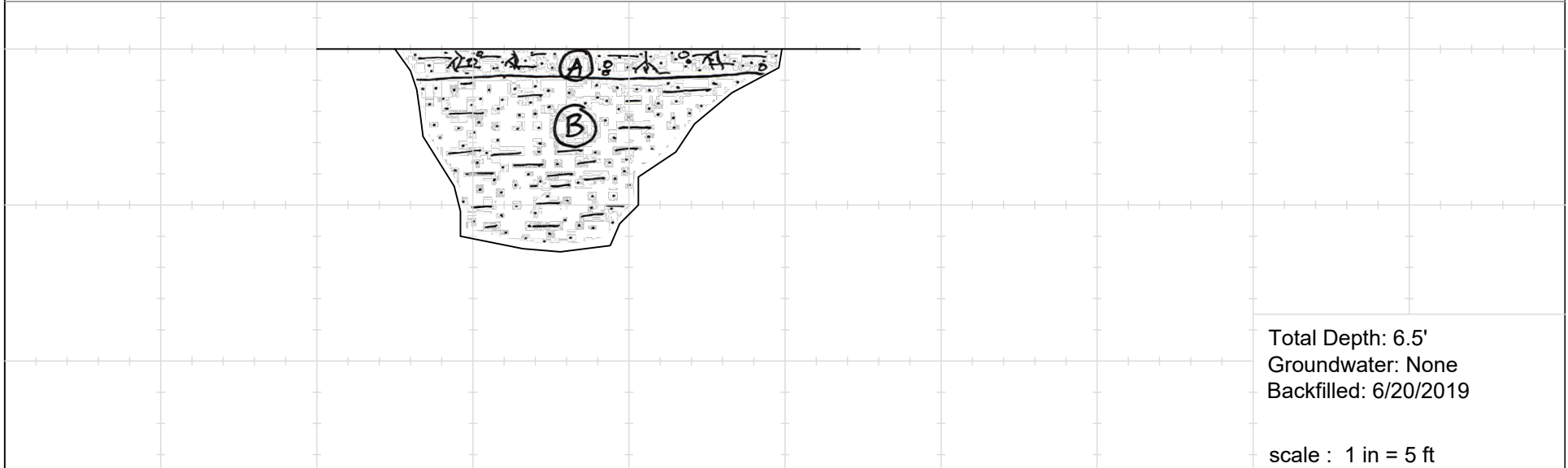
Total Depth: 7'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-9		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0' - 1' Silty SAND to Sandy SILT: dusky brown, dry, loose/soft; abundant rootlets; scarce gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1'-2.5' Silty SAND: medium brown, dry to slightly moist, loose to medium dense @2.5'-T.D. Silty SAND and Sandy SILT: medium brown, slightly moist, medium dense/stiff; noticeably tighter material	Qye	SM SM-ML			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 760 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



Total Depth: 6.5'
Groundwater: None
Backfilled: 6/20/2019

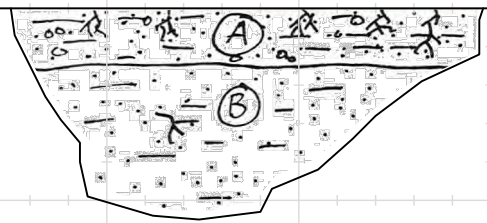
scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-10	
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:	
Equipment: Cat 420F Excavator		Location: See Geotechnical Map		




Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	<i>Artificial Fill - Undocumented</i> @0'-1.5' Silty SAND to Sandy SILT: dusky to medium brown, dry, loose/soft; abundant rootlets; scattered gravel.	afu	SM/ML			
	b	<i>Quaternary Young Eolian Deposits</i> @1.5'-T.D. Silty SAND: medium to tan brown, slightly moist, medium dense; massive; occasional root	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 755 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



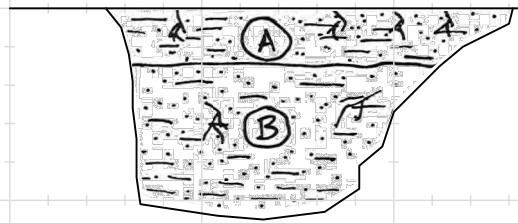
Total Depth: 5.5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-11		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	<i>Artificial Fill - Undocumented</i> @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry, loose/soft; abundant rootlets	afu	SM/ML			
	b	<i>Quaternary Young Eolian Deposits</i> @1.5'-T.D. Silty SAND grading to Sandy SILT: tan brown, slightly moist, medium dense/stiff; occasional root	Qye	SM-ML			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 766 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



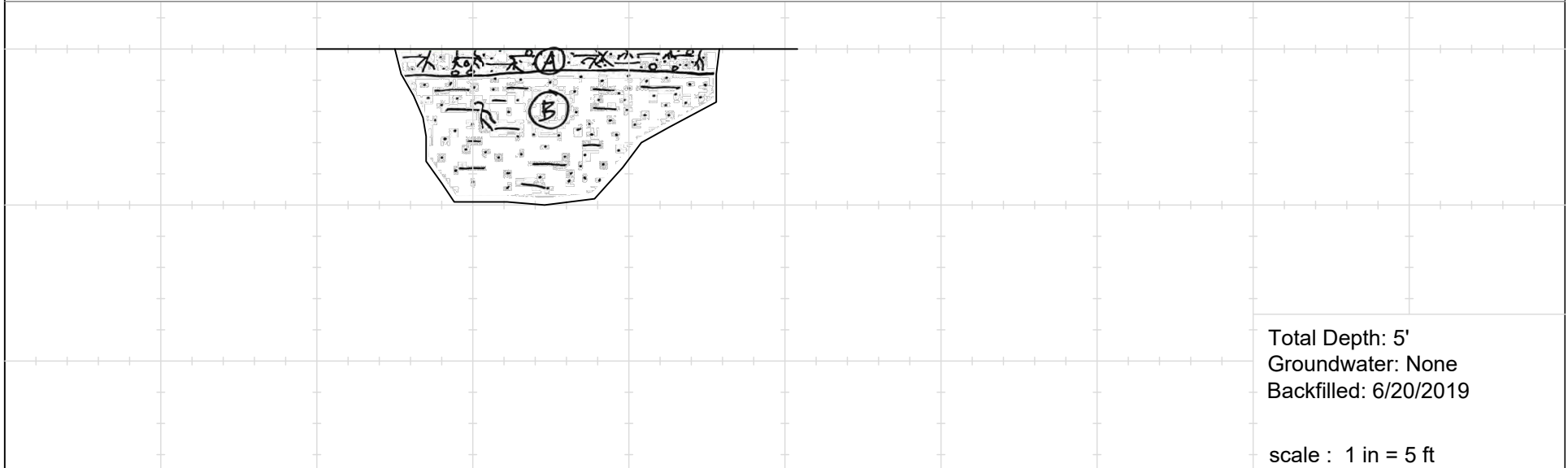
Total Depth: 5.5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-12		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky to medium brown, dry, loose/soft; abundant rootlets; scattered gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND: medium brown, slightly moist, medium dense; massive; occasional root	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 766 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



Last Edited: 6/25/2019

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-1

Test hole dimensions (if circular)	
Boring Depth (feet)*:	16
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)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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)	2.2
Factor of Safety	
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



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

*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)	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
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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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)	1.3
Factor of Safety	
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

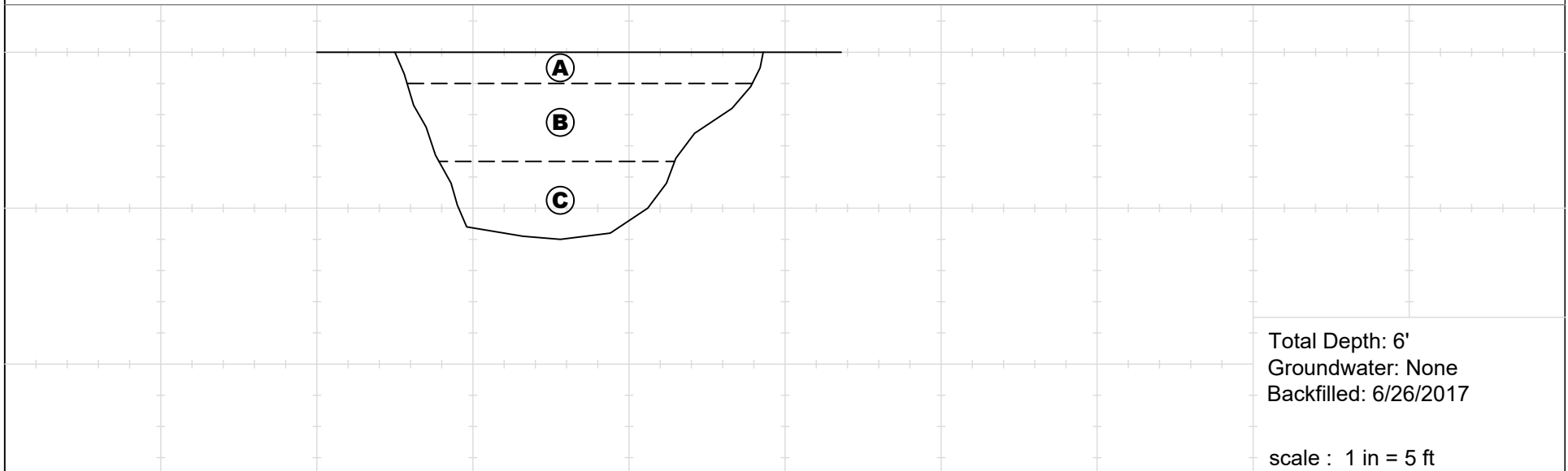
Notes:




Project Name: VanderEyk		Logged By: KTM	Trench No: TP-6		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		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:	Qye				
	B	@ 0' to 1' - SAND: moderately brown variable, dry, loose; organics; roots					
	C	@ 1' to 3.5' - SAND with some SILT: light brown, dry to slightly moist with depth, loose to moderately dense; slightly indurated; few rootlets					
		@ 3.5' to TD - SAND (fine): light brown, slightly dense, moist; "beach sand" appearance					

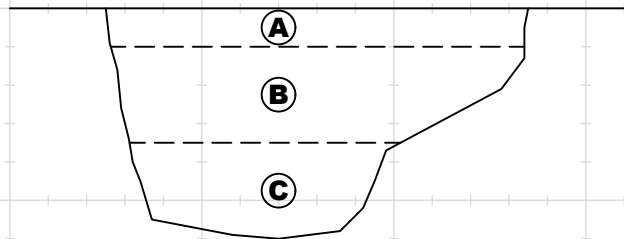
GRAPHICAL REPRESENTATION BELOW: **Elevation : 755 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: VanderEyk		Logged By: KTM	Trench No: TP-7		
Project Number : 17074-01		Date : 6/26/2017	Engineering Properties:		
Equipment: Case Backhoe		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A B C	@ 0' to TD - Quaternary Young Eolian Deposits: @ 0' to 1' - Organic-rich SAND: moderately brown (variable), dry, loose @ 1' to 3.5' - SAND with some Silt: light brown, moderately dense; slightly indurated; rootlets @ 3.5' to TD - SAND (fine): light brown, slightly moist to moist, loose to moderately dense; friable; minor caving	Qye				

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



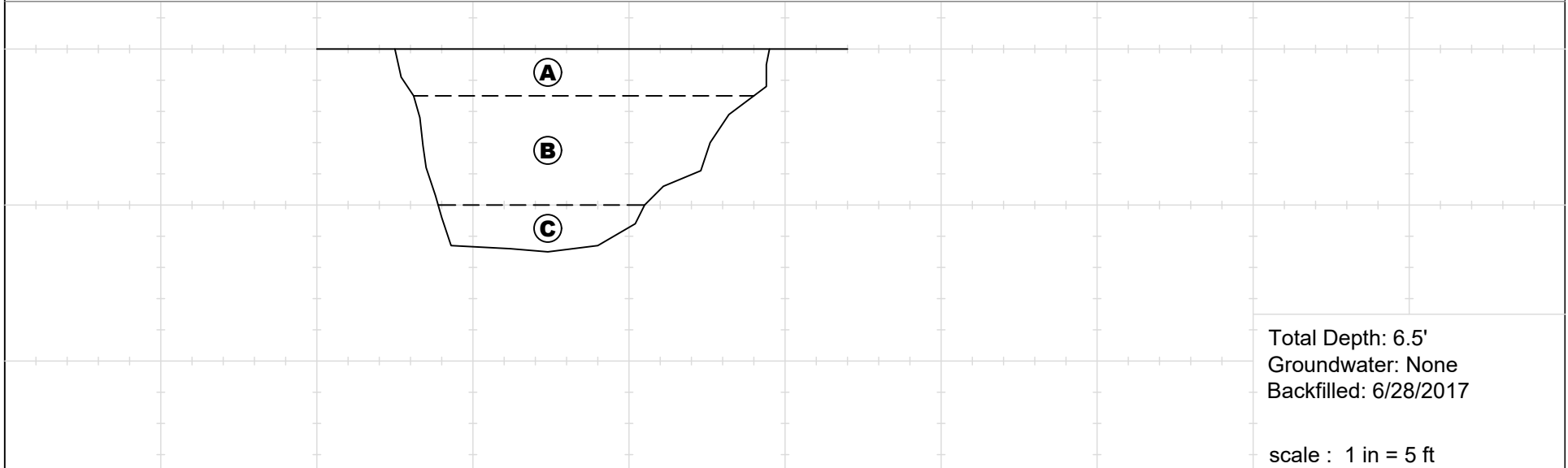
Total Depth: 6'
Groundwater: None
Backfilled: 6/26/2017


scale : 1 in = 5 ft

Project Name: VanderEyk		Logged By: KTM	Trench No: TP-8		
Project Number : 17074-01		Date : 6/28/2017	Engineering Properties:		
Equipment: Case Backhoe		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:	Qye				
	B	@ 0' to 1.5' - Organic-rich SAND and SILT: brown, dry, loose; roots; organics					
	C	@ 1.5' to 5.0' - Silty fine SAND: light brown, dry to slightly moist, moderately dense; increase moisture at 3.5'; decrease induration					
		@ 5.0' to TD - SAND (fine), light brown, moist, moderately dense; homogeneous					

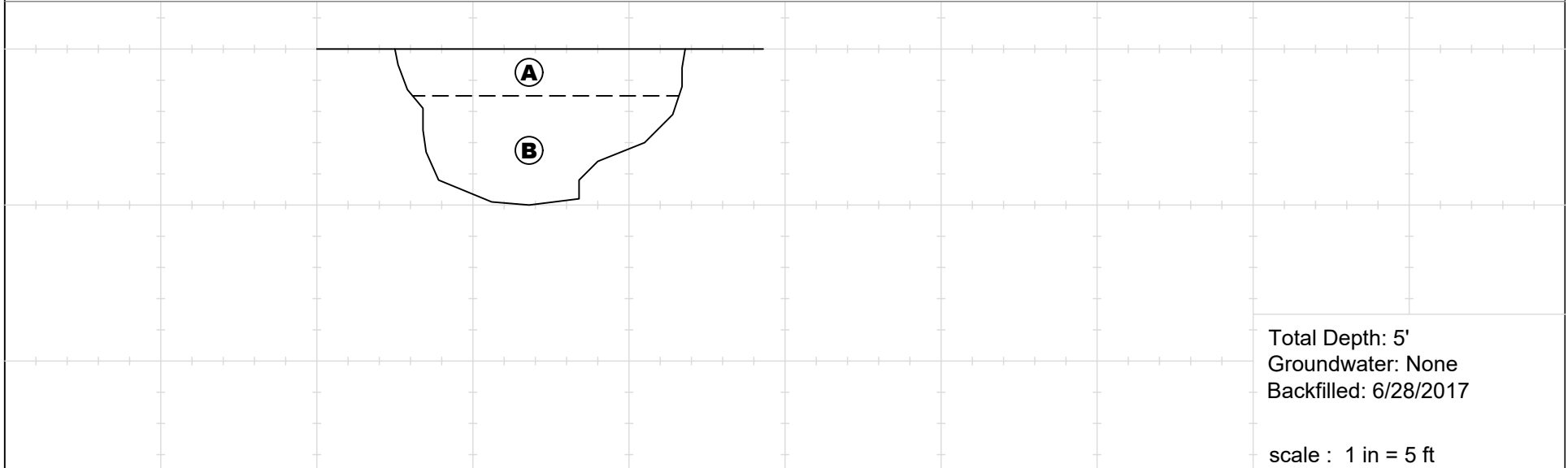
GRAPHICAL REPRESENTATION BELOW: **Elevation : 749 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: VanderEyk		Logged By: KTM	Trench No: TP-9	
Project Number : 17074-01		Date : 6/28/2017	Engineering Properties: 	
Equipment: Case Backhoe		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 1.5' - Organic-rich SAND and SILT: brown and light gray variable, dry, loose; rootlets; minor debris	Qye				
	B	@ 1.5' to TD - SAND with trace Silt: light brown, moist (increasing with depth), moderately dense; few coarse sand lenses @ 1.5' to 2.2' - Laminations; subhorizontal iron oxidation banding					

GRAPHICAL REPRESENTATION BELOW: **Elevation : 748 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



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

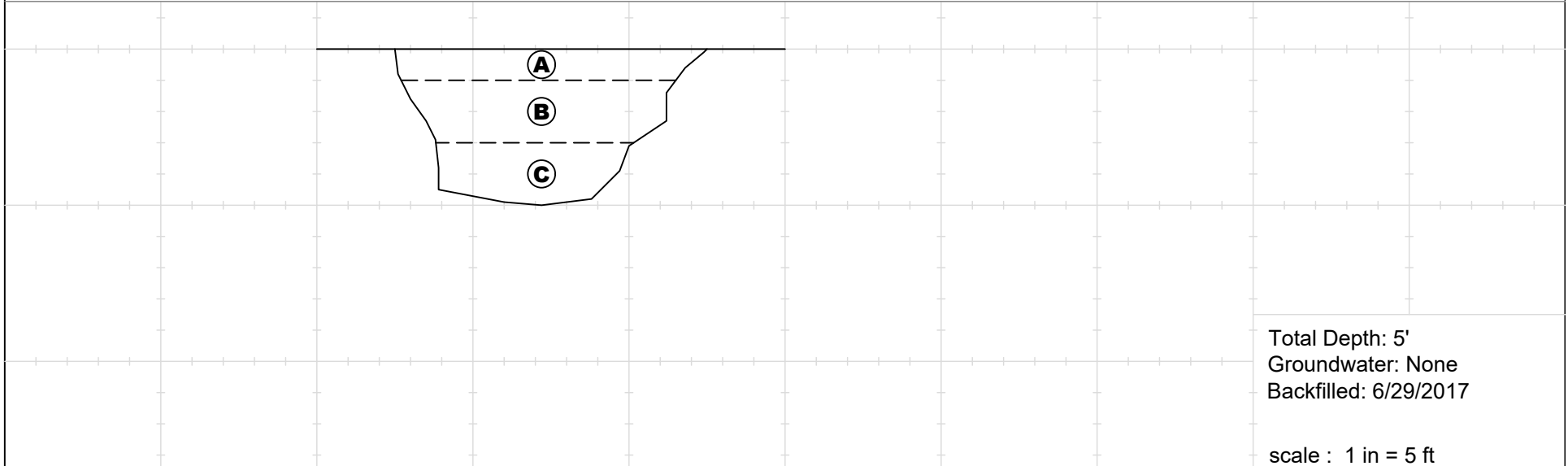
scale : 1 in = 5 ft

Project Name: VanderEyk		Logged By: KTM	Trench No: TP-10	
Project Number : 17074-01		Date : 6/29/2017	Engineering Properties:	
Equipment: Case Backhoe		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 and SILT: brown (variable), dry, loose; rootlets; organic-rich	Qye				
	B	@ 1' to 3' - SAND and SAND with Silt: light brown and gray variable, dry to slightly moist, moderately dense; lenses of silt; rootlets; partially indurated					
	C	@ 3' to 4' - Very thin Silt bed over SAND with Silt: brown and light brown layered; interbedded with coarse sand stringers @ 4 to TD - SAND: light brown, moist, loose to moderately dense; subhorizontal iron oxidation banding; friable					

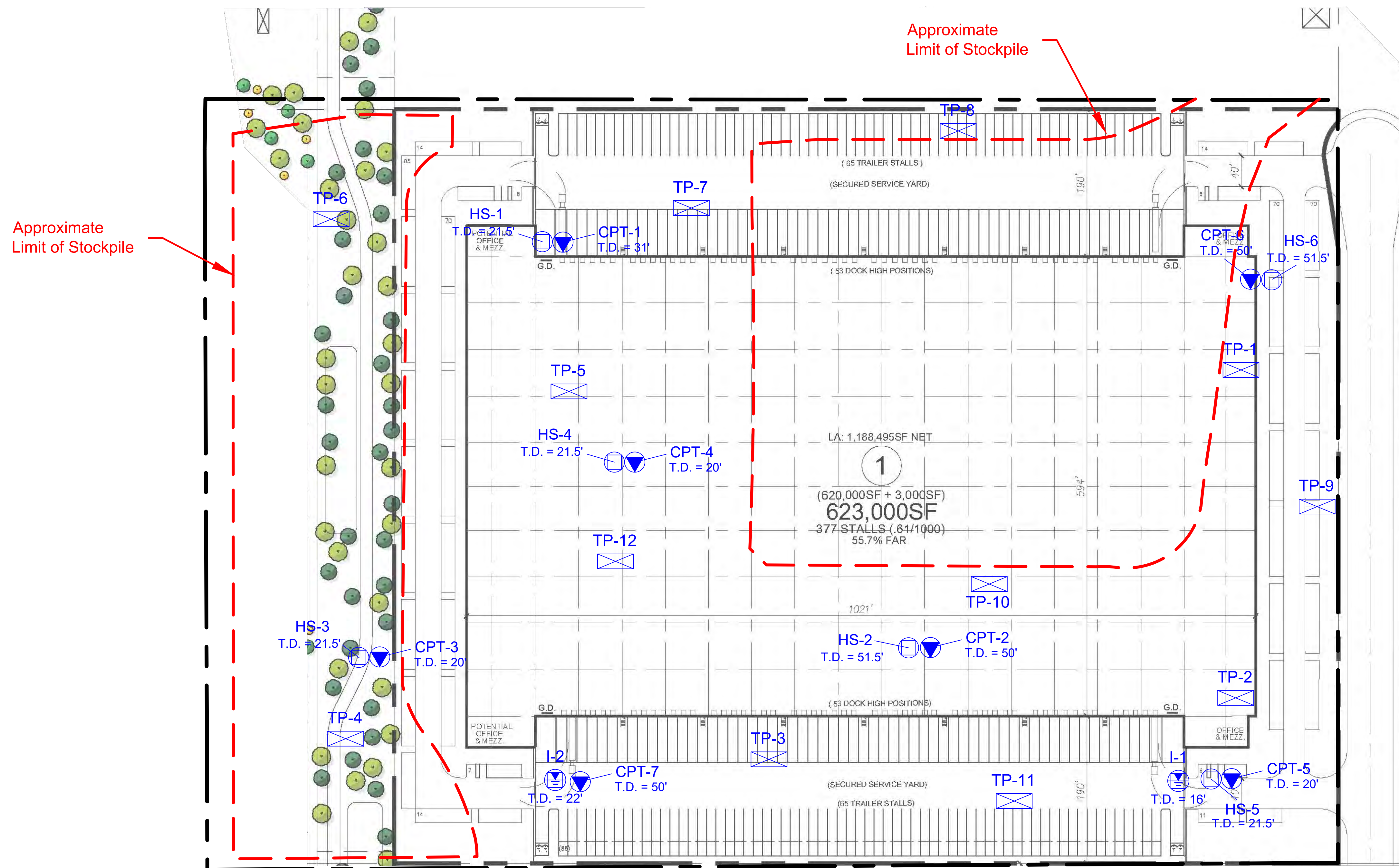
GRAPHICAL REPRESENTATION BELOW: **Elevation : 736 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Total Depth: 5'
Groundwater: None
Backfilled: 6/29/2017




scale : 1 in = 5 ft


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



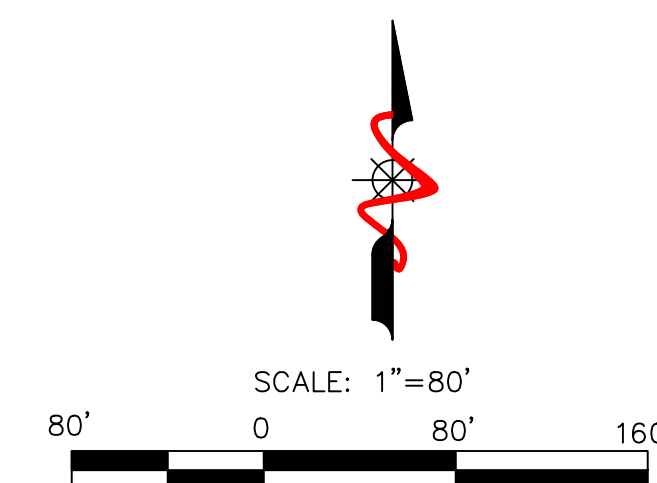
*See Sheet 3 for Additional Shallow Test Pit Locations

LEGEND

- 
HS-6
 T.D. = 21.5'
 Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet
- 
I-2
 T.D. = 22'
 Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet
- 
TP-12
 Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical

- 
CPT-7
 T.D. = 50'
 Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

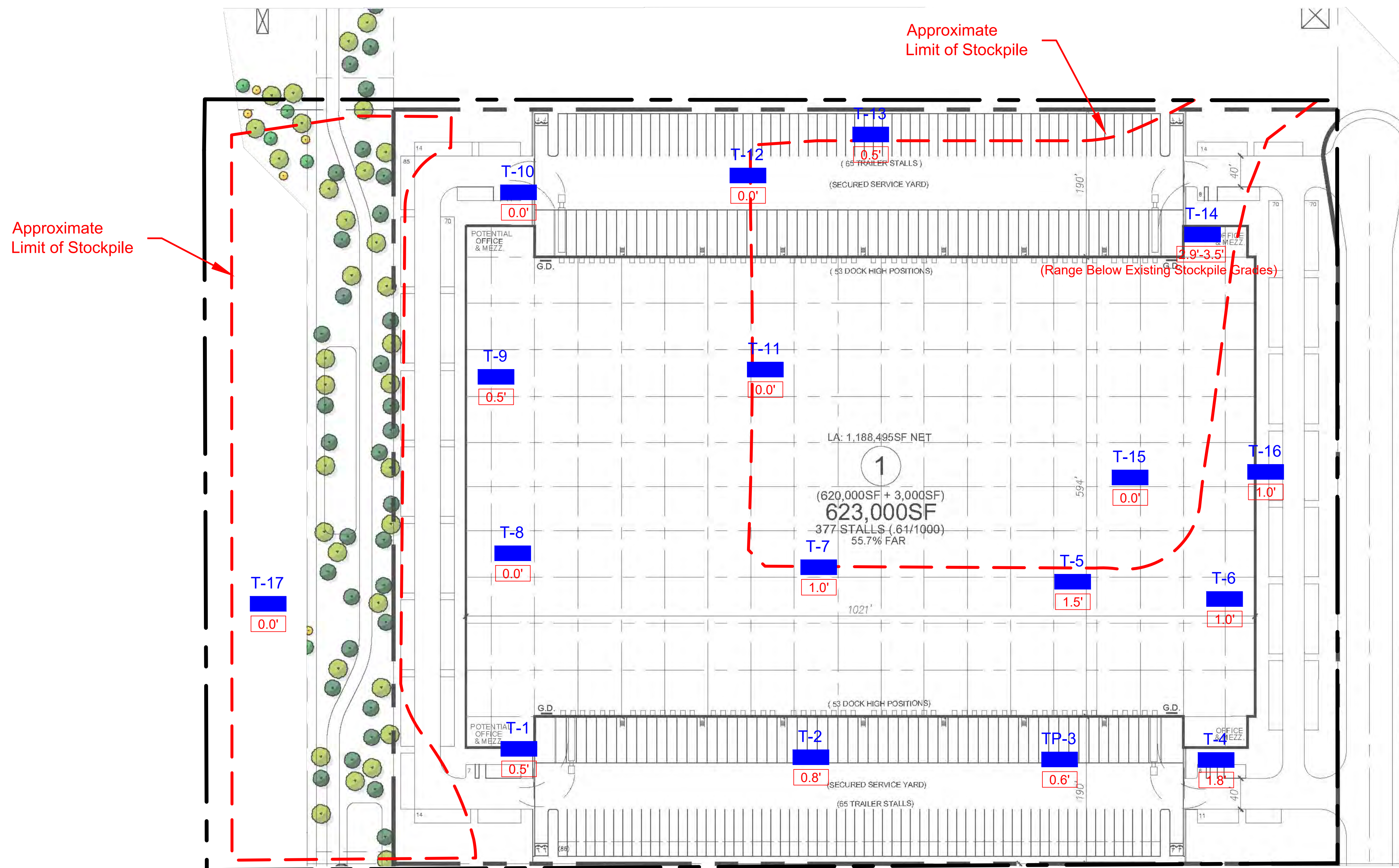
— — — — — Approximate Limits of This Report



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

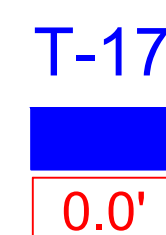
**Geotechnical Exploration Location Map
 With Conceptual Plan**

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



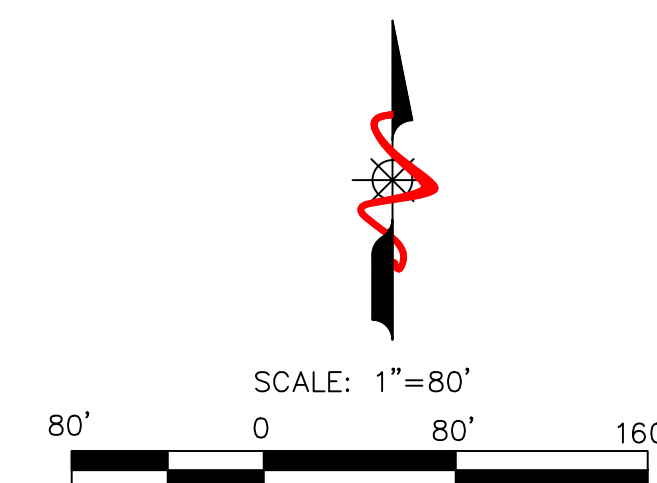
*See Sheets 1 and 2 for Boring, Infiltration Test, CPT and Geotechnical Trench Locations

LEGEND



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
SCALE	1" = 80'
DATE	August 2021

SHEET
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.

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.

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 (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

Collapse/Swell Potential: 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.

Maximum Density Tests: 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)

Expansion Index: 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

* Per ASTM D4829

Soluble Sulfates: 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

Chloride Content: 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	pH	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)

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.

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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-6
 Sample No.: R-2
 Sample Description: Light olive brown silty sand (SM)

Tested By: G. Bathala Date: 07/16/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 7.5

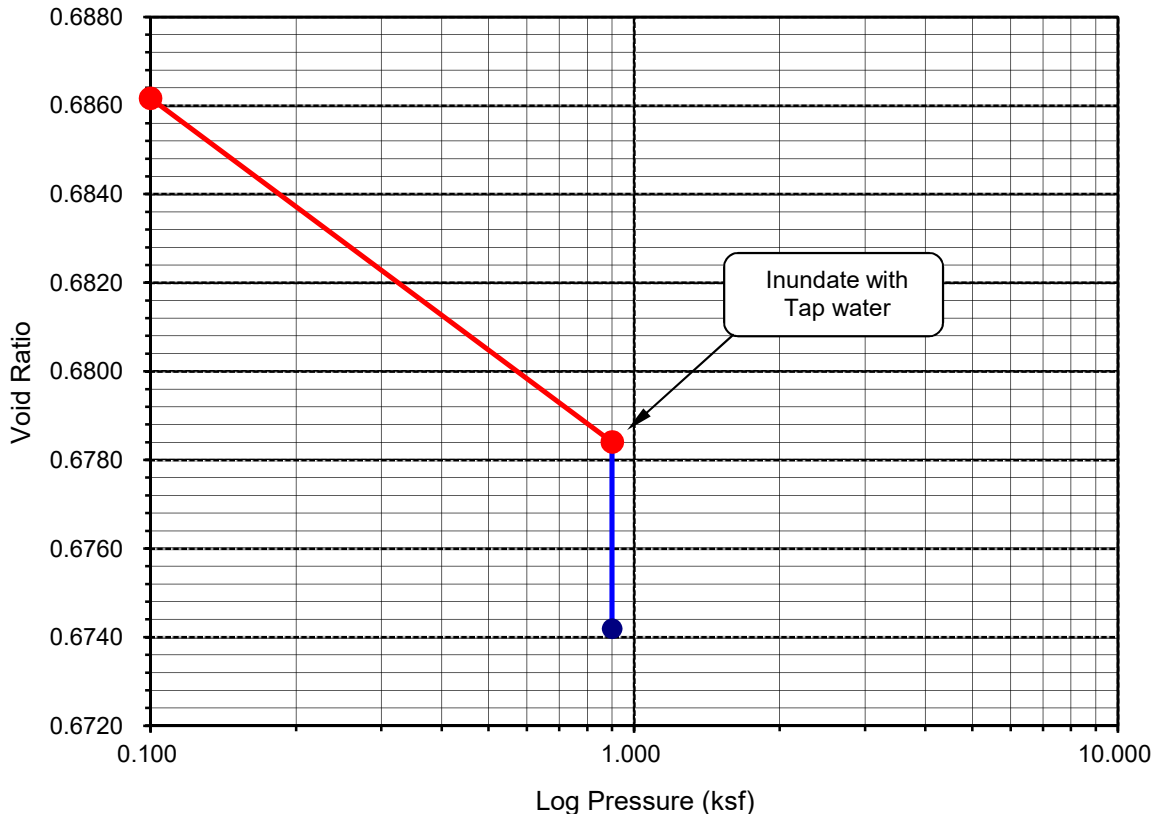
Initial Dry Density (pcf):	100.0
Initial Moisture (%):	9.04
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2702
Diameter(in):	2.415

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

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

Percent Swell (+) / Settlement (-) After Inundation = -0.25

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-2
 Sample No.: R-1
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 07/16/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 2.5

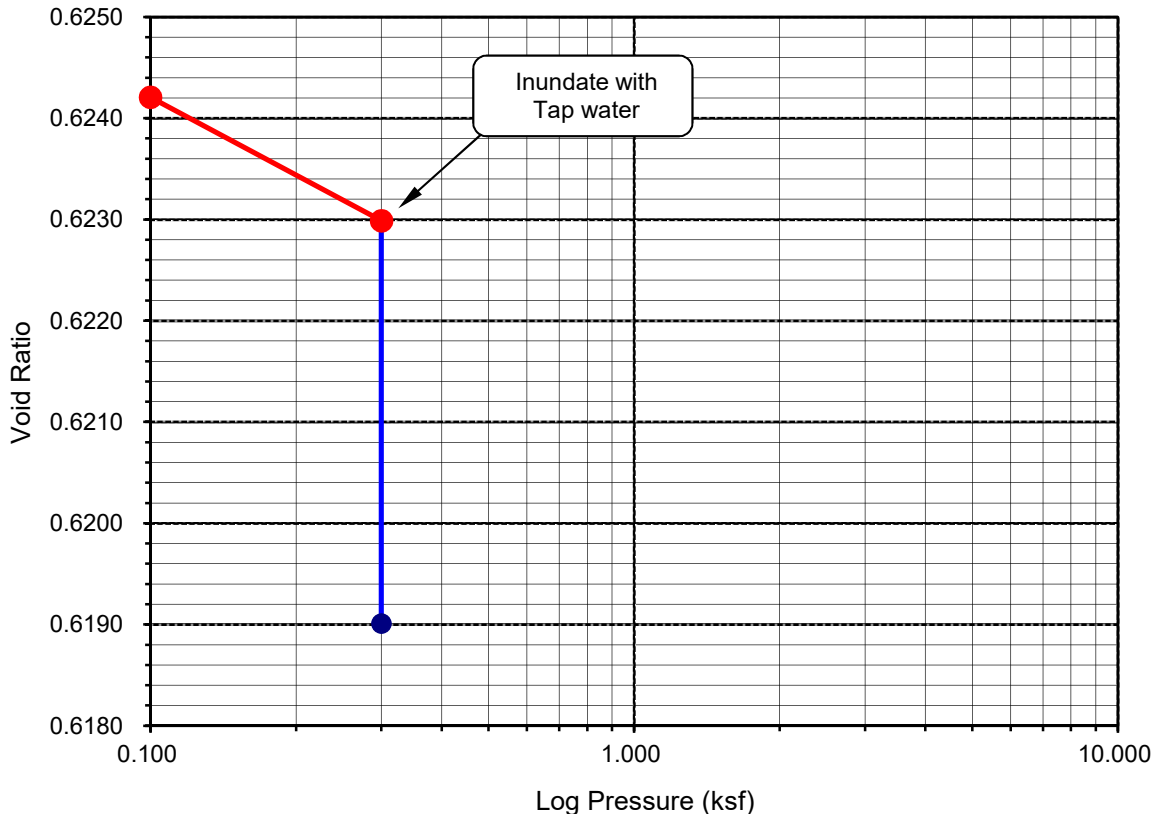
Initial Dry Density (pcf):	103.7
Initial Moisture (%):	4.44
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3294
Diameter(in):	2.415

Final Dry Density (pcf):	104.1
Final Moisture (%) :	18.8
Initial Void Ratio:	0.6249
Specific Gravity(assumed):	2.70
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

Percent Swell (+) / Settlement (-) After Inundation = -0.25

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-3
 Sample No.: R-1
 Sample Description: Olive silt with sand (ML)s, organic material noted

Tested By: G. Bathala Date: 07/17/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 5.0

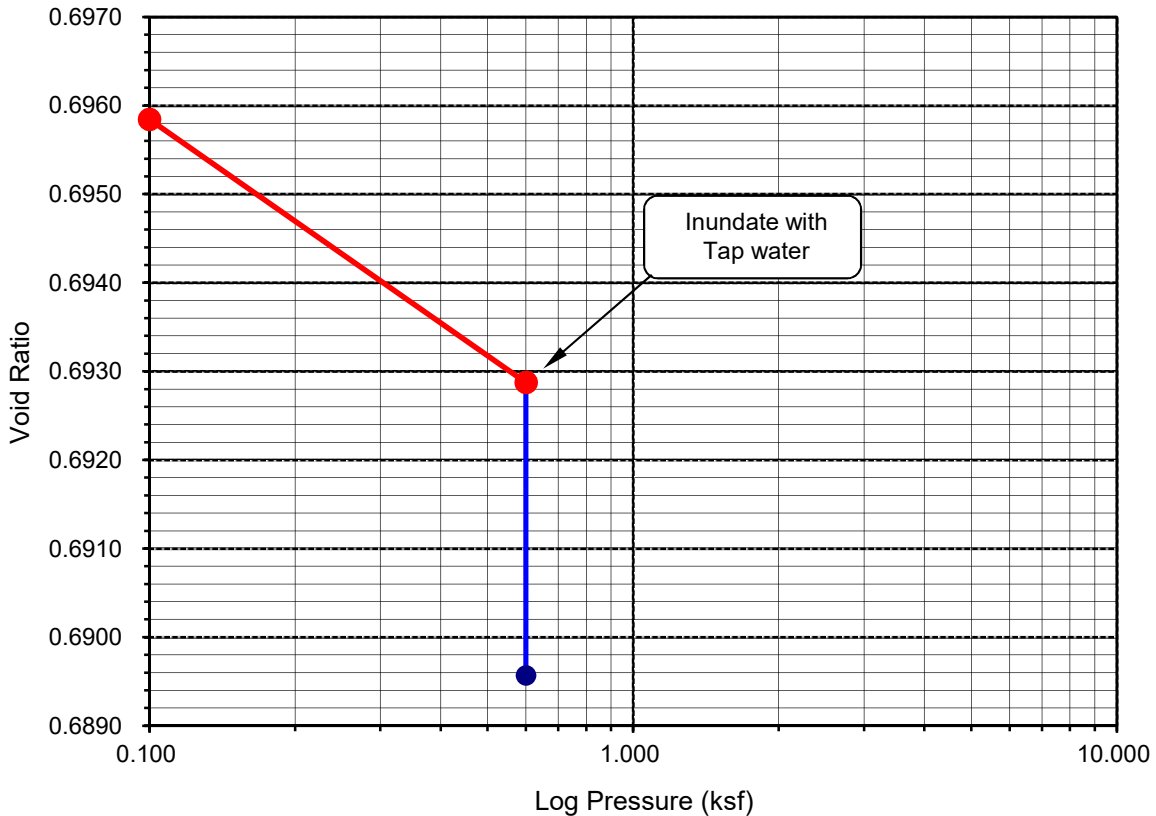
Initial Dry Density (pcf):	99.4
Initial Moisture (%):	10.70
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3151
Diameter(in):	2.415

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

Percent Swell (+) / Settlement (-) After Inundation = -0.20

Void Ratio - Log Pressure Curve



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

Project Name: Colonial
 Project No.: 16163-01
 Boring No.: HS-1
 Sample No.: R-1
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 07/17/19
 Checked By: J. Ward Date: 07/25/19
 Sample Type: Ring
 Depth (ft.): 5.0

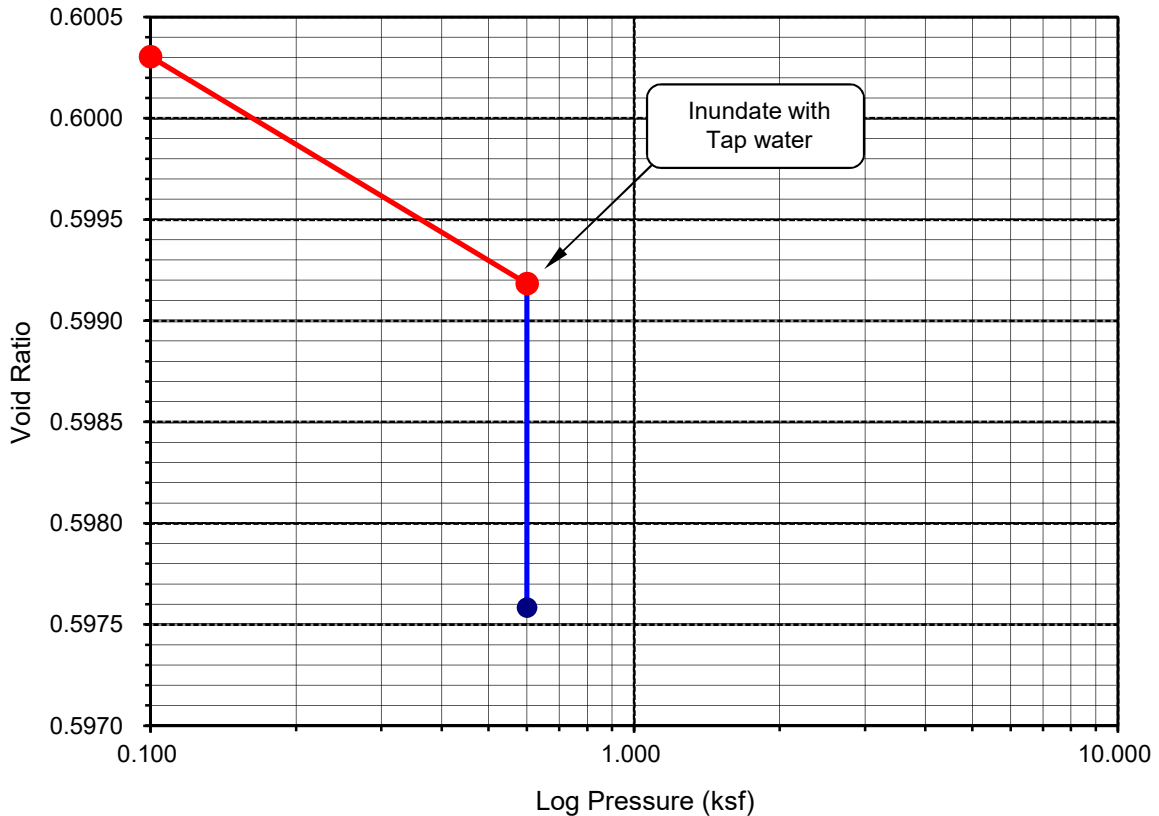
Initial Dry Density (pcf):	105.3
Initial Moisture (%):	5.30
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2910
Diameter(in):	2.415

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

Percent Swell (+) / Settlement (-) After Inundation = -0.10

Void Ratio - Log Pressure Curve



**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: Light olive brown silty sand (SM)

		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 Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

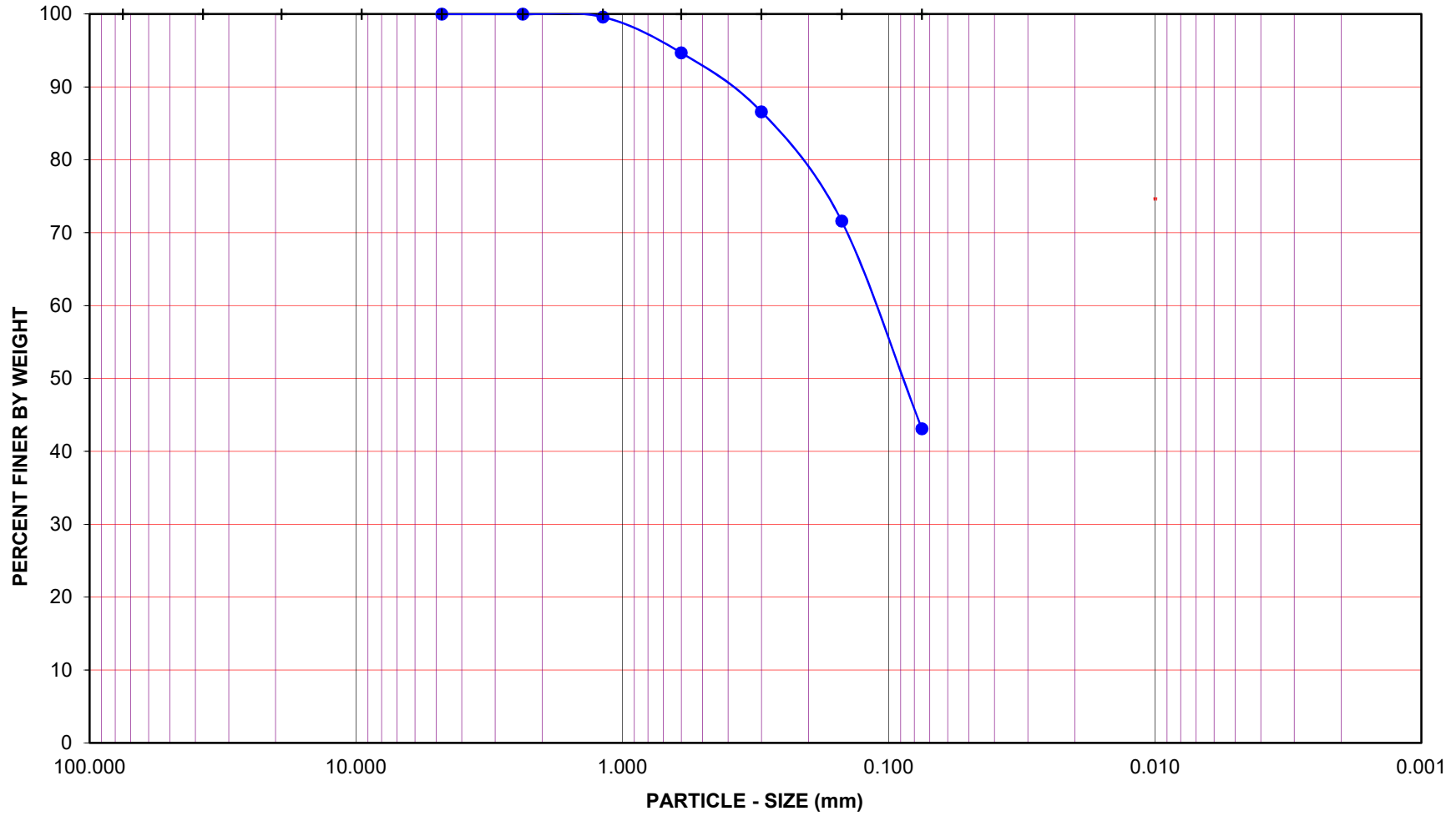
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-6

Sample No.: R-2

Depth (feet): 7.5

Soil Type : SM

Soil Identification: Light olive brown silty sand (SM)

GR:SA:FI : (%) 0 : 57 : 43

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

Jul-19

**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-2

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 + 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

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 Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

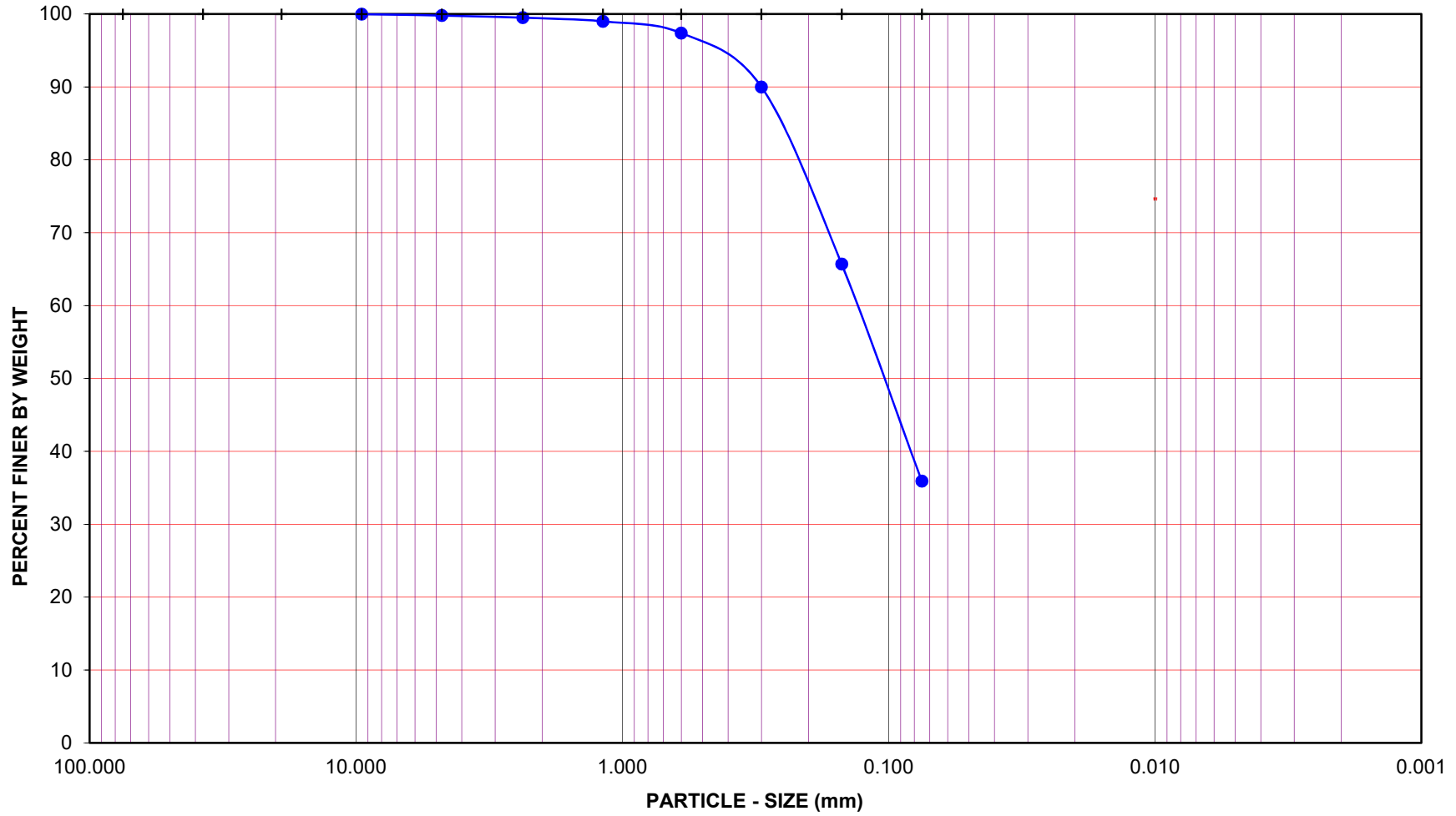
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-2

Depth (feet): 2.5

Soil Identification: Olive silty sand (SM)

GR:SA:FI : (%) **0 : 64 : 36**

Sample No.: R-1

Soil Type : SM

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

Jul-19

**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.:	HA	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

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

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

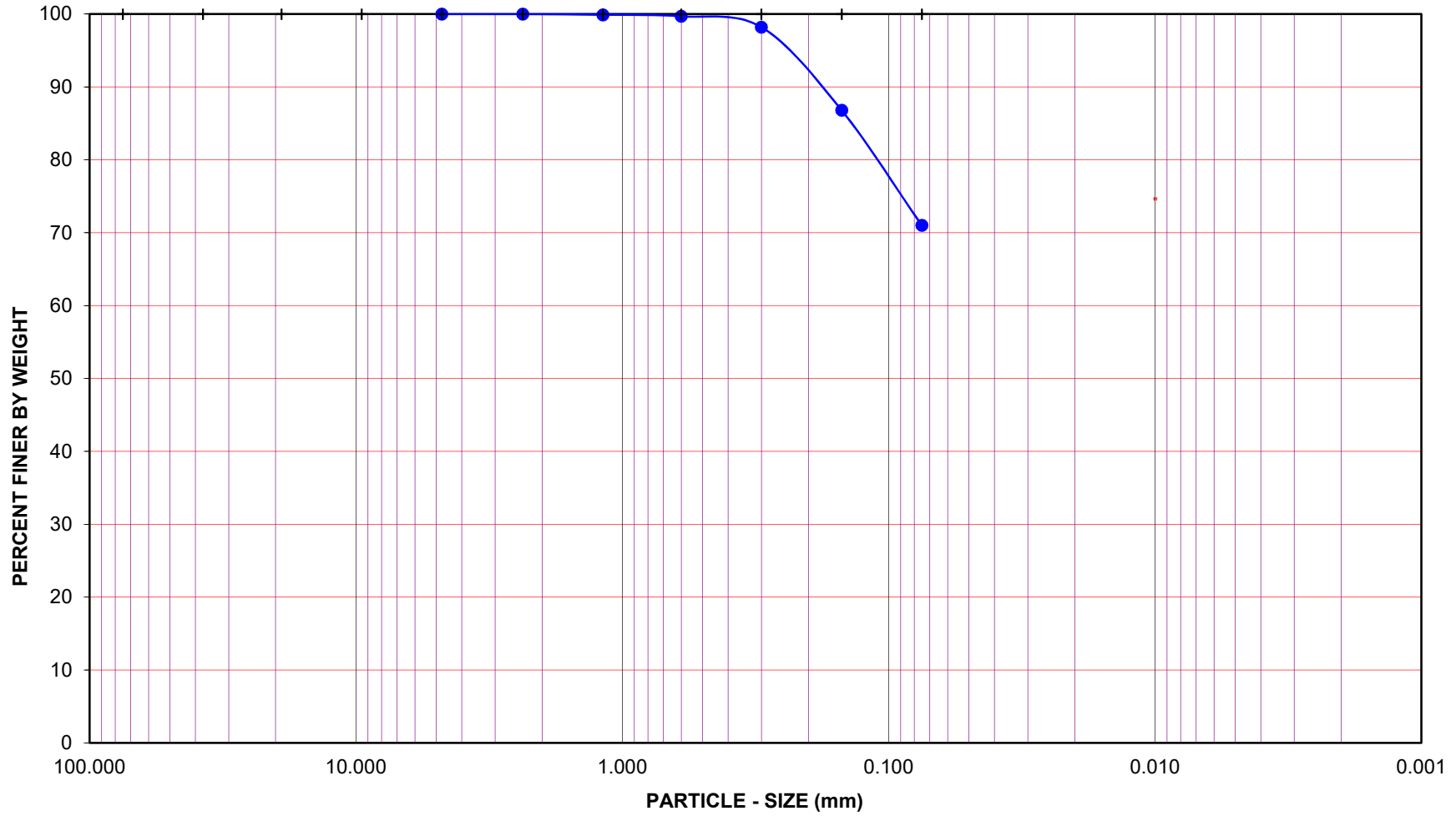
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-3

Sample No.: Depth

(feet): 5.0

Soil Type (ML)s

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

GR:SA:FI : (%) **0 : 29 : 71**

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

JUL-19

**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-1

Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Olive silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<u>GE</u>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<u>599.4</u>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<u>250.2</u>	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)	<u>488.4</u>
	Wt. of Container (g)	250.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	238.2

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
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	<u>0.0</u>	100.0
#16	1.18	<u>0.1</u>	100.0
#30	0.600	<u>0.7</u>	99.8
#50	0.300	<u>14.3</u>	95.9
#100	0.150	<u>119.1</u>	65.9
#200	0.075	<u>229.4</u>	34.3
PAN			

GRAVEL: **0 %**

SAND: **66 %**

FINES: **34 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = _____

Cc = (D30)²/(D60*D10) = _____

Remarks: _____

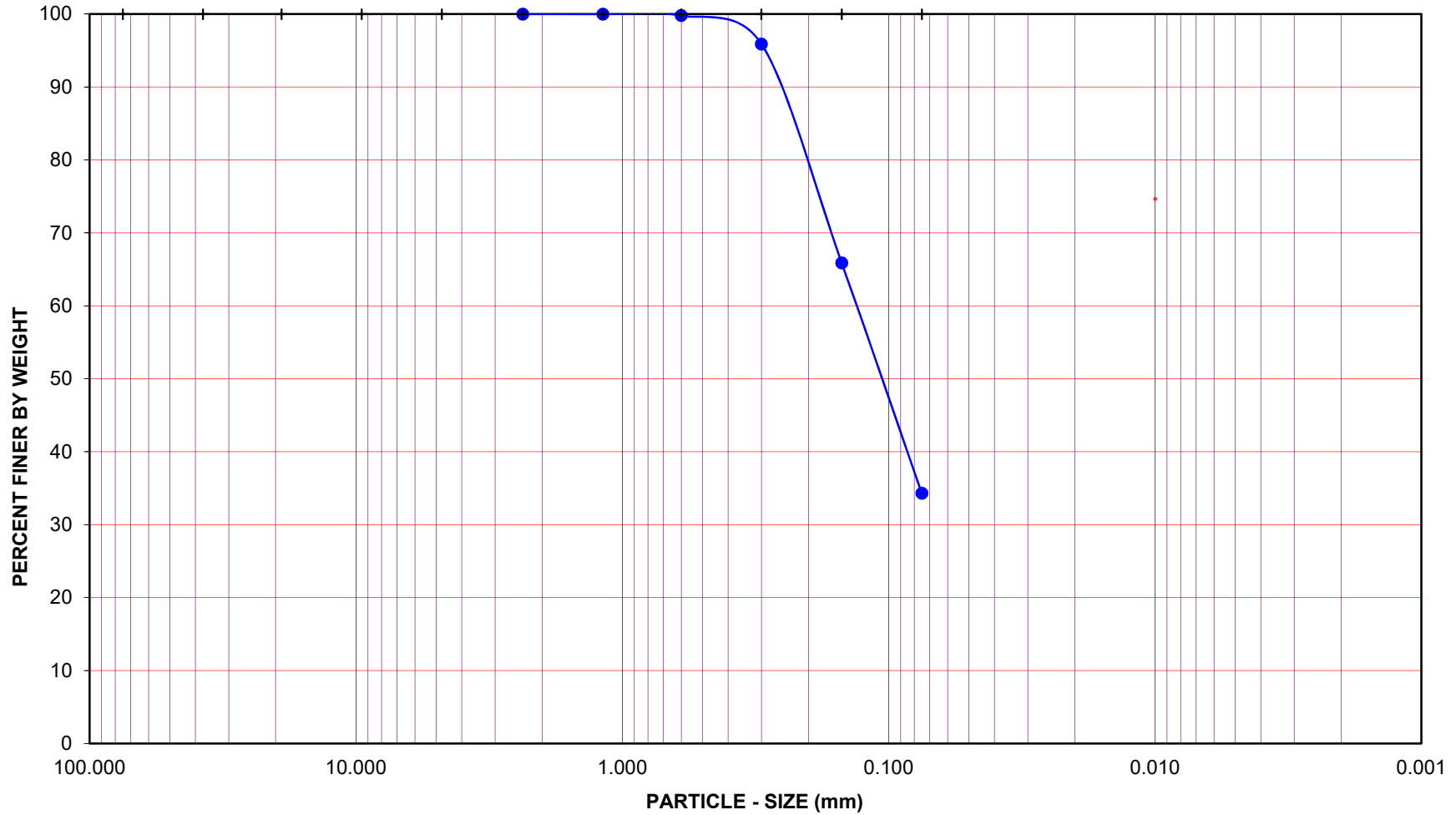
GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8" #4 #8 #16 #30 #50 #100 #200

U.S. STANDARD SIEVE NUMBER

HYDROMETER



Project Name: Colonial

Project No.: 16163-01

Boring No.: HS-1

Sample No.: R-1

Depth (feet): 5.0

Soil Type : SM

Soil Identification: Olive silty sand (SM)

GR:SA:FI : (%) 0 : 66 : 34

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**


JUL-19

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 (0')*							
Depth (ft)	% Organics						
1.0	0.6						
4.0	1.1						

Legend

> 5%	"High" Organic Content "Soils" Recommended for Export from Site
2 to 5%	"Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils
< 2%	"Clean" Soils

Note: (#)'* 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: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Brookfield	Type of Rig: Track Rig
Project Number: 20246-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~755' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	5 6 7	105.7	2.1	SP-SM	<p>@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)</p> <p>@2.5' - SAND with Silt: dusky brown, dry, medium dense</p>	
750	5		R-2	4 6 10	109.5	3.7	SM	@5' - Silty SAND: dusky brown, dry, medium dense	
745	10		SPT-1	4 5 6		5.8		@10' - Silty SAND: dusky brown, slightly moist, medium dense	
740	15		R-3	4 8 13	101.2	8.1	ML	@14' - Sandy SILT: dusky brown slightly moist, stiff	#200
730	20							Total Depth = 16' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021	



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

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE</p> <p>R RING SAMPLE (CA Modified Sampler)</p> <p>G GRAB SAMPLE</p> <p>SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>DS DIRECT SHEAR</p> <p>MD MAXIMUM DENSITY</p> <p>SA SIEVE ANALYSIS</p> <p>S&H SIEVE AND HYDROMETER</p> <p>EI EXPANSION INDEX</p> <p>CN CONSOLIDATION</p> <p>CR CORROSION</p> <p>AL ATTERBERG LIMITS</p> <p>CO COLLAPSE/SWELL</p> <p>RV R-VALUE</p> <p>#200 % PASSING # 200 SIEVE</p>
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Geotechnical Boring Log Borehole I-2

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Brookfield	Type of Rig: Track Rig
Project Number: 20246-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	9 11 9	105.5	3.7	SM	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: gray brown, dry, medium dense	EI CR #200
750	5		R-2	5 8 13	112.0	3.5		@5' - Silty SAND: dusky gray brown, dry, medium dense	
745	10		SPT-1	6 5 6		5.9		@10' - Silty SAND: dusky gray brown, slightly moist, medium dense	
740	20		R-3	7 14 9	101.2	1.9	SP-SM	@20' - SAND with Silt: dusky gray brown, dry, medium dense	#200
735	25							Total Depth = 22' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021	
730	30								







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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-1

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~766' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
765	0							@0' to 2.5' Artificial Fill - Undocumented (afu) @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND: gray brown, slightly moist, medium dense	
760	5	R-1	SPT-1	3 4 5	106.6	5.3	SM	@5' - Silty SAND: olive gray, slightly moist, medium dense	#200 CO
			SPT-2	4 5 7		6.3	SM	@7.5' - Silty SAND: gray brown, slightly moist, medium dense	
755	10	R-2	SPT-2	4 9 15	105.6	2.3	SM	@10' - Silty SAND: gray brown, slightly moist, medium dense	
750	15		SPT-3	5 6 8		3.4	SM	@15' - Silty SAND: olive gray, slightly moist, medium dense	
745	20	R-3	SPT-3	13 14 16	105.7	4.1	SP	@20' - SAND: gray brown, slightly moist, medium dense	
740	25							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
	30								

	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.	<table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE  GROUNDWATER TABLE </td> <td style="vertical-align: top;"> TEST TYPES: 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 </td> </tr> </table>	SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE  GROUNDWATER TABLE	TEST TYPES: 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
SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE  GROUNDWATER TABLE	TEST TYPES: 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-2

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test	
755	0	B-1	R-1	4 5 7	102.0	4.4	SM	@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, loose	#200 CO	
750	5		SPT-1	4 5 6	101.1	2.5	SM			@5' - Silty SAND: olive brown, slightly moist, medium dense
745	10		SPT-2	3 6 7	111.1	3.5	SM			@10' - Silty Fine SAND: gray brown, slightly moist, medium dense
740	15		R-3	8 16 22	8.0	3.8	SM			@15' - Silty SAND with Gravel: gray, slightly moist, medium dense
735	20		SPT-3	6 6 8	96.0	4.2	SP	@20' - Silty SAND: brown, moist, medium dense		
730	25		R-4	8 13 15				@25' - SAND: gray brown, slightly moist, 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 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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-2

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~758' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	30		SPT-4	5 6 11		10.9	SC	@30' - Clayey SAND: brown, moist, medium dense	
720	35		R-5	8 14 22	114.5	9.5	SC	@35' - Clayey SAND: gray and reddish brown mottled, moist, medium dense; iron oxide staining; pin hole porosity	
715	40		SPT-5	10 17 22		10.6	SM	@40' - Silty SAND: gray brown, moist, dense; minor iron oxide staining	
710	45		R-6	6 12 18	110.2	18.2	ML	@45' - SILT: olive brown and reddish orange mottled, very moist, very stiff; iron oxide staining	
705	50		SPT-6	13 23 25		9.5	SM	@50' - Silty SAND: gray brown, moist, very dense	
700	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
60									



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-3

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0							@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets	
	5		R-1	8 8 11	101.9	10.7	ML	@2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: gray brown, slightly moist, medium dense @5' - SILT with Sand: olive brown, moist, stiff; roots; wood fragments	#200 CO
750								@7.5' - Silty SAND: gray brown, slightly moist, medium dense	
	10		R-2	8 9 11	111.4	2.5	SP	@10' - SAND: gray brown, slightly moist, medium dense	
745								@15' - Sandy SILT: olive gray, very moist, very stiff	
740	15		SPT-3	3 6 9		15.0	ML		
	20		R-3	3 9 14	99.6	12.6	SM	@20' - Silty SAND: olive brown, moist, medium dense; white root casts	
735								Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
730	25								
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-4

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
755	0	B-1	R-1	9 10 16	108.3	4.9	SM	<p>@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - Silty SAND: olive brown, slightly moist, medium dense; white rootlets @5' - Silty SAND: olive gray, slightly moist, loose</p>	EI MD CR
750	5		SPT-1	4 4 4		3.9	SM		
745	10		R-2	5 10 15	88.9	3.6	ML		
740	15		SPT-2	4 7 10		1.5	SM	@10' - Silty SAND: gray brown, dry, medium dense	
735	20		R-3	8 9 13	99.9	10.2	SM	@15' - Silty SAND: brown, moist, medium dense	
730	25		SPT-3	12 10 10		1.8	SP	@20' - SAND with Gravel: gray brown, dry, medium dense	
	30							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-5

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~757' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test	
755	0	B-1	R-1	5 9	101.3	2.5	SP	@0' to 2.5' Artificial Fill - Undocumented @0' - Silty SAND: brown, dry, loose; scattered grass and rootlets @2.5' to T.D. Quaternary Young Eolian Deposits (Qye) @2.5' - SAND: gray brown, slightly moist, medium dense	EI MD	
750	5		SPT-1	3 4 4		4.5	SP			@5' - SAND: gray brown, slightly moist, loose
745	10		R-2	8 9 10	106.8	7.7	SM			@7.5' - Silty SAND: olive brown, moist, medium dense
740	15		SPT-2	4 6 8		5.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium dense		
735	20		R-3	9 14 19	130.6	1.8	SP	@15' - SAND: gray brown, dry, medium dense		
730	25		SPT-3	8 10 9		4.9	SP	@20' - SAND: gray brown, slightly moist, medium dense		
	30							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019		



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

TEST TYPES:
 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

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~763' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
760	0	B-1	R-1	5 6 10	103.4	4.0	SP	<p>@0' to 2.5' Artificial Fill - Undocumented</p> <p>@0' - Silty SAND: brown, dry, loose; scattered grass and rootlets</p> <p>@2.5' to T.D. Quaternary Young Eolian Deposits (Qye)</p> <p>@2.5' - SAND: olive brown, slightly moist, medium dense</p> <p>@5' - Clayey SAND: brown, moist, medium dense</p> <p>@7.5' - Silty SAND: light olive brown, moist, medium dense; white root casts</p> <p>@10' - Silty SAND: olive brown, moist, loose</p> <p>@15' - Silty SAND: gray brown, moist, medium dense</p> <p>@20' - SAND: gray brown, moist, medium dense</p> <p>@25' - Silty SAND: gray brown, moist, medium dense; trace gravel</p>	MD EI
755	5		SPT-1	4 5 6	97.5	9.0	SM		#200 CO
750	10		SPT-2	4 4 4	102.6	8.5	SM		
745	15		R-3	4 8 12	93.9	10.7	SM		
740	20	SPT-3	6 6 9						
735	25	R-4	3 6 9						
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-6

Date: 6/21/2019	Drilling Company: Cal Pac
Project Name: Colonial	Type of Rig: Limited Access HS
Project Number: 16163-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~763' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
730	30		SPT-4	5 6 10		15.4	ML	@30' - SILT: brown with reddish brown mottled, very moist, very stiff	
725	35		R-5	13 18 50	114.2	8.5	SC	@35' - Clayey SAND: reddish brown and brown mottled, moist, very dense	
720	40		SPT-5	12 15 20		5.4	SP	@40' - SAND: brown, slightly moist, dense	
715	45		R-6	17 27 27	123.6	6.3	SP	@45' - SAND: brown, slightly moist, dense; trace amounts of clay	
710	50		SPT-6	8 23 26		2.4	SP	@50' - SAND: reddish brown, slightly moist, very dense	
705	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 6/21/2019	
60									



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

TEST TYPES:
 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



LGC Geotechnical, Inc.

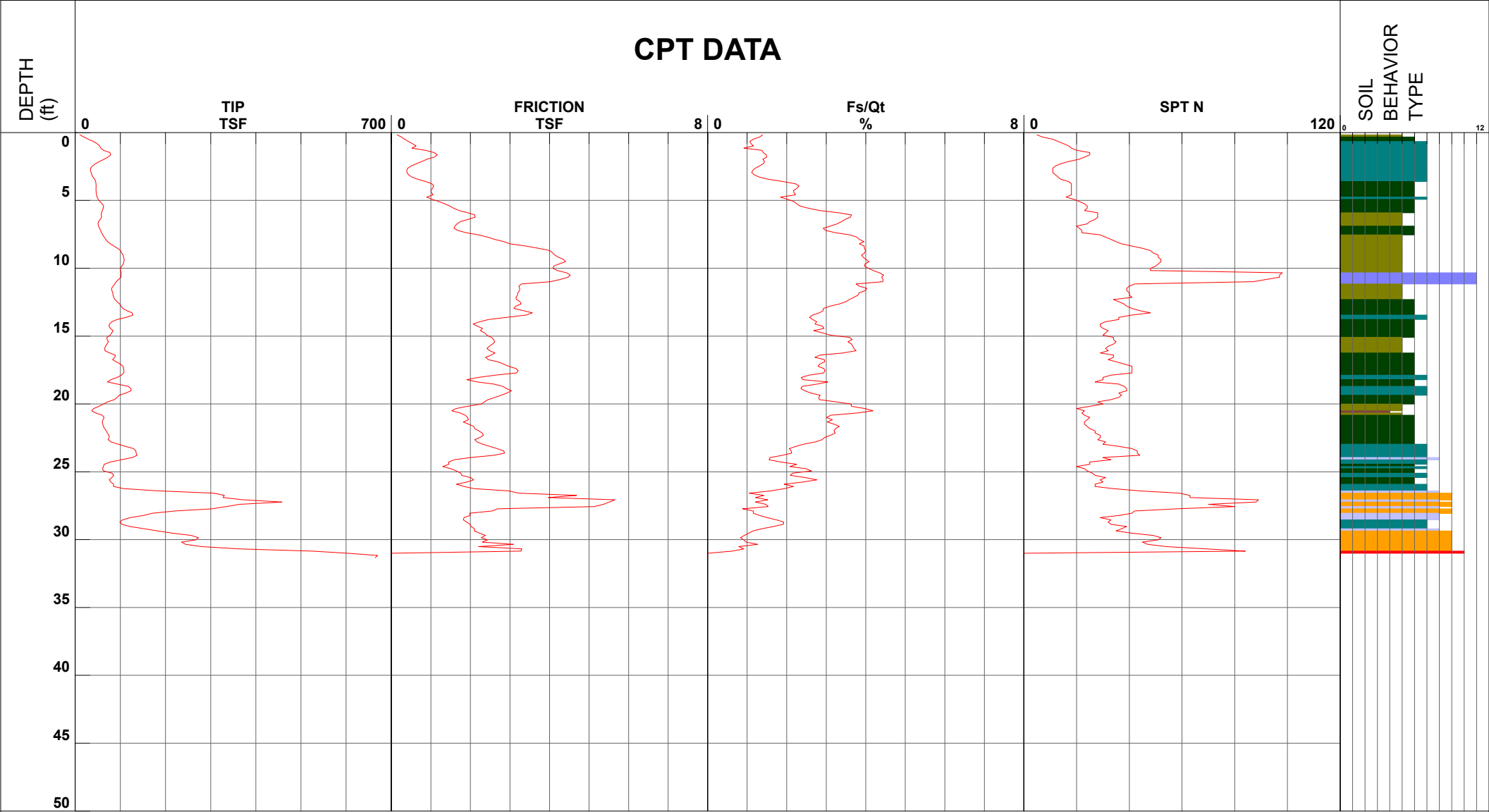
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 Hole Number CPT-01
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Net Area Ratio .8

CPT DATA



SOIL BEHAVIOR TYPE

- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

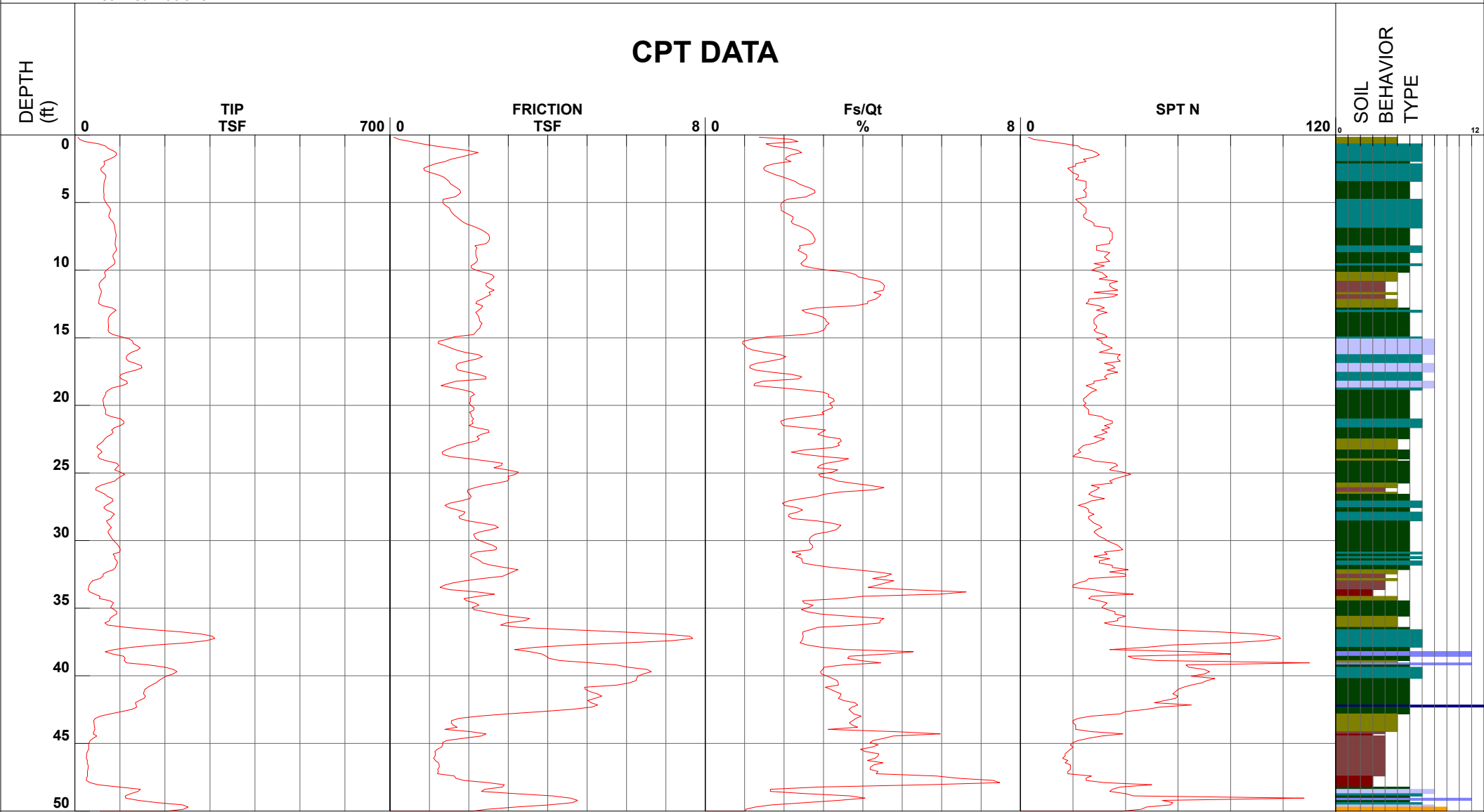
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 Hole Number CPT-02
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 GPS _____
 Maximum Depth 50.52 ft

Net Area Ratio .8

CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

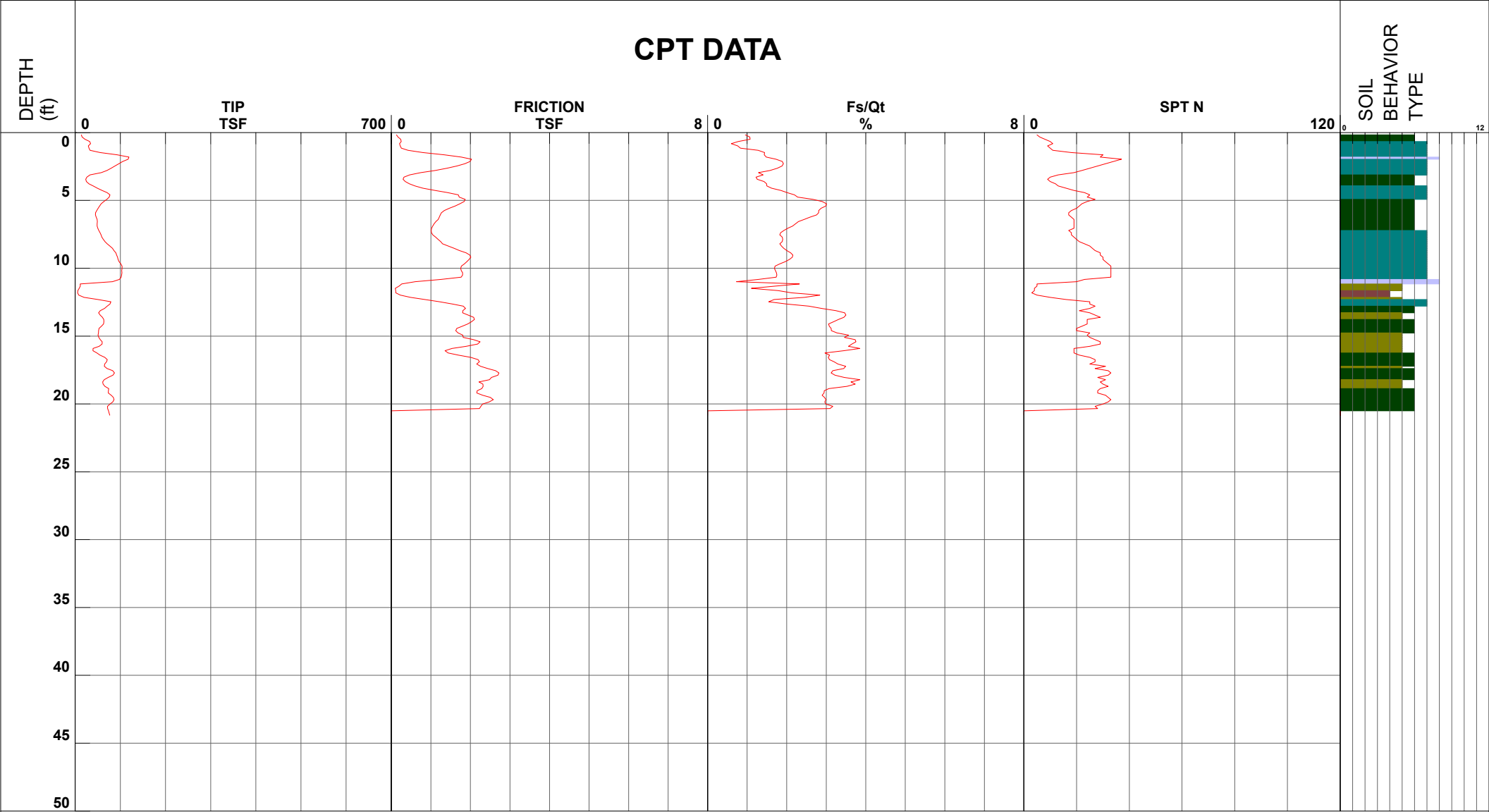
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 Hole Number CPT-03
 EST GW Depth During Test _____

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Filename SDF(770).cpt
 GPS _____
 Maximum Depth 20.83 ft

Net Area Ratio .8

CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

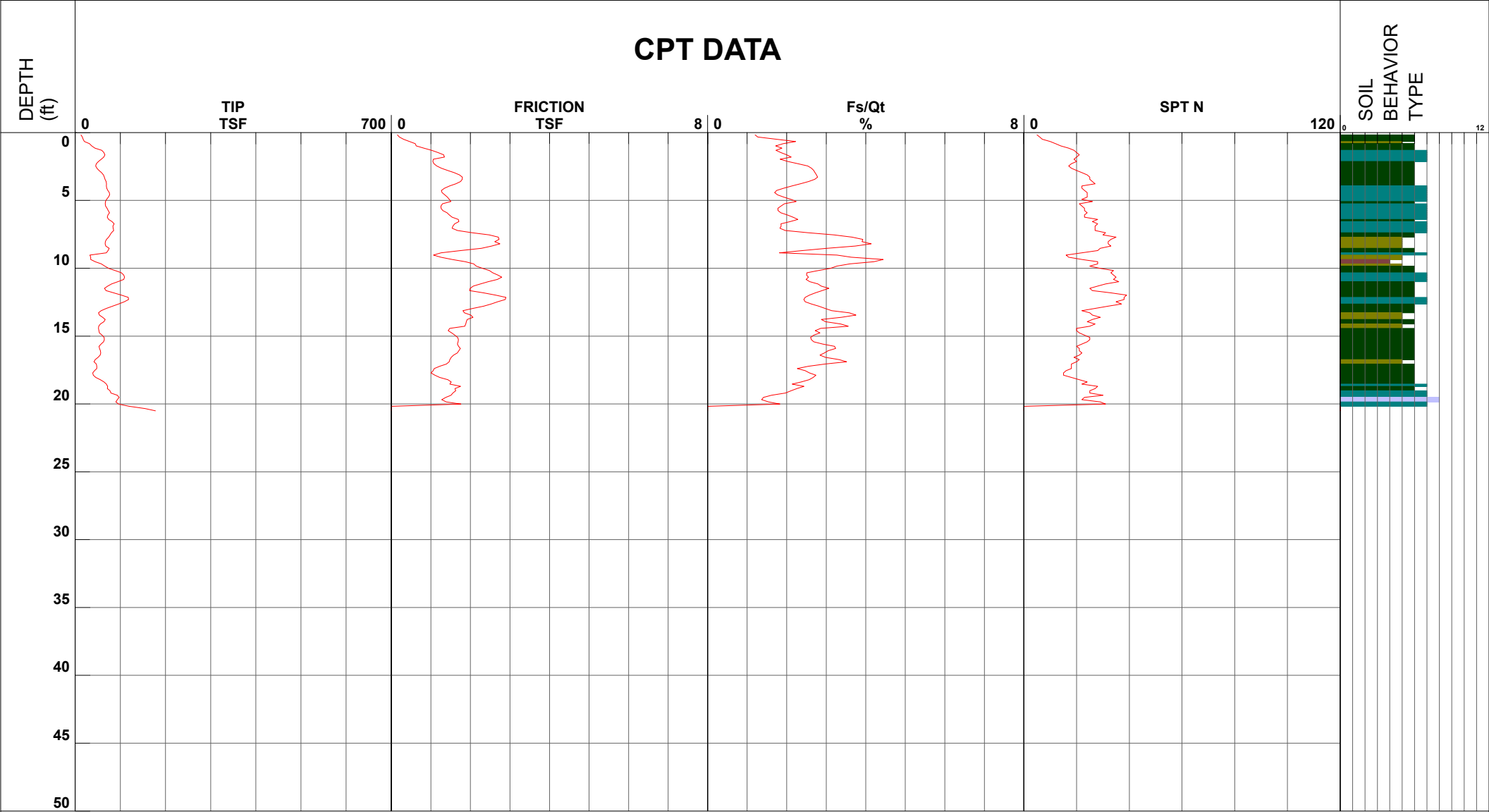
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 EST GW Depth During Test _____

Operator RC AS
 Cone Number DDG1471
 Date and Time 6/20/2019 2:19:06 PM
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Filename SDF(771).cpt
 GPS _____
 Maximum Depth 20.51 ft

Net Area Ratio .8

CPT DATA



SOIL
BEHAVIOR
TYPE

- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

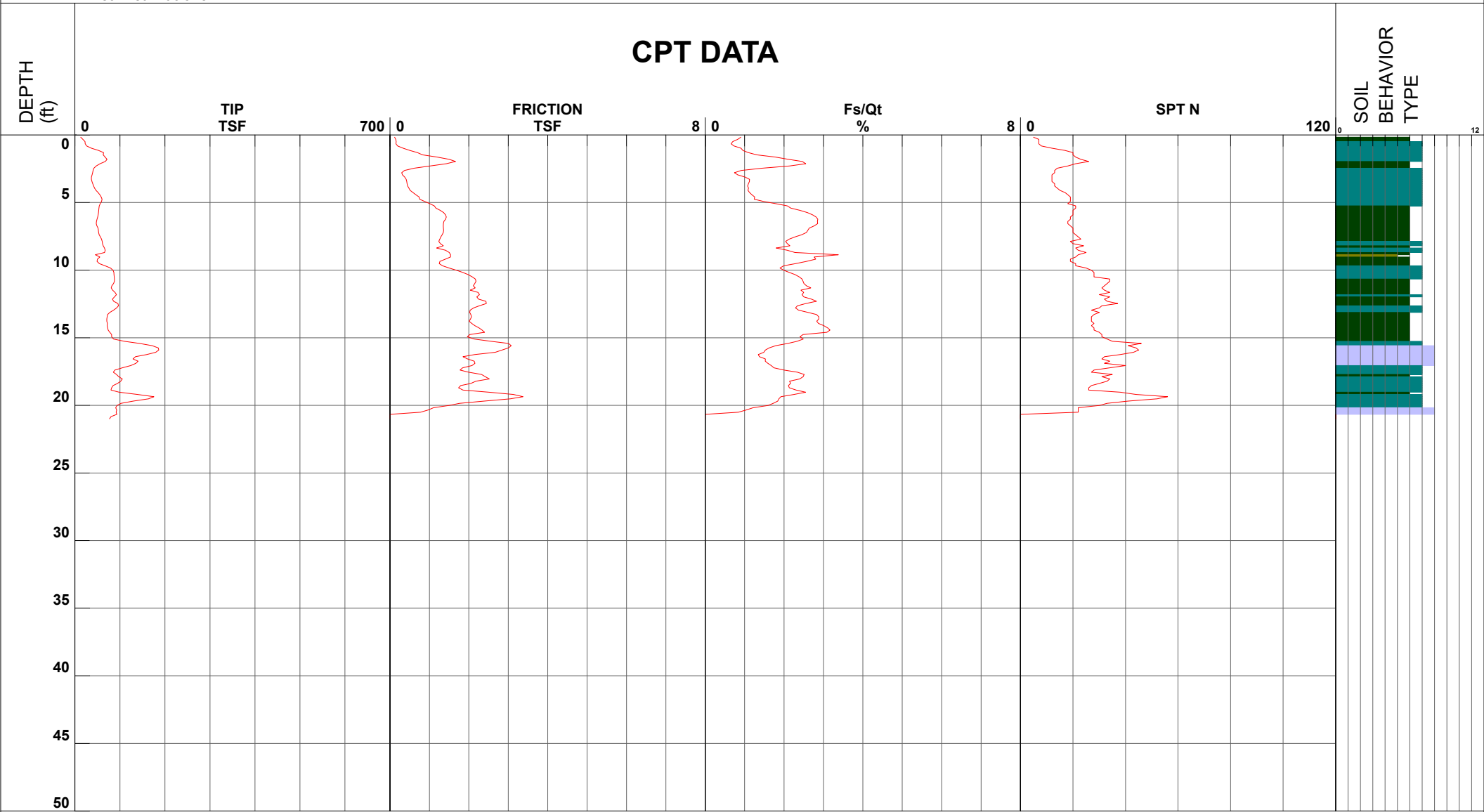
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Filename SDF(772).cpt
 GPS _____
 Maximum Depth 21.00 ft

Net Area Ratio .8

CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical, Inc.

