GEOTECHNICAL AND INFILTRATION EVALUATION
FOR
PROPOSED SINGLE-FAMILY RESIDENTIAL DEVELOPMENT
TRACT NO. 38066
RAMONA BOULEVARD & RANCH VIEW LANE
SAN JACINTO, RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR

GOLDEN OCEAN REALTY, LLC
608 DEODAR LANE
BRADBURY, CALIFORNIA 91008

PREPARED BY

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PROJECT NO. 2741-CR **MAY 26, 2021**

GEOTEK

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May 26, 2021
Project No. 2741-CR

Golden Ocean Realty, LLC
608 Deodar Lane
Bradbury, California 91008

Attention: Mr. Tony Tang

Subject: Geotechnical and Infiltration Evaluation
Proposed Single-Family Residential Development
Tract No. 38066
Ramona Boulevard & Ranch View Lane
San Jacinto, Riverside County, California

Dear Mr. Tang:

We are pleased to provide our geotechnical and infiltration report for proposed development at the subject property located in the city of San Jacinto, Riverside County, California. This report presents a discussion of our evaluation and provides updated geotechnical recommendations for earthwork, foundation design, and construction.

In our opinion, site development appears feasible from a geotechnical viewpoint provided that the recommendations presented in this report are incorporated into the design and construction phases of the project.

The opportunity to be of service is sincerely appreciated. If you have any questions, please do not hesitate to call our office.

Respectfully submitted,
GeoTek, Inc.

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1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the existing geotechnical conditions for the currently proposed development. Services provided for this study included the following:

- Research and review of readily available geologic data and past soil reports pertinent to the site,
- A site reconnaissance,
- Site exploration via eight exploratory borings to depths between 16.5 and 51.5 feet and five Cone Penetration Test (CPT) soundings to depths of about 50 feet each across the site,
- Testing of four percolation test borings to estimate the infiltration rate of the subsoils within a potential basin location toward the northwestern corner of the site,
- Collection relatively undisturbed and bulk samples of the site soils for geotechnical and corrosion assessment,
- Review and evaluation of site seismicity,
- Engineering analyses, and;
- Compilation of this updated geotechnical and infiltration evaluation which presents our findings, conclusions, and recommendations for site development.

The intent of this report is to aid in the evaluation of the site for future proposed development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report may need to be updated based upon our review of the final site development plans. Final site development plans should be provided to GeoTek for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The irregularly shaped project site is located at the southwest corner of the intersection of Ramona Boulevard and Ranch View Lane in San Jacinto, California. At the time of the site investigation, the site was vacant and undeveloped land and appears to have recently been used for farming. Topographically, the site is relatively level sloping gently downward to the southwest.

The site is bounded by Ramona Boulevard to the northeast north, Ranch View Lane to the southeast with undeveloped land to the south and west. The general location of the site is shown in Figure 1.

2.2 PROPOSED DEVELOPMENT

Based on a review of Tentative Tract Map 38066, prepared by W&W Land Design Consultants, Inc., dated February 2020, we understand that the property will be developed into a residential tract and will include 144 residential lots, street improvements, open spaces, and stormwater management areas. Based on the relatively flat topography, we anticipate that the maximum depths of cut and fill will be less than about 7 feet, not including any needed remedial grading

We anticipate that the 1 and 2-story residential buildings will be supported by shallow spread footings and will utilize a conventional floor slab. Although structural loading information was not available at the time of this report preparation, we have assumed maximum column and wall loads of about 50 kips and 2.5 kips per foot, respectively.

If site development differs from the information presented in this report, the recommendations should be subject to further review and evaluation by GeoTek. Final site development plans should be reviewed by GeoTek when they become available.

3. FIELD EXPLORATION

GeoTek conducted a field exploration at the site on April 23, 2021 which consisted of excavating eight exploratory borings extended to depths ranging from about 16-½ to 51-½ feet below grade. Four shallow borings were also drilled to a depth of about 5 feet for

percolation/infiltration testing. Some of the boring locations were restricted due to access limitations.

Five CPT soundings were subsequently excavated at the site on May 19, 2021 to depths of about 50 feet each. The approximate locations of these excavations are shown on Figure 2, Exploration Location Map. Logs of the excavations are included in Appendix B.

3.1 LABORATORY TESTING

Laboratory testing was performed on selected soil samples collected during our field exploration. The purpose of the laboratory testing was to confirm the field classification of the soil materials encountered and to evaluate the physical properties of the soils for use in the engineering design and analysis. Laboratory testing included in-situ dry density-moisture content, proctor, remolded direct shear, collapse, expansion index, among other tests. Test results are presented in Appendix C.