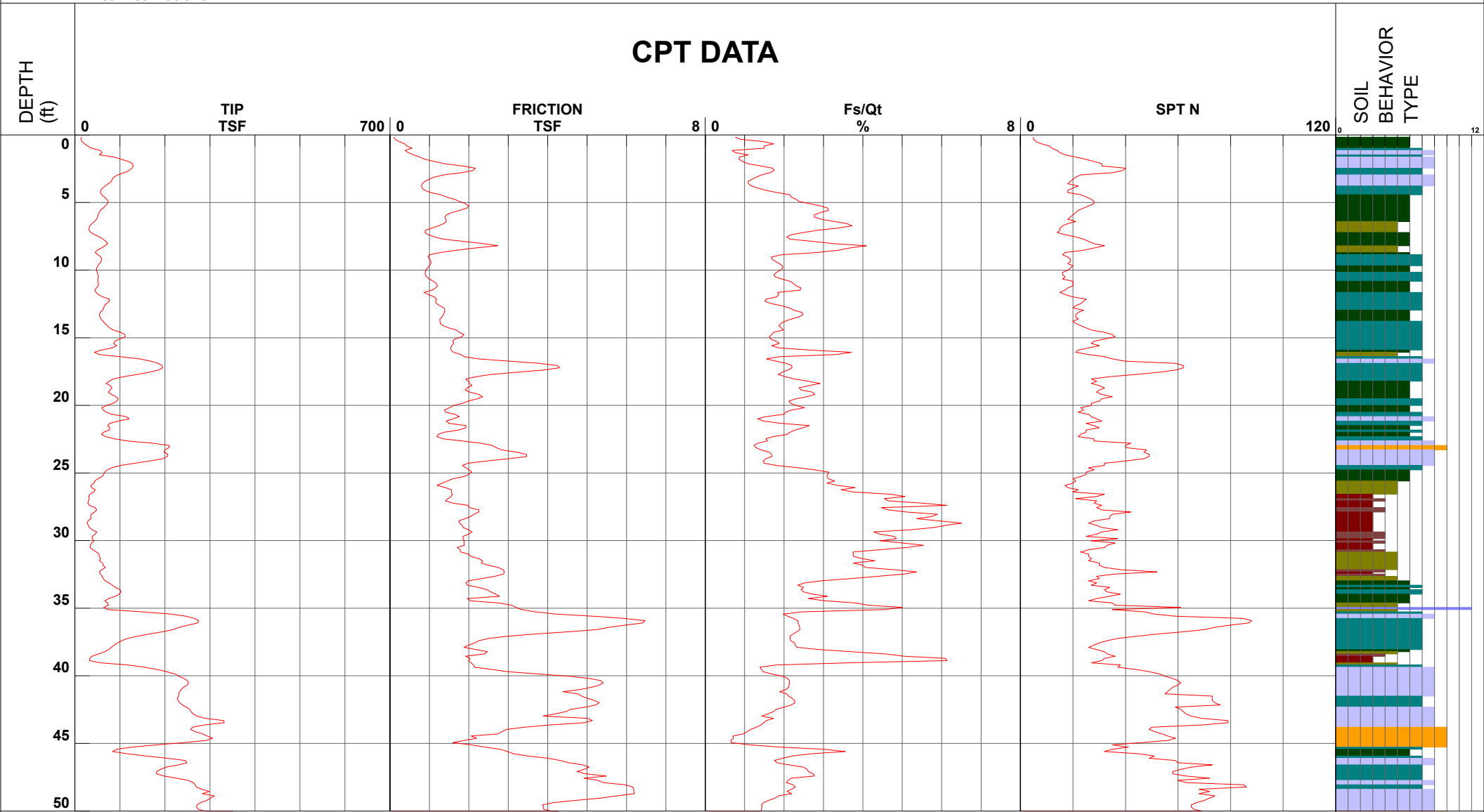
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 Job Number 16163-01
 Hole Number CPT-06
 EST GW Depth During Test _____

Operator RC AS
 Cone Number DDG1471
 Date and Time 6/20/2019 2:56:46 PM
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Filename SDF(773).cpt
 GPS _____
 Maximum Depth 50.69 ft

Net Area Ratio .8


CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

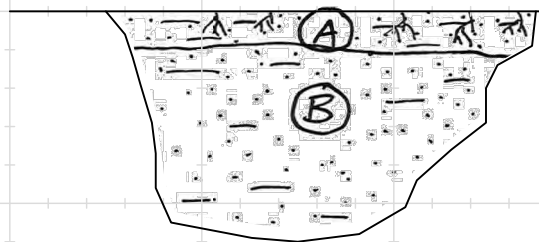
Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Project Name: Colonial		Logged By: ARN	Trench No: TP-1		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Sandy SILT to Silty SAND: medium to dark brown, dry, loose/soft; abundant rootlets	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; increasing moisture with depth; occasional root; massive	Qye	SM-SP			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 758 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



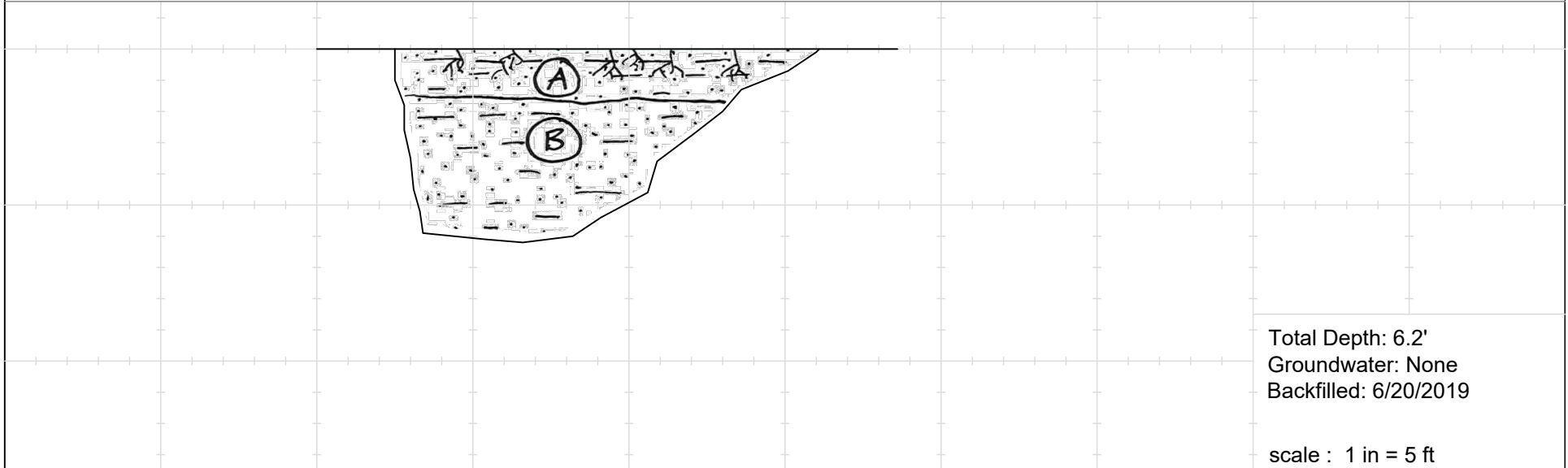
Total Depth: 6'
Groundwater: None
Backfilled: 6/20/2019


scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-2		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.75' Sandy SILT to Silty SAND: dusky to dark brown, dry, loose/soft; abundant rootlets in upper 12 inches	afu	SM/ML	B-1		
	b	Quaternary Young Eolian Deposits @1.75'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; increasing moisture with depth; occasional root; massive	Qye	SM-SP			

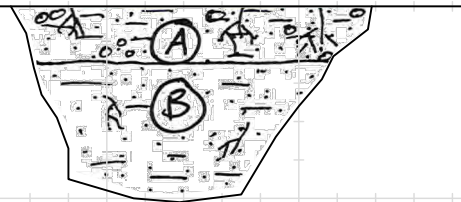
GRAPHICAL REPRESENTATION BELOW: **Elevation : 756 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



Project Name: Colonial		Logged By: ARN	Trench No: TP-3		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry , soft/loose; abundant rootlets; occasional gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND and SAND: medium to tan brown, slightly moist, medium dense; infrequent roots and old decaying organics; grades to moist with depth; massive	Qye	SM-SP			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 754 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



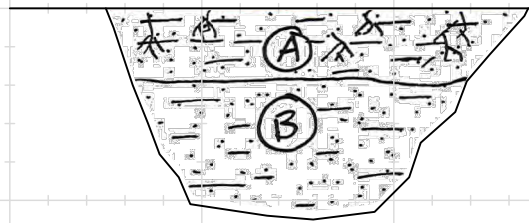
Total Depth: 5.1'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-4		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-2' Silty SAND to Sandy SILT: dusky brown to brown, dry, soft/loose; abundant rootlets; scattered refuse	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: medium brown, slightly moist, medium dense; some small zones of sandy silt; increased moisture with depth	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 755 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



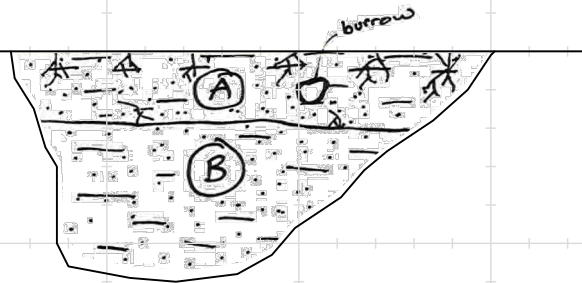
Total Depth: 5.5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-5		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: dusky brown, dry, loose/medium stiff; roots; scattered gravel @1'-2' Silty SAND: medium to tan brown, dry to slightly moist, medium dense; occasional root; iron oxide stained burrow	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: medium brown, slightly moist to moist, medium dense	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 758 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



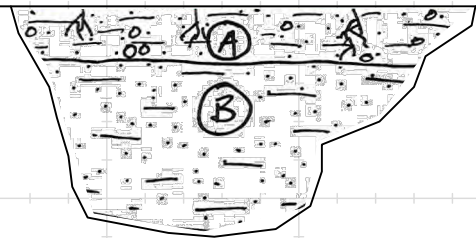
Total Depth: 6'
 Groundwater: None
 Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-6		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry, loose/medium stiff; roots; scattered gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND: tan to medium brown, slightly moist, medium dense; some staining; massive; mottled to 3' then homogeneous coloration	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 764 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



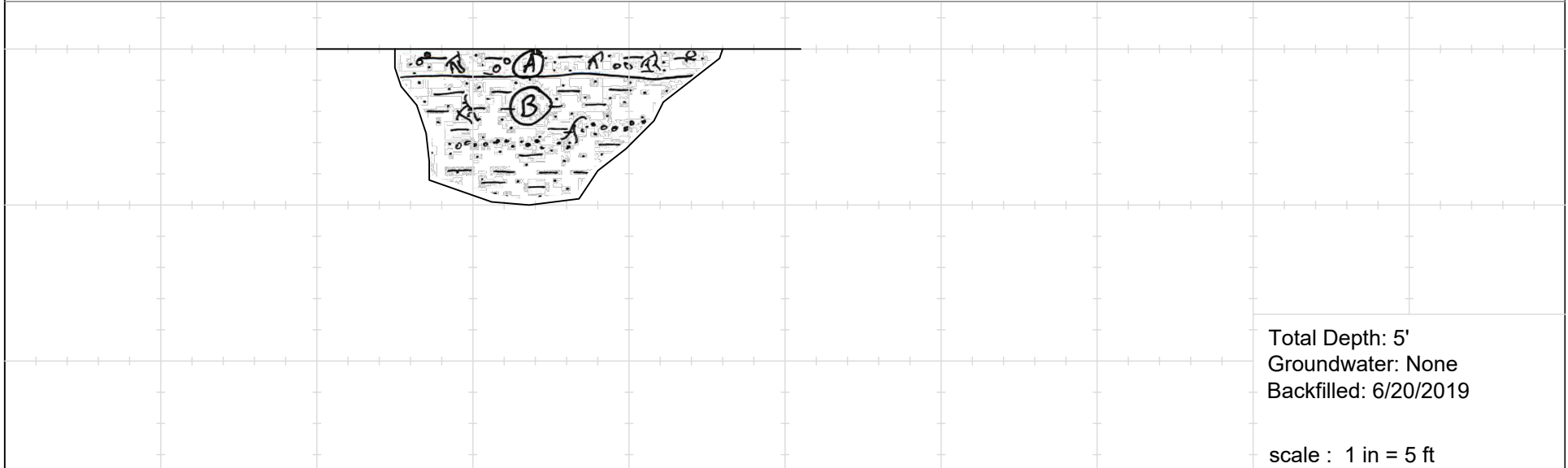
Total Depth: 6'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-7		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1' Silty SAND to Sandy SILT: medium to dusky brown, dry, loose/soft, abundant rootlets; occasional gravel	afu	SM/ML			
	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	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 762 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



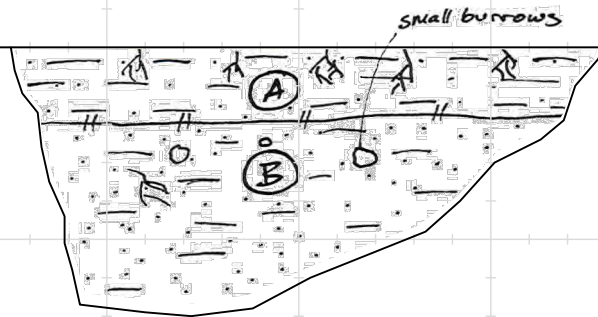
Total Depth: 5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-8		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-2' Sandy SILT: dusky brown, dry, loose/soft; scattered gravel; abundant rootlets; minor refuse; gradational contact	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @2'-T.D. Silty SAND: tan to medium brown, slightly moist, medium dense; occasional rootlets; burrows in upper portions of the formation; massive	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 768 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



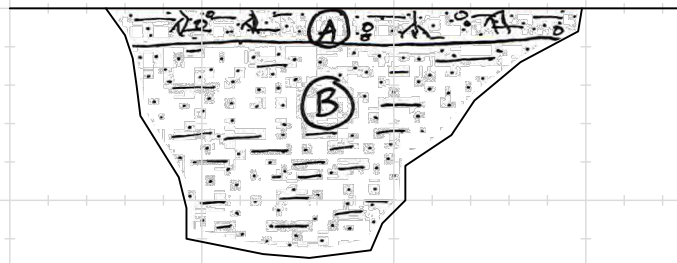
Total Depth: 7'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft

Project Name: Colonial		Logged By: ARN	Trench No: TP-9		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0' - 1' Silty SAND to Sandy SILT: dusky brown, dry, loose/soft; abundant rootlets; scarce gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1'-2.5' Silty SAND: medium brown, dry to slightly moist, loose to medium dense @2.5'-T.D. Silty SAND and Sandy SILT: medium brown, slightly moist, medium dense/stiff; noticeably tighter material	Qye	SM SM-ML			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 760 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



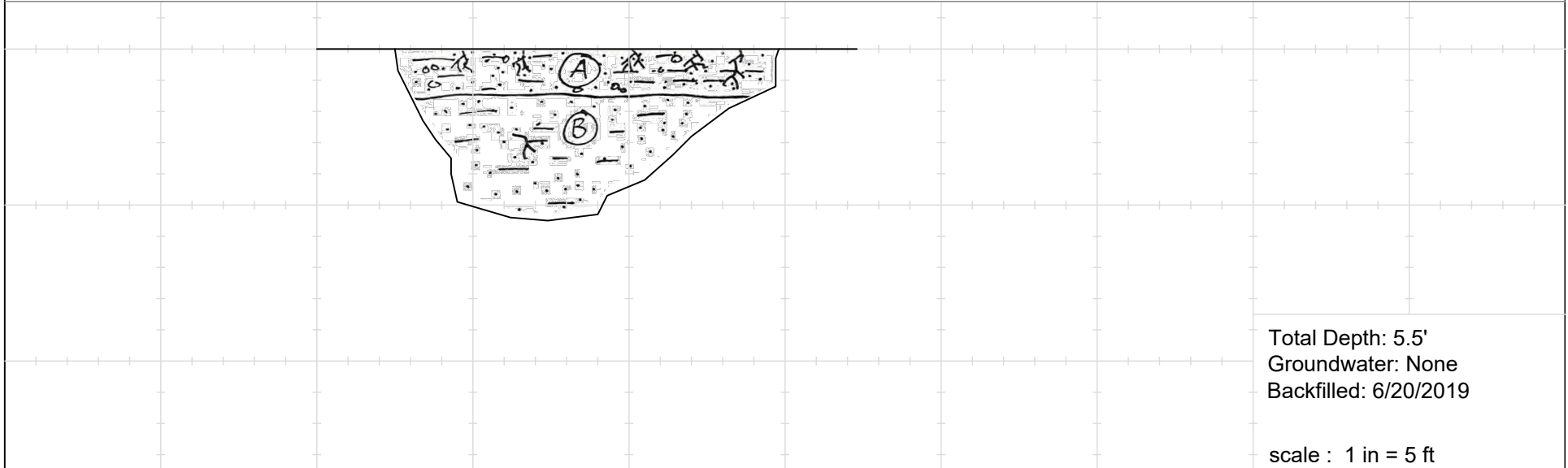
Total Depth: 6.5'
Groundwater: None
Backfilled: 6/20/2019

scale : 1 in = 5 ft


Project Name: Colonial		Logged By: ARN	Trench No: TP-10	
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties: 	
Equipment: Cat 420F Excavator		Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	<i>Artificial Fill - Undocumented</i> @0'-1.5' Silty SAND to Sandy SILT: dusky to medium brown, dry, loose/soft; abundant rootlets; scattered gravel.	afu	SM/ML			
	b	<i>Quaternary Young Eolian Deposits</i> @1.5'-T.D. Silty SAND: medium to tan brown, slightly moist, medium dense; massive; occasional root	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 755 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**

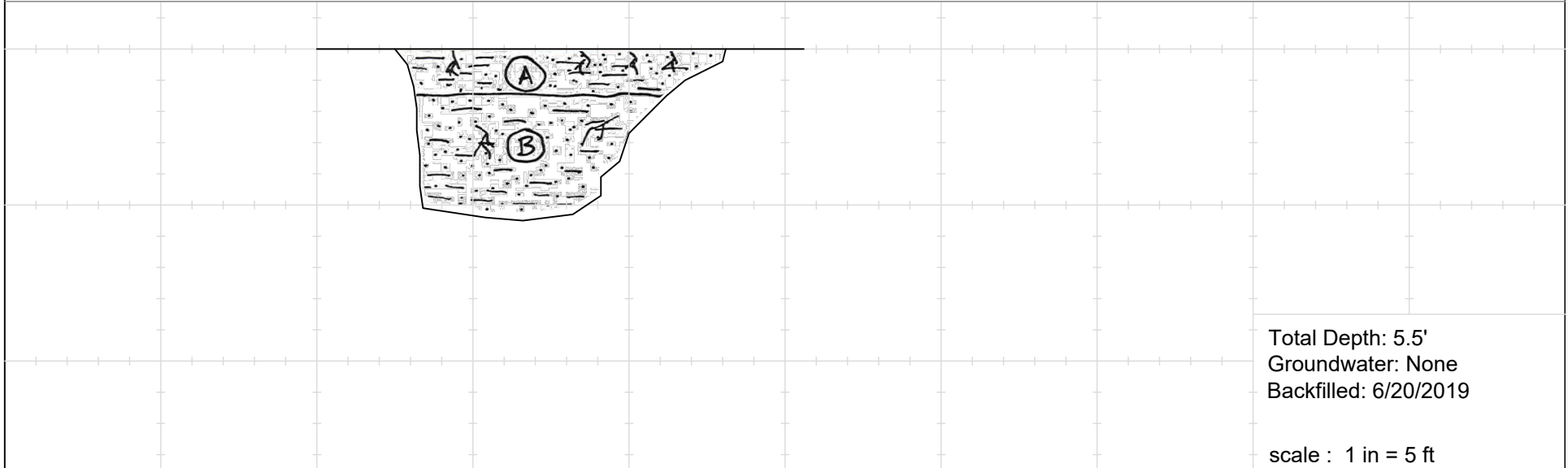



Last Edited: 6/25/2019

Project Name: Colonial		Logged By: ARN	Trench No: TP-11		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	<i>Artificial Fill - Undocumented</i> @0'-1.5' Silty SAND to Sandy SILT: dusky brown, dry, loose/soft; abundant rootlets	afu	SM/ML			
	b	<i>Quaternary Young Eolian Deposits</i> @1.5'-T.D. Silty SAND grading to Sandy SILT: tan brown, slightly moist, medium dense/stiff; occasional root	Qye	SM-ML			

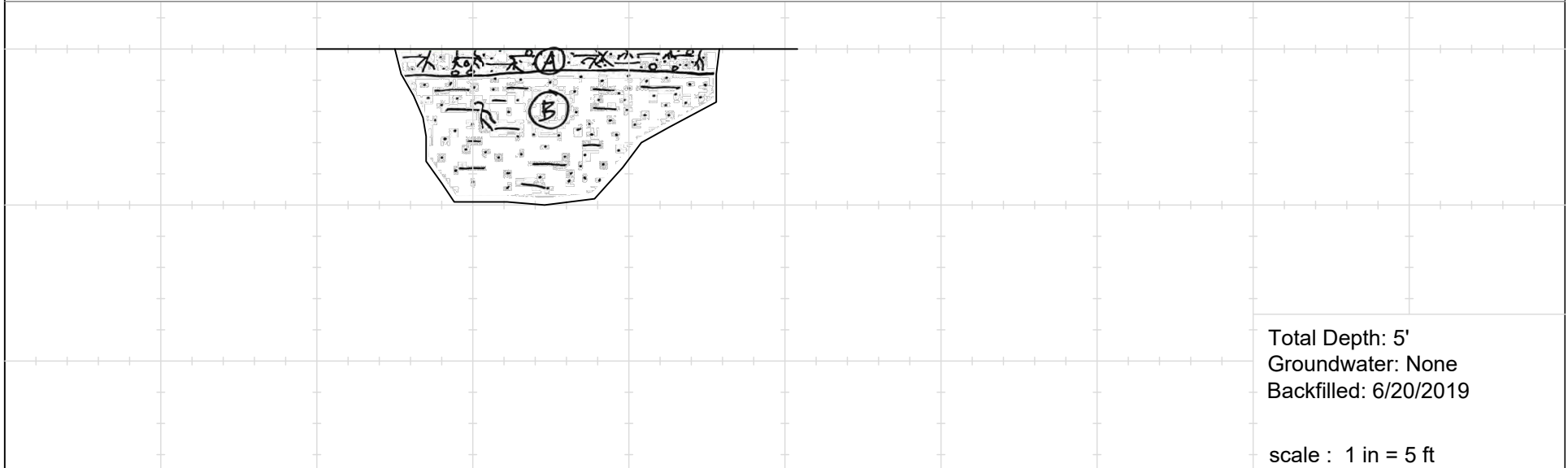
GRAPHICAL REPRESENTATION BELOW: **Elevation : 766 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



Project Name: Colonial		Logged By: ARN	Trench No: TP-12		
Project Number : 16163-01		Date : 6/20/2019	Engineering Properties:		
Equipment: Cat 420F Excavator		Location: See Geotechnical Map			

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	a	Artificial Fill - Undocumented @0'-1.5' Silty SAND to Sandy SILT: dusky to medium brown, dry, loose/soft; abundant rootlets; scattered gravel	afu	SM/ML			
	b	Quaternary Young Eolian Deposits @1.5'-T.D. Silty SAND: medium brown, slightly moist, medium dense; massive; occasional root	Qye	SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 766 ' MSL** **Surface Slope: 0 deg.** **Trend: N-S**



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-1

Test hole dimensions (if circular)	
Boring Depth (feet)*:	16
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)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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)	2.2
Factor of Safety	
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



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

*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)	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
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, Δt (min)	Initial Depth to Water, D _o (feet)	Final Depth to Water, D _f (feet)	Change in Water Level, ΔD (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

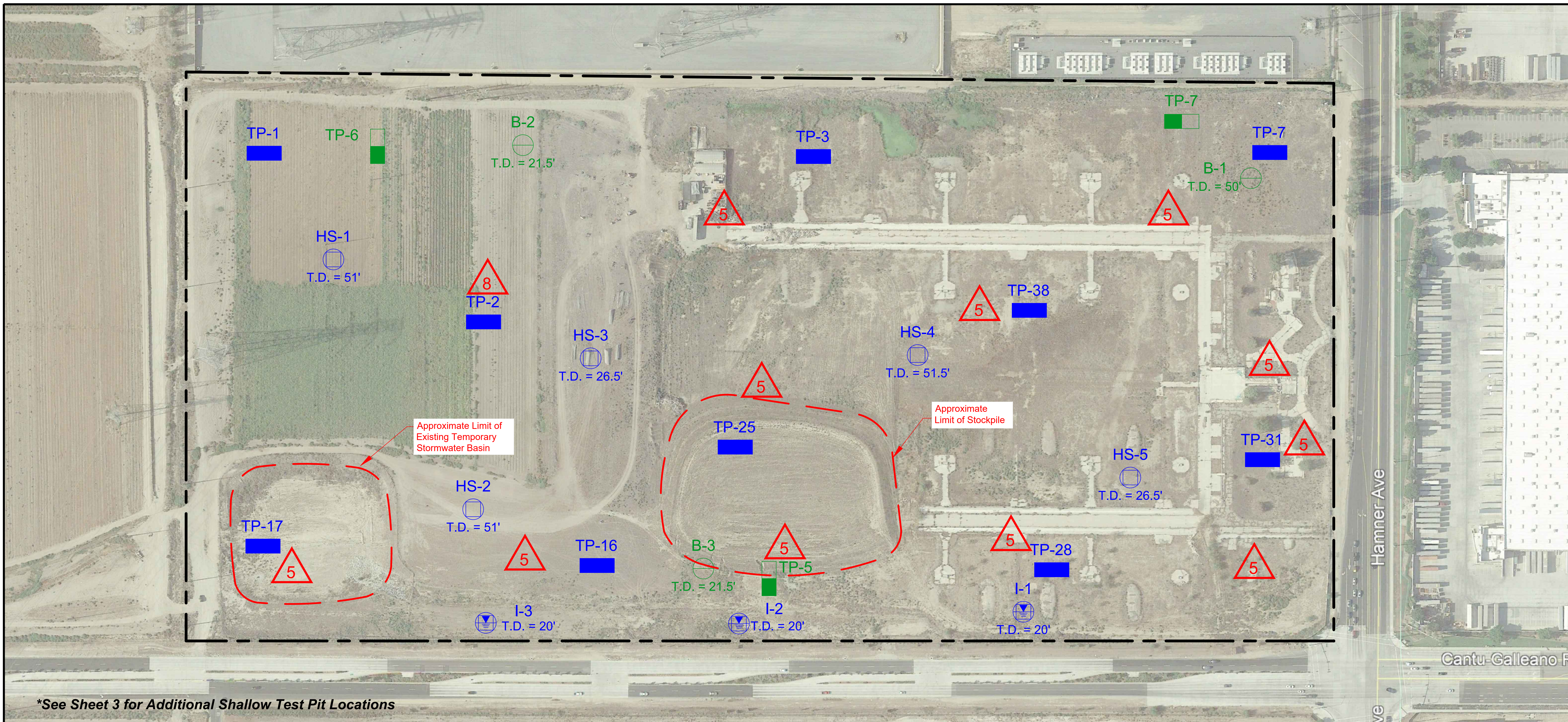
Calculated Infiltration Rate (No factors of safety)	1.3
Factor of Safety	
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:

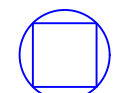




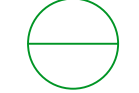




Appendix E
Geotechnical Subsurface Evaluation Data –
Visser (20179-01)

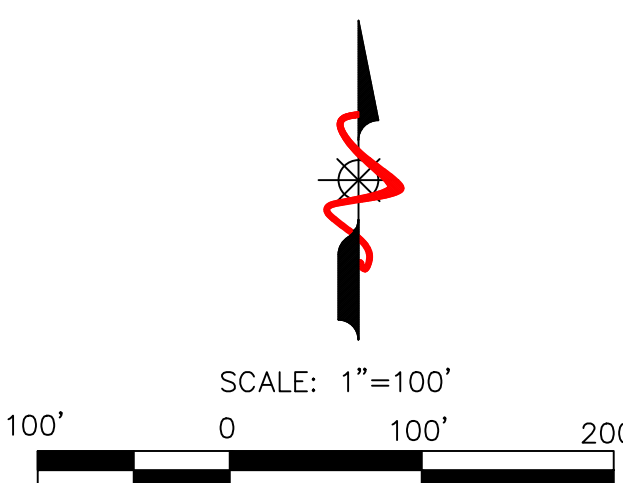


*See Sheet 3 for Additional Shallow Test Pit Locations

LEGEND

- 
 HS-5
 T.D. = 26.5'

 I-3
 T.D. = 20'

 TP-38
 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

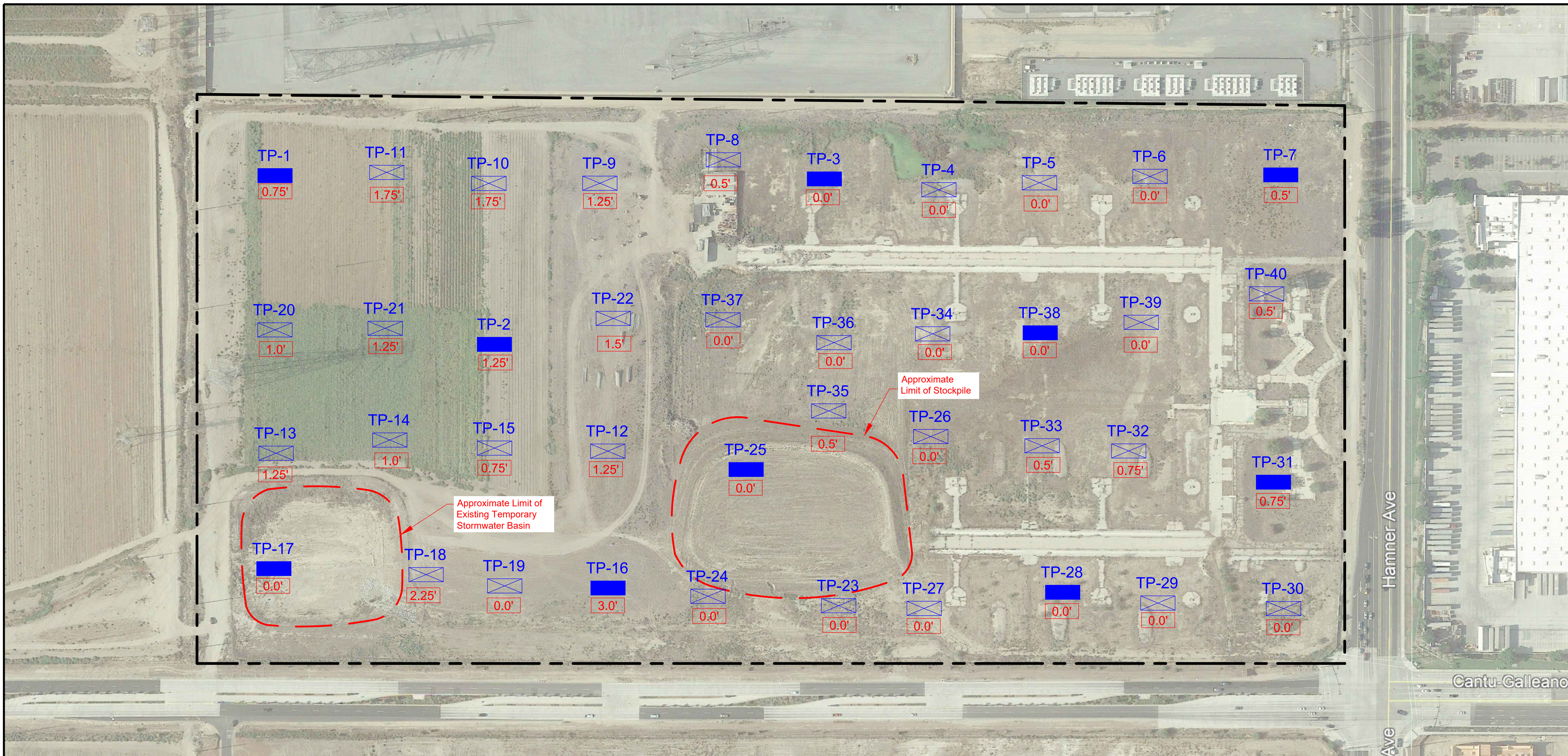
- 
 B-3
 T.D. = 21.5'

 T-7
 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
- 
 5
 Approximate Depth of Removal and Recompaction Below Existing Grade in Feet
- 
 8
 Approximate Depth of Removal and Recompaction Below Existing Grade in Feet



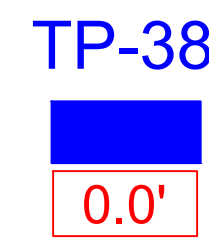
LGC Geotechnical, Inc.
 131 Calle Iglesia, Ste. 200
 San Clemente, CA 92672
 TEL (949) 369-6141 FAX (949) 369-6142

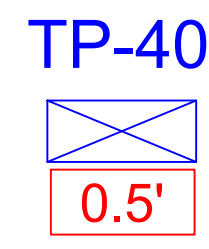
**Geotechnical Exploration Location Map
 With Satellite Image**

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

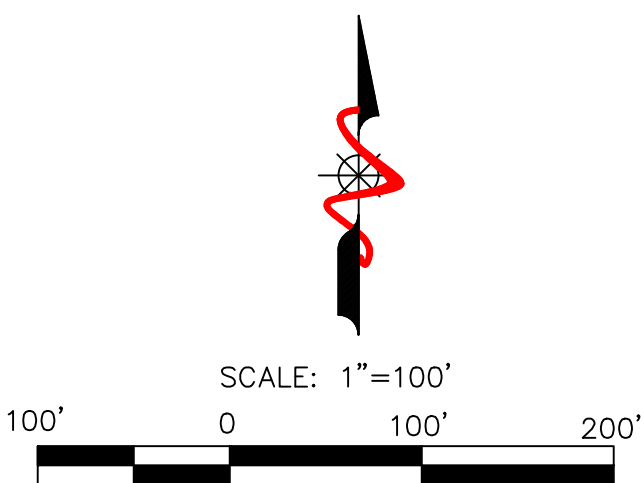


LEGEND

- 
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

----- 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

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

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

SHEET
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.

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.

Grain Size Distribution/Fines Content: 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)

Consolidation: 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.

Collapse/Swell Potential: 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.

Maximum Density Tests: 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

Expansion Index: 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

* Per ASTM D4829

Soluble Sulfates: 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)

Chloride Content: 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	pH	Minimum Resistivity (ohms-cm)
HS-1 @ 1-5 ft	7.91	3998
HS-4 @ 1-5 ft	8.11	1700


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
TP-5 (0.0')*		TP-6 (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')*		TP-11 (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
TP-13 (1.25')*		TP-14 (1.0')*		TP-15 (0.75')*		TP-16 (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	-	-	-	-	-	-
TP-25 (0.0')* Stockpile		TP-26 (0.0')*		TP-27 (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	-	-	-	-	-	-
TP-29 (0.0')*		TP-30 (0.0')*		TP-31 (0.75')*		TP-32 (0.75')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% 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
TP-33 (0.5')*		TP-34 (0.0')*		TP-35 (0.5')*		TP-36 (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
TP-37 (0.0')*		TP-38 (0.0')*		TP-39 (0.0')*		TP-40 (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

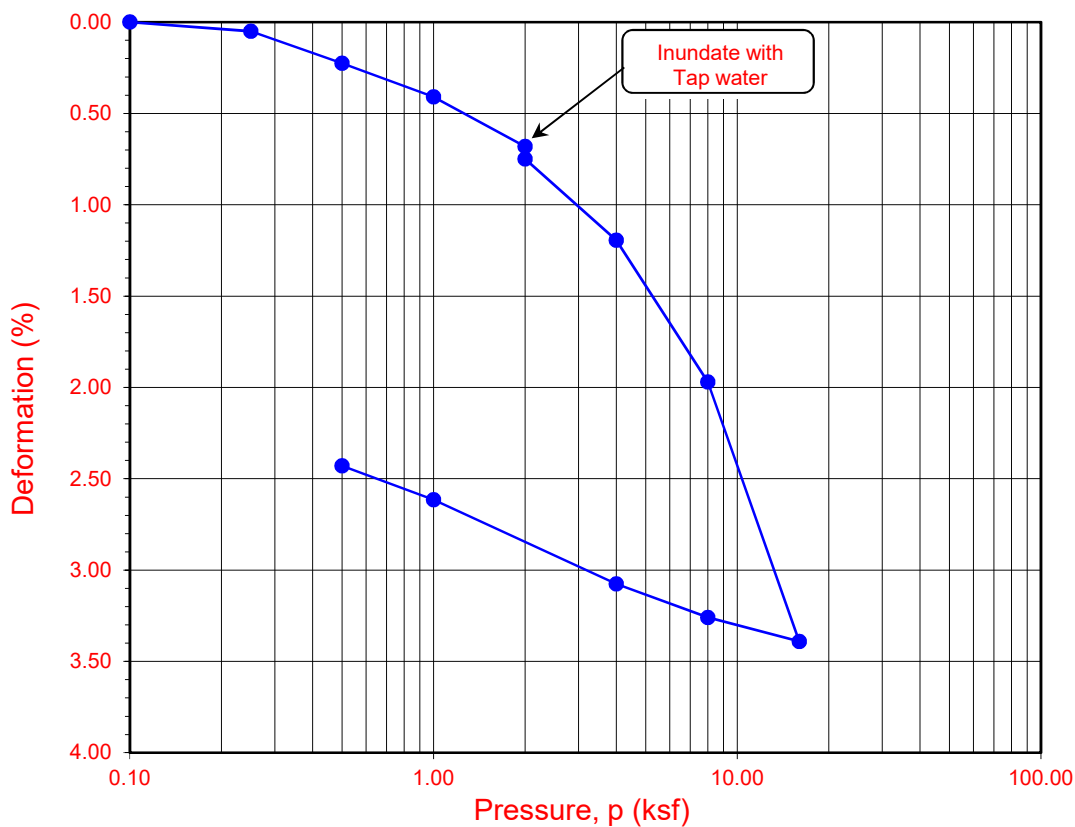
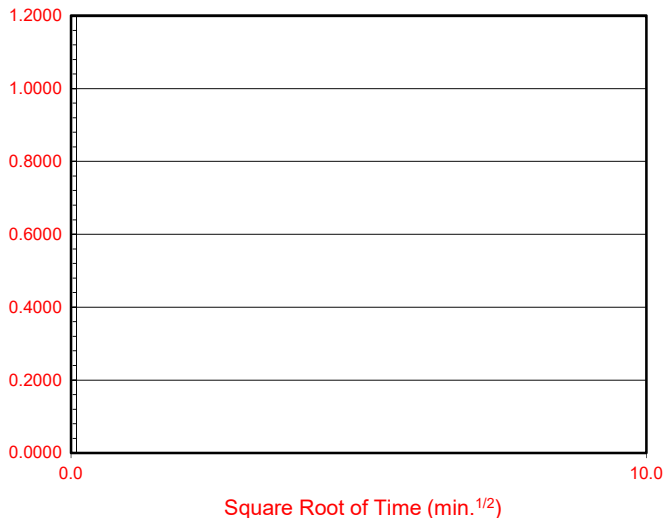
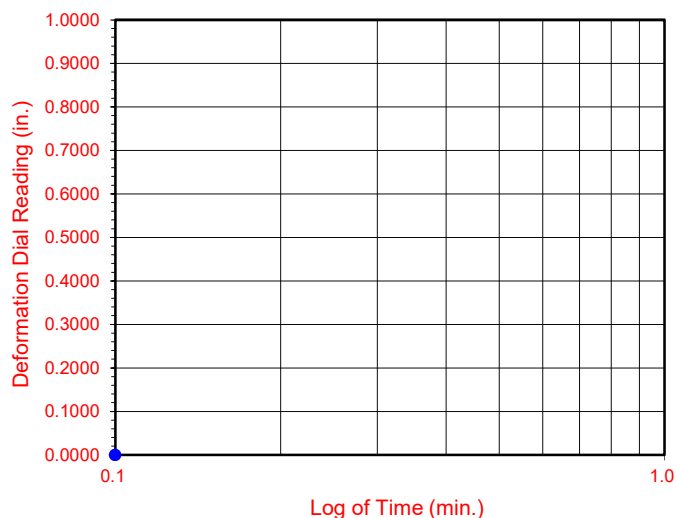
Legend

> 5%	"High" Organic Content "Soils" Recommended for Export from Site
2 to 5%	"Transitional" Soils Recommended for Mix/Blend w/ "Clean" Soils
< 2%	"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

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
I-3	R-2	10.0	6.7	29.4	92.9	91.3	0.814	0.770	22	94

Soil Identification: Olive silty sand (SM)

	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
 Project No.: 20179-01
 Boring No.: HS-1
 Sample No.: R-3
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 10/04/20
 Checked By: A. Santos Date: 10/07/20
 Sample Type: Ring
 Depth (ft.): 7.5

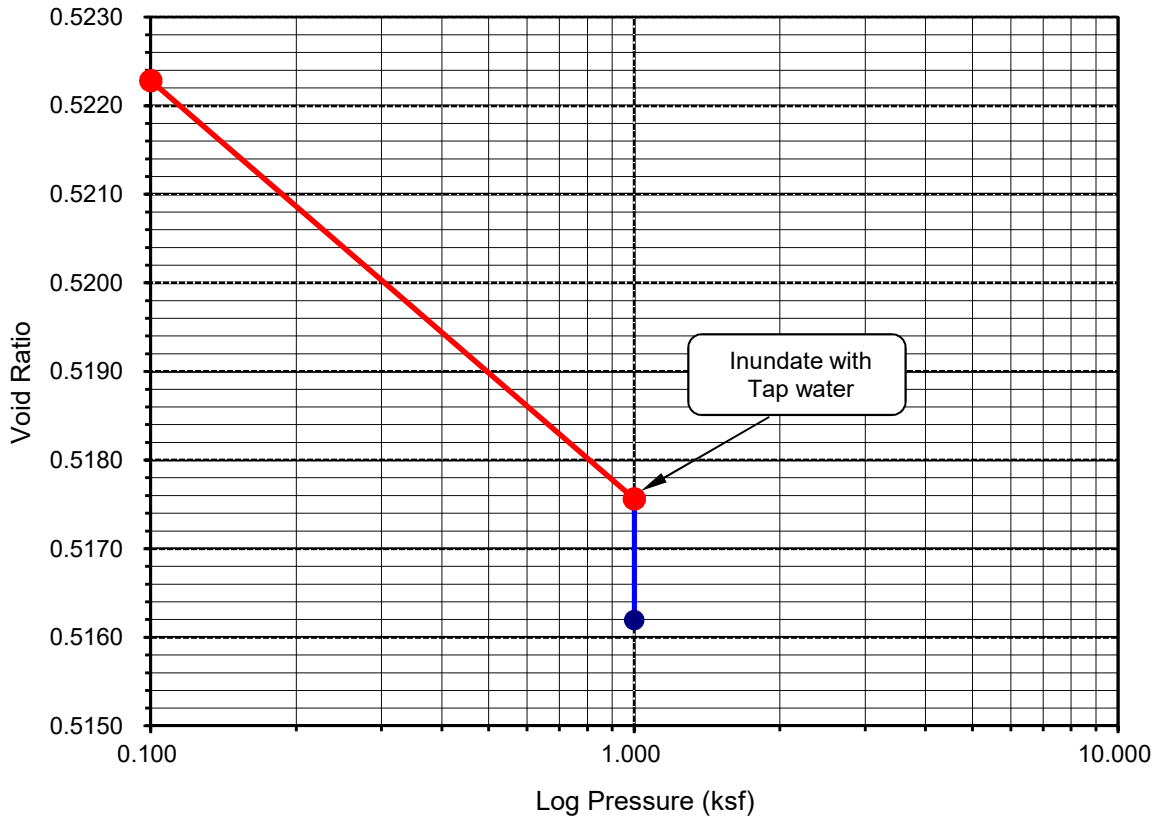
Initial Dry Density (pcf):	110.7
Initial Moisture (%):	9.09
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2700
Diameter(in):	2.415

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

Void Ratio - Log Pressure Curve



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

Project Name: Ontario
 Project No.: 20179-01
 Boring No.: HS-4
 Sample No.: R-2
 Sample Description: Olive silty sand (SM)

Tested By: G. Bathala Date: 10/04/20
 Checked By: A. Santos Date: 10/07/20
 Sample Type: Ring
 Depth (ft.): 5.0

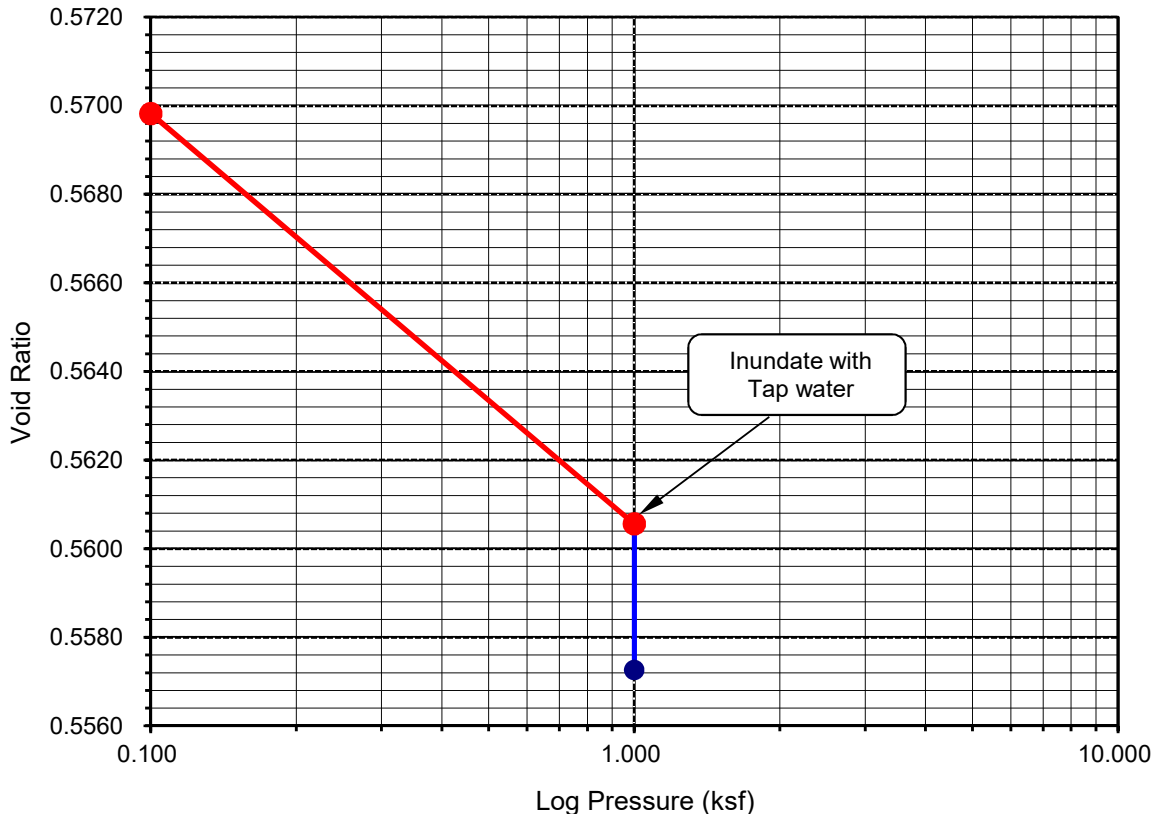
Initial Dry Density (pcf):	107.3
Initial Moisture (%):	5.44
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3032
Diameter(in):	2.415

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

Void Ratio - Log Pressure Curve



LABORATORY TEST DATA

IN SITU MOISTURE AND DRY DENSITY ^{1,2}

Test Pit Number	Depth (feet)	Soil Type	Moisture (%)	Dry Density (pcf)
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

Boring or Test Pit No.	Depth (feet)	Soil Type	Optimum Moisture (%)	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	Depth (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-1	0-5	Sand	11	Very Low

SOLUBLE SULFATES AND CHLORIDES ⁶

Boring Number	Depth (feet)	Soil Type	Sulfate Content (%)	Chloride 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

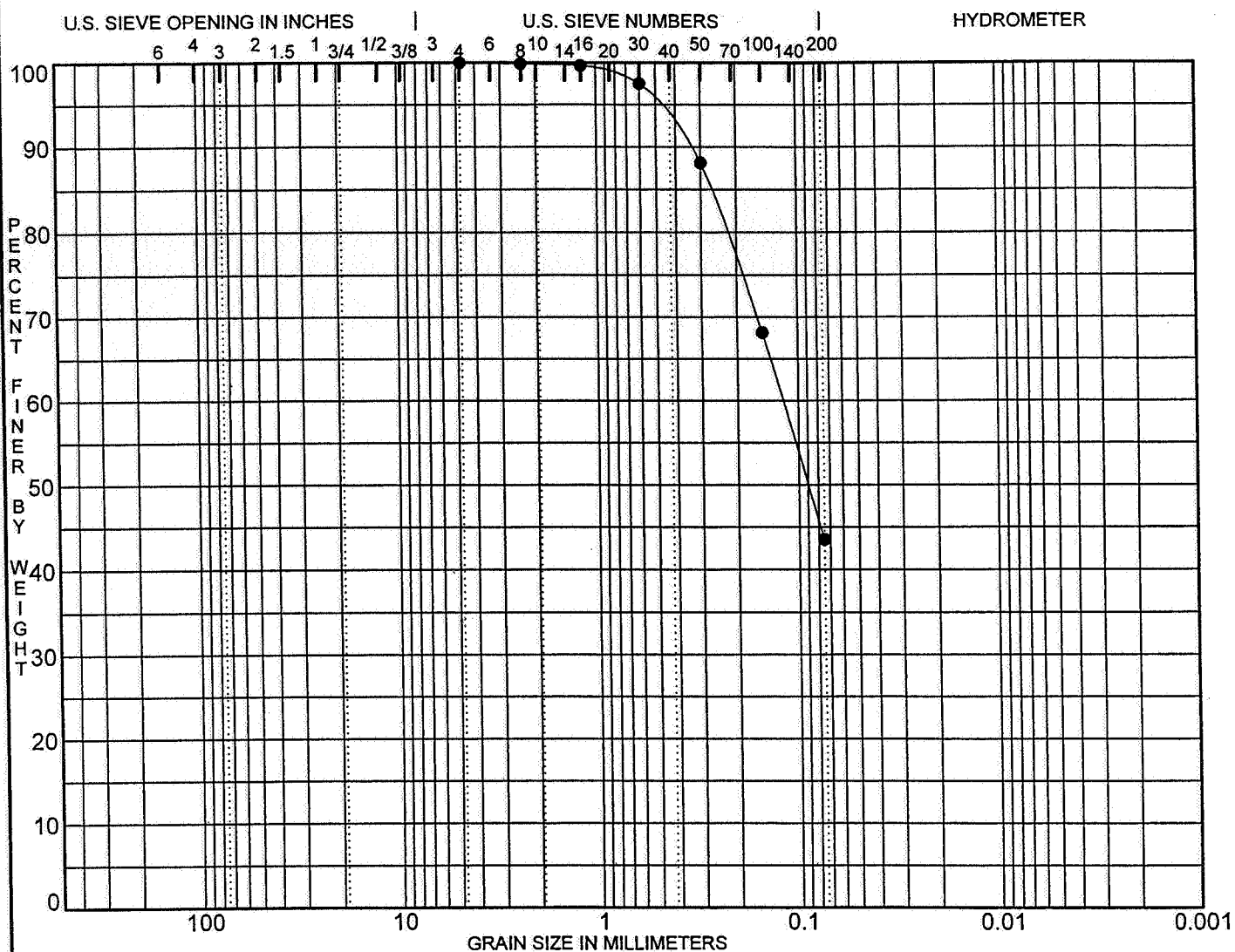
Boring Number	Depth (feet)	Soil Type	pH	Minimum Resistivity (ohm-cm)
B-1	0-5	Sand	6.9	3,000
B-9	0-5	Silty Sand	6.3	3,200
B-12	0-5	Sand	7.7	3,400
TP-1	0-5	Sand	7.8	3,700

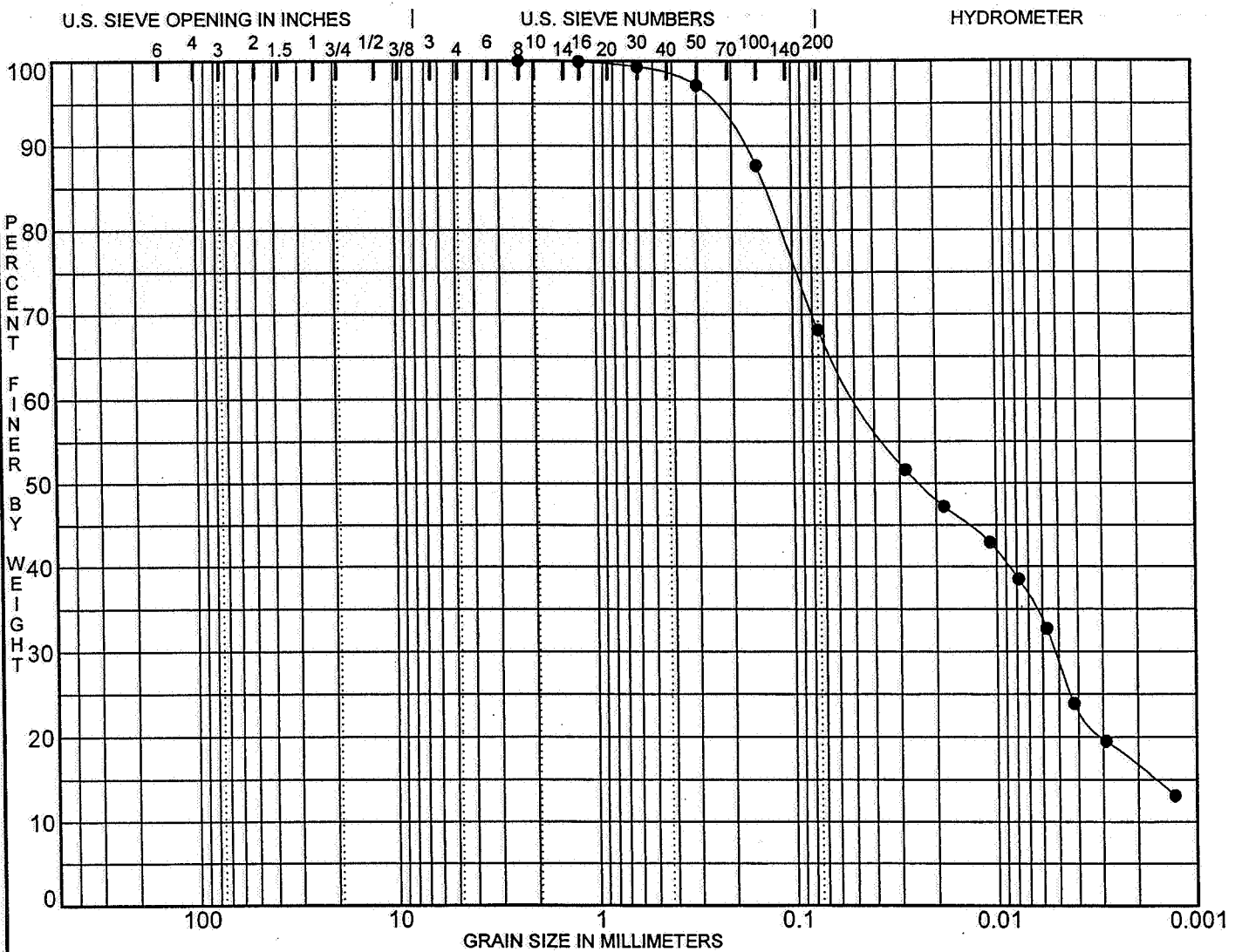
IN PLACE ORGANIC CONTENT ⁸

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
	3	0.81	TP-10	0.5	0.47
	4	0.56		1.5	0.30
		3		0.32	
TP-2	1	1.04	TP-11	0.5	1.83
	2	1.13		1.5	1.63
	3	0.60		3	0.51
	4	0.35	TP-12	0.5	6.61
TP-4	0.5	0.52		1.5	0.73
	1.5	0.43		3	0.18
	3	0.40	TP-13	0.5	0.58
	4.5	0.50		1.5	0.49
		3		0.88	
TP-5	1.5	0.29	TP-14	0.5	6.12
	3	0.29		1.5	0.86
	4.5	0.82		3	0.98
TP-6	1	0.80			
	2	0.59			
	3	0.39			
	4	0.80			
TP-7	1.5	0.51			
	2	0.52			
	3	0.90			
TP-8	1	1.27			
	2	0.38			

- (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







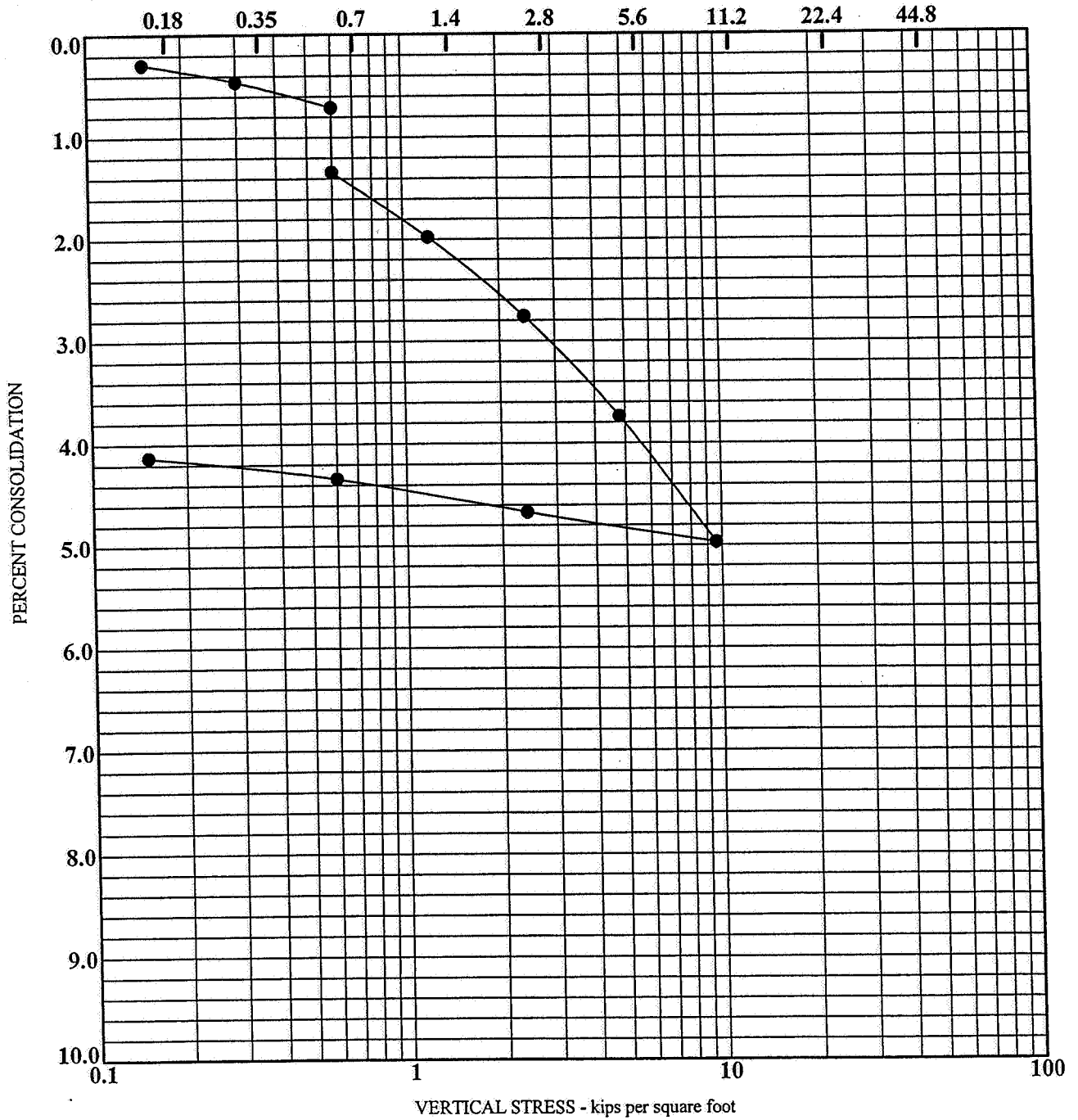
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● B-1 45.0	Clayey Sand (SC) Sandy Clay (CL)						

Specimen Identification	D100	D60	D30	D50	%Gravel	%Sand	%Silt	%Clay
● B-1 45.0	2.36	0.05	0.005	0.0241	0.0	31.8	39.2	28.9

GRAIN SIZE -V1 463-05.GPJ PETRA.GDT 9/16/05

SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL			INUNDATED
		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)
● B-1 @ 5.0	Silty Sand (SM)	103.6	6.1	26	0.60



CONSOLIDATION - STRAIN 463-05.GPJ PETRA.GDT 9/16/05

J.N. 463-05

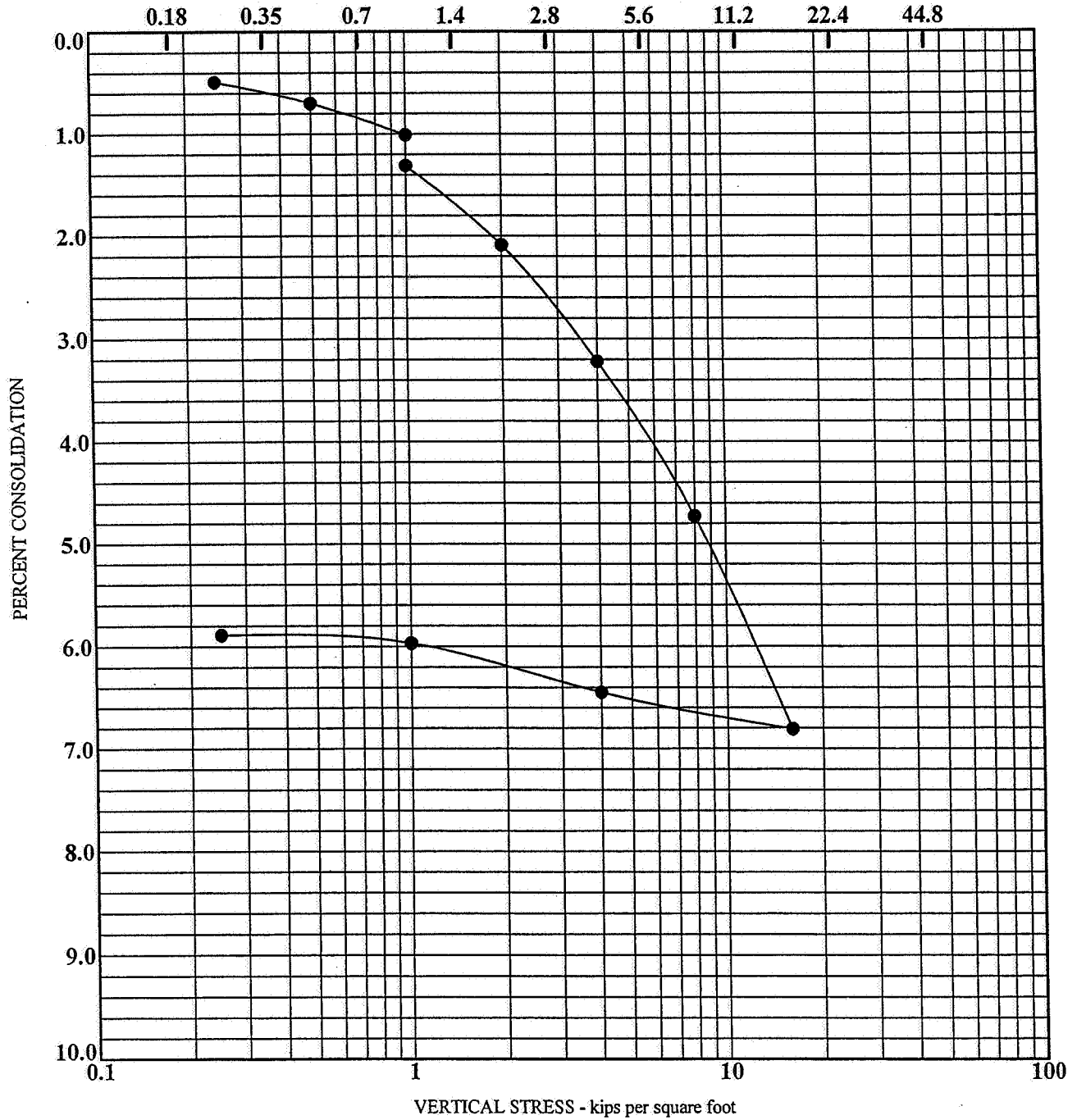
PETRA GEOTECHNICAL, INC.

CONSOLIDATION TEST RESULTS

September, 2005

PLATE B-7

SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL			INUNDATED
		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)
● B-2 @ 9.0	Silty Sand (SM)	100.3	10.6	42	1.00



CONSOLIDATION - STRAIN 463-05.GPJ PETRA.GDT 9/16/05

J.N. 463-05

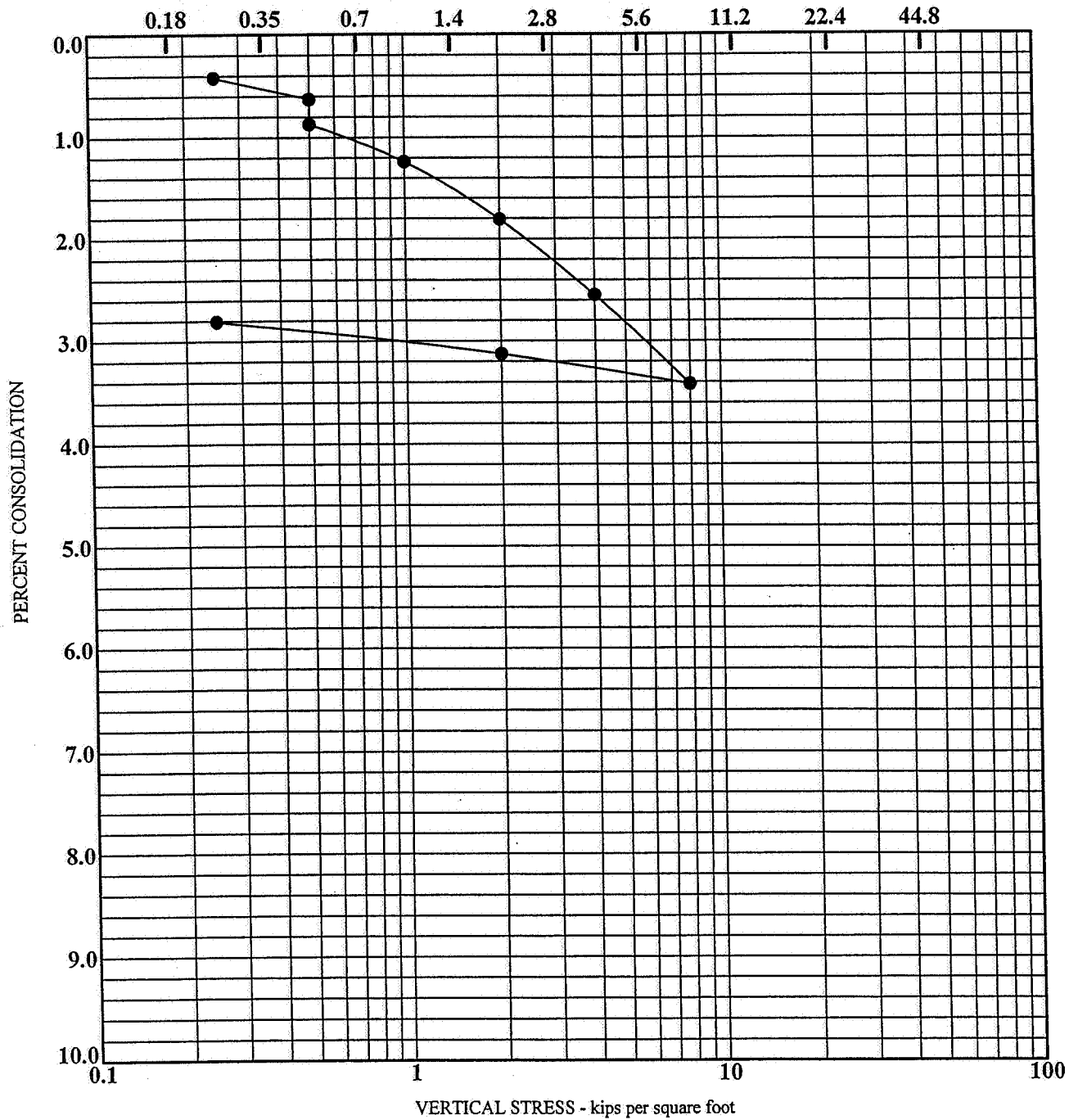
PETRA GEOTECHNICAL, INC.

CONSOLIDATION TEST RESULTS

September, 2005

PLATE B-8

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



CONSOLIDATION - STRAIN 463-05.GPJ, PETRA.GDT 9/16/05

J.N. 463-05

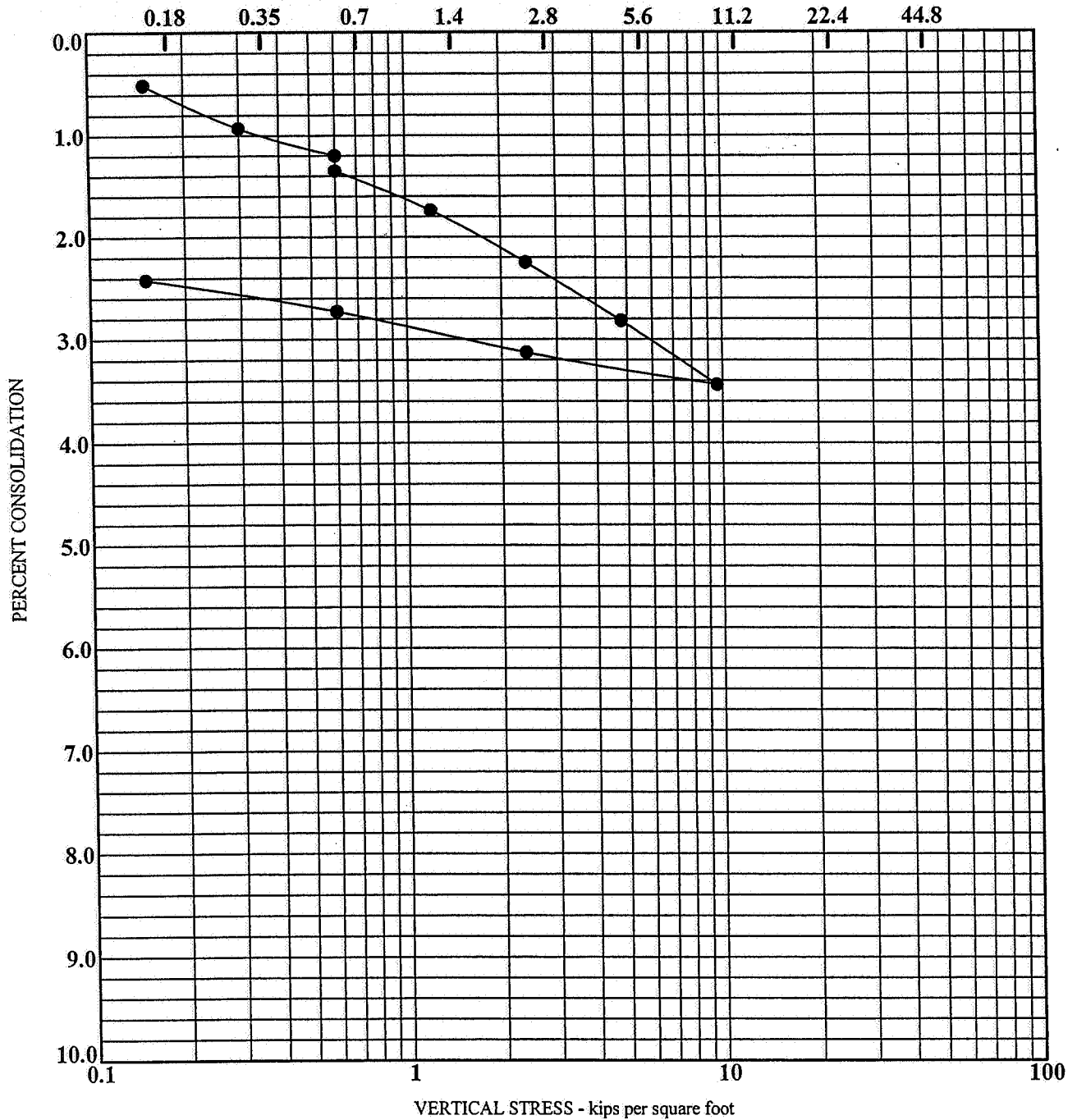
PETRA GEOTECHNICAL, INC.

CONSOLIDATION TEST RESULTS

September, 2005

PLATE B-15

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



CONSOLIDATION - STRAIN 463-05.GPJ PETRA.GDT 9/16/05

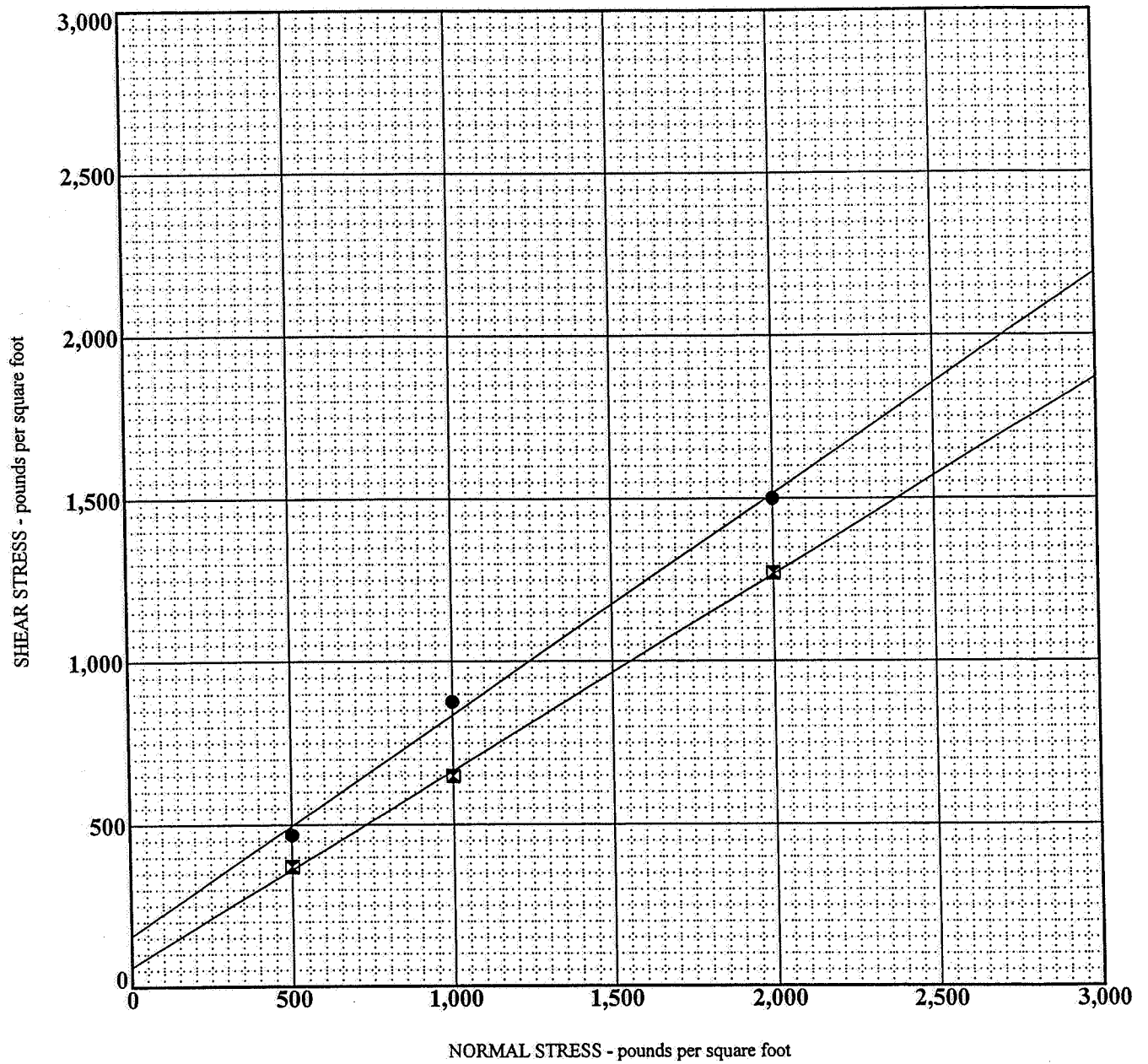
J.N. 463-05

PETRA GEOTECHNICAL, INC.

CONSOLIDATION TEST RESULTS

September, 2005

PLATE B-16



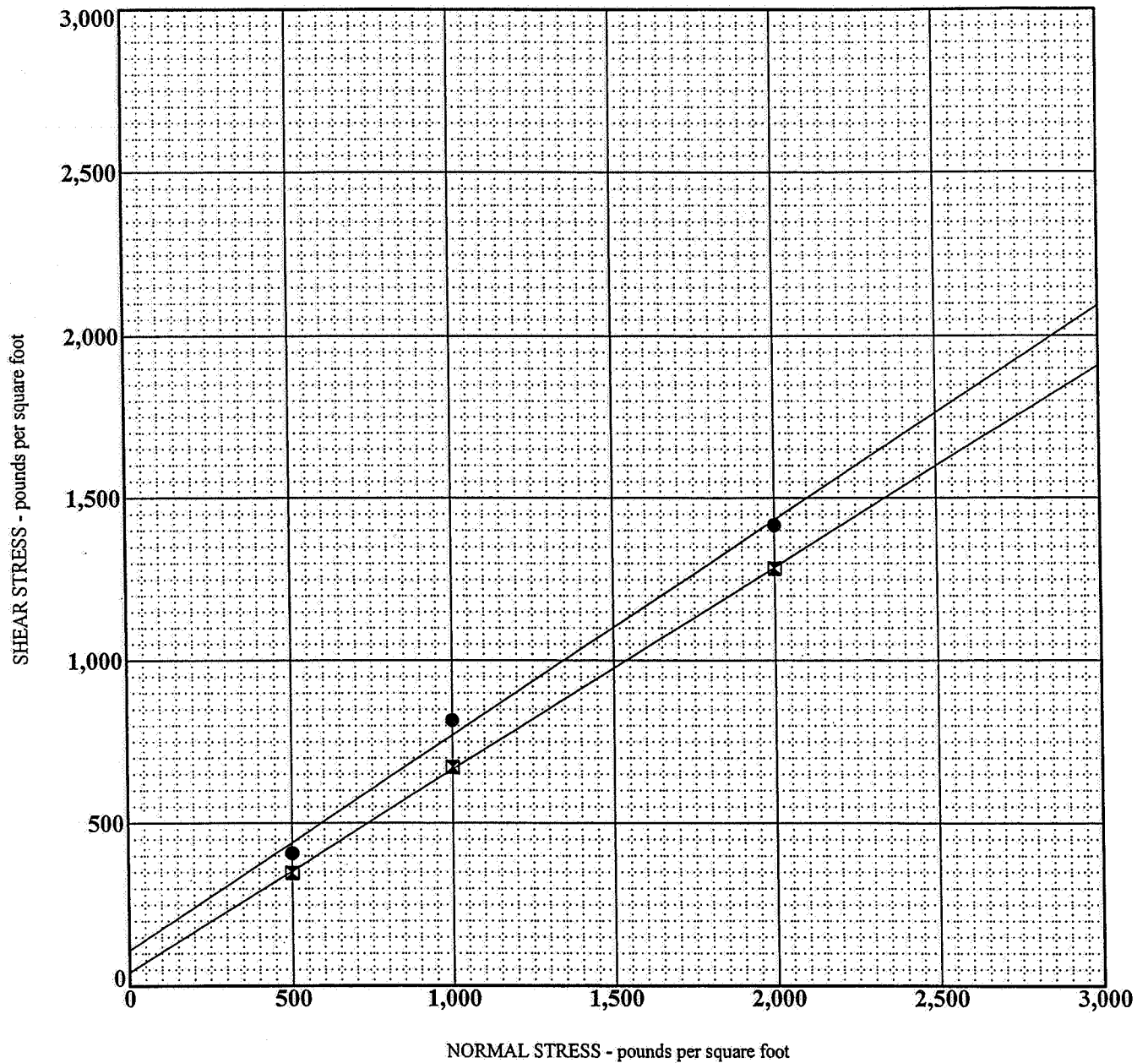
SAMPLE LOCATION	DESCRIPTION	FRICTION ANGLE (°)	COHESION (PSF)
● B-12 @ 0.0 - 5.0	Poorly Graded Sand (SP) - Peak	34	160
☒ B-12 @ 0.0 - 5.0	Poorly Graded Sand (SP) - Ultimate	31	60

NOTES:

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

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

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



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

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

J.N. 463-05

PETRA GEOTECHNICAL, INC.

**DIRECT SHEAR TEST DATA
 REMOLDED TEST SAMPLES**

September, 2005

PLATE B-21

Geotechnical Boring Log Borehole HS-1

Date: 9/14/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: CME 75
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~739' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	#200 CR EI MD
735		B-1	R-1	16 18 19	112.6	5.9	SM	@2.5' - Silty SAND: gray brown, slightly moist, medium dense	
	5		R-2	6 8 9	107.9	10.2		@5' - Silty SAND: brown, moist, medium dense	
730			R-3	6 8 11	111.5	9.1		@7.5' - Silty SAND: light brown, moist, medium dense	
	10		R-4	14 16 19	106.3	10.9		@10' - Silty SAND: brown, moist, medium dense	
725	15		SPT-1	7 9 10			5.1	SP-SM	@15' - SAND with Silt: gray brown, slightly moist, medium dense
720	20	R-5	32 50/4"	124.9	2.5	SP	@20' - SAND with Gravel: gray brown, dry, very dense		
715	25	SPT-2	20 32 40			3.6		@25' - SAND with Gravel: gray brown, dry, very dense	
710	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-1

Date: 9/14/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: CME 75
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~739' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
705	30		R-6	40 50/3"	116.1	2.4	SP	@30' - SAND with Gravel: gray brown, dry, very dense	
705	35		SPT-3	15 18 32		9.9	SM	@35' - Silty SAND: brown, moist, very dense	
700	40		R-7	29 50/5"	112.6	17.4	ML	@40' - Sandy SILT: gray brown, very moist, hard	
695	45		SPT-4	11 14 18		15.8		@45' - Sandy SILT: brown, very moist, hard	
690	50		R-8	42 50/4"	128.0	7.5	SM	@50' - Silty SAND with Gravel: gray brown, moist, very dense	
685	55							Total Depth = 51' Groundwater Not Encountered Backfilled with Cuttings on 9/14/2020	
680	60								



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

TEST TYPES:
 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-2

Date: 9/14/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: CME 75
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~737' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0	B-1	R-1	26 32 35	110.3	2.2	SP	@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf) @2.5' - SAND: gray brown, dry, very dense	
730	5		R-2	20 32 40	104.3	4.2		@5' - SAND: gray brown, slightly moist, very dense	
			R-3	18 26 35	101.6	3.0		@7.5' - SAND: light brown, dry, dense	
	10		R-4	30 38 50/5"	107.6	2.3		@10' - SAND with Gravel: gray brown, dry, very dense	
725	15		SPT-1	6 7 10		15.5	SM	@15' - Silty SAND: brown, very moist, medium dense	
720	20		R-5	36 50/6"	119.8	1.4	SP	@20' - SAND with Gravel: gray and light gray, dry, very dense	
715	25		SPT-2	7 9 10		3.9	SM	@25' - Silty SAND with Gravel: brown, dry, medium dense	
710	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-2

Date: 9/14/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: CME 75
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~737' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
705	30		R-6	30 50/6"	114.3	8.5	SM	@30' Silty SAND: dusky brown, moist, very dense	
700	35		SPT-3	6 8 11		20.3	ML	@35' Sandy SILT: gray and dusky brown, very moist, very stiff	
695	40		R-7	20 32 40	119.4	14.3		@40' Sandy SILT: dusky brown, very moist, hard	
690	45		SPT-4	7 9 12		29.8	CL	@45' CLAY: light brown, very moist, very stiff	
685	50		R-8	40 50/5"	124.1	9.2	SM	@50' Silty SAND: light brown, moist, very dense	
680	55							Total Depth = 51' Groundwater Not Encountered Backfilled with Cuttings on 9/14/2020	



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

TEST TYPES:
 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-3

Date: 9/14/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: CME 75
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~738' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	
735		B-1	R-1	50/5"	104.1	3.8	SP	@2.5' - SAND: gray brown, dry, very dense	
	5		R-2	35 50/6"	118.3	3.6		@5' - SAND with Gravel: gray brown, dry, very dense	
730			R-3	25 40 50/5"	110.6	6.3		@7.5' - SAND: gray brown, slightly moist, very dense	
	10		R-4	18 26 32	107.8	3.6		@10' - SAND: gray brown, dry, dense	
725			SPT-1		10 15 19		5.1	@15' - SAND: gray brown, slightly moist, dense	
720			R-5	24 30 50/5"	106.3	3.2	SM	@20' - Silty SAND: gray brown, dry, very dense	
715			SPT-2			8.4	@25' - Silty SAND: dusky brown, moist, very dense		
710							Total Depth = 26.5' Groundwater Not Encountered Backfilled with Cuttings on 9/14/2020		
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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

≡ GROUNDWATER TABLE

Geotechnical Boring Log Borehole HS-4

Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~737' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0	B-1						@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	CR EI
			R-1	6 9 11	117.3	6.8	SM	@2.5' - Silty SAND: dusky brown, slightly moist, medium dense	
	5		R-2	8 10 12	108.0	5.4		@5' - Silty SAND: dusky brown, slightly moist, medium dense	#200 CO
730			R-3	9 15 18	103.1	3.9		@7.5' - Silty SAND: dusky brown, dry, medium dense	
	10		R-4	9 16 19	99.6	2.8	SP	@10' - SAND: reddish brown, dry, medium dense	
725									
	15		SPT-1	4 5 6		13.2	ML	@15' - SILT with Sand: gray, moist, stiff	#200
720									
	20		R-5	9 11 15	104.1	2.0	SP	@20' - SAND: gray brown, dry, medium dense	
715									
	25		SPT-2	11 9 11		14.3	SM	@25' - Silty SAND: dusky brown, very moist, medium dense	
710									
	30								

	<p>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.</p>	<p>SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES: 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</p>
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Geotechnical Boring Log Borehole HS-4

Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~737' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
705	30		R-6	6 22 24	110.5	18.7	ML	@30' - Sandy SILT: gray, very moist, hard	AL
700	35		SPT-3	4 7 8		19.3	CL	@35' - Sandy CLAY: reddish brown, very moist, very stiff	
695	40		R-7	23 50/5"	118.2	14.3	SM	@40' - Silty SAND: brown, very moist, very dense	
690	45		SPT-4	9 17 19		9.5		@45' - Silty SAND: brown, moist, dense	
685	50		R-8	16 20 41	107.6	7.2		@50' - Silty SAND: brown, slightly moist, dense; iron oxide weathering	
680	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
60									



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-5

Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~741' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
740	0							@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	MD
			R-1	5 5	109.7	5.6	SM	@2.5' - Silty SAND: brown, slightly moist, loose	
735	5		R-2	7 9 13	123.7	5.1		@5' - Silty SAND: brown, slightly moist, medium dense	
			R-3	11 31 33	122.8	1.4	GP	@7.5' - Sandy GRAVEL: gray, dry, very dense	
730	10		R-4	33 29 43	122.0	1.3	SP	@10' - SAND with Gravel: gray, dry, very dense	
			R-5	12 13 17	120.4	1.8		@15' - SAND with Gravel: gray, dry, medium dense	
725	15								
720	20		SPT-1	10 11 18		2.4		@20' - SAND with Gravel: gray brown, dry, dense	
			R-6	11 23 30	109.2	8.4	SM	@25' - Silty SAND: gray brown, moist, dense	
715	25								
								Total Depth = 26.5' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
	30								

Last Edited: 9/21/2020



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

TEST TYPES:
 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 I-1

Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~737' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0							@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	
730	5	█	R-1	8 9	112.8	10.4	SM	@5' - Silty SAND: brown, moist, medium dense	
725	10	█	R-2	6 11	102.3	16.8	ML	@10' - Sandy SILT: brown, very moist, stiff	
720	15								
715	20	X	SPT-1	5 7		13.1	SM	@18' - Silty SAND: dusky brown, very moist, medium dense	
710	25							Total Depth = 20' Groundwater Not Encountered 3" Perforated Pipe Surrounded by Gravel Installed and Presoaked on 9/17/2020 Backfilled with Cuttings on 9/18/2020	
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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 I-2

Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~734' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
730	0							@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	
725	5	R-1		13 15 21	114.2	2.0	SM	@5' - Silty SAND: brown, dry, medium dense	
720	10	R-2		7 19 24	101.7	2.3	SP	@10' - SAND: gray brown, dry, dense	
715	15		SPT-1	9 15 18		1.7		@18' - SAND with Gravel: gray brown, dry, dense	
710	20							Total Depth = 20' Groundwater Not Encountered 3" Perforated Pipe Surrounded by Gravel Installed and Presoaked on 9/17/2020 Backfilled with Cuttings on 9/18/2020	
705	25								
700	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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 I-3


Date: 9/17/2020	Drilling Company: Choice Drilling
Project Name: Visser, Ontario	Type of Rig: Limited Access Track Rig
Project Number: 20179-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~733' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
0								Logged By ARN Sampled By ARN Checked By RLD	
730								@0' to T.D. - Quaternary Alluvial Fan Deposits (Qyf)	
5		█	R-1	7 11 13	102.3	9.8	SM	@5' - Silty SAND: gray brown, moist, medium dense	
725									
10		█	R-2	6 7 10	95.4	6.7		@10' - Silty SAND: gray brown, slightly moist, medium dense; mottled	CN
720									
15									
715		X	SPT-1	8 13 15		2.0	SP	@18' - SAND with Gravel: gray brown, dry, dense	
20									
710								Total Depth = 20' Groundwater Not Encountered 3" Perforated Pipe Surrounded by Gravel Installed and Presoaked on 9/17/2020 Backfilled with Cuttings on 9/18/2020	
25									
705									
30									



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	TEST TYPES: 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
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Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-1	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

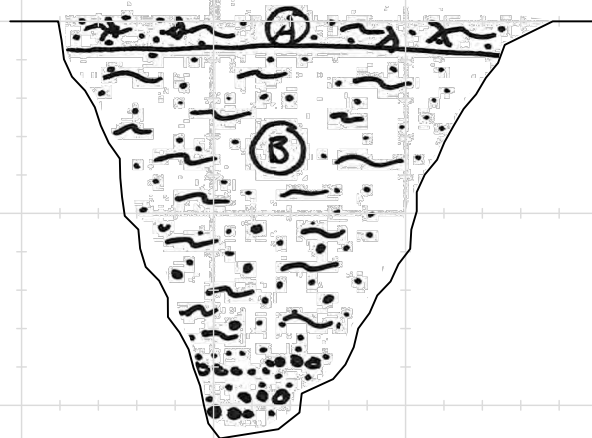
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-0.75' Silty SAND: brown and dark brown, dry, loose; scattered rootlets	Qyf	SM	GB-1 @ 3" GB-2 @ 9" GB-3 @ 12" B-1 @ 1'-5'		
	B	<u>Quaternary Alluvial Fan Deposits</u> @0.75'-4' Silty SAND: light brown, dry, medium dense; scattered iron oxide staining; infrequent rootlets; trace pinhole pores; blocky excavation @4'-5' Slightly harder, increased moisture @5'-9' tan-brown, trace pea gravel @9'-T.D. SAND with Gravel lenses: gray, slightly moist, medium dense; gravel interbeds 3 inches wide; subrounded clasts 1-inch in maximum dimension		SP			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 740' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 11'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-2	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

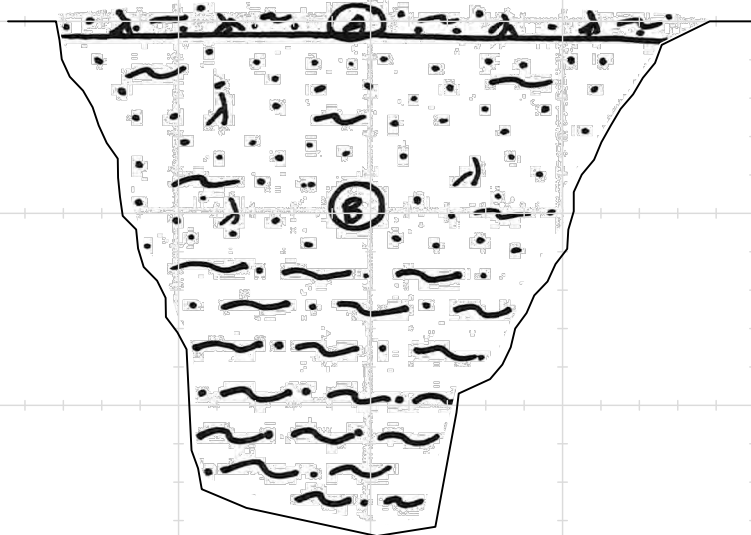
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0"-4" Silty SAND: dark brown, dry, loose; abundant rootlets; dry, dead vegetation @6" Transition zone, moist to slightly moist, reddish brown	Qyf	SM	GB-1 @ 3" GB-2 @ 8" GB-3 @ 24" GB-4 @ 6"		
	B	<u>Quaternary Alluvial Fan Deposits</u> @10"-6' Silty SAND: olive gray, moist, loose to medium dense; scattered rootlets @6'-T.D. Sandy SILT: reddish brown, moist, stiff; slightly clayey; may be fill; excavates easily to total depth		ML			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 740' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 15'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-3	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

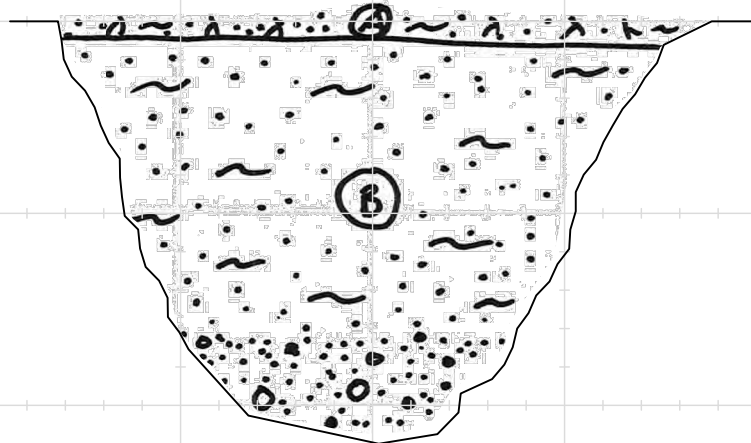
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	Topsoil @0'-4" Silty SAND: light to medium brown, loose, dry; scattered grass, sticks, dried and dead vegetation	Qyf	SM	GB-1 @ 2" GB-2 @ 6"		
	B	Quaternary Alluvial Fan Deposits @4"-7' Silty SAND: light brown, dry, medium dense; scattered to trace gravel; blocky excavation; slightly moist by 2' @7' - Silty fine SAND: brown, slightly moist to moist, medium dense @8'-9' SAND with trace Gravel: gray, dry to slightly moist, medium dense; coarse to medium-grained sand @9' - T.D. SAND: brown, slightly moist, medium dense; scattered cobbles and gravel in fine to medium-grained sand		SP			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 741' MSL

Surface Slope: 0 deg.

Trend: E-W



Total Depth: 11'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-7	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

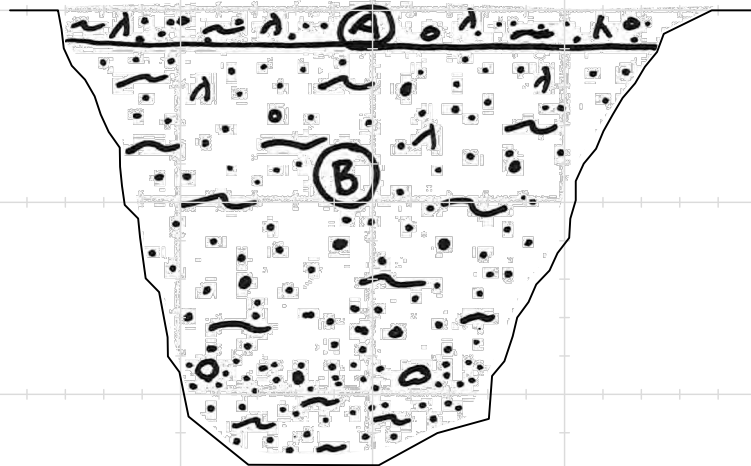
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	Topsoil @0'-1' Silty SAND: medium brown, dry, medium dense; scattered rootlets; scattered gravel	Qyf	SM	GB-1 @ 2" GB-2 @ 1" GB-3 @ 1.5"		
	B	Quaternary Alluvial Fan Deposits @1'-8' Silty SAND: medium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

GRAPHICAL REPRESENTATION BELOW:

Elevation: 741' MSL


Surface Slope: 0 deg.

Trend: E-W



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

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-16	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

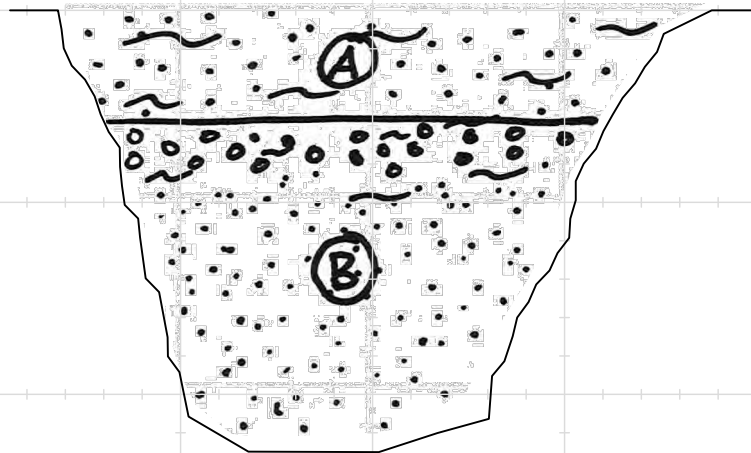
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Undocumented Artificial Fill</u> @0'-3' Sand with SILT to Silty SAND: reddish brown, slightly moist, medium dense; brown organic staining; gray mottle by 19"	Afu	SM	GB-1 @ 16" GB-2 @ 32" GB-3 @ 40"		
	B	<u>Quaternary Alluvial Fan Deposits</u> @3'-5.5' SAND with SILT: gray brown, slightly moist, medium dense; 2-inch thick gravel bed just beneath; subrounded clasts @5.5'-T.D. SAND: gray, slightly moist, medium dense; generally medium-grained sand	Qyf	SP-SM SP	B-1 @ 1'-5'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 737' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 11.5'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-17	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

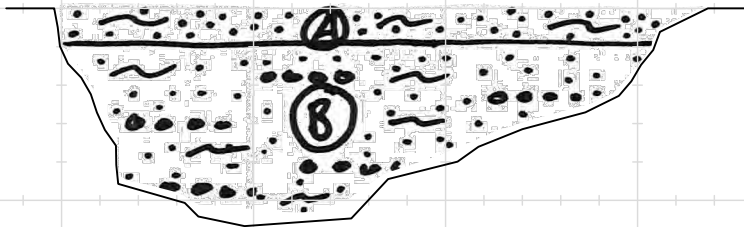
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	Topsoil @0'-1' Silty SAND: light brown, dry, dense material, blocky excavation	Qyf	SM	GB-1 @ 2" GB-2 @ 12"		
	B	Quaternary Alluvial Fan Deposits @1'-T.D. SAND with SILT to Silty SAND: gray and brown, dry to slightly moist, medium dense to dense; several gravel interbeds 1 foot thick		SP-SM			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 723' MSL

Surface Slope: 0 deg.

Trend: N-S



Total Depth: 5.5'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-25	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

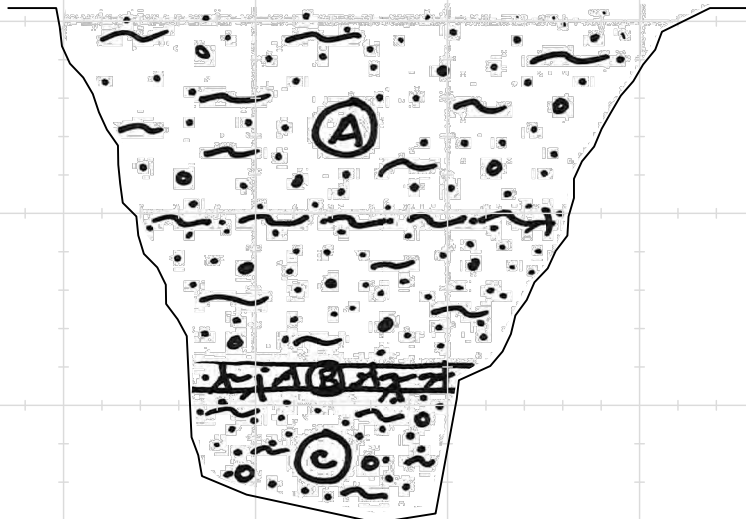
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Undocumented Artificial Fill (Stockpile)</u> @0'-5' Silty SAND: brown, dry, medium dense; minor vegetation in upper 1'; slightly moist by 2'; scattered gravel @5'-6' Silty SAND: brown and gray mottle, moist, medium dense, lenses of brown organic silt @6'-9.5' Silty SAND: brown, slightly moist, medium dense; scattered gravel	Afu	SM	GB-1 @ 6" B-1 @ 0-5' GB-2 @ 5.5' GB-3 @ 9.7' GB-4 @ 10.1' GB-5 @ 10.5'		
	B	<u>Topsoil</u> @9.5'-10' Silty to Clayey SAND: dark brown, moist, medium dense; organic staining		SM/SC			
	C	<u>Quaternary Alluvial Fan Deposits</u> @10'-T.D. Silty SAND: medium brown, dry, dense; occasional gravel; blocky excavation	Qyf	SM			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 747' MSL

Surface Slope: 0 deg.

Trend: N-S



Total Depth: 15.3'
 Groundwater: None
 Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario		Logged By: ARN	Trench No.: TP-28	
Project Number: 20179-01		Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator		Location: Ontario		



Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<p><i>Quaternary Alluvial Fan Deposits</i></p> <p>@0'-1.5' Silty SAND: light brown, dry, medium dense; very few surficial/subsurface organics; blocky excavation</p> <p>@1.5' - 3.5' SAND with Silt and trace Gravel: medium brown, slightly moist, medium dense; scattered gravel and cobble interbeds</p> <p>@3.5'-T.D. Graded Cobble and Gravel beds; medium rounded; slightly moist sand matrix</p>	Qyf	SM	GB-1 @ 2" GB-2 @ 5"		
				SP-SM			
				GW-GM			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 739' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 6'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-31	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

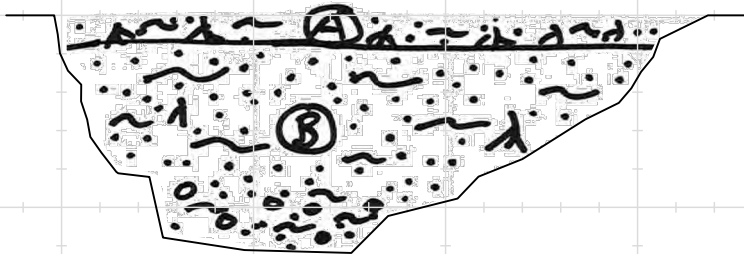
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-0.5' Silty SAND: medium brown, dry loose; abundant rootlets	Qyf	SM	GB-1 @ 1"		
	B	<u>Quaternary Alluvial Fan Deposits</u> @0.5'-2' Silty SAND: light brown, dry, medium dense; roots to 4' @4'-TD Silty SAND with Gravel: light brown, dry, medium dense			GB-2 @ 4" GB-2 @ 12" B-1 @ 1'-5'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 745' MSL


Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10.5'
Groundwater: None
Backfilled: 9/22/20

scale: 1 in = 5 ft

Project Name: Visser - Ontario	Logged By: ARN	Trench No.: TP-38	
Project Number: 20179-01	Date: 9/22/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

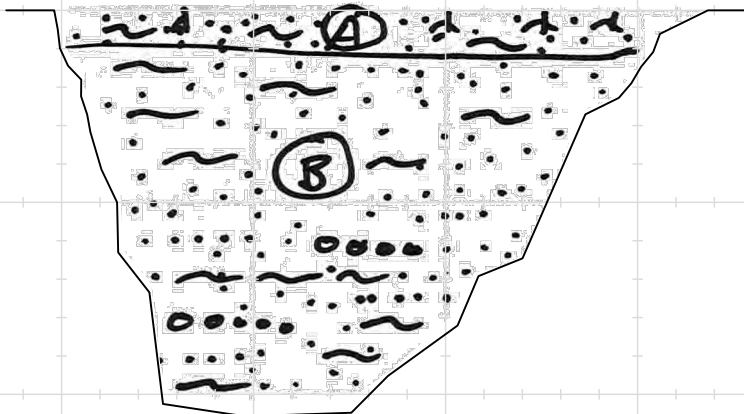
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1' Silty SAND: light brown, dry, loose; abundant rootlets to 4"	Qyf	SM	GB-1 @ 3" GB-2 @ 6" GB-2 @ 12"		
	B	<u>Quaternary Alluvial Fan Deposits</u> @1'-T.D. Silty SAND: light brown, dry, medium dense; coarse sand and silty sand interbeds; scattered gravel					

GRAPHICAL REPRESENTATION BELOW:

Elevation: 740' MSL

Surface Slope: 0 deg.

Trend: E-W



Total Depth: 10.5'
 Groundwater: None
 Backfilled: 9/22/20

scale: 1 in = 5 ft

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

*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)	Final 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

*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 _o (feet)	Final Depth to Water, D _f (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							
Measured Infiltration Rate (No Factor 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



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

*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)	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

*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 _o (feet)	Final Depth to Water, D _f (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							

Measured Infiltration Rate (No Factor of Safety) 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



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)	Final 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

*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 _o (feet)	Final Depth to Water, D _f (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							
Measured Infiltration Rate (No Factor of Safety)							1.9

Sketch:

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

Based on Guidelines from: San Bernardino County (2013)



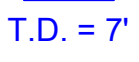

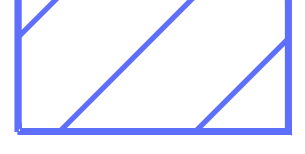
Spreadsheet Revised on: 10/30/2019



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



LEGEND

- 
HS-11
 T.D. = 50'
*Approximate Location of Proposed Hollow Stem Boring
 (With Proposed Depth Indicated)*
- 
CPT-12
 T.D. = 50'
*Approximate Location of Proposed Cone Penetration Test
 (With Proposed Depth Indicated)*
- 
TP-14
 T.D. = 7'
*Approximate Location of Proposed Geotechnical Trench
 (With Proposed Depth Indicated)*
- 
Approximate Limits of This Project
- 
Approximate Area of Active Dairy Farm (NO ACCESS)



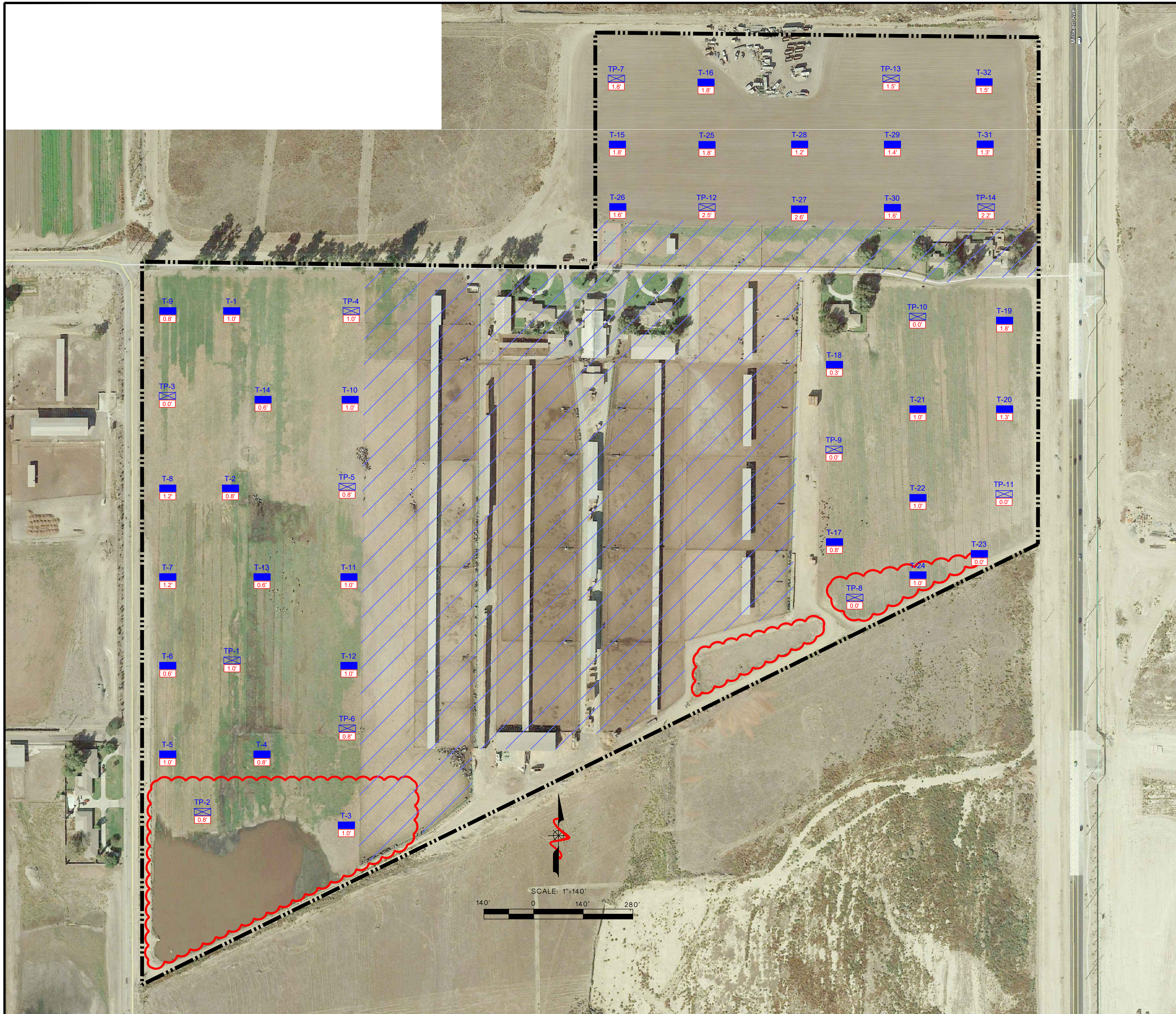
LGC Geotechnical, Inc.
 131 Calle Iglesia, Ste. A
 San Clemente, CA 92672
 TEL (949) 369-6141 FAX (949) 369-6142

**Geotechnical Exploration Location Map
 With Satellite Image**


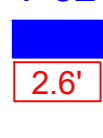


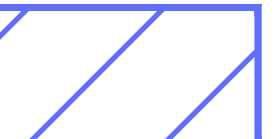
CLIENT:
 Richland Communities, Inc.
 3161 Michelson Drive, Suite 425
 Irvine, CA 92626

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

**SHEET
 1 of 3**



LEGEND

- 
TP-14
Approximate Location of Geotechnical Test Pits by LGC Geotechnical with Estimated Minimum Depth of Manure to be Removed/Exported, in Feet
- 
T-32
Approximate Location of Trenches by LGC Geotechnical with Estimated Minimum Depth of Manure to be Removed/Exported, in Feet
- 
Approximate Location of Waste Water Ponds Requiring Additional Organic Off-Site Removals/Export up to Approximately 5 Feet Deep
- 
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

Recommended Organics Removal Map

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
SCALE	1" : 140'
DATE	March 2018

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.

Grain Size Distribution/Fines Content: 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)

Consolidation: 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.

Collapse/Swell Potential: 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 in-situ effective stress. The curves are presented in this Appendix.

Direct Shear: 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.

Maximum Density Tests: 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

Expansion Index: 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

* Per ASTM D4829

APPENDIX C

Laboratory Test Results (Continued)

R-value Test: 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

Soluble Sulfates: 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%

Chloride Content: 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

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	pH	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

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 this Table 5.

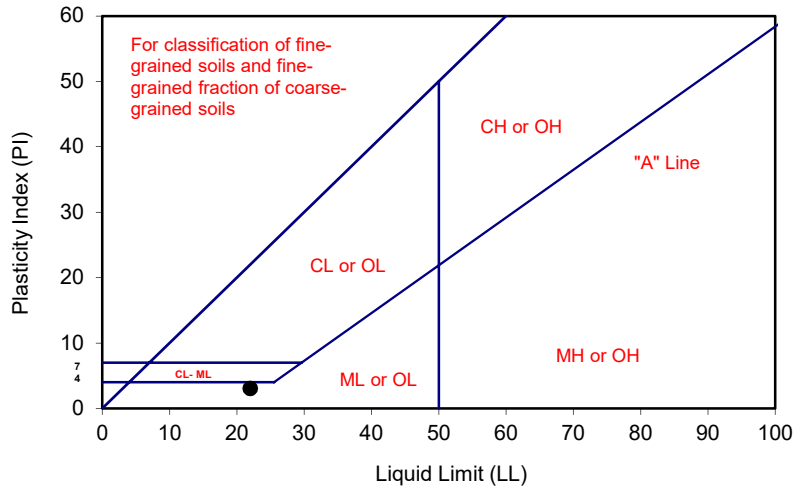
ATTERBERG LIMITS

ASTM D 4318

Project Name: <u>Esperanza</u>	Tested By: <u>R. Manning</u>	Date: <u>09/26/17</u>
Project No. : <u>17114-01</u>	Input By: <u>G. Bathala</u>	Date: <u>10/11/17</u>
Boring No.: <u>HS-4</u>	Checked By: <u>J. Ward</u>	
Sample No.: <u>R-3</u>	Depth (ft.) <u>7.5</u>	
Soil Identification: <u>Olive brown silt with sand (ML)</u>		

TEST NO.	PLASTIC LIMIT		LIQUID LIMIT			
	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 (%) [W _n]	18.88	18.97	21.01	21.78	22.64	

Liquid Limit	22
Plastic Limit	19
Plasticity Index	3
Classification	ML



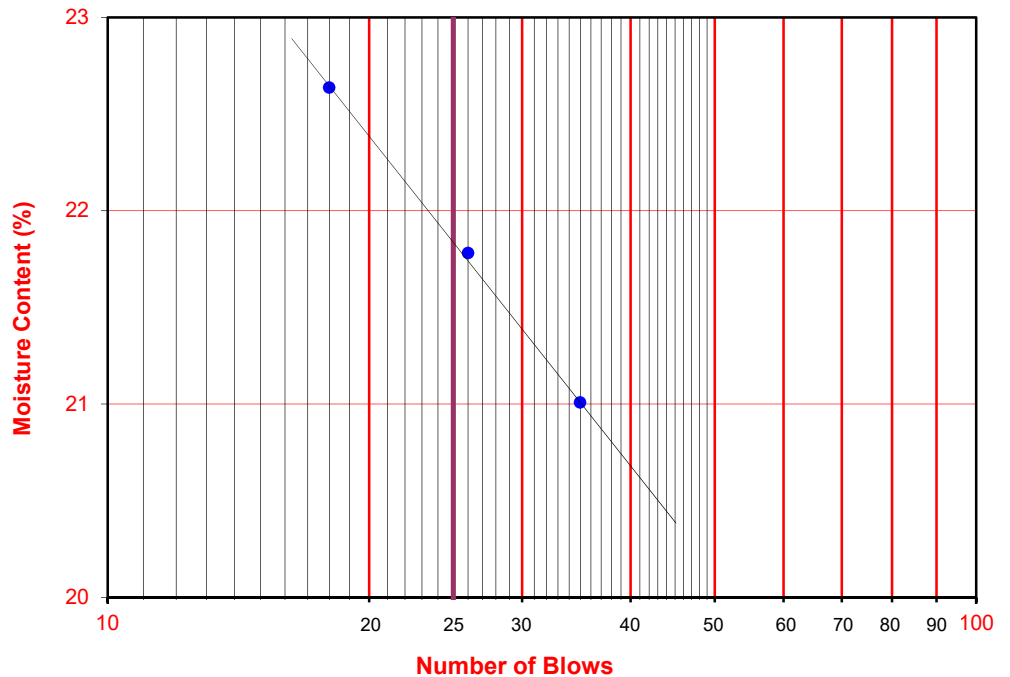
PI at "A" - Line = $0.73(LL-20)$ 1.46

One - Point Liquid Limit Calculation

$$LL = W_n(N/25)^{0.121}$$

PROCEDURES USED

- Wet Preparation
Multipoint - Wet
- Dry Preparation
Multipoint - Dry
- Procedure A
Multipoint Test
- Procedure B
One-point Test



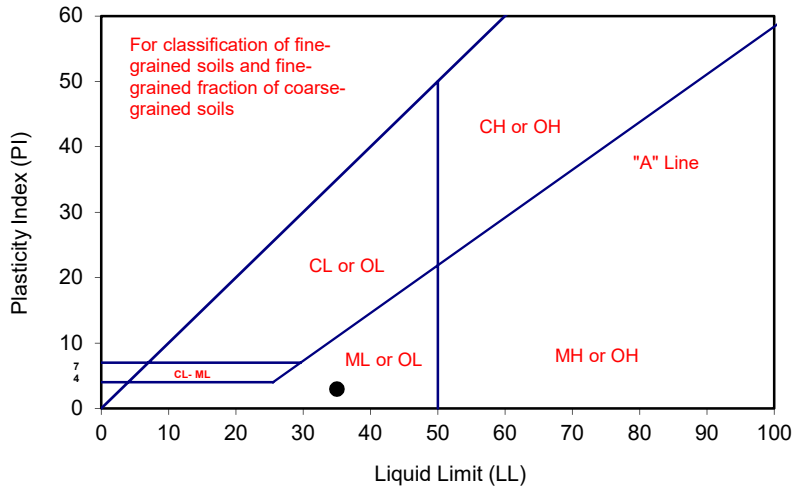
ATTERBERG LIMITS

ASTM D 4318

Project Name: <u>Esperanza</u>	Tested By: <u>R. Manning</u>	Date: <u>09/26/17</u>
Project No. : <u>17114-01</u>	Input By: <u>G. Bathala</u>	Date: <u>10/11/17</u>
Boring No.: <u>HS-6</u>	Checked By: <u>J. Ward</u>	
Sample No.: <u>R-3</u>	Depth (ft.) <u>7.5</u>	
Soil Identification: <u>Olive brown/green silt (ML)</u>		

TEST NO.	PLASTIC LIMIT		LIQUID LIMIT			
	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



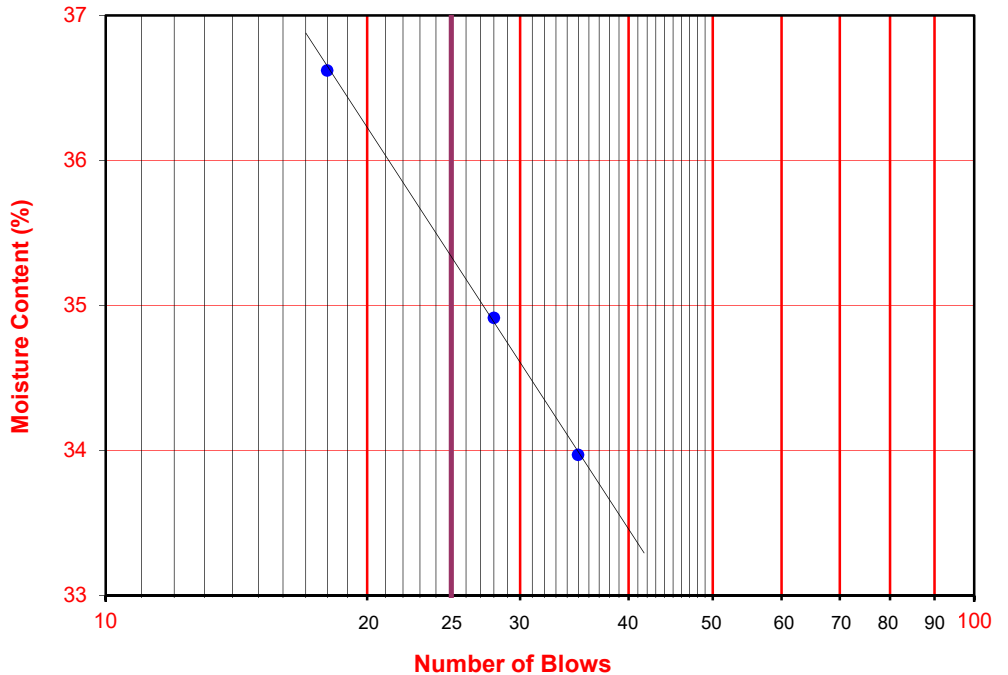
PI at "A" - Line = $0.73(LL-20)$ 10.95

One - Point Liquid Limit Calculation

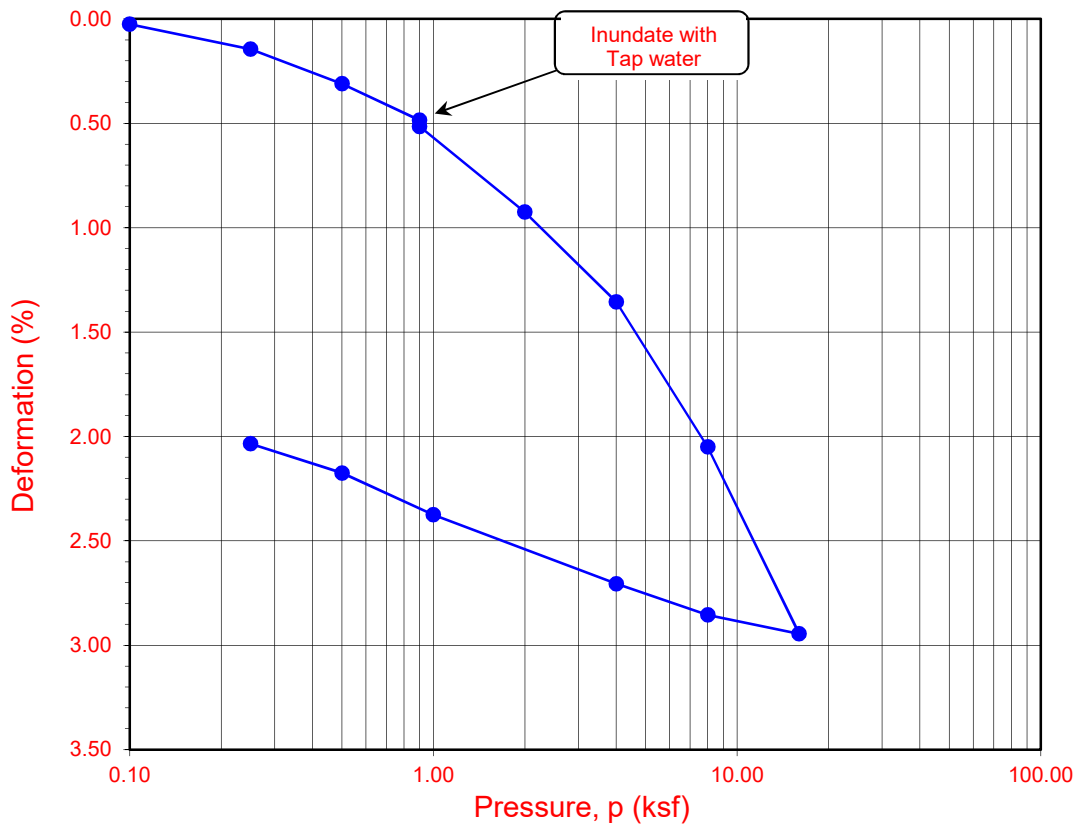
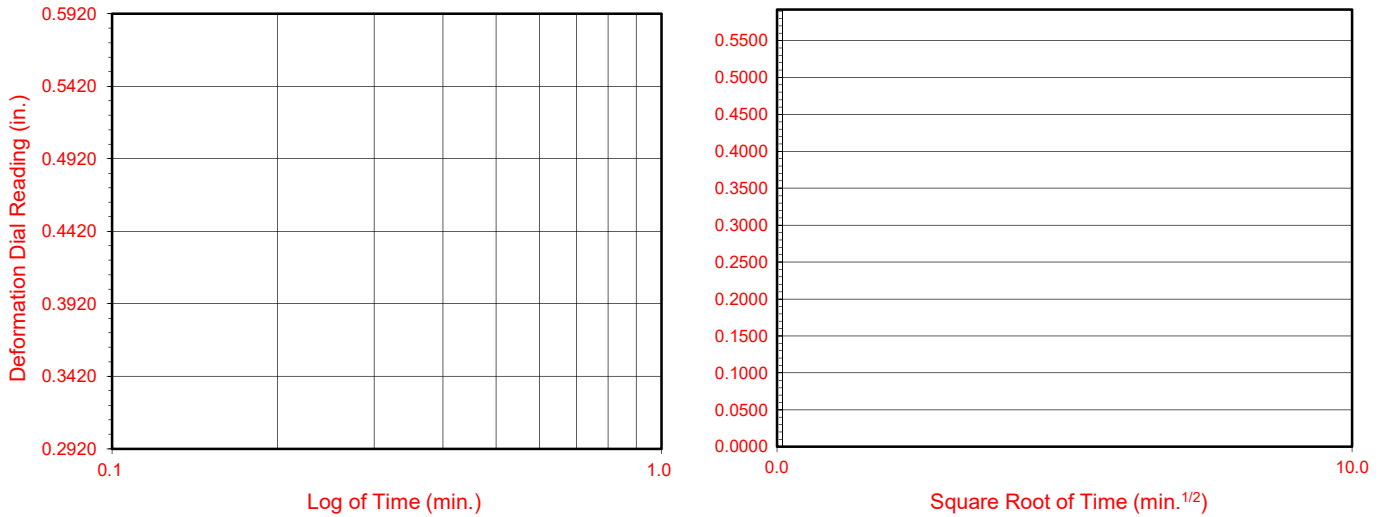
$$LL = Wn(N/25)^{0.121}$$

PROCEDURES USED

- Wet Preparation
Multipoint - Wet
- Dry Preparation
Multipoint - Dry
- Procedure A
Multipoint Test
- Procedure B
One-point Test



Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-4	R-3	7.5	17.2	16.3	110.3	113.6	0.528	0.497	88	91

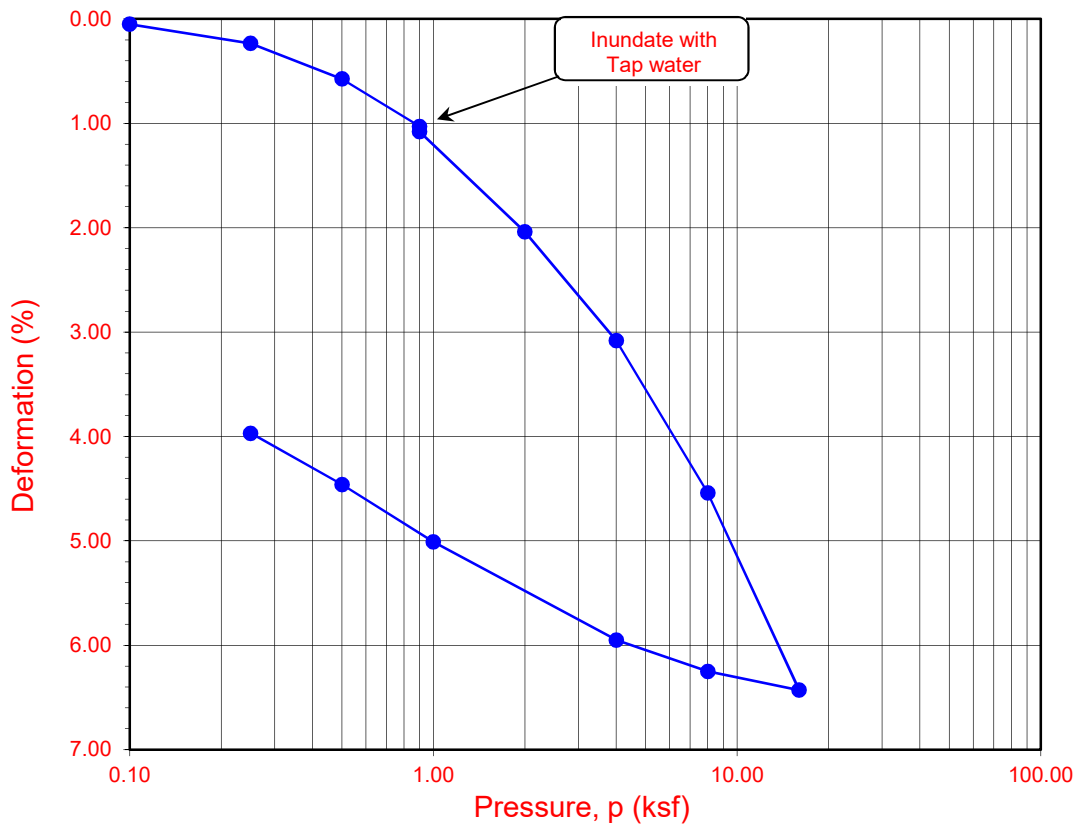
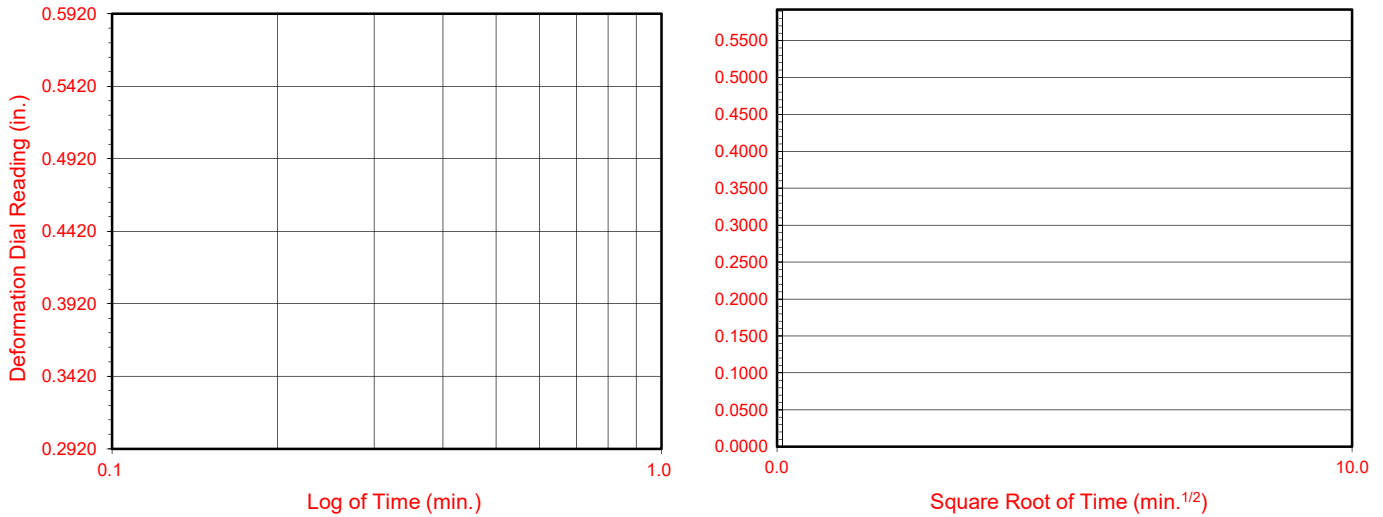
Soil Identification: Olive brown silt with sand (ML)

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

Project No.: 17114-01

Esperanza

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-6	R-3	7.5	30.9	31.7	91.9	93.9	0.943	0.866	94	100

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
 Project No.: 17114-01
 Boring No.: HS-1
 Sample No.: R-3
 Sample Description: Olive brown and green sand with silt (SP-SM)

Tested By: G. Bathala Date: 09/21/17
 Checked By: J. Ward Date: 10/11/17
 Sample Type: Ring
 Depth (ft.): 7.5

Note: Loads were applied incrementally up to the inundation load

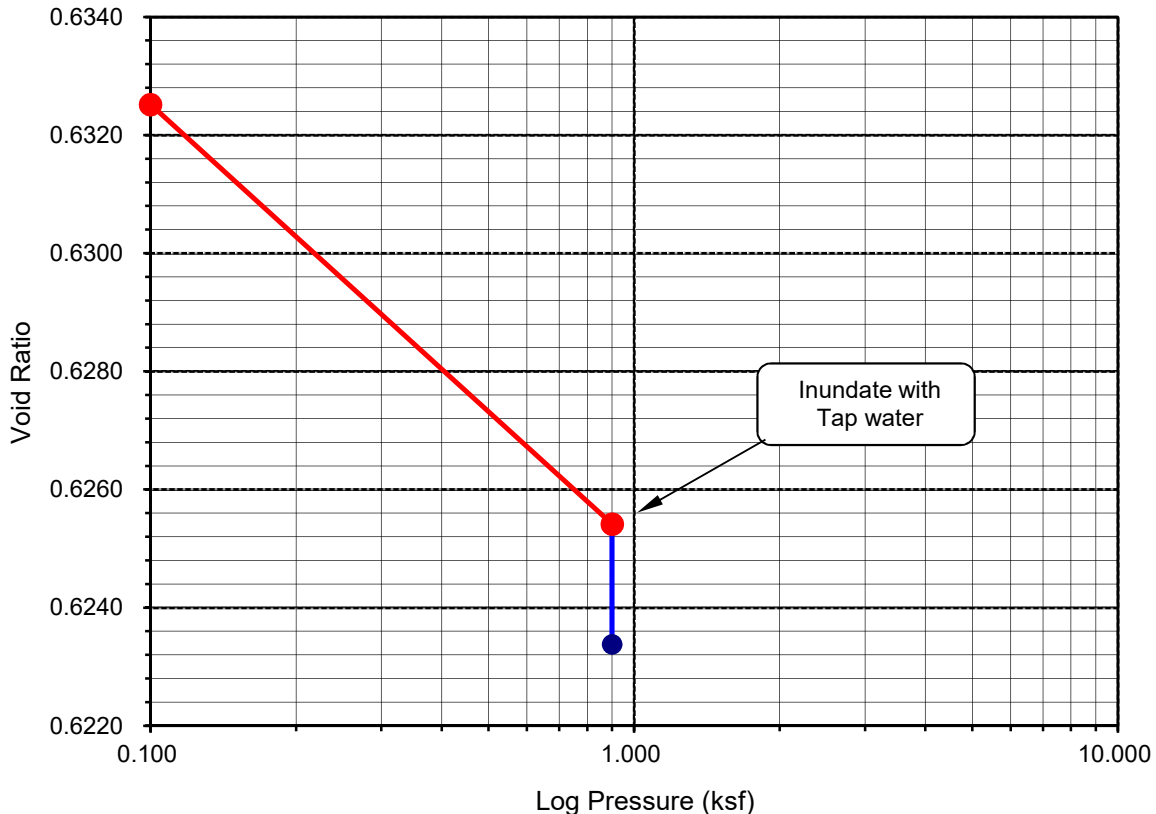
Initial Dry Density (pcf):	103.2
Initial Moisture (%):	3.99
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2587
Diameter(in):	2.415

Final Dry Density (pcf):	103.8
Final Moisture (%) :	18.2
Initial Void Ratio:	0.6326
Specific Gravity(assumed):	2.70
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

Void Ratio - Log Pressure Curve



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

Project Name: Esperanza
 Project No.: 17114-01
 Boring No.: HS-3
 Sample No.: R-3
 Sample Description: Gray/brown poorly-graded sand (SP)

Tested By: G. Bathala Date: 09/21/17
 Checked By: J. Ward Date: 10/11/17
 Sample Type: Ring
 Depth (ft.): 7.5

Note: Loads were applied incrementally up to the inundation load

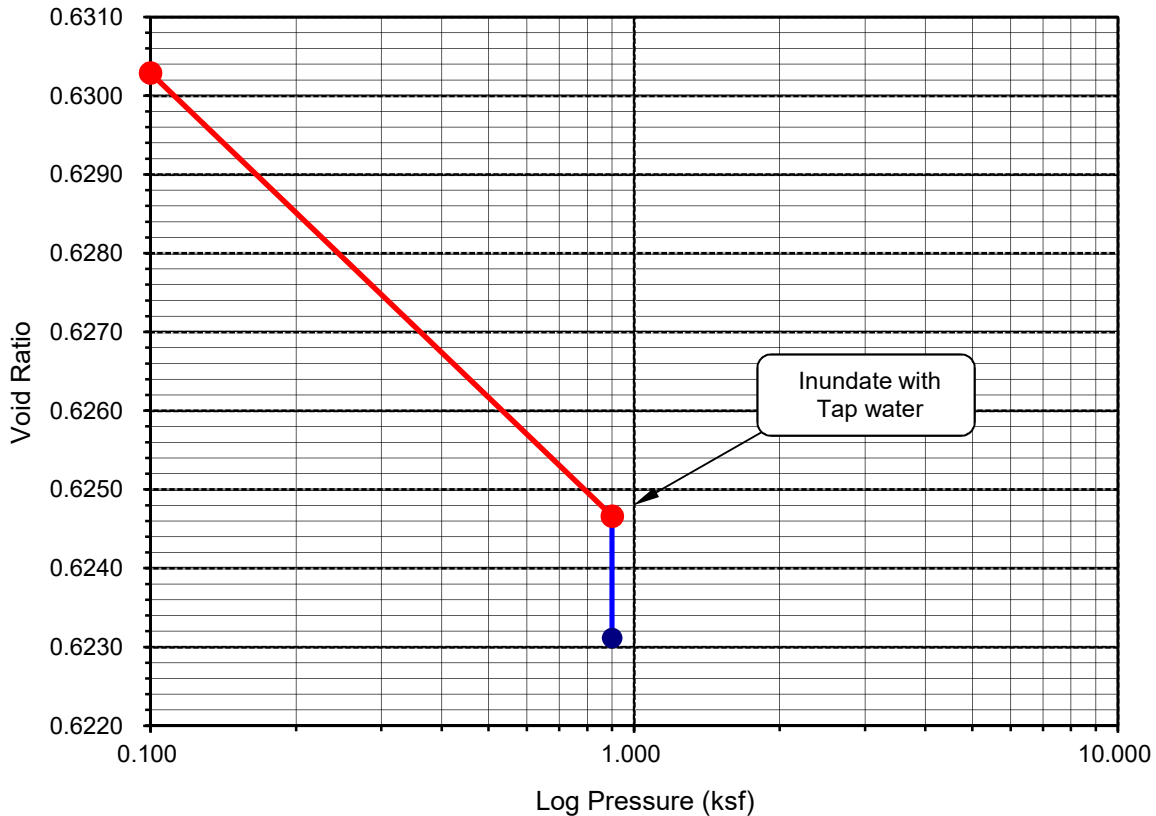
Initial Dry Density (pcf):	103.4
Initial Moisture (%):	3.34
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2785
Diameter(in):	2.415

Final Dry Density (pcf):	103.9
Final Moisture (%) :	20.3
Initial Void Ratio:	0.6308
Specific Gravity(assumed):	2.70
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

Void Ratio - Log Pressure Curve



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

Project Name: Esperanza
 Project No.: 17114-01
 Boring No.: HS-10
 Sample No.: R-3
 Sample Description: Brown/gray silty sand (SM)

Tested By: G. Bathala Date: 09/21/17
 Checked By: J. Ward Date: 10/11/17
 Sample Type: Ring
 Depth (ft.): 7.5

Note: Loads were applied incrementally up to the inundation load

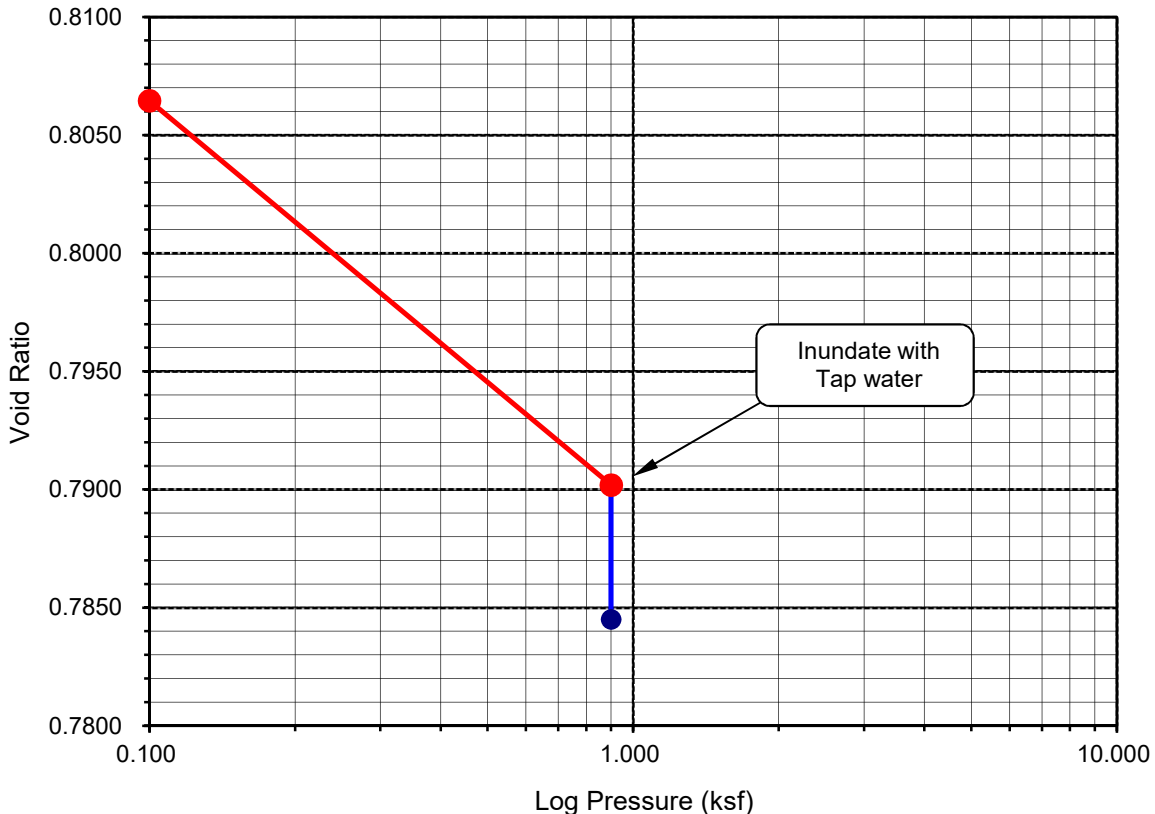
Initial Dry Density (pcf):	93.3
Initial Moisture (%):	6.04
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3008
Diameter(in):	2.415

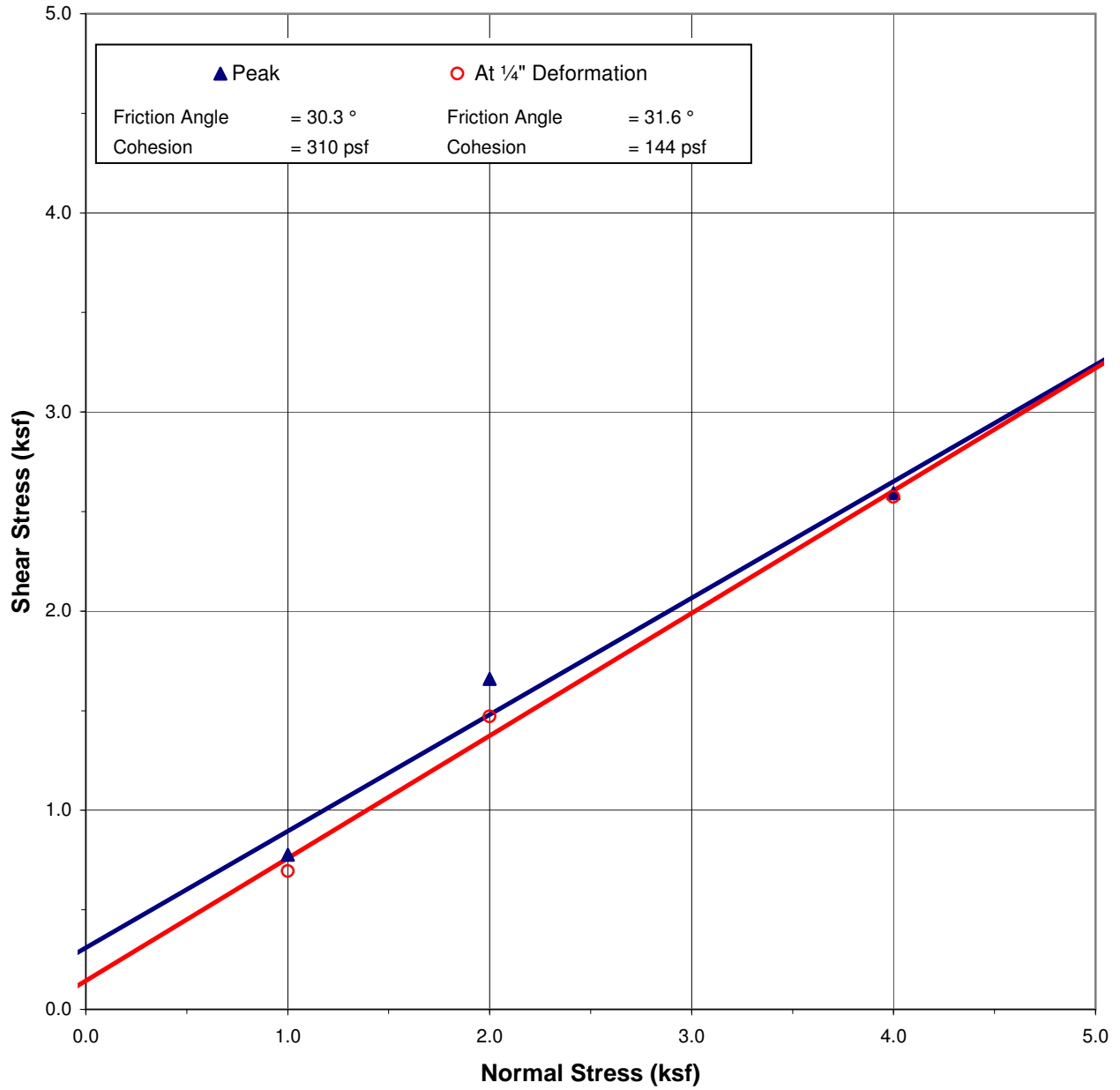
Final Dry Density (pcf):	94.5
Final Moisture (%) :	26.8
Initial Void Ratio:	0.8066
Specific Gravity(assumed):	2.70
Initial Saturation (%)	20.2

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

Void Ratio - Log Pressure Curve





Location:	Sample No.:	Depth (ft)	Sample Type	Shear Rate (inch/min)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-2	B-1	5'	Remolded	0.002	109.0	10.5	21.1

Sample Description: Gray beige silt (ML)

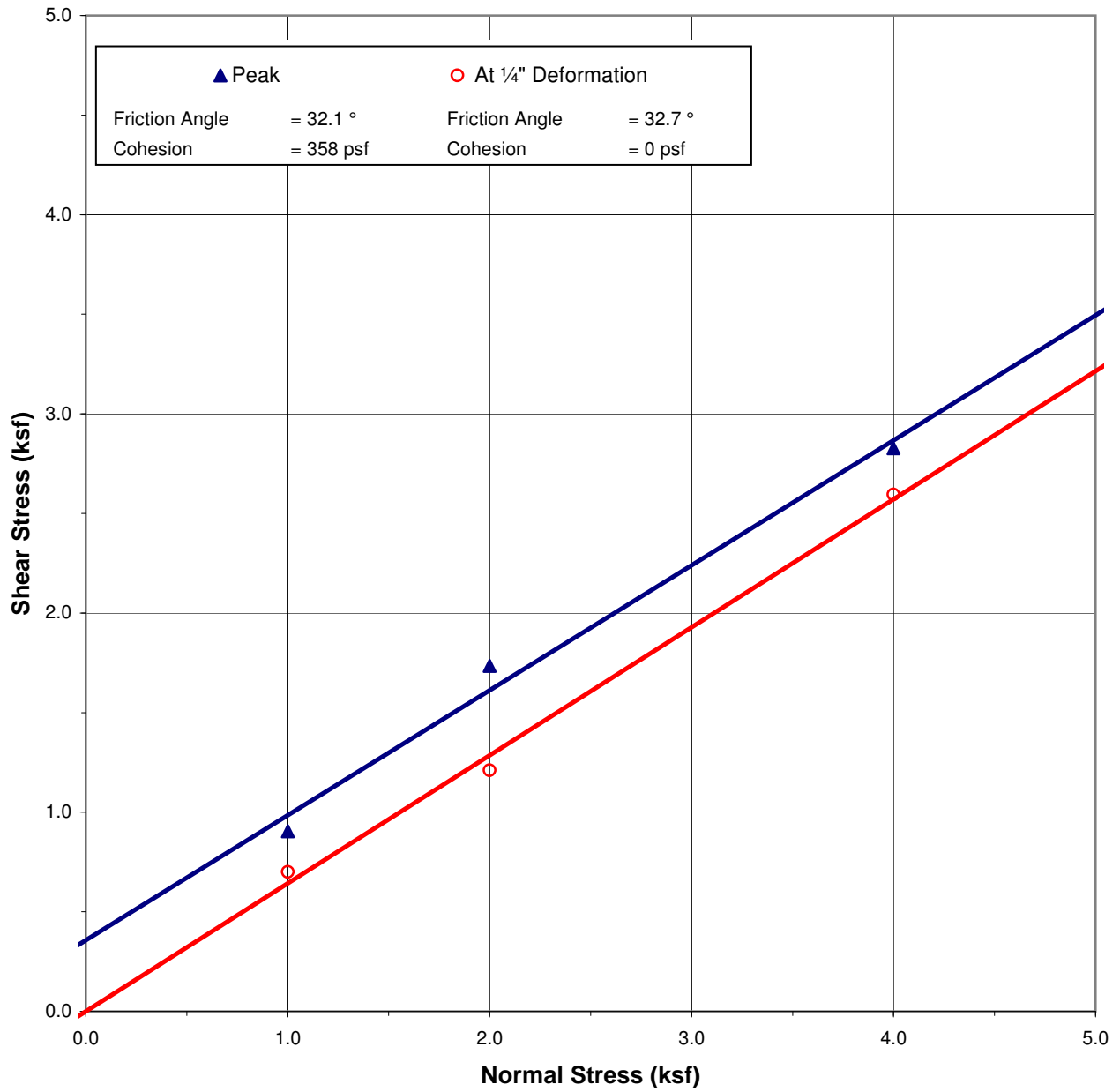


DIRECT SHEAR PLOT

Project Number: 17114-01

Date: Sep-17

Esperanza



Location:	Sample No.:	Depth (ft)	Sample Type	Shear Rate (inch/min)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-4	B-1	5'	Remolded	0.002	108.5	11.5	17.0

Sample Description: Olive green silty sand (SM)



DIRECT SHEAR PLOT

Project Number: 17114-01

Date: Sep-17

Esperanza

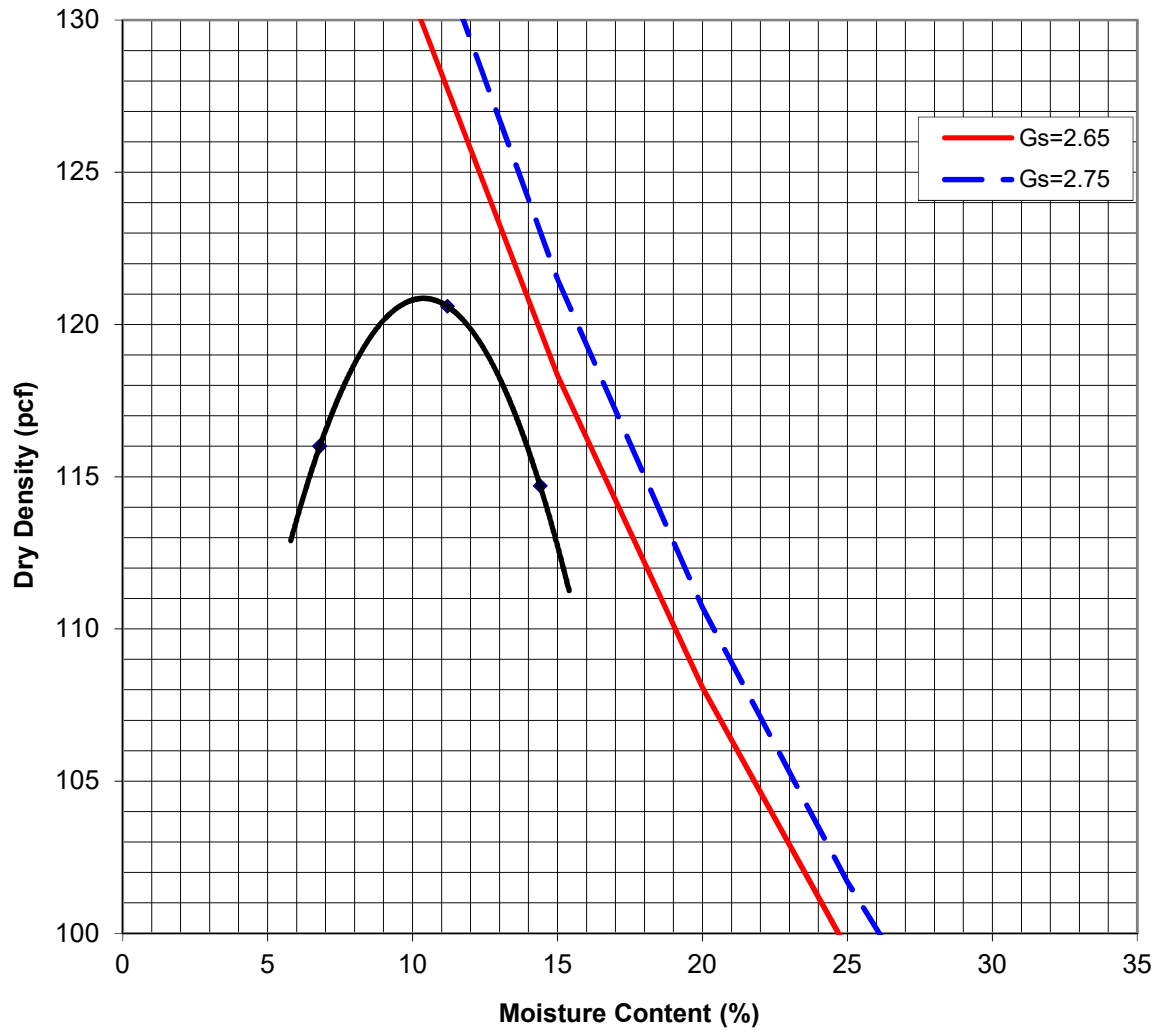
Location	Sample No.	Depth (ft)	Molding Moisture Content (%)	Initial Dry Density (pcf)	Final Moisture Content (%)	Expansion Index	Expansion Classification ¹
HS-2	B-1	0-5'	11.4	111.3	23.3	15	Very Low
HS-4	B-1	0-5'	10.5	114.4	15.8	14	Very Low
HS-10	B-1	0-5'	7.0	118.4	12.6	6	Very Low



EXPANSION INDEX
(ASTM D 4829)

Project Number: 17114-01
Date: Sep-17

Esperanza



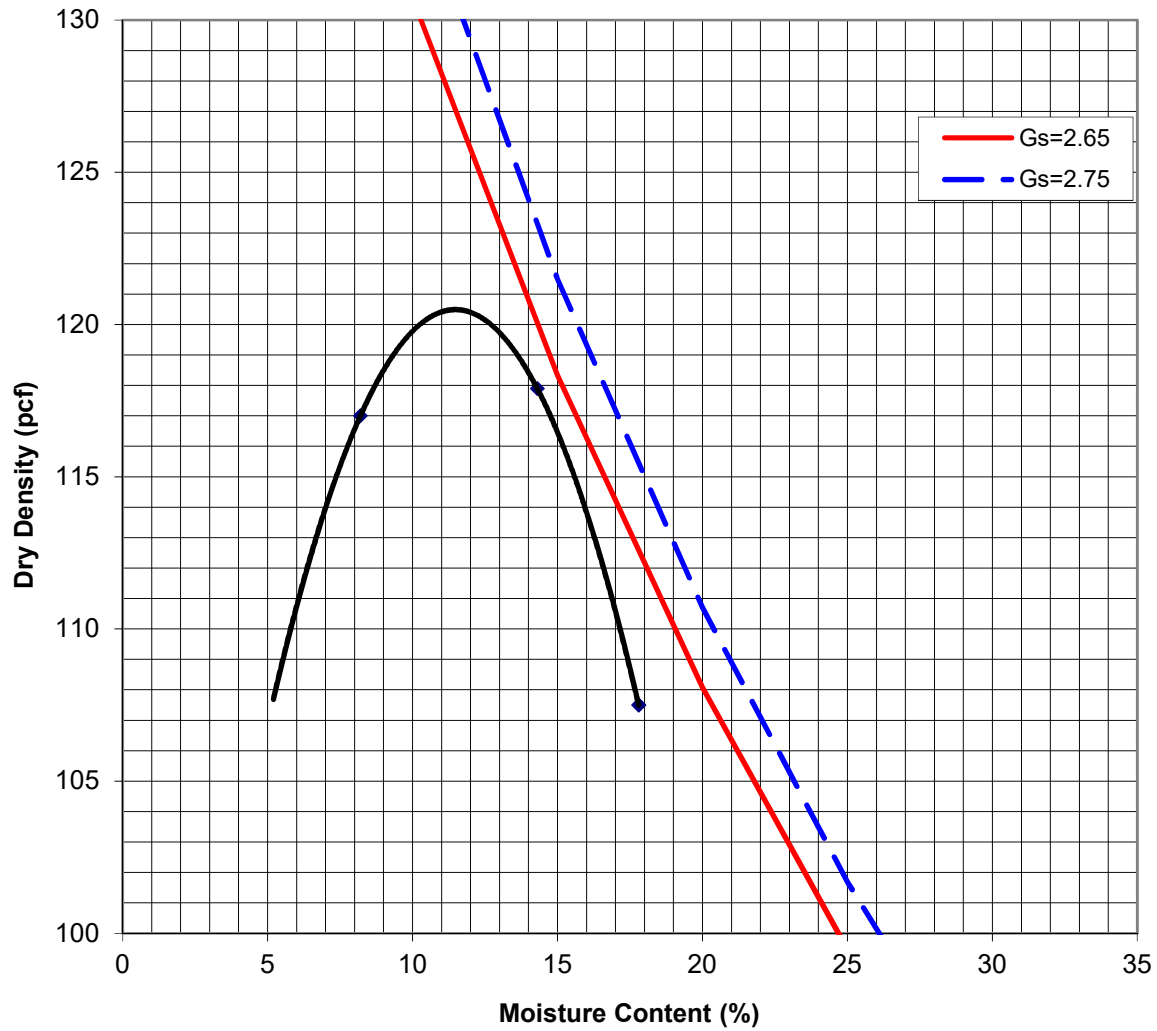
Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-2	B-1	0-5'	Gray beige sandy silt	121.0	10.5



LABORATORY COMPACTION
(ASTM D 1557)

Project Number: 17114-01
Date: Sep-17

Esperanza



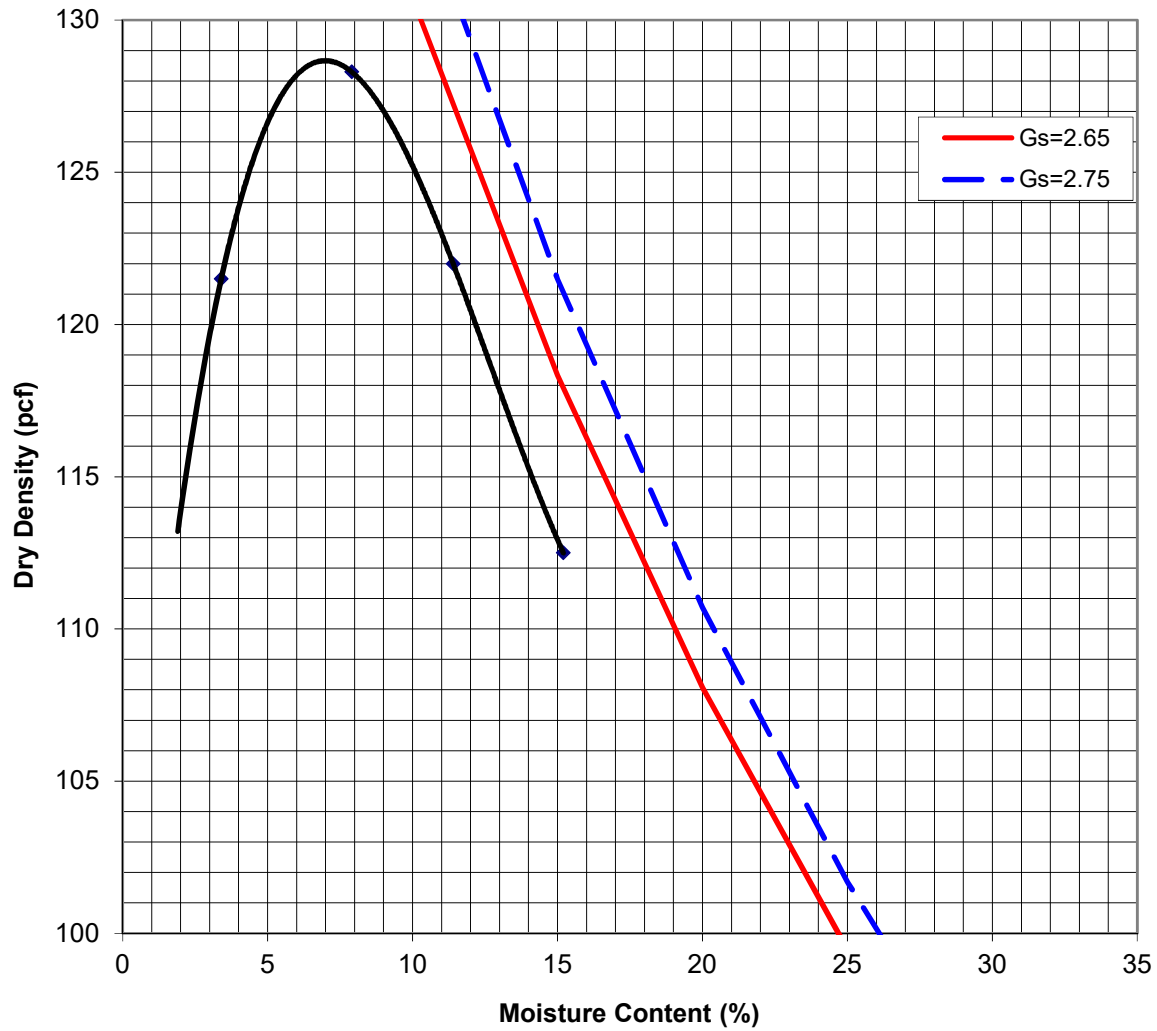
Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-4	B-1	0-5'	Olive green/brown silty sand	120.5	11.5



LABORATORY COMPACTION
(ASTM D 1557)

Project Number: 17114-01
Date: Sep-17

Esperanza



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

Esperanza

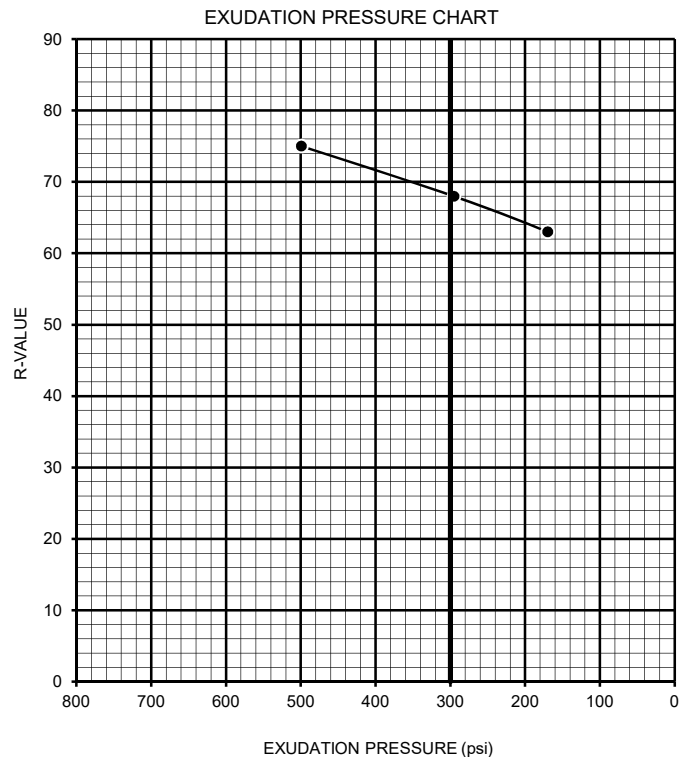
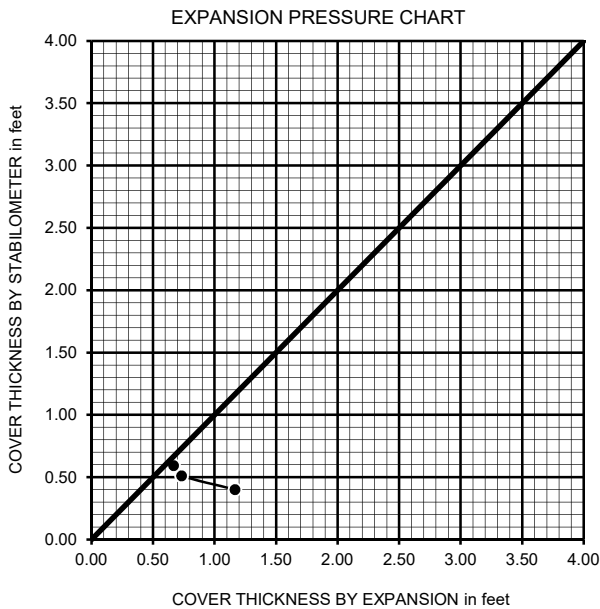
R-VALUE TEST RESULTS

DOT CA Test 301

PROJECT NAME:	<u>Esperanza</u>	PROJECT NUMBER:	<u>17114-01</u>
BORING NUMBER:	<u>HS-7</u>	DEPTH (FT.):	<u>0-5</u>
SAMPLE NUMBER:	<u>B-1</u>	TECHNICIAN:	<u>S. Felter</u>
SAMPLE DESCRIPTION:	<u>Yellowish brown silty sand (SM)</u>	DATE COMPLETED:	<u>9/25/2017</u>

TEST SPECIMEN	a	b	c
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	a	b	c
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



R-VALUE BY EXPANSION:	<u>61</u>
R-VALUE BY EXUDATION:	<u>68</u>
EQUILIBRIUM R-VALUE:	<u>61</u>

**TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS**

Project Name: Esperanza
Project No. : 17114-01

Tested By : G. Berdy Date: 09/21/17
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 AgNO ₃ 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
 Project No. : 17114-01
 Boring No.: HS-2
 Sample No. : B-1

Tested By : G. Berdy Date: 09/21/17
 Data Input By: G. Bathala Date: 10/11/17
 Depth (ft.) : 0-5

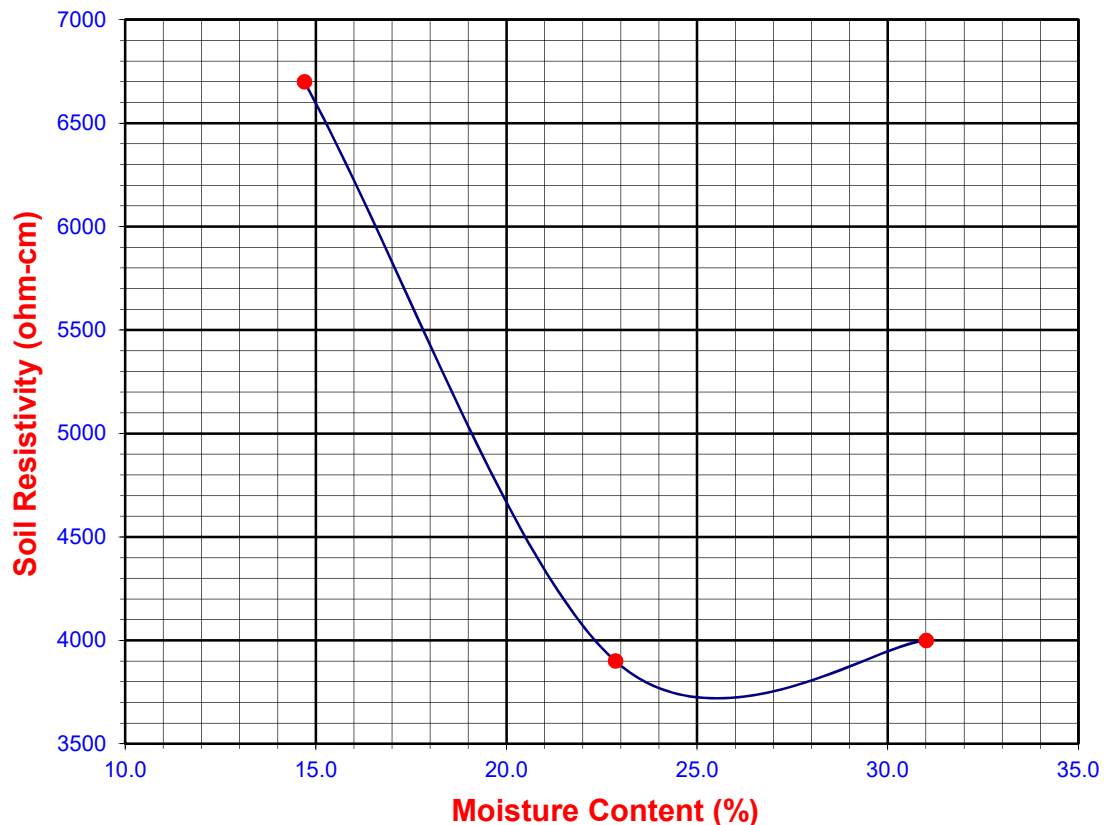
Soil Identification:* Green/beige ML

*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				

Moisture Content (%) (Mci)	6.55
Wet Wt. of Soil + Cont. (g)	199.19
Dry Wt. of Soil + Cont. (g)	190.63
Wt. of Container (g)	59.94
Container No.	
Initial Soil Wt. (g) (Wt)	130.67
Box Constant	1.000
$MC = (((1 + Mci/100) \times (Wa/Wt + 1)) - 1) \times 100$	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II		DOT CA Test 643	
3700	25.5	128	21	7.66	20.1



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name: Esperanza
 Project No. : 17114-01
 Boring No.: HS-4
 Sample No. : B-1

Tested By : G. Berdy Date: 09/21/17
 Data Input By: G. Bathala Date: 10/11/17
 Depth (ft.) : 0-5

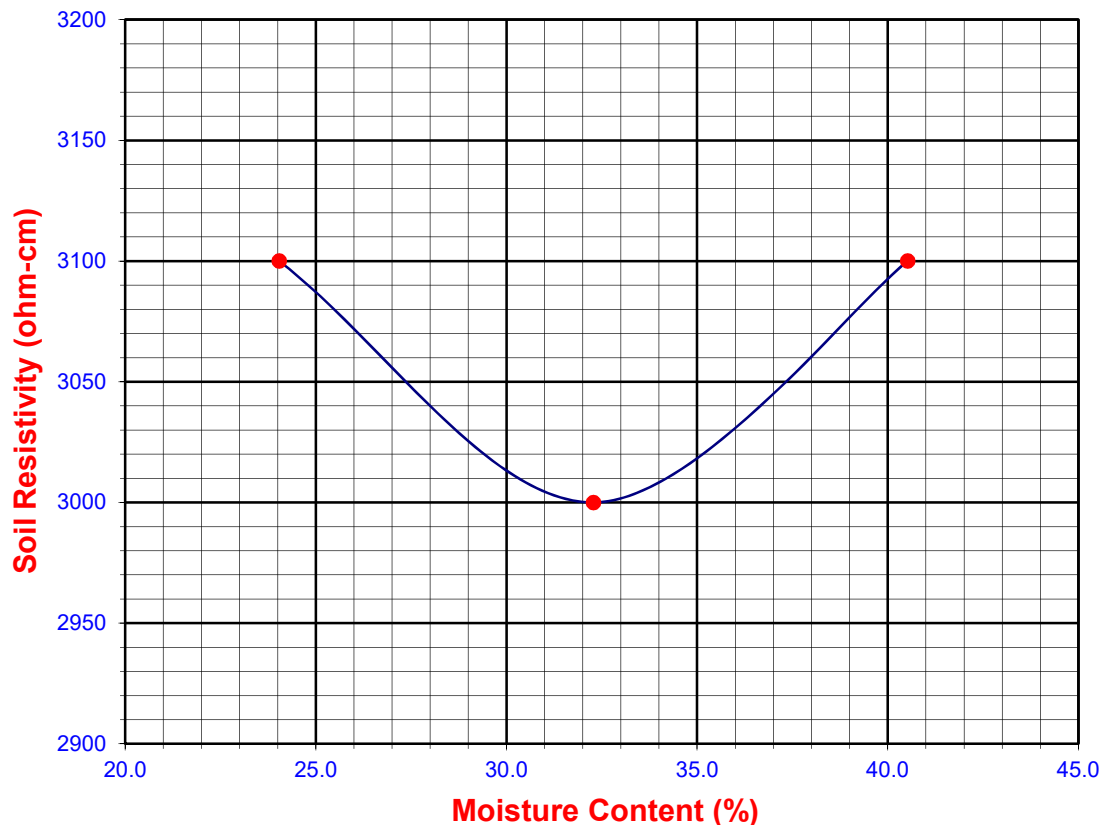
Soil Identification:* Olive green SM

*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				

Moisture Content (%) (Mci)	7.56
Wet Wt. of Soil + Cont. (g)	200.64
Dry Wt. of Soil + Cont. (g)	191.23
Wt. of Container (g)	66.79
Container No.	
Initial Soil Wt. (g) (Wt)	130.54
Box Constant	1.000
$MC = (((1 + Mci/100) \times (Wa/Wt + 1)) - 1) \times 100$	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II		DOT CA Test 643	
3000	32.3	93	43	6.98	20.1



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name: Esperanza
 Project No. : 17114-01
 Boring No.: HS-10
 Sample No. : B-1

Tested By : G. Berdy Date: 09/21/17
 Data Input By: G. Bathala Date: 10/11/17
 Depth (ft.) : 0-5

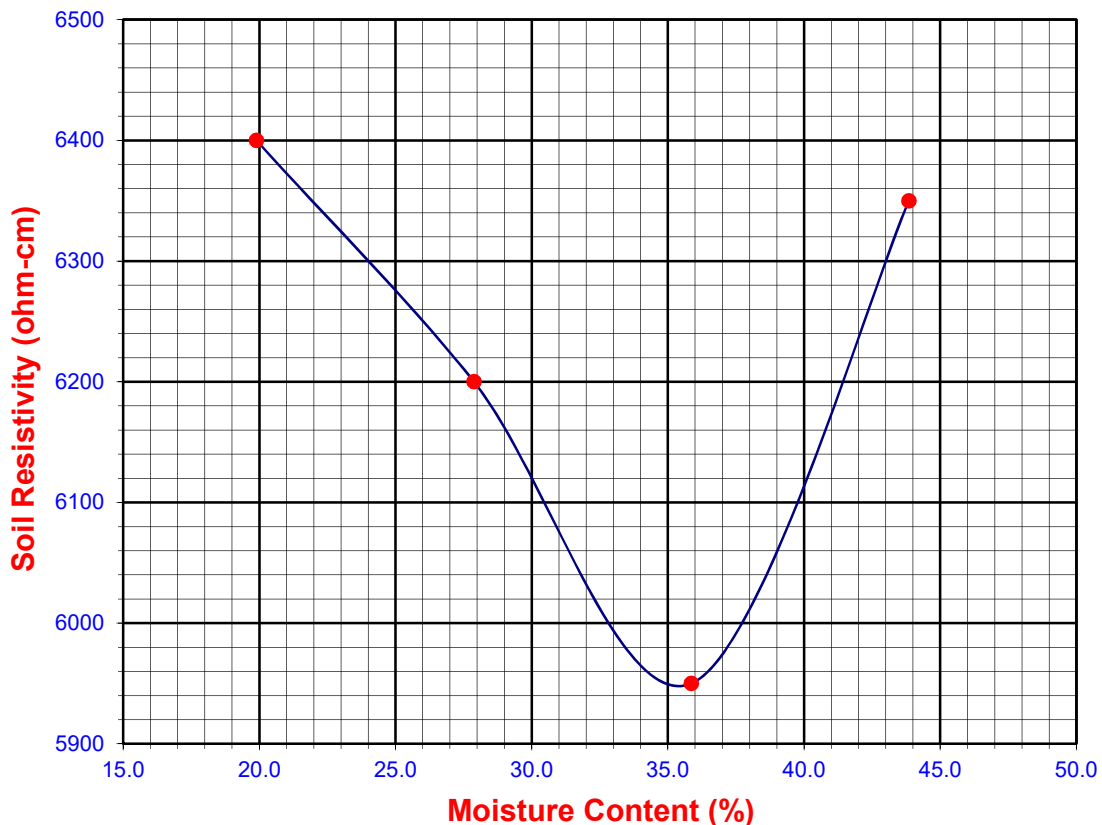
Soil Identification:* Olive brown SM


*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	20	19.89	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
$MC = (((1 + Mci/100) \times (Wa/Wt + 1)) - 1) \times 100$	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II		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')*		TP-6 (0.8')*		TP-7 (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
TP-9 (0.0')*		TP-10 (0.0')*		TP-11 (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
T-3 (1.0')*		T-4 (0.8')*		T-5 (1.0')*		T-6 (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
T-7 (1.2')*		T-8 (1.2')*		T-9 (0.8')*		T-10 (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
T-11 (1.0')*		T-12 (1.0')*		T-13 (0.6')*		T-14 (0.6')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	55.5	0.8'	62.9	0.4'	20.4	0.4'	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
T-15 (1.8')*		T-16 (1.8')*		T-17 (0.8')*		T-18 (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
T-23 (0.0')*		T-24 (1.0')*		T-25 (1.8')*		T-26 (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
T-27 (2.6')*		T-28 (1.2')*		T-29 (1.4')*		T-30 (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
T-31 (1.3')*		T-32 (1.5')*		Legend > 5% Recommended for Offsite Removal 2 to 5% Recommended for Mix/Blend w/ "Clean" Soils < 2% "Clean" Soils Note: (#)'* Indicates Recommended Organic Removal Depth in Feet			
Depth (ft)	% Organics	Depth (ft)	% Organics				
1.0'	13.4	1.0'	18.6				
1.5'	4.4	1.8'	3.3				
2.0'	2.8	2.2'	2.1				
				Table 5 - Summary of Measured Organic Content vs Depth of Sample		Project Name Richland - Esperanza & Pietersma Project Number 17114-01 & 17115-01 ENG./GEOL. RLD/KTM Date Feb-18	

Geotechnical Boring Log Borehole HS-1

Date: 9/11/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~722' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
720	0	B-1	R-1	7 6 8	111.0	8.5	SM	<p>@ 0' to TD - Quaternary Young Eolian Deposits (Qye):</p> <p>@ 2.5' Silty SAND: olive green/brown, slightly moist, medium dense</p> <p>@ 5.0' SAND with Silt: olive green/brown, dry, medium dense</p> <p>@ 7.5' SAND with Silt: olive green/brown, dry, medium dense</p> <p>@ 10' Silty SAND: olive green/brown, very moist, medium dense</p> <p>@ 15' Silty SAND: olive green/brown, moist, medium dense; fine sand</p> <p>@ 20' Sandy SILT: olive green/brown, very moist, stiff</p> <p>@ 25' Sandy SILT, olive green/brown, dry, stiff</p>	CO-#200
715	5		R-2	6 10 13	104.0	4.5	SP-SM		
710	10		R-3	7 9 10	105.5	4.0	SM		
705	15		SPT-1	4 5 7	108.7	16.6	SM		
700	20		R-5	4 6 11	105.9	18.3	ML		
695	25	SPT-2	8 7 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 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

TEST TYPES:
 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-2

Date: 9/11/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~708' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
705	0	B-1	R-1	16 26 30	99.1	3.4	ML	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Sandy SILT: gray/light brown, dry, hard; rootlets	DS MD EI CR RV #200
700	5		R-2	8 13 18	106.1	1.8		@ 5.0' Sandy SILT: gray/light brown, dry, very stiff; few fine gravel	
			R-3	5 8 9	97.8	3.3	SM	@ 7.5' Silty SAND: light brown-brown, dry, medium dense; rootlets	
	10		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		



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-3

Date: 9/11/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~727' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	0	B-1	R-1	3 4 5	110.5	12.8	SM	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Silty SAND: medium brown/olive green, very moist, loose; scattered fine gravel @ 5.0' Silty SAND: brown with mottled gray, dry, medium dense; some fine gravel @ 7.5' SAND: gray/brown, dry, medium dense @ 10' SAND with Silt: brown, dry, medium dense; scattered fine gravel @ 15' Sandy SILT: olive brown/green, very moist, loose; scattered fine gravel @ 20' SAND with Gravel: olive green/brown, dry, medium dense; coarse gravel @ 25' Silty SAND: brown, green, black mottled, dry, dense; scattered gravel Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/11/2017	CO #200
720	5		R-2	4 7 13	108.3	3.6	SP-SM		
715	10		R-3	6 9 14	106.1	3.3	SP		
710	15		SPT-1	2 2 3		23.3	SM		
705	20		R-5	17 17 17	130.0	2.5	SP		
700	25	SPT-2	8 16 18		3.4	SM			
30	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-4

Date: 9/11/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~721' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
720	0	B-1	R-1	5 4 7	124.7	3.3	SM	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Silty SAND: olive green/brown, dry, loose @ 5.0' Silty SAND: olive green/brown, slightly moist, medium dense @ 7.5' SILT with Sand: olive brown, very moist, very stiff @ 10' Silty SAND: olive green/brown, slightly moist, medium dense @ 15' Silty SAND to Sandy SILT: olive green/brown, very moist, medium dense to very stiff; scattered fine gravel @ 20' Silty SAND with Gravel: gray, dry, dense @ 25' Silty SAND: olive green/brown, very moist, dense	DS MD EI CR #200
715	5		R-2	5 7 9	92.3	6.7			
			R-3	5 9 13	109.9	17.2	ML		CN AL
710	10		R-4	10 13 10	99.7	8.4	SM		
705	15		R-5	4 8 14	116.8	15.0	SM-ML		
700	20		SPT-1	11 21 21		3.6	SM		
695	25	R-6	5 14 25	108.2	11.3				
	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 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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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-5

Date: 9/12/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~727' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	0	B-1	R-1	11 14 20	111.6	3.0	SM	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Silty SAND with Gravel: light brown/gray, dry, medium dense	
720	5		R-2	11 14 18	109.3	2.6		@ 5.0' Silty SAND with Gravel: light brown/gray, dry, medium dense	
			R-3	7 10 12	107.6	4.9	SP	@ 7.5' SAND with Gravel: light brown/gray, slightly moist, medium dense	
			R-4	10 17 26	109.9	4.6	SM	@ 10' Silty SAND with Gravel: light brown/gray, slightly moist, dense	
715	15		SPT-1	4 6 7			ML	@ 15' Sandy SILT: olive brown, very moist, very stiff	
710	20		R-5	5 8 14	112.8	16.1		@ 20' Sandy SILT: olive brown/green, very moist, very stiff	
705	25		SPT-2	11 14 26			SM	@ 25' Silty SAND: white/light brown/brown, dry, dense	
700									
	30								



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

TEST TYPES:
 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-5

Date: 9/12/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~727' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
695	30		R-6	35 50/6"	113.4	9.3	SP	@ 30' Gravelly SAND: brown, moist, very dense; fine to coarse gravel	
690	35	▽	SPT-3	17 37 41		4.3	SM	@ 35' Silty SAND: brown/gray, slightly moist, very dense; few fine and coarse gravel	
685	40		R-7	9 19 24	116.9	16.7	ML	@ 40' Sandy SILT, olive brown, wet, hard	
680	45		SPT-4	7 10 18		19.1	CL	@ 45' Silty CLAY: olive brown/green, wet, hard	
675	50		R-8	11 24 33	122.7	12.3	SM	@ 50' Silty SAND: red brown/olive brown, very moist, dense	
670	55							Total Depth = 50' Groundwater Encountered at Approximately 37.5' Backfilled with Cuttings on 9/12/2017	
60									

	<p>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.</p>	<table style="width: 100%; border: none;"> <tr> <td>SAMPLE TYPES:</td> <td>TEST TYPES:</td> </tr> <tr> <td>B BULK SAMPLE</td> <td>DS DIRECT SHEAR</td> </tr> <tr> <td>R RING SAMPLE (CA Modified Sampler)</td> <td>MD MAXIMUM DENSITY</td> </tr> <tr> <td>G GRAB SAMPLE</td> <td>SA SIEVE ANALYSIS</td> </tr> <tr> <td>SPT STANDARD PENETRATION TEST SAMPLE</td> <td>S&H SIEVE AND HYDROMETER</td> </tr> <tr> <td></td> <td>EI EXPANSION INDEX</td> </tr> <tr> <td></td> <td>CN CONSOLIDATION</td> </tr> <tr> <td></td> <td>CR CORROSION</td> </tr> <tr> <td></td> <td>AL ATTERBERG LIMITS</td> </tr> <tr> <td style="text-align: center;">▽ GROUNDWATER TABLE</td> <td>CO COLLAPSE/SWELL</td> </tr> <tr> <td></td> <td>RV R-VALUE</td> </tr> <tr> <td></td> <td>#200 % PASSING # 200 SIEVE</td> </tr> </table>	SAMPLE TYPES:	TEST TYPES:	B BULK SAMPLE	DS DIRECT SHEAR	R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY	G GRAB SAMPLE	SA SIEVE ANALYSIS	SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER		EI EXPANSION INDEX		CN CONSOLIDATION		CR CORROSION		AL ATTERBERG LIMITS	▽ GROUNDWATER TABLE	CO COLLAPSE/SWELL		RV R-VALUE		#200 % PASSING # 200 SIEVE
SAMPLE TYPES:	TEST TYPES:																									
B BULK SAMPLE	DS DIRECT SHEAR																									
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	CR CORROSION																									
	AL ATTERBERG LIMITS																									
▽ GROUNDWATER TABLE	CO COLLAPSE/SWELL																									
	RV R-VALUE																									
	#200 % PASSING # 200 SIEVE																									

Geotechnical Boring Log Borehole HS-6

Date: 9/12/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~714' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Logged By LJH Sampled By LJH Checked By RLD	
710		B-1	R-1	7 8 10	112.6	7.0	ML	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Sandy SILT: brown, slightly moist, stiff, some rootlets	CN AL
	5		R-2	5 7 9	109.8	4.7	SM	@ 5.0' Silty SAND: brown, slightly moist, medium dense	
705			R-3	5 5 6	93.6	30.9	ML	@ 7.5' SILT: olive brown/green, wet, stiff	
	10		R-4	5 5 11	100.2	11.3		@ 10' Sandy SILT: brown/ red, moist, stiff	
700			R-5	5 7 4	103.4	8.8	SM	@ 15' Silty SAND: brown/olive brown, moist, loose	
695			SPT-1	5 7 9		22.5	CL	@ 20' Silty CLAY: olive brown/green, very moist, very stiff	
690			R-6	7 17 25	112.2	2.2	SM	@ 25' Silty SAND: olive brown/green, red/brown, dry, dense	
685									
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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

GROUNDWATER TABLE

Geotechnical Boring Log Borehole HS-6

Date: 9/12/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~714' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	Logged By LJH Sampled By LJH Checked By RLD DESCRIPTION	Type of Test
680	30		SPT-2	26 50/6"		7.2	SM	@ 30' Silty SAND: brown/gray, slightly moist, very dense	
675	35		R-7	13 13 22	120.0	10.8	ML	@ 35' Sandy SILT: olive brown/green, moist, very stiff	
670	40		SPT-3	8 12 15		20.6	CL	@ 40' Silty CLAY: olive brown/green, very moist, hard	
665	45		R-8	6 19 40	119.5	14.1	SM	@ 45' Silty SAND: olive brown/green, very moist, dense	
660	50		SPT-4	18 23 27		13.4		@ 50' Silty SAND: red/brown/gray, very moist, very dense	
655	55							Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 9/12/2017	
650	60								



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

TEST TYPES:
 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-7

Date: 9/12/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: CME 61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~717' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
715	0	B-1	R-1	21 27 30	113.3	2.1	ML	<p>@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Sandy SILT with Gravel: light brown/light brown, dry, hard; some rootlets</p> <p>@ 5.0' Silty SAND: light brown/gray, dry, medium dense; fine gravel</p> <p>@ 7.5' Sandy SILT: olive brown/green, very moist, stiff</p> <p>@ 10' Silty SAND: brown/red, moist, medium dense</p>	
710	5		R-2	14 15 17	108.8	1.6	SM		
			R-3	4 5 8	100.0	20.5	ML		
			R-4	5 7 9	95.9	8.3	SM		
705	10								
700	15		SPT-1	6 4 6		11.9	ML	@ 15' Clayey SILT: brown/olive brown, moist, stiff; few gravel	
695	20		R-5	8 13 14	108.6	8.4	SM	@ 20' Silty SAND: olive brown/green, moist, medium dense	
690	25		SPT-2	6 9 12				@ 25' Silty SAND: olive brown/green, moist, medium dense	
	30							Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/12/2017	



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 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

TEST TYPES:
 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-8

Date: 9/13/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: B61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~717' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
715	0	B-1	R-1	4 4 6	106.1	9.7	SM	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Silty SAND: olive brown, moist, loose; rootlets	
710	5		R-2	2 6	102.4	19.7	SM	@ 5.0' Silty SAND: olive brown, very moist, loose	
			R-3	3 6	94.0	17.5	ML	@ 7.5' Sandy SILT with Gravel: olive brown/green, very moist, stiff; small pockets of FeO2 staining	
	10		R-4	3 8	120.4	13.9	SM	@ 10' Silty SAND with Gravel: olive brown/green, very moist, medium dense; fine gravel	
705									
700	15		R-5	4 7 10	107.7	13.1		@ 15' Silty SAND: olive brown/green, very moist, medium dense	
695	20	SPT-1		3 17 12			@ 20' Silty SAND: olive brown/green, very moist, dense; some fine gravel		
690	25	R-6	4 6 10	99.4	24.7	CL	@ 25' Sandy CLAY: olive green, very moist, stiff		
	30						Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/13/2017		



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 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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-9

Date: 9/13/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: B61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~711' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
710	0	B-1	R-1	10 13 15	122.6	6.7	SM	@ 0' to TD - Quaternary Young Eolian Deposits (Qye): @ 2.5' Silty SAND: brown, moist, medium dense; some rootlets	
705	5		R-2	5 7 10	113.3	3.9		@ 5.0' Silty SAND: brown, dry, medium dense	
			R-3	5 8 11	100.9	3.6		@ 7.5' Silty SAND: brown, dry, medium dense	
700	10		R-4	6 7 11	108.4	16.2	ML	@ 10' SILT: olive brown/green, very moist, stiff; some fine gravel	
695	15		SPT-1	4 4 7				@ 15' Sandy SILT: olive brown/green, moist, stiff	
690	20		R-5	4 4 8	97.5	25.0		@ 20' SILT: olive brown/green, gray, very moist, stiff	
685	25		SPT-2	2 2 2			CL	@ 25' Silty CLAY: olive green/gray, very moist, medium stiff	
	30								





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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-9

Date: 9/13/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: B61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~711' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
680	30		R-6	4 7 11	94.6	28.1	CL-ML	@ 30' Silty CLAY: olive green/brown, very moist, stiff	
675	35		SPT-3	3 5 7				@ 35' Silty CLAY: olive green/brown, very moist, stiff	
670	40		R-7	7 14 27	109.6	19.4	SC	@ 40' Clayey SAND: olive brown, very moist, dense	
665	45		SPT-4	4 6 9			SM	@ 45' Silty SAND: olive green/brown, very moist, medium dense	
660	50		R-8	6 12 19	105.6	21.9	ML	@ 50' Sandy SILT: olive brown/green, very moist, very stiff	
655	55							Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 9/13/2017	
650	60								

	<p>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.</p>	<p>SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES: 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</p>
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Geotechnical Boring Log Borehole HS-10

Date: 9/13/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: B61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~716' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
715	0	B-1	R-1	4 805	113.4	6.3	SM	<p>@ 0' to TD - Quaternary Young Eolian Deposits (Qye):</p> <p>@ 2.5' Silty SAND: olive brown/brown, slightly moist, medium dense; rootlets</p> <p>@ 5.0' Silty SAND: brown, dry, medium dense</p> <p>@ 7.5' Silty SAND: brown/gray, slightly moist, medium dense</p> <p>@ 10' Silty SAND with Gravel: olive green/brown, very moist, medium dense</p> <p>@ 15' Silty SAND: olive brown/green, moist, medium dense</p> <p>@ 20' Clayey SILT: olive brown/green, very moist, stiff</p> <p>@ 25' Sandy SILT: olive green/brown, wet, stiff</p>	MD EI CR #200
710	5		R-2	4 811	109.0	2.3			
			R-3	5 909	95.1	6.0			
705	10		R-4	3 959	105.9	21.0			
700	15		R-5	5 125	101.4	14.0			
695	20		SPT-1	3 44			ML		
690	25	R-6	6 108	96.6	28.4				
	30						Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/13/2017		



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 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	TEST TYPES: 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
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Last Edited: 10/16/2017

Geotechnical Boring Log Borehole HS-11

Date: 9/13/2017	Drilling Company: Cal Pac Drilling
Project Name: Esperanza/Pietersma	Type of Rig: B61
Project Number: 17114-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~711' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
710	0	B-1	R-1	9 12 14	116.1	5.6	SM	<p>@ 0' to TD - Quaternary Young Eolian Deposits (Qye):</p> <p>@ 2.5' Silty SAND: brown-olive brown, slightly moist, medium dense</p> <p>@ 5.0' Silty SAND: brown/olive brown, slightly moist, medium dense</p> <p>@ 7.5' Sandy SILT: brown/olive brown, moist, stiff; few fine gravel</p> <p>@ 10' Silty SAND: brown/olive, dry, medium dense</p> <p>@ 15' Silty SAND: olive brown/green, slightly moist, medium dense</p> <p>@ 20' Silty SAND: olive brown/green, slightly moist, medium dense</p> <p>@ 25' Clayey SILT: olive green/brown, moist, very stiff</p>	
	5		R-2	6 7 11	109.6	6.8			
705			R-3	5 6 10	108.7	9.6	ML		
	10		R-4	5 9 12	102.6	1.9	SM		
695	15		SPT-1	5 8 10					
	20	R-5	9 12 17	108.4	6.7				
690									
	25	SPT-2	9 12 13				ML		
685									
	30								
Total Depth = 25' Groundwater Not Encountered Backfilled with Cuttings on 9/13/2017									

Last Edited: 10/16/2017

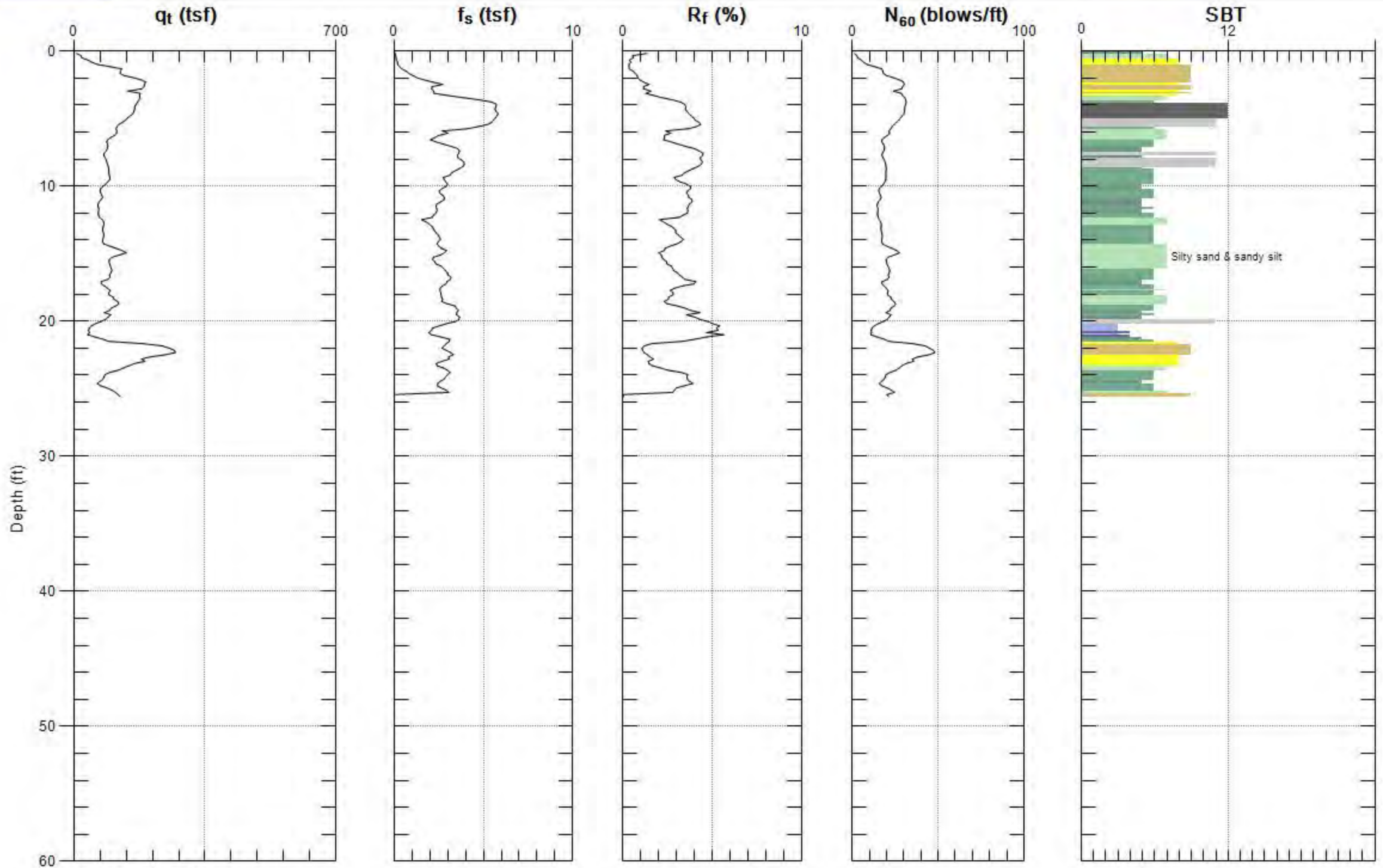


THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE 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

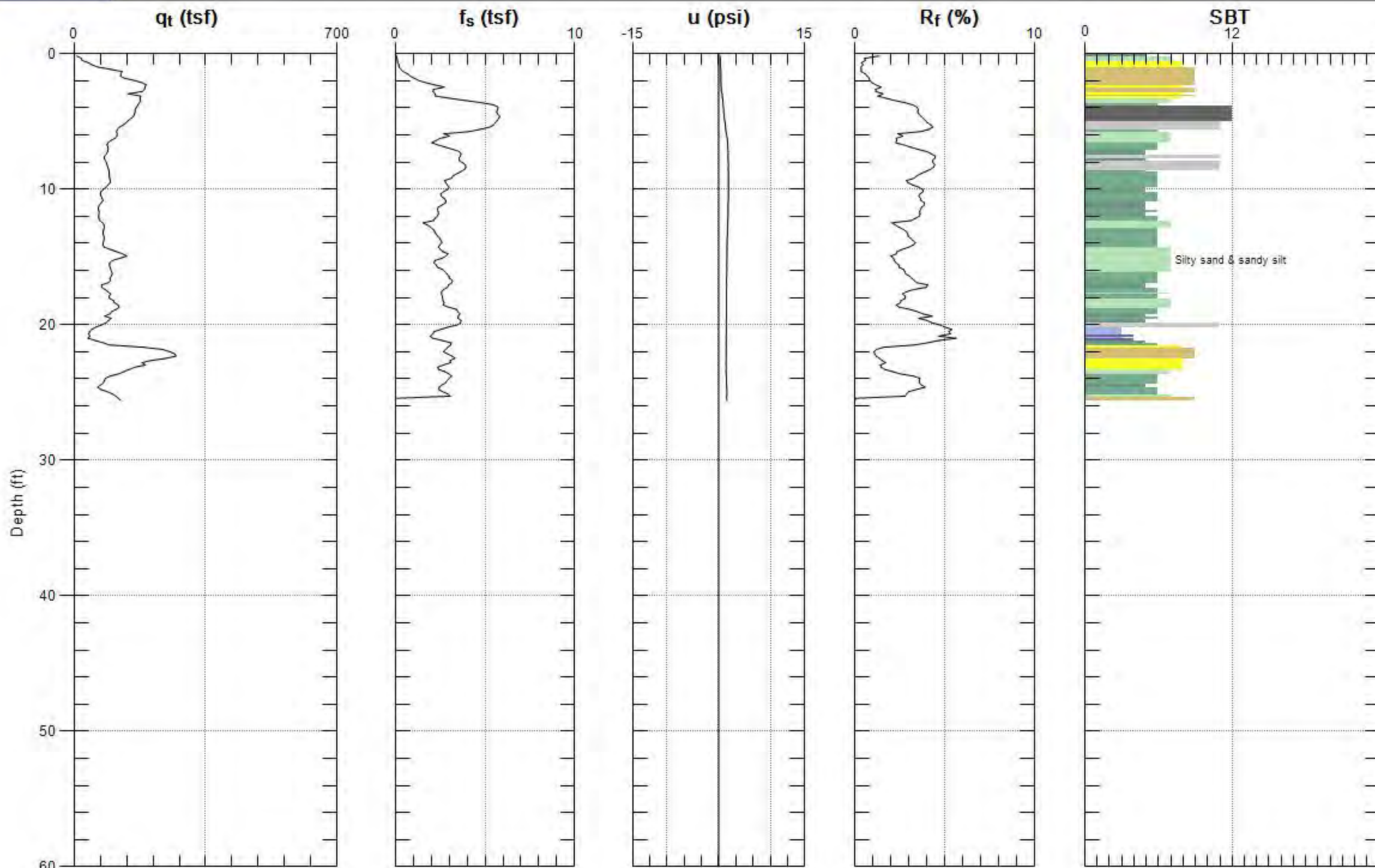
GROUNDWATER TABLE

TEST TYPES:
 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



Max. Depth: 25.591 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 25.591 (ft)
 Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