3.2 PERCOLATION TESTING

GeoTek utilized the percolation test procedure (Riverside County, 2011) to estimate the infiltration rate of the subsoils within the planned stormwater management areas of the site.

The percolation test borings (Borings I-1 through I-4) were excavated within the cited areas with a hollow-stem auger drill rig. All percolation test borings were drilled to depths of approximately five feet. The borings were approximately eight inches in diameter. A three-inch diameter perforated PVC pipe encapsulated in filter sock was inserted into each of the test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

Subsequent to pre-soaking the test holes, percolation testing was performed in the lower 20 inches of each test hole by a representative from our firm. The percolation rates were converted to infiltration rates via the Porchet Method.

The infiltration rates, which do not include a factor of safety and were determined after the water levels had stabilized, are presented in the following table.

Boring No.	Field Percolation Rate (min/inch)	Infiltration Field Rate (inches per hour)
I-1	6.0	1.03
I-2	6.3	0.97
I-3	6.7	0.91
I-4	6.7	0.91

Detailed infiltration/percolation test data and Porchet conversion calculations are presented in Appendix C.

Over the lifetime of the basin systems, the infiltration rates may be affected by silt build up and biological activities, as well as local variations in near surface soil conditions. A suitable factor of safety should be applied to the field rates to design the infiltration system.

It should be noted that the infiltration rates provided above were performed in relatively undisturbed native materials. Infiltration rates will vary and are mostly dependent on the underlying consistency of the site soils. Infiltration rates will be impacted by weight of equipment travelling over the soils, placement of engineered fill and other various factors. GeoTek assumes no responsibility or liability for the ultimate design or performance of the storm water management system.

4. GEOLOGIC AND SOILS CONDITIONS

4.1 REGIONAL SETTING

The property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. Basically, it extends from the point of contact with the Transverse Ranges geomorphic province, southerly to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San

Jacinto Fault zone trend northwest-southeast and are found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province.

More specific to the subject property, the site is located in an area geologically mapped to be underlain by alluvium (Dibblee, T.W. and Minch, J.A., 2003).

4.2 SUBSURFACE CONDITIONS

A brief description of the earth materials as encountered within our explorations is presented below.

4.2.1 Alluvium

Alluvial deposits were encountered at the ground surface within all explorations at the site and extended to the maximum depths explored. The alluvium generally consisted of a loose to medium dense silty sand, clayey sand and sand and a stiff to very stiff sandy to clayey silt.

According to the results of the laboratory testing performed on two samples of the near surface soils, the near surface soils have a "very low" expansion potential (EI=0) when tested and classified in accordance with ASTM D 4829. The test results are provided in Appendix B.

Detailed logs of the site explorations are included in Appendix A. The locations of the site explorations are shown on the Exploration Location Map presented as Figure 2.

4.3 SURFACE WATER AND GROUNDWATER

4.3.1 Surface Water

Surface water on this site is the result of precipitation or surface run-off from surrounding areas. Overall surface drainage is generally to the north-northwest.

4.3.2 Groundwater

Groundwater was encountered within Boring B-5 at a depth of about 29.5 feet below existing grade. Based on a review of groundwater information contained on the California Water Data Library (https://wdl.water.ca.gov/waterdatalibrary/) for wells within the site vicinity, we believe that the depth to the hydrostatic water table at the site is at least 80 feet below grade. It is our opinion that the shallow water observed within boring B-5 is a perched water condition.

4.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is presently known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone. The County of Riverside (https://countyofriverside.us/Residents/PropertyInformation.aspx) has designated the site area as "not in fault zone", "not in a fault line", having a "moderate" potential for liquefaction, and in an "active" subsidence zone. The nearest zoned fault is the San Jacinto fault zone-San Jacinto Valley Section located approximately 0.5 miles to the southwest and 1.3 miles to the northeast.

4.4.1 Seismic Design Parameters

The site is located at approximately 33.7928° Latitude and -116.9527° Longitude. Based on the data from site explorations and geologic mapping, we consider that Site Class "D" is appropriate for the property. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "D" site, was determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. Using the ASCE 7-16 option on the SEAOC/OSHPD website results in the values for S_{M1} and S_{D1} reported as "null-See Section 11.4.8" (of ASCE 7-16). As noted in ASCE 7-16, Section 11.4.8, a site-specific ground motion procedure is recommended for Site Class D when the value S_1 exceeds 0.2. The value S_1 for the subject site exceeds 0.2. For a site Class "D", an exception to performing a site-specific ground motion analysis is allowed in ASCE 7-16 where S_1 exceeds 0.2 provided the value of the seismic response coefficient, Cs, is conservatively calculated by Eq 12.8-2 of ASCE 7-16 for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. 12.8-3 for $T_L \geq T > 1.5T_s$ or Eq. 12.8-4 for $T > T_L$.