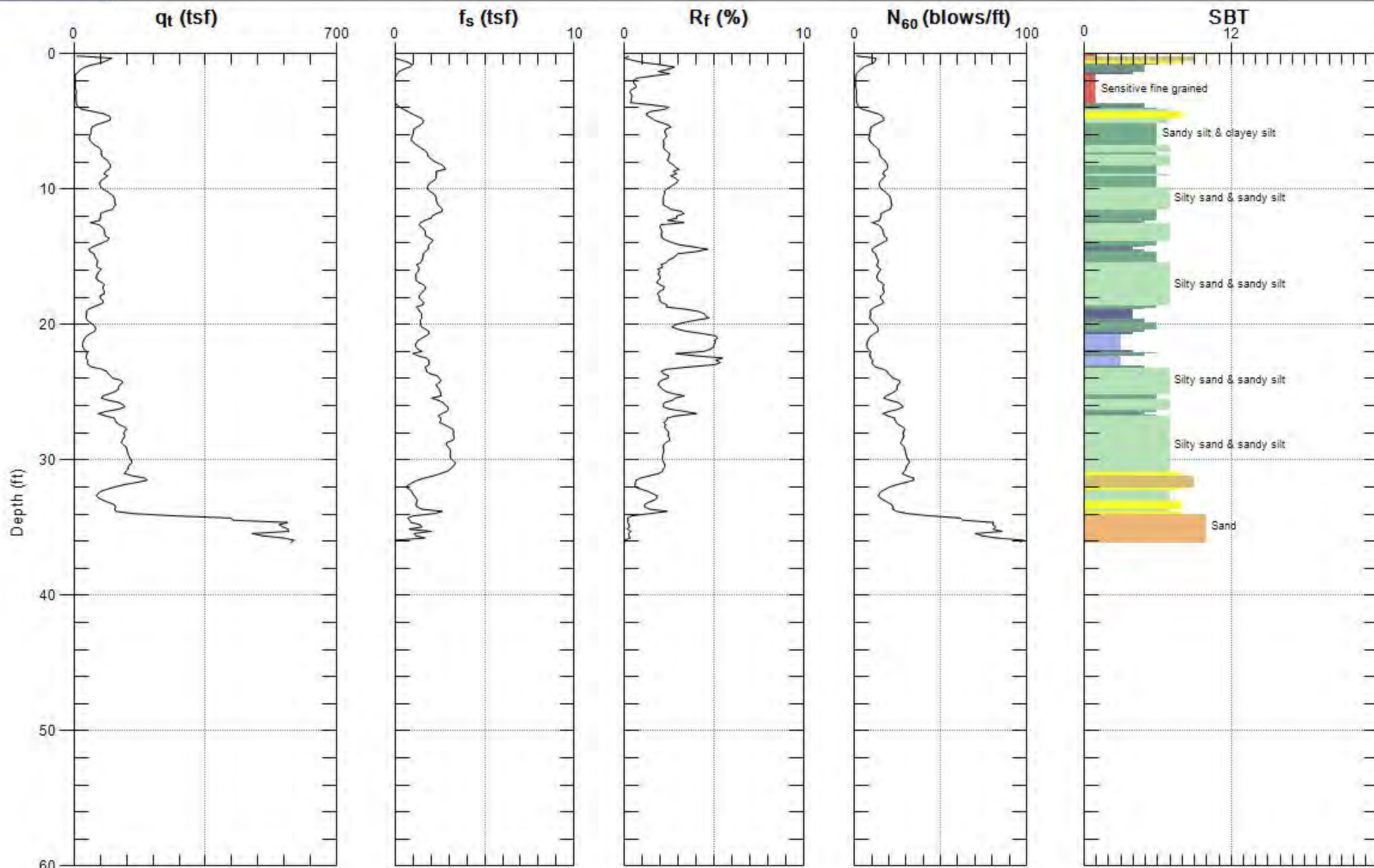
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Site: EXPERANZA

Engineer: R.DOUGLAS

Sounding: CPT-2

Date: 9/11/2017 09:06



Max. Depth: 36.089 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



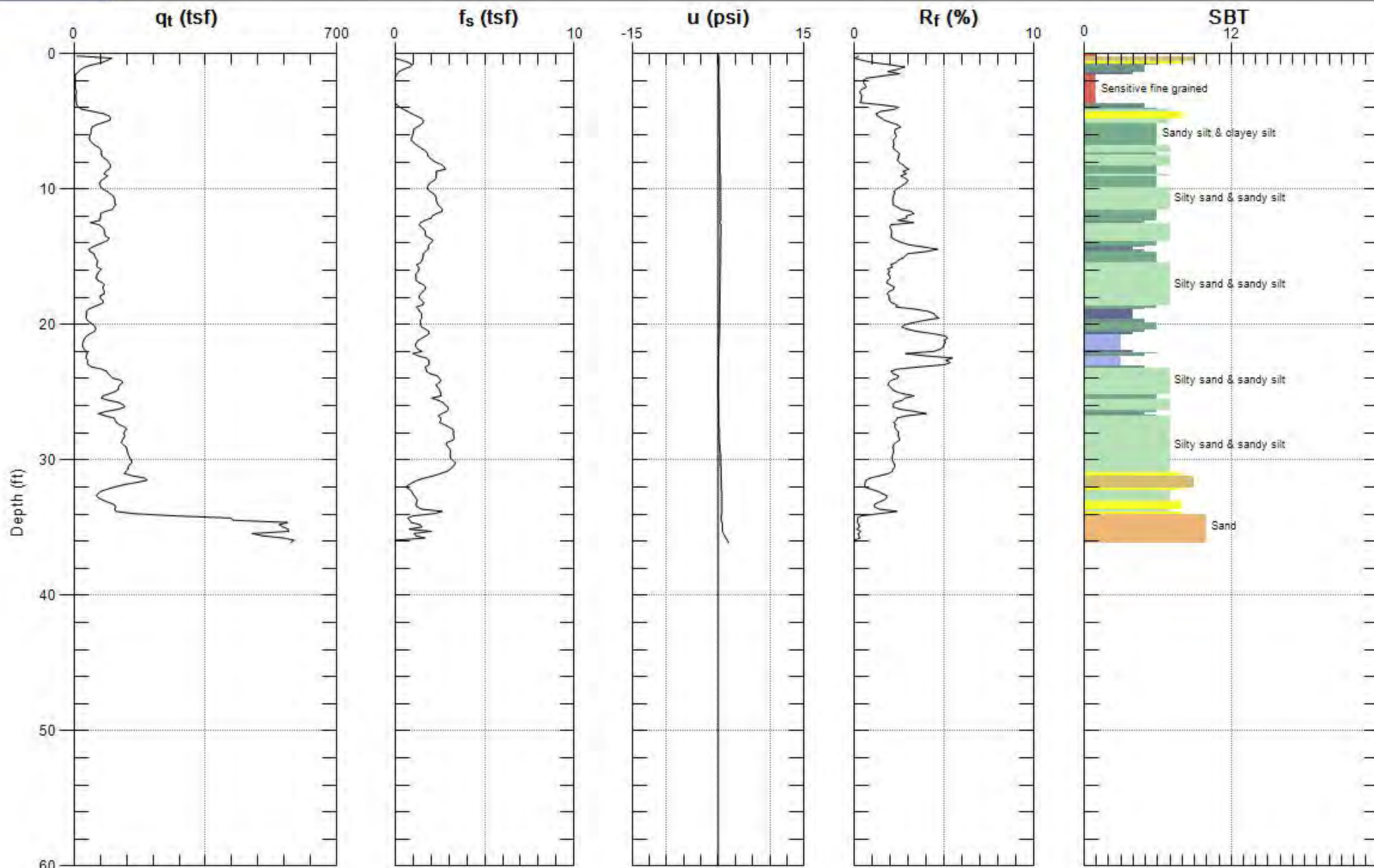
LGC GEOTECHNICAL

Site: EXPERANZA

Engineer: R.DOUGLAS

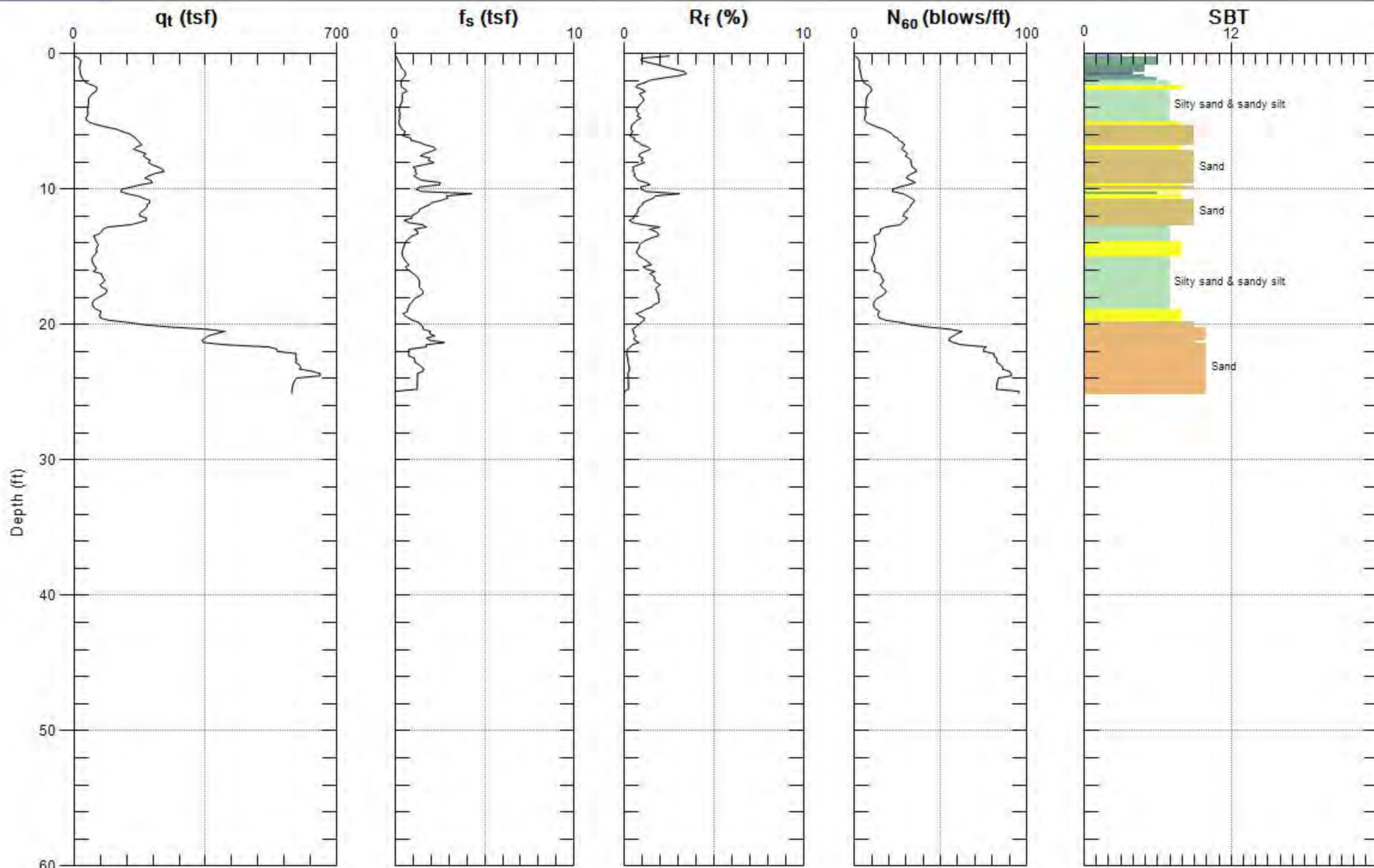
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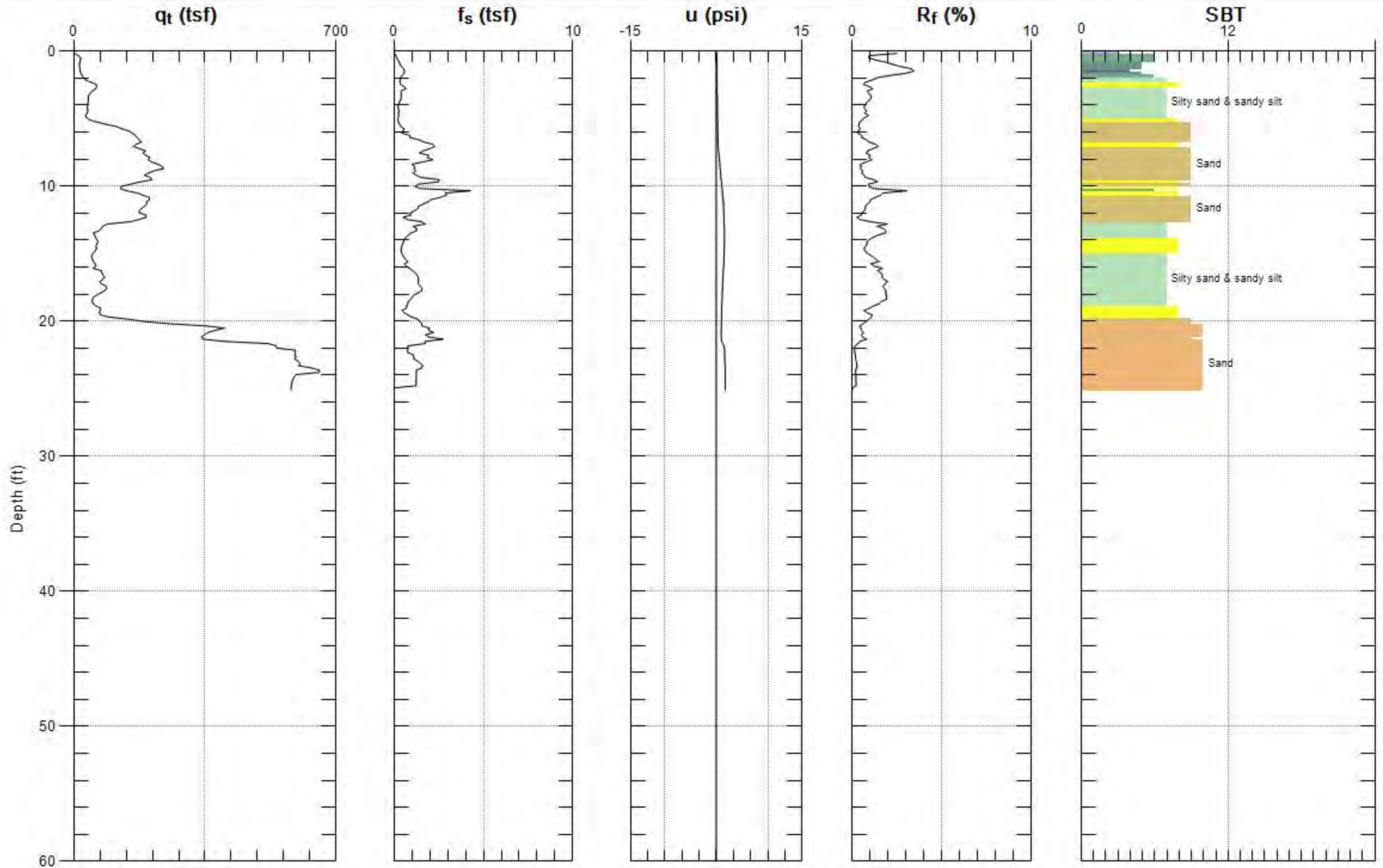
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 25.098 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 25.098 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



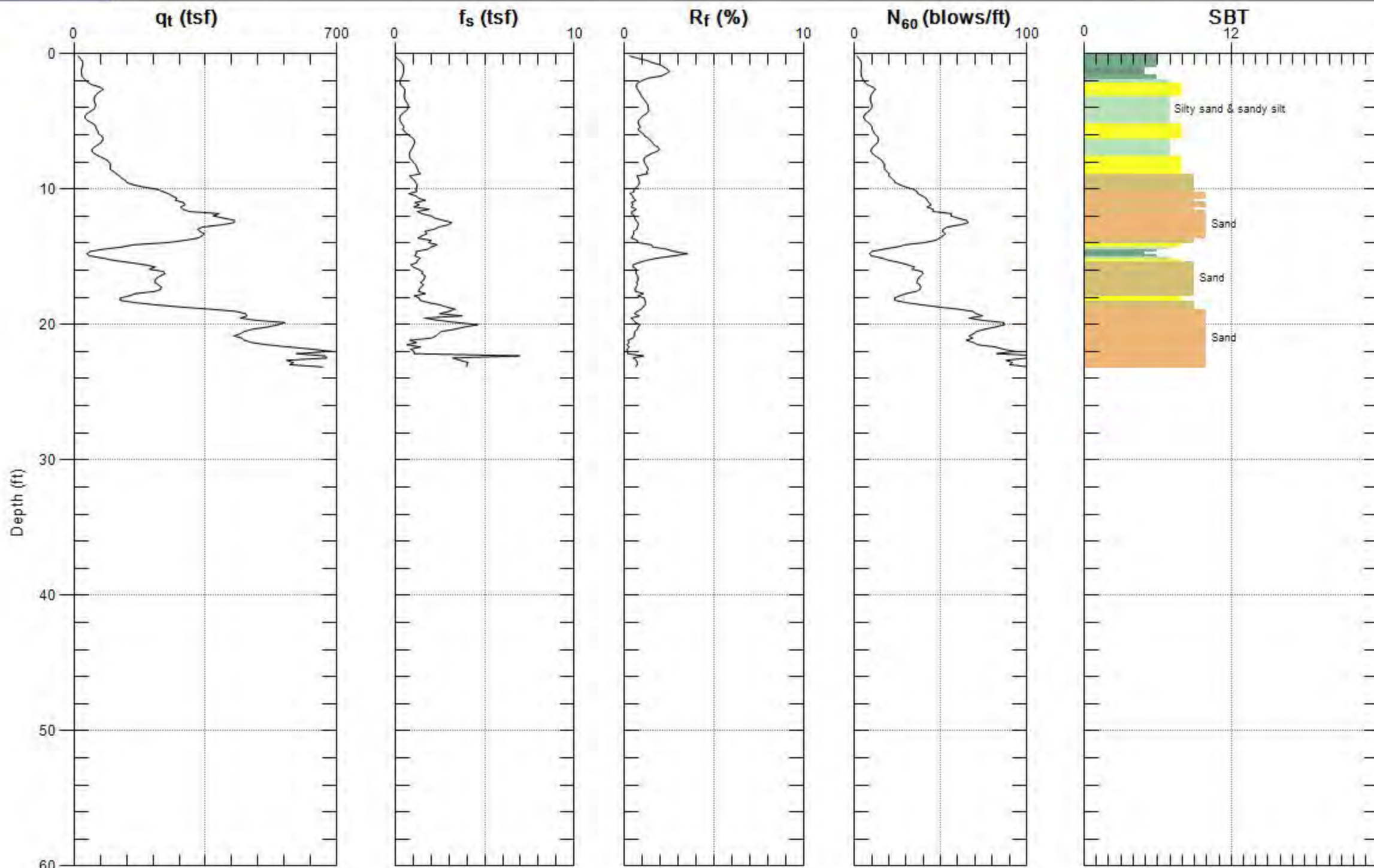
LGC GEOTECHNICAL

Site: EXPERANZA

Engineer: R.DOUGLAS

Sounding: CPT-4

Date: 9/11/2017 10:10



Max. Depth: 23.130 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



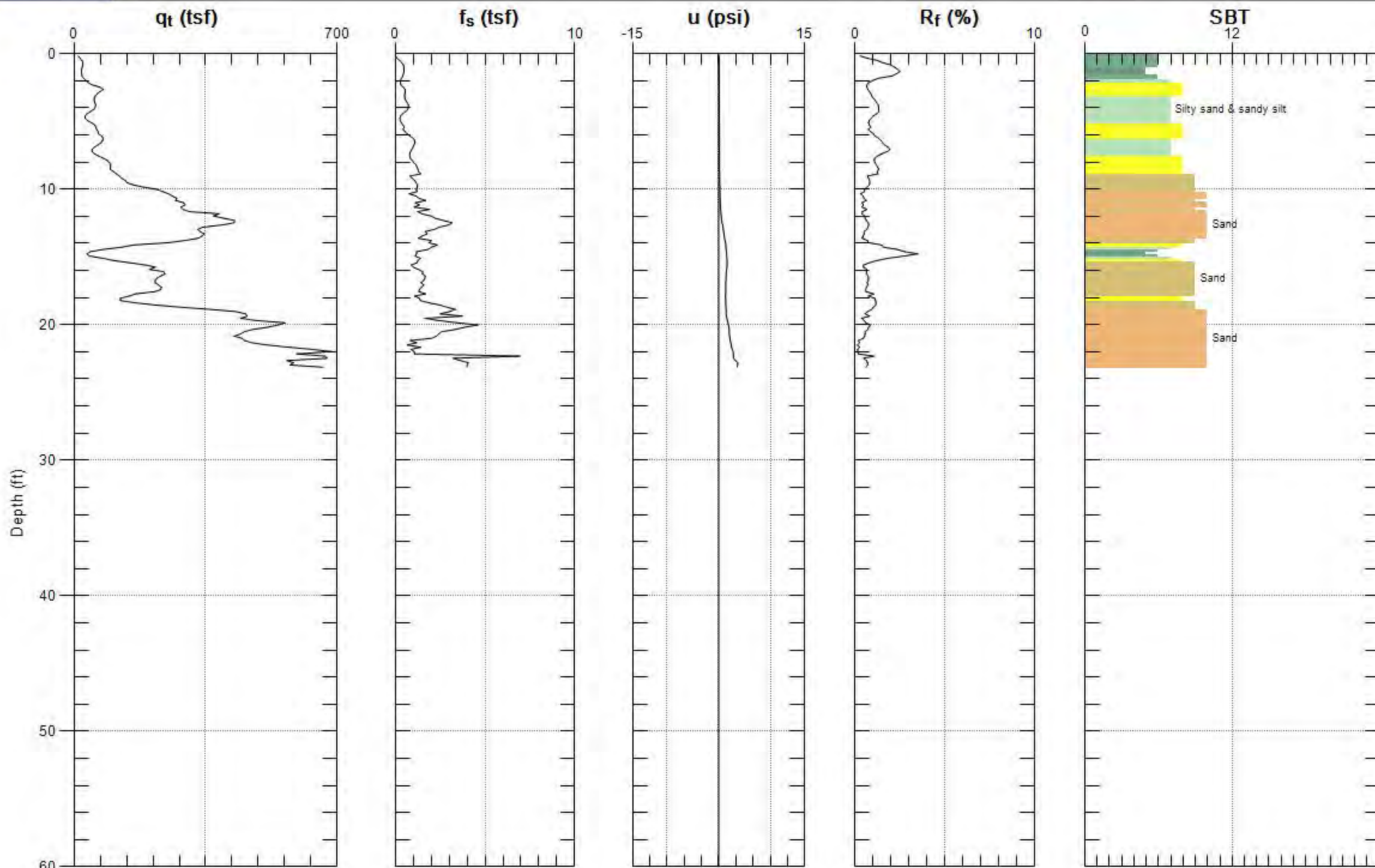
LGC GEOTECHNICAL

Site: EXPERANZA

Engineer: R.DOUGLAS

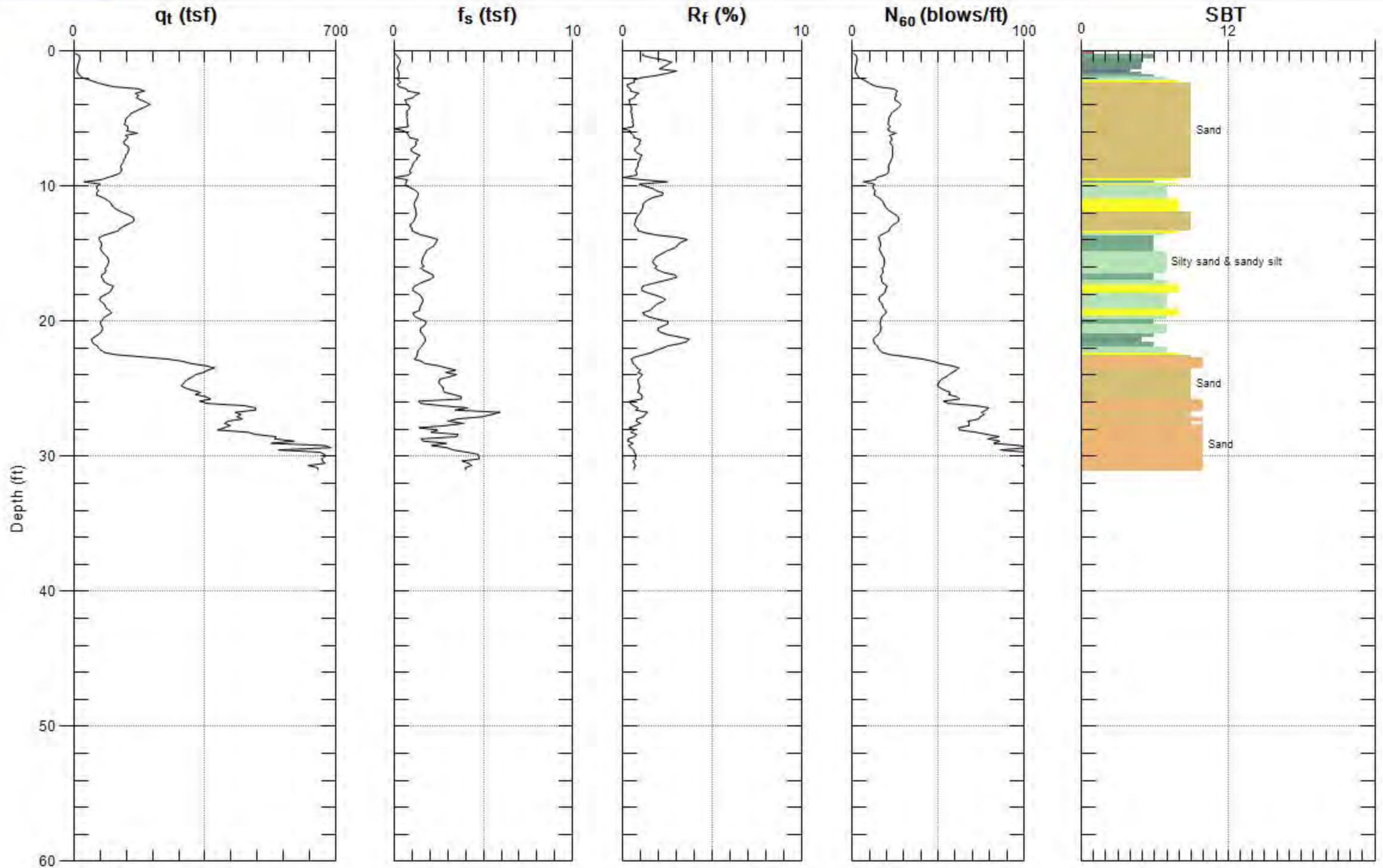
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Date: 9/11/2017 10:10



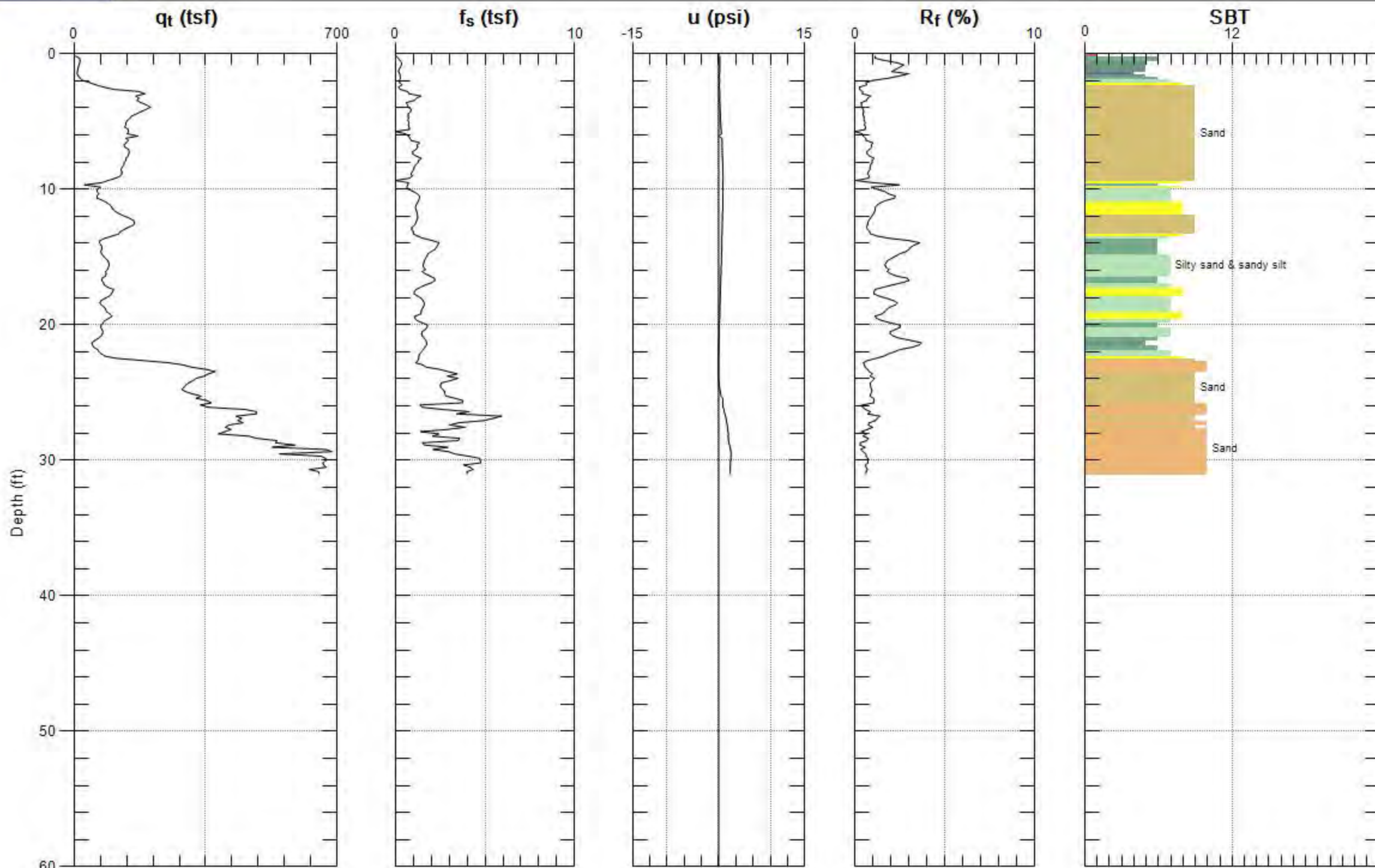
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



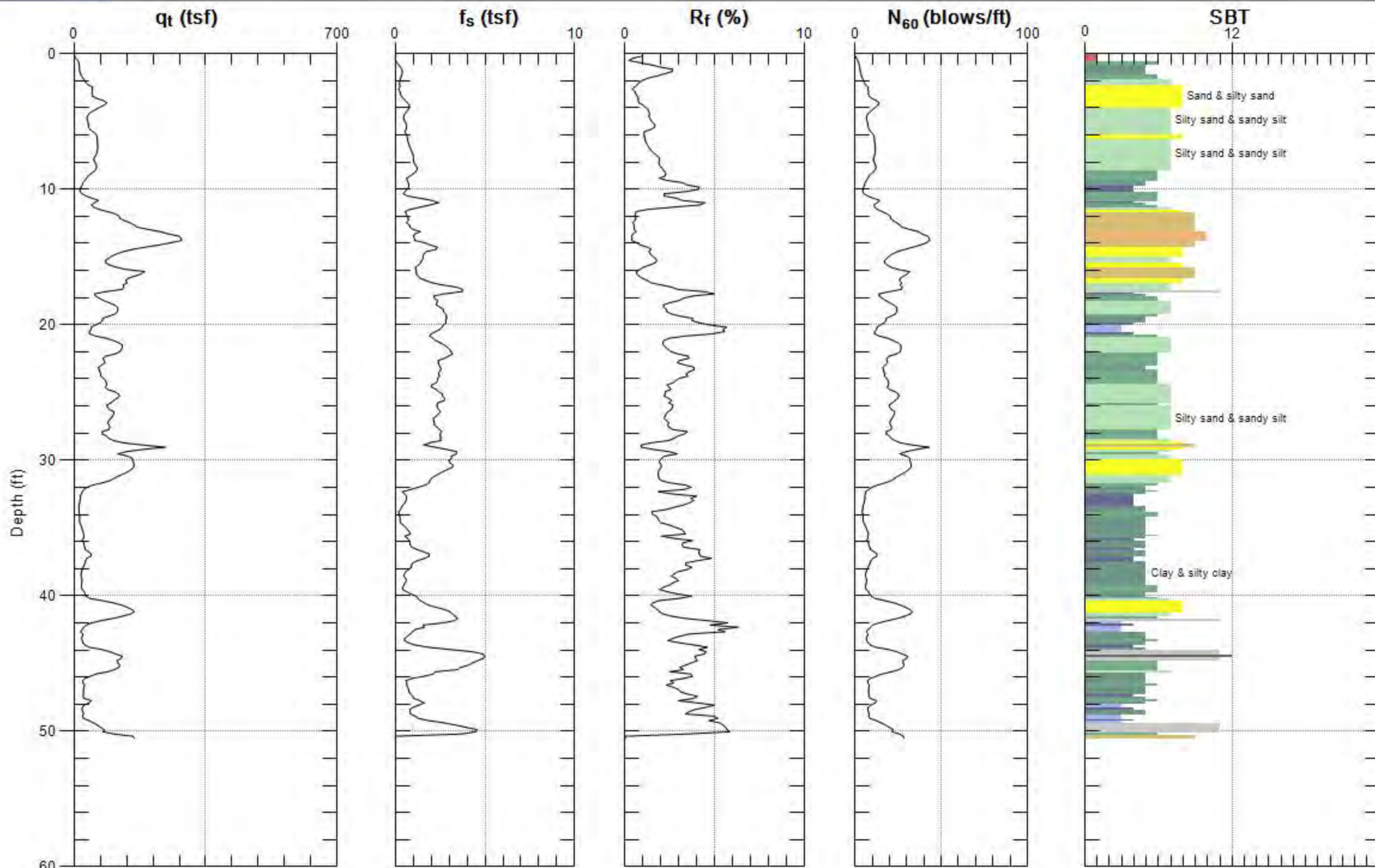
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



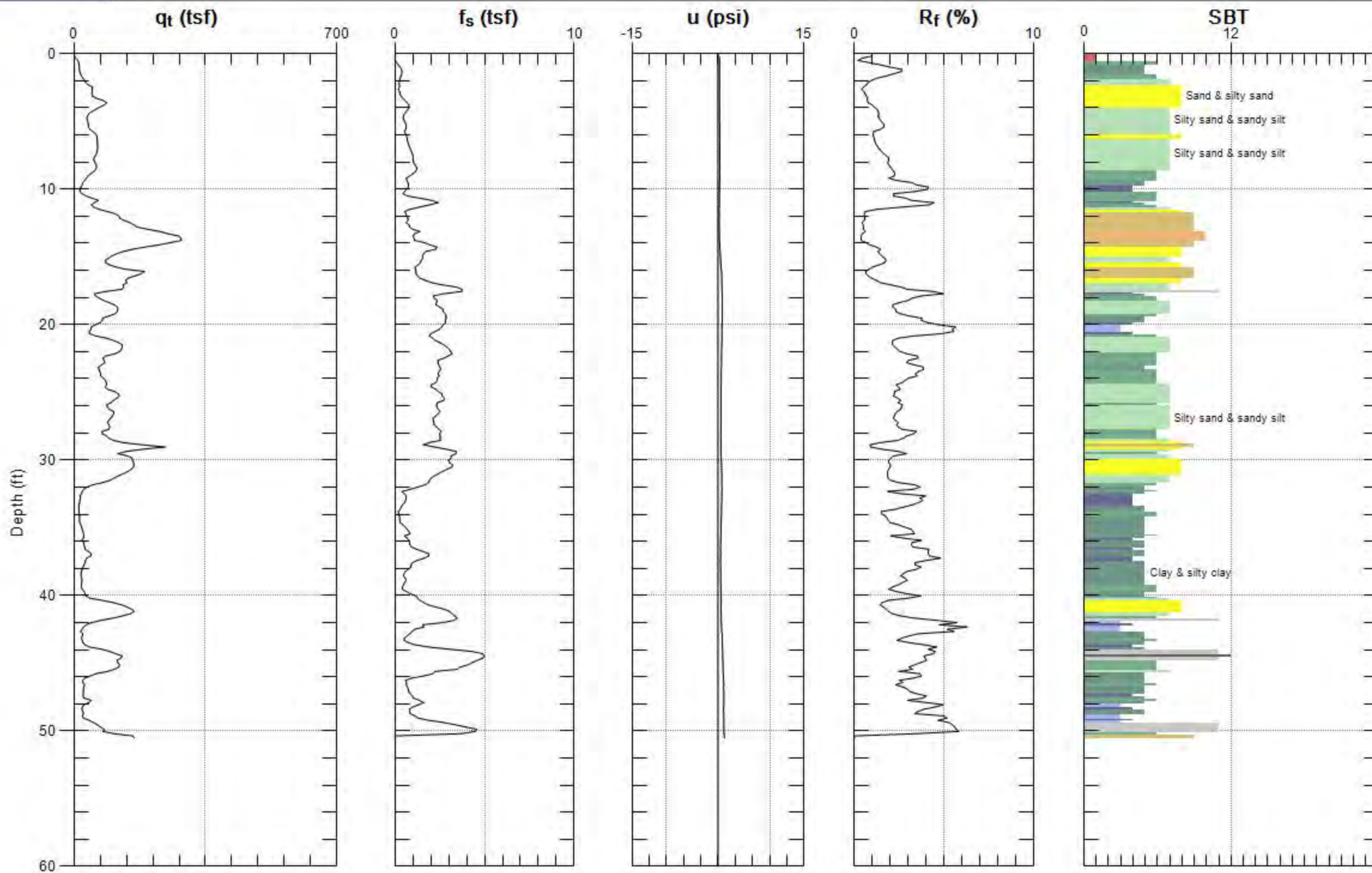
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.525 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.525 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



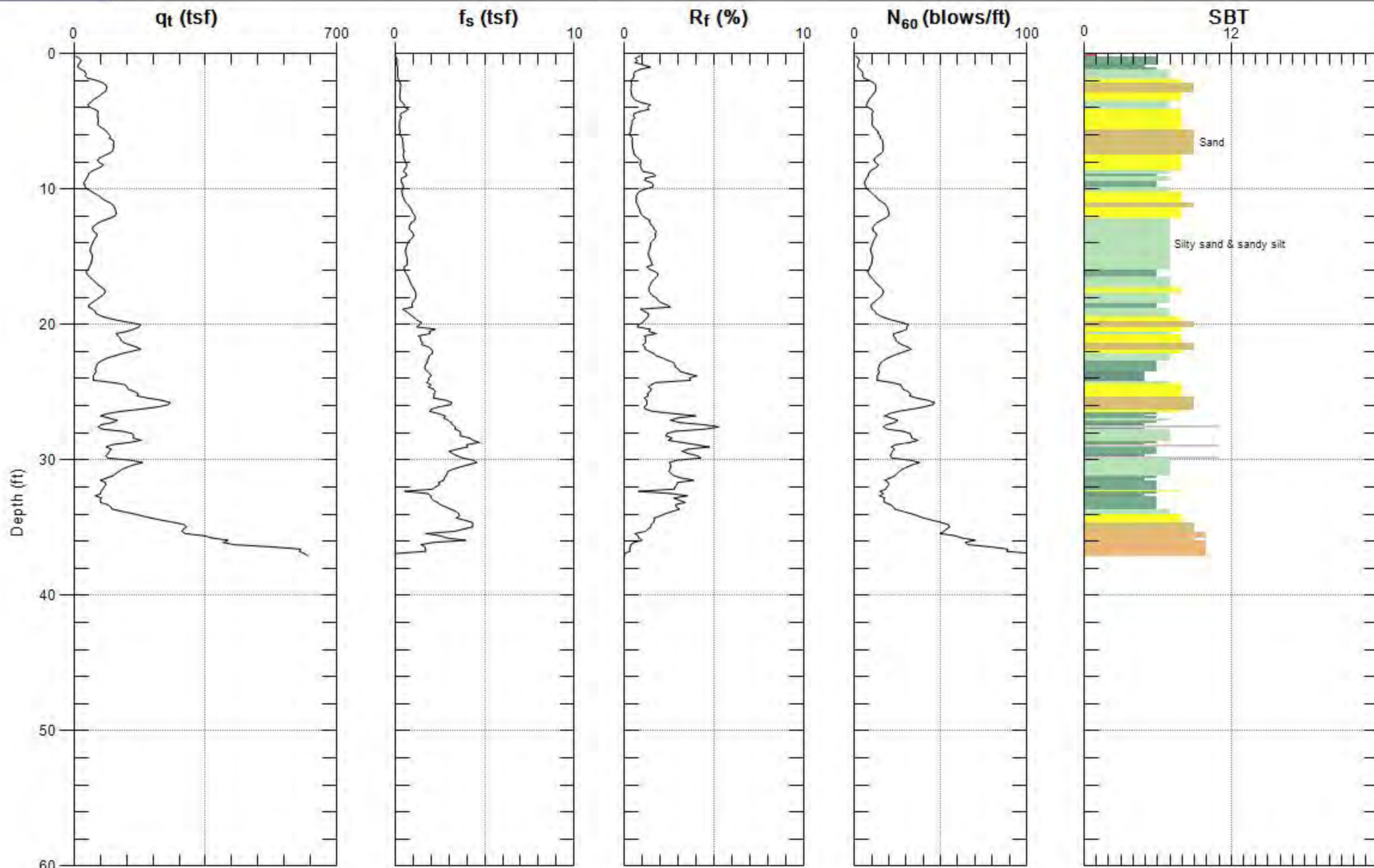
LGC GEOTECHNICAL

Site: EXPERANZA

Sounding: CPT-7

Engineer: R.DOUGLAS

Date: 9/12/2017 07:40



Max. Depth: 37.073 (ft)

Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



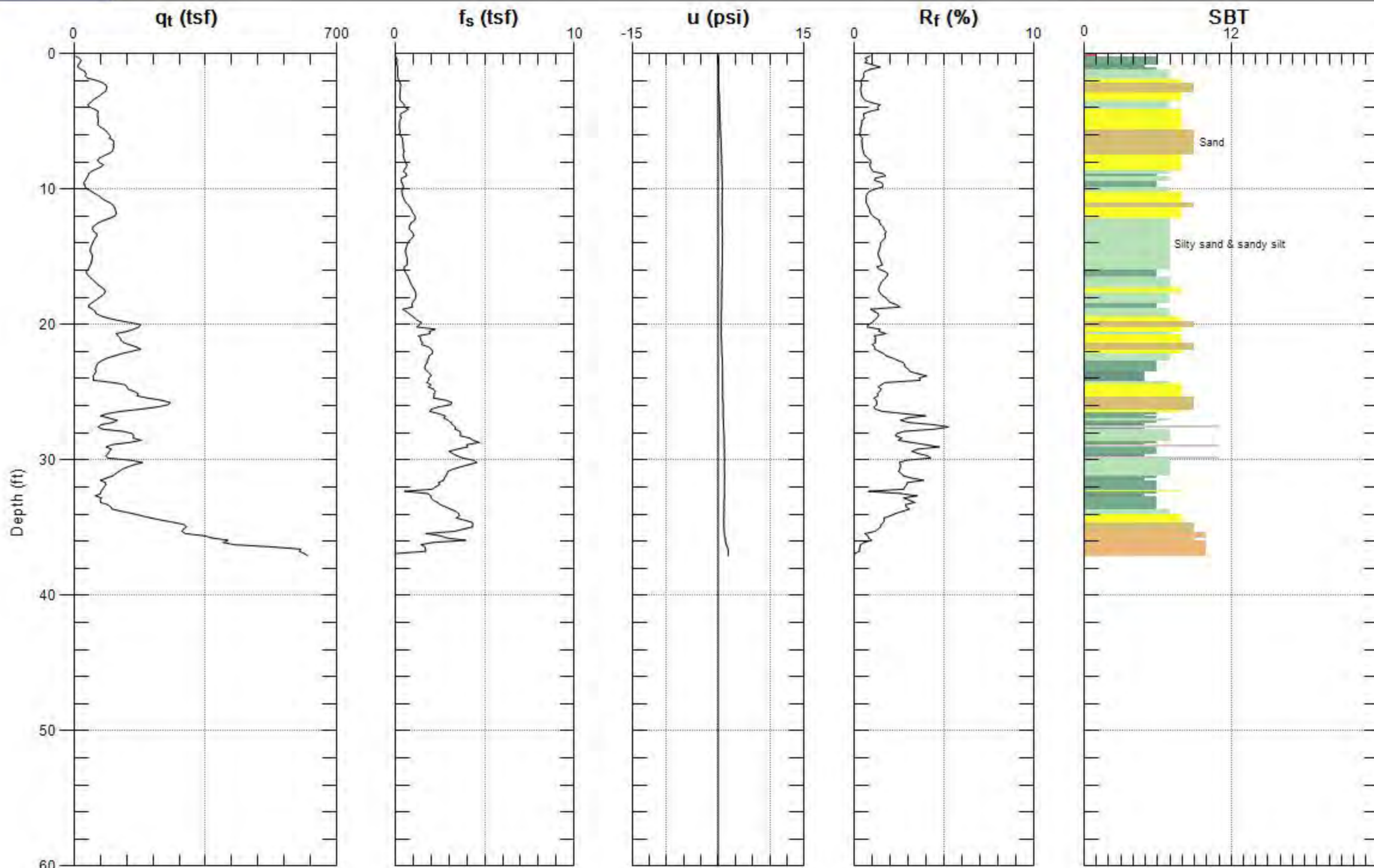
LGC GEOTECHNICAL

Site: EXPERANZA

Engineer: R.DOUGLAS

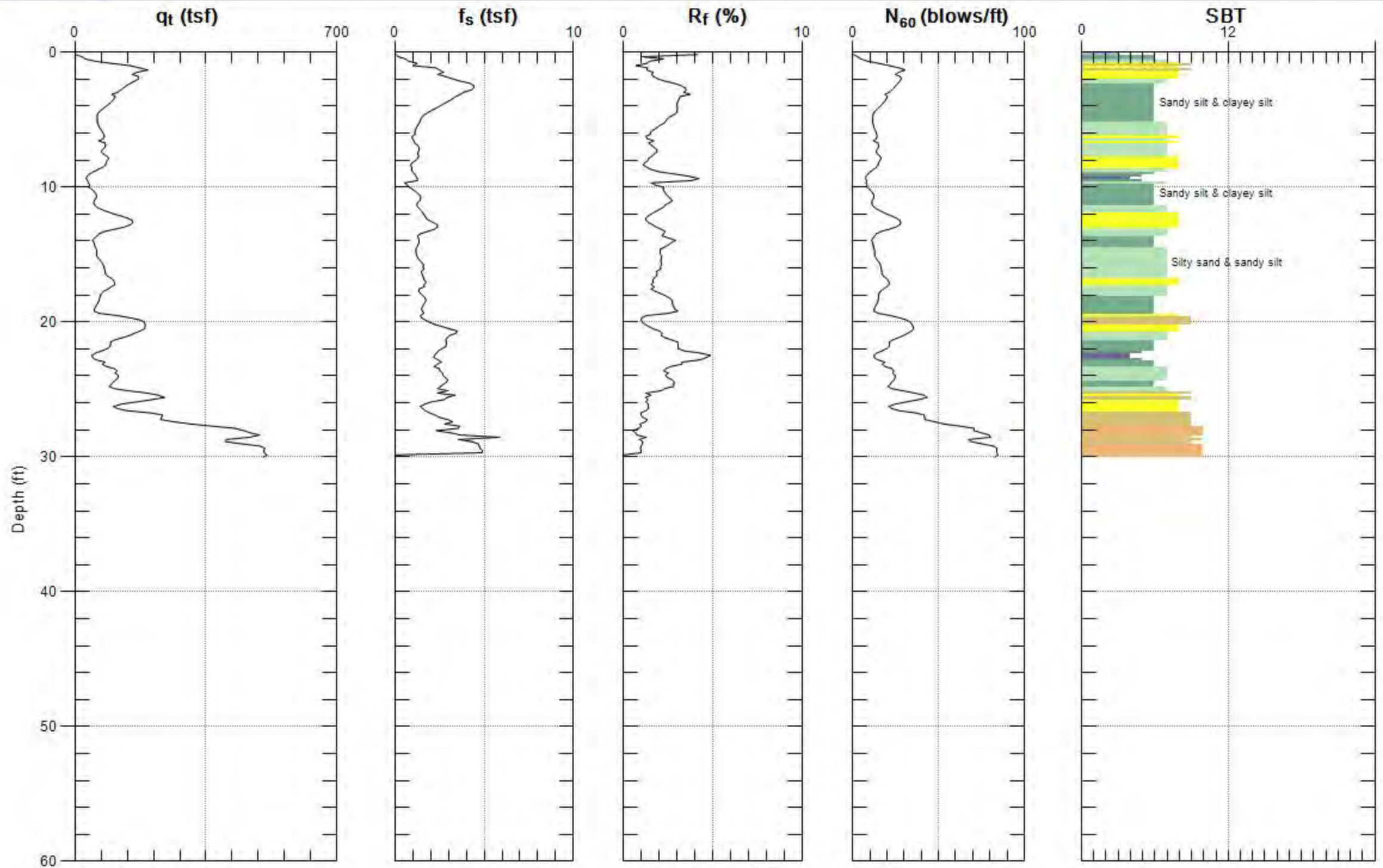
Sounding: CPT-7

Date: 9/12/2017 07:40



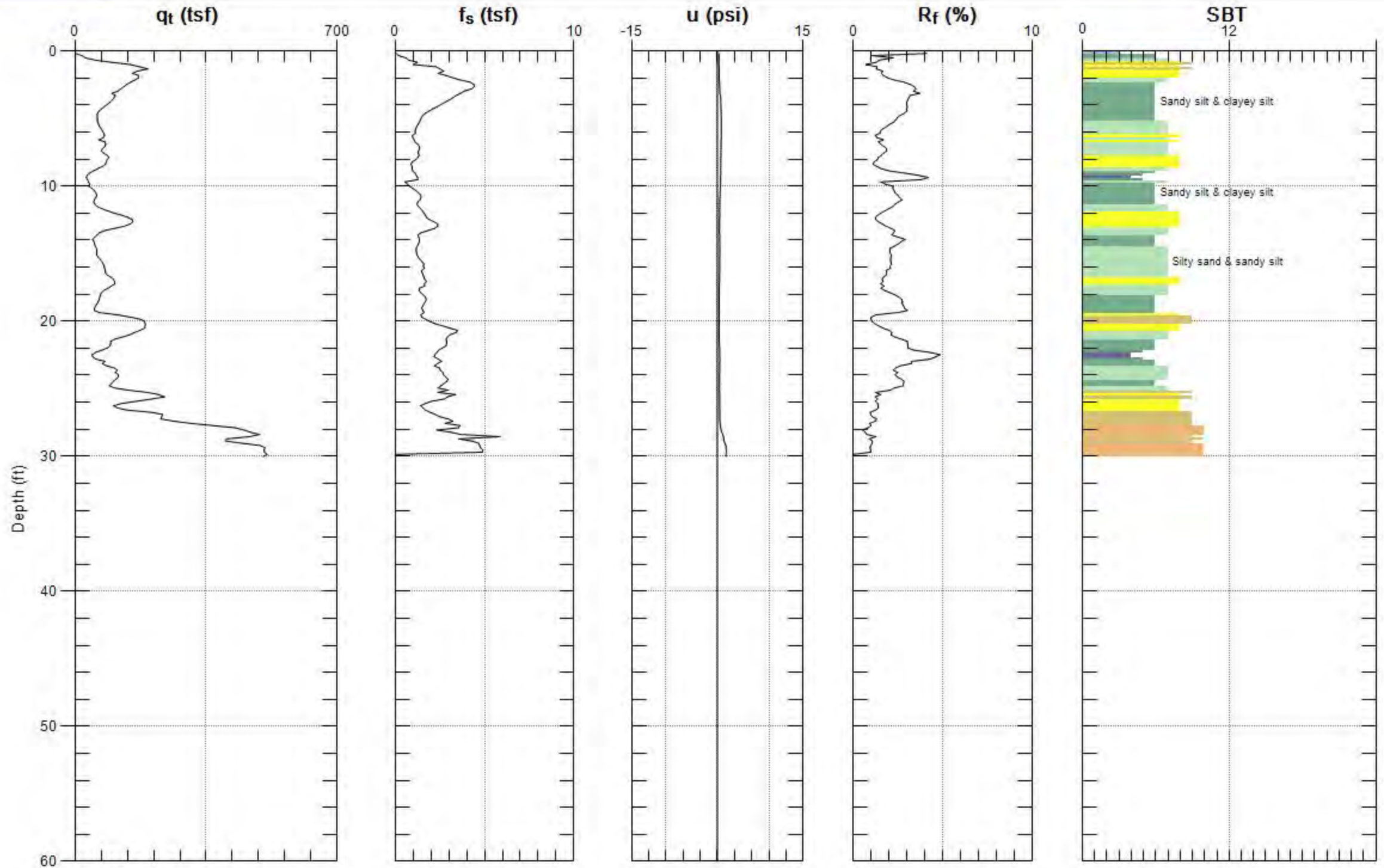
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



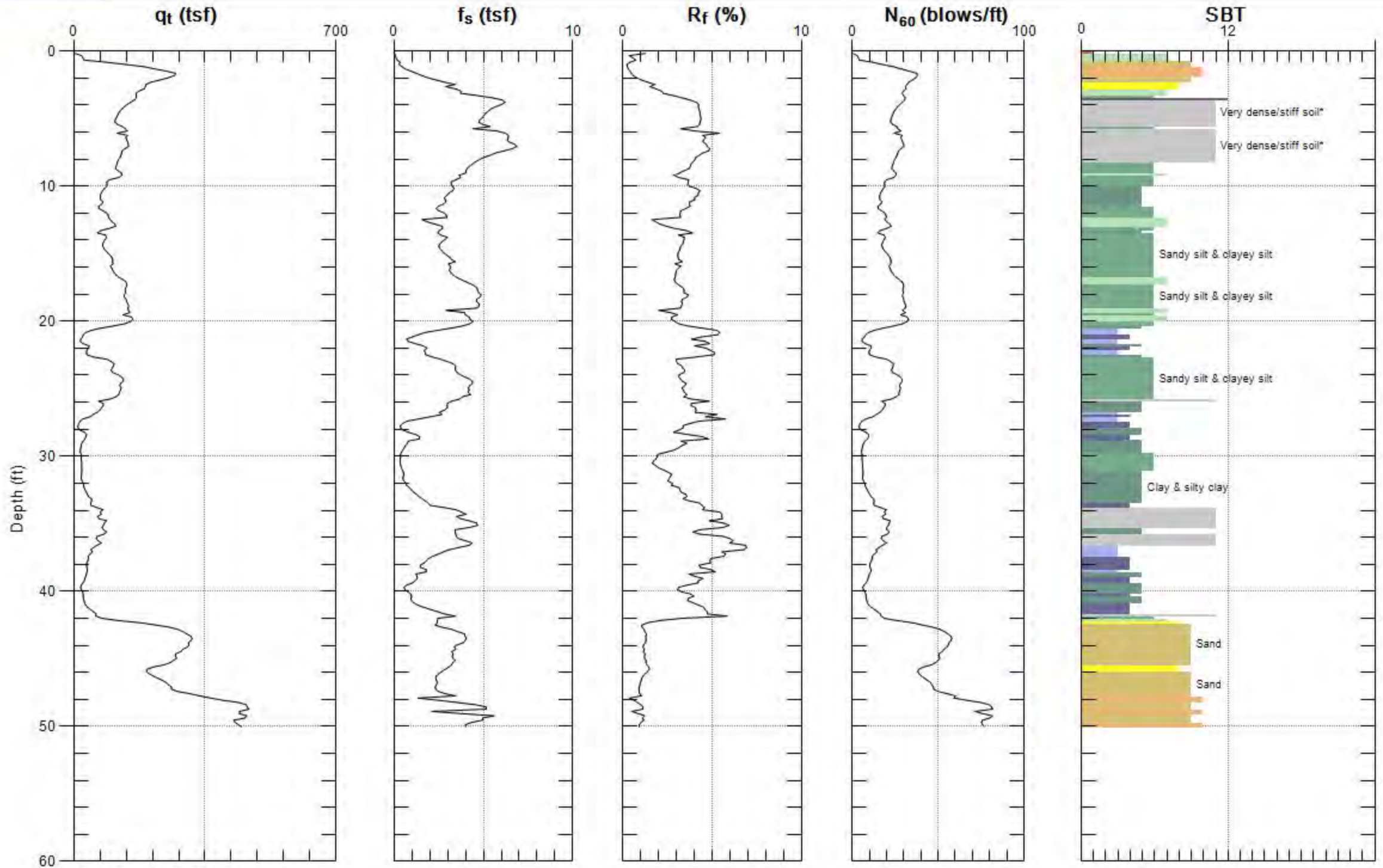
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SBT: Soil Behavior Type (Robertson 1990)



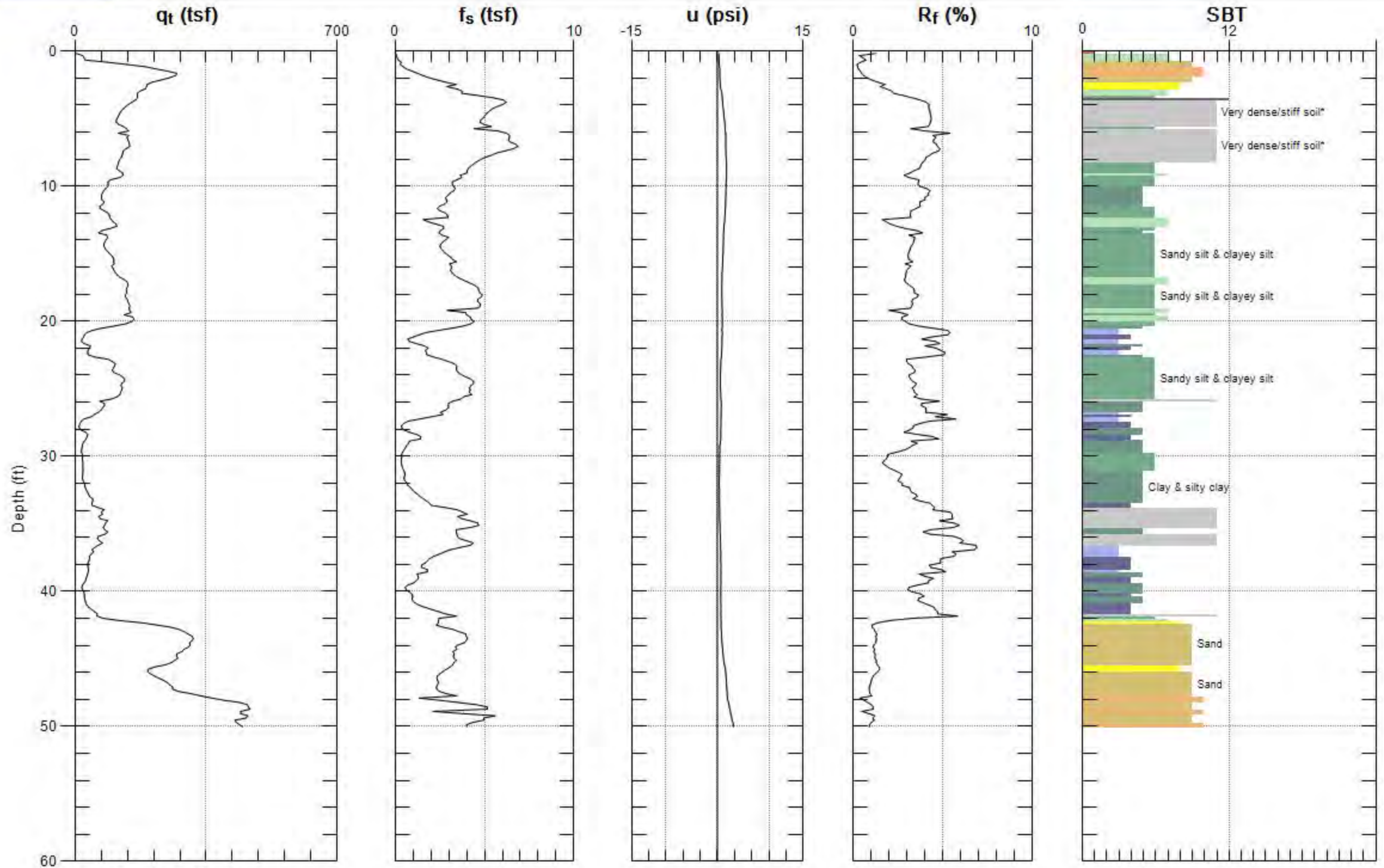
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SBT: Soil Behavior Type (Robertson 1990)



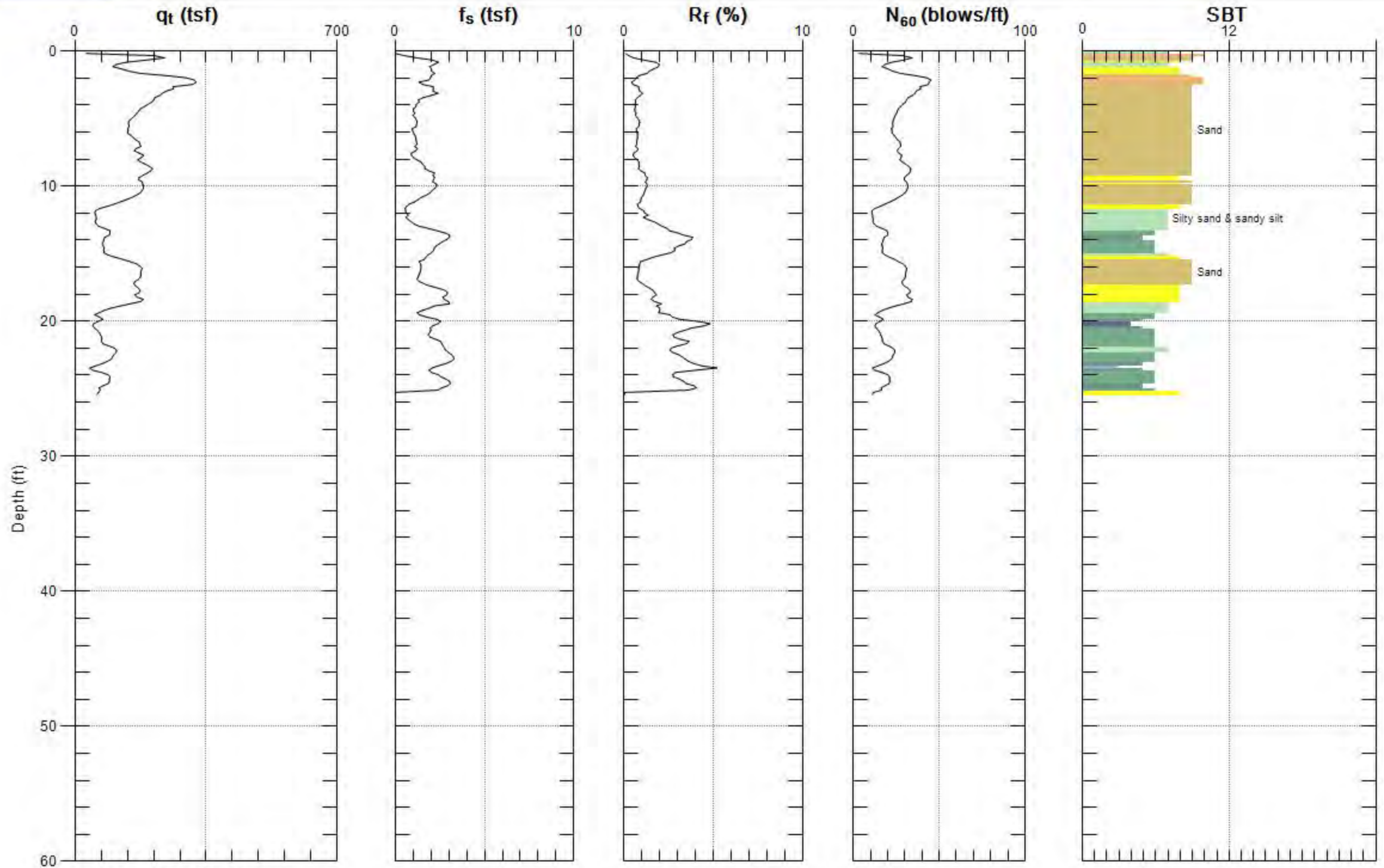
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



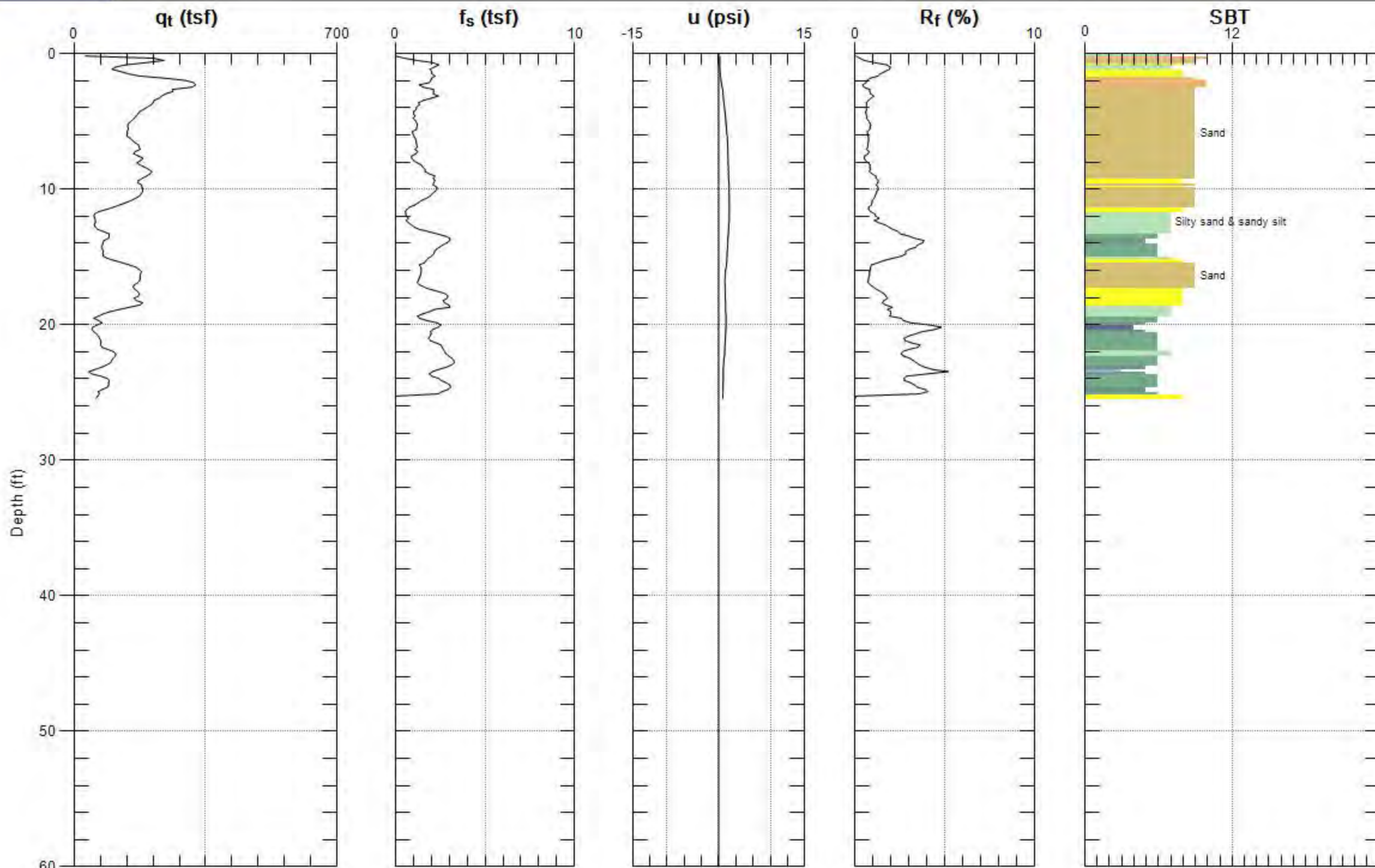
Max. Depth: 50.033 (ft)
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SBT: Soil Behavior Type (Robertson 1990)



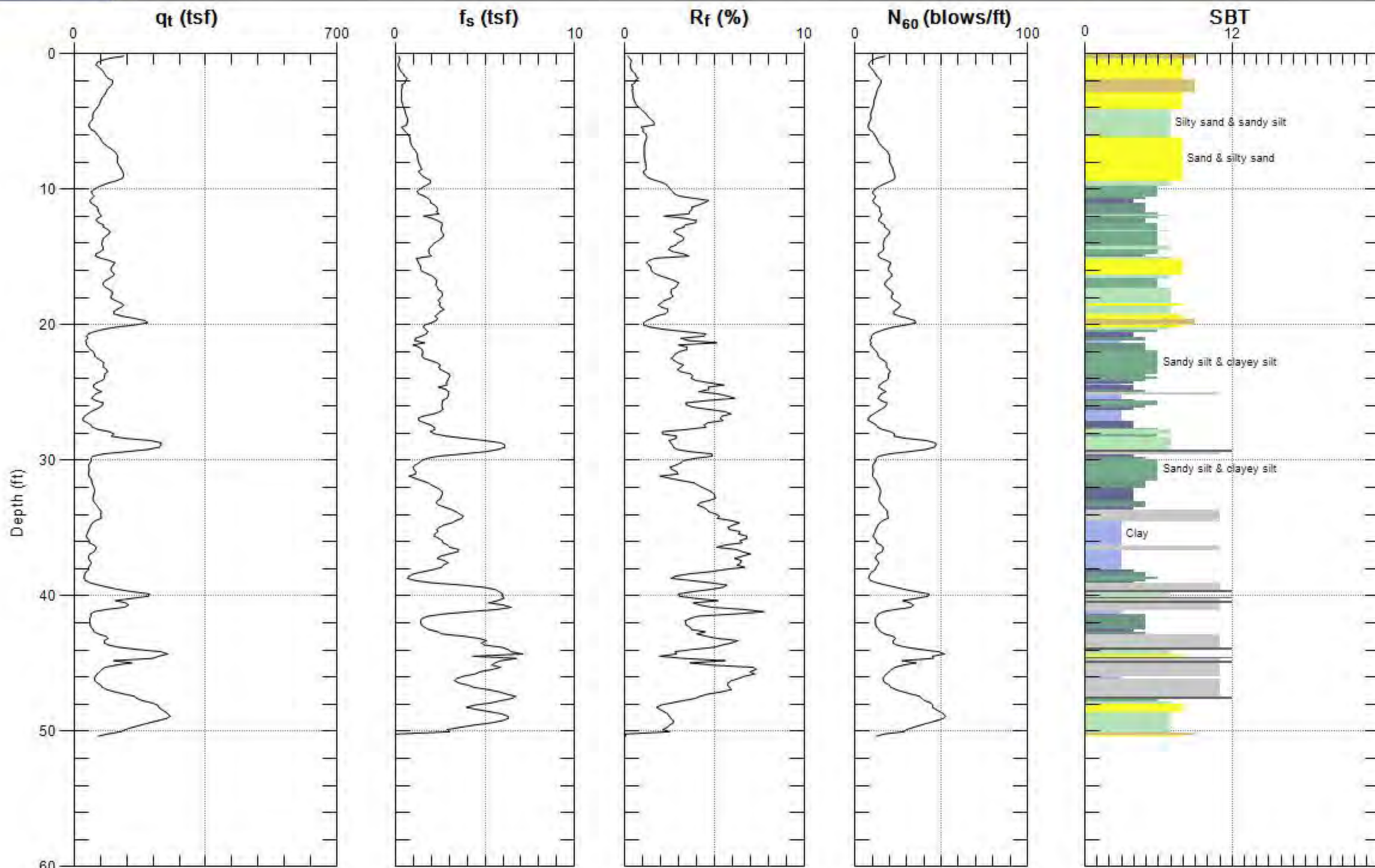
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Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



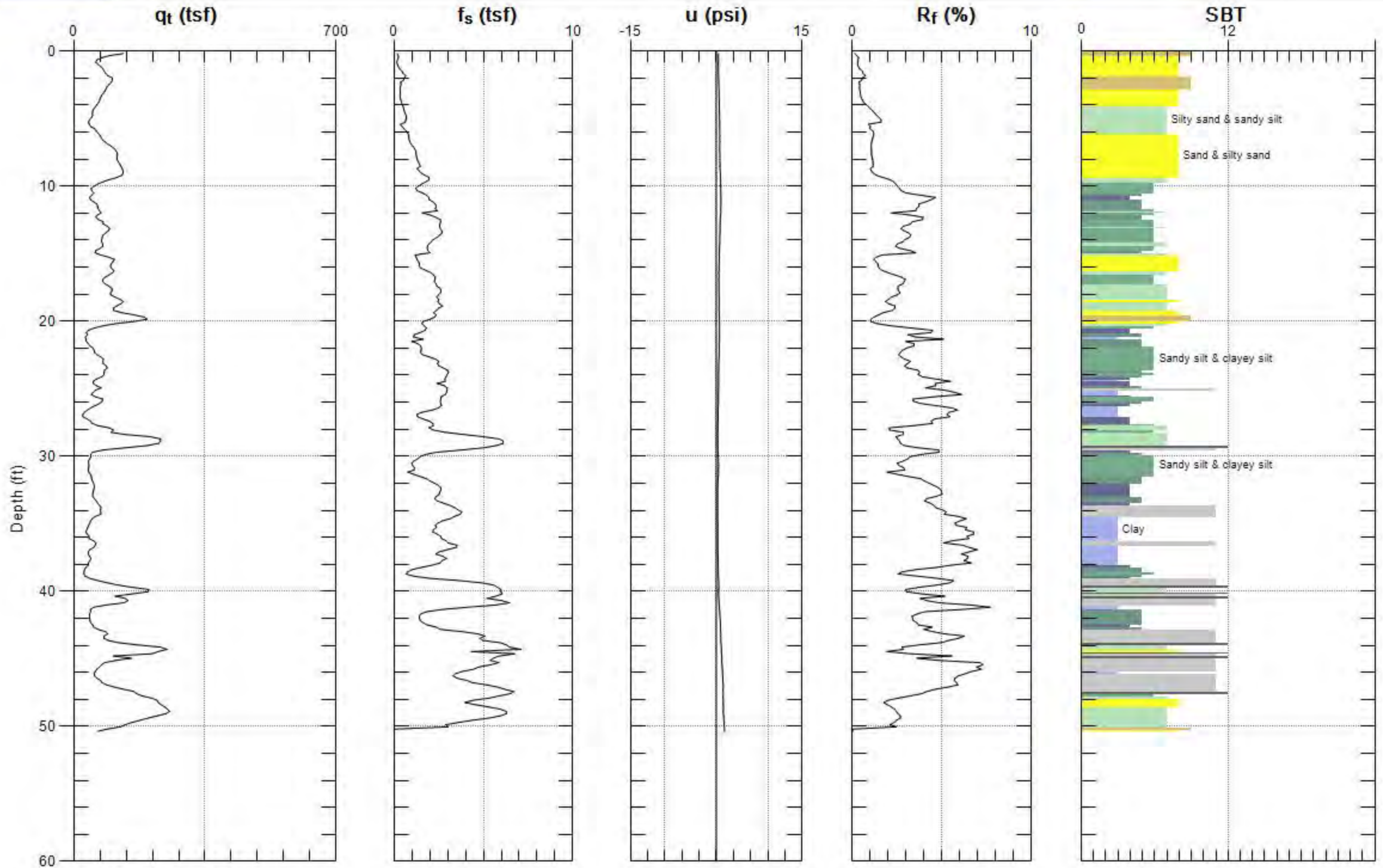
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SBT: Soil Behavior Type (Robertson 1990)



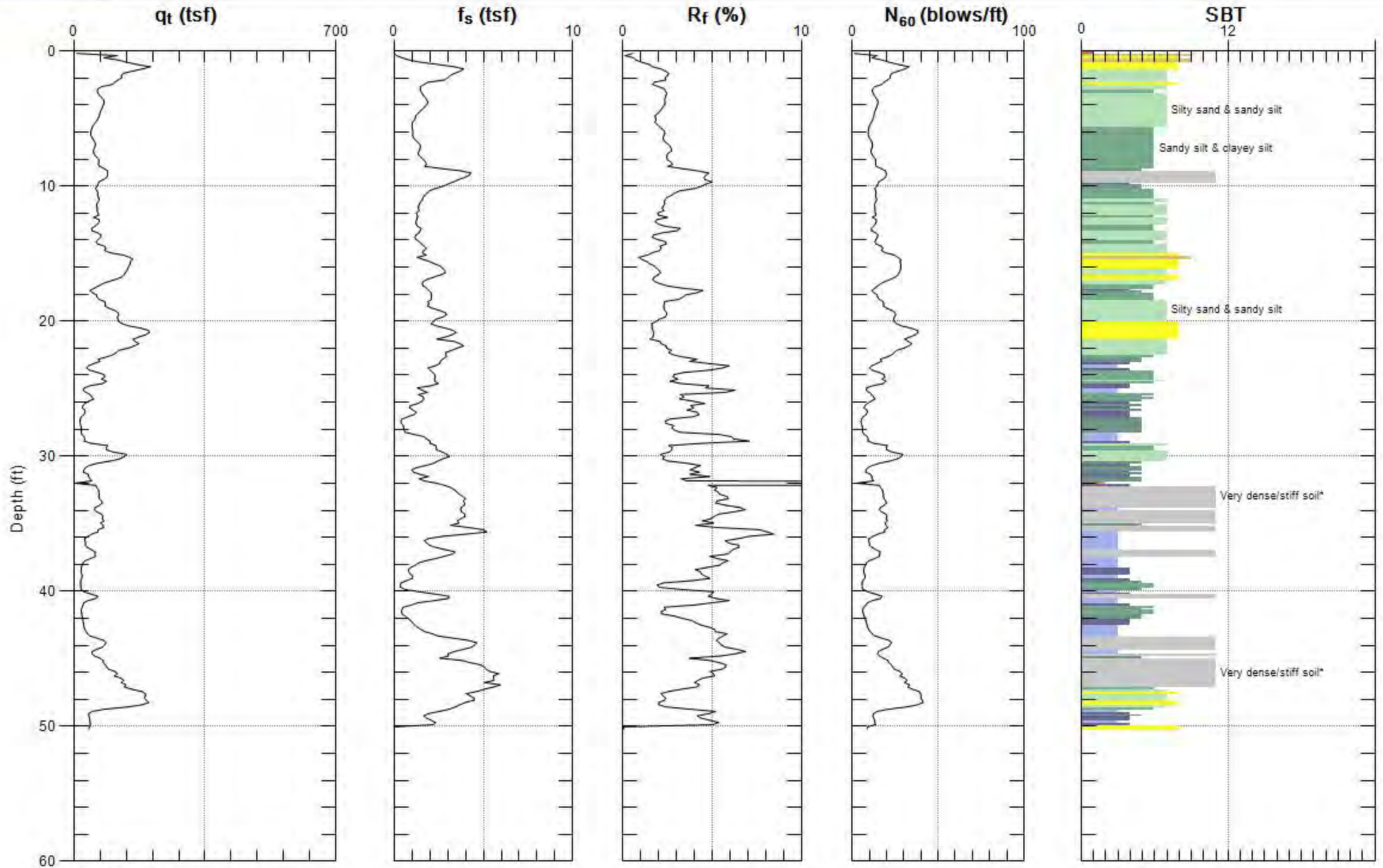
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SBT: Soil Behavior Type (Robertson 1990)



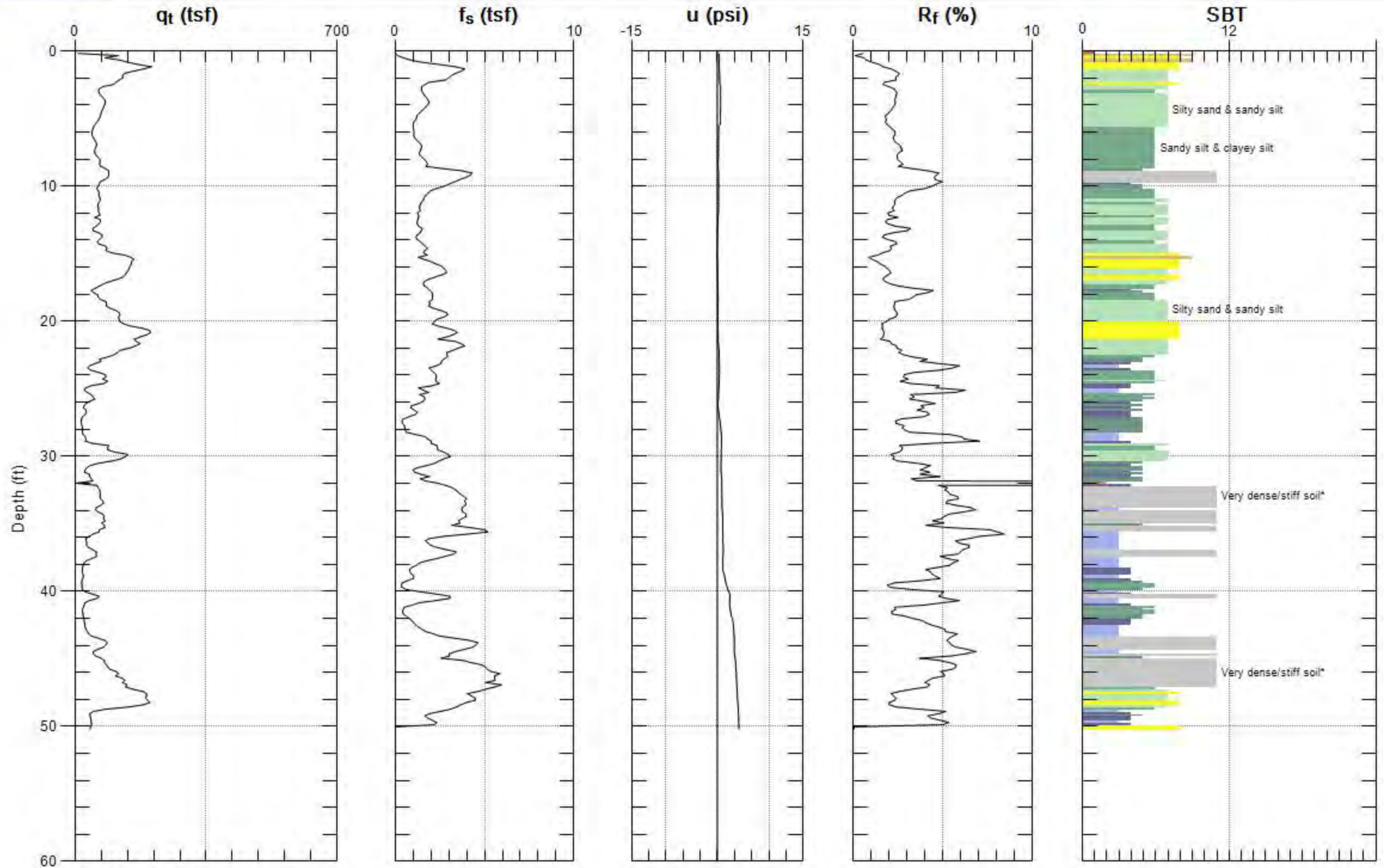
Max. Depth: 50.361 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.197 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)



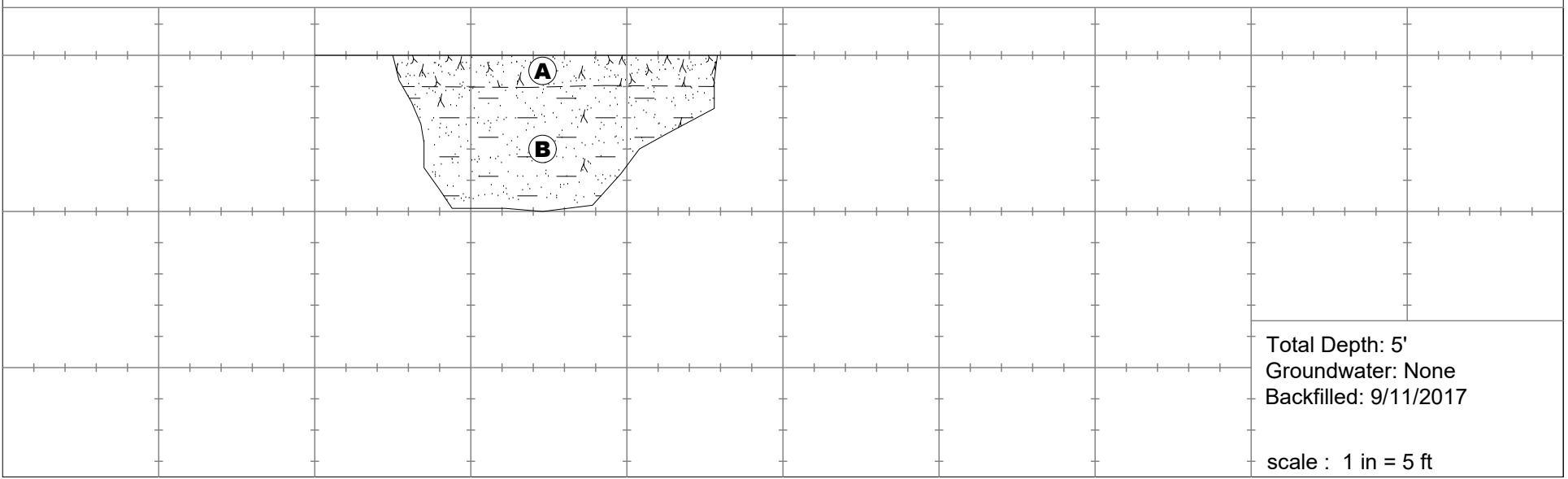
Max. Depth: 50.197 (ft)
Avg. Interval: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-1	
Project Number : 17114-01	Date : 9/11/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' Clayey SAND: dark brown, dry, loose to stiff; abundant roots and manure		SC			
	B	@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			

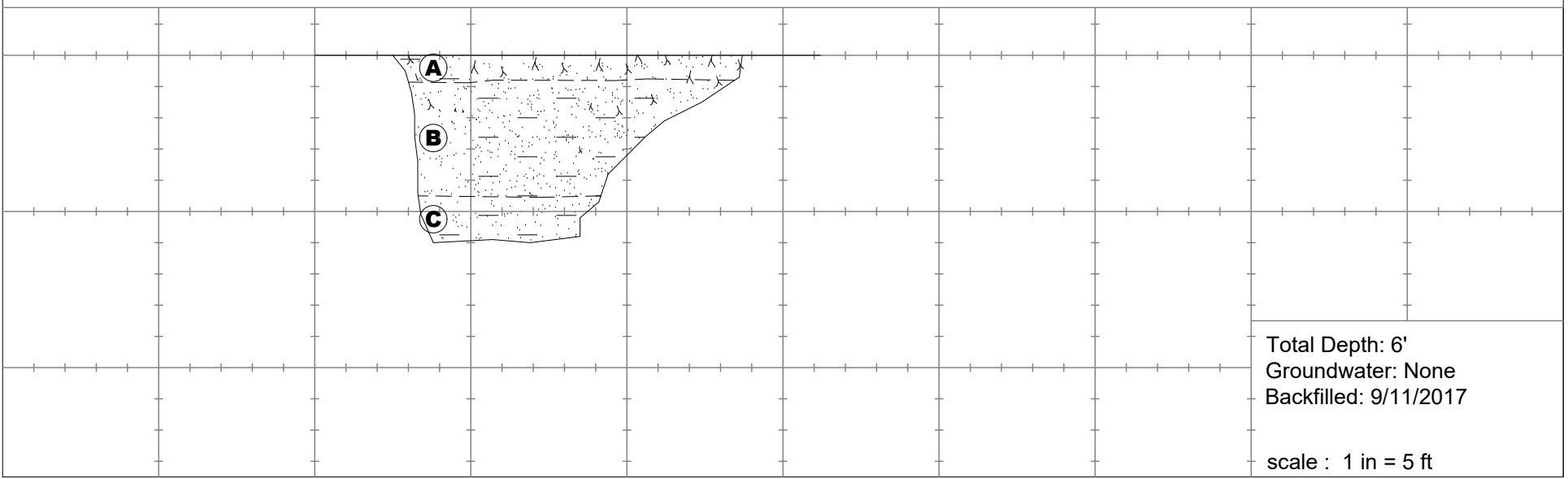
GRAPHICAL REPRESENTATION BELOW: **Elevation : 711 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-2	
Project Number : 17114-01	Date : 9/11/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 0.8' SAND w/ Clay: dark brown, dry, loose; abundant roots, manure and grass in upper 4"		SC			
	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'		SM			
	C	@4.5' to TD Silty SAND to Sandy SILT: brown, slightly moist, medium dense; decrease in induration	SM				

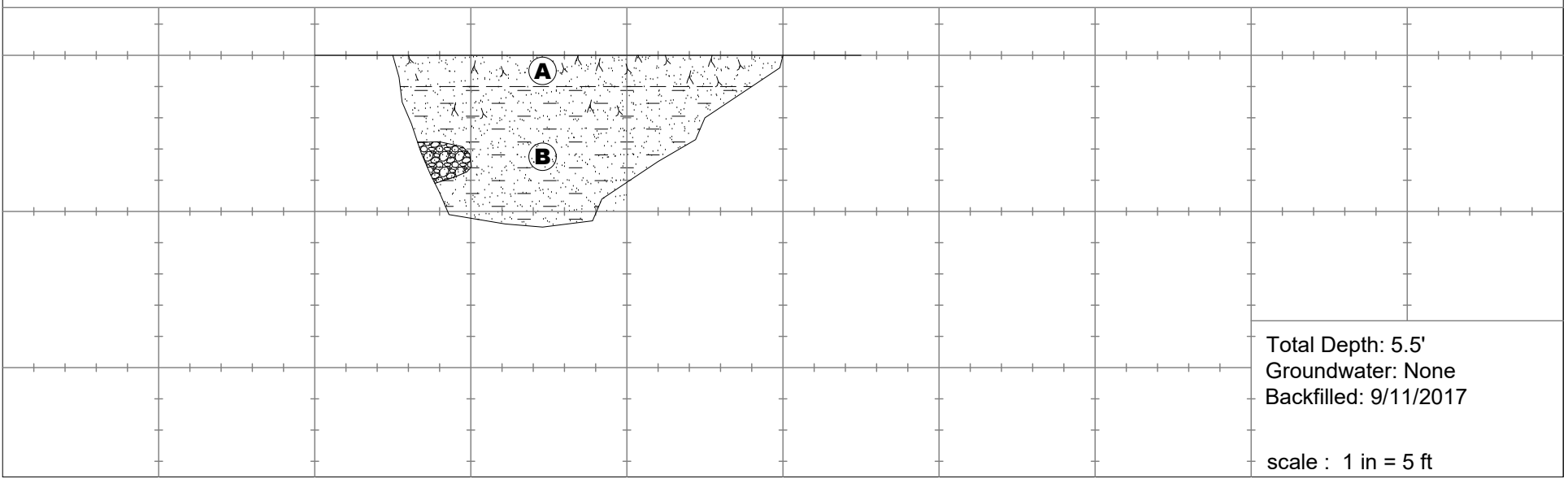
GRAPHICAL REPRESENTATION BELOW: **Elevation : 708 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-3	
Project Number : 17114-01	Date : 9/11/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' SAND w/ Clay: dark brown, dry, loose; abundant roots, old manure layer		SC			
	B	@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			

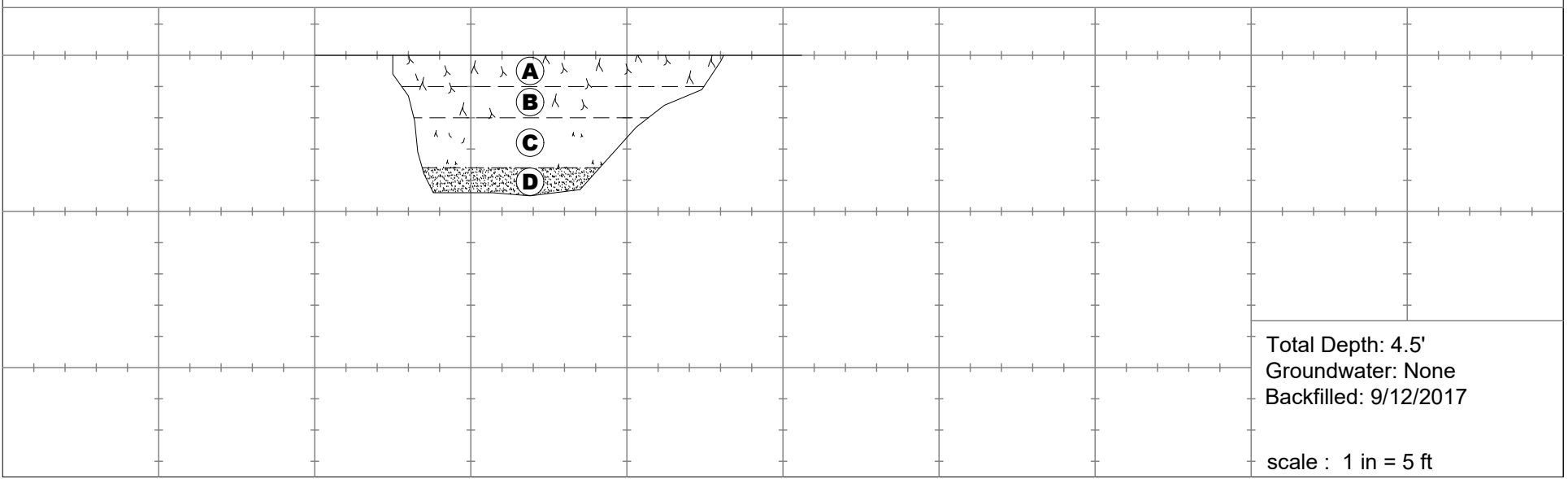
GRAPHICAL REPRESENTATION BELOW: **Elevation : 718 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-4	
Project Number : 17114-01	Date : 9/12/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' SAND w/ Clay: medium brown, dry, loose; organic rich, abundant roots, grass and manure layer		SC			
	B	@1' to 2' Silty SAND: light grayish brown, dry, medium dense; rootlets, possible agricultural till zone		SM			
	C	@2' to 3.6' SAND w/ Silt: light yellowish brown, dry grades to slightly moist, medium dense to dense; moderately well indurated, bottom of rootlets		SM			
	D	@3.6' to TD SAND: brown, moist, medium dense; "beach sand"		SW			

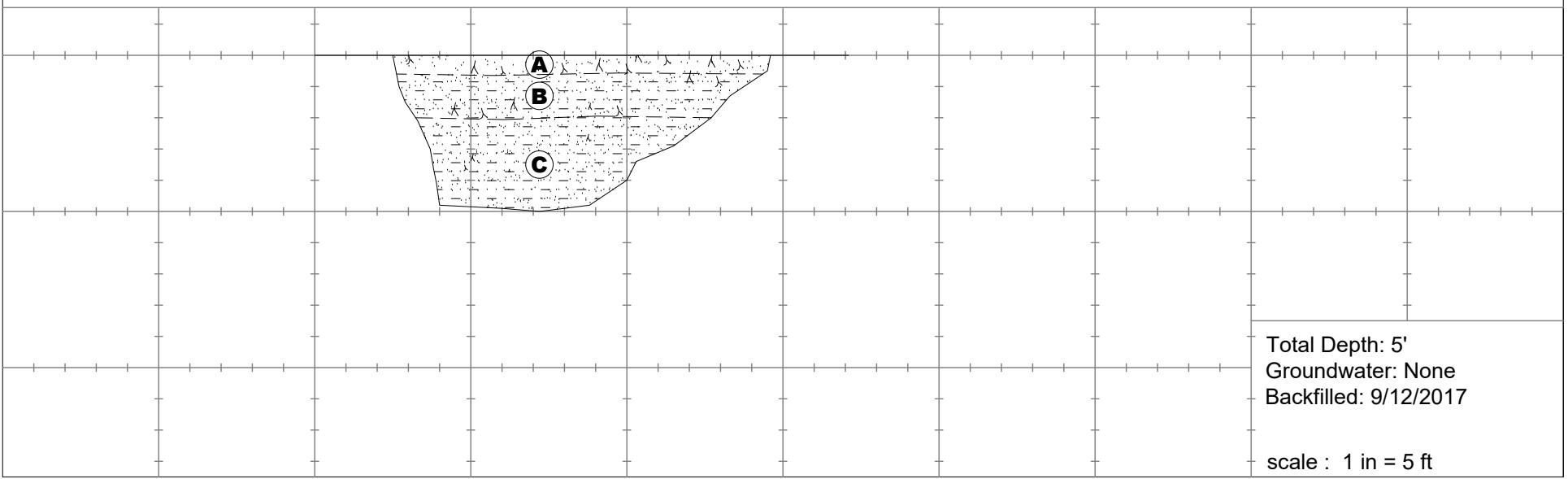
GRAPHICAL REPRESENTATION BELOW: **Elevation : 721 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-6	
Project Number : 17114-01	Date : 9/12/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 0.6' SAND w/ Clay: medium brown, dry, loose; organic rich, roots, grass, old manure		SC			
	B	@0.6' to 2' SAND w/ Silt: light grayish brown, dry, slightly dense; medium grained, scattered rootlets, moderately well indurated		SM			
	C	@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				

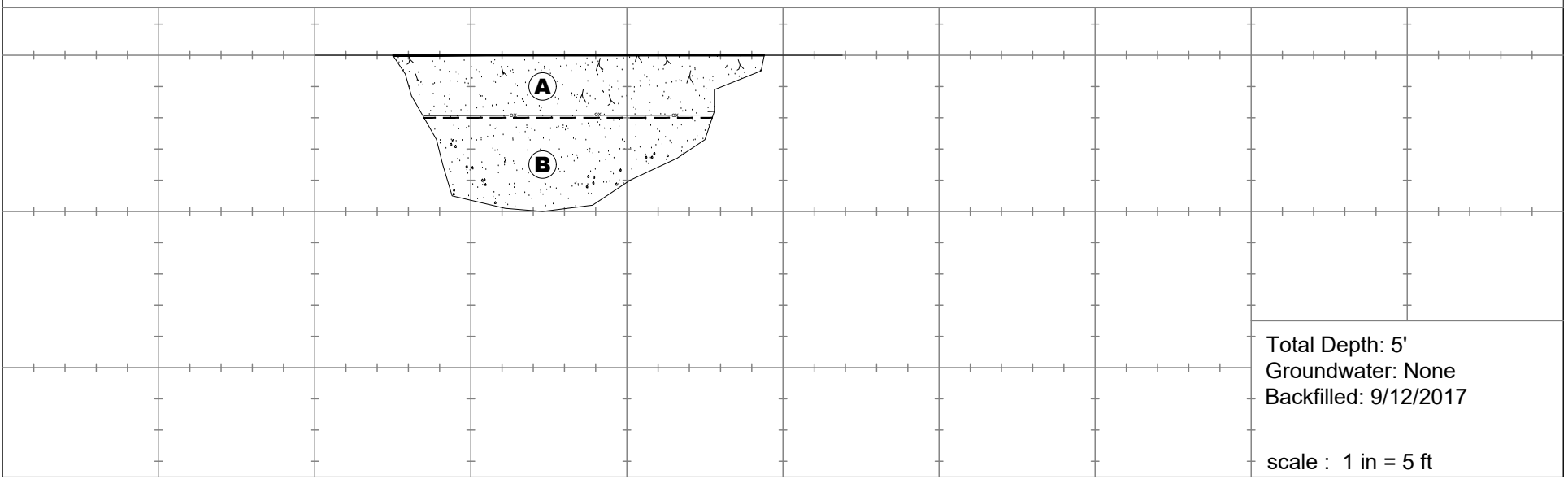
GRAPHICAL REPRESENTATION BELOW: **Elevation : 708 ' MSL** **Surface Slope: none** **Trend: EW**




Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-7	
Project Number : 17114-01	Date : 9/12/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
		<p>@0' to TD Quaternary Young Eolian Deposits</p> <p>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</p> <p>B @2' to TD SAND w/ Clay: light yellowish brown, very moist, loose to medium dense; scattered gravels, lacks visible rootlets</p>	Qye	SM			
				SC			

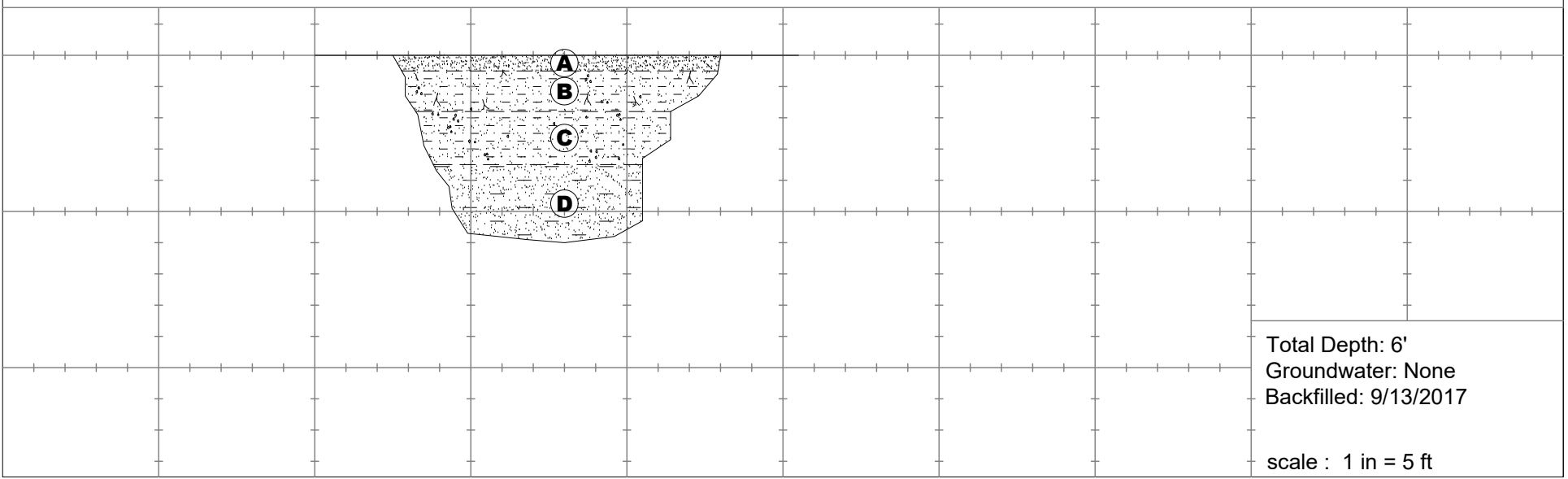
GRAPHICAL REPRESENTATION BELOW: **Elevation : 730 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-8	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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					
	B	@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			
	C	@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				

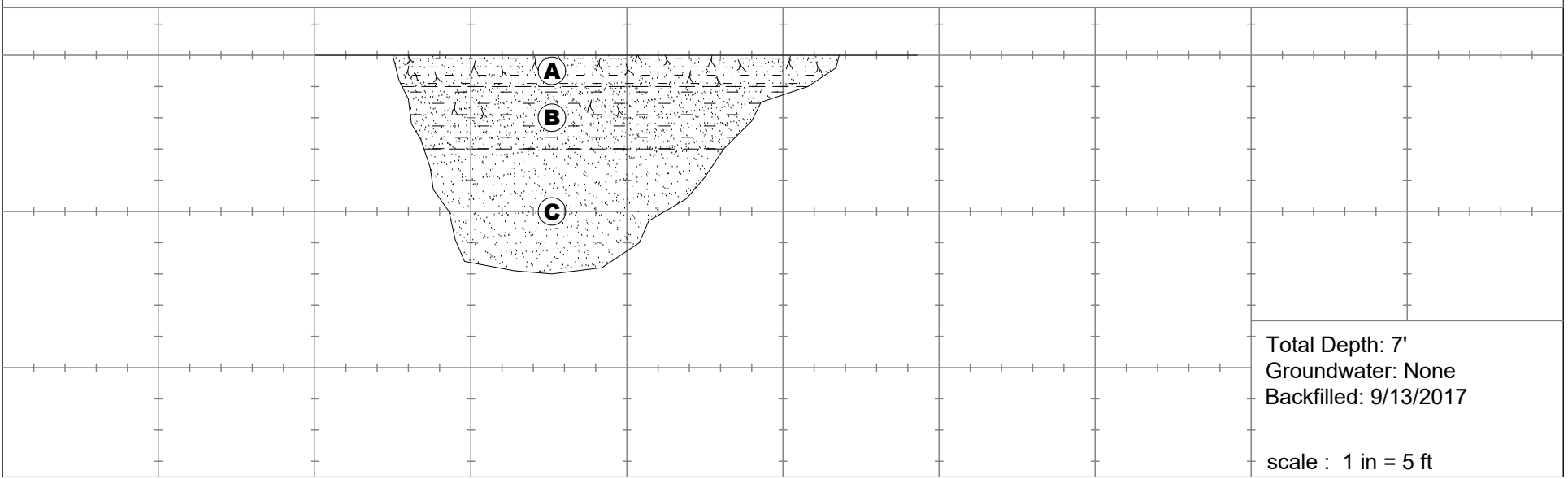
GRAPHICAL REPRESENTATION BELOW: **Elevation : 712 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-9	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' SAND w/ Silt: moderate brown, dry, loose; clods, grass at top, variable thickness		SM			
	B	@1' to 3' Silty SAND: light yellowish brown, dry grades to slightly moist, medium dense to dense; decrease in induration with depth, rootlets to 3'		SM			
	C	@3' to TD SAND w/ Silt: yellowish brown, moist to very moist, medium dense; scattered gravels, lacks roots, lacks induration	SM				

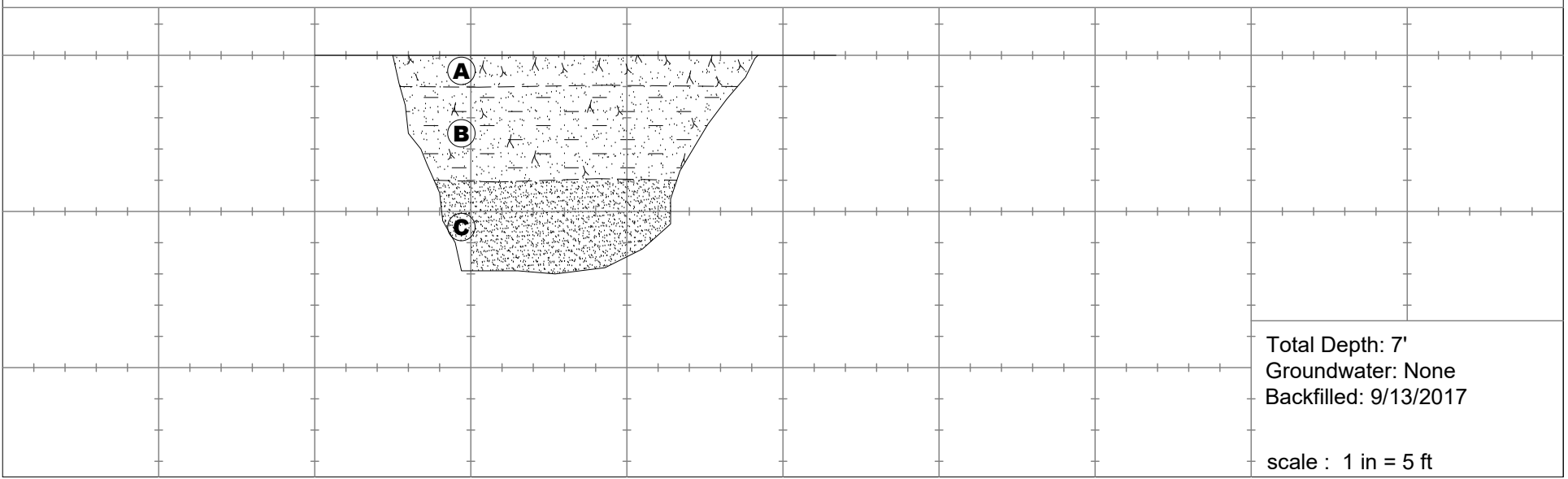
GRAPHICAL REPRESENTATION BELOW: **Elevation : 716 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-10	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' SAND w/ Clay: mottled dark to medium brown, dry, loose; organic rich		SC			
	B	@1' to 4' Silty SAND: light yellowish brown, moist, medium dense; slightly indurated, scattered root casts and fine roots to 3'		SM	B-2		
	C	@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	@1' to 4'		

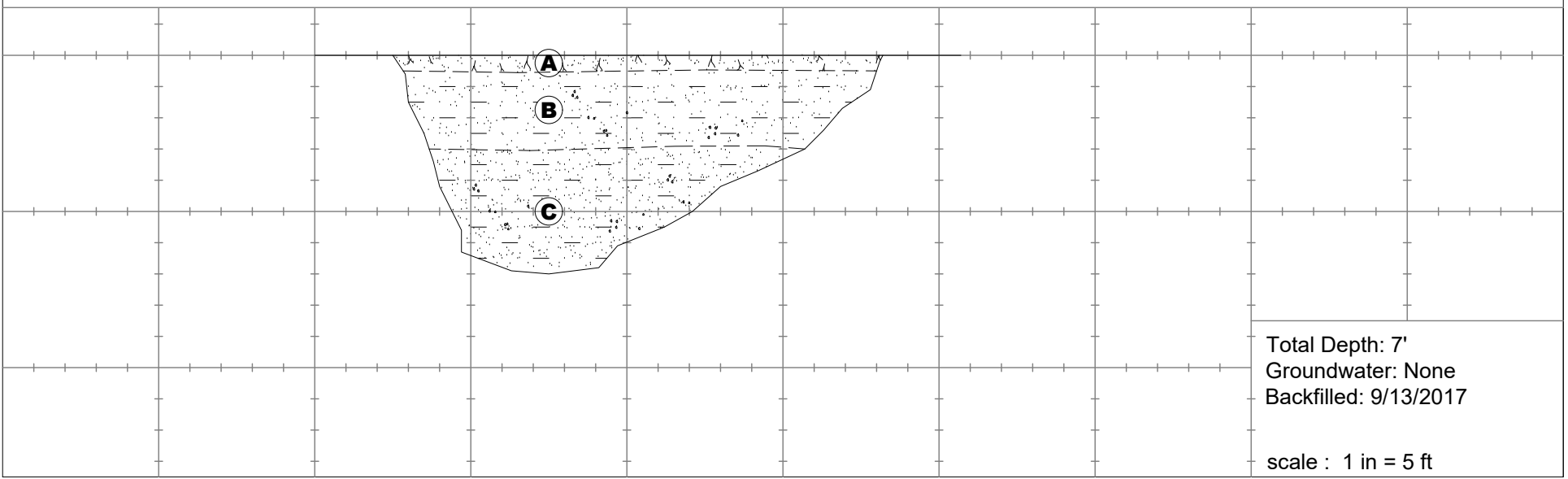
GRAPHICAL REPRESENTATION BELOW: **Elevation : 719 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-11	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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' SAND & SILT: light grayish brown, dry, loose; organics		SM			
	B	@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				

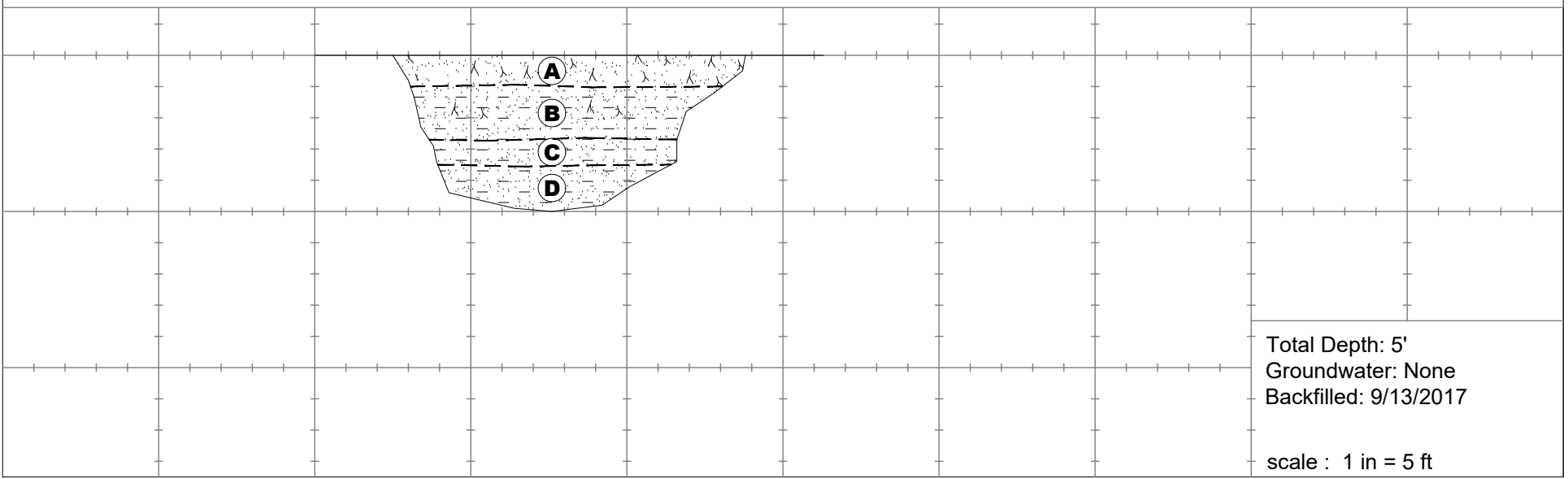
GRAPHICAL REPRESENTATION BELOW: **Elevation : 713 ' MSL** **Surface Slope: none** **Trend: EW**



Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-12	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 1' SAND w/ Clay: dark brown, moist, loose; abundant organics, roots, old manure; grades to B (agricultural till)		SC			
	B	@1' to 2.7' Silty SAND w/ Clay: dark brown mottled, very moist, medium dense; few rootlets, organic rich		SM			
	C	@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				

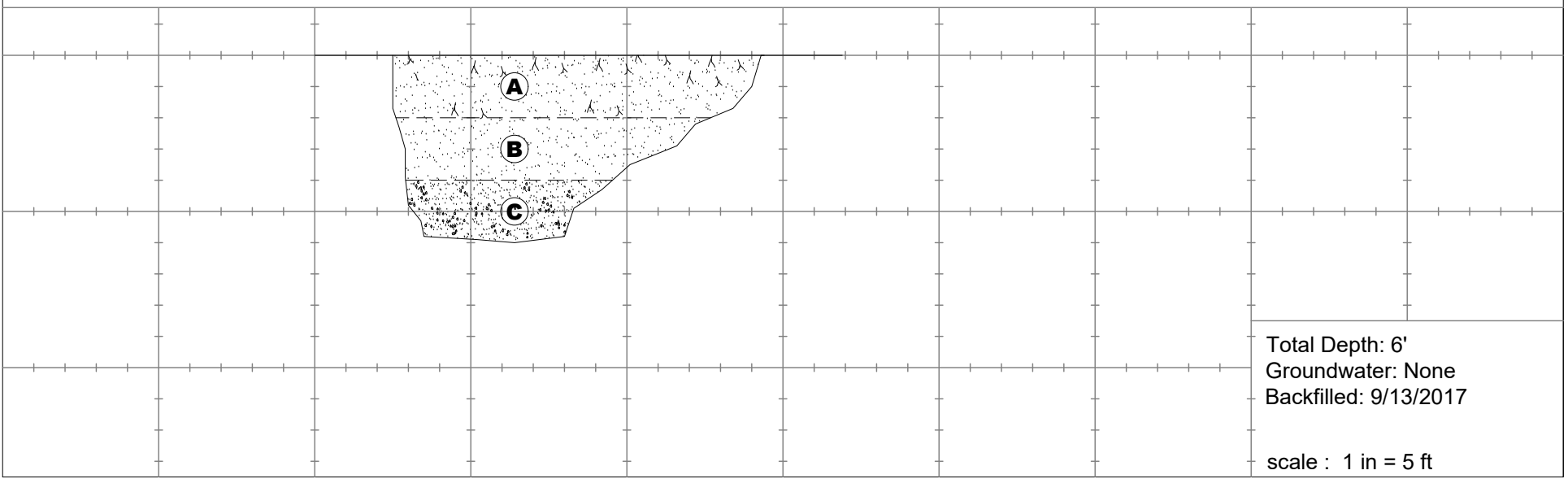
GRAPHICAL REPRESENTATION BELOW: **Elevation : 726 ' MSL** **Surface Slope: none** **Trend: EW**




Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-13	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical 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 2' Silty SAND: dark brown mottled, very moist, loose to medium dense; scattered gravels, agricultural till, organic content decreases with depth		SM			
	B	@2' to 4' SAND w/ Silt: yellowish brown, moist, medium dense; few gravels, few roots casts at 3' but generally lacks organics		SM			
	C	@4' to TD Gravelly SAND: grayish brown, very moist, medium dense; lacks induration, friable	SW				

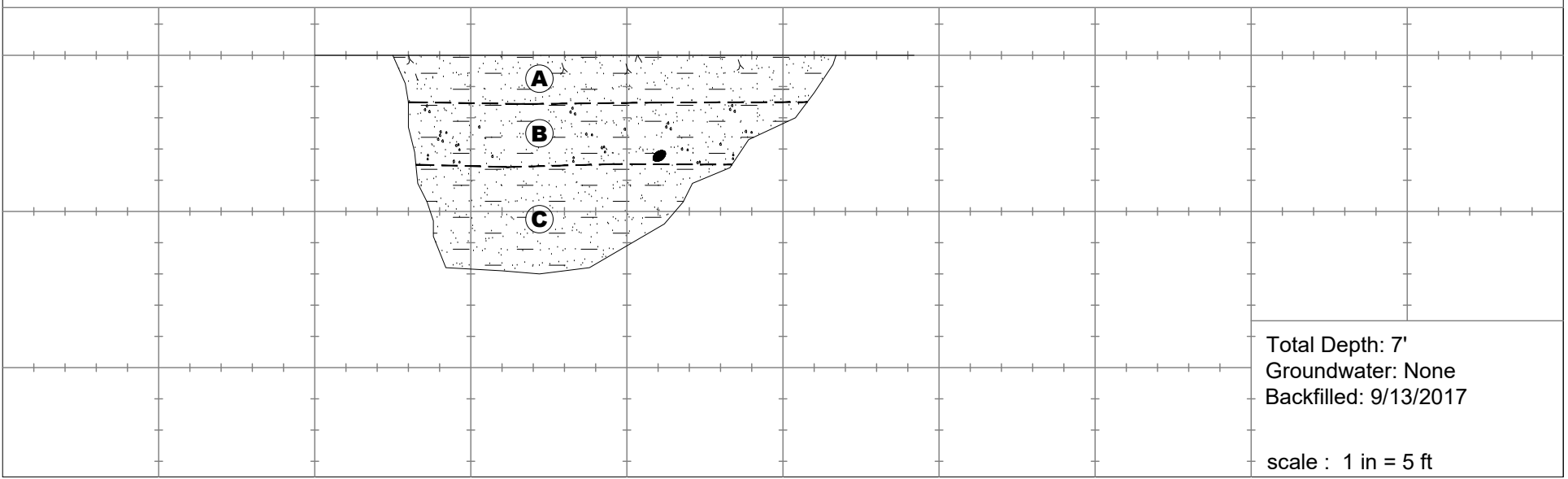
GRAPHICAL REPRESENTATION BELOW: **Elevation : 728 ' MSL** **Surface Slope: none** **Trend: EW**



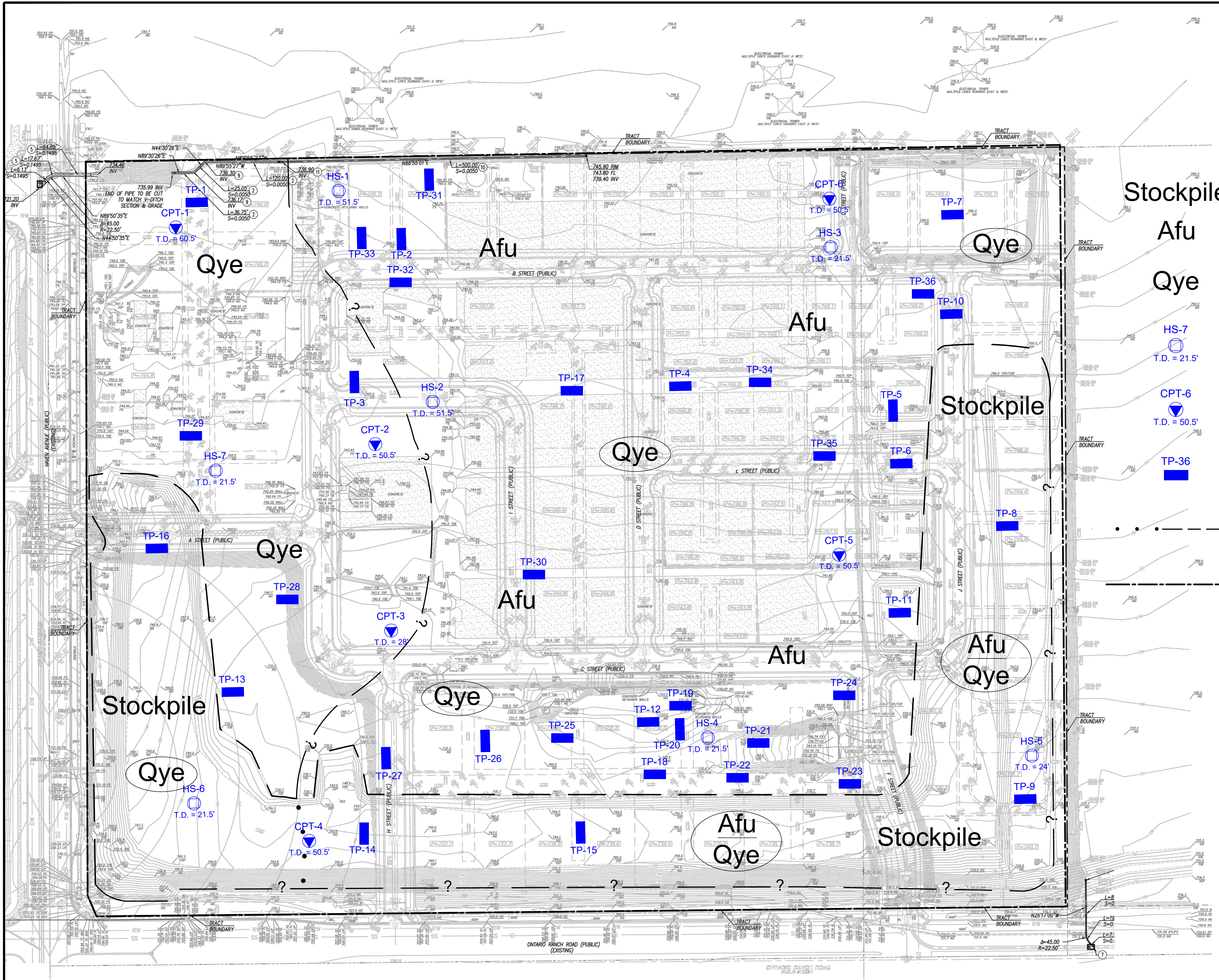
Project Name: Esperanza and Pietersma	Logged By: KTM	Trench No: TP-14	
Project Number : 17114-01	Date : 9/13/2017	Engineering Properties:	
Equipment: CAT 420F Backhoe	Location: See Geotechnical Map		

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 1.5' SAND w/ Clay: dark brown, very moist, soft; organic rich, old manure, roots, scattered gravel		SC			
	B	@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			
	C	@4' to TD Silty SAND: yellowish brown, very moist, medium dense; lacks induration, lacks organics	SM				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 720 ' MSL** **Surface Slope: none** **Trend: EW**

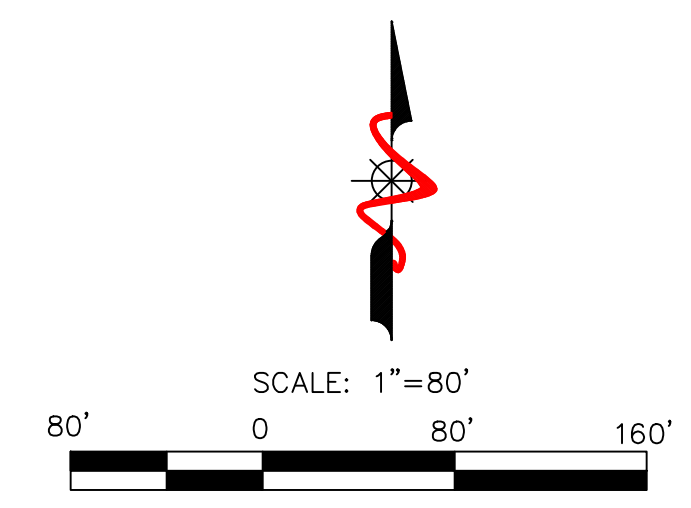


Appendix G
Geotechnical Subsurface Evaluation Data -
Regions North (16159-01)



LEGEND

- Recently Placed Soil
- Artificial Fill Undocumented, Circled Where Buried
- Quaternary Young Eolian Deposits, Circled Where Buried
- 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

PROJECT NAME	Regions North	SHEET 1 of 2
PROJECT NO.	16159-01	
ENG. / GEOL.	BJE/KTM	
SCALE	1" = 80'	
DATE	April 2017	

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.

Atterberg Limits: 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:

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS 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

*Per Chapter 18 of the 2007 C.B.C.; ASTM D 4829 Section 5.3

Maximum Density Tests: 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 @ 0-5 feet	Brown Silty Sand	121.0	8.5

Collapse /Swell Potential: 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

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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)] x 100 (3)	99.0	99.1	99.1	99.2	97.8
Organic Matter (%) = 100 - (3)	1.0	0.9	0.9	0.8	2.2

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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)] x 100 (3)	98.9	99.5	98.9	99.0	99.4
Organic Matter (%) = 100 - (3)	1.1	0.5	1.1	1.0	0.6

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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)] x 100 (3)	99.8	95.4	97.7	99.4	99.4
Organic Matter (%) = 100 - (3)	0.2	4.6	2.3	0.6	0.6

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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-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)] x 100 (3)	44.7	99.1	99.4	92.7	99.2
Organic Matter (%) = 100 - (3)	55.3	0.9	0.6	7.3	0.8

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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-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)] x 100 (3)	99.5	99.5	99.6	98.9	91.7
Organic Matter (%) = 100 - (3)	0.5	0.5	0.4	1.1	8.3

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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-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)] x 100 (3)	99.1	99.4	96.8	97.9	99.5
Organic Matter (%) = 100 - (3)	0.9	0.6	3.2	2.1	0.5

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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-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)] x 100 (3)	98.4	96.8	96.9	98.8	98.8
Organic Matter (%) = 100 - (3)	1.6	3.2	3.1	1.2	1.2

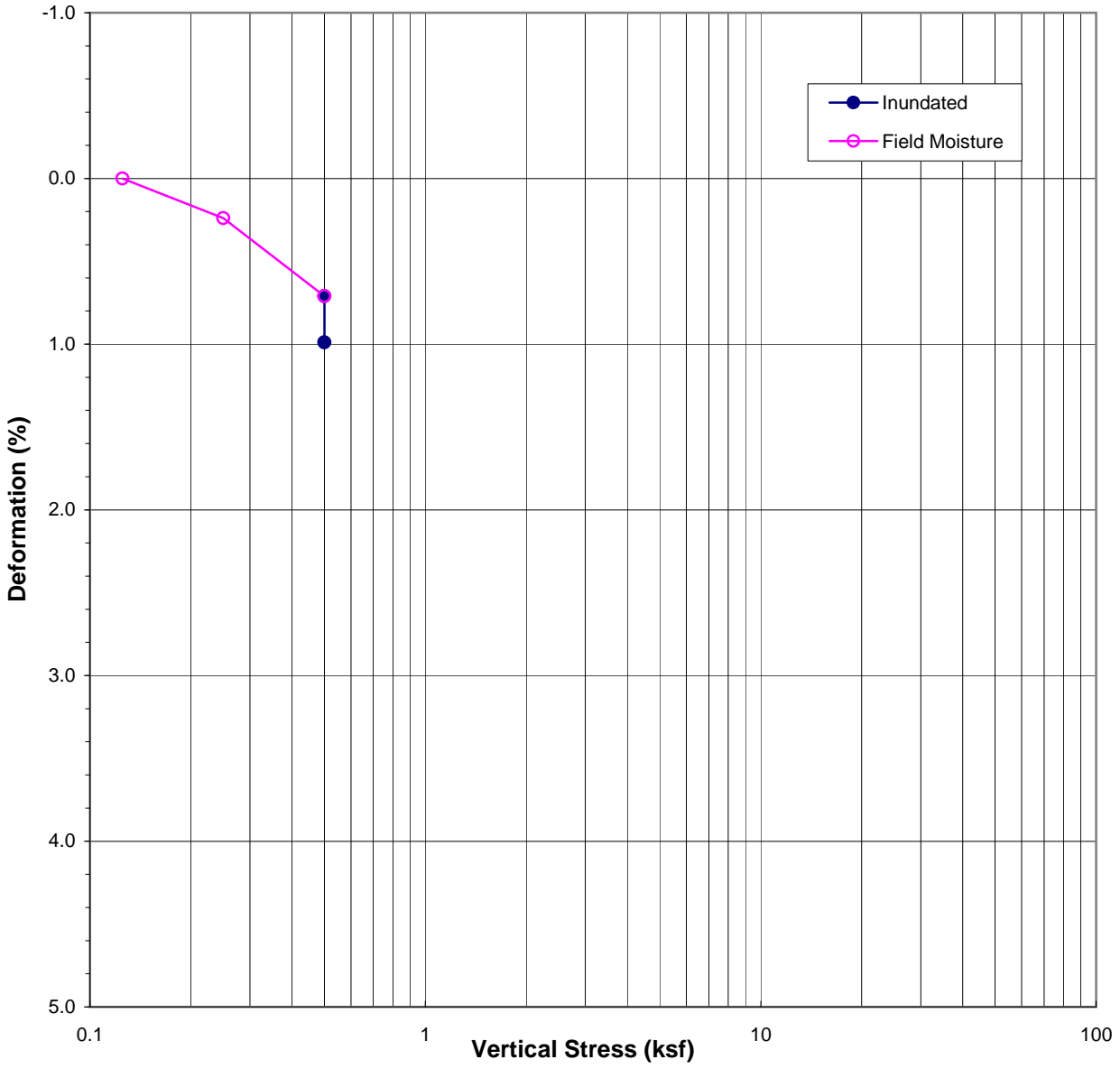
Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.

**MOISTURE, ORGANIC MATTER and
ASH CONTENT of SOILS
ASTM D 2974 (Test Methods A & C)**

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-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)] x 100 (3)	95.6	99.0	99.2	99.0	
Organic Matter (%) = 100 - (3)	4.4	1.0	0.8	1.0	

Remarks: Moisture, ash & organic contents are calculated as percentages of oven-dried mass of test specimen.



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-1	R-2	5'	105.3	10.5	21.0

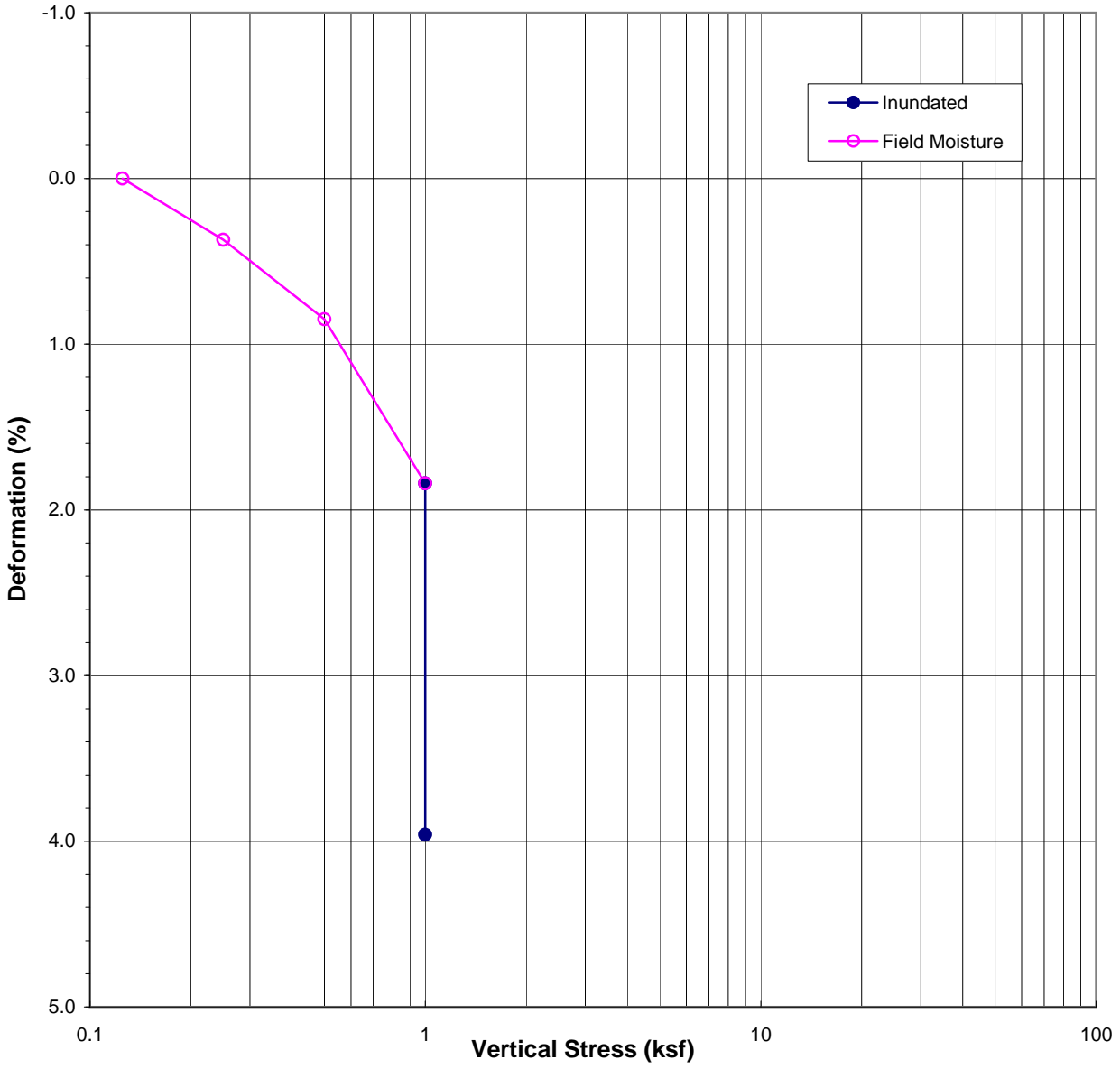
Sample Description: SM



COLLAPSE TEST

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-1	R-4	10'	104.1	11.1	22.0

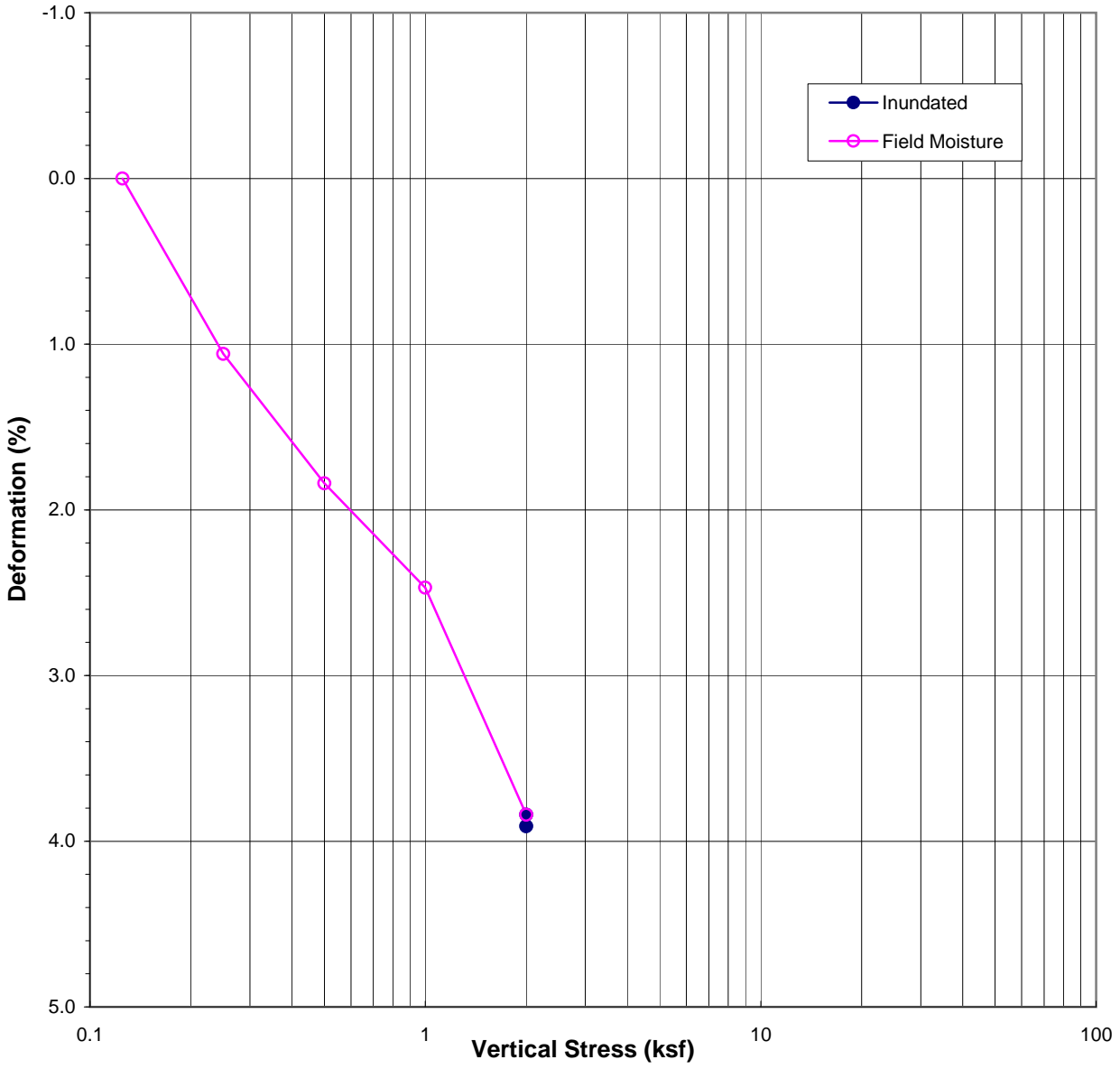
Sample Description: SM



COLLAPSE TEST

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-2	R-5	15'	106.5	15.8	24.2

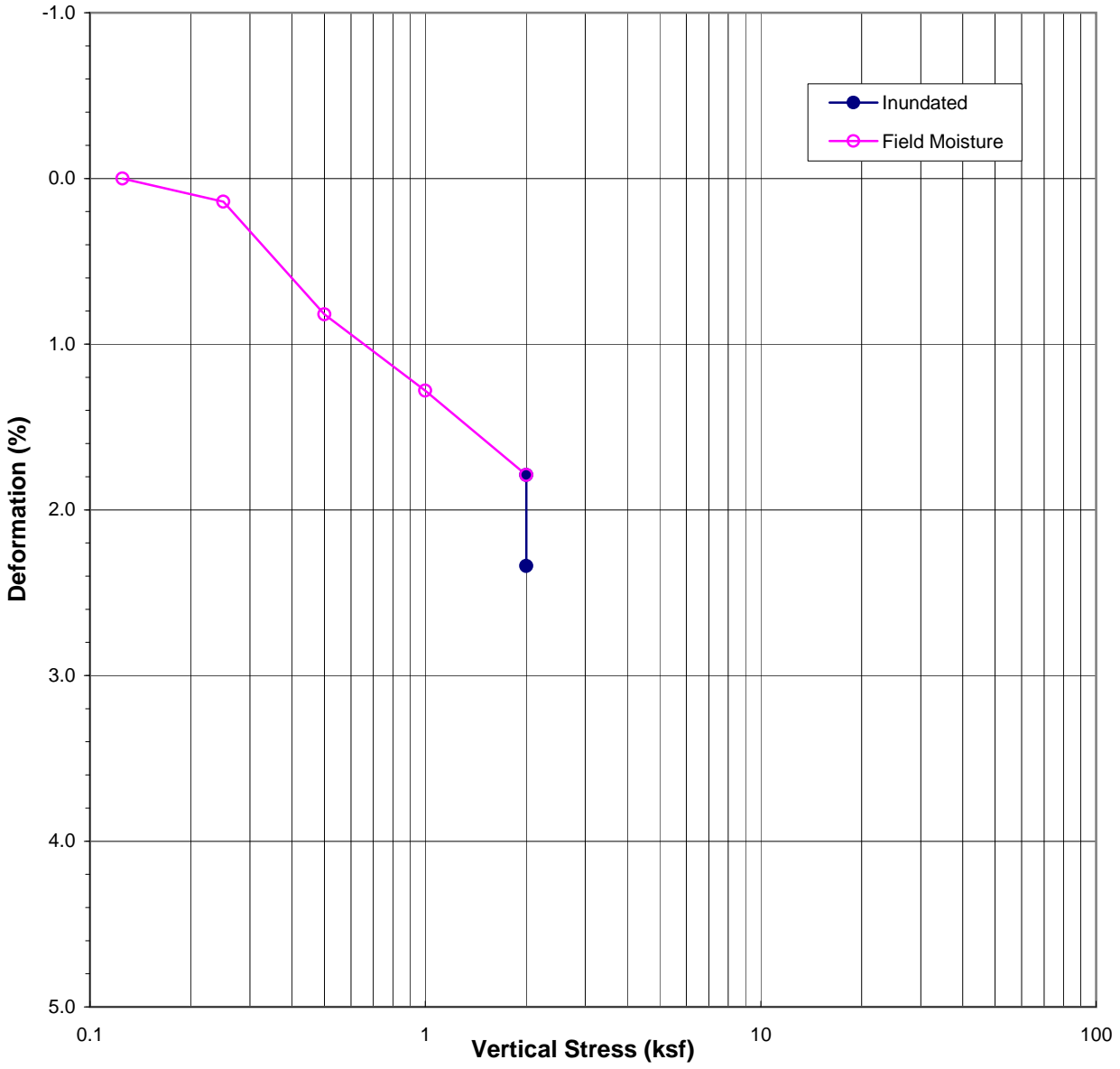
Sample Description: ML



COLLAPSE TEST

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-3	R-5	20'	101.0	2.9	23.4

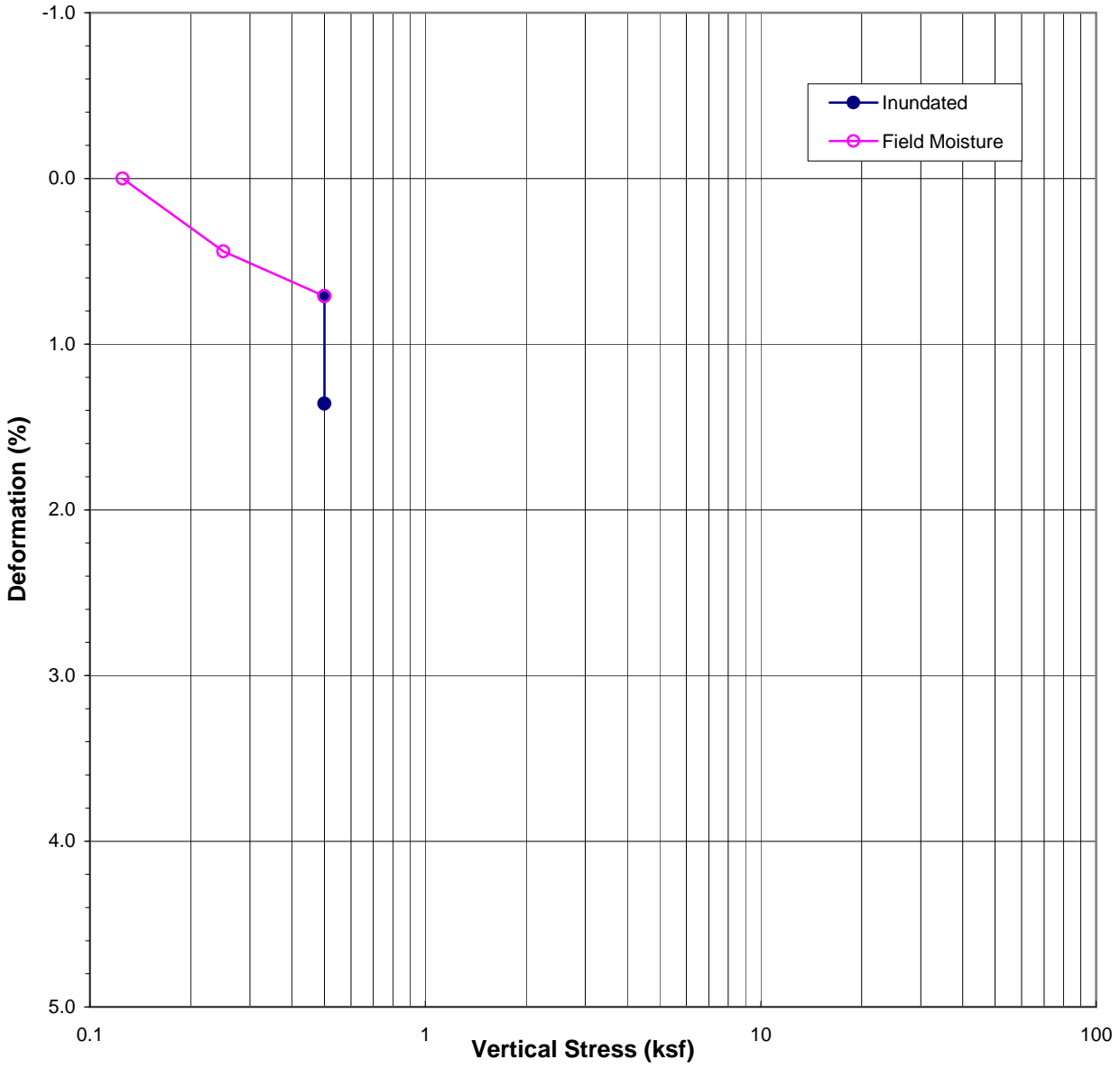
Sample Description: SM



COLLAPSE TEST

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-4	R-2	5'	98.0	4.4	21.4

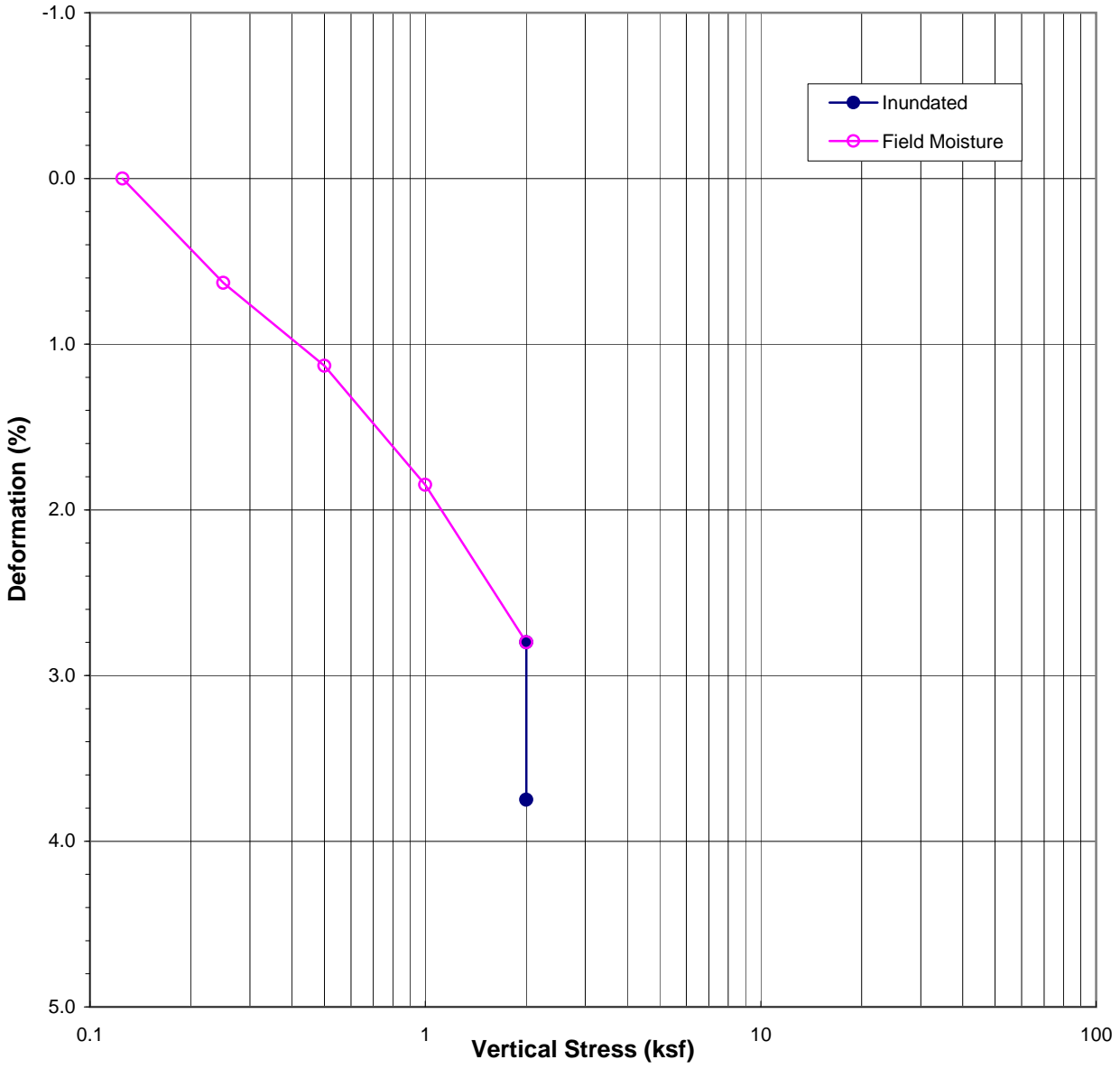
Sample Description: SM



COLLAPSE TEST

Project Number: 16159-01
Date: Feb-17

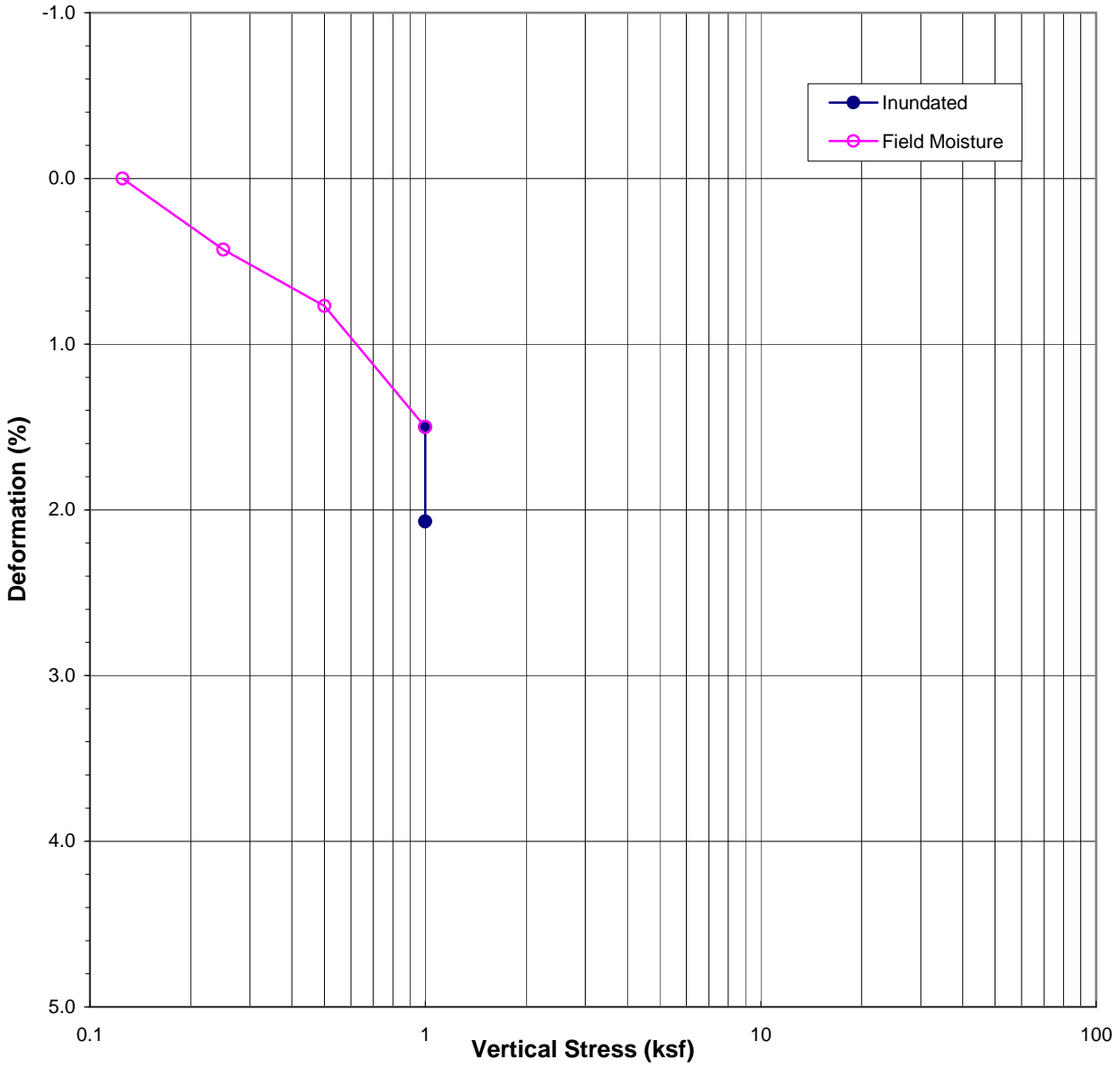
Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-6	R-5	15'	105.5	11.1	24.1

Sample Description: ML

	COLLAPSE TEST	Project Number: 16159-01 Date: Feb-17
		Regions North



Location:	Sample No.:	Depth (ft)	Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Content (%)
HS-7	R-3	7.5'	101.0	13.4	24.4

Sample Description: ML

	COLLAPSE TEST	Project Number: 16159-01 Date: Feb-17
		Regions North

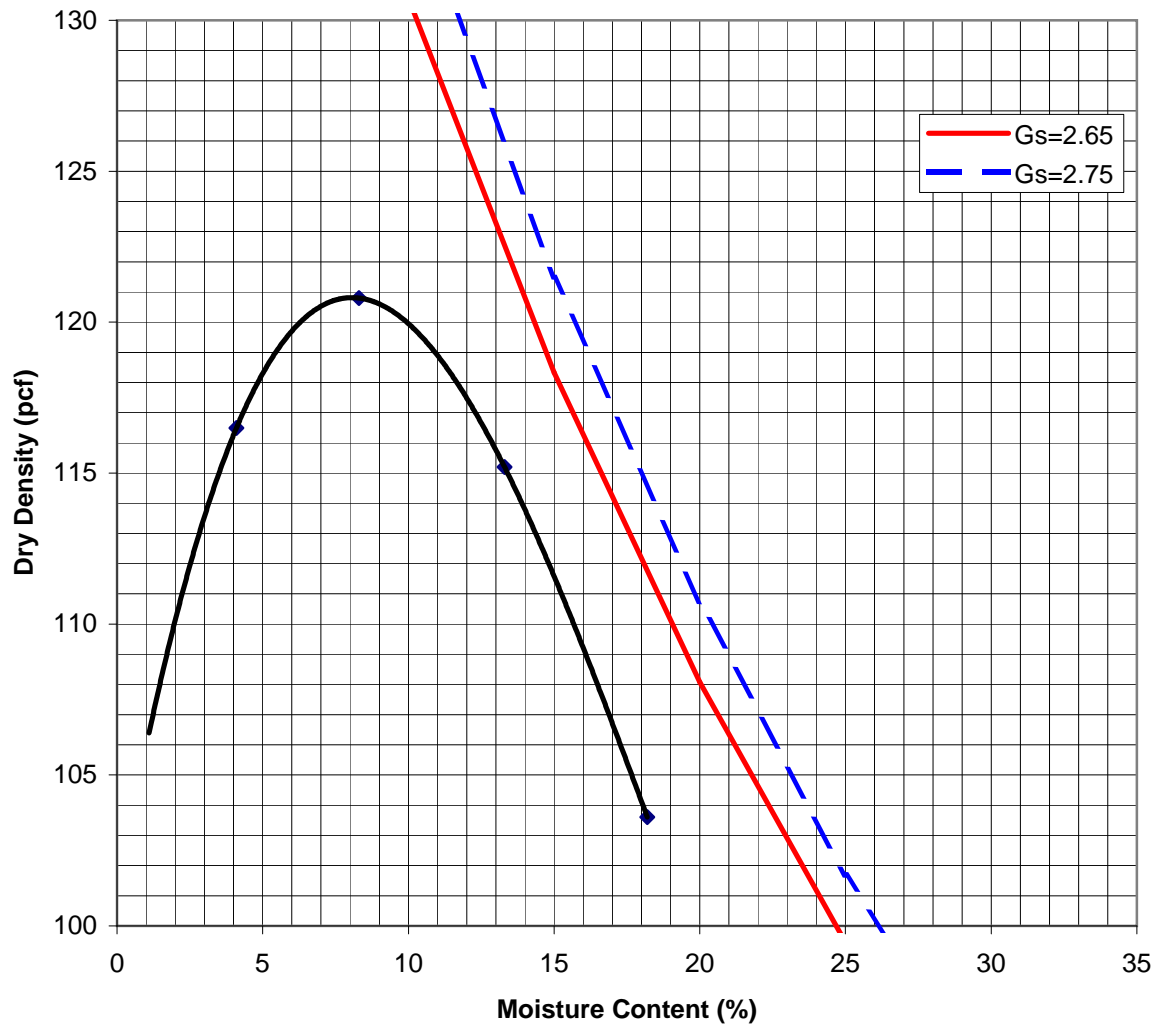
Location	Sample No.	Depth (ft)	Molding Moisture Content (%)	Initial Dry Density (pcf)	Final Moisture Content (%)	Expansion Index	Expansion Classification ¹
HS-2	B-1	15'-20'	9.7	117.7	14.4	5	Very Low



EXPANSION INDEX
(ASTM D 4829)

Project Number: 16159-01
Date: Feb-17

Regions North



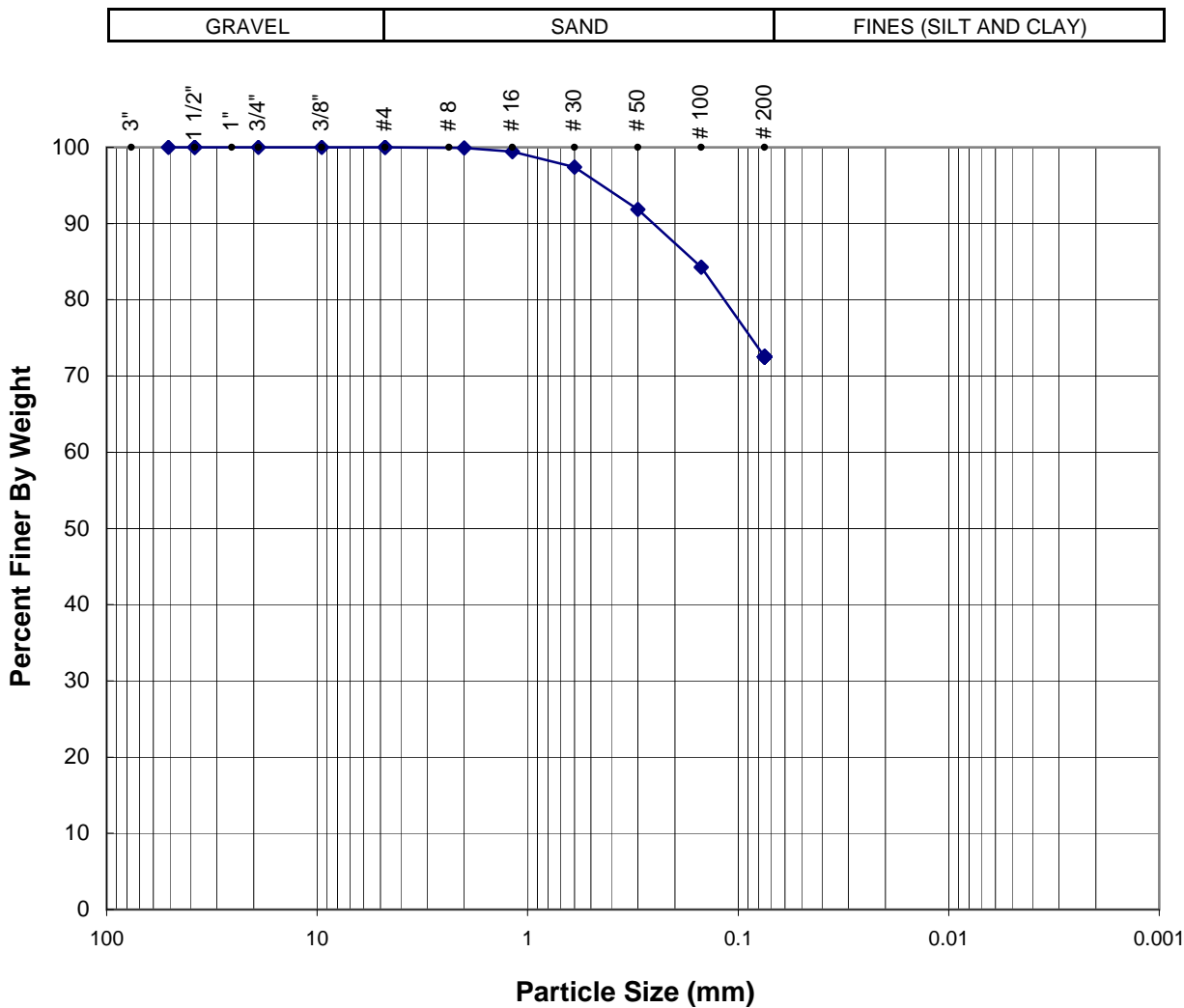
Location:	Sample No.:	Depth (ft)	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
HS-1	B-1	0-5'	Brown Silty Sand	121.0	8.5



LABORATORY COMPACTION
(ASTM D 1557)

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft.)	Soil Type	Gravel (%)	Sand (%)	Fines (%)
HS-2	R-5	15'	ML	0	27	73

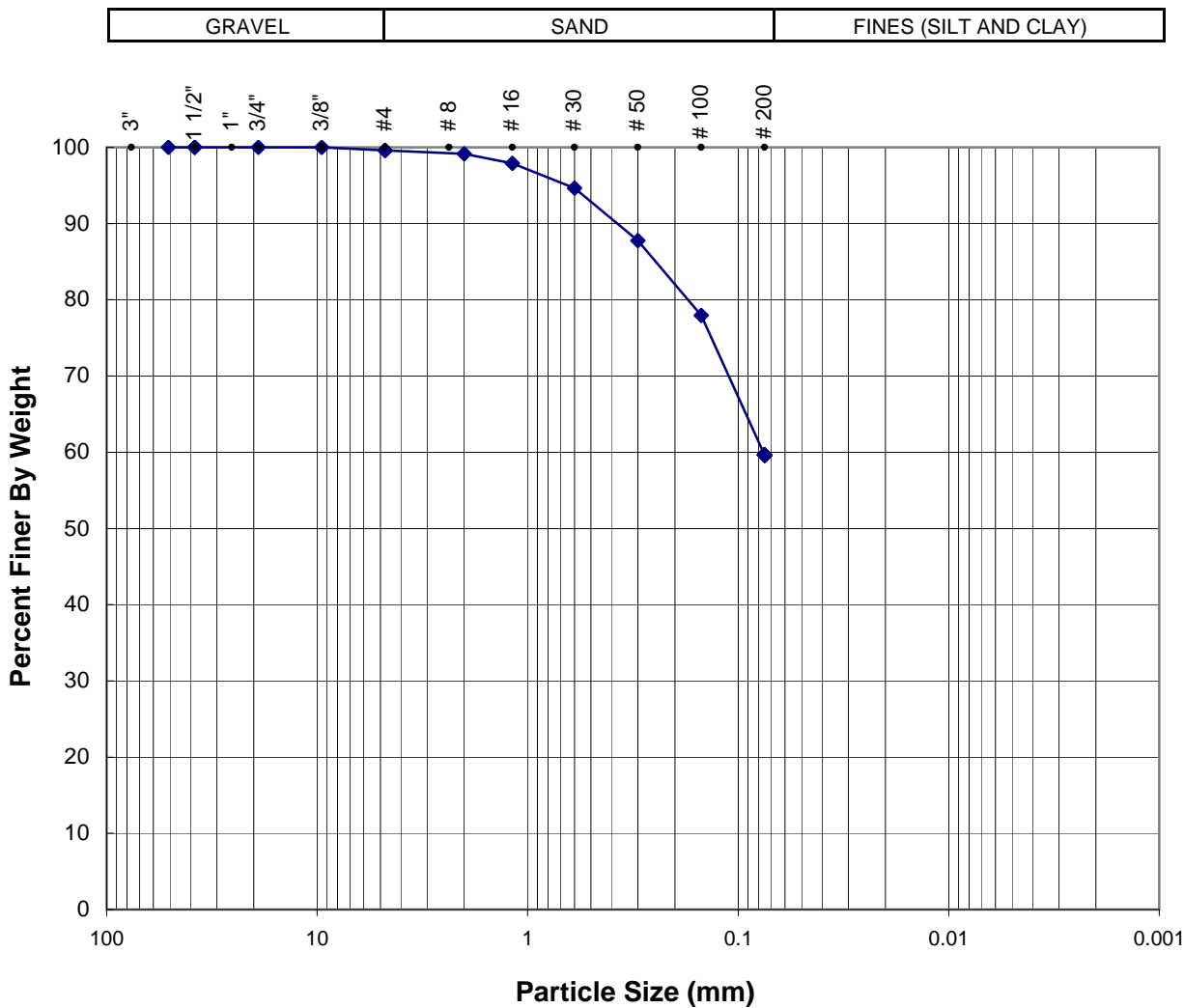
Sample Description: **Sandy Silt**



PARTICLE SIZE ANALYSIS
(ASTM D 422)

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft.)	Soil Type	Gravel (%)	Sand (%)	Fines (%)
HS-2	SPT-2	30'	ML	0	40	60

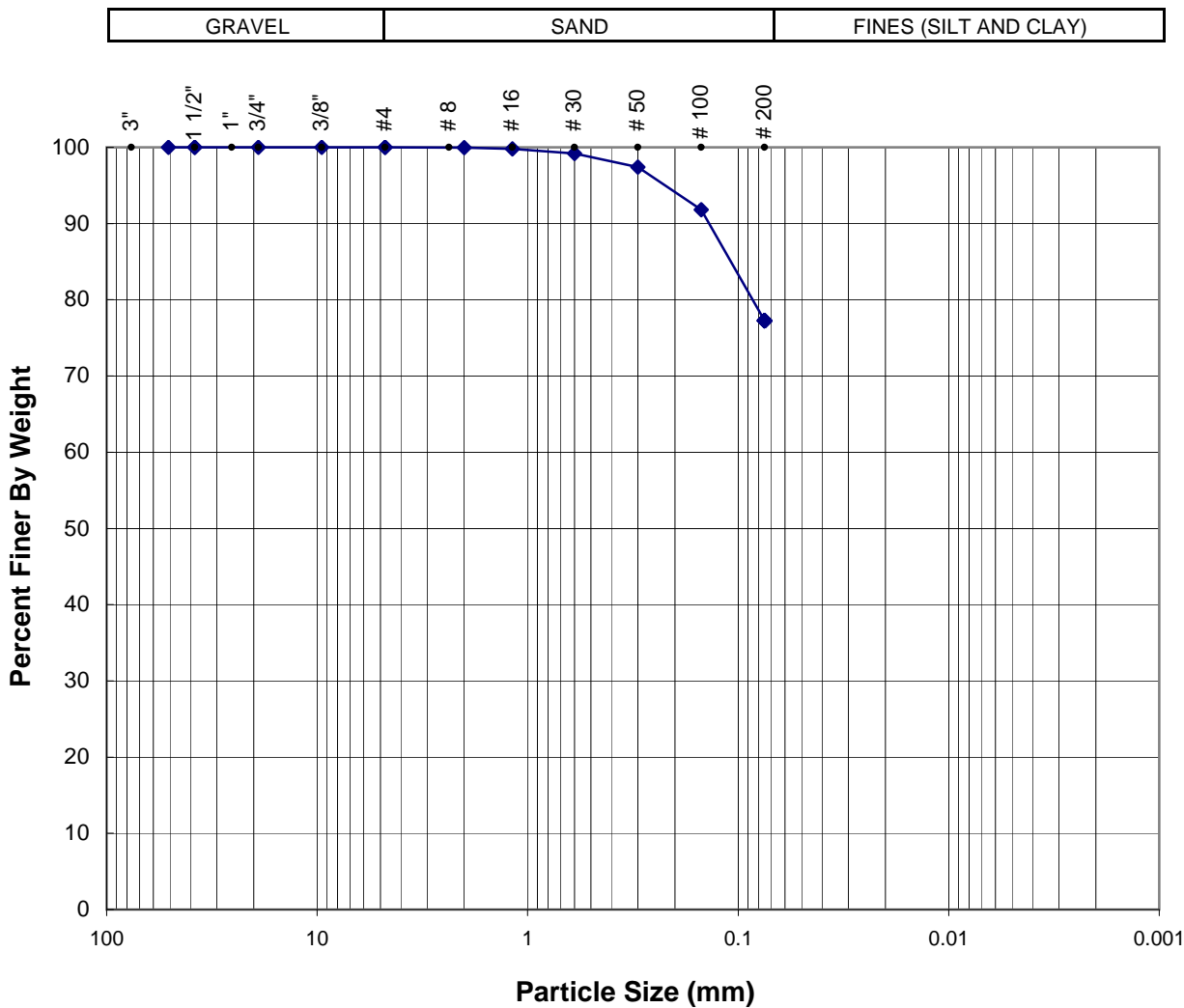
Sample Description: **Sandy Silt**



PARTICLE SIZE ANALYSIS
(ASTM D 422)

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft.)	Soil Type	Gravel (%)	Sand (%)	Fines (%)
HS-2	R-8	45'	CL	0	23	77

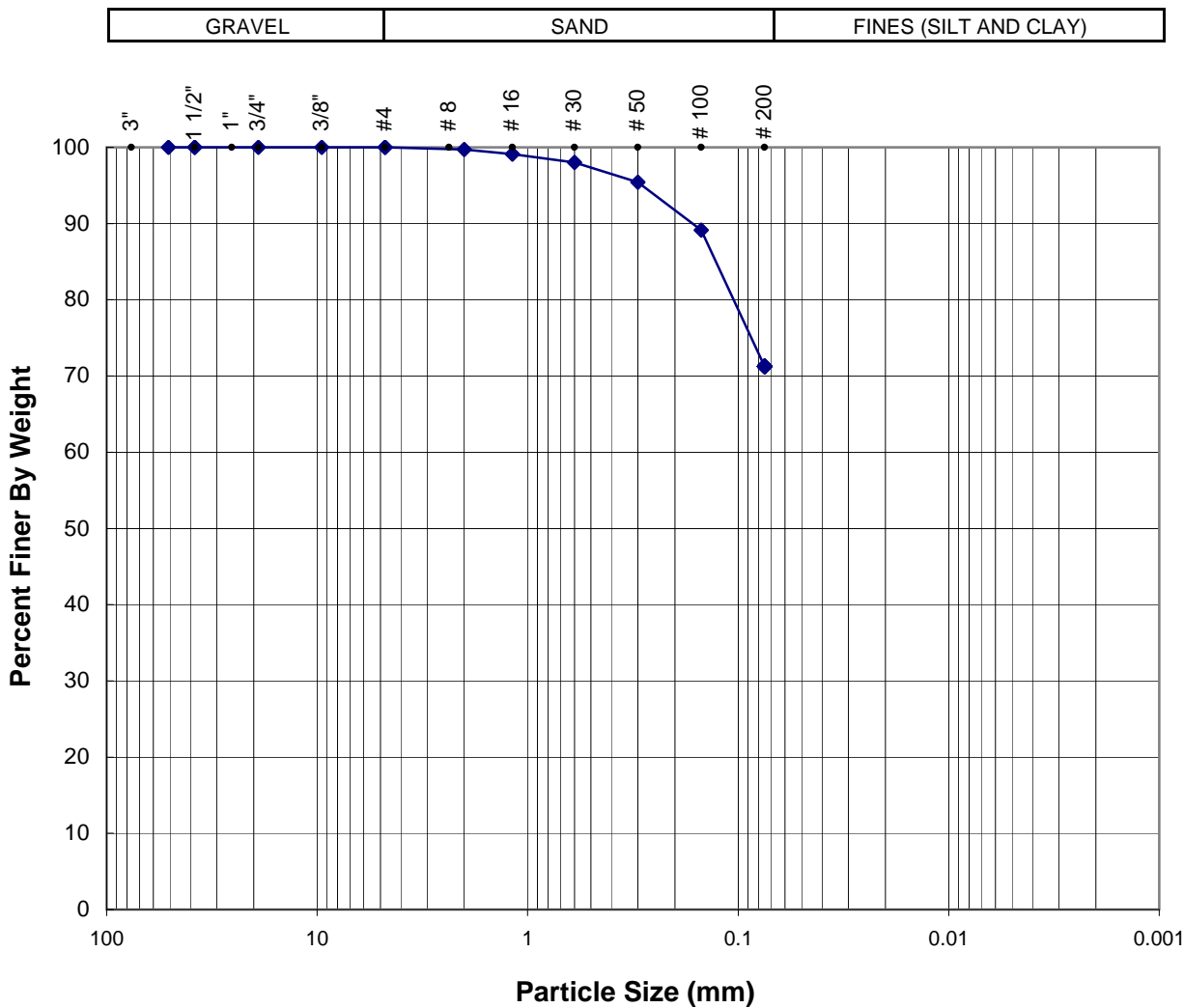
Sample Description: **Sandy Clay**



PARTICLE SIZE ANALYSIS
(ASTM D 422)

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft.)	Soil Type	Gravel (%)	Sand (%)	Fines (%)
HS-6	R-5	15'	ML	0	29	71

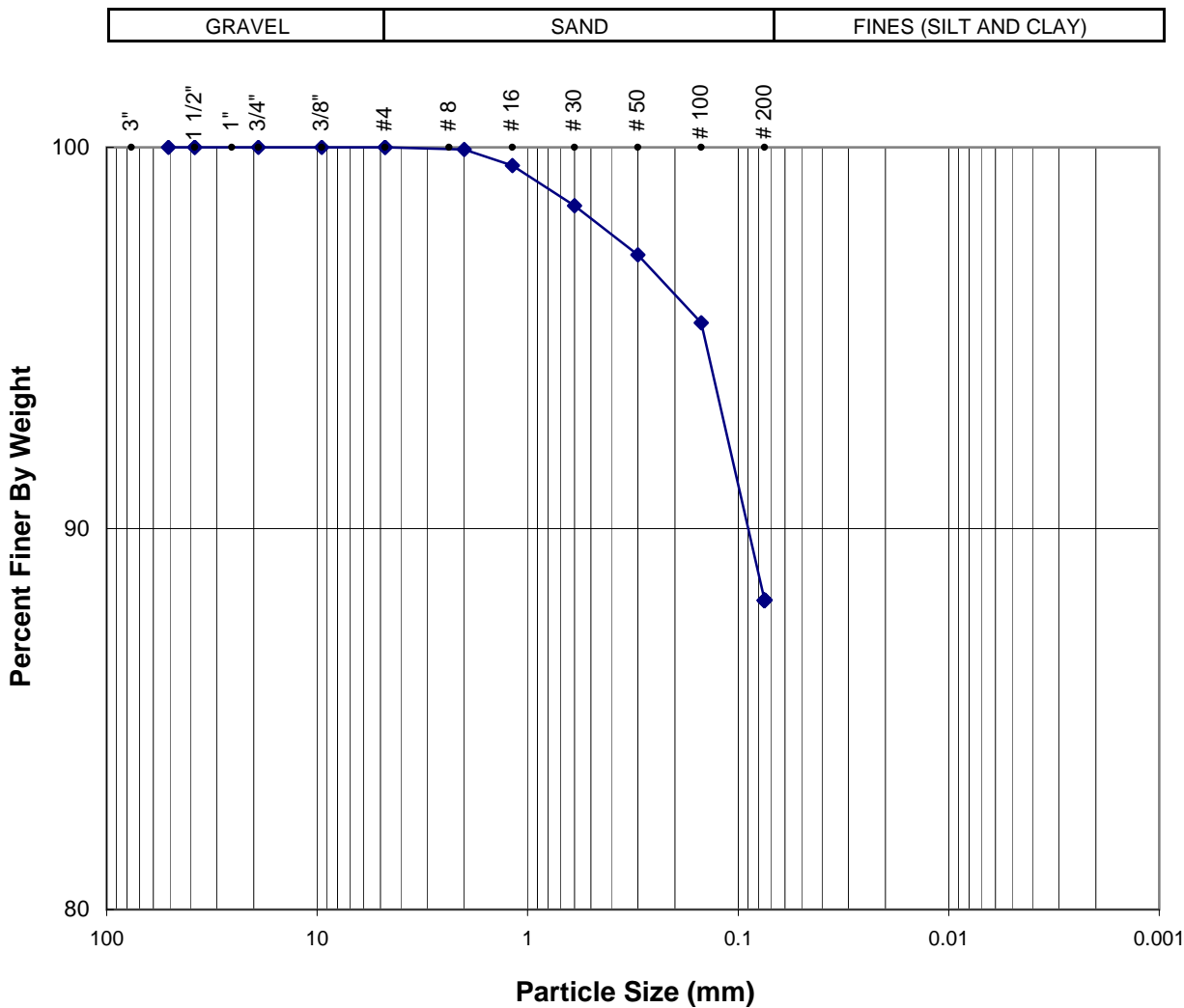
Sample Description: **Sandy Silt**



PARTICLE SIZE ANALYSIS
(ASTM D 422)

Project Number: 16159-01
Date: Feb-17

Regions North



Location:	Sample No.:	Depth (ft.)	Soil Type	Gravel (%)	Sand (%)	Fines (%)
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

Regions North

Geotechnical Boring Log Borehole HS-1

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~747' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
745	0	B-1					SM	Undocumented Artificial Fill (Afu): @0.5' - Grass and scattered hay remnants	
			R-1	1 1-5	99.9	7.5	SP	@1' - Silty SAND: light brown, wet (recent rain), dense. @2.5' - SAND : light brown, moist, loose, bits of plastic and rootlets.	MD
740	5		R-2	4 3-7	105.3	10.5	SM	Quaternary Young Eolian Deposits (Qye): @5' - Silty SAND: light brown, moist, medium dense, rootlets.	CO
			R-3	2 4-6	110.1	17.0	SC	@7.5' - Clayey SAND: light brown, very moist, medium Dense, few root casts.	
735	10		R-4	3 6-8	104.1	11.1	SM	@10' - Silty SAND: light brown, slightly moist, medium Dense, fine grained sand.	CO
730	15	B-2	SPT-1	4 3-7		14.5	ML	SILT with some SAND: light brown, dry, stiff.	
725	20		R-5	7 12-18	99.6	2.2	SP	SAND: light brown, dry, dense, micaceous.	
720	25		SPT-2	5 6-11		4.9	SM	Silty SAND: brown, slightly moist, medium dense, iron oxide, some gravel.	



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

TEST TYPES:
 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-1

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~747' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
715	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	
710	35		SPT-3	7 9 14		7.2	ML-SP	Silt with SAND: light brown, slightly moist, medium dense.	
705	40		R-7	5 14 24	113.4	7.5	SC	Clayey SAND: brown, moist, dense.	
700	45		SPT-4	9 12 14		20.3	CL-SP	CLAY with SAND: brown, moist, hard.	AL
695	50		R-8	7 15 26	117.9	15.7	CL-SP	Clay with SAND, brown, moist, hard, micaceous, manganese oxide, fine grain sand.	
690	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	
60									





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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-2

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~743' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Undocumented Artificial Fill (Afu): @0' - Gravel / old asphalt.	
740			R-1	6 9	108.6	6.5	SP	Quaternary Young Eolian Deposits (Qye): SAND: brown, moist, medium dense.	
	5		R-2	6 10	107.9	18.1	ML	SILT: brown, moist to very moist, stiff.	
735			R-3	5 14	112.0	6.9	SM	Silty SAND: brown, moist, medium dense, some small angular gravels, fine grains of sand.	
	10	B-1	R-4	7 16	112.1	9.9	SM	Silty SAND: grayish brown, slightly moist, medium dense, fine grains of sand.	EI
730			R-5	2 5	106.5	15.8	ML-SP	Clayey SILT with SAND, grayish brown, slightly moist to moist, stiff, iron oxide, trace rootlet, pores.	AL CO SA
	20		SPT-1	7 9		26.6	SM	Sandy SILT, brown, moist stiff, laminations.	
720			R-6	5 9	103.1	16.2	CL	Silty CLAY: brown/gray, moist, stiff, micaceous, iron oxide, scattered gravel, mottled.	
715									
	30								

	<p>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.</p>	<p>SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES: 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</p>
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Last Edited: 3/31/2017

Geotechnical Boring Log Borehole HS-2

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~743' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
710	30		SPT-2	4 6 8		17.3	SM	Sandy SILT, brown, moist, stiff, laminations.	AL SA
705	35		R-7	3 10 25	112.9	14.0	SP - GP	SAND with GRAVEL: gray and orange, mottled, moist, dense, few scattered root pores.	
700	40		SPT-3	6 11 11		18.2	SM	Sandy SILT: orange/brown, moist, very stiff, micaceous, iron oxide.	
695	45		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.	AL SA
690	50		SPT-4	7 11 16		14.6	SC	Sandy CLAY: brown, moist, very stiff, iron oxide, manganese oxide, fine grains of sand, pinhole porosity.	
685	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	
680	60								



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-3

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~748' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0			5 5				Undocumented Artificial Fill (Afu): Old asphalt turned gravel, scattered bones, broken glass.	
735		B-1	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 plastic.	
730			R-3	4 10 27	100.7	19.6	SC	Clayey SAND: black, wet, medium dense, approx. 30% organics/plastics.	
	10		R-4	2 4 7	113.0	3.6	SP	SAND: brown, very moist, dense, some organics.	
725								Quaternary Young Eolean Deposits (Qye):	
	15		SPT-1	2 4 7		26.1	SM	Silty SAND: brown, moist, dense.	
720			R-5	4 7 15	101.0	2.9		SAND: very light brown, slightly moist, medium dense, fine grained.	CO
715								Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	
	25								
710									
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole HS-4

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~738' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0		R-1	546	99.2	22.1	SM	Undocumented Artificial Fill (Afu): Old asphalt turned gravel, scattered bones, broken glass.	
730	5		R-2	578	98.0	4.4	SP	Quaternary Young Eolian Deposits (Qye): Silty SAND: brown, very moist, medium dense, micaceous.	CO
725	10		R-3	588	93.6	20.6	SM	SAND: light, brown, very moist, medium dense, micaceous.	
720	15		R-4	578	101.5	9.1	ML	Sandy SILT: brown, slightly moist, stiff.	AL
715	20		R-5	357	87.7	29.8	SM	SILT: grayish brown, slightly moist, stiff.	
710	25		SPT-1	579		17.0		Sandy SILT, grayish brown, moist, stiff.	
	30							Sandy SILT, grayish brown, moist, stiff, micaceous.	
								Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	



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

<p>SAMPLE TYPES:</p> <ul style="list-style-type: none"> B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE <p style="text-align: center;"> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <ul style="list-style-type: none"> 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
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Geotechnical Boring Log Borehole HS-5

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~742' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
740	0						SM	Scattered weeds	
			R-1	18 27 37	119.3	6.8	SM	Stockpile over Undocumented Artificial Fill (Afu): Silty SAND: dark brown, slightly moist, very dense, strong organic odor.	
735	5		R-2	15 18 20	106.5	9.3	SP	Fine grain SAND: dark gray, moist, very dense, abundant organics @ 6'.	
			R-3	6 10 18	100.7	4.5	SP	SAND: gray, slightly moist, dense, decreased odor.	
730	10		R-4	7 13 17	106.2	4.6		SAND: gray with black at base of sample, slightly moist, dense, strong organic odor.	
725	15		SPT-1	5 6 6		17.5	ML	Quaternary Young Eolean Deposits (Qye): Sandy SILT: gray, slightly moist, stiff, strong organic odor.	
720	20		R-5	5 12 19	101.4	2.7	SP	SAND: brown, slightly moist, dense, no odor.	
715	25		SPT-2	6 10 11		6.8	SM	Silty SAND: light brown, slightly moist to moist, dense, no odor.	
								Total Depth = 25.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	
	30								



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	TEST TYPES: 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
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Last Edited: 3/31/2017

Geotechnical Boring Log Borehole HS-6

Date: 2/9/2017	Drilling Company: Cal Pac
Project Name: Regions North	Type of Rig: Hollow Stem
Project Number: 16159-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~742' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
740	0		R-1	7 17 24	122.6	7.4	SM	Gravel Stockpile: Silty SAND: brown, moist, dense, scattered gravel.	
735	5		R-2	11 14 28	119.9	5.7	SM	Silty SAND: brown, moist, dense, scattered gravel. Quaternary Young Eolean Deposits (Qye):	
			R-3	13 17 25	118.8	6.6	SM	Silty SAND: brown, moist, dense.	
730	10		R-4	8 11 13	108.2	4.3	SM	Silty SAND: brown, slightly moist, dense, fine grained.	
725	15		R-5	3 4 6	105.5	11.1	ML	SILT: brown, slightly moist, stiff, rootlets.	AL CO SA
720	20		SPT-1	5 7 10		11.8	ML	SILT with SAND: light brown, moist, stiff.	
715	25							Total Depth = 21.5' Groundwater Not Encountered Backfilled with Cuttings on 2/9/2017	
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE



LGC Geotechnical

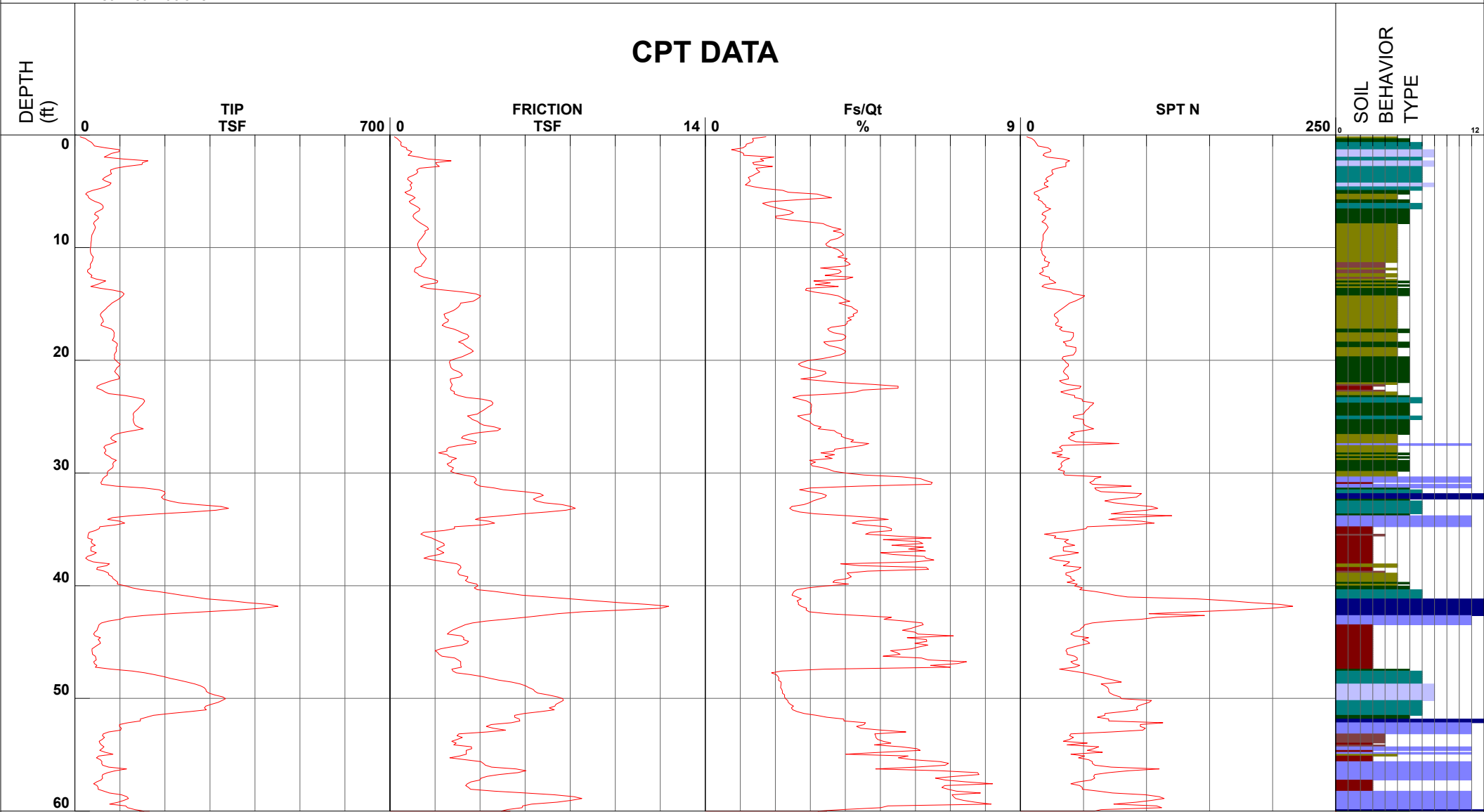
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 Job Number 16159-01
 Hole Number CPT-01
 EST GW Depth During Test

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 7:43:11 AM
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Filename SDF(494).cpt
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 Maximum Depth 60.53 ft

Net Area Ratio .8

CPT DATA



SOIL BEHAVIOR TYPE

- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical

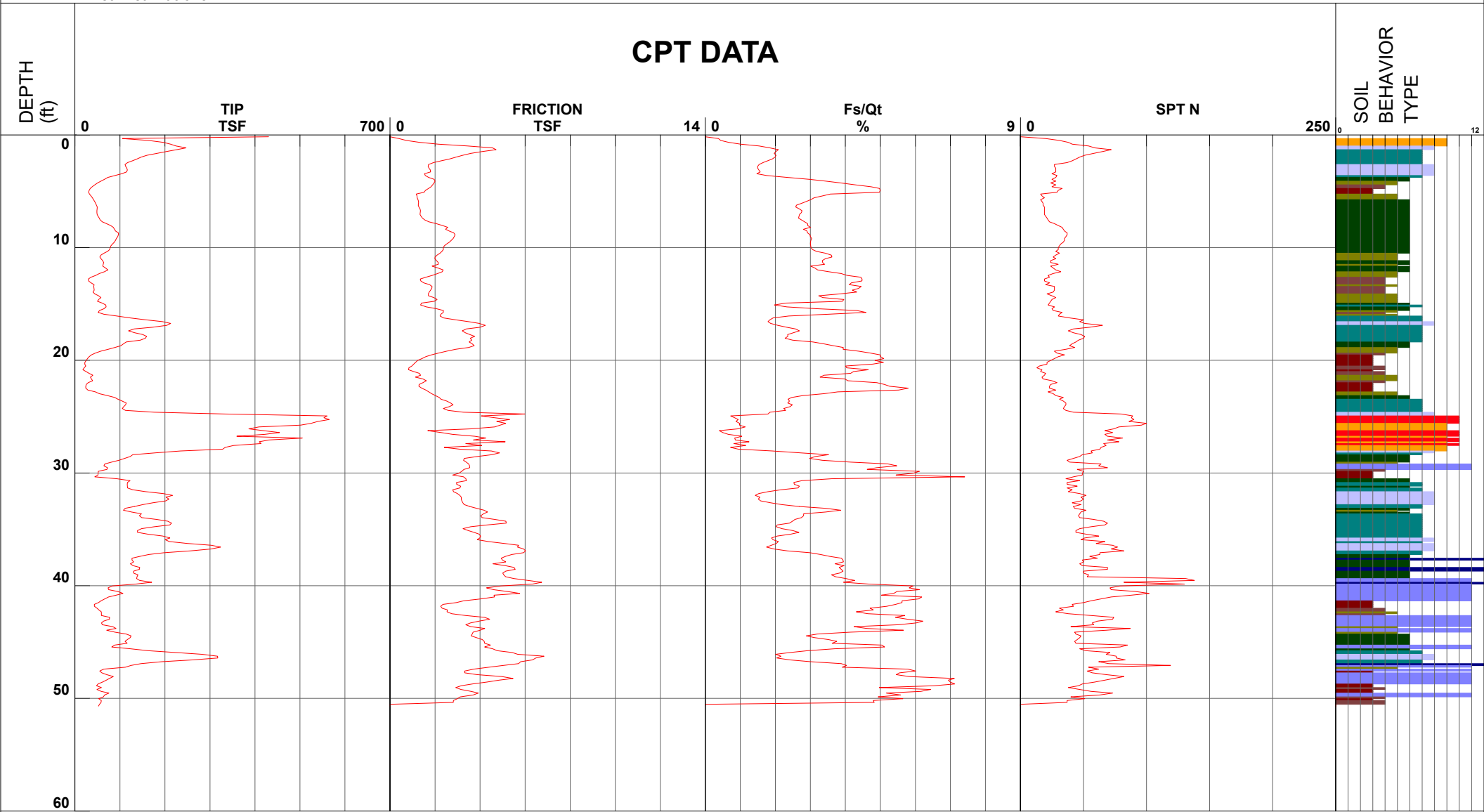
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 EST GW Depth During Test _____

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 8:33:30 AM

Filename SDF(495).cpt
 GPS _____
 Maximum Depth 50.69 ft

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay

- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt

- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand

- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical

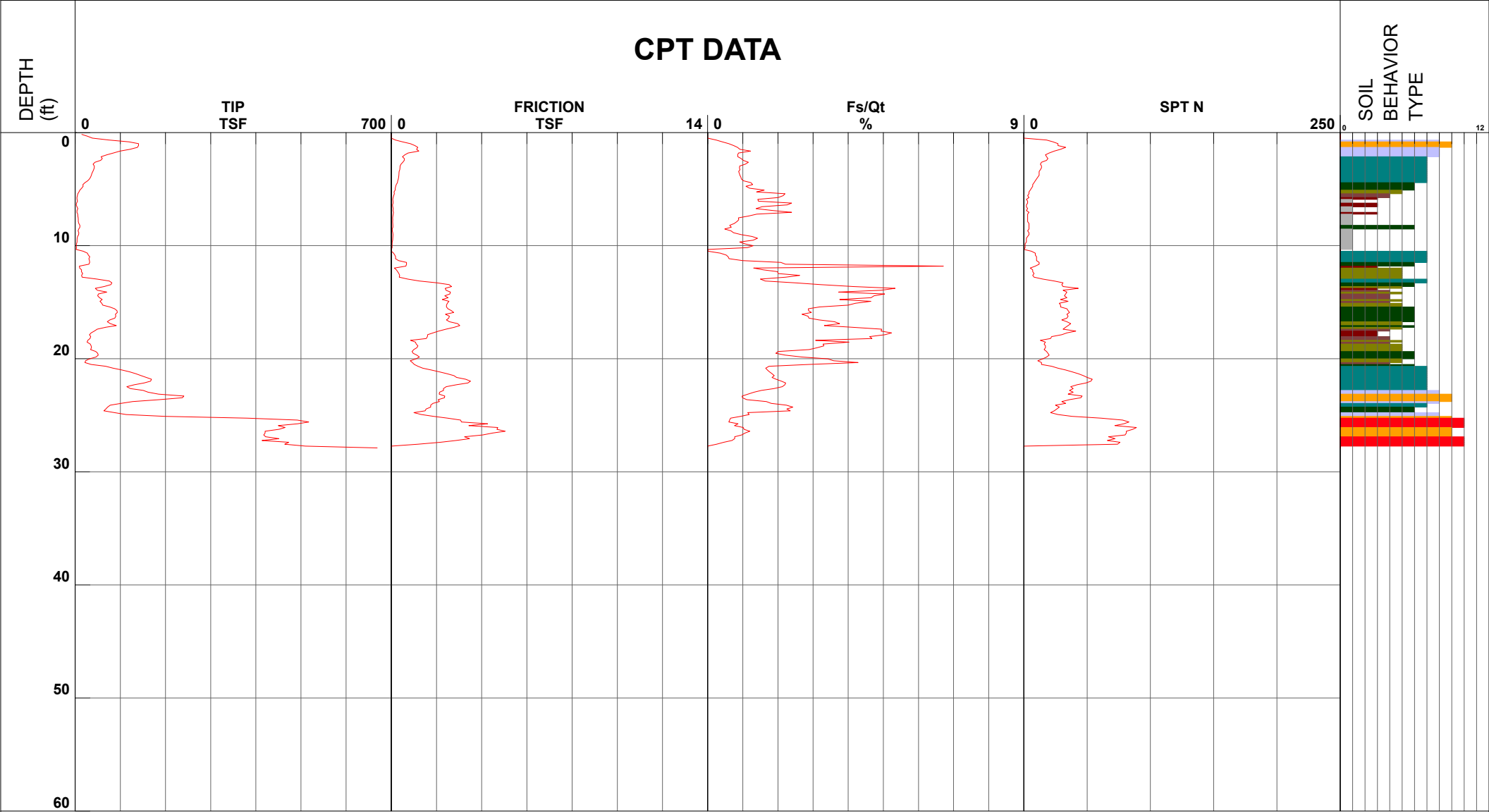
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 Job Number 16159-01
 Hole Number CPT-03
 EST GW Depth During Test _____