The results, based on the 2015 NEHRP and the 2019 CBC, are presented in the following table and we have assumed that the exception as allowed in ASCE 7-16 is applicable. If the exception is deemed not appropriate, a site-specific ground motion analysis will be required.

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_s	2.225g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.907g
Site Coefficient for Site Class "D", F_a	1.0
Site Coefficient for Site Class "D", F_v	1.7
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	2.225g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	1.542g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.483g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	1.028g
Peak Ground Acceleration Adjusted for Site Class Effects, PGA_M	1.11g
Seismic Design Category	E

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

4.5 LIQUEFACTION AND SEISMICALLY INDUCED SETTLEMENT

The County of Riverside has designated the site as possessing a moderate liquefaction potential. As noted previously, perched water was observed within Boring B-5 at a depth of about 29.5 feet below grade. Although this water is believed to be representative of a perched water condition, a liquefaction analysis was performed assuming this shallow perched condition is present at the time of a nearby seismic event. For this analysis we utilized the penetration data from CPT-1 through CPT-5, incorporated a ground acceleration (PGA_M) of 1.11g, a mean earthquake magnitude of 7.47 and a high-water depth of 29 feet. The ground acceleration and earthquake magnitude were obtained from the USGS websites. The computer software program Cliq version 3.3.1.14 (Geologistmiki, 2016) was also used for this analysis.

The following table summarizes the amount of seismic-induced dry and total seismically induced settlement (i.e. settlement of unsaturated sands and liquefaction-related settlement) estimated at each CPT location:

ESTIMATED SEISMICALLY INDUCED TOTAL SETTLEMENT		
CPT Sounding	Dry Settlement (in)*	Total Seismic Settlement (in)**
1	0.37	0.52
2	1.2	1.15
3	1.28	1.10
4	1.52	1.83
5	1.25	1.60

*Based on groundwater at 80 feet below grade

**Based on groundwater at 29 feet below grade

Based on this analysis, a worst-case seismic settlement of about 1.9 inches should be assumed. A seismic differential settlement of about 1 inch over a 30-foot span is also considered possible. Based on these results, it is our opinion that ground modification or special foundation design is not warranted. The results of the seismic settlement analyses are presented within Appendix D.

4.6 OTHER HAZARDS

Evidence of ancient landslides or slope instabilities at this site was not observed during our site reconnaissance. Thus, the potential for landslides is considered negligible for design purposes.

The potential for secondary seismic hazard such as a tsunami is considered negligible due to site elevation and great distance to the ocean.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

The proposed development appears feasible from a geotechnical viewpoint provided that the following recommendations are incorporated into design and construction.

5.2 EARTHWORK CONSIDERATIONS

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the City of San Jacinto/County of Riverside, the 2019 California Building Code (CBC), and recommendations contained in this report. The Grading Guidelines included in Appendix E outline general procedures and do not anticipate all site-specific situations. In the

event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix E.

5.2.1 Site Clearing

The site should be cleared of existing vegetation, roots, and any above-ground or below-grade utilities. These materials should be properly disposed of off-site.

5.2.2 Remedial Grading

We recommend that the soil to a depth of at least 4 feet from existing grade or finished grade or 2 feet below the base of foundations, whichever is deeper, should be completely removed within the proposed structural areas. The depth of removal/over-excavation should be extended, where needed, to remove any undocumented fill (if encountered). As a minimum removals/over-excavations should extend down and away from foundation elements at a 1:1 (h:v) projection to the recommended removal depth.

The bottom of all removals should be scarified to a minimum depth of 12 inches, brought to slightly above the optimum moisture content, and then recompacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557. The bottoms of remedial excavations should be observed and approved by a GeoTek representative prior to scarification.

5.2.3 Excavation Characteristics

Excavation in the on-site soils is expected to be feasible utilizing heavy-duty grading equipment in good operating condition.

All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Based on the data from our explorations, we consider the site soils can be categorized as OSHA Soil Type C. We recommend that temporary slopes greater than four feet in height not be constructed at inclinations steeper than 1.5:1 (h:v). Flatter inclinations may be needed depending on the field conditions. Temporary construction slopes should be periodically examined by a competent person, per OSHA requirements, to look of evidence of instability.

5.2.4 Engineered Fill

The onsite soils are considered suitable for reuse as engineered fill provided they are free from vegetation, debris, deleterious material, and hard lumps greater than six inches in maximum dimension.