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 9:12:40 AM

Filename SDF(496).cpt
 GPS _____
 Maximum Depth 27.89 ft

Net Area Ratio .8

CPT DATA



SOIL BEHAVIOR TYPE

- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical

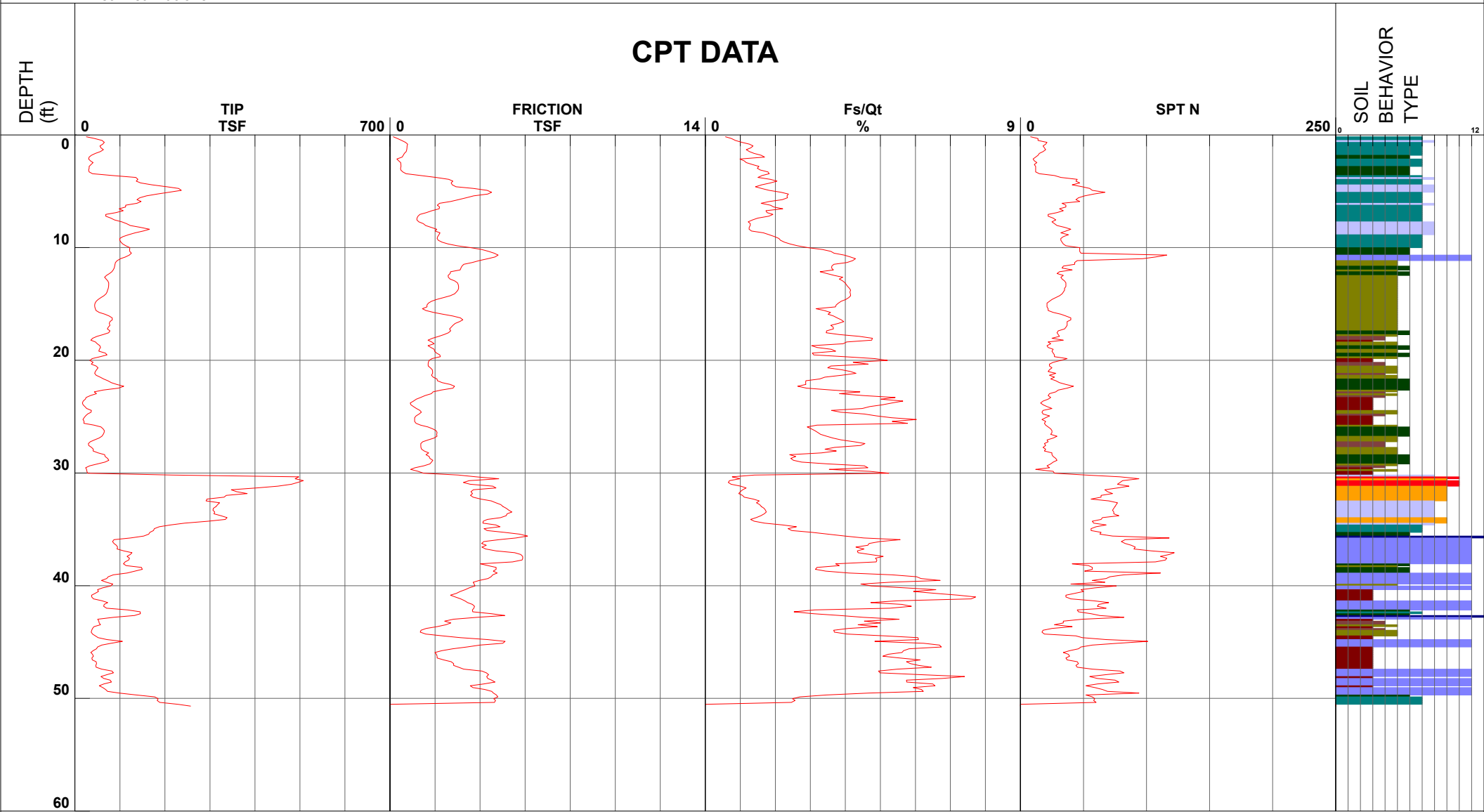
Project Regions North
 Job Number 16159-01
 Hole Number CPT-04
 EST GW Depth During Test _____

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 9:43:18 AM

Filename SDF(497).cpt
 GPS _____
 Maximum Depth 50.69 ft

Net Area Ratio .8

CPT DATA



SOIL BEHAVIOR TYPE

- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay

- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt

- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand

- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical

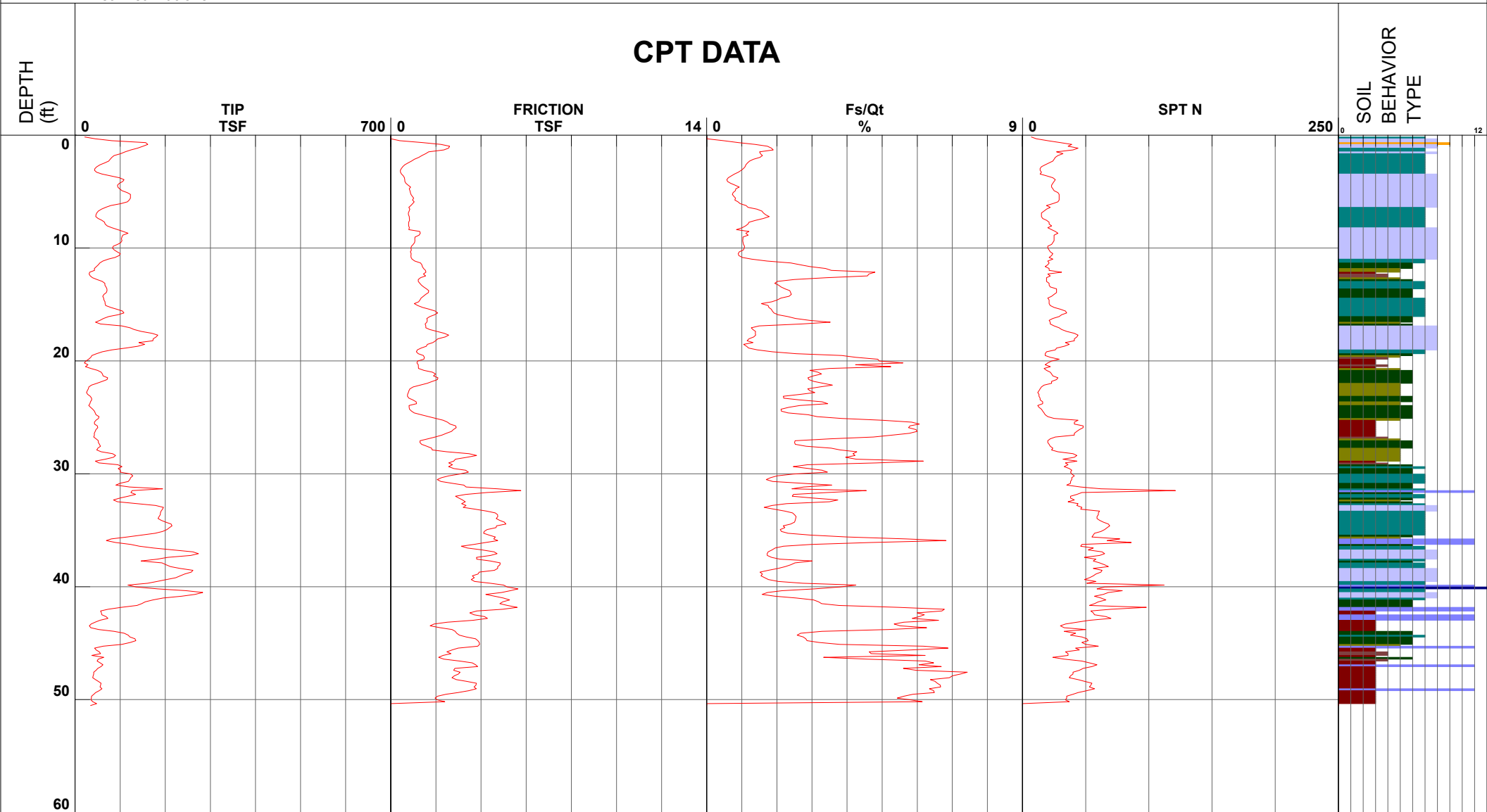
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 Job Number 16159-01
 Hole Number CPT-05
 EST GW Depth During Test _____

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 10:19:03 AM

Filename SDF(498).cpt
 GPS _____
 Maximum Depth 50.52 ft

Net Area Ratio .8

CPT DATA



- | | | | |
|------------------------------|---------------------------------|--------------------------------|------------------------------------|
| ■ 1 - sensitive fine grained | ■ 4 - silty clay to clay | ■ 7 - silty sand to sandy silt | ■ 10 - gravelly sand to sand |
| ■ 2 - organic material | ■ 5 - clayey silt to silty clay | ■ 8 - sand to silty sand | ■ 11 - very stiff fine grained (*) |
| ■ 3 - clay | ■ 6 - sandy silt to clayey silt | ■ 9 - sand | ■ 12 - sand to clayey sand (*) |

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983



LGC Geotechnical

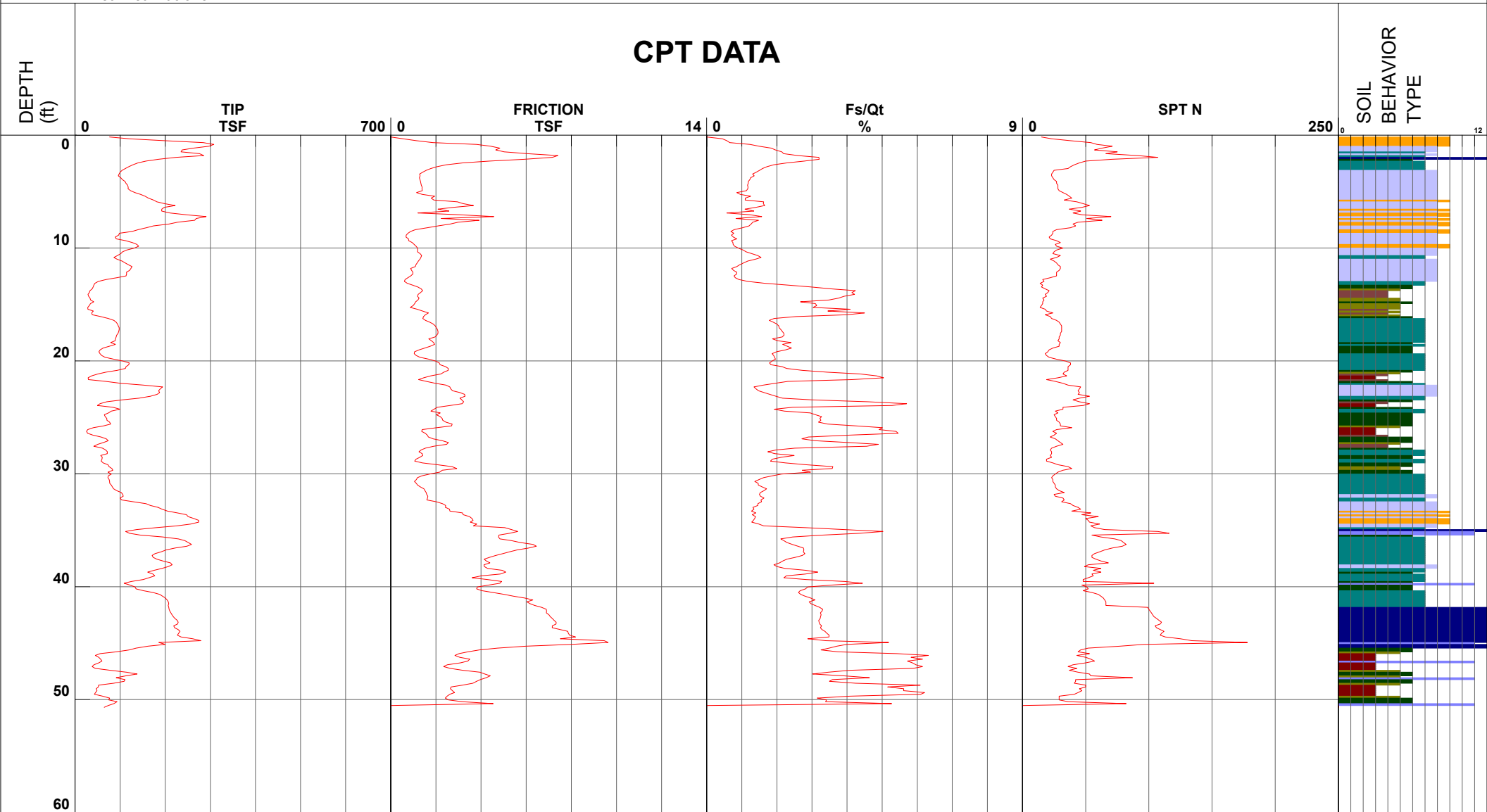
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 Job Number 16159-01
 Hole Number CPT-06
 EST GW Depth During Test

Operator DG-BH
 Cone Number DDG1350
 Date and Time 2/9/2017 10:55:41 AM

Filename SDF(499).cpt
 GPS
 Maximum Depth 50.69 ft

Net Area Ratio .8

CPT DATA



- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

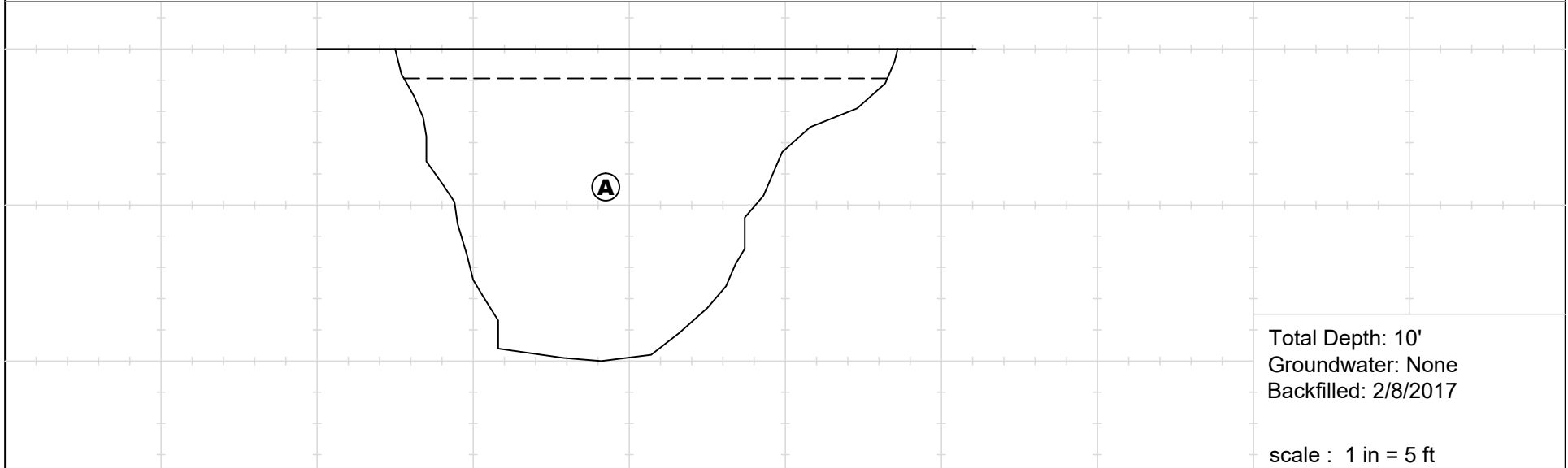
Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Project Name: Regions North	Logged By: CNJ	Trench No: TP-1	
Project Number : 16159-01	Date : 2/8/2017	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 T.D. - Quaternary Young Eolian Deposits (Qye): @ 0' Silty SAND: dark brown, wet grading to dry, loose; abundant roots (Topsoil) @ 6" SAND: brown, moist, medium dense with loose pockets; rootlets @ 2' Increase density to dense @ 5' SAND: gray brown and light brown mottled, moist, dense; some roots @ 9' SAND: very light brown, slightly moist, dense to very dense; fine grained, slightly indurated	Qye	SM SP	GB-1 @ 1-2' GB-2 @ 3-4' GB-3 @ 5-7' GB-4 @ 9-10'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 747 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



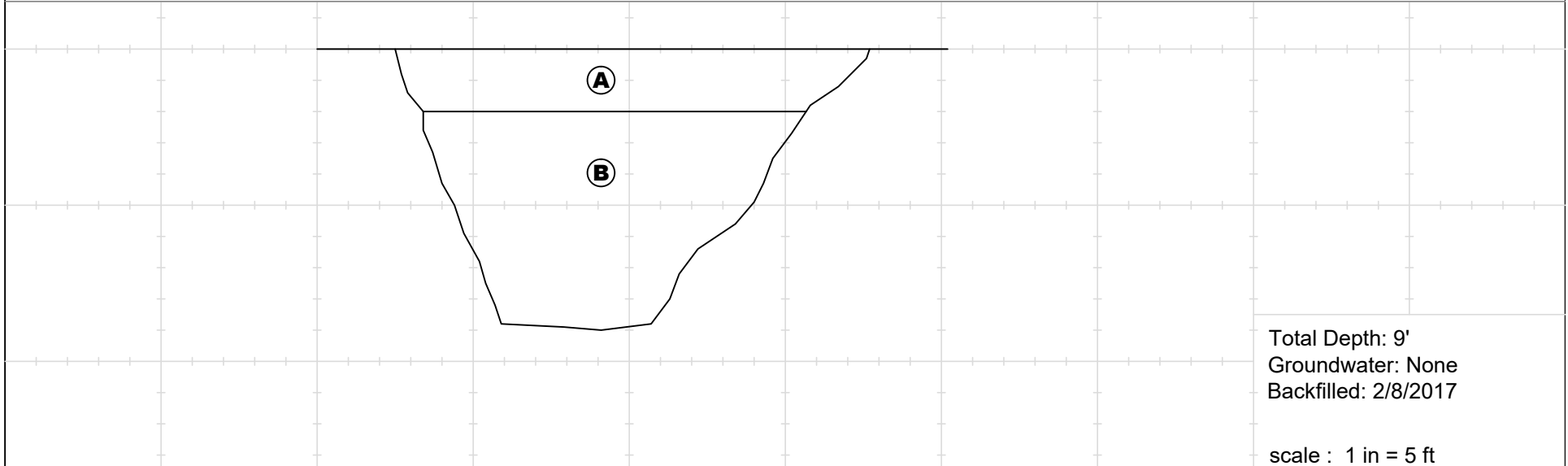
Total Depth: 10'
Groundwater: None
Backfilled: 2/8/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-2	
Project Number : 16159-01		Date : 2/8/2017	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 Artificial Fill (afu):	Afu	SM	GB-1 @		
		@ 0' Silty SAND with scattered gravels: light brown, slightly moist, very dense			1-3'		
	B	@ 2' to T.D. - Quaternary Young Eolian deposits (Qye):	Qye	SP			
		@ 2' SAND: light brown, slightly moist to moist, medium dense with some loose pockets; pinhole porosity					
		@ 5' Increase density to dense			GB-2 @		
		@ 8' SAND: light brown, moist to very moist, dense; fine grained			5-6'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 747 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



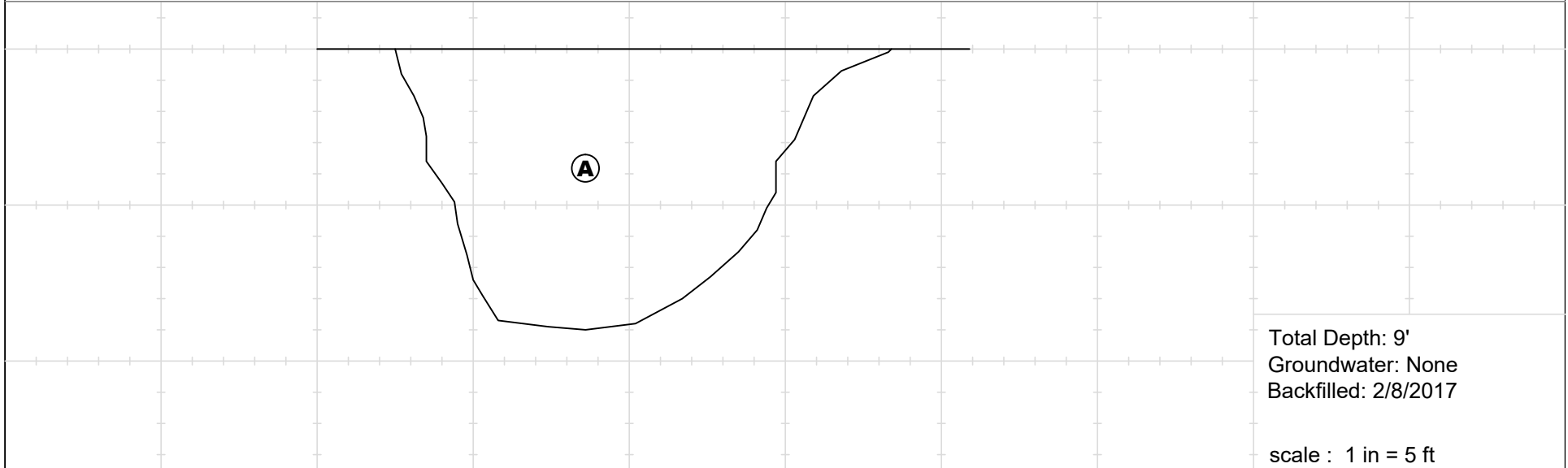
Total Depth: 9'
Groundwater: None
Backfilled: 2/8/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-3	
Project Number : 16159-01		Date : 2/8/2017	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 T.D. - Quaternary Young Eolian Deposits (Qye): About 2" layer of Asphalt Concrete and CMB @ 2" SAND: light brown, moist, loose to medium dense @ 4' Silty SAND: grayish light brown, moist to very moist, medium dense to dense; rootlets and pinhole porosity @ 8' Silty SAND: light grayish brown, moist to very moist, medium dense to dense	Qye	SP SM	GB-1 @ 2-3' GB-2 @ 4-5' GB-3 @ 8-9'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 743 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



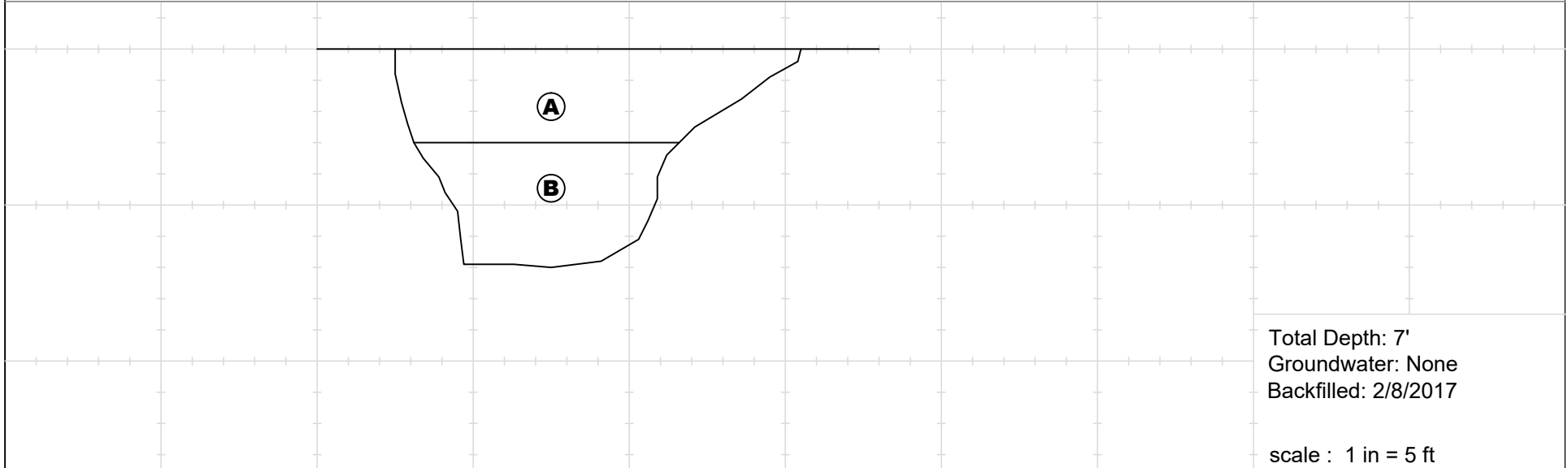
Total Depth: 9'
Groundwater: None
Backfilled: 2/8/2017

scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-4	
Project Number : 16159-01	Date : 2/8/2017	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 3' - Undocumented Artificial Fill (afu): @ 0' - Asphalt Concrete @ 8" Silty SAND with Gravel: brown, dark brown, and gray, moist, dense; trash; bones; treated lumber	Afu				
	B	@ 3' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 3' SAND: light brown, moist, dense; pinhole porosity @ 5' SAND: very light grayish brown, moist, dense	Qye	SP	GB-1 @ 3-5' GB-2 @ 5-7'		

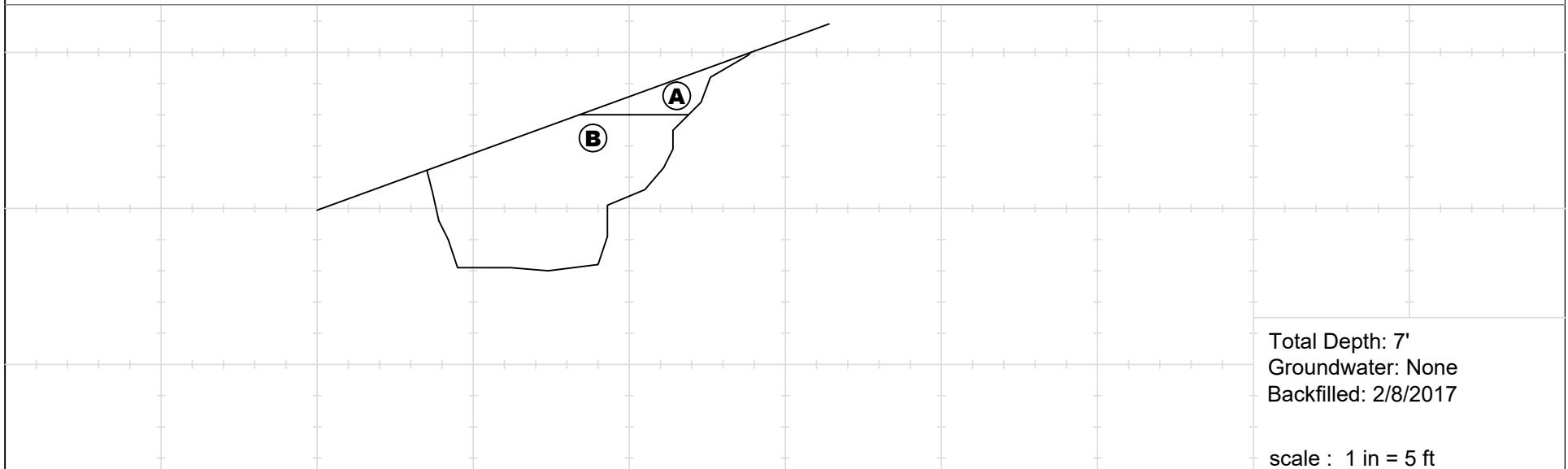
GRAPHICAL REPRESENTATION BELOW: **Elevation : 746 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-5		
Project Number : 16159-01		Date : 2/8/2017	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 Artificial Fill (afu): @ 0' Silty SAND: brown, moist to very moist, loose; ~80% organics	Afu	SM	GB-1 @ 0-1'		
	B	@ 1' Silty SAND: brown, dry, loose; roots, about 50% organics @ 2' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 2' SAND with some Silt: brown, moist, loose to medium dense; larger roots up to 1" diameter @ 5' SAND: grayish-brown, moist, dense	Qye	SP	GB-2 @ 1-2' GB-3 @ 3-4' GB-4 @ 6-7'		

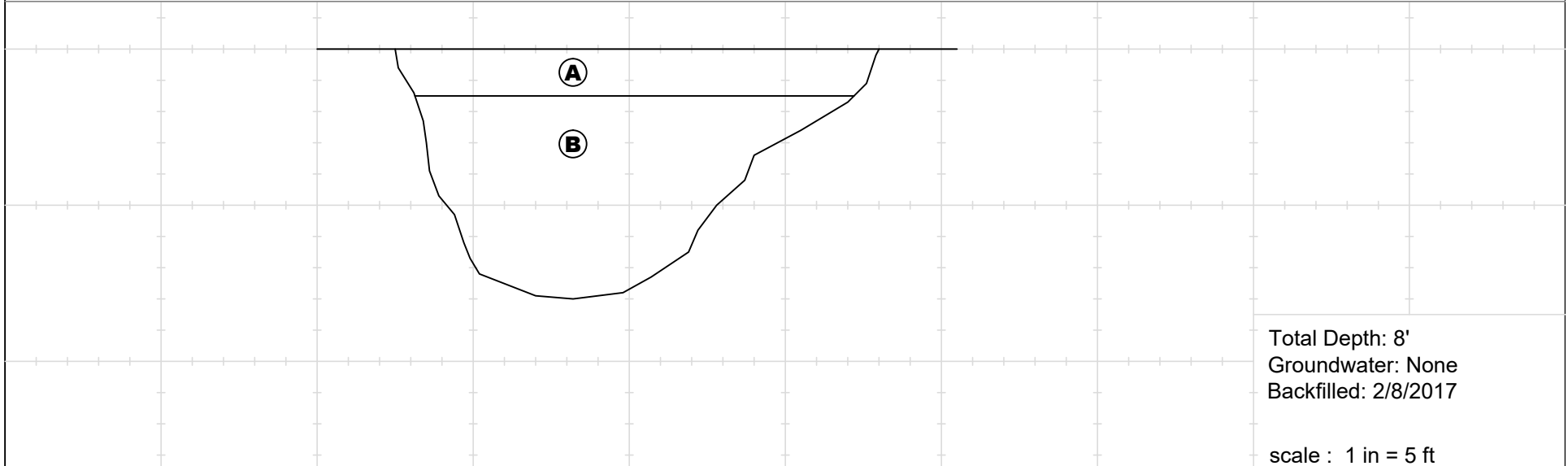
GRAPHICAL REPRESENTATION BELOW: **Elevation : 748 ' MSL** **Surface Slope: 20 deg.** **Trend: NS**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-6		
Project Number : 16159-01		Date : 2/8/2017	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 1' - Undocumented Artificial Fill (Afu): @ 0' SILT and CLAY: dark brown, very moist to wet, stiff; organic rich	Afu	ML-CL	GB-1 @ 0-1'		
	B	@ 1' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 1' Silty SAND to Sandy SILT: gray brown, very moist, medium dense to stiff; porous @ 4' SAND: gray brown, moist to very moist, dense; scattered gravels	Qye	SM	GB-2 @ 2-3'		
				SP	GB-3 @ 4-5'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 743 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**

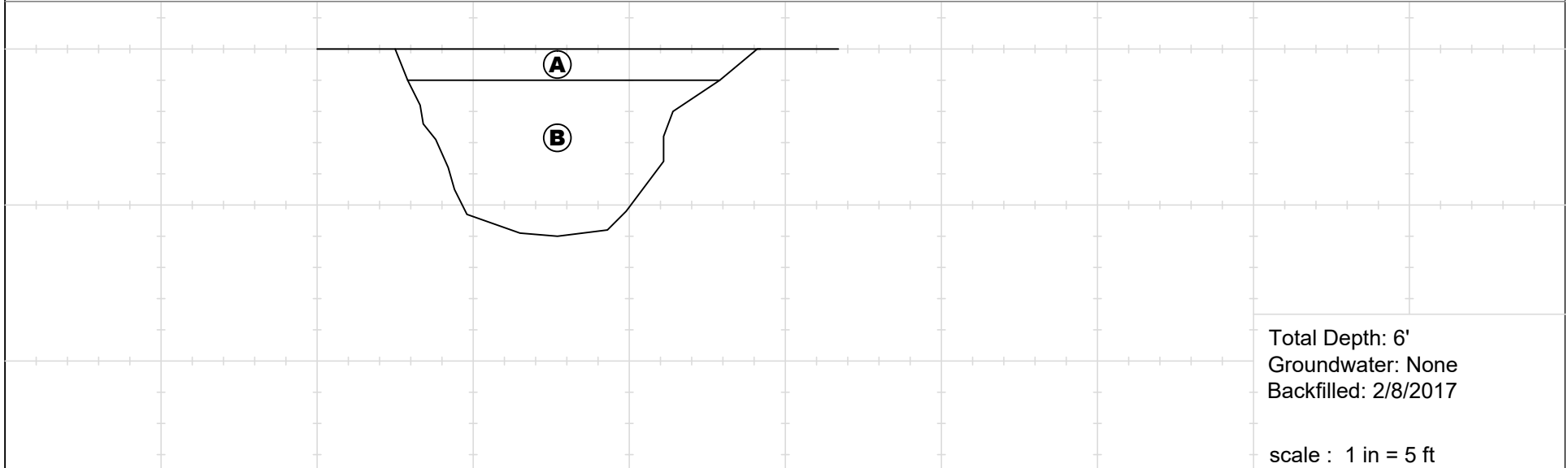


Last Edited: 4/06/2017

Project Name: Regions North		Logged By: CNJ	Trench No: TP-7		
Project Number : 16159-01		Date : 2/8/2017	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 1' - Undocumented Artificial Fill (afu):	Afu				
		@ 0' SILT and CLAY: dark brown, very moist to wet, stiff		ML-CL	GB-1 @ 0-1'		
	B	@ 1' to T.D. - Quaternary Young Eolian Deposits (Qye):	Qye				
		@ 1' Silty SAND: gray brown, moist to very moist, medium dense with some loose pockets; scattered roots; pinhole porosity		SM	GB-2 @ 2-3'		
		@ 3' Sandy SILT and CLAY: gray and orange mottled, very moist, stiff; abundant rootlets; pinhole porosity		SM-CL	GB-3 @ 3-4'		
		@ 4.5 SAND: grayish brown, moist, dense		SP			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 748 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



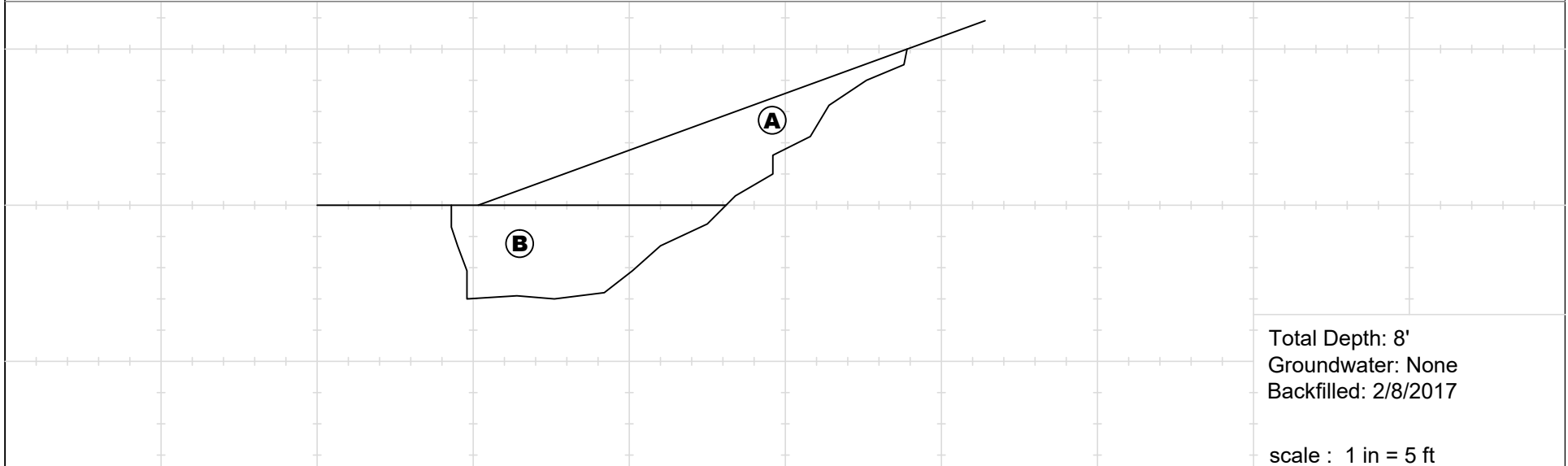
Total Depth: 6'
Groundwater: None
Backfilled: 2/8/2017

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		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' - 5' - Stockpile @ 0' Silty SAND to Sandy SILT: gray brown to light brown, moist to very moist, dense to very stiff; "lifts" visible	Stockpile	SM			
	B	@ 5' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 5' Silty SAND: brown, moist, medium dense with some loose pockets; abundant roots; upper one foot disturbed @ 6' SAND: light gray brown, dry grading to moist by 8', grades to dense by 8'	Afu/Qye	SP	GB-1 @ 3-4' GB-2 @ 6-8'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 749 ' MSL** **Surface Slope: 20 deg.** **Trend: EW**



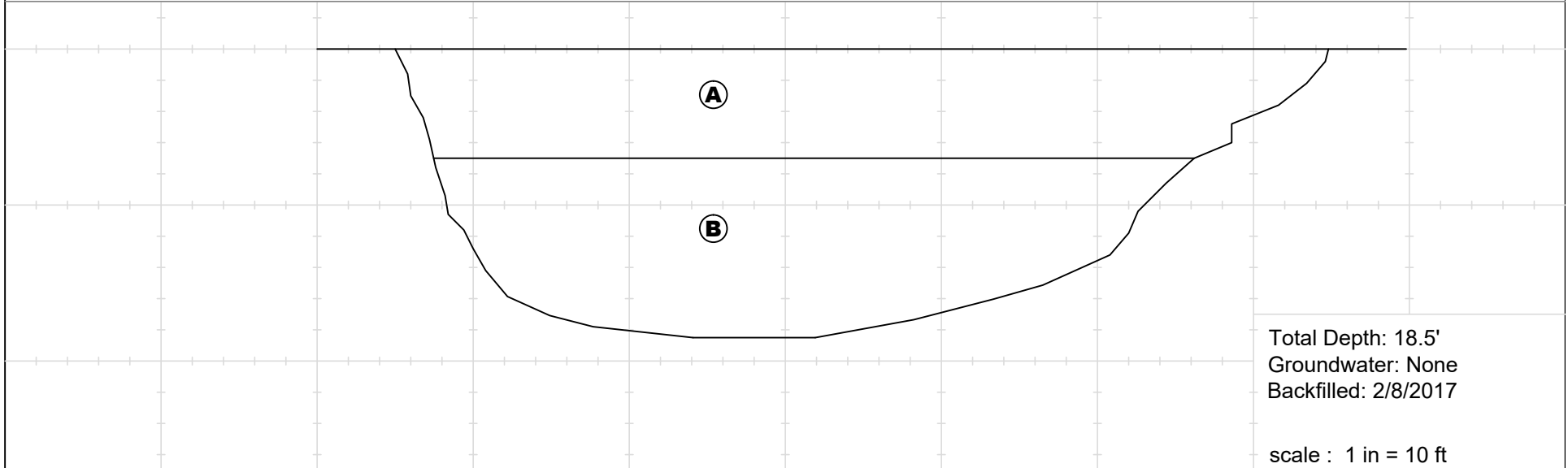
Total Depth: 8'
Groundwater: None
Backfilled: 2/8/2017


scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-9		
Project Number : 16159-01		Date : 2/8/2017	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 7' Undocumented Artificial Fill (afu) or Stockpile: @ 0' Silty SAND: light brown to gray, moist, dense to very dense; scattered trash visable down to 5'; "lifts" visible @ 6' SILT and CLAY: dark brown, dry, hard; indurated; organic rich	Stockpile /Afu	SM ML-CL	GB-1 @ 2-3' GB-2 @ 6'		
	B	@ 7' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 7' SAND: dark gray, moist, dense; odoriferous	Qye	SP	GB-3 @ 7-9' GB-4 @ 18'		

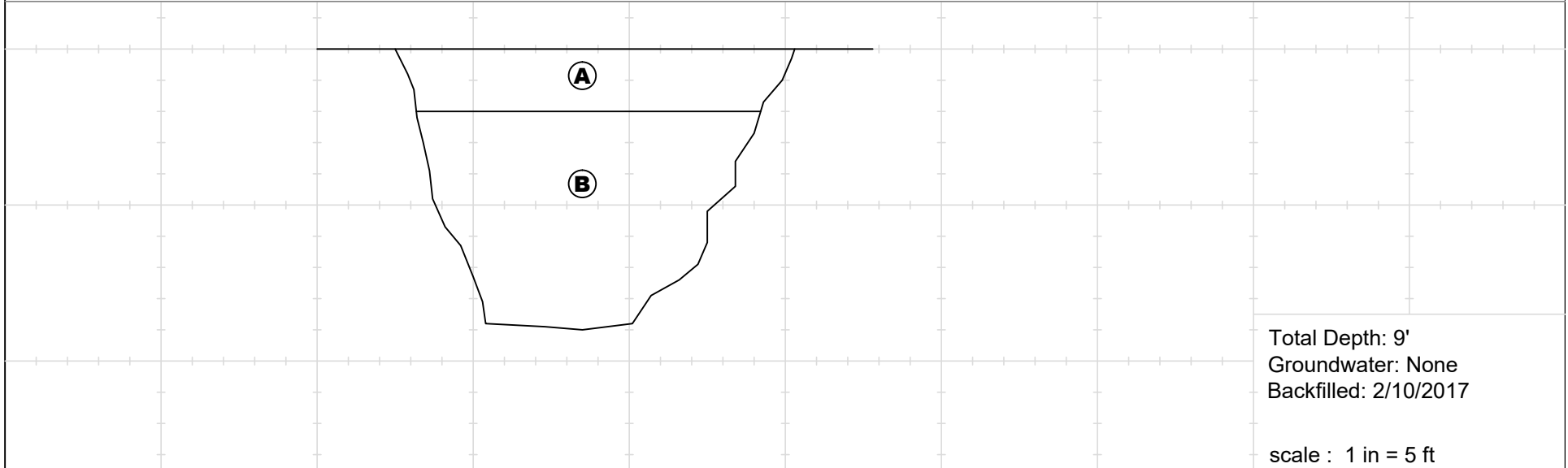
GRAPHICAL REPRESENTATION BELOW: **Elevation : 741 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**




Project Name: Regions North	Logged By: CNJ	Trench No: TP-10	
Project Number : 16159-01	Date : 2/10/2017	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 Artificial Fill (afu): @ 0' Silty SAND: dark brown, very moist, loose; bone fragments; abundant trash; odoriferous; organic rich	Afu	SM			
	B	@ 2' to T.D. - Quaternary Young Eolian Deposits (Qye): @2' SAND: grayish brown, very moist to wet, loose to medium dense @ 7' Silty SAND: grayish brown, very moist to wet, medium dense to dense; iron oxide	Qye	SP SM	GB-1 @ 0-2' GB-2 @ 2-4' GB-3 @ 7-9'		

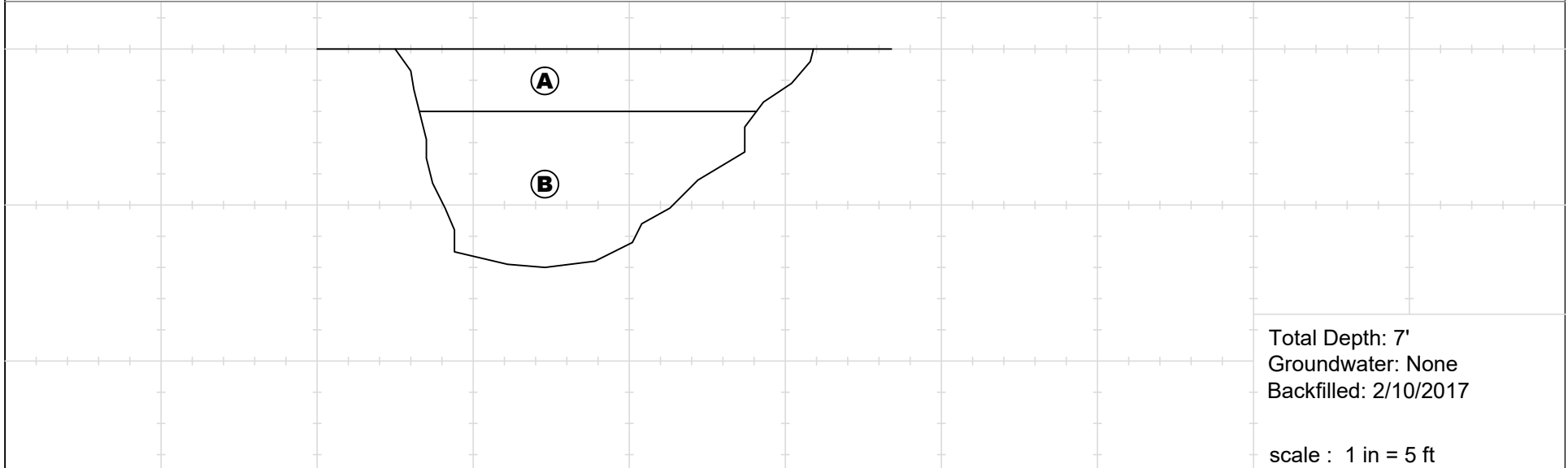
GRAPHICAL REPRESENTATION BELOW: **Elevation : 749 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-11	
Project Number : 16159-01		Date : 2/10/2017	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 Artificial Fill (afu): @ 0' Sandy SILT: brown, wet, soft; abundant roots	Afu	SM	GB-1		
	B	@ 1' Silty SAND: grayish brown, very moist, medium dense					
		@ 2' to T.D. - Quaternary Young Eolian Deposits (Qye): @2' SAND: grayish brown, very moist, medium dense; scattered gravel; iron oxide	Qye	SP	GB-2		
				SM			

GRAPHICAL REPRESENTATION BELOW: **Elevation : 740 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



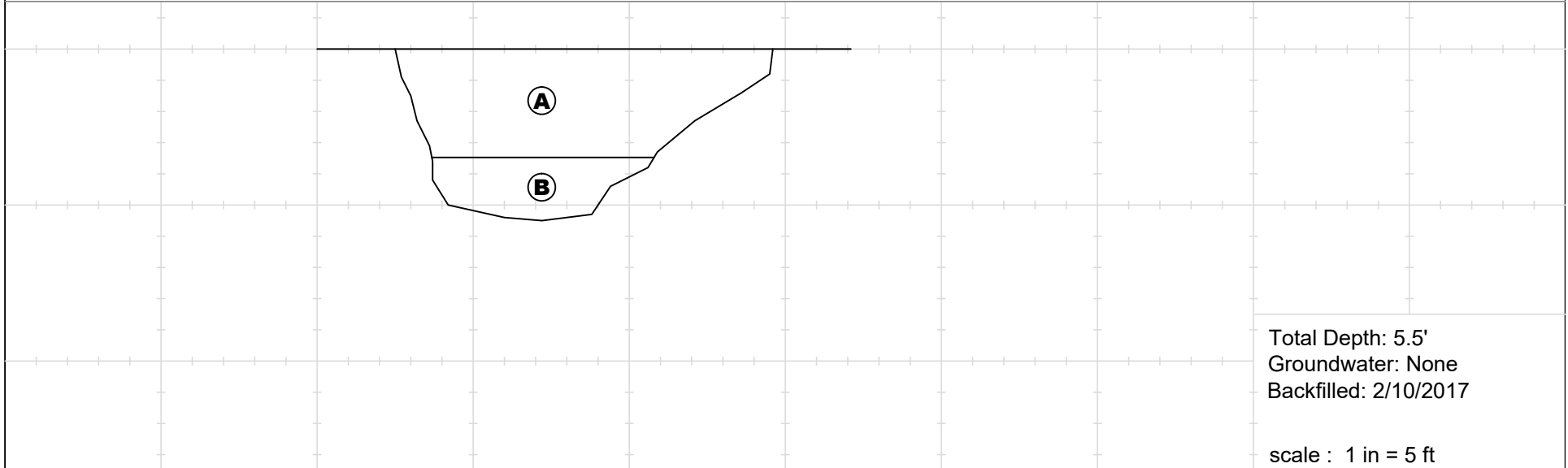
Total Depth: 7'
Groundwater: None
Backfilled: 2/10/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-12	
Project Number : 16159-01		Date : 2/10/2017	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 3.5' - Undocumented Artificial Fill (afu): @ 0' SILT and SAND: dark brown, very moist, soft; abundant rootlets; organic rich; bone fragments; abundant trash; odoriferous	Afu	SM	GB-1 @ 0-3'		
	B	@ 3.5' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 3.5' SAND with Silt: gray brown, very moist, medium dense to dense; iron oxide	Qye	SP	GB-2 @ 4-5'		

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



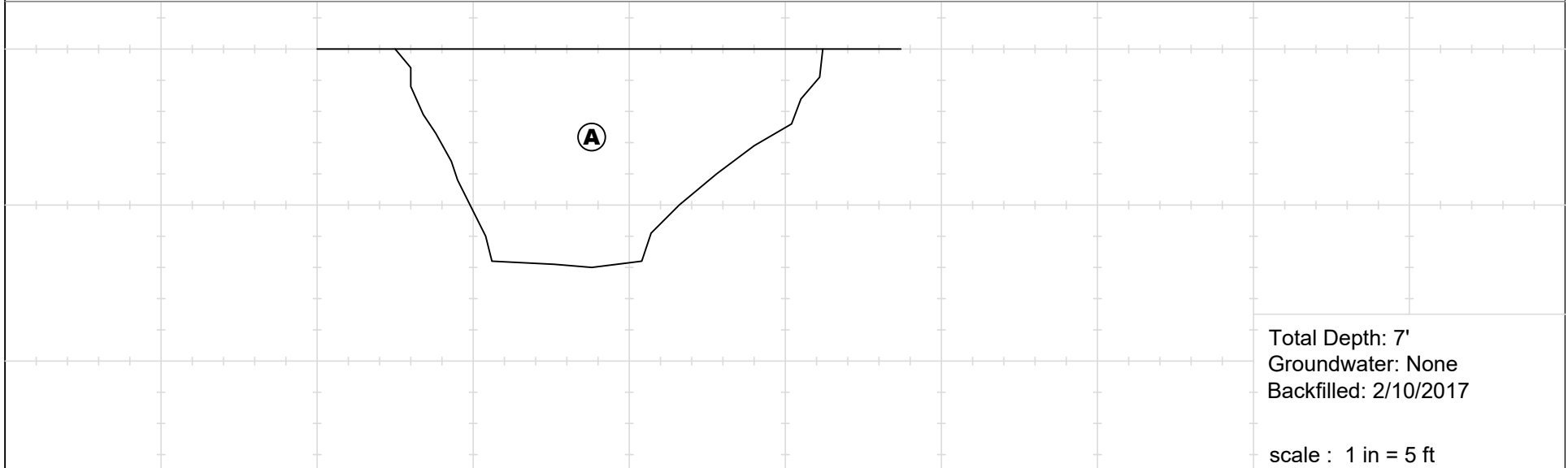
Total Depth: 5.5'
Groundwater: None
Backfilled: 2/10/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-13	
Project Number : 16159-01		Date : 2/10/2017	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 T.D. - Quaternary Young Eolian Deposits (Qye): @ 0' SILT with Sand: dark brown, very moist; abundant roots @ 4' Silty SAND: brown, very moist to wet, medium dense; scattered gravels; occasional rock greater than 8" diameter; roots to 4'	Qye	SM SM-ML	GB-1 @ 2-3'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 740 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



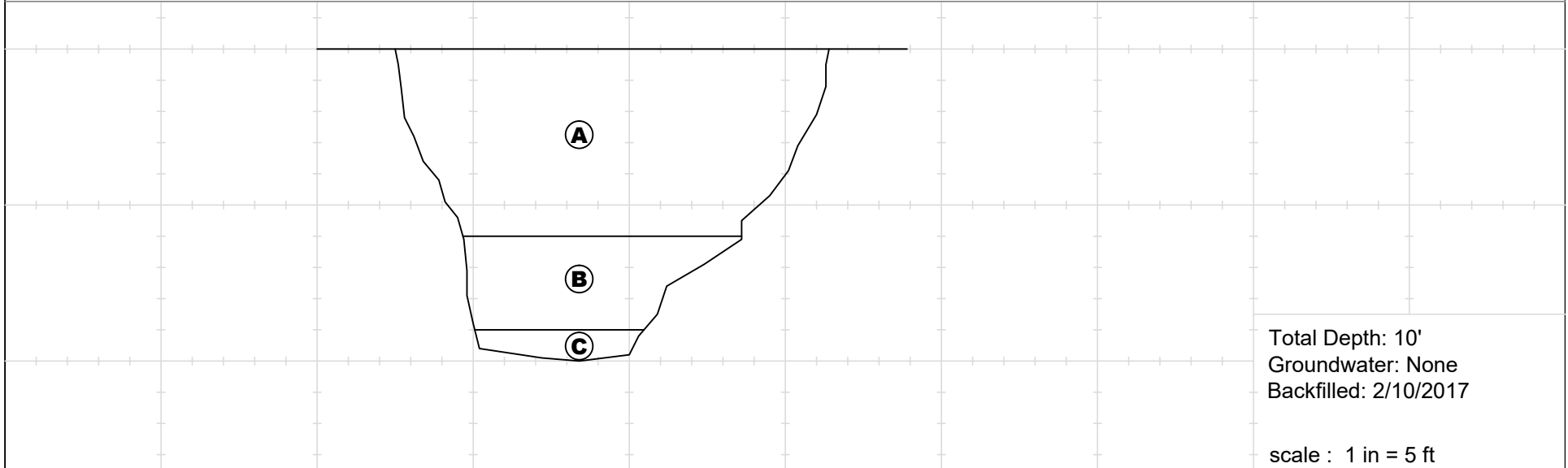
Total Depth: 7'
Groundwater: None
Backfilled: 2/10/2017

scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-14	
Project Number : 16159-01	Date : 2/10/2017	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 6' - Stockpile	Stockpile	SM	GB-1 @ 6-8'		
		@ 0' Silty SAND to Sandy SILT: grayish brown, moist, dense to very stiff; trace trash					
	B	@ 6' to 9' - Undocumented Artificial Fill (afu):					
		@ 6' Silty SAND: brown, dry, medium dense with loose pockets; organic rich; abundant trash	Afu				
	C	@ 9' to T.D. - Quaternary Young Eolian Deposits (Qye):	Qye		GB-2 @ 9-10'		
		@9' Silty SAND: light grayish brown, dry to slightly moist, medium dense to dense					

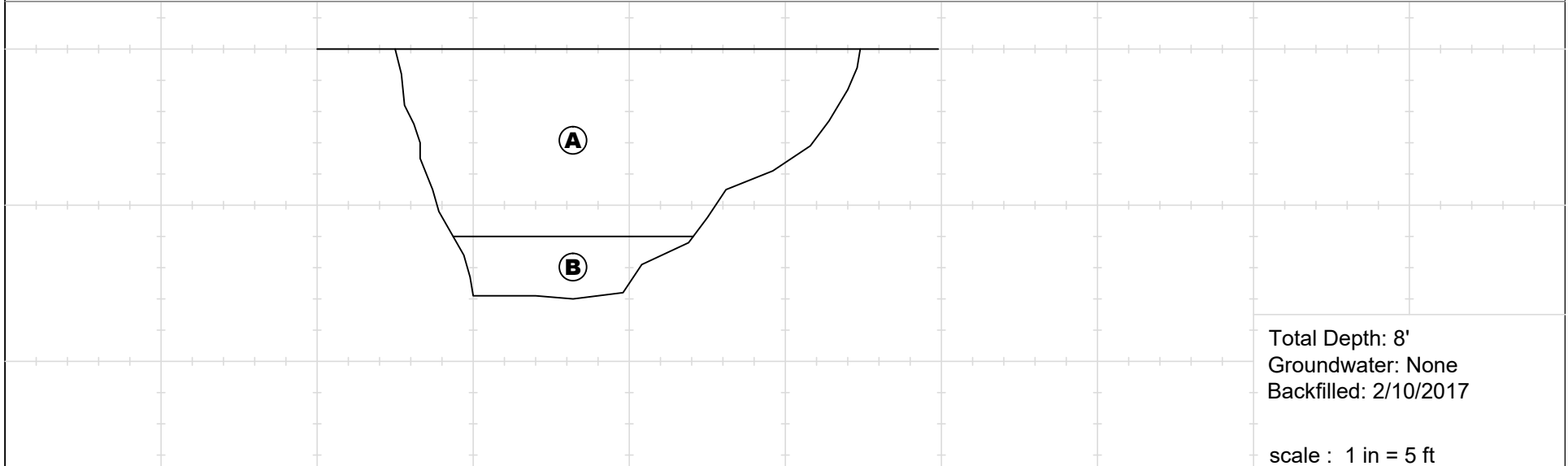
GRAPHICAL REPRESENTATION BELOW: **Elevation : 743 ' MSL** **Surface Slope: 0 deg.** **Trend: N30W**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-15	
Project Number : 16159-01		Date : 2/10/2017	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 6' - Stockpile	Stockpile				
		@ 0' Silty SAND: brown to gray, moist, dense; trace trash; scattered gravel and bone fragments; "lifts" visible		SM			
	B	@ 6' to T.D. - Undocumented Artificial Fill (afu):	Afu				
		@ 6' SAND and SILT: dark brown, dry, loose; organic rich					

GRAPHICAL REPRESENTATION BELOW: **Elevation : 745 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



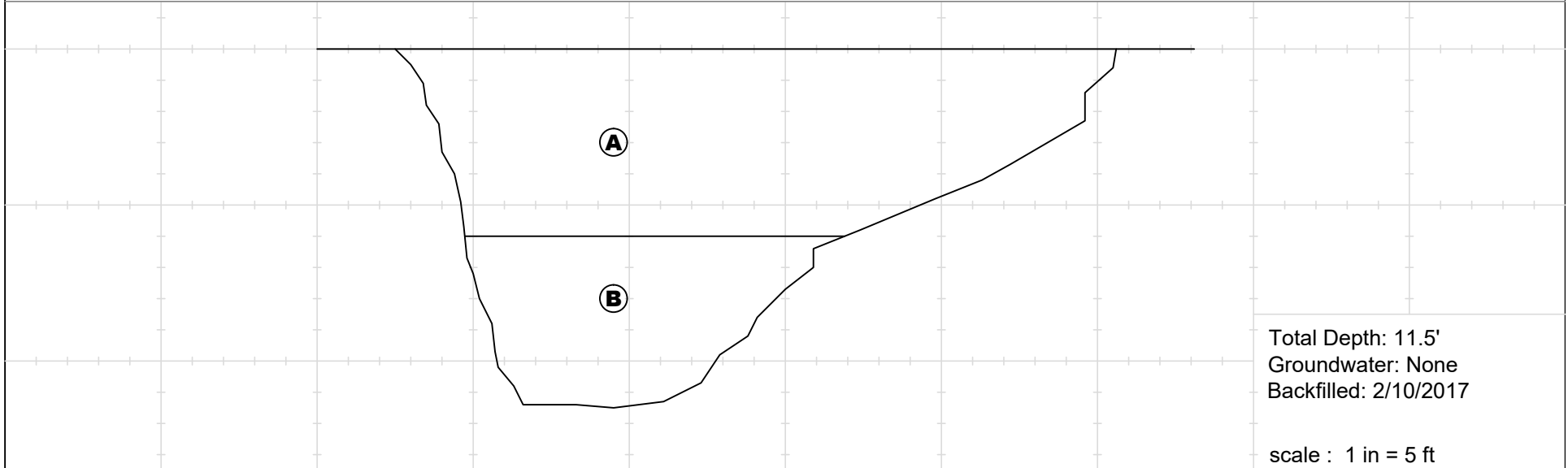
Total Depth: 8'
Groundwater: None
Backfilled: 2/10/2017


scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-16		
Project Number : 16159-01		Date : 2/10/2017	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 6' - Artificial Fill (Stockpile): @ 0' Silty SAND: brown, very moist, dense; scattered trash; roots; gravel; trace rock up to 1' diameter; "lifts" visible	Stockpile	SM	GB-1 @ 2-3'		
	B	@ 6' to T.D. - Quaternary Young Eolian Deposits (Qye): @ 6' Silty SAND: light brown to brown, slightly moist to moist, medium dense to dense; scattered gravel	Qye		GB-2 @ 8-9'		

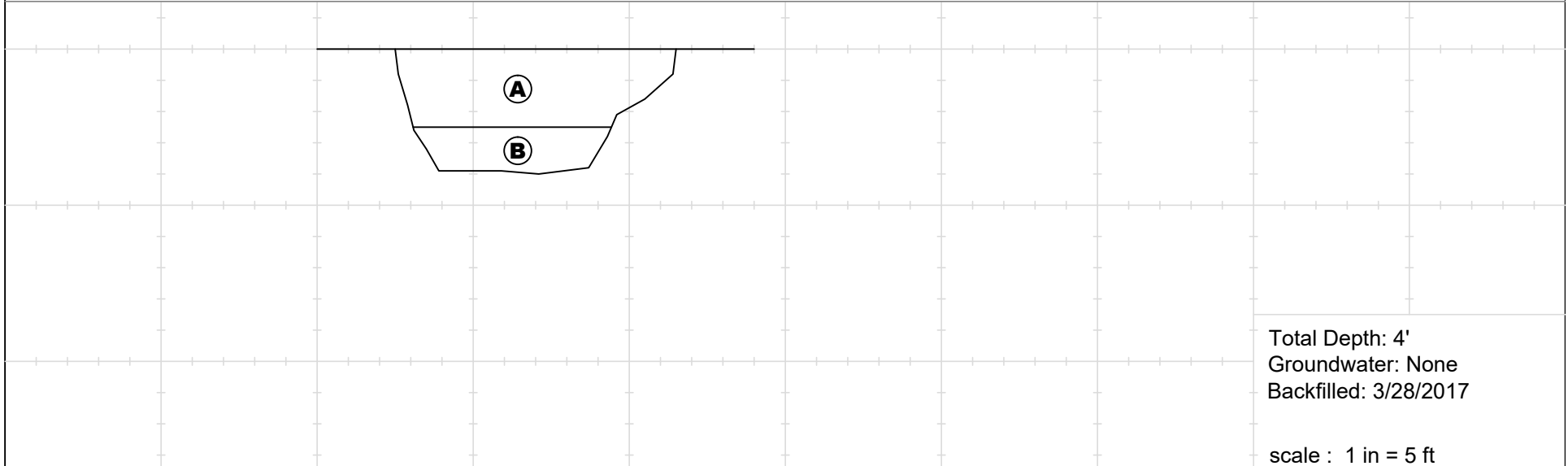
GRAPHICAL REPRESENTATION BELOW: **Elevation : 751 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



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			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 2.5' - Undocumented Artificial Fill (afu): @0' - Asphalt Concrete	Afu				
	B	@6" - Silty SAND: brown, moist, dense; trash; bones @2.5' to T.D. - Quaternary Young Eolian Deposits (Qye): @2.5' - SAND: gray brown, moist, medium dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 746 ' MSL** **Surface Slope: 0 deg.** **Trend: N60E**



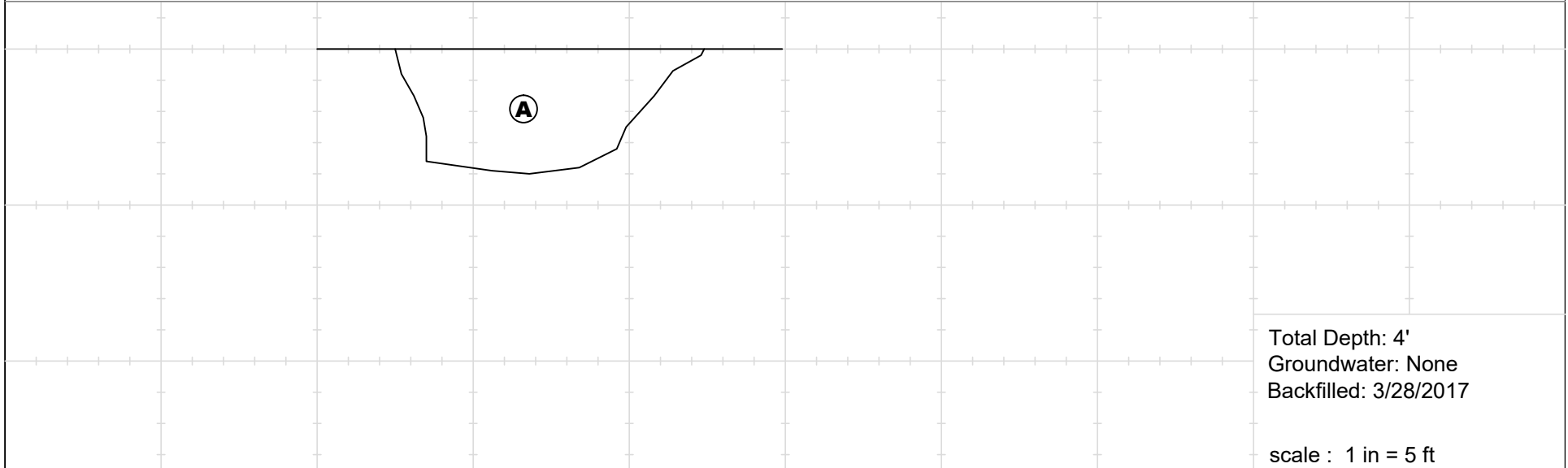
Total Depth: 4'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-18		
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 T.D. - Undocumented Artificial Fill (afu): @0' - Weeds; scattered trash @0' to T.D. - Silty fine SAND: light brown to brown, slightly moist to moist; abundant trash to 4'; trash concentrated in certain pockets, not homogeneous; bone fragments; medium dense; organic rich; odoriferous	Afu				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 740 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



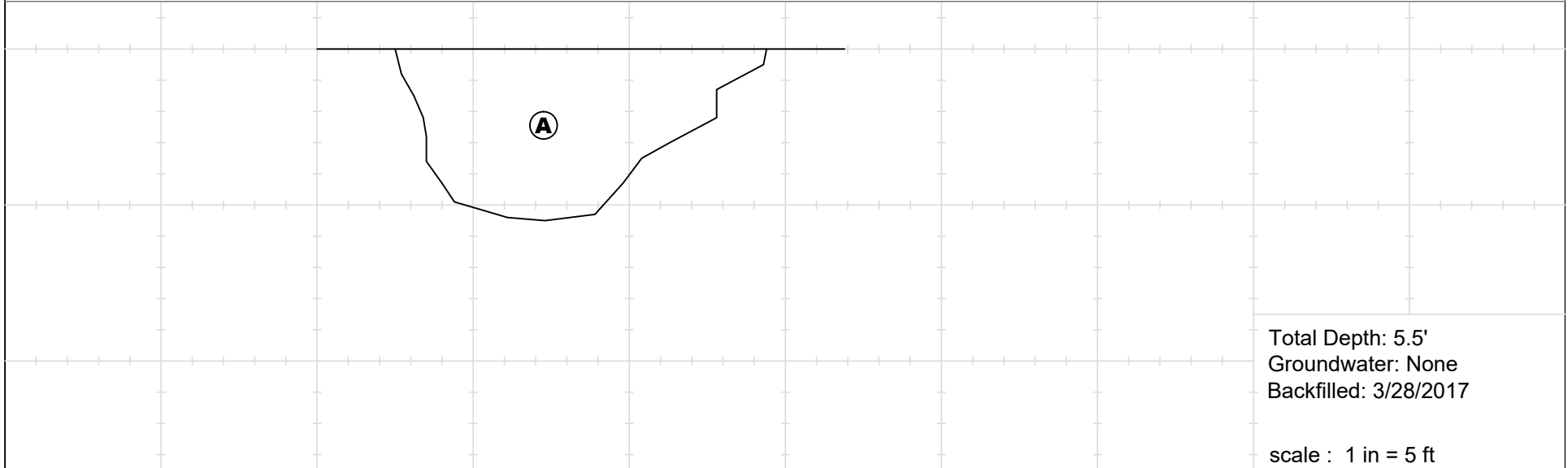
Total Depth: 4'
Groundwater: None
Backfilled: 3/28/2017


scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-19		
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 T.D. - Undocumented Artificial Fill (afu): @0' - Weeds @0' to T.D. - Sandy SILT to Silty SAND: brown, moist to wet, medium stiff to medium dense; trash in zones to 5.5'; splotches of black and gray; scattered bone fragments; organinc rich; odoriferous	Afu				

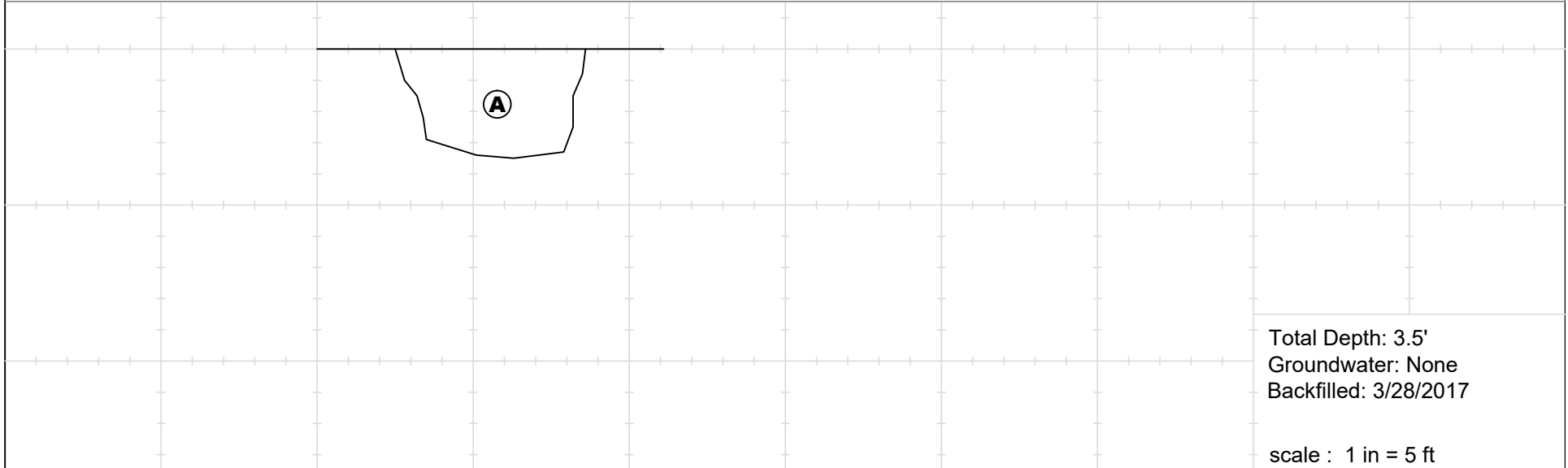
GRAPHICAL REPRESENTATION BELOW: **Elevation : 734 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-20		
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 T.D. - Undocumented Artificial Fill (afu): @0' - Weeds @0' to T.D. - Silty SAND: light brown and brown, moist, medium dense; scattered trash to 3.5'; organic rich, odoriferous	Afu				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



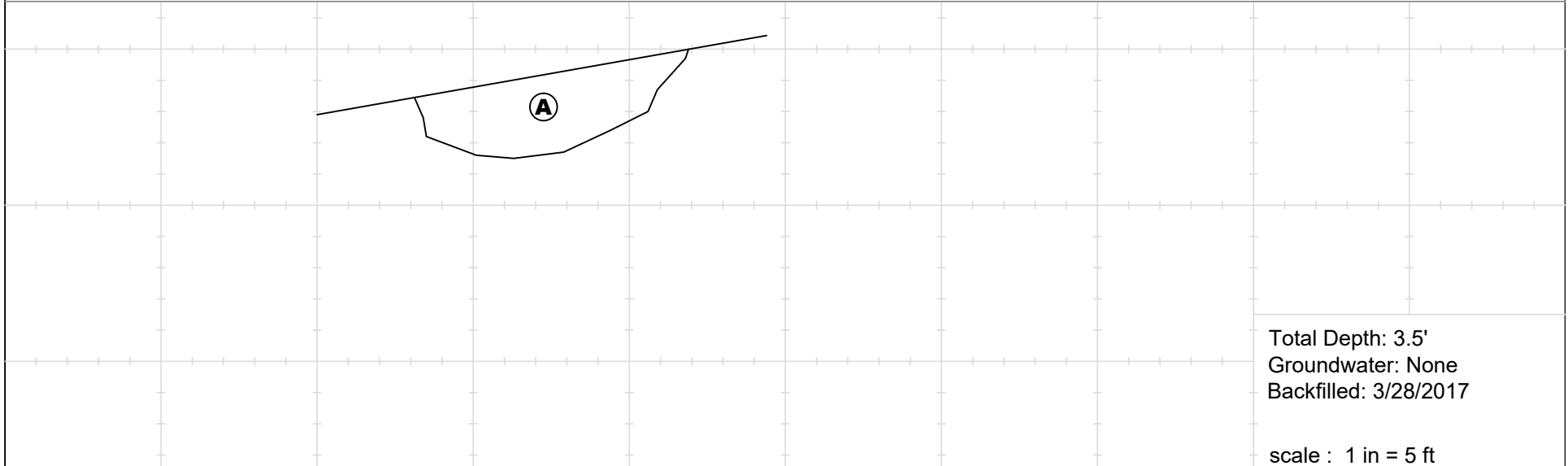
Total Depth: 3.5'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-21		
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 T.D. - Undocumented Artificial Fill (afu): @0' - Weeds @0' to 6" - SAND (Decomposed Granitic Sand) @6" - Silty SAND: light brown to brown, moist, medium dense; scattered gravel	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		
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 3' - Undocumented Artificial Fill (afu): @0' - Weeds	Afu				
	B	@0' to 3' - Silty SAND: brown to light brown with lifts of dark brown, moist, medium dense; abundant trash @3' to T.D. - Quaternary Young Eolian Deposits (Qye): @3' - Fine SAND: brown, moist, medium dense; scattered gravel; some iron oxide	Qye				

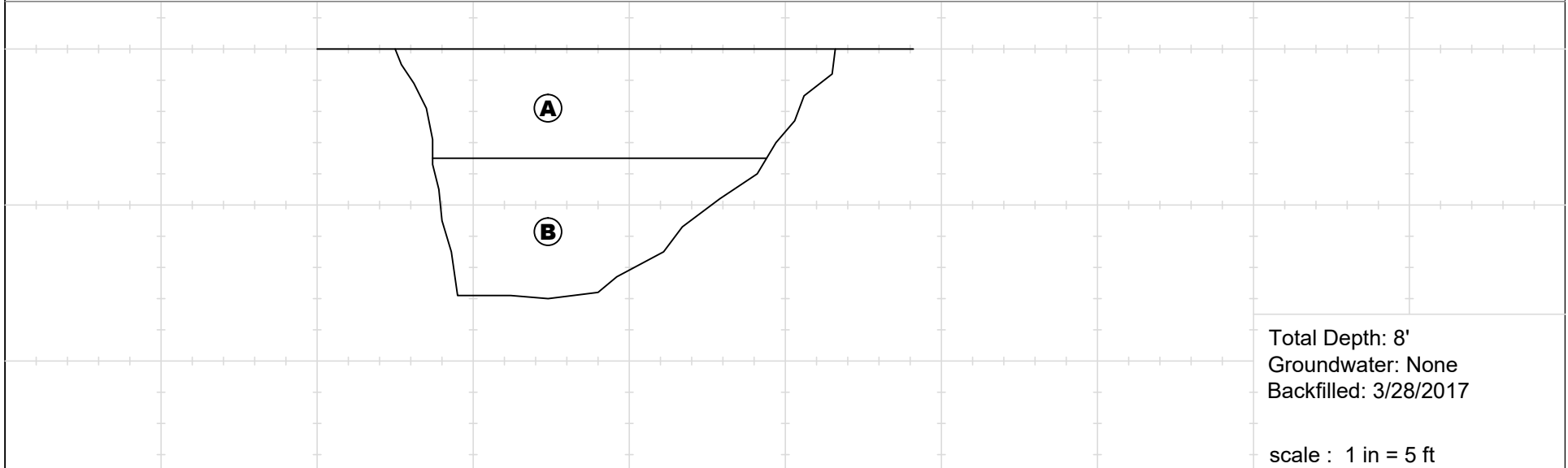
GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-23	
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 3.5' - Undocumented Artificial Fill (afu): @0' - Weeds @0' to 3.5' - SAND: brown, moist, medium dense; scattered trash; organic rich; odoriferous	Afu				
	B	@3.5' to T.D. - Quaternary Young Eolian Deposits (Qye): @3.5' - SAND: gray, moist, medium dense; odoriferous	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 738 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



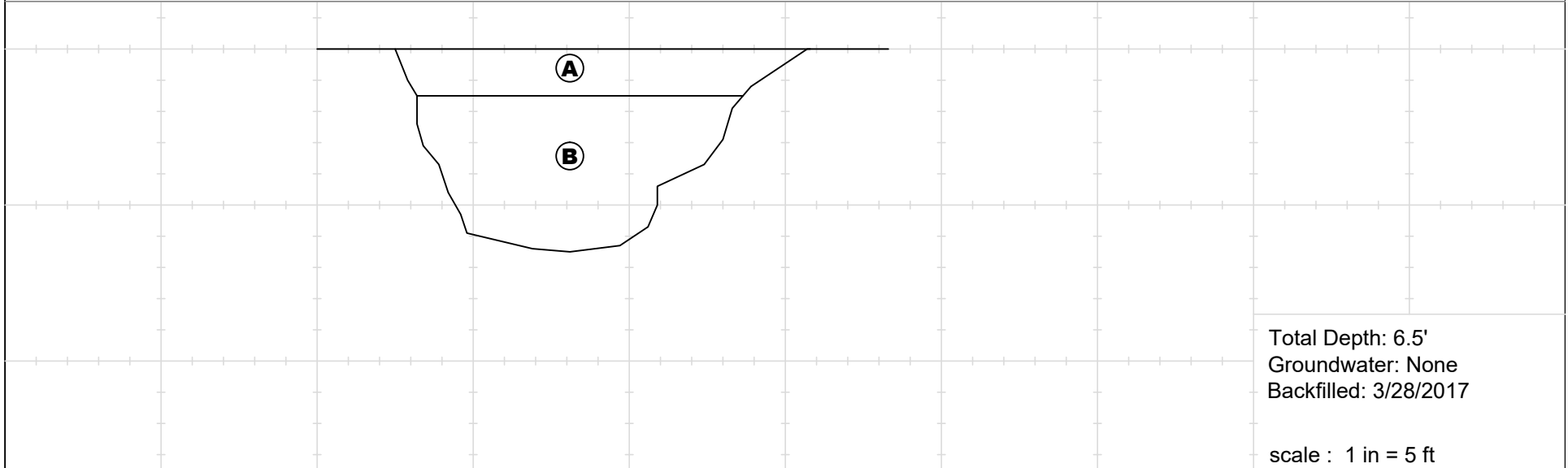
Total Depth: 8'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-24		
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 1.5' - Undocumented Artificial Fill (afu):	Afu				
		@0' - SILT: dark brown, slight moist, soft; manure; trash; odoriferous; slight indurated					
	B	@1.5' to T.D. - Quaternary Young Eolian Deposits (Qye):	Qye				
		@1.5' - SAND: gray, moist, medium dense; odoriferous; ammonia					

GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



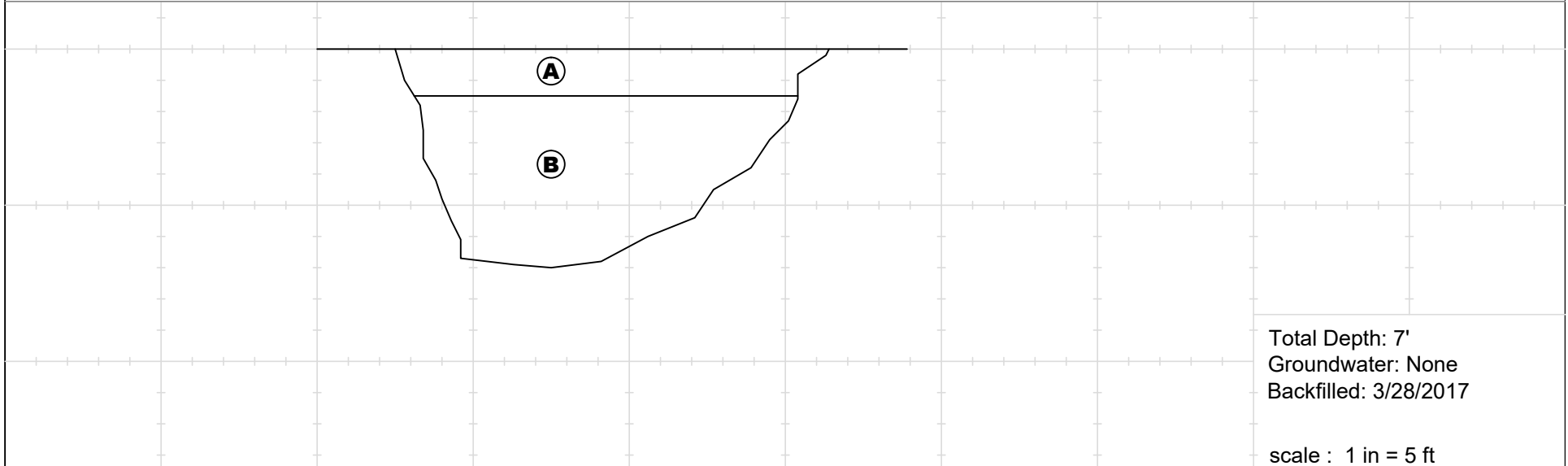
Total Depth: 6.5'
Groundwater: None
Backfilled: 3/28/2017


scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-25		
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 4' - Undocumented Artificial Fill (afu): @0' - WeedsSILT: dark brown, slight moist, soft; manure; trash; odoriferous; slight indurated	Afu				
	B	@0' to 4' - Sandy SILT: brown, moist, stiff; bone fragments; trash; odor; organics @4' to T.D. - Quaternary Young Eolian Deposits (Qye): @4' SAND: gray brown, moist, medium dense	Qye				

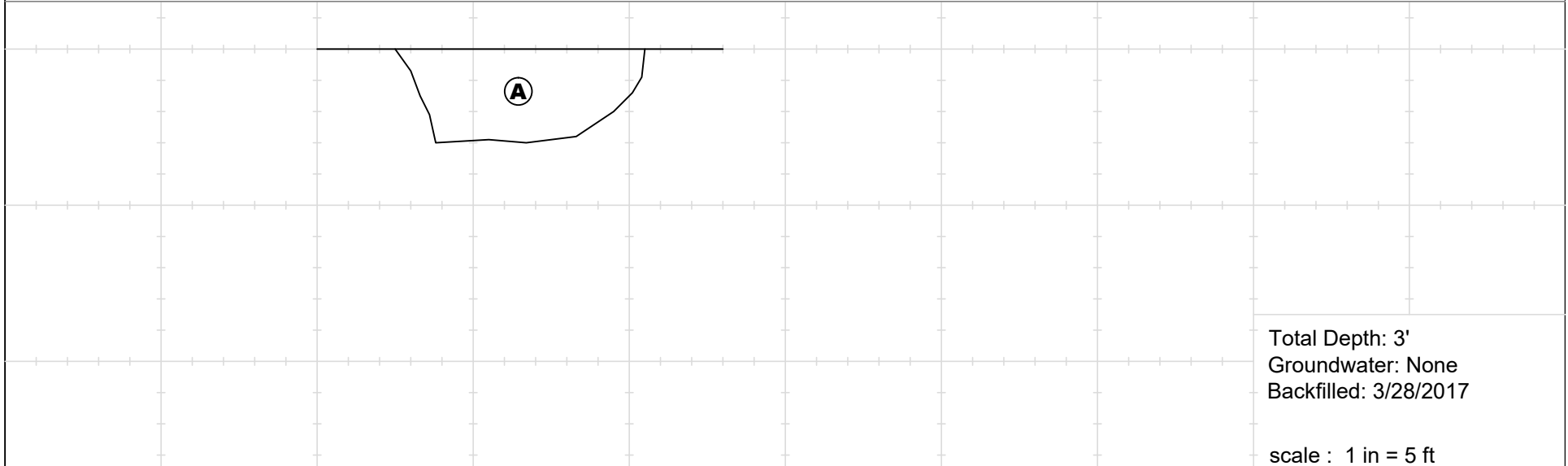
GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-26		
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 T.D. - Quaternary Young Eolian Deposits (Qye): @0' Silty SAND: dark brown, moist, medium dense; trash; organics; odoriferous; roots in upper 1'	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



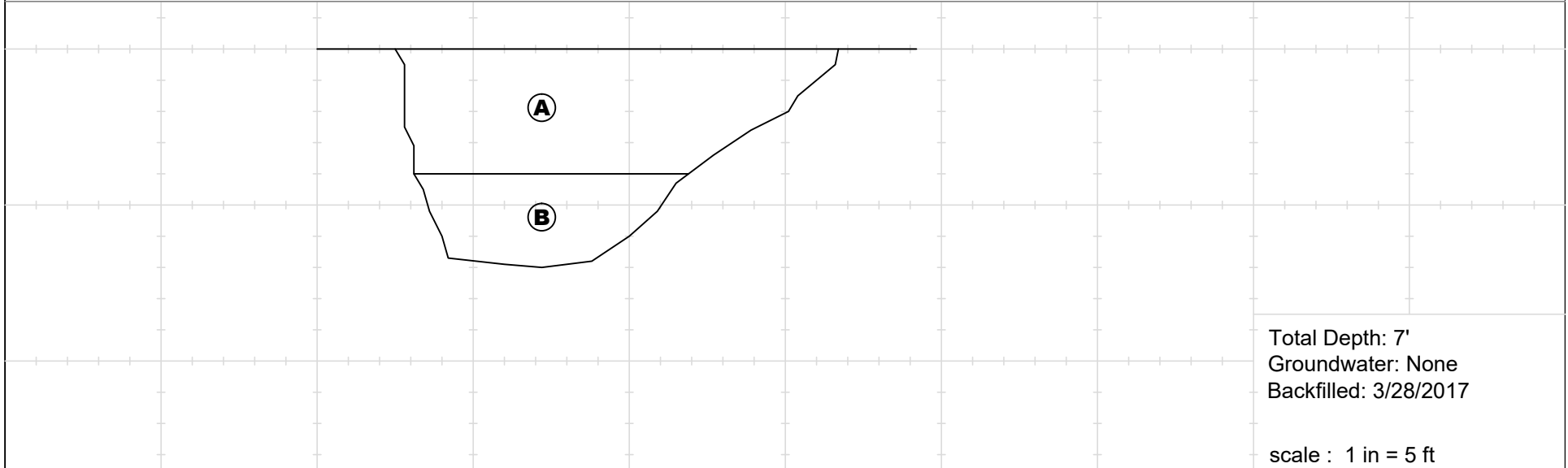
Total Depth: 3'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-27	
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 4' - Undocumented Artificial Fill (afu): @0' Weeds @0' to 4' - Silty SAND: brown and dark brown, moist, medium dense; trash; bones; organics; odor	Afu				
	B	@4' to 7' - Quaternary Young Eolian Deposits (Qye): @4' - SAND: gray brown, moist, medium dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



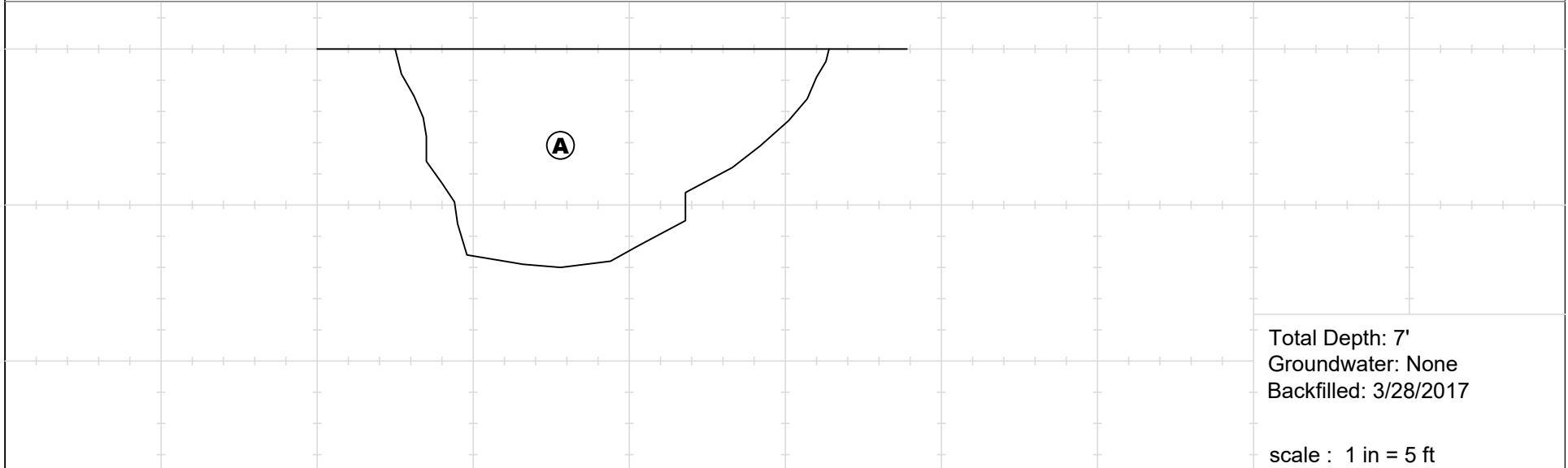
Total Depth: 7'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-28	
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 T.D. - Quaternary Young Eolian Deposits (Qye): @0' - Grass @0' to T.D. - SAND with Silt: light brown, moist, medium dense; roots in upper 6"; pores until 2'	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 740 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



Total Depth: 7'
Groundwater: None
Backfilled: 3/28/2017

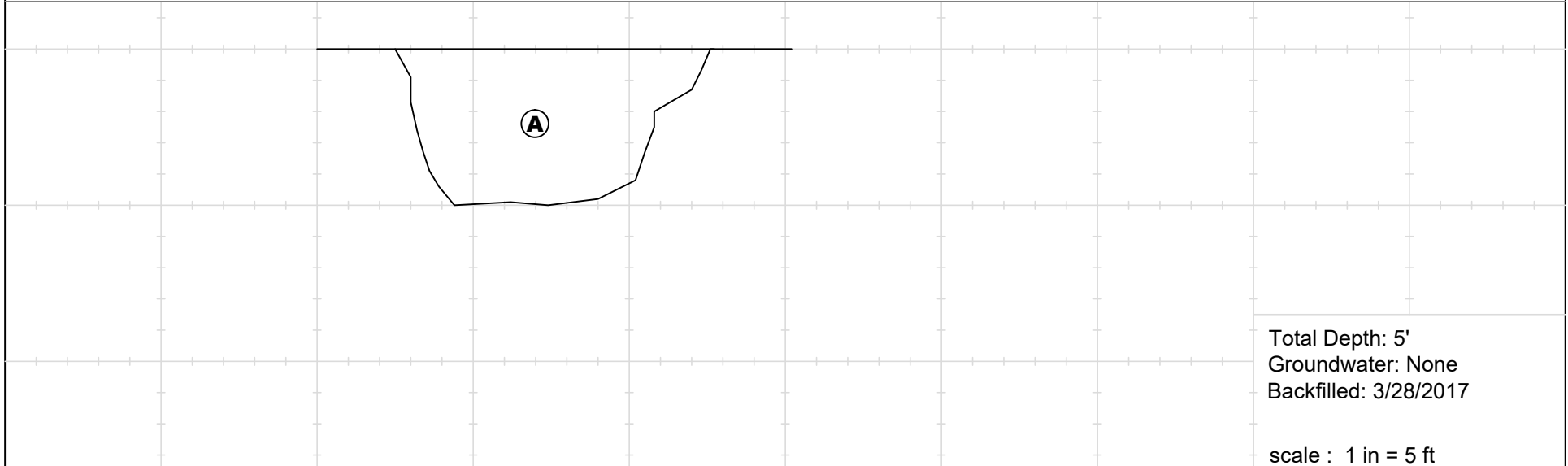
scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-29	
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 T.D. - Quaternary Young Eolian Deposits (Qye): @0' - SAND; light brown, slight moist, medium dense; friable (caving)	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 744 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



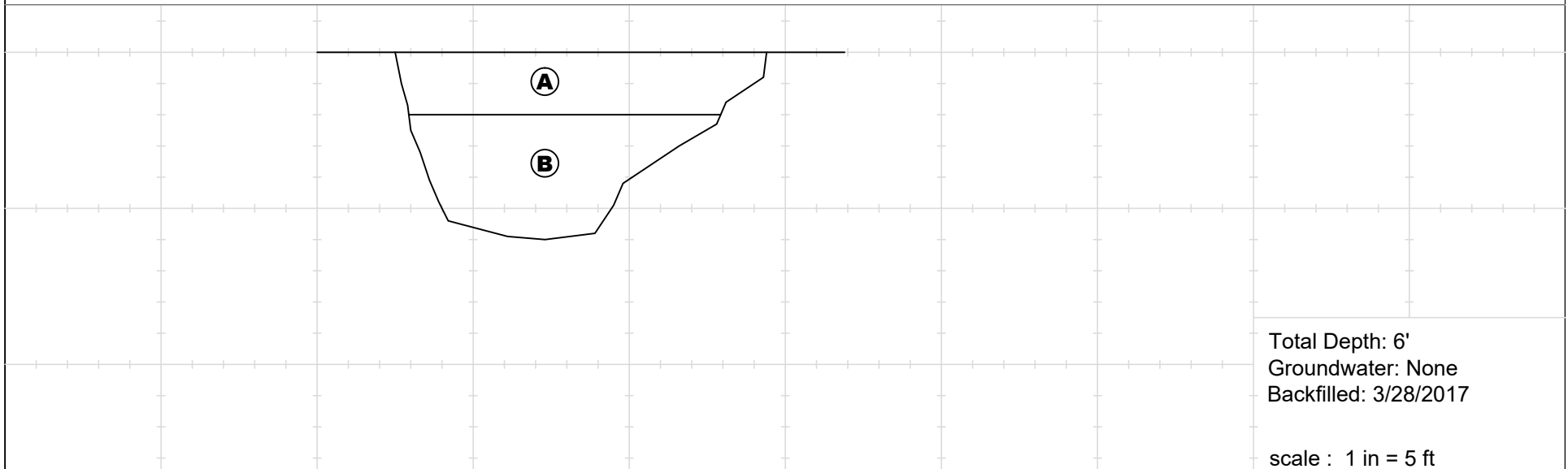
Total Depth: 5'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North	Logged By: CNJ	Trench No: TP-30	
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 Artificial Fill (afu): @0' - 3" Asphalt @3" - Silty SAND: brown, moist, dense; trash, bone fragments	Afu				
	B	@2' to T.D. - Quaternary Young Eolean Deposits (Qye): @2' - SAND: brown, moist, medium dense to dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 742 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



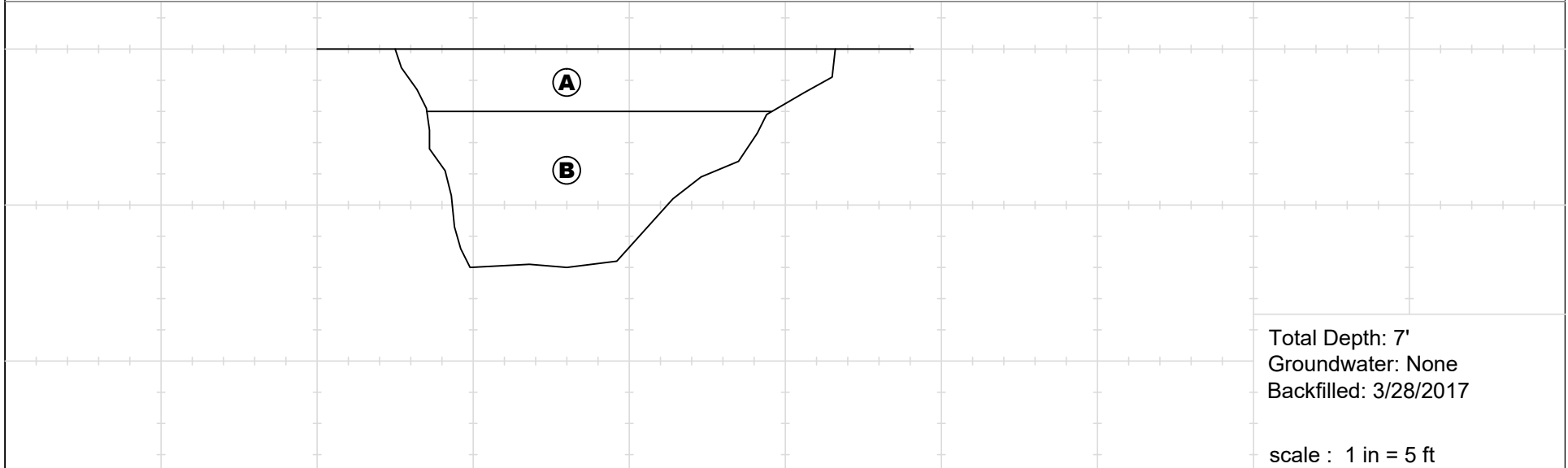
Total Depth: 6'
Groundwater: None
Backfilled: 3/28/2017


scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-31		
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 Artificial Fill (afu):	Afu				
		@0' - Silty SAND: light brown, slightly moist, very dense; trash; bone fragments					
	B	@2' to T.D. - Quaternary Young Eolean Deposits (Qye):	Qye				
		@2' - SAND: light brown, moist, medium dense					

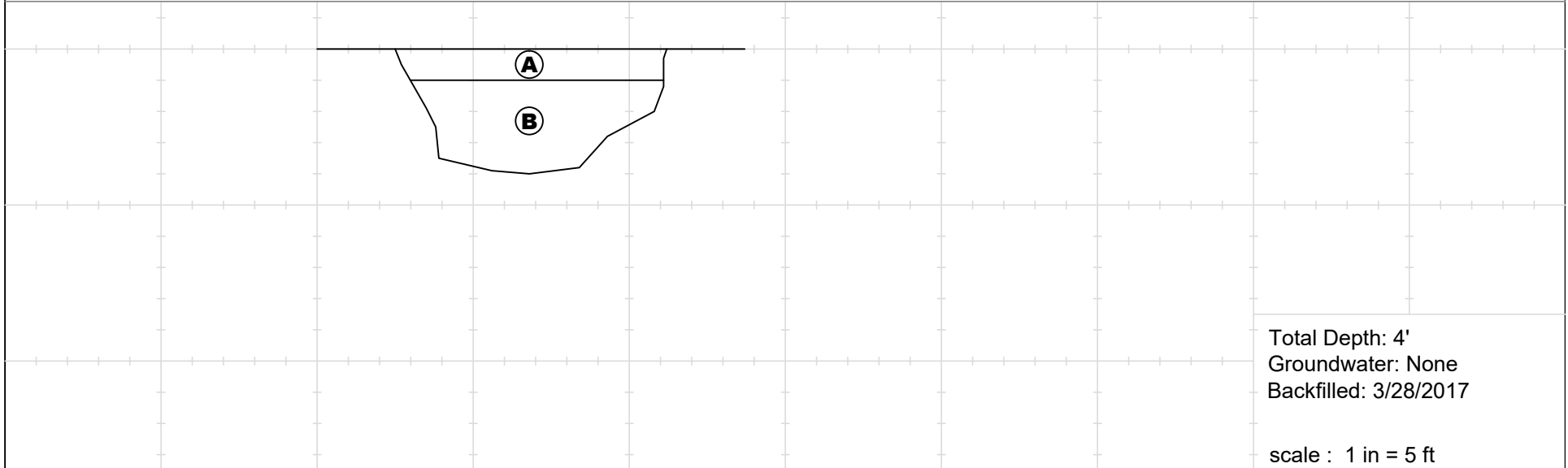
GRAPHICAL REPRESENTATION BELOW: **Elevation : 748 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



Project Name: Regions North		Logged By: CNJ	Trench No: TP-32		
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 1' - Undocumented Artificial Fill (afu): @0' - Silty SAND: light brown, dry, loose; rootlets; trash	Afu				
	B	@1' to T.D. - Quaternary Young Eolean Deposits (Qye): @1' - SAND: light brown, moist, medium dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 746 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



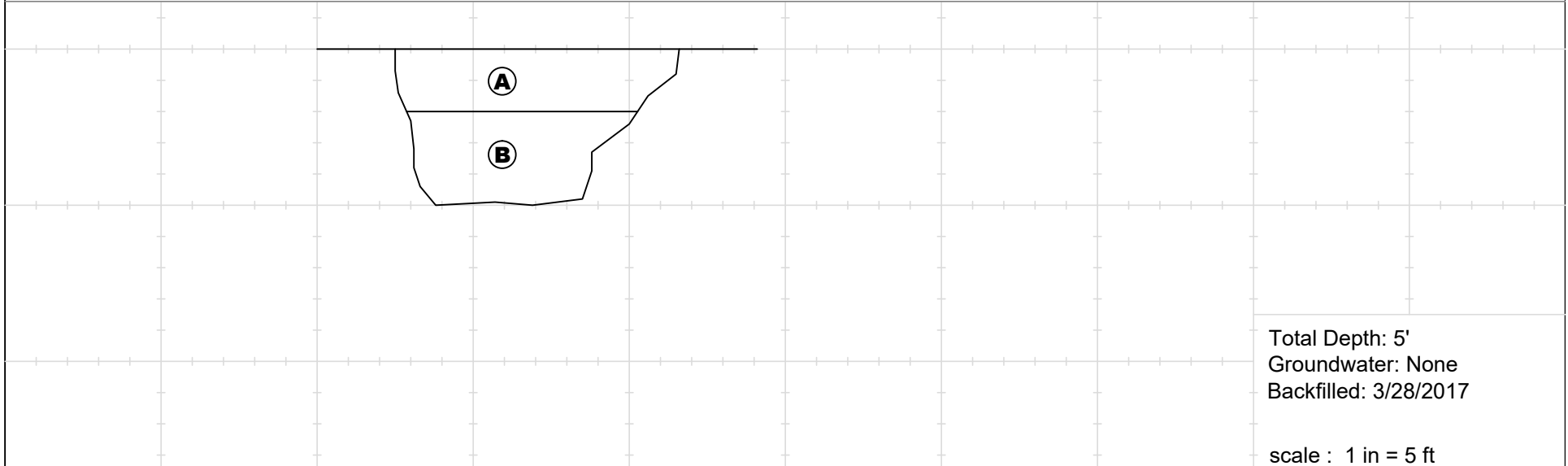
Total Depth: 4'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 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			


Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@0' to 2' - Undocumented Artificial Fill (afu): @0' - Silty SAND: light brown, slightly moist, dense; trash; bones	Afu				
	B	@2' to T.D. - Quaternary Young Eolean Deposits (Qye): @2' - SAND: brown, moist, medium dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 746 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



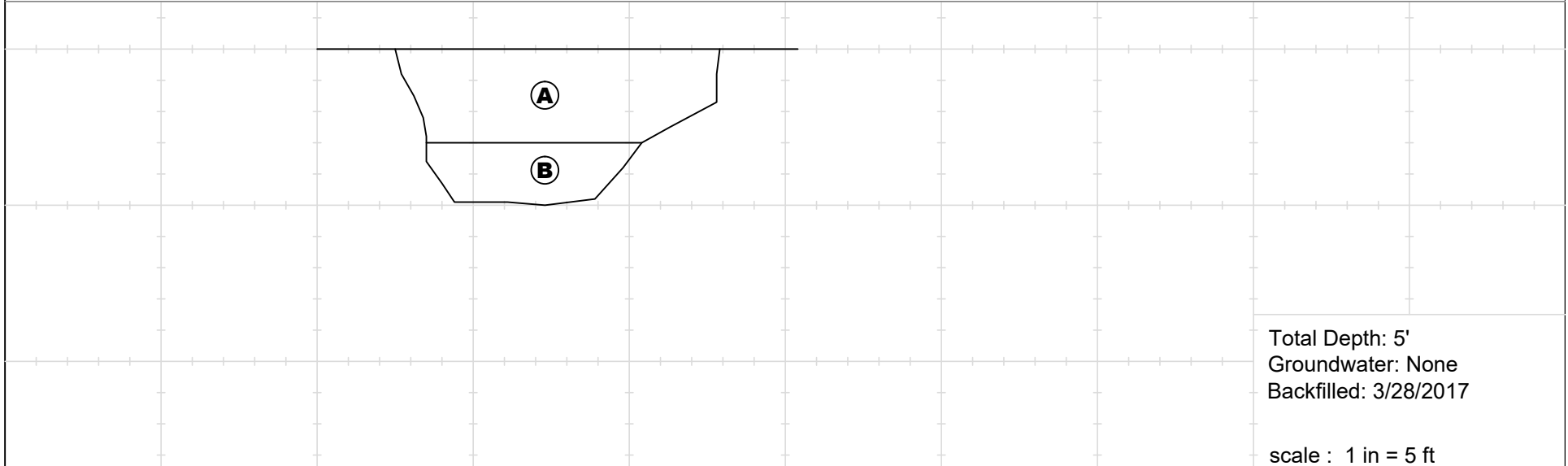
Total Depth: 5'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-34	
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 3' - Undocumented Artificial Fill (afu): @0' - 6" thick asphalt	Afu				
	B	@6" - Silty SAND: dark brown, moist, dense to medium dense; trash; bones; odoriferous; organics @3' to T.D. - Quaternary Young Eolean Deposits (Qye): @3' - SAND: brown, moist, medium dense	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 746 ' MSL** **Surface Slope: 0 deg.** **Trend: NS**



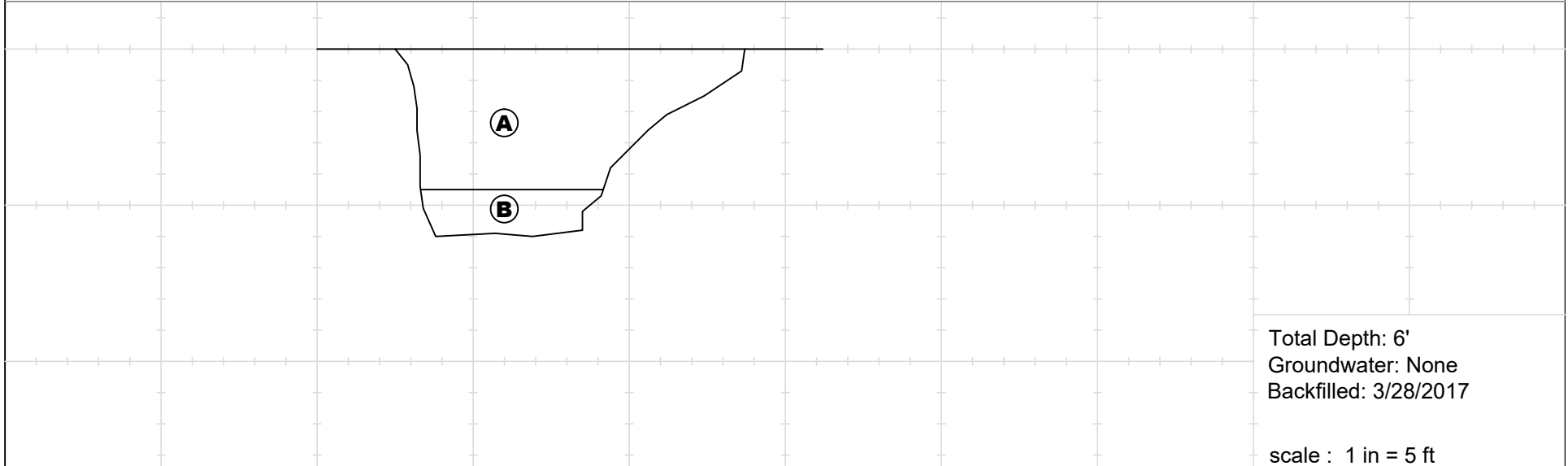
Total Depth: 5'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

Project Name: Regions North		Logged By: CNJ	Trench No: TP-35		
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 4.5' - Undocumented Artificial Fill (afu): @0' - Silty SAND: brown, moist, medium dense; some trash; scattered bones; organic smell	Afu				
	B	@4.5' to T.D. - Quaternary Young Eolean Deposits (Qye): @4.5' - SAND with Gravel: light gray, dry, dense; lacks cementation; rounded gravels	Qye				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 745 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**



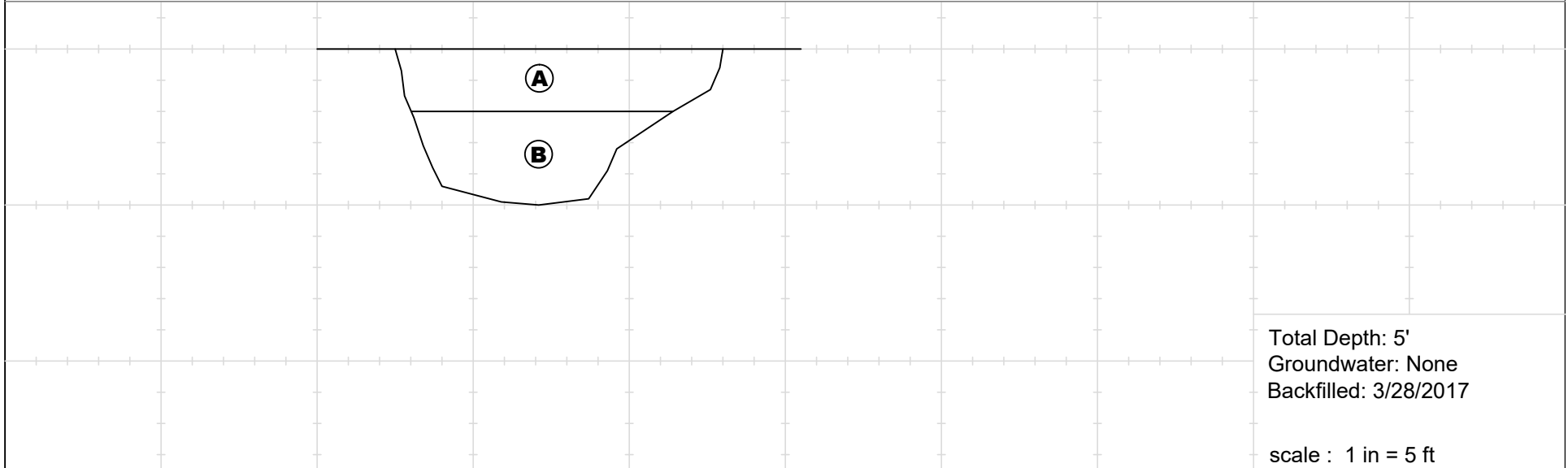
Total Depth: 6'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

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 Artificial Fill (afu):	Afu				
		@0' - Silty SAND: dark brown, moist, loose to medium dense; trash; bones; organic smell					
	B	@2' to T.D. - Quaternary Young Eolean Deposits (Qye):	Qye				
		@2' - SAND: gray brown motled, moist, medium dense; iron oxide					

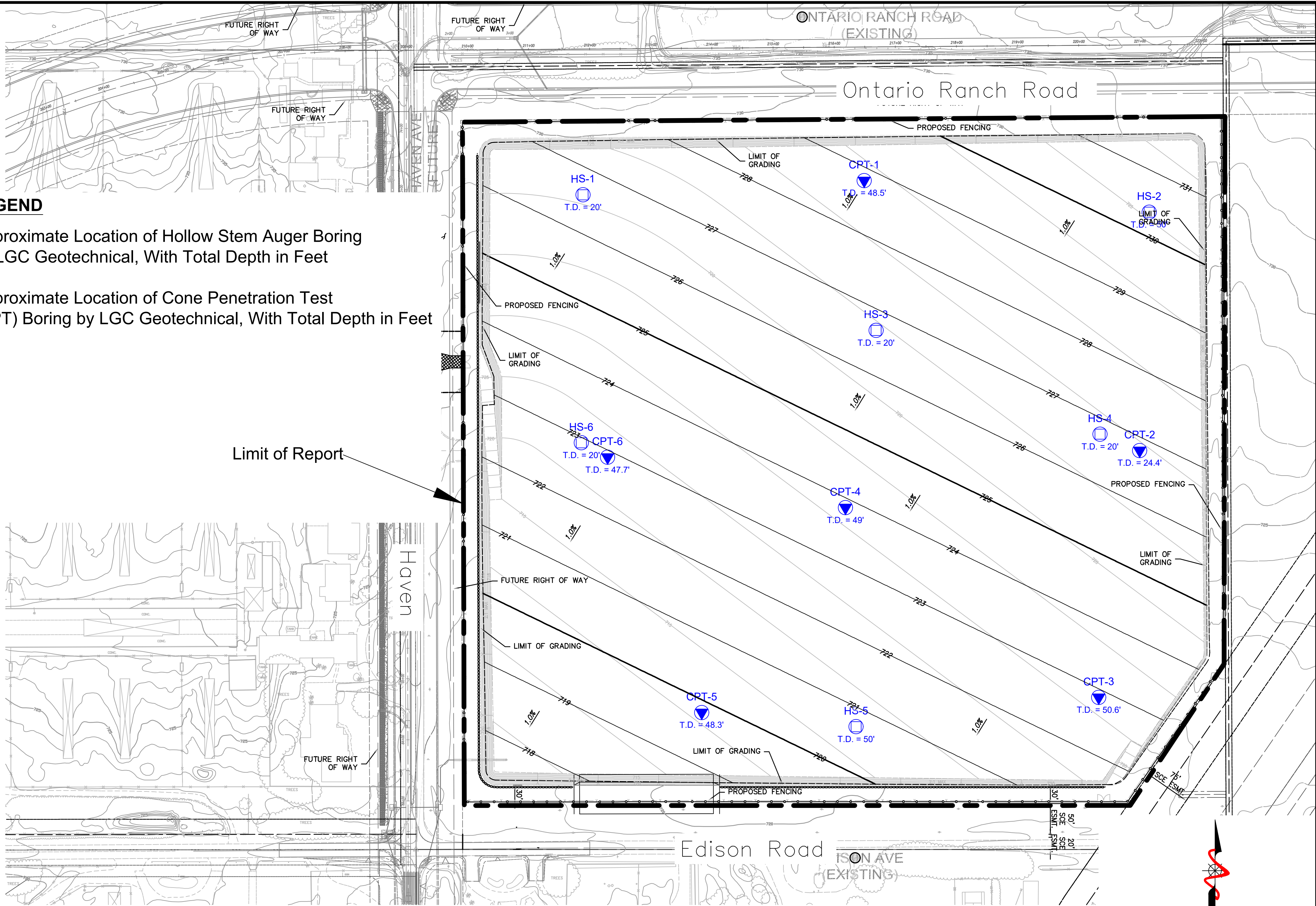
GRAPHICAL REPRESENTATION BELOW: **Elevation : 749 ' MSL** **Surface Slope: 0 deg.** **Trend: EW**





Total Depth: 5'
Groundwater: None
Backfilled: 3/28/2017

scale : 1 in = 5 ft

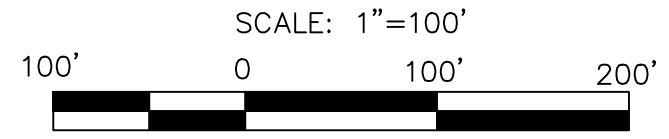
Appendix H
Geotechnical Subsurface Evaluation Data –
Regions South (16158-01)



LEGEND

- 
HS-6
 T.D. = 20'
 Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet
- 
CPT-6
 T.D. = 47.7'
 Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet

Limit of Report



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

Geotechnical Map

PROJECT NAME	Regions South	SHEET 1 of 1
PROJECT NO.	16158-01	
ENG. / GEOL.	BJE/KTM	
SCALE	1" = 100'	
DATE	June 2017	

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

*Per Chapter 18 of the 2007 C.B.C.; ASTM D 4829 Section 5.3

Collapse /Swell Potential: 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.

Chloride Content: 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	pH	Minimum Resistivity (ohms-cm)
HS-4 @ 5-7.5 feet	7.43	1000

Soluble Sulfates: 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

Geotechnical Boring Log Borehole LGC-HS-1

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Quaternary Young Eolian Deposits (Qye):	
		B-1	R-1	5 8 11	104.2	6.4	SP	@2.5' - SAND: brown, medium dense, moist, poorly graded	
720	5		SPT-1	4 4 7		20.6	SM	@5' - Sandy SILT: brownish grey, medium dense, moist	
		B-2	R-2	9 10 18	110.9	6.2		@10' - Silty SAND: brown, medium dense, moist	
710	15		SPT-2	11 10 11		6.7	SP	@15' - SAND: light brown, medium dense, moist, poorly graded	
705	20		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								
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-2

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Logged By SHH Sampled By SHH Checked By BJE	
								Quaternary Young Eolian Deposits (Qye):	
		B-1	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	CO
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								





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	TEST TYPES: 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
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Geotechnical Boring Log Borehole LGC-HS-2

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2



Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		SPT-4	13 17 24		10.1	SM	@30' - Silty SAND with gravel: brown, very dense, moist	
695	35		R-4	11 28 37	121.7	10.4	SP	@35' - SAND: orangish brown, very dense, moist, poorly graded	
690	40	B-3	SPT-5	4 7 9		17.5	ML	@40' - SILT: brown, medium dense, moist	
685	45		R-5	11 33 45	123.9	12.7	SM	@45' - Silty SAND: orangish brown, very dense, moist	
680	50		SPT-6	5 8 12		13.8		@50' - Silty SAND: orangish brown, medium dense, moist	
								Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 5/8/2017	
675	55								
	60								

	<p>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.</p>	<p>SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES: 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</p>
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Geotechnical Boring Log Borehole LGC-HS-3

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~723' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1



Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Logged By SHH Sampled By SHH Checked By BJE	
	720	B-1	R-1	8 8 11	101.5	24.2	ML	<u>Quaternary Young Eolian Deposits (Qye):</u> @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 4 9	115.0	12.6		@10' - SILT with Sand: gray to orangish brown, moist, medium dense	CO
	710								
	15		SPT-2	5 8 14		7.0	SP	@15' - SAND: orangish brown, medium dense, moist, poorly graded	
	705								
	20		R-3	7 14 28	118.9	13.2	SM	@20' - Silty SAND: orangish brown, dense, moist	
	700							Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 5/8/2017	
	25								
	695								
	30								

	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	TEST TYPES: 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
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Geotechnical Boring Log Borehole LGC-HS-4

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Logged By SHH Sampled By SHH Checked By BJE	
								Quaternary Young Eolian Deposits (Qye):	
			SPT-1	4 5 7		7.5	SP	@2.5' - SAND: greyish brown, medium dense, moist, poorly graded	
720	5	B-1	R-1	8 9 13	90.4	31.7	SC	@5' - Clayey SAND: greyish brown, medium dense, moist	EI, CR
715	10	B-2	SPT-2	3 4 7		20.2	ML	@10' - Sandy SILT: brown, medium dense, moist	
710	15		R-2	2 18 25	115.9	8.1	SP	@15' - SAND: dark brown, dense, moist, poorly graded	
705	20		SPT-3	3 6 11		23.6	ML	@20' - Sandy SILT: brown, medium dense, moist	#200
700	25							Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 5/8/2017	
	30								

	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	TEST TYPES: 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
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Geotechnical Boring Log Borehole LGC-HS-5

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~720' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Quaternary Young Eolian Deposits (Qye):	
715	2.5	B-1	R-1	10 16 20	101.0	22.0	ML	@2.5' - Sandy SILT: grey, medium dense, moist	
	5		SPT-1	4 4 6		31.1		@5' - SILT: gray, medium dense, moist	
710	10		R-2	6 12 10	112.5	7.1	SP	@10' - SAND: orangish brown, medium dense, moist, poorly graded	
	15	B-2							
705	15		SPT-2	4 4 5		15.1	SM	@15' - Silty SAND: grayish brown, medium dense, moist	#200
700	20		R-3	10 16 23	123.5	12.2		@20' - Silty SAND: orangish brown, dense, moist	
695	25		SPT-3	5 9 14		22.9	ML	@25' - Sandy SILT: brown, medium dense, moist	
	30								





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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole LGC-HS-5

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~720' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-4	10 18 32	124.5	11.8	SP	@30' - SAND: orangish brown, dense, moist, poorly graded	
690	35		SPT-4	4 8 13		18.0	ML	@35' - Sandy SILT: light brown, medium dense, moist	#200
685	40	B-3	R-5	8 18 29	117.1	15.9	SC	@40' - Clayey SAND: orange, dense, moist	
680	45		SPT-5	11 15 19		9.9	SM	@45' - Silty SAND: orangish brown, dense, moist	
675	50		R-6	25 32 40	116.0	12.3	SP	@50' SAND: orangish brown, very dense, moist, poorly graded	
670	55							Total Depth = 50' Groundwater Not Encountered Backfilled with Cuttings on 5/8/2017	
	60								

	<p>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.</p>	<p>SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p> <p>TEST TYPES: 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</p>
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Geotechnical Boring Log Borehole LGC-HS-6

Date: 5/8/2017	Drilling Company: 2R Drilling
Project Name: Regions South	Type of Rig: CME
Project Number: 16158-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

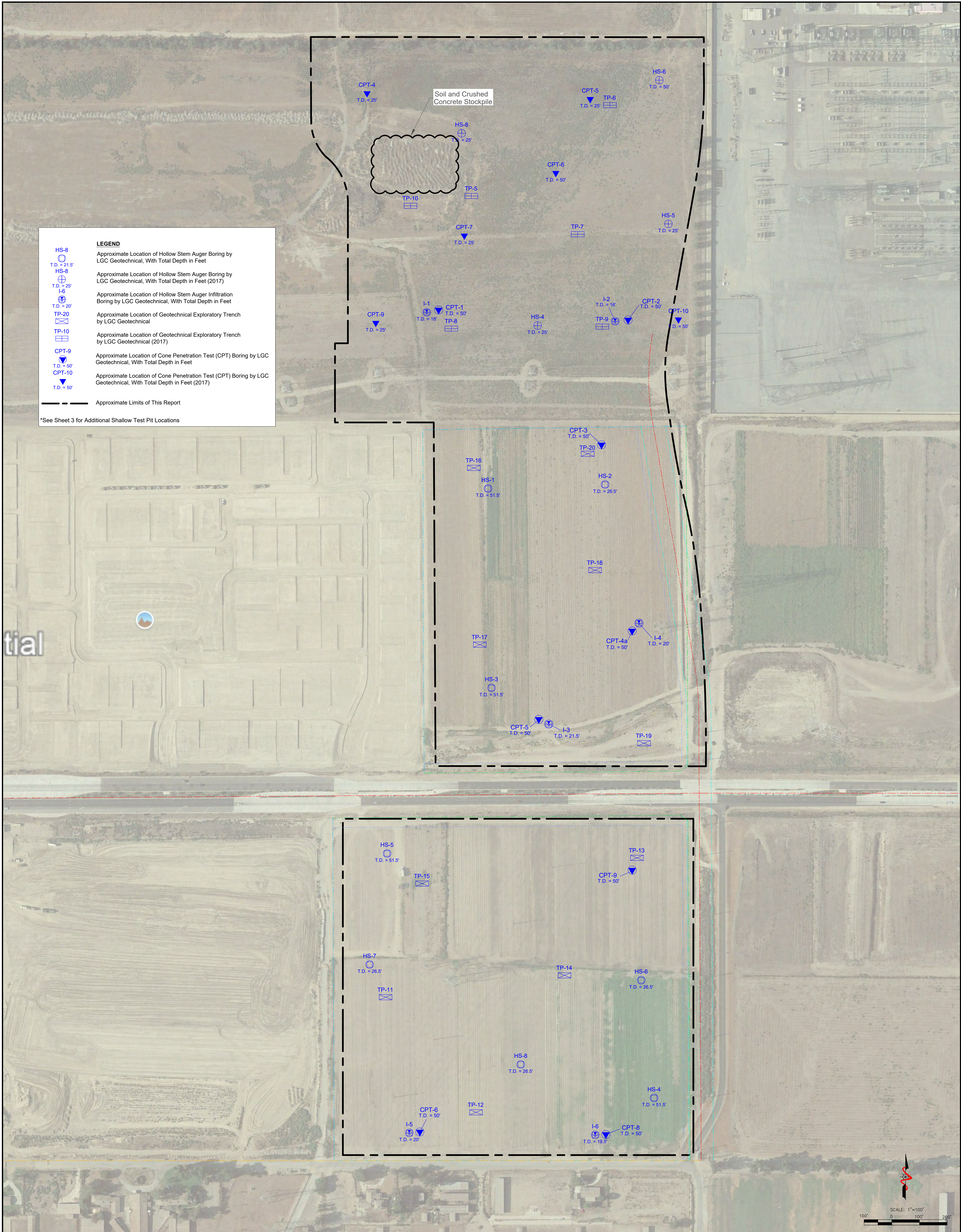
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							Logged By SHH Sampled By SHH Checked By BJE	
		Quaternary Young Eolian Deposits (Qye):							
		B-1	SPT-1	4 7		13.7	SM	@2.5' - Silty SAND: light brown, medium dense, moist	
720	5		R-1	4 8 9	101.9	22.3	ML	@5' - Sandy SILT: brown, medium dense, moist	
715	10		SPT-2	3 4 7		11.7	SM	@10' - Silty SAND: light brown, medium dense, moist	
710	15		R-2	8 11 13	110.4	16.6	ML	@15' - SILT with Sand: light brown, medium dense, moist	CO
705	20		SPT-3	8 12 13		5.5	SP	@20' - SAND: light brown, dense, moist, poorly graded	
								Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 5/8/2017	
	25								
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Appendix I
***Geotechnical Subsurface Evaluation Data – Mill
Creek Business Center/Randall (20220-01***



LEGEND

- HS-8
T.D. = 21.5'
○
Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet
- HS-8
T.D. = 25'
⊕
Approximate Location of Hollow Stem Auger Boring by LGC Geotechnical, With Total Depth in Feet (2017)
- I-6
T.D. = 20'
⊕
Approximate Location of Hollow Stem Auger Infiltration Boring by LGC Geotechnical, With Total Depth in Feet
- TP-20
⊗
Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical
- TP-10
⊗
Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical (2017)
- CPT-9
T.D. = 30'
▼
Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet
- CPT-10
T.D. = 50'
▼
Approximate Location of Cone Penetration Test (CPT) Boring by LGC Geotechnical, With Total Depth in Feet (2017)
- — — — —
Approximate Limits of This Report

*See Sheet 3 for Additional Shallow Test Pit Locations

tial

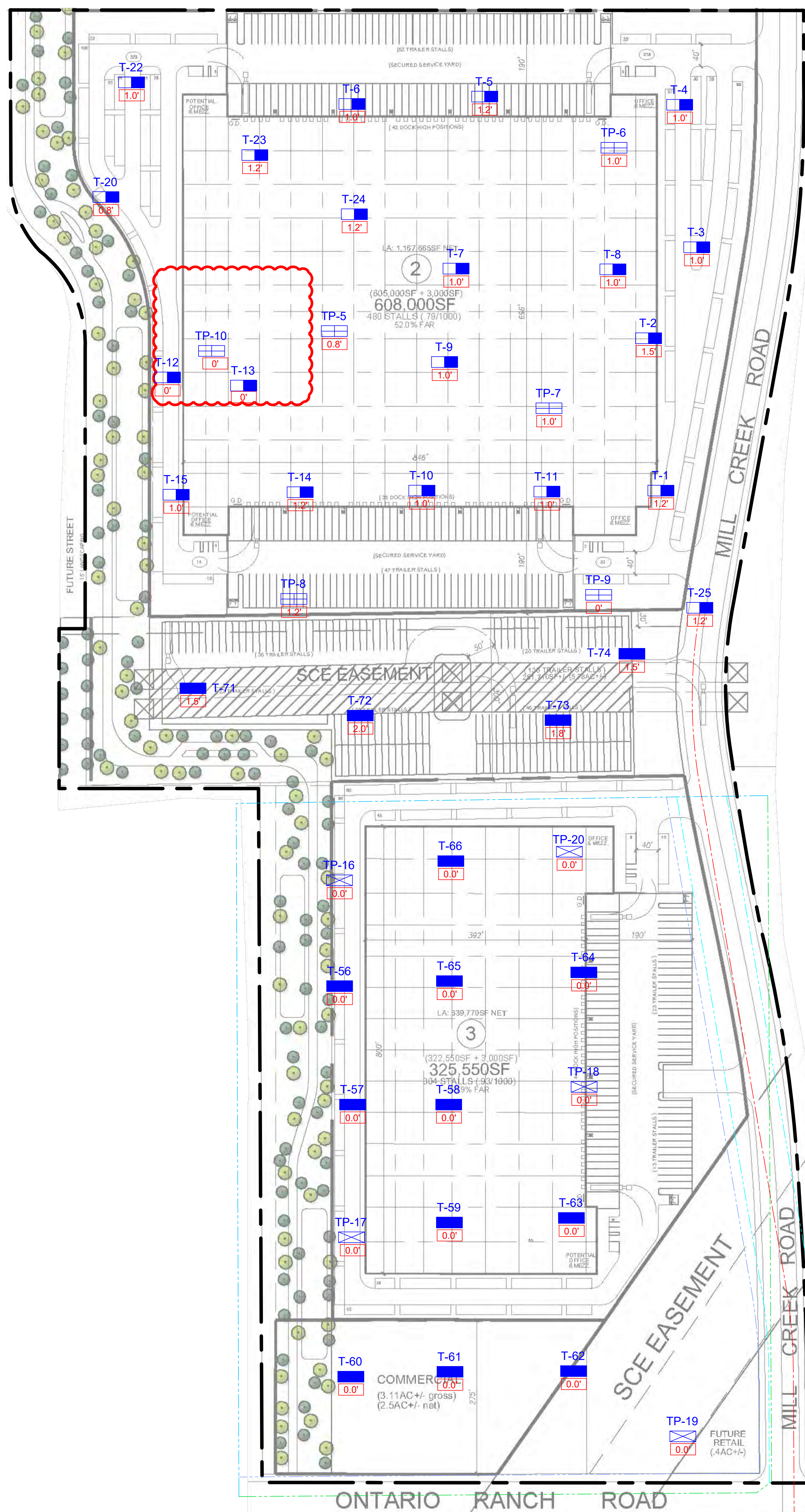
PROJECT NAME	Richland - MCBC
PROJECT NO.	20220-01
ENG. / GEOL.	RLD/ARN
SCALE	1" = 100'
DATE	June 2021

SHEET
1 of 3



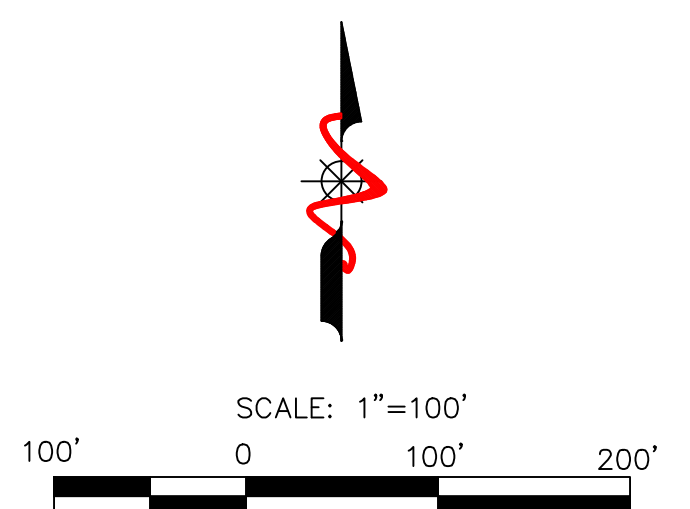
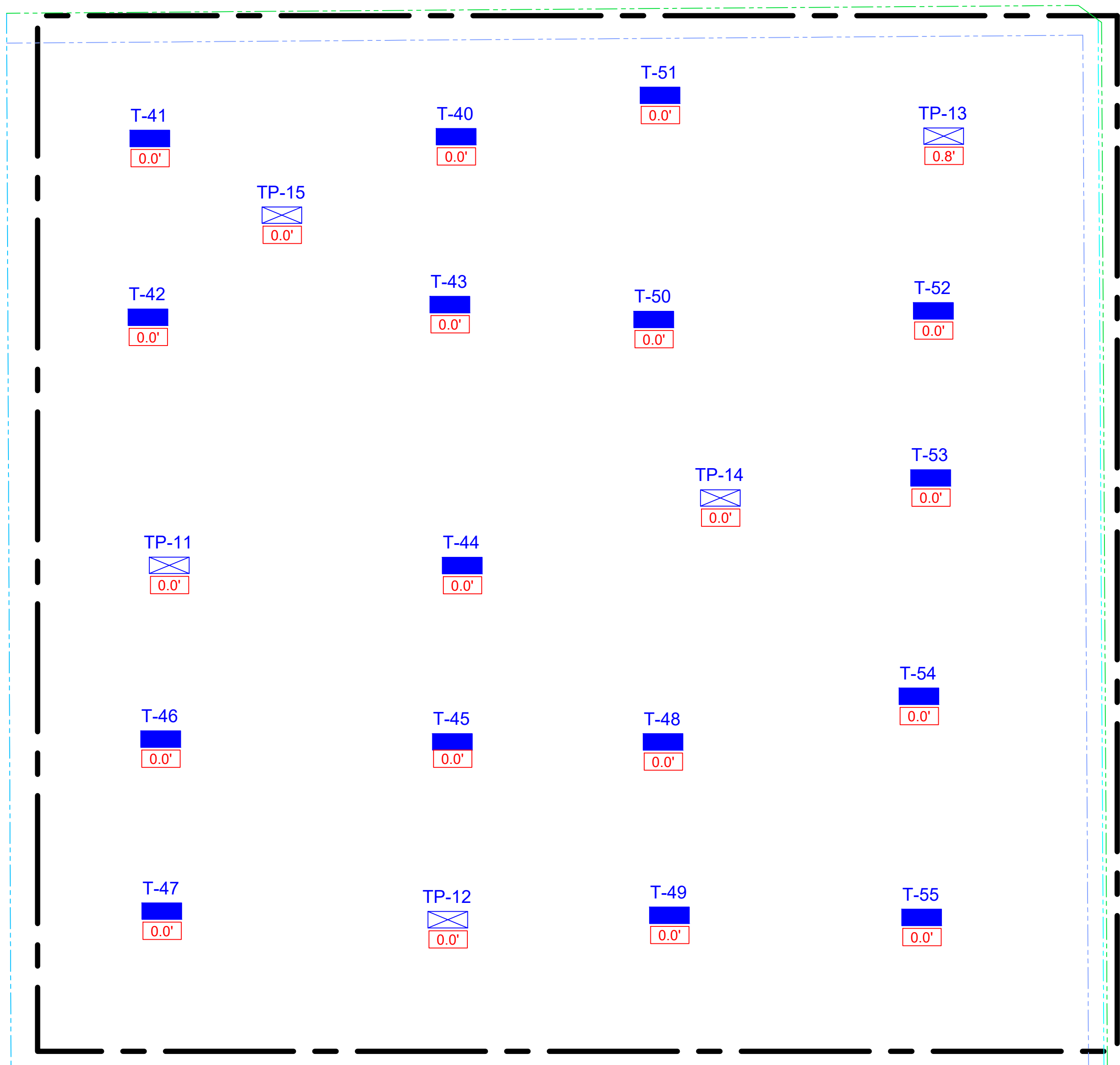
LGC Geotechnical, Inc.
131 Calle Iglesia, Ste. 200
San Clemente, CA 92672
TEL (949) 369-6141 FAX (949) 369-6142

**Geotechnical Exploration Location Map
With Satellite Image**



LEGEND

	Approximate Location of Shallow Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet
	Approximate Location of Shallow Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet (2017)
	Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet
	Approximate Location of Geotechnical Exploratory Trench by LGC Geotechnical with Estimated Minimum Depth of High Organic "Soil" to be Exported From the Site, in Feet (2017)
	Approximate Location of Waste Water Pond Requiring Additional Organic Haul-Off (Removal and Export Depths Estimated to be 5 feet)
	Approximate Limits of This Report



LGC Geotechnical, Inc.
 131 Calle Iglesia, Ste. 200
 San Clemente, CA 92672
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Recommended High Organic "Soil" Export Map

PROJECT NAME	Richland - MCBC	SHEET 3 of 3
PROJECT NO.	20220-01	
ENG. / GEOL.	RLD/ARN	
SCALE	1" = 100'	
DATE	June 2021	

TP-5 (0.8')*		TP-6 (1.0')*		TP-7 (1.0')		TP-8 (1.2')	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	9.8	0.8'	15.8	0.8'	13.7	0.8'	10.8
1.2'	0.6	1.2'	0.6	1.2'	0.9	1.2'	3.9
2'	0.5	2.2'	0.6	2.2'	0.4	2.2'	0.9
TP-9 (0')*		TP-10 (0')*		TP-11 (0')*		TP-12 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
1'	3.8	0.5'	1.5	0.4	2.8	1.0	2.0
1.5'	0.7	1.2'	1.0	1.5	0.9	1.4	0.9
2.5'	0.5	-	-	2.1	0.5	1.6	0.5
TP-13 (0.8')*		TP-14 (0')*		TP-15 (0')*		TP-16 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.6	6.1	0.7	2.8	0.4	2.0	0.2	2.0
1.6	1.9	1.1	2.1	1.0	2.5	1.1	1.6
2.0	0.8	1.5	0.9	1.8	0.2	1.4	0.6
7.4	0.7	2.4	0.3	3.0	0.7	-	-
TP-17 (0')*		TP-18 (0')*		TP-19 (0')*		TP-20 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.5	2.3	0.2	2.4	1.0	1.5	0.2	2.6
1.7	1.4	1.4	1.4	2.0	0.6	1.0	2.2
2.1	0.3	1.9	0.3	3.6	0.5	1.5	0.5
T-1 (1.2')*		T-2 (1.5')*		T-3 (1.0')*		T-4 (1.0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	6.0	1.2'	10.1	0.8'	11.4	1'	20.7
1.5'	0.9	1.8'	2.0	1.2'	1.3	1.5'	1.4
2'	0.4	2.2'	1.1	2.2'	0.8	2.5'	0.5
T-5 (1.2')*		T-6 (1.0')*		T-7 (1.0')*		T-8 (1.0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	6.8	0.8'	9.4	0.8'	9.9	0.8'	7.0
1.5'	0.3	1.5'	0.7	1.2'	0.3	1.2'	0.3
-	-	2.5'	0.5	2'	0.4	-	-
T-9 (1.0')*		T-10 (1.0')*		T-11 (1.0')*		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'	0.3	1.2'	1.5	1.2'	1.1	1.2'	0.4
2.5'	0.3	2.0	1.1	2'	0.5	2'	0.4
T-13 (0')*		T-14 (1.2')*		T-15 (1.0')*		T-20 (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'	0.5	1.8'	1.1	1.2'	0.8	1'	0.8
1.5'	0.5	2.2'	0.8	2'	0.5	1.5'	0.4
T-22 (1.0')*		T-23 (1.2')*		T-24 (1.2')*		T-25 (1.2')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.8'	9.8	1'	52.0	1'	40.7	1'	10.6
1.2'	2.0	1.4'	0.8	1.5'	1.9	1.5'	0.8
2'	0.4	-	-	2'	0.7	-	-
T-40 (0')*		T-41 (0')*		T-42 (0')*		T-43 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.5	2.2	0.5	2.4	.5'	2.5	.8'	1.8
1.5	1.7	1.4	0.8	1.6'	0.8	1.7'	1.0
1.8	0.6	1.8	0.4	2.8'	0.6	2.7'	0.3
T-44 (0')*		T-45 (0')*		T-46 (0')*		T-47 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.7	1.9	1.1	2.1	0.3	2.5	0.1	3.6
1.3	1.7	2.1	0.5	0.4	2.8	0.8	1.4
1.7	0.3	3.0	0.6	1.6	0.9	1.8	0.5
T-48 (0')*		T-49 (0')*		T-50 (0')*		T-51 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	2.9	0.5	2.8	0.6	2.9	0.8	2.0
1.5	2.0	1.7	1.5	1.3	2.0	1.3	1.4
2.1	0.6	2.2	0.7	2.0	0.8	2.1	0.5
T-52 (0')*		T-53 (0')*		T-54 (0')*		T-55 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.6	1.9	0.7	2.7	0.5	2.4	0.7	2.7
1.2	2.9	1.6	1.4	1.0	1.3	1.0	1.2
1.8	0.6	1.9	0.7	2.0	0.8	1.4	0.8
T-56 (0')*		T-57 (0')*		T-58 (0')*		T-59 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	2.0	0.2	2.5	0.2	2.3	0.2	2.4
1.4	1.2	0.7	1.9	0.8	2.3	1.7	1.7
1.7	0.7	1.2	0.4	1.2	0.7	2.1	0.6
T-60 (0')*		T-61 (0')*		T-62 (0')*		T-63 (0')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.1	2.7	0.2	2.3	0.3	2.4	0.2	2.5
0.5	2.4	1.1	1.9	1.2	2.7	1.1	1.8
0.7	0.6	1.5	0.3	2.0	0.4	1.6	0.5
T-64 (0')*		T-65 (0')*		T-66 (0')*		T-71 (1.5')*	
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics
0.2	2.4	0.2	2.4	0.2	2.4	0.2	7.6
1.5	2.0	1.0	0.8	1.1	1.3	1.2	12.1
2.0	0.5	2.0	0.5	1.5	0.7	1.5	0.8
T-72 (2.0')*		T-73 (1.8')*		T-74 (1.5')*			
Depth (ft)	% Organics	Depth (ft)	% Organics	Depth (ft)	% Organics		
0.3	10.0	0.2	13.4	0.3	9.4		
1.7	9.6	1.5	11.2	2.5	3.6		
2.2	0.5	2.1	0.8	3.0	0.7		

Legend

> 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 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

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.

Grain Size Distribution/Fines Content: 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

*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

Consolidation: 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.

Collapse/Swell Potential: 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.

Direct Shear: 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)

Maximum Density Tests: 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

*testing from LGC Geotechnical (2017)

Expansion Index: 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

*testing from LGC Geotechnical (2017)

R-value Test: 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)

Soluble Sulfates: 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%

*testing from LGC Geotechnical (2017)

Chloride Content: 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

*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	pH	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

*testing from LGC Geotechnical (2017)

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.

**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.: HS-4

Depth (feet): 5.0

Sample No.: R-1

Soil Identification: Light olive brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<u>K-2</u>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<u>474.2</u>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<u>75.4</u>	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	<u>398.8</u>	Moisture Content (%)	0.0

After Wet Sieve	Container No.	K-2
	Wt. of Dry Soil + Container (g)	<u>370.9</u>
	Wt. of Container (g)	75.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	295.5

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
6"	150.0		
3"	75.0		
1 1/2"	37.5		
3/4"	19.0		
3/8"	9.5		
#4	4.75	<u>0.0</u>	100.0
#8	2.36	<u>0.1</u>	100.0
#16	1.18	<u>0.5</u>	99.9
#30	0.600	<u>5.1</u>	98.7
#50	0.300	<u>48.5</u>	87.8
#100	0.150	<u>182.6</u>	54.2
#200	0.075	<u>285.2</u>	28.5
PAN			

GRAVEL: **0 %**

SAND: **71 %**

FINES: **29 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = _____

Cc = (D30)²/(D60*D10) = _____

Remarks: _____

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

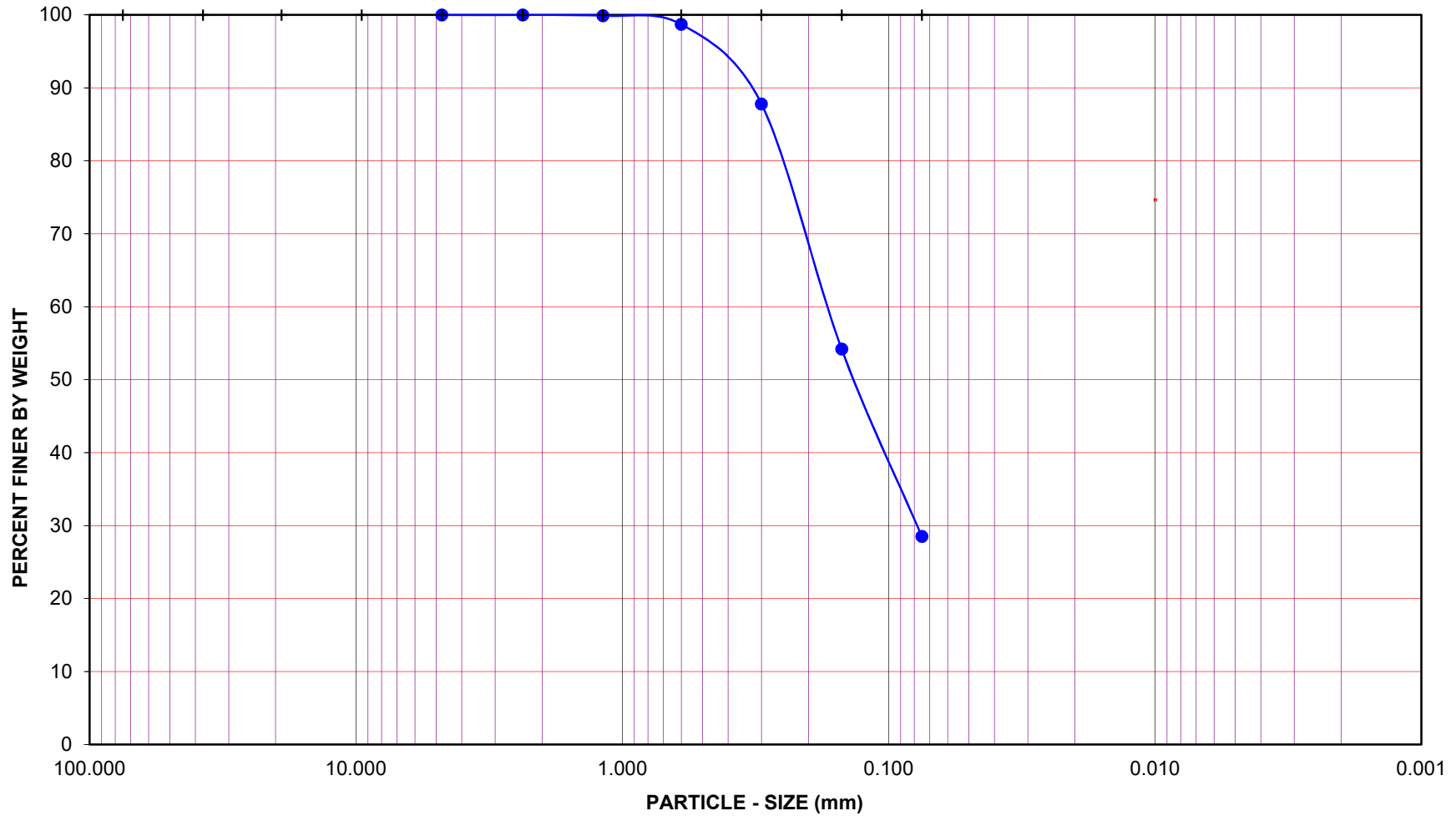
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Vander Eyk

Project No.: 17074-01

Boring No.: HS-4

Sample No.: R-1

Depth (feet): 5.0

Soil Type : SM

Soil Identification: Light olive brown silty sand (SM)

GR:SA:FI : (%) 0 : 71 : 29

**PARTICLE - SIZE
DISTRIBUTION
ASTM D 6913**

Jul-1 /

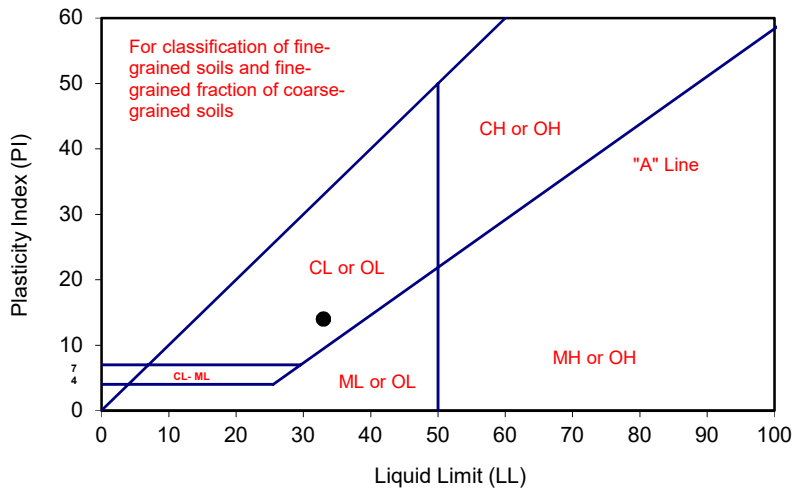
ATTERBERG LIMITS

ASTM D 4318

Project Name: <u>Ontario</u>	Tested By: <u>Y. Nguyen</u>	Date: <u>01/05/21</u>
Project No. : <u>20220-01</u>	Input By: <u>G. Bathala</u>	Date: <u>01/14/21</u>
Boring No.: <u>HS-2</u>	Checked By: <u>J. Ward</u>	
Sample No.: <u>R-3</u>	Depth (ft.) <u>7.5</u>	
Soil Identification: <u>Olive lean clay (CL)</u>		

TEST NO.	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	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 (%) [W _n]	19.24	18.82	31.94	32.87	33.65	

Liquid Limit	33
Plastic Limit	19
Plasticity Index	14
Classification	CL



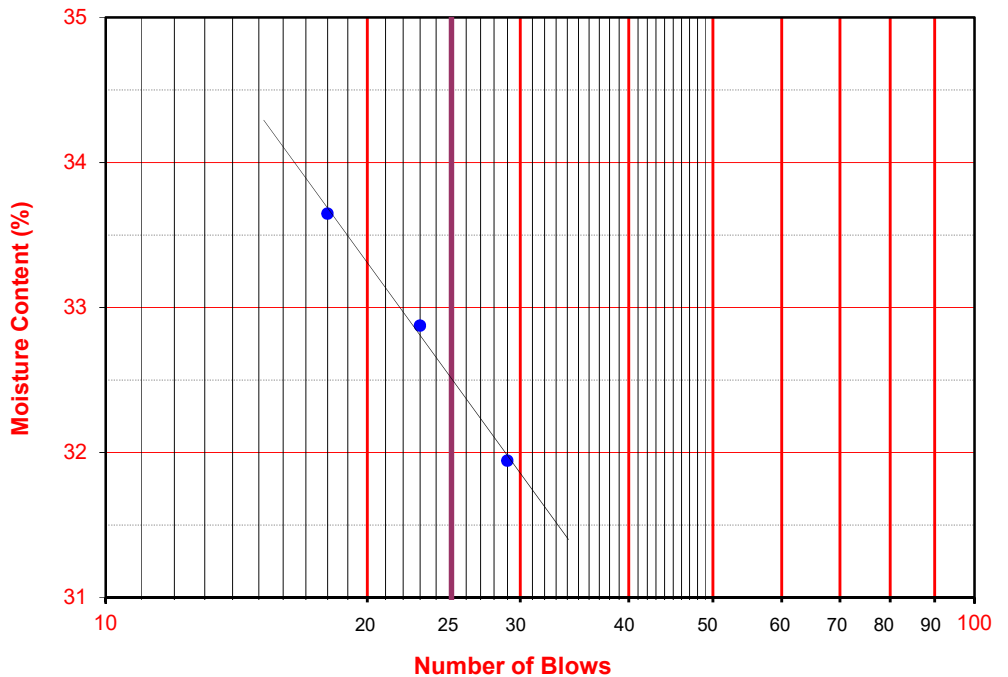
PI at "A" - Line = $0.73(LL-20)$ 9.49

One - Point Liquid Limit Calculation

$$LL = W_n(N/25)^{0.121}$$

PROCEDURES USED

- Wet Preparation
Multipoint - Wet
- Dry Preparation
Multipoint - Dry
- Procedure A
Multipoint Test
- Procedure B
One-point Test



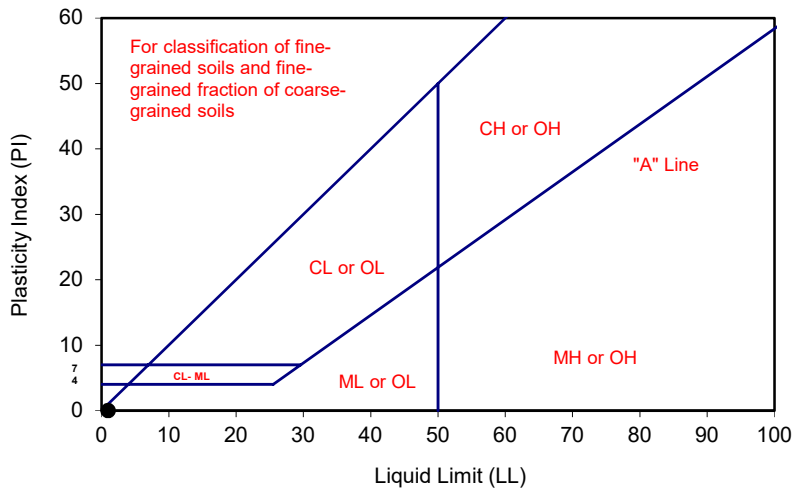
ATTERBERG LIMITS

ASTM D 4318

Project Name: <u>Ontario</u>	Tested By: <u>Y. Nguyen</u>	Date: <u>01/14/21</u>
Project No. : <u>20220-01</u>	Input By: <u>G. Bathala</u>	Date: <u>01/20/21</u>
Boring No.: <u>HS-7</u>	Checked By: <u>J. Ward</u>	
Sample No.: <u>R-3</u>	Depth (ft.) <u>7.5</u>	
Soil Identification: <u>Olive silt (ML)</u>		

TEST NO.	PLASTIC LIMIT		LIQUID LIMIT			
	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 10 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



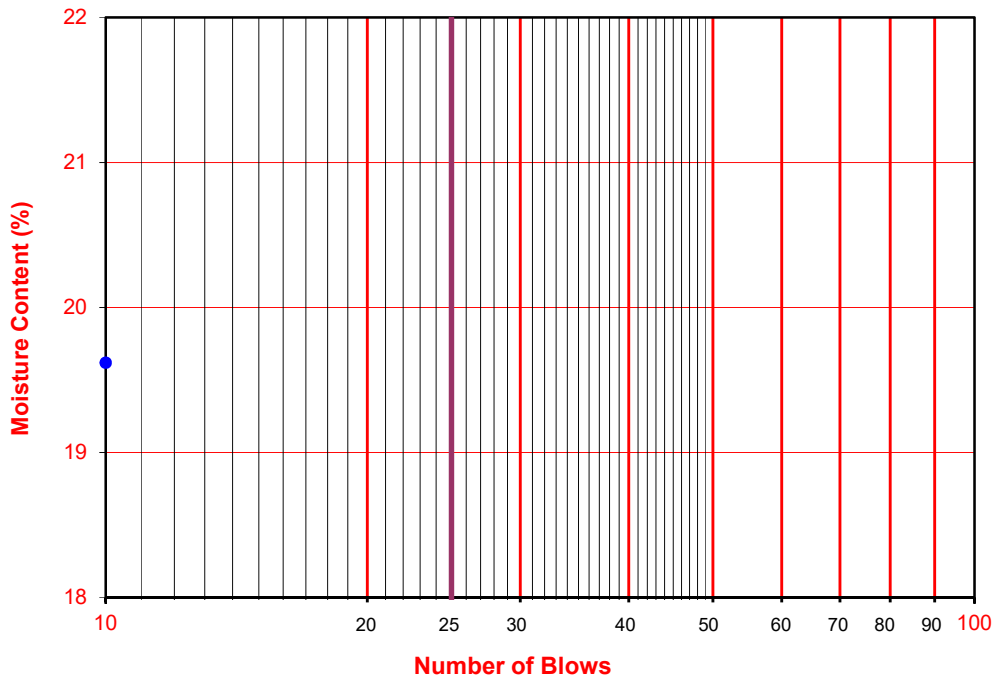
PI at "A" - Line = $0.73(LL-20)$ =

One - Point Liquid Limit Calculation

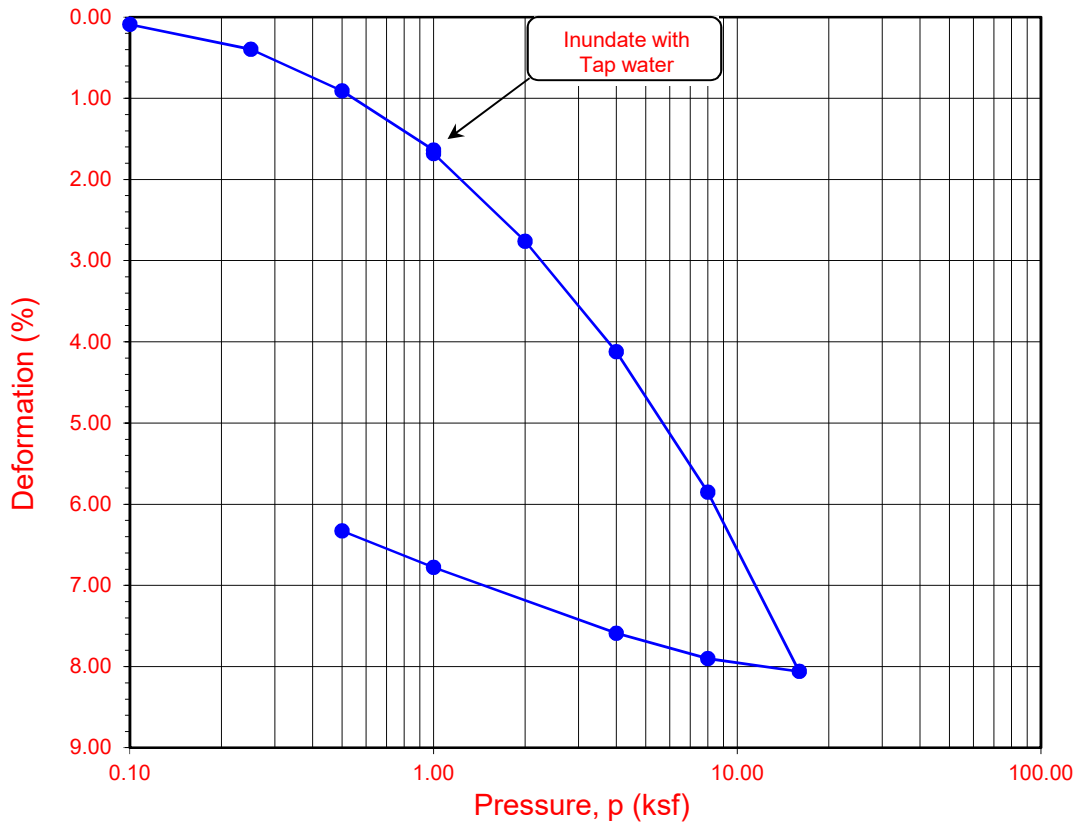
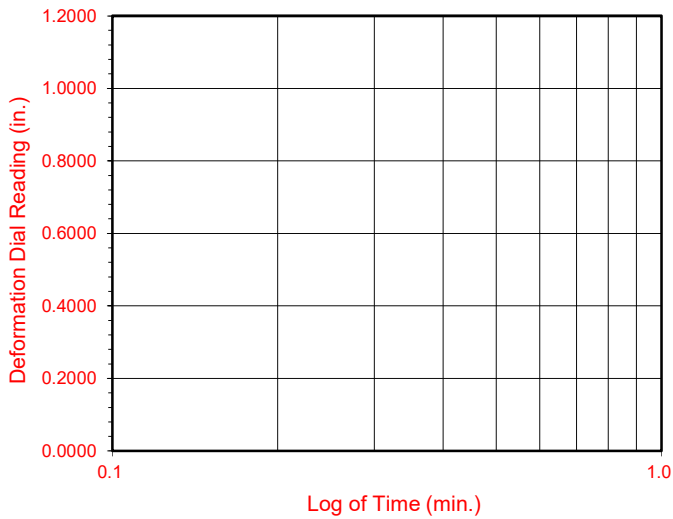
$$LL = Wn(N/25)^{0.121}$$

PROCEDURES USED

- Wet Preparation
Multipoint - Wet
- Dry Preparation
Multipoint - Dry
- Procedure A
Multipoint Test
- Procedure B
One-point Test



Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-2	R-3	7.5	30.0	31.5	91.5	94.2	0.957	0.833	90	100

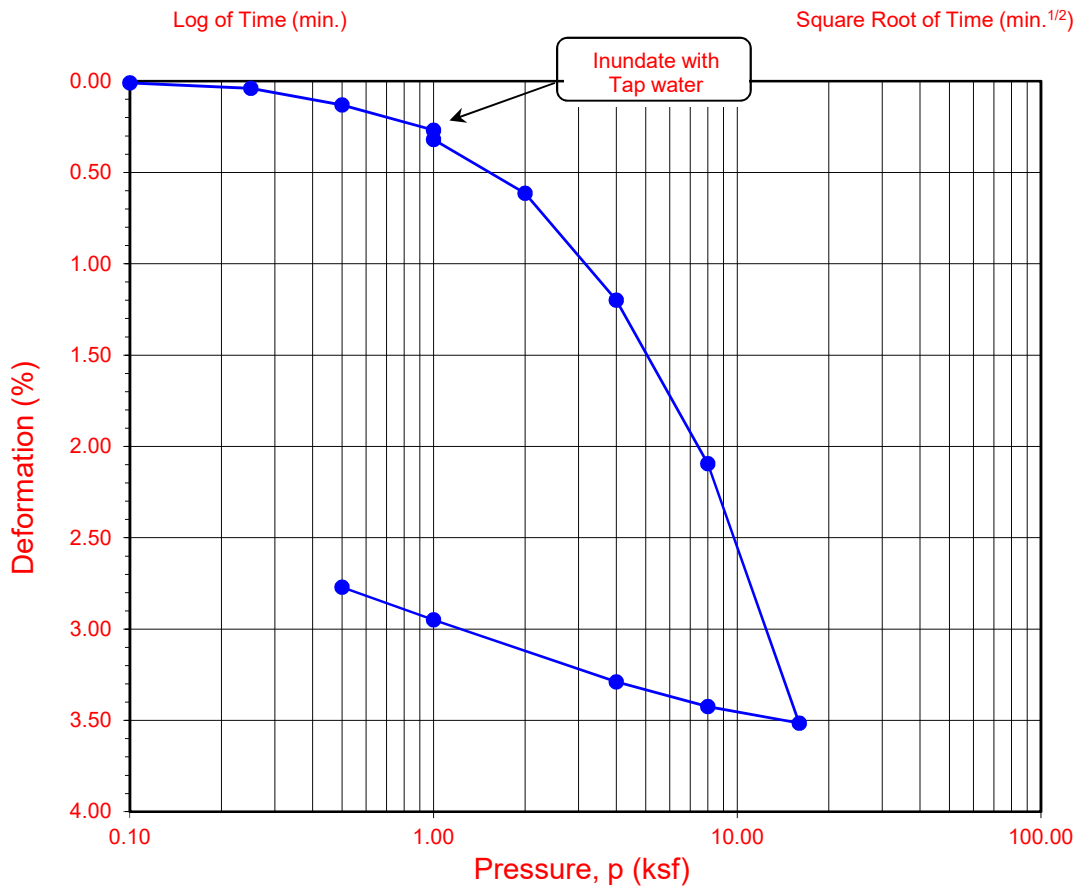
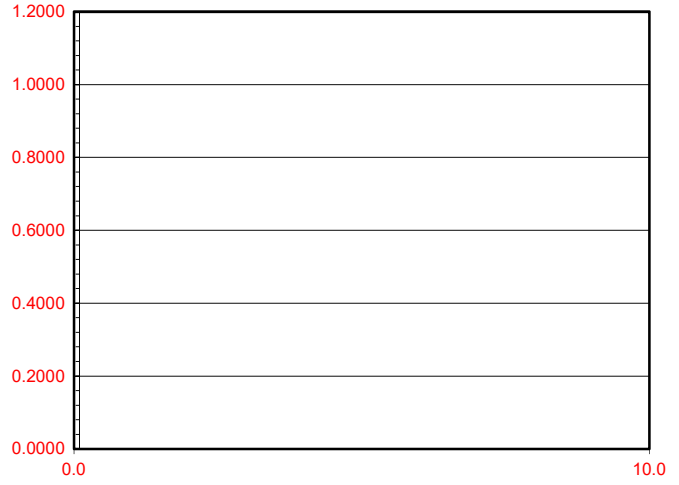
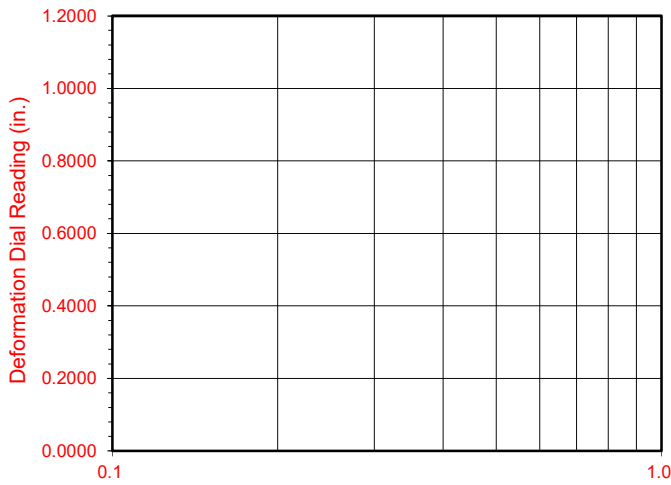
Soil Identification: Olive lean clay (CL)

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

Project No.: 20220-01

Ontario

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
HS-7	R-3	7.5	9.9	19.2	105.1	107.9	0.604	0.559	44	92

Soil Identification: Olive silt (ML)

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435

Project No.: 20220-01

Ontario

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

Project Name: Ontario
 Project No.: 20220-01
 Boring No.: HS-4
 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

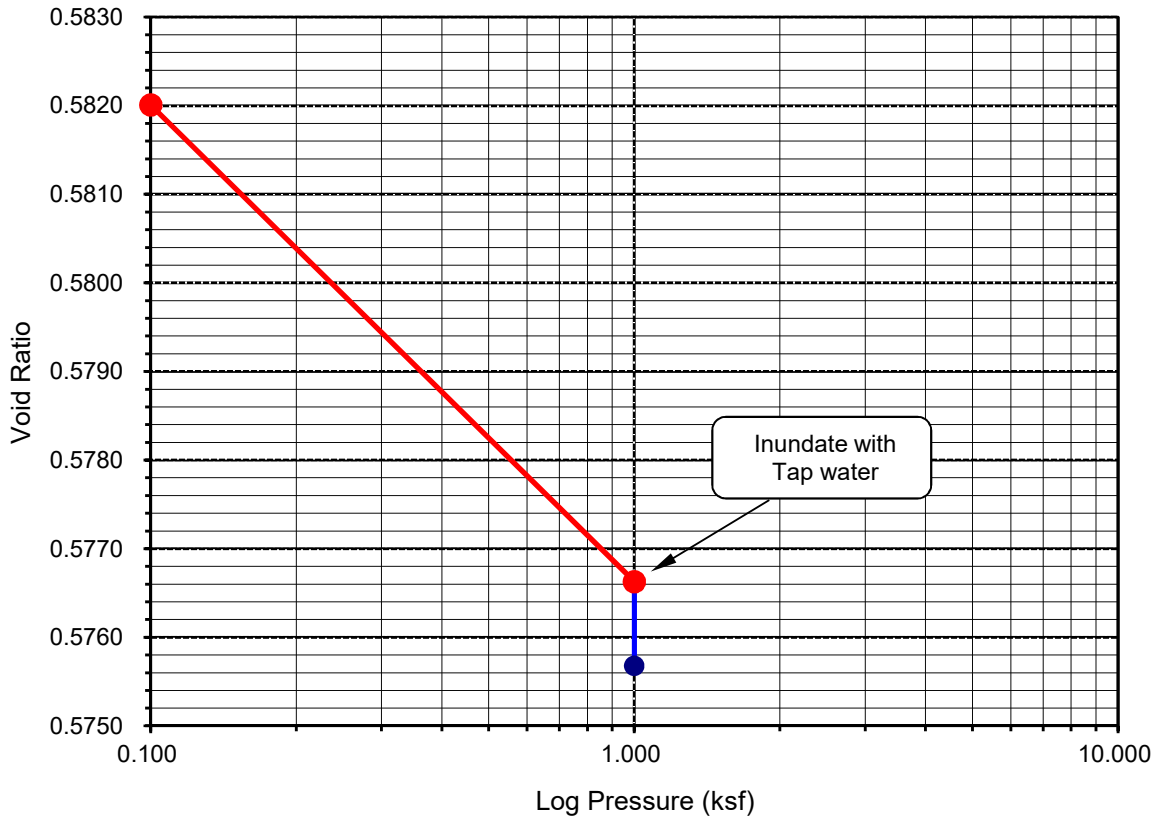
Initial Dry Density (pcf):	106.5
Initial Moisture (%):	11.35
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2965
Diameter(in):	2.415

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

Void Ratio - Log Pressure Curve



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

Project Name: Ontario
 Project No.: 20220-01
 Boring No.: HS-8
 Sample No.: R-2
 Sample Description: Olive gray poorly-graded sand with silt (SP-SM)

Tested By: G. Bathala Date: 01/18/21
 Checked By: J. Ward Date: 02/03/21
 Sample Type: Ring
 Depth (ft.): 5.0

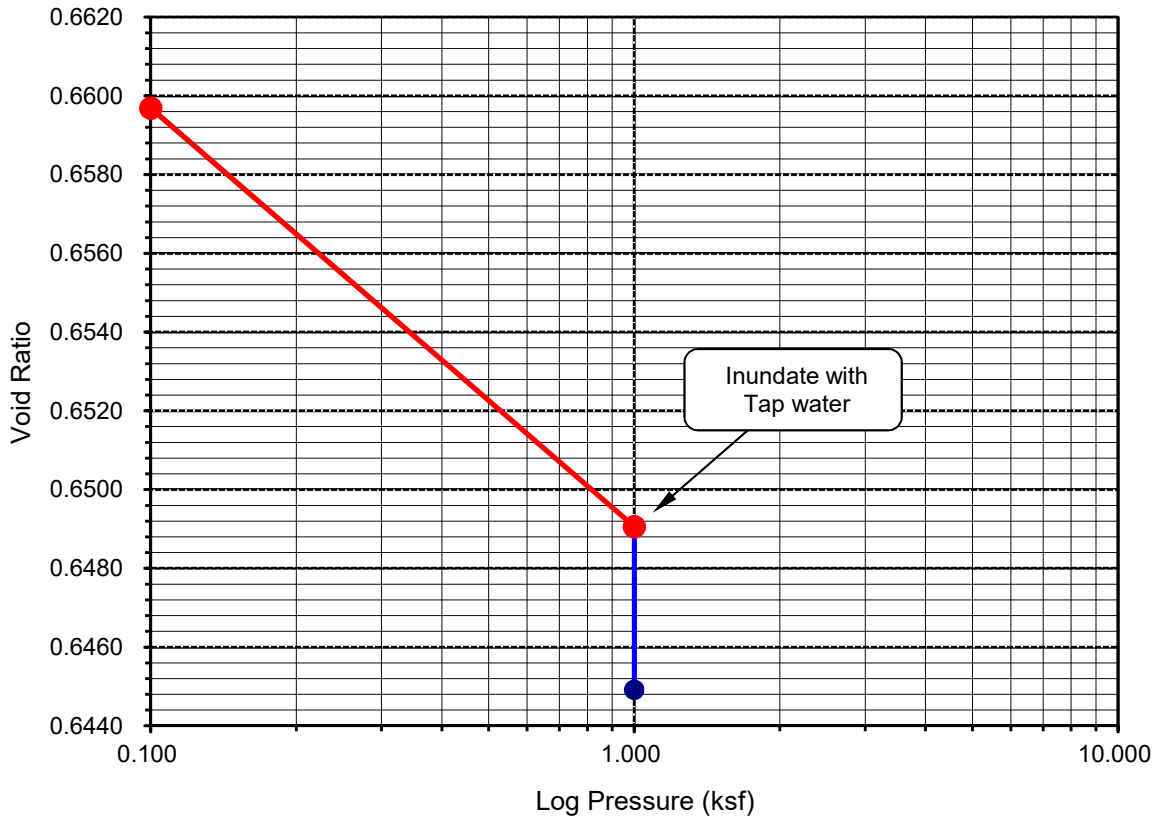
Initial Dry Density (pcf):	101.5
Initial Moisture (%):	2.58
Initial Length (in.):	1.0000
Initial Dial Reading:	0.3140
Diameter(in):	2.415

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**

Void Ratio - Log Pressure Curve



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

Project Name: Ontario
 Project No.: 20220-01
 Boring No.: I-3
 Sample No.: R-2
 Sample Description: Light olive gray silty sand (SM)

Tested By: G. Bathala Date: 01/07/21
 Checked By: J. Ward Date: 01/27/21
 Sample Type: Ring
 Depth (ft.): 5.0

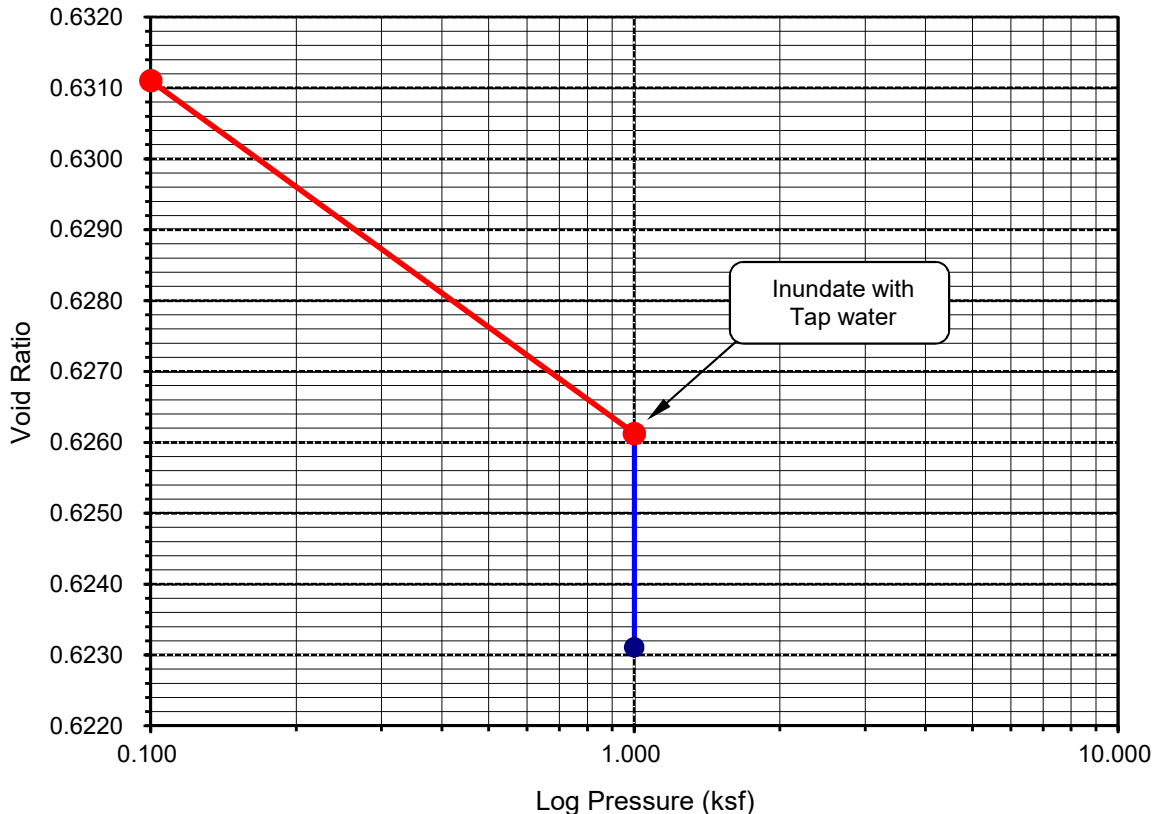
Initial Dry Density (pcf):	103.3
Initial Moisture (%):	2.15
Initial Length (in.):	1.0000
Initial Dial Reading:	0.2597
Diameter(in):	2.415

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 = -0.19

Void Ratio - Log Pressure Curve



One-Dimensional Swell or Settlement Potential of Cohesive Soils (ASTM D 4546)

Project Name: Vander Eyk
 Project No.: 17074-01
 Boring No.: HS-4
 Sample No.: R-1
 Sample Description: Light olive brown silty sand (SM)

Tested By: G. Bathala Date: 07/20/17
 Checked By: J. Ward Date: 07/31/17
 Sample Type: Ring
 Depth (ft.): 5.0

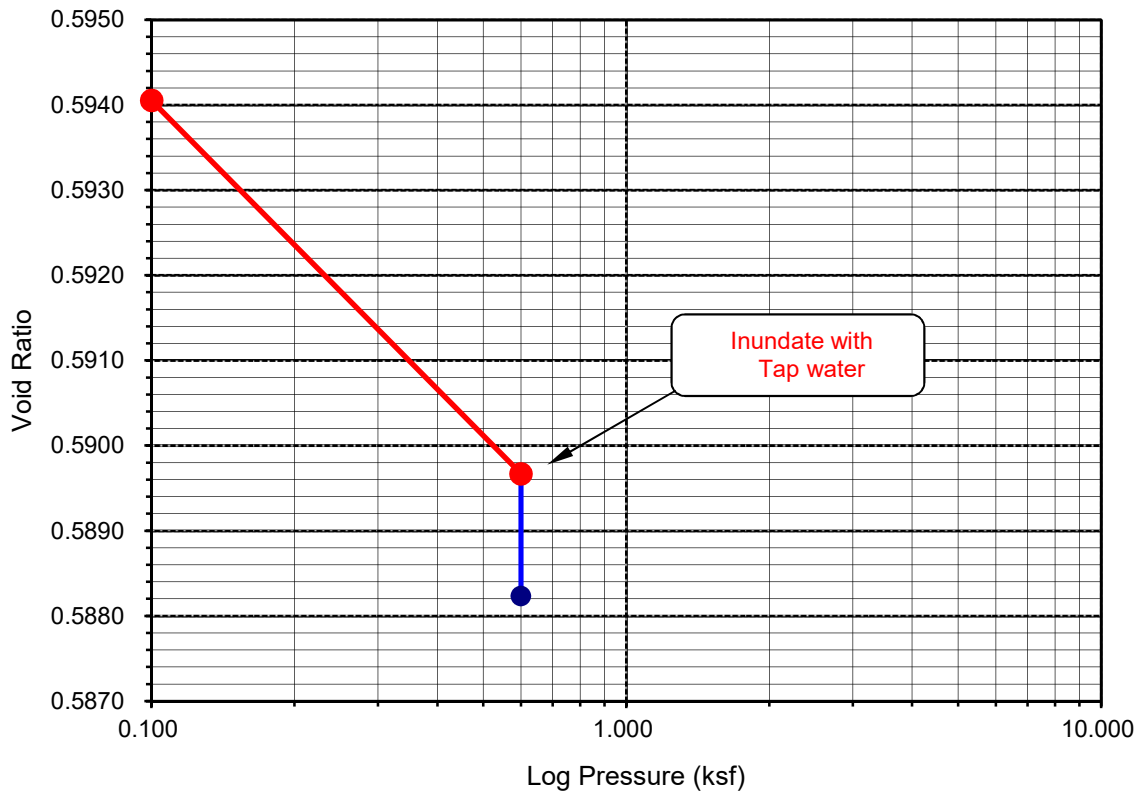
Initial Dry Density (pcf):	105.7
Initial Moisture (%):	5.83
Initial Length (in.):	1.0000
Initial Dial Reading:	0.1924
Diameter(in):	2.415

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

Void Ratio - Log Pressure Curve



One-Dimensional Swell or Settlement Potential of Cohesive Soils (ASTM D 4546)

Project Name: Vander Eyk
 Project No.: 17074-01
 Boring No.: HS-8
 Sample No.: R-2
 Sample Description: Olive brown sandy silt (ML)

Tested By: G. Bathala Date: 07/20/17
 Checked By: J. Ward Date: 07/31/17
 Sample Type: Ring
 Depth (ft.): 10.0

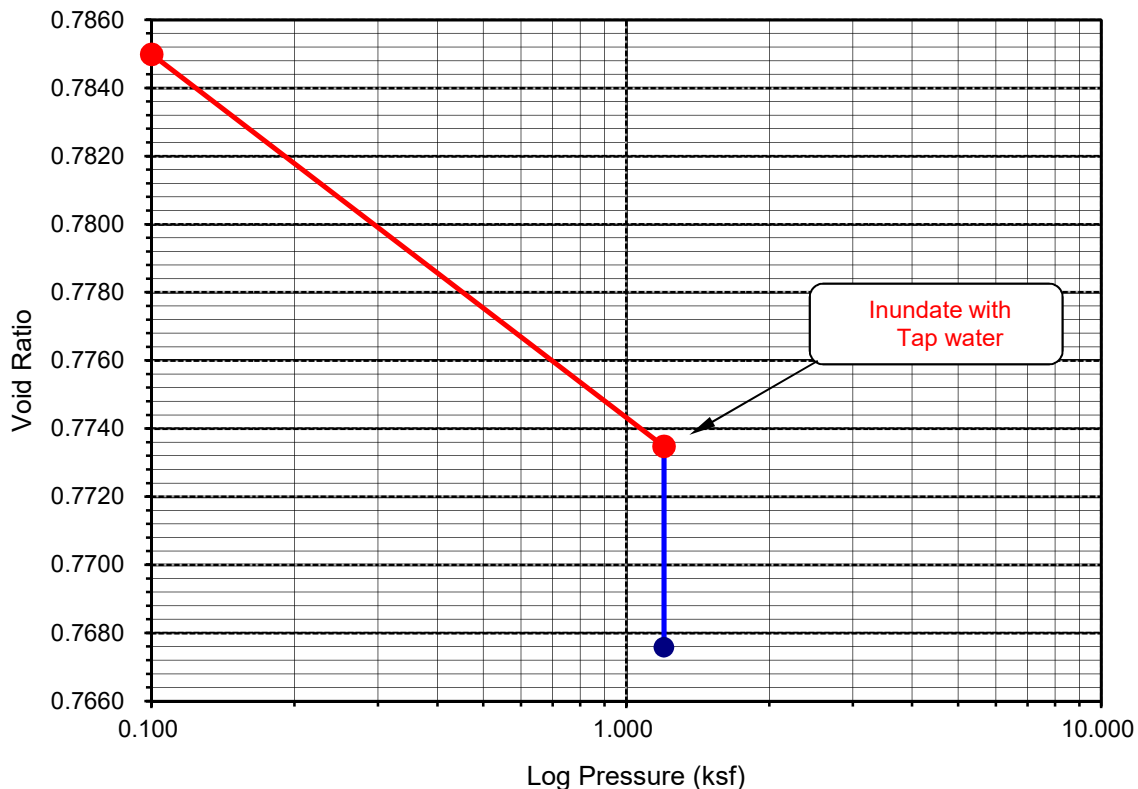
Initial Dry Density (pcf):	94.4
Initial Moisture (%):	4.99
Initial Length (in.):	1.0000
Initial Dial Reading:	0.1389
Diameter(in):	2.415

Final Dry Density (pcf):	95.4
Final Moisture (%):	26.0
Initial Void ratio:	0.7851
Specific Gravity(assumed):	2.70
Initial Saturation (%):	17.2

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.: B-1 Depth (ft.): 1-5
 Soil Identification: Light olive brown silty sand (SM)

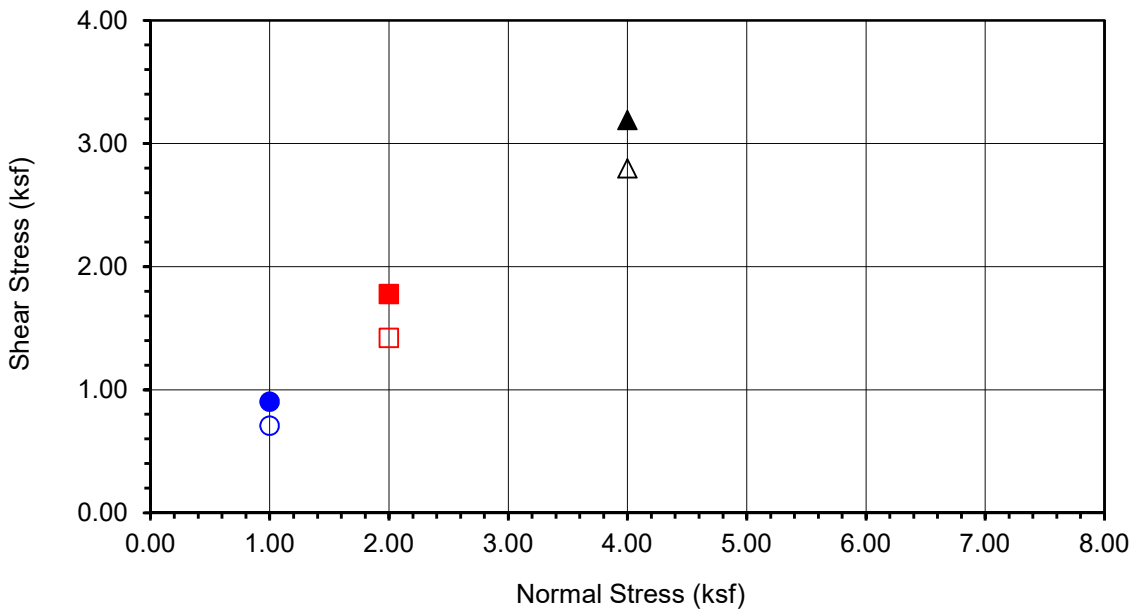
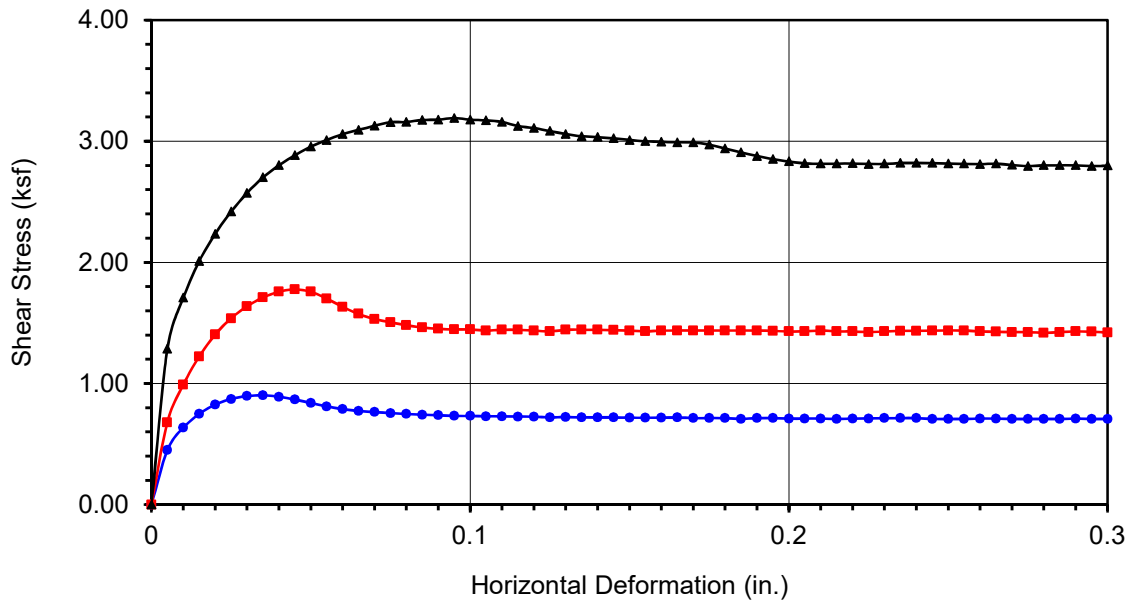
Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	190.13	191.20	191.49
Weight of Ring(gm):	45.32	45.72	45.73

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
<u>Sample Type:</u>	
90% Remold	
<u>Soil Identification:</u>	
Light olive brown silty sand (SM)	

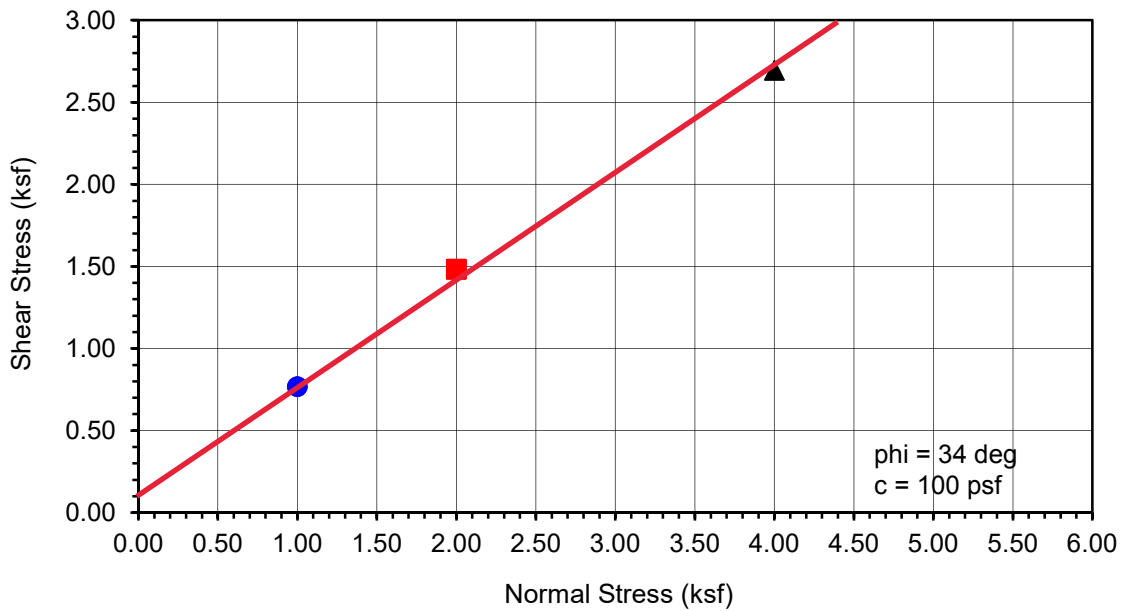
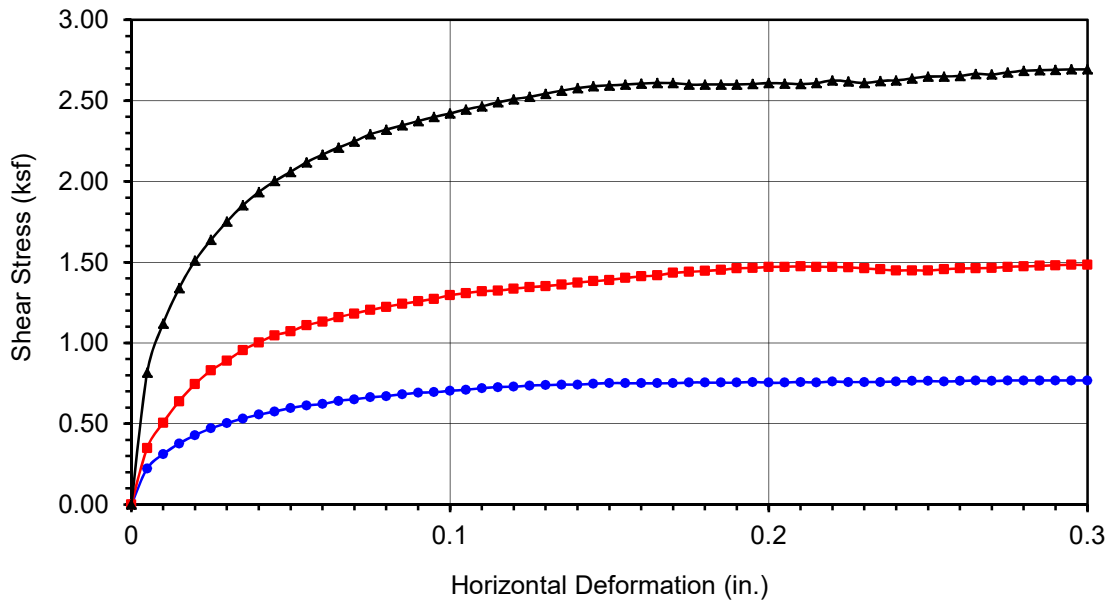
Normal Stress (kip/ft ²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft ²)	● 0.902	■ 1.776	▲ 3.191
Shear Stress @ End of Test (ksf)	○ 0.707	□ 1.421	△ 2.798
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	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.: 20220-01

Ontario

01-21



Boring No.	HS-8
Sample No.	R-1
Depth (ft)	5
<u>Sample Type:</u>	
Ring	
<u>Soil Identification:</u>	
Olive brown silt with sand (ML)s	

Normal Stress (kip/ft ²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft ²)	● 0.767	■ 1.484	▲ 2.694
Shear Stress @ End of Test (ksf)	○ 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

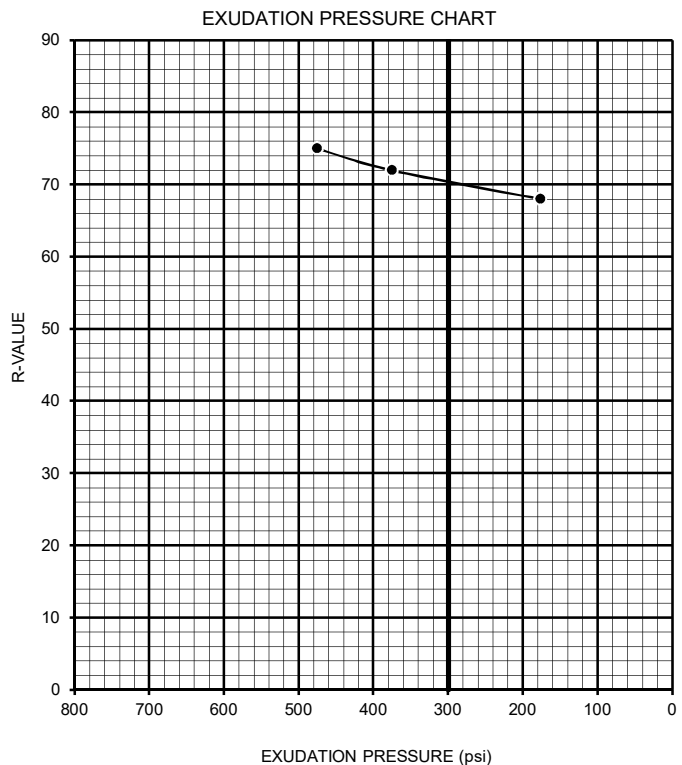
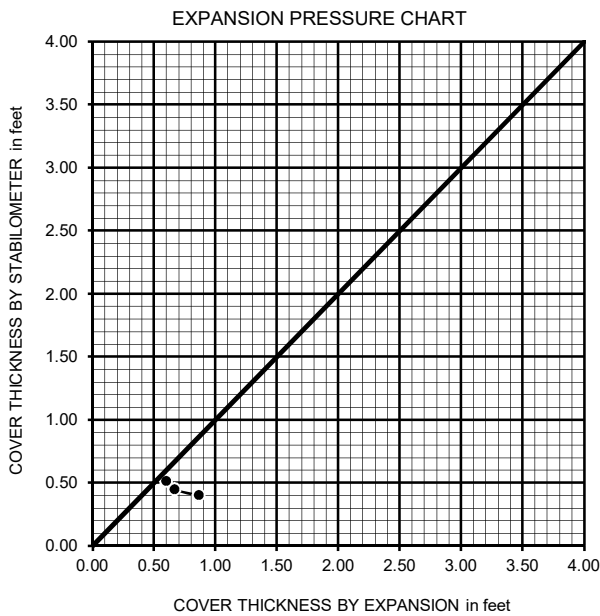
R-VALUE TEST RESULTS

DOT CA Test 301

PROJECT NAME:	<u>Ontario</u>	PROJECT NUMBER:	<u>20220-01</u>
BORING NUMBER:	<u>HS-5</u>	DEPTH (FT.):	<u>1-5</u>
SAMPLE NUMBER:	<u>B-1</u>	TECHNICIAN:	<u>O. Figueroa</u>
SAMPLE DESCRIPTION:	<u>Olive brown silty sand (SM), organics noted</u>	DATE COMPLETED:	<u>1/15/2021</u>

TEST SPECIMEN	a	b	c
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 10 ^{exp-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	a	b	c
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



R-VALUE BY EXPANSION:	<u>65</u>
R-VALUE BY EXUDATION:	<u>70</u>
EQUILIBRIUM R-VALUE:	<u>65</u>

Geotechnical Boring Log Borehole HS-1

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~744' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
740		█	R-1	5 6 8	103.9	1.2	SM	@2.5' - Silty SAND: light brown, dry, medium dense	-#200
	5	█	R-2	5 6 11	105.1	1.1	SP-SM	@5' - SAND with Silt: gray brown, dry, medium dense	
735		█	R-3	5 8 10	107.5	1.7		@7.5' - SAND with Silt: gray, dry, medium dense	
	10	█	R-4	5 7 10	107.0	8.6	SM	@10' - Silty SAND: brown, moist, medium dense	
730		X	SPT-1	4 7 8		4.8	SP	@15' - SAND: brown, slightly moist, medium dense	
	20	█	R-5	7 10 13	108.0	19.3	SM	@20' - Silty SAND: brown, very moist, medium dense	
725		X	SPT-2	5 15 13		4.5	SP	@25' - SAND: brown, slightly moist, medium dense; single gravel clast	
720									
715									
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-1

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~744' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
710	30		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	
705	35		SPT-3	3 5 8		18.0	ML	@35' - Sandy SILT: gray with red orange, very moist, stiff; iron oxide mottle	
700	40		R-7	11 16 21	112.6	15.0	SM	@40' - Silty SAND: olive brown, very moist, dense	
695	45		SPT-4	3 4 6		23.1		@45' - Sandy SILT: olive brown, very moist, stiff	
690	50		R-8	7 17 20	113.2	17.8	CL	@50' - Sandy CLAY: dusky brown, moist to very moist, very stiff	
685	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
685	60								



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-2

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~745' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
740	5	█	R-1	3 4 6	108.4	4.5	SM	@2.5' - Silty SAND: brown, slightly moist, loose	#200 EI, MD, CR
		█	R-2	5 7 11	109.8	4.6		@5' - Silty SAND: brown, slightly moist, medium dense	
735	10	█	R-3	3 4 6	90.1	30.0	CL	@7.5' - CLAY: olive, very moist, medium stiff	AL, CR
		█	R-4	3 6 10		12.6	SM	@10' - Silty SAND: brown, moist, medium dense	
730	15	X	SPT-1	4 8 11		5.1	SP-SM	@15' - SAND with Silt: brown, brown, slightly moist, medium dense	
725	20	█	R-5	6 17 13	116.3	6.7	SM	@20' - Silty SAND: brown, slightly moist, medium dense; iron oxide mottle	
720	25	X	SPT-2	3 6 9		19.5	ML	Sandy SILT: gray brown; very moist, very stiff; iron oxide mottle	
	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 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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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-3

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~736' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	7 8 10	104.9	2.3	SP	@2.5' - SAND with Silt: gray brown, dry, medium dense; scattered very coarse sand	
730	5		R-2	7 12 16	103.2	1.9		@5' - SAND: gray, dry, medium dense	
			R-3	4 6 9	109.5	14.6	SM	@7.5' - Silty SAND: dusky brown, moist, medium dense; micaceous	
725	10		R-4	4 4 5	94.6	28.9	ML	@10' - Sandy SILT: gray, very moist, stiff	
720	15		SPT-1	6 7 8		3.5	SP	@15' - SAND: brown, dry, medium dense	
715	20		R-5	8 15 16	102.6	17.3	ML	@20' - Sandy SILT: gray, very moist, very stiff	
710	25		SPT-2	6 9 9		7.1	SP-SM	@25' - SAND with SILT: brown, moist, medium dense	
								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 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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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-4

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~721' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
720	0							@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	7 10 12	118.6	12.0	SM	@2.5' - Silty SAND: olive brown, moist, medium dense	
715	5		R-2	7 9 13	102.2	2.6	SP	@5' - SAND: olive brown, dry, medium dense	
			R-3	5 7 10	109.8	11.3	CL	@7.5' - Sandy CLAY: olive brown, slightly moist, stiff; minor caliche	CO
710	10		R-4	6 7 12	104.1	12.4	SM	@10' - Silty SAND: olive brown, moist, medium dense	
705	15		SPT-1	5 7 9		16.4	ML	@15' - Sandy SILT: gray brown, very moist, very stiff	
700	20		R-5	10 13 29	108.5	8.5	SM	@20' - Silty SAND: gray and red brown, moist, dense	
695	25		SPT-2	6 8 11		10.4	SM	@25' - Silty SAND: gray and red brown, moist, medium dense	
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-4

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~721' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
690	30		R-6	14 50/6"	96.0	33.4	ML	@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	
680	40		R-7	14 24 20	124.0	4.7	SM	@40' - Silty SAND: rusty brown, slightly moist, dense	
675	45		SPT-4	7 8 11		16.8	SC	@45' - Clayey SAND: gray brown, very moist, medium dense	
670	50		R-8	13 50/6"	111.4	14.3	SM	@50' - Silty SAND: light brown and brown, very moist, very dense	
665	55							Total Depth = 51.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
660	60								



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-5

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~734' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
730		█	R-1	6 7 11	100.6	2.3	SM	@2.5' - Silty SAND: light brown, dry, medium dense	#200 RV
	5	█	R-2	5 9 15	98.4	2.0	SP	@5' - SAND: gray, dry, medium dense	
725		█	R-3	7 9 15	100.2	7.7	SM	@7.5' - Silty SAND: gray brown, moist, medium dense; minor caliche	
	10	█	R-4	8 11 15	106.9	8.4		@10' - Silty SAND: brown, moist, medium dense	
720									
	15	X	SPT-1	6 6 9		8.7		@15' - Silty SAND: gray, moist, medium dense	
715									
	20	█	R-5	6 12 10	109.3	16.2	ML	@20' - Sandy SILT: gray brown, very moist, stiff	
710									
	25	X	SPT-2	2 6 6		21.9		@25' - Sandy SILT: gray and red orange, very moist, stiff	
705									
	30								



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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-5

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~734' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	32 50/6"	110.6	3.4	SP	@30' - SAND with Gravel: gray, dry, very dense	
700	35		SPT-3	6 9 14		16.8	SC	@35' - Clayey SAND: rusty brown, very moist, medium dense	
695	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 11 14		20.0	SM	@45' - Silty SAND: brown and red orange: very moist, medium dense	
685	50		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								



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.

<p>SAMPLE TYPES:</p> <p>B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE</p> <p> GROUNDWATER TABLE</p>	<p>TEST TYPES:</p> <p>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</p>
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Geotechnical Boring Log Borehole HS-6

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~727' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	11 12 14	114.6	5.5	SM	@2.5' - Silty SAND: brown, slightly moist, medium dense	CR, DS, EI, MD, #200
	5		R-2	5 9 12	105.2	19.3		@5' - Silty SAND: dusky brown, very moist, medium dense; scattered caliche	
	720		R-3	5 6 11	107.8	9.1		@7.5' - Silty SAND: brown, moist, medium dense	
	10		R-4	5 10 14	116.0	5.6		@10' - Silty SAND: gray brown, slightly moist, medium dense	
	15		SPT-1	4 5 8		18.5		@15' - Silty SAND: gray brown, very moist, medium dense	
	20		R-5	10 13 13	101.1	12.3		@20' - Silty SAND: gray and red brown, moist, medium 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 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

TEST TYPES:
 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-7

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~729' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
725	2.5	█	R-1	3 5 8	98.3	9.5	SM	@2.5' - Silty SAND: light gray, moist, medium dense	
720	5	█	R-2	6 11 13	94.7	1.6	SP	@5' - SAND: gray, dry, medium dense	
720	7.5	█	R-3	5 7 9	105.5	9.9	ML	@7.5' - SILT: olive, slightly moist, stiff	AL, CN
715	10	█	R-4	4 9 18	102.3	6.1	SM	@10' - Silty SAND: gray brown, slightly moist, medium dense	
710	15	X	SPT-1	5 7 10		16.4		@15' - Silty SAND: gray brown, very moist, medium dense	
705	20	█	R-5	5 8 14	99.4	17.5		@20' - Silty SAND: gray brown, very moist, medium dense	
700	25	X	SPT-2	2 5 8		29.0	ML	@25' - Sandy SILT: gray with red orange, very moist, stiff	
	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 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	TEST TYPES: 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
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Geotechnical Boring Log Borehole HS-8

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 6"
Elevation of Top of Hole: ~726' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
725	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	2 3 7	107.9	2.3	SP	@2.5' - SAND: brown, dry, loose	
720	5		R-2	6 9 15	102.5	2.6	SP-SM	@5' - SAND with Silt: olive gray, dry, medium dense	#200 CO
			R-3	8 12 18	102.8	2.5	SP	@7.5' - SAND: gray, dry, medium dense	
715	10		R-4	12 10 11	113.5	1.9		@10' - SAND: gray brown, dry, medium dense	
710	15		SPT-1	8 11 12		8.1	SP-SM	@15' - SAND with SILT: moist, medium dense	
705	20		R-5	5 11 29	109.7	6.9	SP	@20' - SAND: gray and brown, moist, dense	
700	25		SPT-2	6 14 20		33.2	ML	@25' - Sandy SILT: gray with red orange, very moist, hard	
								Total Depth = 26.5' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
	30								



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SAMPLE TYPES: B BULK SAMPLE R RING SAMPLE (CA Modified Sampler) G GRAB SAMPLE SPT STANDARD PENETRATION TEST SAMPLE GROUNDWATER TABLE	TEST TYPES: 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 I-1

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~750' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@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	█	R-2	6 8 12	110.8	1.2	SP-SM	@5' - SAND with Silt: gray, dry, medium dense	
740	10	X	SPT-1	3 4 5		5.8	SM	@10' - Silty SAND: gray brown, slightly moist, loose	
735	15	█	R-3	16 14 43	98.5	2.8	SP	@16' - SAND: gray brown, dry, dense	
730	20							Total Depth = 18' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/19/2021	
725	25								
	30								



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SAMPLE TYPES:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole I-2

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~749' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
745	2.5	█	R-1	9 11 15	102.6	6.5	SM	@2.5' - Silty SAND: gray brown, slightly moist, medium dense	
740	5	█	R-2	4 6 11	95.7	20.5	ML	@5' - Sandy SILT: light gray brown: very moist, stiff	
735	10	X	SPT-1	2 3 4		16.6		@10' - Sandy SILT: brown, very moist, medium stiff	
730	15	█	R-3	11 5 8	108.5	3.5	SM	@14' - Silty SAND: brown, dry, medium dense	
725	20							Total Depth = 16' Groundwater Not Encountered Infiltration Well Installed Per County Guidelines Backfilled with Cuttings on 12/18/2021	
720	25								
	30								



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:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole I-3

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~736' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0	B-1						@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	3 100 7	112.0	3.5	SM	@2.5' - Silty SAND with Gravel: brown, dry, medium dense, dry	#200, EI, CR CO
730	5		R-2	7 9 15	105.0	2.1	SP-SM	@5' - SAND with Silt: gray, dry, medium dense	
725	10		SPT-1	3 5		17.1	SM	@10' - Silty SAND: brown, very moist, loose	
715	20		R-3	6 9 14	107.4	16.5		@20' - Silty Sand: gray with red orange, very moist, medium dense	
710	25							Total Depth = 22' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
	30								



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

GROUNDWATER TABLE

TEST TYPES:
 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 I-4

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~738' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
735	0		R-1	3 4 6	100.4	22.0	ML	@0' to T.D. Quaternary Young Eolian Deposits (Qye): @2.5' - Sandy SILT: gray, very moist, medium stiff	
730	5		R-2	6 12 16	108.8	1.5	SP	@5' - SAND: gray, dry, medium dense	
725	10		SPT-1	3 6		22.9	ML	@10' - Sandy SILT: olive brown, very moist, stiff	
720	15		R-3	10 15 16	101.2	1.5	SP	@18' - SAND: gray brown, dry, medium dense	
715	20							Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
710	25								
	30								



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SAMPLE TYPES:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	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 I-5

Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~725' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' to T.D. Quaternary Young Eolian Deposits (Qye):	
			R-1	7 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		6.7	SP-SM	@10' - SAND with Silt: brown, moist, loose	
710	15								
705	20		R-3	6 10 13	111.7	10.0	SM	@18' - Silty SAND: gray brown, moist, medium dense	
								Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
700	25								
	30								



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SAMPLE TYPES:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

Geotechnical Boring Log Borehole I-6

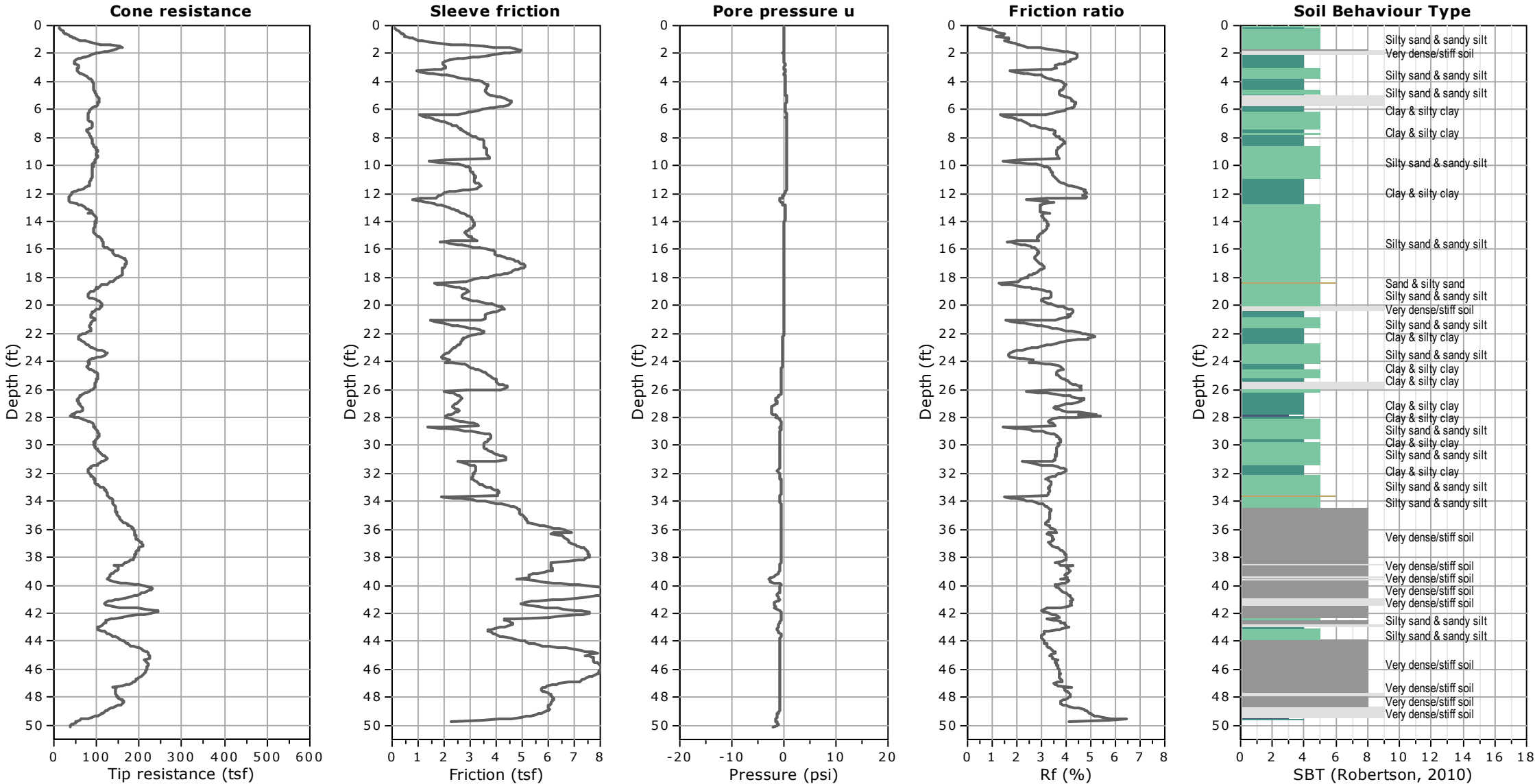
Date: 12/18/2021	Drilling Company: Cal Pac Drilling
Project Name: MCBC-Richland	Type of Rig: Track Rig
Project Number: 20220-01	Drop: 30" Hole Diameter: 8"
Elevation of Top of Hole: ~723' MSL	Drive Weight: 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

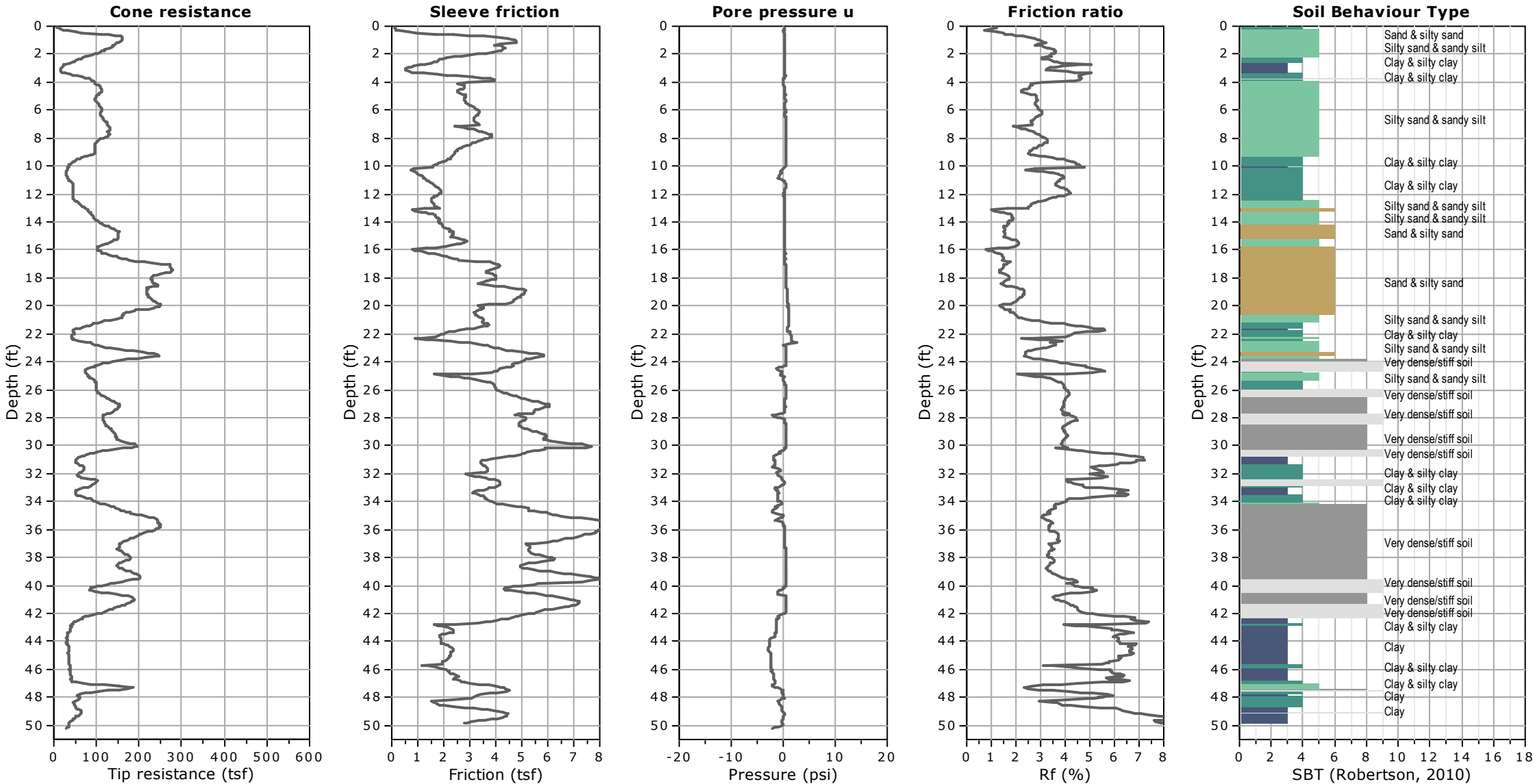
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
720	0		R-1	4 5 7	108.6	10.2	SM	<p>@0' to T.D. Quaternary Young Eolian Deposits (Qye):</p> <p>@2.5' - Silty SAND: dusky brown, moist, loose</p>	
715	5		R-2	3 6 9	112.5	9.6		@5' - Silty SAND: brown, moist, medium dense	
710	10		SPT-1	3 4 5		14.6		@10' - Silty SAND: brown, very moist, loose	
705	15		R-3	4 10 14	107.5	19.2	ML	@18' - Sandy SILT: gray with red orange: very moist, medium dense	
700	20							Total Depth = 20' Groundwater Not Encountered Backfilled with Cuttings on 12/18/2021	
695	25								
30	30								

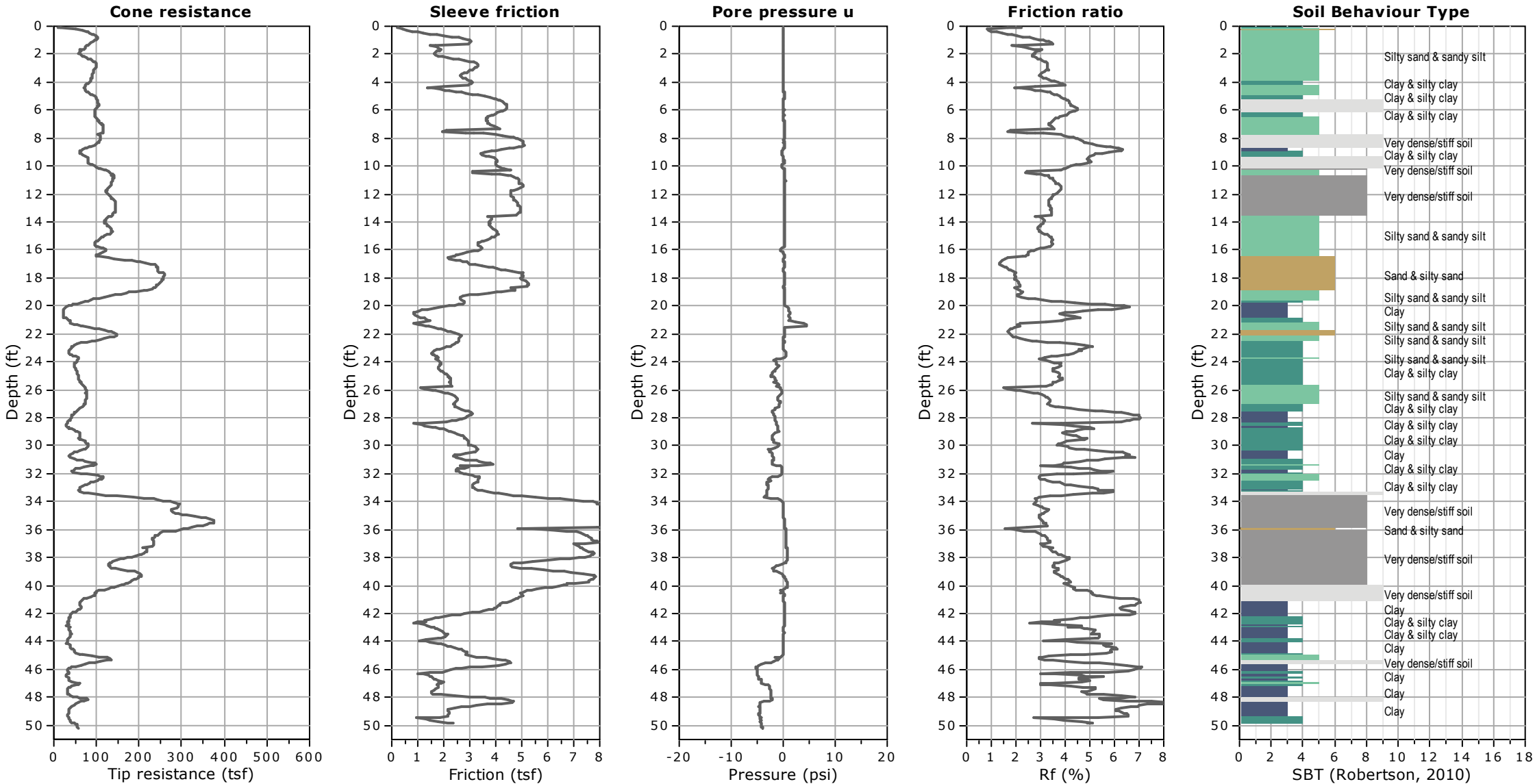


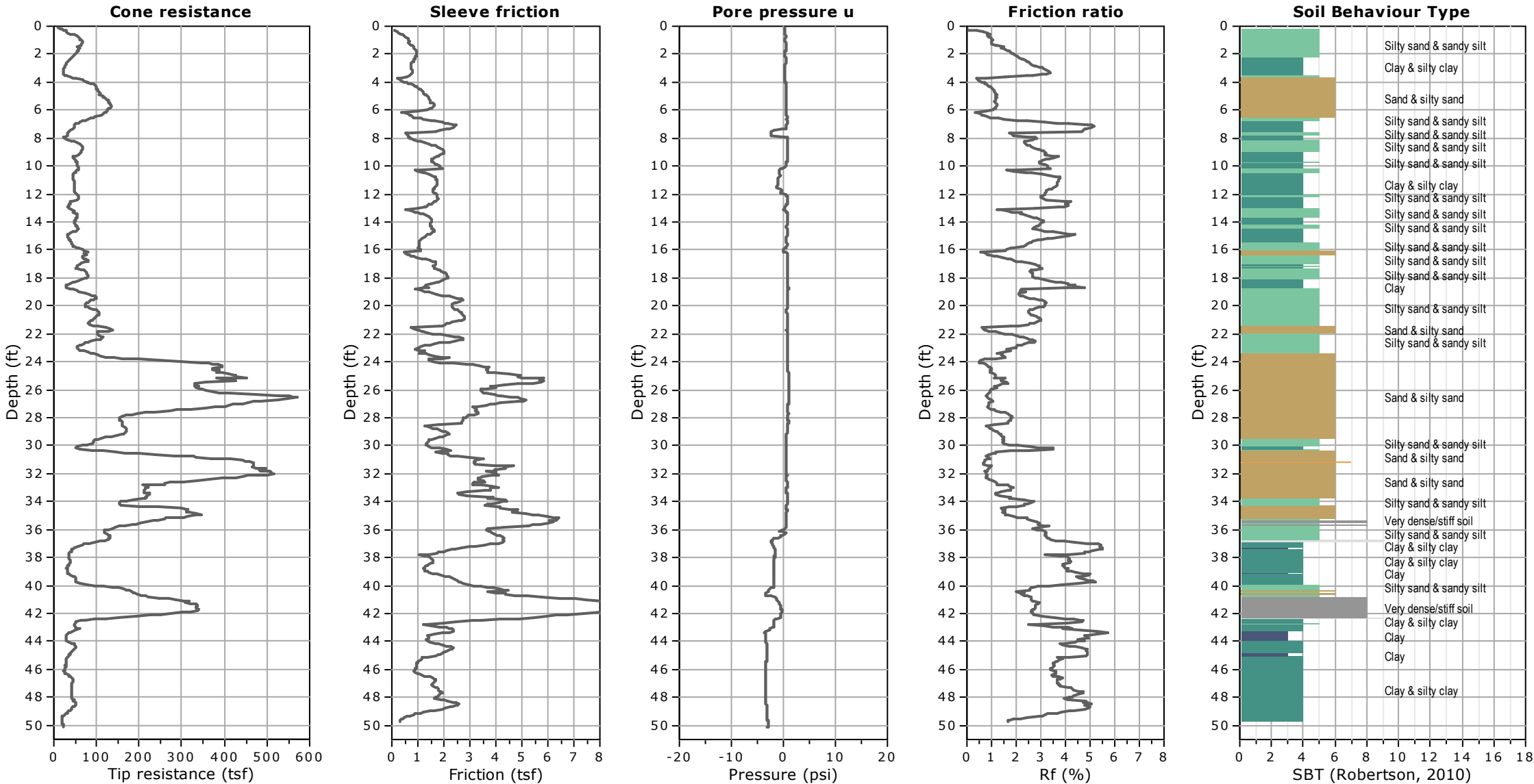
THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE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

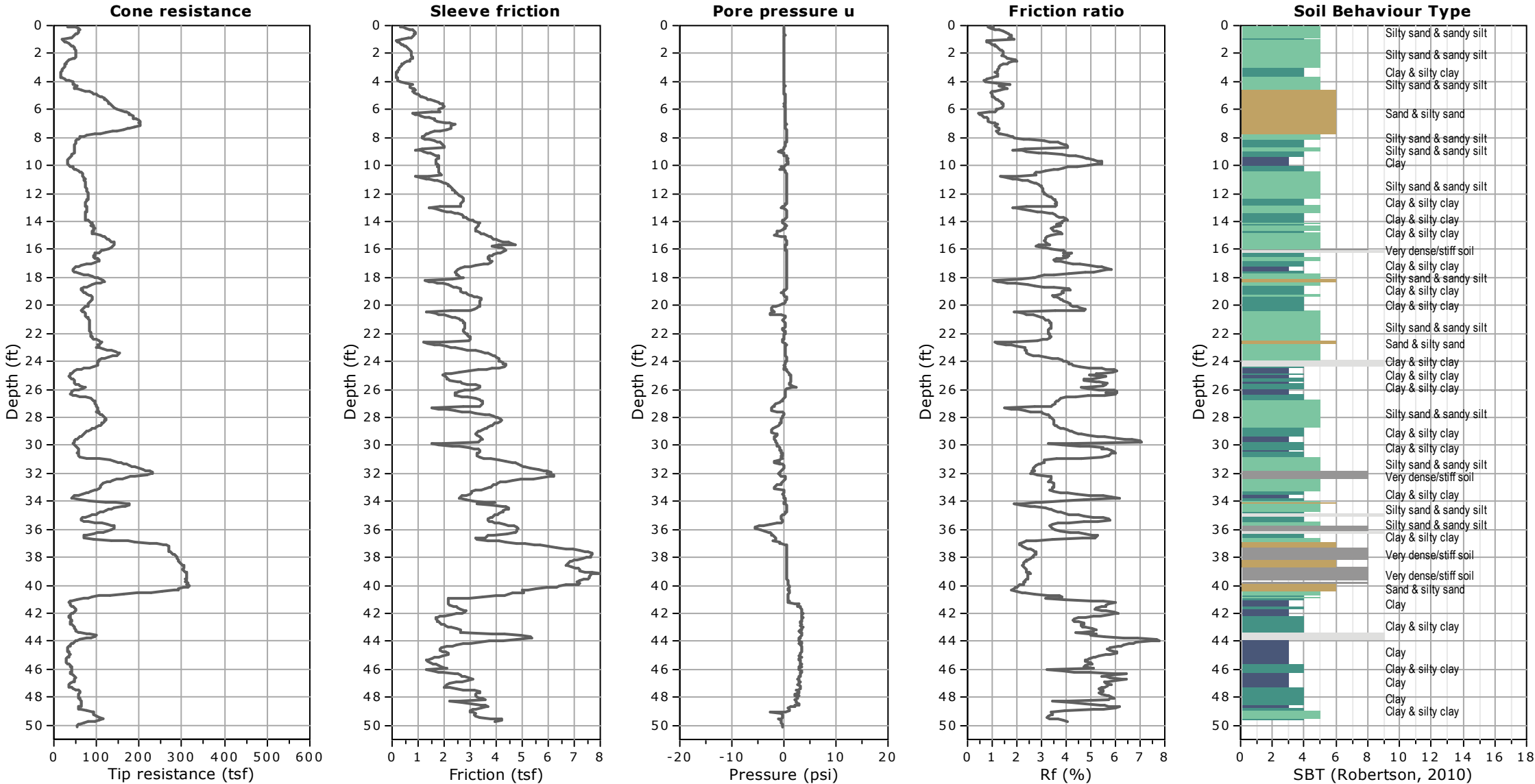
SAMPLE TYPES:	TEST TYPES:
B BULK SAMPLE	DS DIRECT SHEAR
R RING SAMPLE (CA Modified Sampler)	MD MAXIMUM DENSITY
G GRAB SAMPLE	SA SIEVE ANALYSIS
SPT STANDARD PENETRATION TEST SAMPLE	S&H SIEVE AND HYDROMETER
	EI EXPANSION INDEX
	CN CONSOLIDATION
	CR CORROSION
	AL ATTERBERG LIMITS
GROUNDWATER TABLE	CO COLLAPSE/SWELL
	RV R-VALUE
	#200 % PASSING # 200 SIEVE

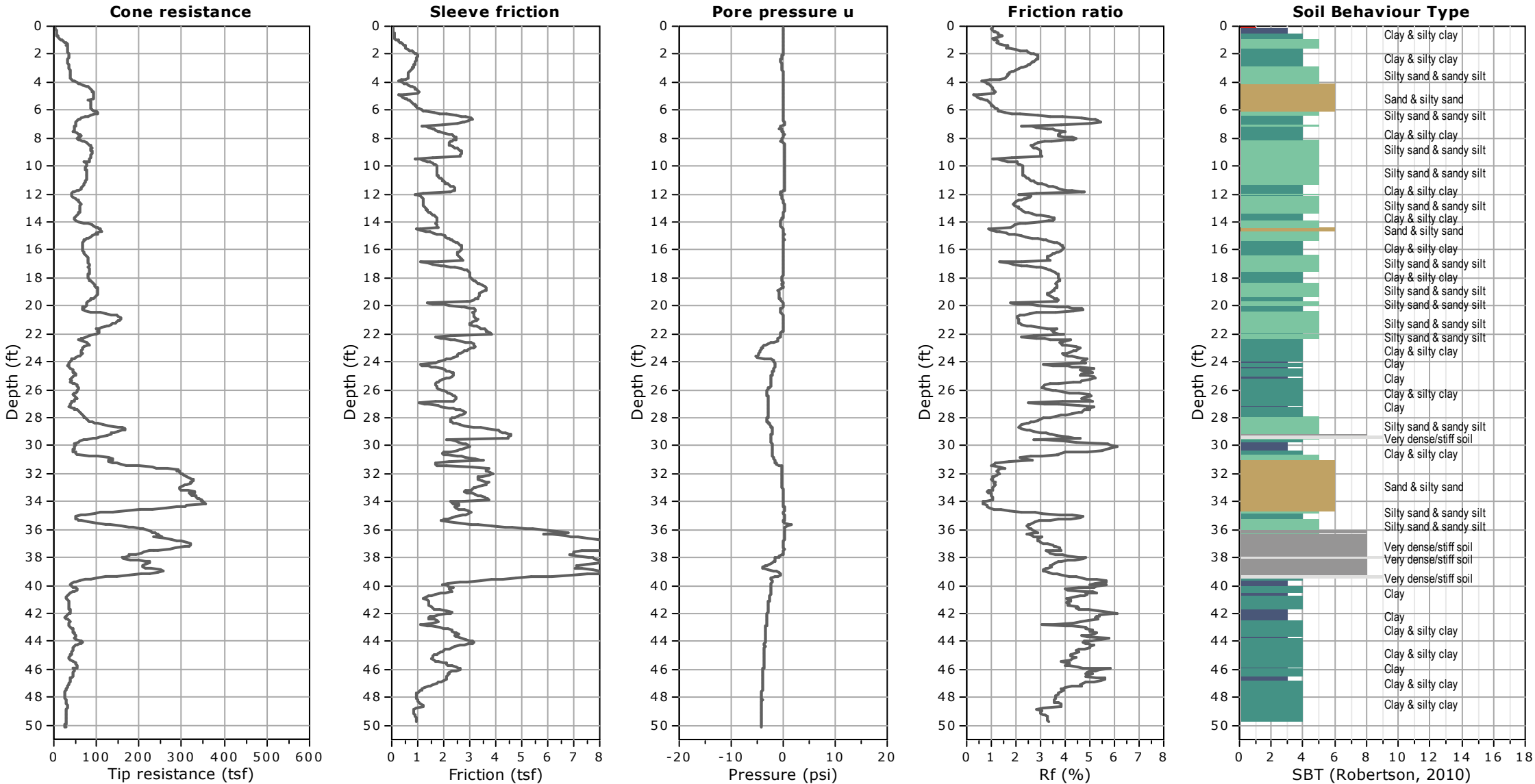


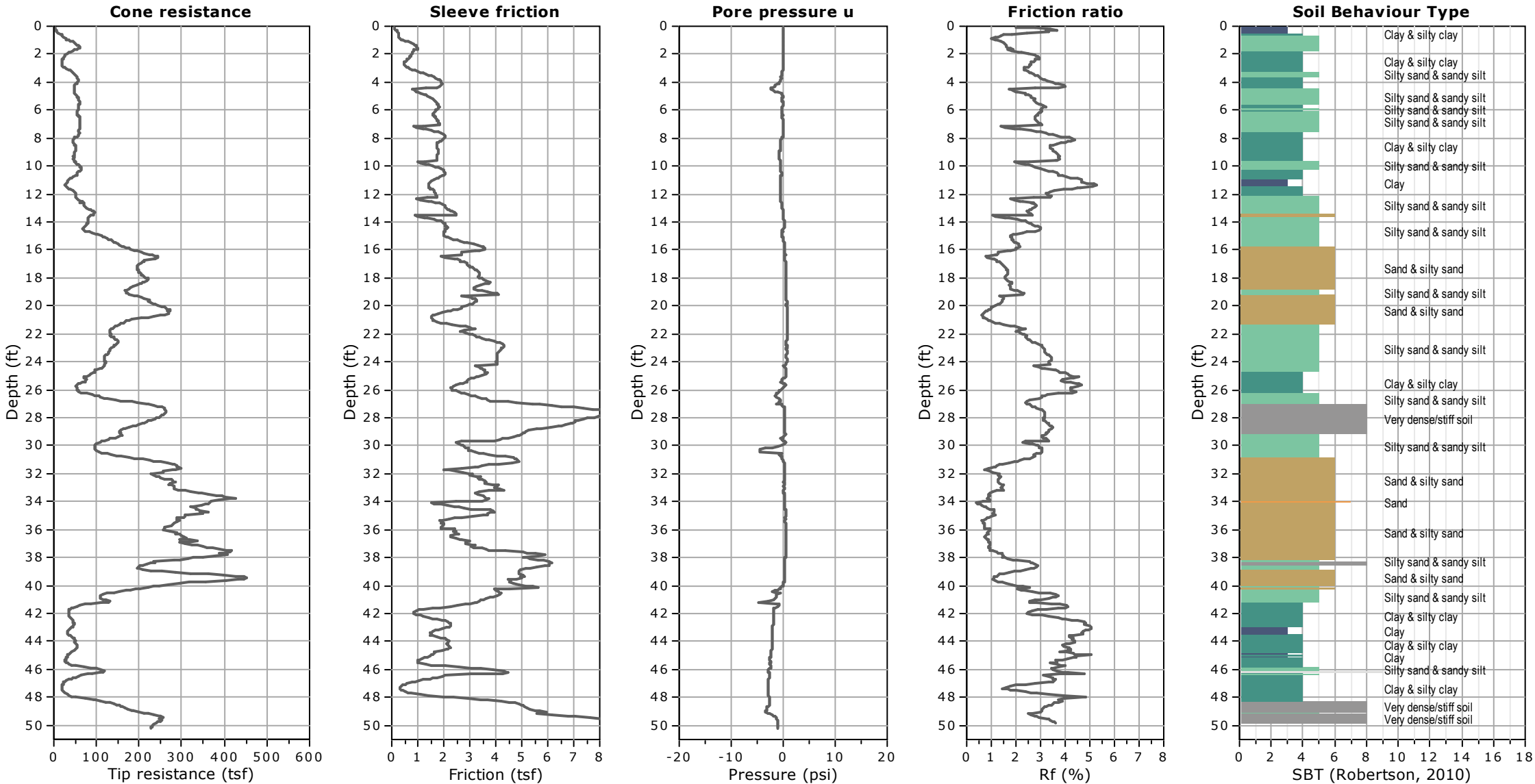


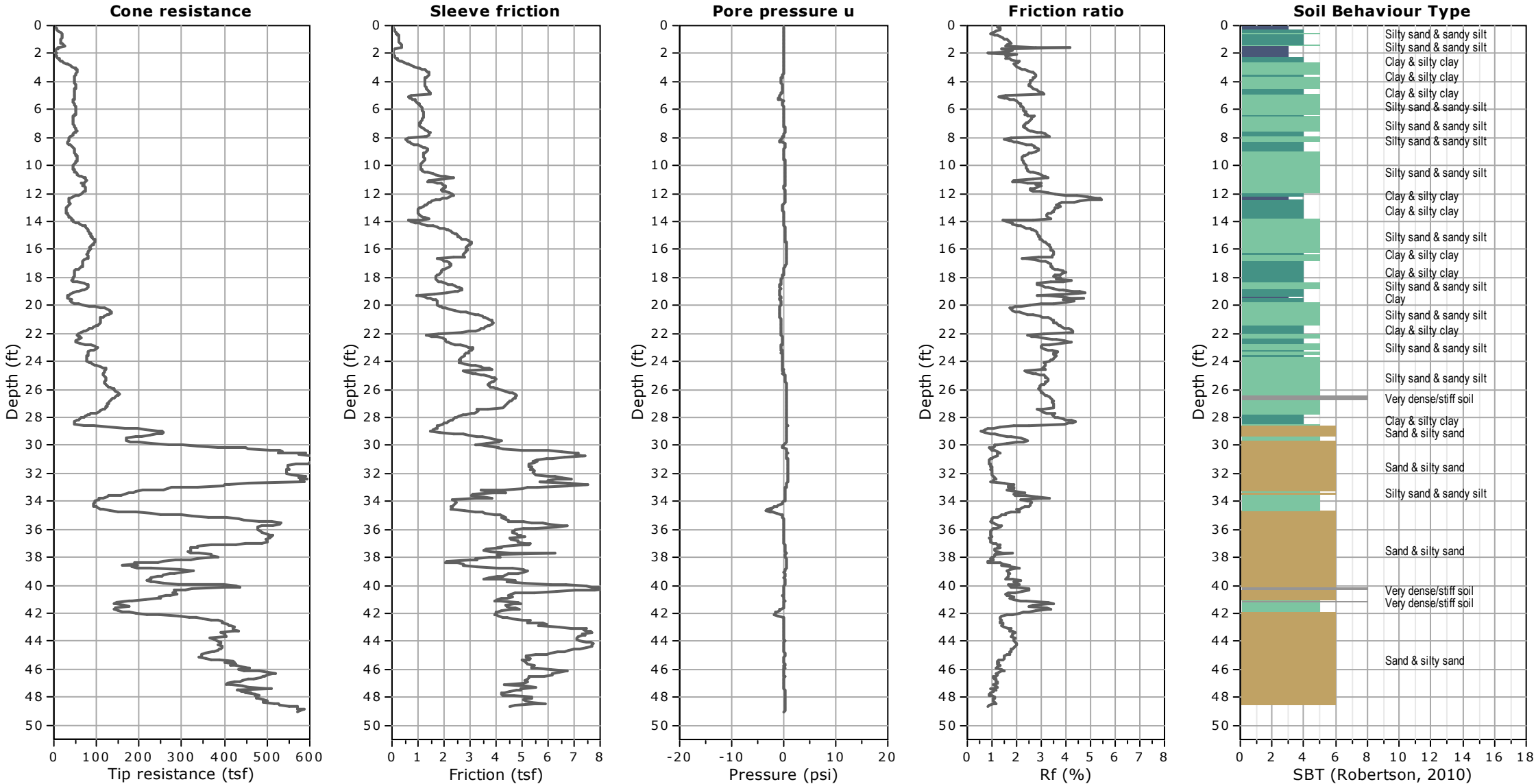












Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-11	
Project Number: 20220-01	Date: 12/7/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

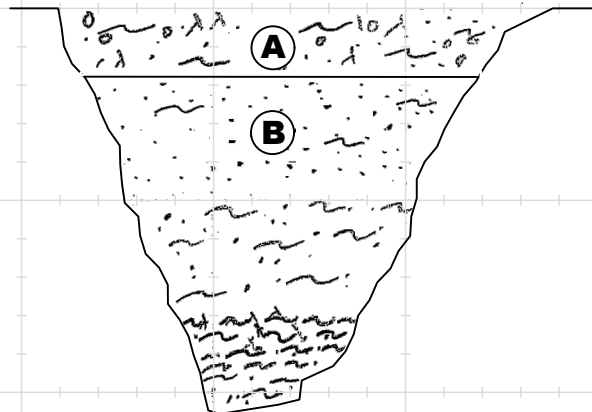
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<i>Topsoil</i> @0'-1' Silty SAND: medium brown, slightly moist, medium dense; scattered gravel @1'-1.8' Silty SAND: yellow brown; occasional rootlet; scattered pinhole porosity	Qye	SM	GB-1 @ 0.4' GB-2 @ 1.5' GB-3 @ 2.1'		
	B	<i>Quaternary Young Eolian Deposits</i> @1.8'-4' SAND with SILT: gray brown, dry to slightly moist, medium dense @4'-8' Silty SAND: gray brown, slightly moist, medium dense @8'-9.5' Sandy SILT: maroon brown, moist, stiff; minor caliche; minor roots @9.5'-T.D. Silty SAND: gray brown, slightly moist, medium dense		SP SM ML SM	GB-4 @ 8.4' GB-5 @ 9.8'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 726' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 10.3'
 Groundwater: None
 Backfilled: 12/7/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC		Logged By: ARN	Trench No.: TP-12	
Project Number: 20220-01		Date: 12/7/2020		
Equipment: JCB 3CX Excavator		Location: Ontario		

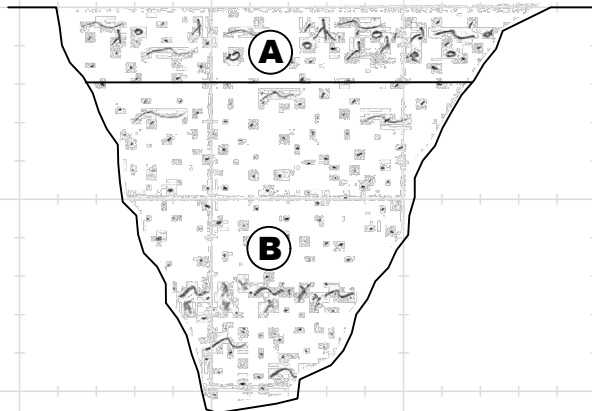
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1.3' Silty SAND: medium to dark brown, moist, medium dense; abundant rootlets; occasional gravel; scattered wood chips @1.3'-2' SAND with Silt: brown, slightly moist, medium dense	Qye	SM	GB-1 @ 1'		
				SP	GB-2 @ 1.4' GB-3 @ 1.6'		
	B	<u>Quaternary Young Eolian Deposits</u> @2'-7.1' SAND: gray, dry to slightly moist, medium dense @7.1'-7.7' Silty SAND: brown, moist, medium dense; abundant pervasive caliche; scattered burrows @7.7'-T.D. SAND with Silt: medium brown, slightly moist, medium dense		SM	GB-4 @ 6.5' GB-5 @ 7.2'		
				SP	GB-6 @ 8'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 725' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 10.4'
 Groundwater: None
 Backfilled: 12/7/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC		Logged By: ARN		Trench No.: TP-13			
Project Number: 20220-01		Date: 12/8/2020		Engineering Properties:			
Equipment: JCB 3CX Excavator		Location: Ontario					

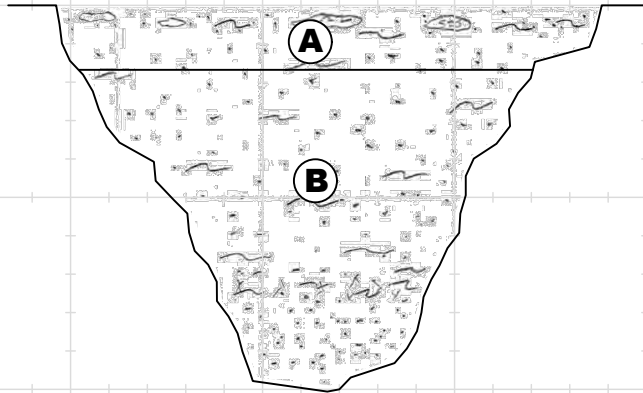
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-0.6' manure mixed with Silty SAND: brown and dark brown, moist, loose; dry vegetation in upper 0.5' @0.6'-1.8' Silty SAND: medium to dark brown, slightly moist to moist, medium dense; some organic staining	Qye	SM	GB-1 @ 0.6' GB-2 @ 1.6' GB-3 @ 2'		
	B	<u>Quaternary Young Eolian Deposits</u> @1.8'-5.5' Silty SAND: brown, moist, medium dense; occasional silty beds; some rootlets to 3' @5.5'-7' Silty SAND: dusky brown, moist @7'-7.8' pervasive caliche and very old rootlets @7.8'-T.D. SAND: brown, moist, medium dense		SP	GB-4 @ 7.4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 730' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 10'
Groundwater: None
Backfilled: 12/8/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-14	
Project Number: 20220-01	Date: 12/8/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

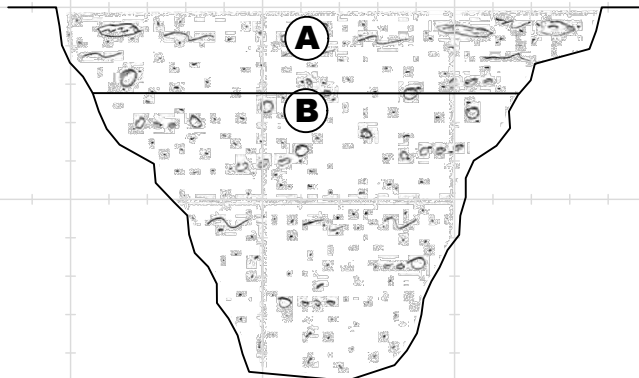
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-0.5' Silty SAND: brown and dark brown, moist, loose; scattered manure @0.5'-1.2' Silty SAND: brown, slightly moist; abundant rootlets; some organic staining; visible porosity @1.2'-2.2' Sandy SILT: light tan brown, slightly moist, medium dense; abundant pinhole porosity; pervasive old rootlets; some organics	Qye	SM	GB-1 @ 0.7'		
	B	<u>Quaternary Young Eolian Deposits</u> @2.2'-5' SAND: gray, dry, medium dense; abundant gravel @5'-6' Silty SAND: brown, moist, medium dense @6'-T.D. SAND: brown and gray, slightly moist, medium dense; occasional gravel bed		SP SM SP	GB-2 @ 1.1' GB-3 @ 1.5' GB-4 @ 2.4'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 727' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 9.5'
 Groundwater: None
 Backfilled: 12/8/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC		Logged By: ARN		Trench No.: TP-15			
Project Number: 20220-01		Date: 12/8/2020		Engineering Properties:			
Equipment: JCB 3CX Excavator		Location: Ontario					

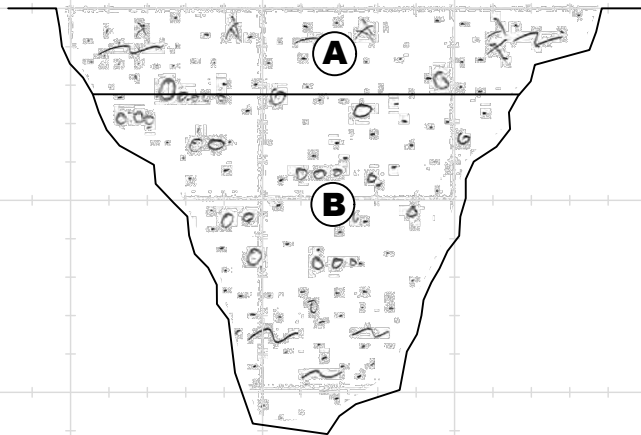
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1.4' Silty SAND: medium brown, dry, medium dense; scattered rootlet; dry vegetation in upper couple inches; moderately indurated	Qye	SM	GB-1 @ 0.4' GB-2 @ 1.0' GB-3 @ 1.8'		
	B	<u>Quaternary Young Eolian Deposits</u> @2.2'-8' SAND: gray, dry, medium dense; abundant gravel @8'-T.D. Silty SAND: brown, slightly moist to moist, medium dense					

GRAPHICAL REPRESENTATION BELOW:

Elevation: 733' MSL

Surface Slope: 0 deg.

Trend: N-S



Total Depth: 11'
Groundwater: None
Backfilled: 12/8/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-16	
Project Number: 20220-01	Date: 12/9/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

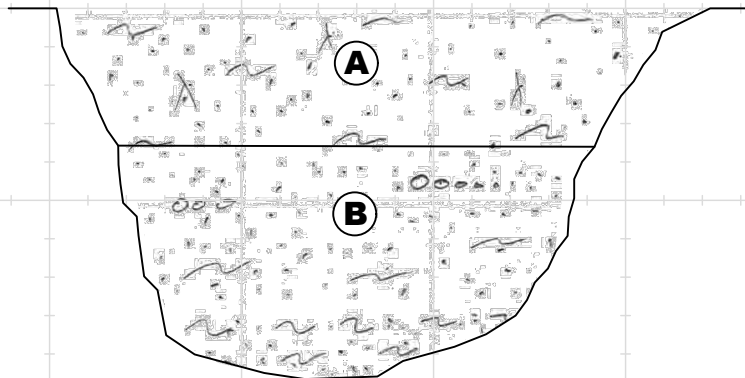
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1.2' Silty SAND: brown, dry, loose; slight discoloration; scattered rootlets in upper couple inches @1.2'-3' SAND with Silt @3'-3.4' Silty SAND: yellow brown, dry, occasional rootlet	Qye	SM	GB-1 @ 0.2' GB-2 @ 1.1' GB-3 @ 1.4'		
	B	<u>Quaternary Young Eolian Deposits</u> 3.4'-5.5' SAND: gray, dry, medium dense; occasional gravel bed @5.5'-7.5' SAND with Silt: gray, slightly moist @7.5'-T.D. Silty SAND to Sandy SILT: gray brown, moist, medium dense/stiff; fine to very fine grained sand		SP SM			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 735' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 9.5'
 Groundwater: None
 Backfilled: 12/9/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-17	
Project Number: 20220-01	Date: 12/9/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

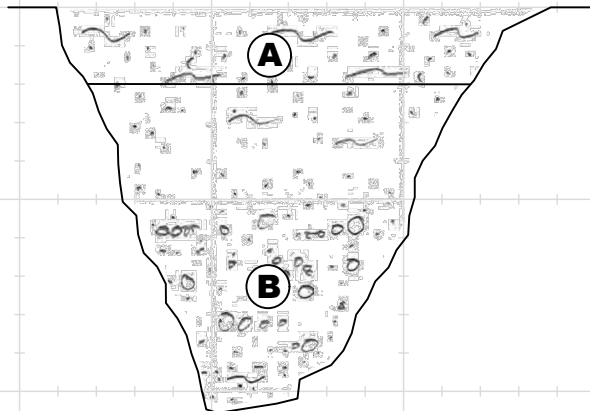
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1.9' Silty SAND: medium to dark brown, slightly moist, medium dense; scattered rootlets; mild organic staining	Qye	SM	GB-1 @ 0.5'		
	B	<u>Quaternary Young Eolian Deposits</u> @1.9'-5' SAND with Silt: brown, slightly moist, medium dense; sand by 4 feet @5'-9.5' Gravelly SAND: gray, dry, medium dense @9.5' - T.D. SAND with Silt: brown, slightly moist, medium dense		SP	GB-2 @ 1.7' GB-3 @ 2.1'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 737' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 10.5'
Groundwater: None
Backfilled: 12/9/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-18	
Project Number: 20220-01	Date: 12/9/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

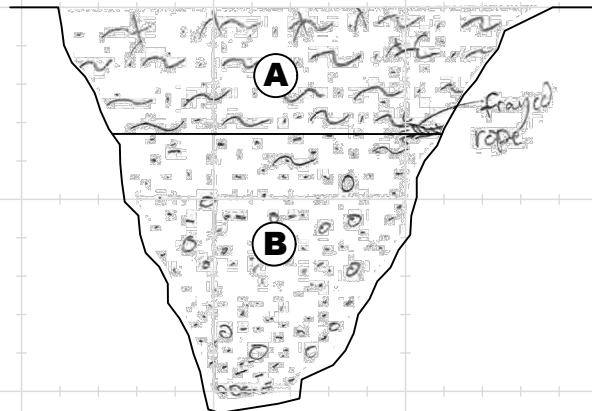
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil / Undocumented Fill</u> @0'-0.7' Sandy SILT: light brown, very dry, loose; scattered dead vegetation @0.7'-1.6' Sandy SILT: medium brown, slightly moist, medium dense; scattered organic mottle @1.6'-3.2' same as above; no organic staining; refuse rope	afu	ML	GB-1 @ 0.2' GB-2 @ 1.4' GB-3 @ 1.9'		
	B	<u>Quaternary Young Eolian Deposits</u> @3.2'-4.4' Silty SAND: brown, moist, medium dense @4.4'-8' SAND: gray, dry, medium dense @8'-T.D. Gravelly SAND: gray, slightly moist; moderate gravel bedding; clasts 3/4-inch in maximum dimension	Qye	SM SP			

GRAPHICAL REPRESENTATION BELOW:

Elevation: 738' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 10.5'
 Groundwater: None
 Backfilled: 12/9/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC		Logged By: ARN	Trench No.: TP-19	
Project Number: 20220-01		Date: 12/9/2020	Engineering Properties: 	
Equipment: JCB 3CX Excavator		Location: Ontario		

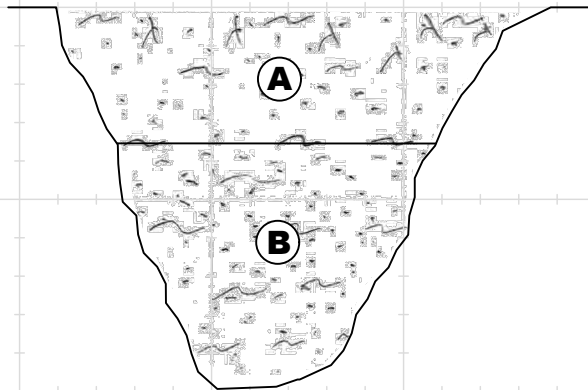
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-0.1.7' Silty SAND: medium brown, dry, very loose; occasional gravel; scattered rootlets; organic staining @1.7'-3.4' same as above; no rootlets; no staining	Qye	SM	GB-1 @ 1.0'		
	B	<u>Quaternary Young Eolian Deposits</u> @3.4'-4.5' SAND with Silt: gray moist, medium dense @4.5'-T.D. Silty SAND: medium brown, slightly moist to moist, medium dense; some caliche in siltier bed		SP SM	GB-2 @ 2.0' GB-3 @ 3.6' GB-4 @ 7.0'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 734' MSL


Surface Slope: 0 deg.

Trend: N-S



Total Depth: 9.9'
Groundwater: None
Backfilled: 12/9/20

scale: 1 in = 5 ft

Project Name: Richland - MCBC	Logged By: ARN	Trench No.: TP-20	
Project Number: 20220-01	Date: 12/9/2020	Engineering Properties:	
Equipment: JCB 3CX Excavator	Location: Ontario		

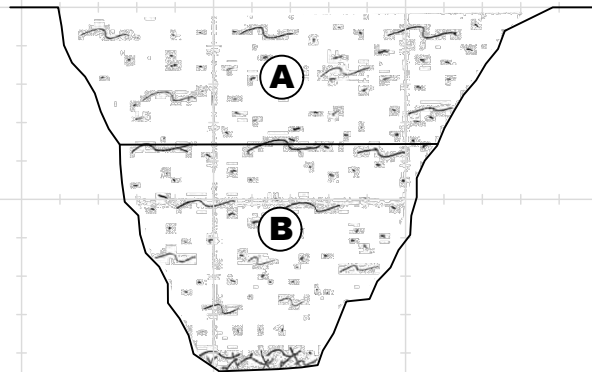
Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	<u>Topsoil</u> @0'-1.2' Silty SAND: medium dark brown, slightly moist, very loose; scattered rootlets and organic staining @1.2'-3.5' Sand with Silt: medium brown, slightly moist, medium dense	Qye	SM	GB-1 @ 0.2'		
	B	<u>Quaternary Young Eolian Deposits</u> @3.5'-9' Silty SAND: brown, moist @9'-T.D Sandy Silt to Silty SAND: brown, moist, medium dense; abundant caliche		SM ML-SM	GB-2 @ 1.0' GB-3 @ 1.5' GB-4 @ 9.0'		

GRAPHICAL REPRESENTATION BELOW:

Elevation: 732' MSL

Surface Slope: 0 deg.

Trend: N-S



Total Depth: 9.5'
 Groundwater: None
 Backfilled: 12/9/20

scale: 1 in = 5 ft

Infiltration Test Data Sheet

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-1

Test hole dimensions (if circular)	
Boring Depth (feet)*:	18
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)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
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

*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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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 Infiltration Rate (No factors of safety)	7.0
Factor of Safety	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



Infiltration Test Data Sheet

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-2

Test hole dimensions (if circular)	
Boring Depth (feet)*: _____	16
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)	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

*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, Δt (min)	Initial Depth to Water, D _o (feet)	Final Depth to Water, D _f (feet)	Change in Water Level, ΔD (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 Infiltration Rate (No factors of safety)	4.3
Factor of Safety	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



Infiltration Test Data Sheet

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

*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)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 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

*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, Δt (min)	Initial Depth to Water, D _o (feet)	Final Depth to Water, D _f (feet)	Change in Water Level, ΔD (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:



Infiltration Test Data Sheet

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-4

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)	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

*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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



Infiltration Test Data Sheet

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: I-5

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)	Final Depth to Water (feet)	Total Change in Water Level (feet)	Greater Than or Equal to 0.5 feet (yes/no)
1	8:58	9:23	25.0	16.26	18.53	2.27	Yes
2	9:25	9:50	25.0	17.05	18.55	1.50	Yes

*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, Δt (min)	Initial Depth to Water, D _o (feet)	Final Depth to Water, D _f (feet)	Change in Water Level, ΔD (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:

Notes:



Infiltration Test Data Sheet

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: I-6

Test hole dimensions (if circular)	
Boring Depth (feet)*:	19.5
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)	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

*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, Δt (min)	Initial Depth to Water, D_o (feet)	Final Depth to Water, D_f (feet)	Change in Water Level, ΔD (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)	0.6
Factor of Safety	TBD
Calculated Infiltration Rate (With Factor of Safety)	

Sketch:

Notes:



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 Compaction of Fill

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 sheepfoot 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

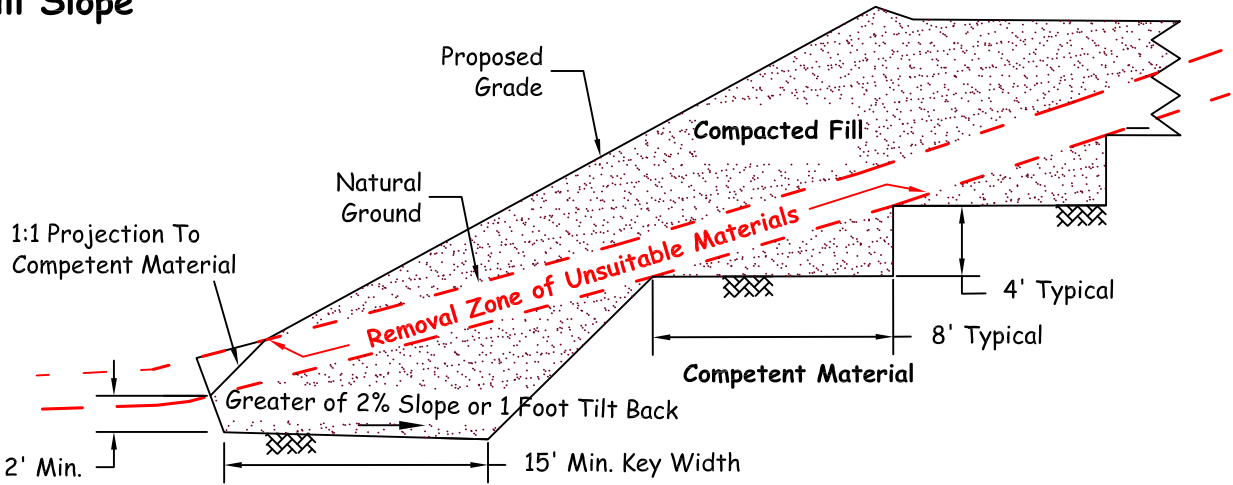
7.1 The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations.

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

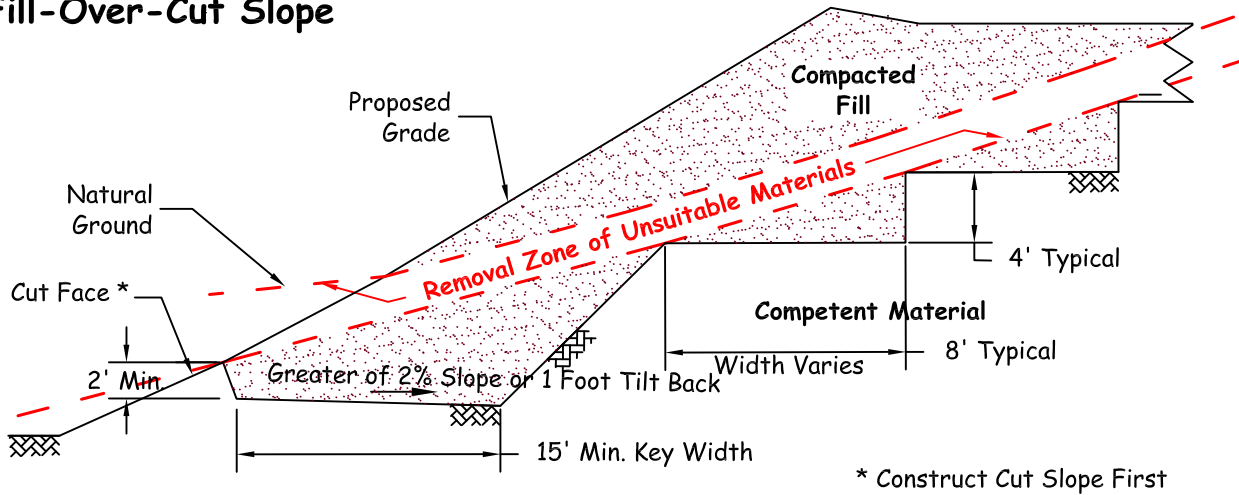
the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

- 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.

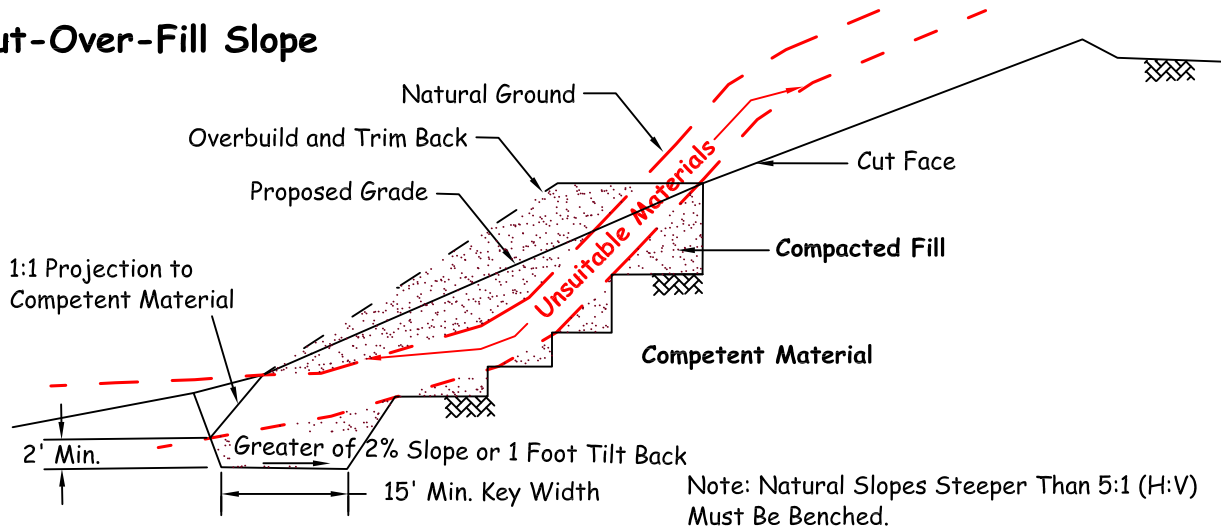
Fill Slope

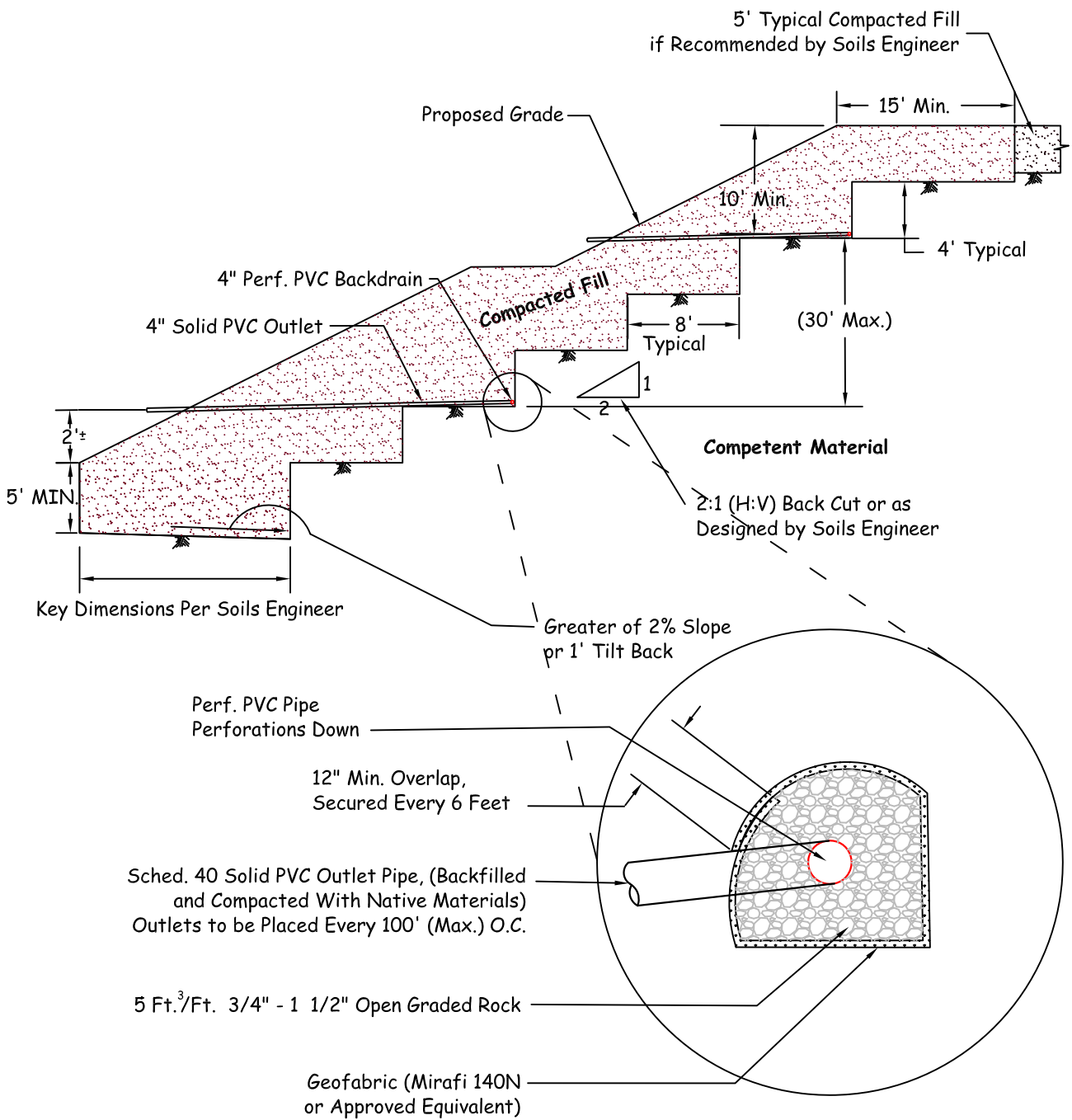


Fill-Over-Cut Slope

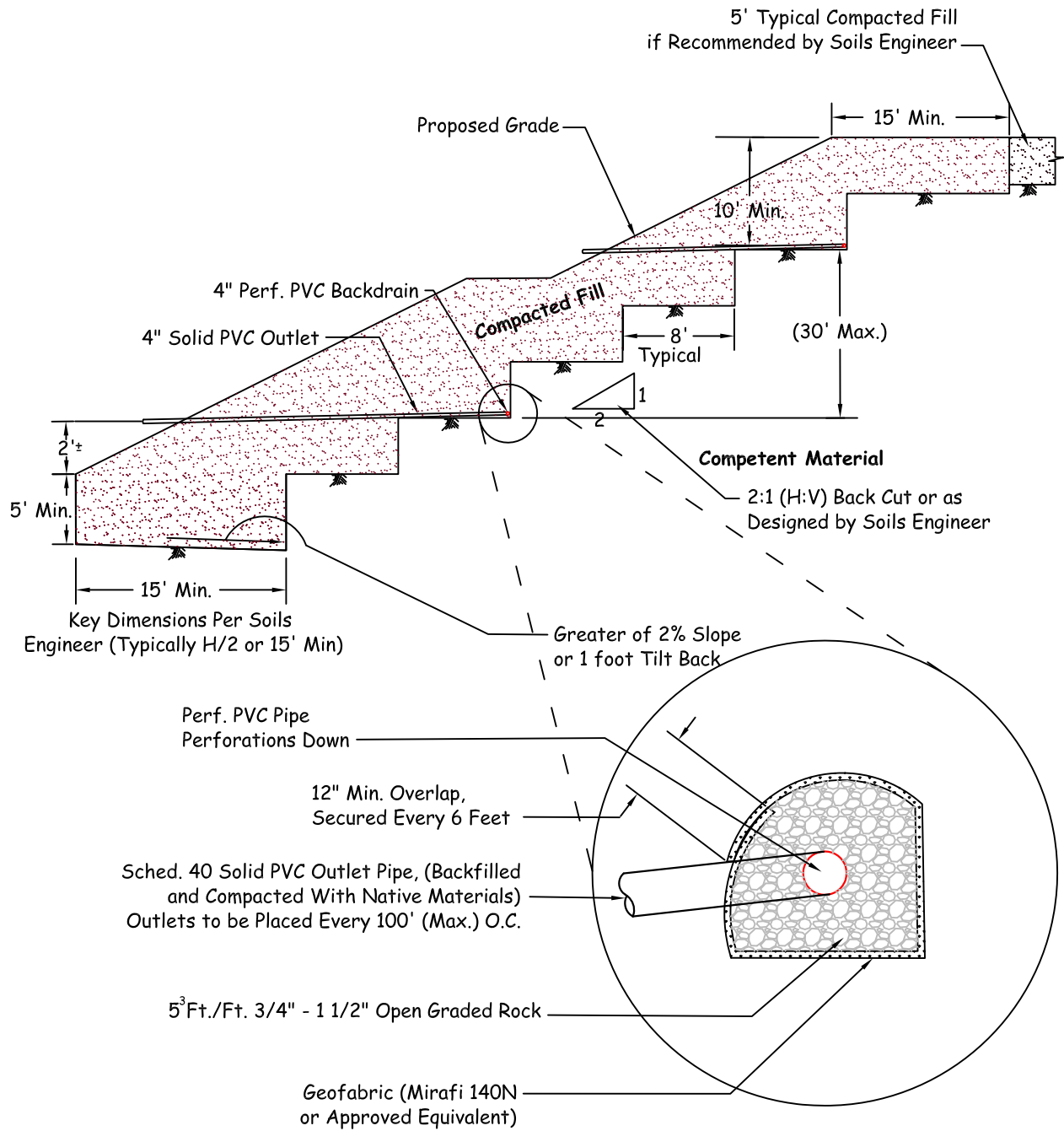


Cut-Over-Fill Slope



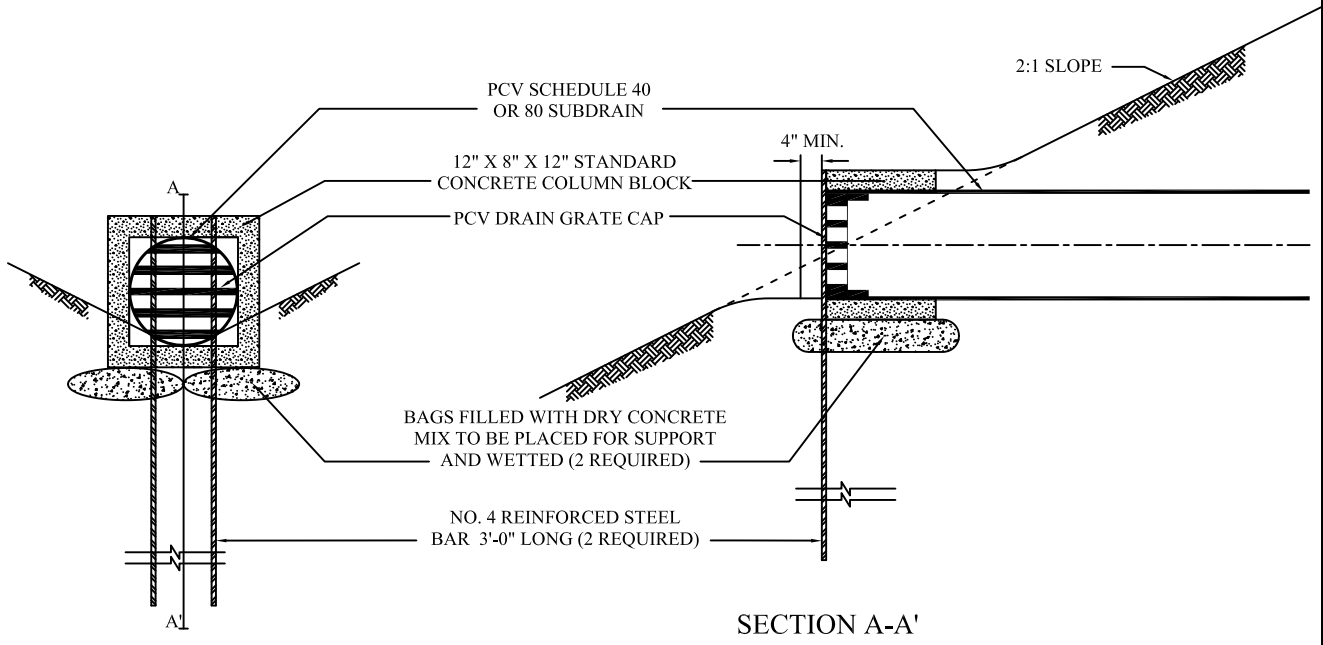


TYPICAL BUTTRESS DETAIL

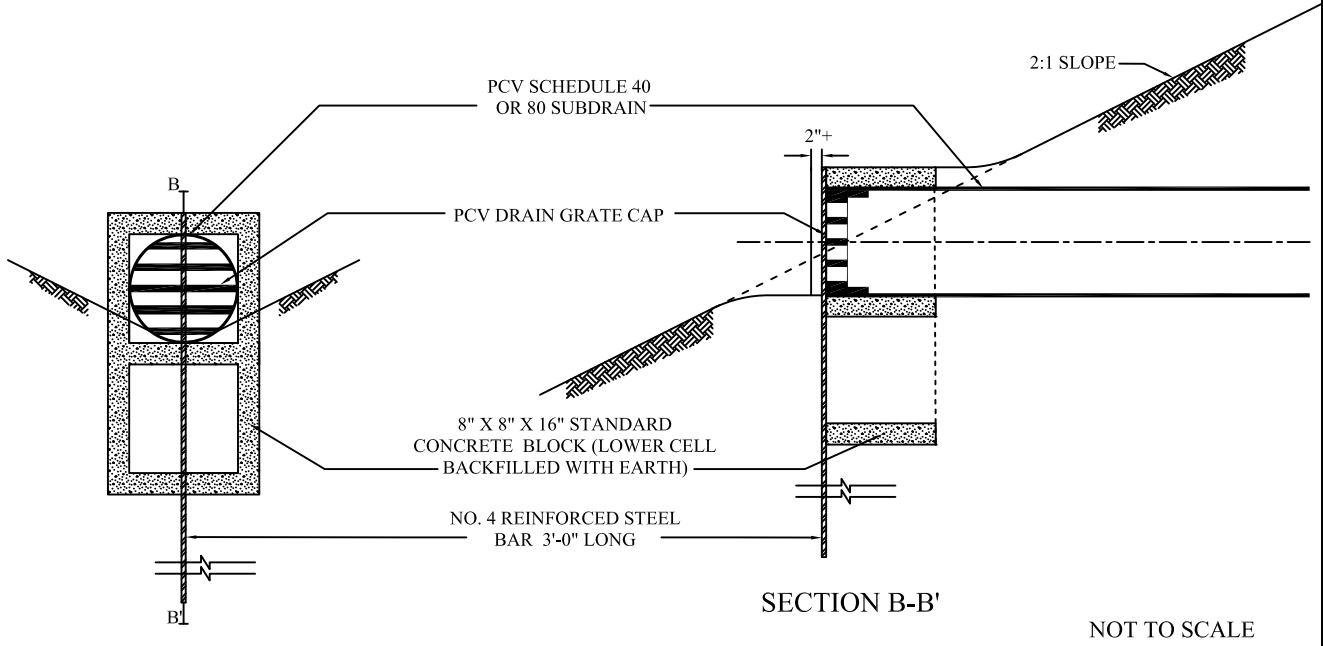


TYPICAL STABILIZATION FILL DETAIL

SUBDRAIN OUTLET MARKER -6" & 8" PIPE

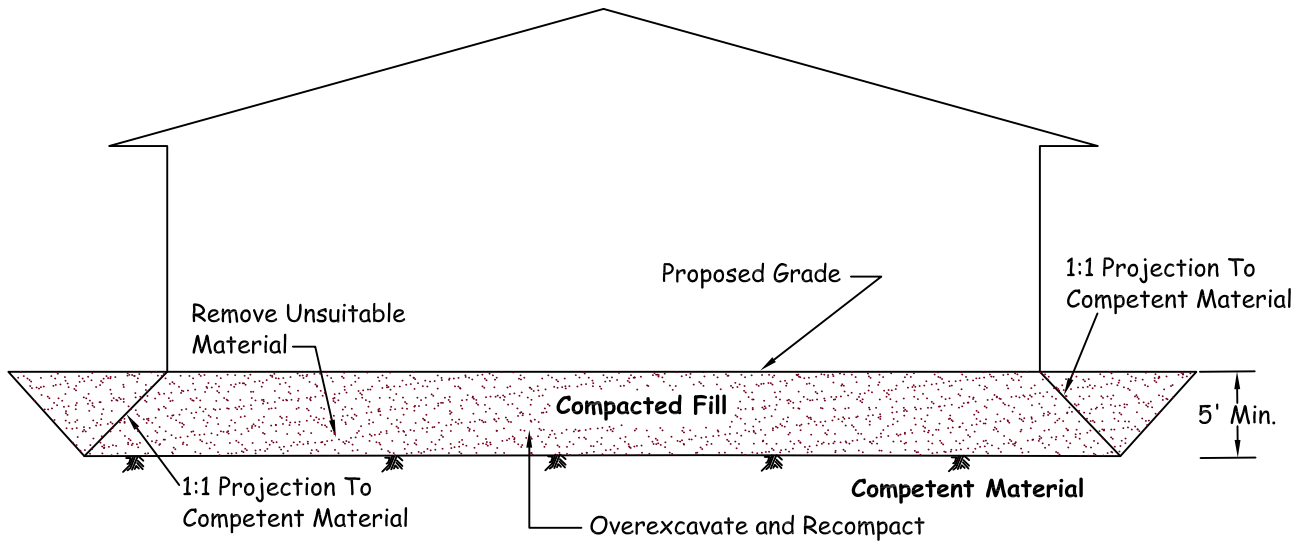


SUBDRAIN OUTLET MARKER -4" PIPE



**SUBDRAIN OUTLET
MARKER DETAIL**

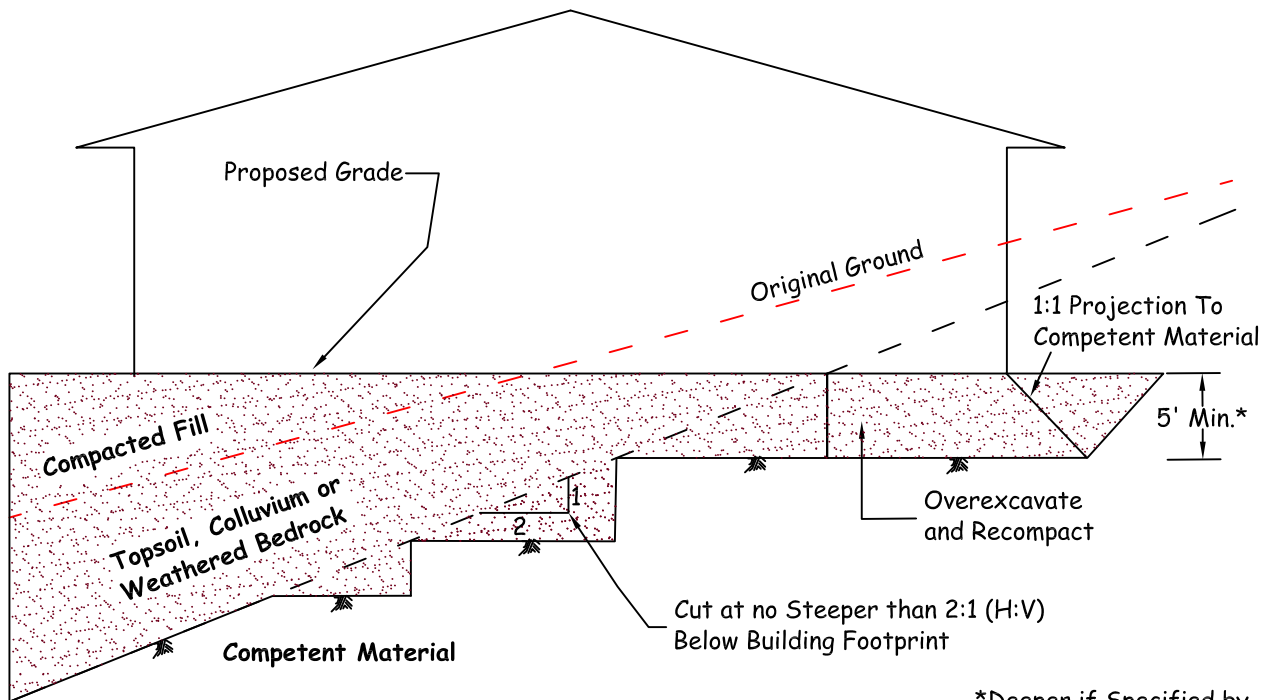
Cut Lot (Exposing Unsuitable Soils at Design Grade)



Note 1: Removal Bottom Should be Graded With Minimum 2% Fall Towards Street or Other Suitable Area (as Determined by Soils Engineer) to Avoid Ponding Below Building

Note 2: Where Design Cut Lots are Excavated Entirely Into Competent Material, Overexcavation May Still be Required for Hard-Rock Conditions or for Materials With Variable Expansion Characteristics.

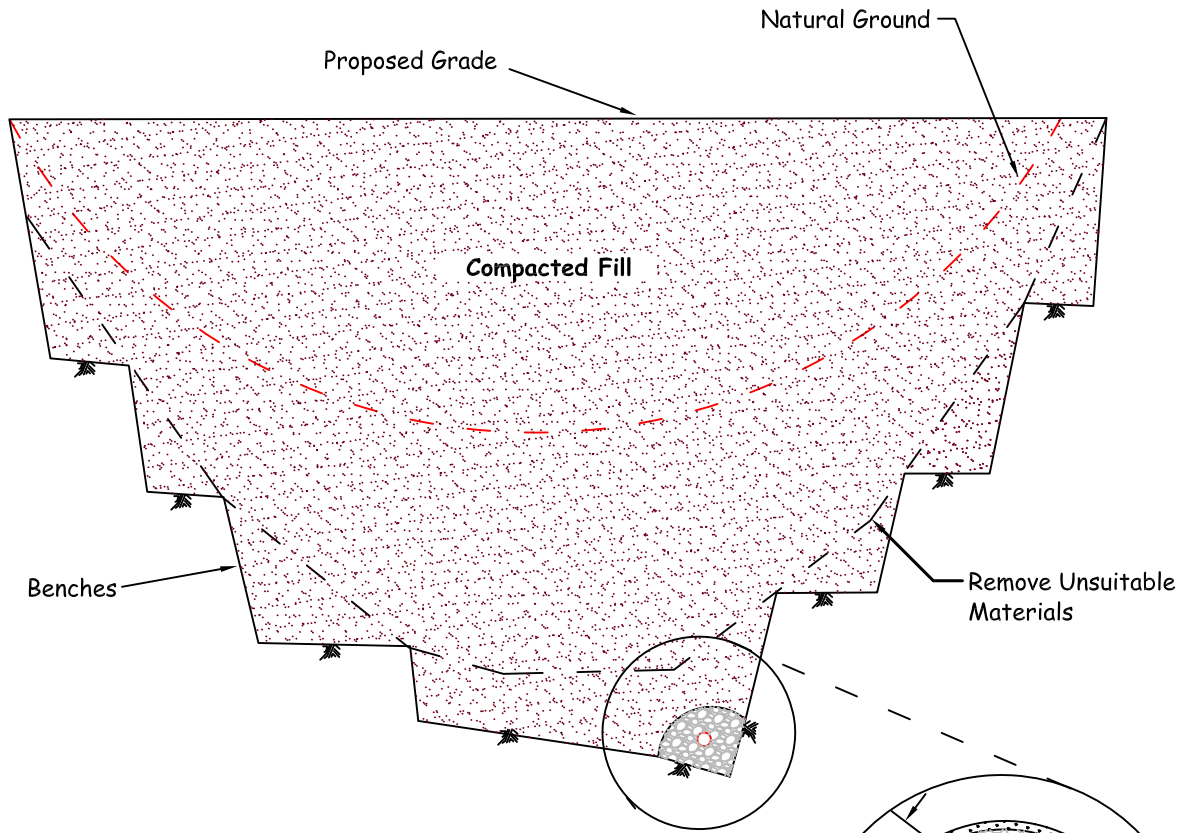
Cut/Fill Transition Lot



*Deeper if Specified by Soils Engineer



CUT AND TRANSITION LOT OVEREXCAVATION DETAIL



Notes:

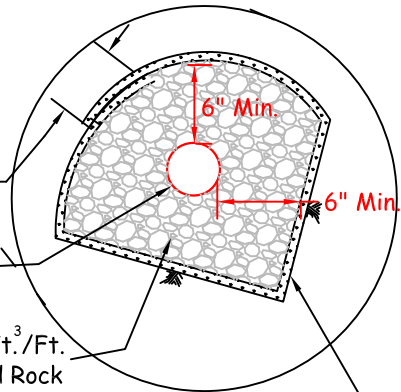
- 1) Continuous Runs in Excess of 500' Shall Use 8" Diameter Pipe.
- 2) Final 20' of Pipe at Outlet Shall be Solid and Backfilled with Fine-grained Material.

12" Min. Overlap,
Secured Every 6 Feet

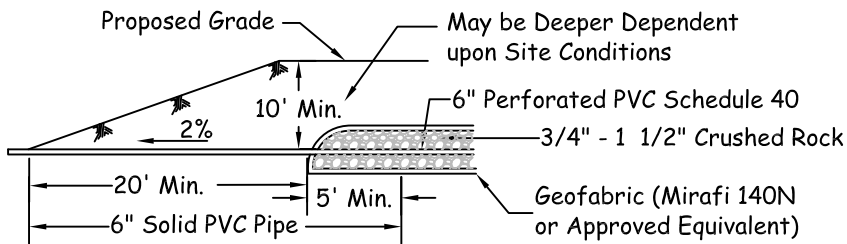
6" Collector Pipe
(Sched. 40, Perf. PVC)

9 Ft.³/Ft.
3/4" - 1 1/2" Crushed Rock

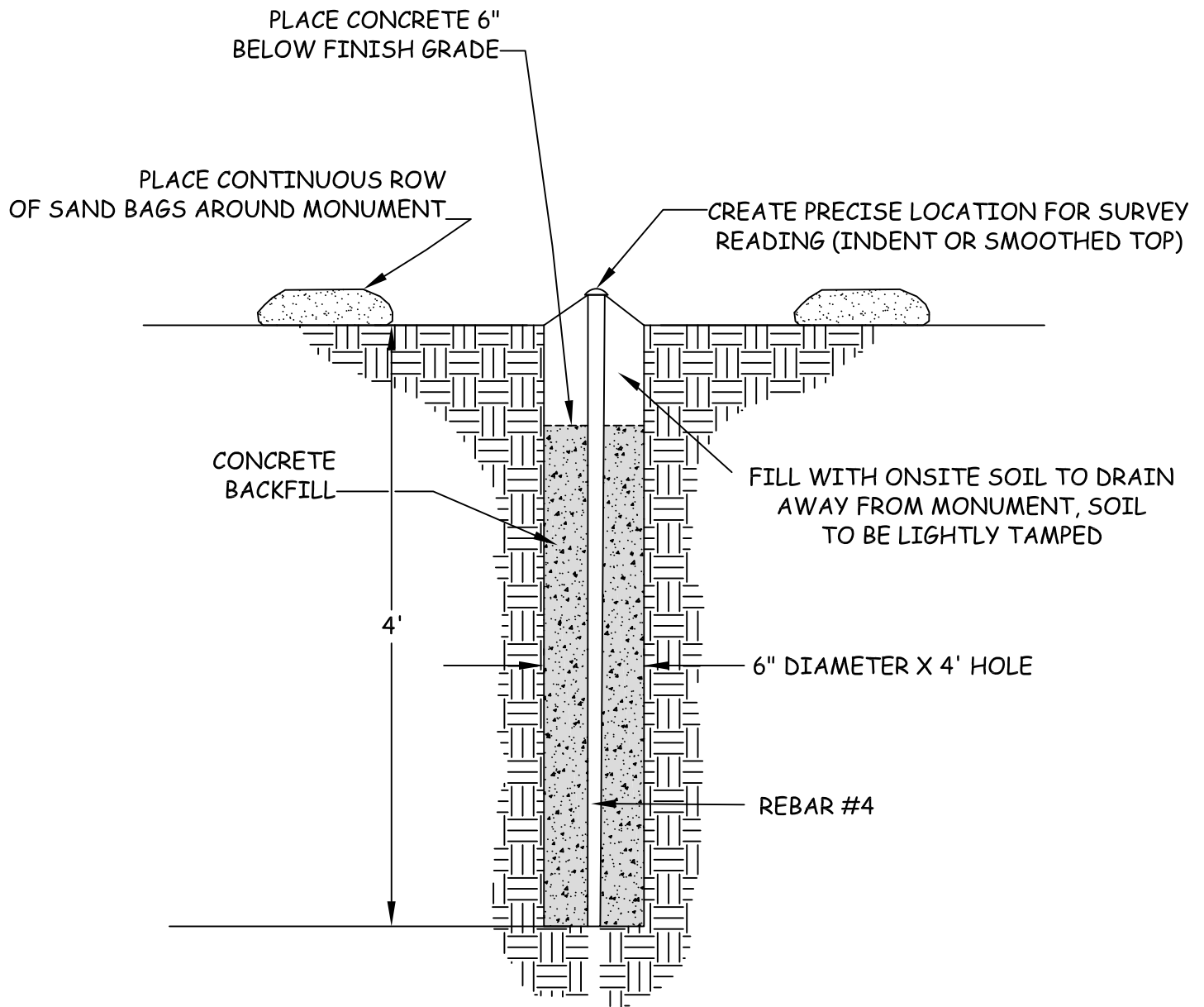
Geofabric (Mirafi 140N
or Approved Equivalent)



Proposed Outlet Detail



CANYON SUBDRAINS

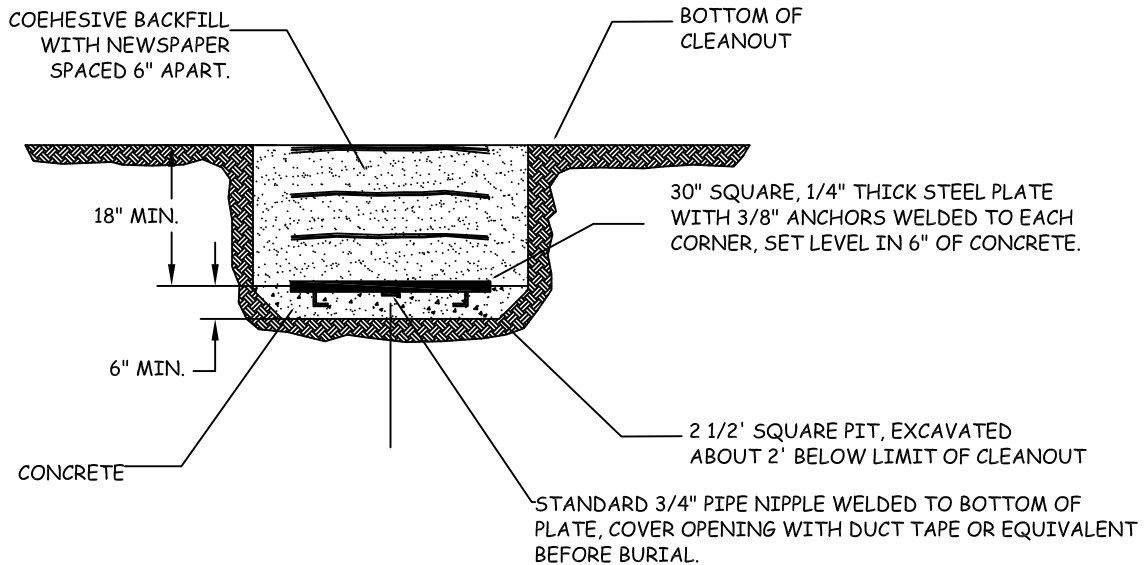
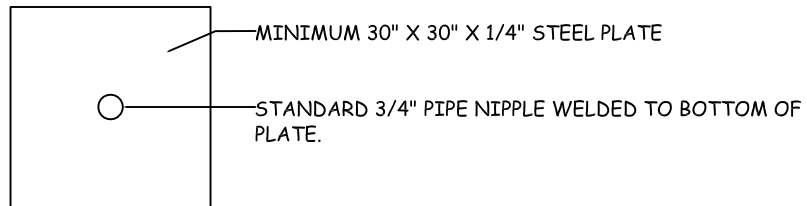


NO CONSTRUCTION EQUIPMENT WITHIN 25 FEET OF ANY INSTALLED SETTLEMENT MONUMENTS



TYPICAL SURFACE SETTLEMENT MONUMENT

TOP VIEW



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 EXPLICITLY 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