Fill materials should be placed in horizontal lifts not exceeding six inches in loose thickness, moisture conditioned to at least the optimum moisture content, and compacted to a minimum relative compaction of 90 percent (ASTM D 1557).

Detailed recommendations pertaining to the placement of engineered fill are presented in Appendix E.

5.2.5 Slopes

Fill and cut slopes constructed at gradients of 2:1 (h:v) or flatter, in accordance with industry standards, are anticipated to be grossly stable. Fill placed on slopes should be properly benched into competent soils per the geotechnical engineer. Cut slopes should be observed by a geotechnical engineer/engineering geologist to approve the exposed conditions upon excavation.

Due to the granular nature of the on-site soils, slopes could be subject to erosion. Thus, it is our recommendation that slopes be landscaped upon their completion of construction.

5.2.6 Trench Excavation and Backfill

Trench excavations should conform to Cal-OSHA regulations. The contractor should have a competent person, per OSHA requirements, on site during construction to observe conditions and to make the appropriate recommendations.

Utility trench backfill should be compacted to at least 90 percent relative compaction (ASTM D 1557). Compaction should be achieved with a mechanical compaction device. Jetting of trench backfill is not recommended. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

5.2.7 Shrinkage and Subsidence

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of approximately 10 to 20 percent may be considered for the materials requiring recompaction. Subsidence of up to 0.2 feet may occur as a result of preparation of natural ground.

5.3 DESIGN RECOMMENDATIONS

5.3.1 Foundation Design Criteria

The soils tested within our laboratory indicated the site soils possess a "very low" ($0 \leq EI \leq 20$) expansion potential in accordance with ASTM D 4829. Foundation design criteria, in general conformance with the 2019 CBC, are presented below. Typical design criteria for the site based upon a "very low" expansion potential are tabulated below. These are minimal recommendations and are not intended to supersede the design by the project structural engineer.

The foundation elements for the proposed structures should bear entirely in engineered fill soils. Foundations should be designed in accordance with the *2019 California Building Code* (CBC).

Expansion index and soluble sulfate testing of the soils should be performed during construction to evaluate the as-graded conditions. Final recommendations should be based upon the as-graded soils conditions.

A summary of our foundation design recommendations is presented in the following table:

Design Parameter	"Very Low" Expansion Potential
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	12
Minimum Foundation Width (Inches)*	12
Minimum Slab Thickness (actual)[1]	4 – Actual
Minimum Slab Reinforcing	6" x 6" – W2.9/W2.9 welded wire fabric placed in middle of slab or No. 3 bars at 18 inch centers
Minimum Footing Reinforcement	Four No. 4 reinforcing bars, two placed near the top and two near the bottom
Presaturation of Subgrade Soil (Percent of Optimum)	Minimum of 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

* Code minimums per Table 1809.7 of the 2019 CBC.

1. Slab thickness and reinforcement should be determined necessary by the structural engineer.

It should be noted that the criteria provided are based on soil support characteristics only. The structural engineer should design the slab and beam reinforcement based on actual loading conditions.

An allowable bearing capacity of 1,800 pounds per square foot (psf) may be used for design of building and retaining wall footings with minimum depths and widths of 12 inches. This value may be increased by 700 psf for each additional 12 inches of embedment depth and by 300 psf for each additional 12 inches in width to a maximum of 3,500 psf. The allowable bearing capacity may be increased by one-third when considering short-term wind and/or seismic loads.

For footings designed in accordance with the recommendations presented in this report, we would anticipate a maximum static settlement of less than one inch and a maximum differential static settlement of less than ½-inch in a 40-foot span. We recommend that the structural engineer evaluate the seismic-induced settlement and determine the impact on the proposed improvements.

The passive earth pressure may be computed as an equivalent fluid having a density of 270 psf per foot of depth, to a maximum earth pressure of 3000 psf for footings founded on engineered fill. A coefficient of friction between soil and concrete of 0.4 may be used with dead load forces. The upper one foot of soil below the adjacent grade should not be used in calculating passive pressure. When combining passive and frictional resistance, the passive pressure component should be reduced by one-third.

If desired, the building floor slabs may be designed using an estimated subgrade modulus of 175 pci, which is based on a value typically obtained from a 1 foot by 1-foot plate bearing test. Depending on how the floor slab is loaded, the subgrade modulus may need to be geometrically modified.

A moisture and vapor retarding system should be placed below slabs-on-grade where moisture migration through the slab is undesirable. Guidelines for these are provided in the 2019 California Green Building Standards Code (CALGreen) Section 4.505.2, the 2019 CBC Section 1907.1, ACI 360R-10 and ACI 203.2R-06. It should be realized that the effectiveness of the vapor retarding membrane can be adversely impacted as a result of construction related punctures (e.g. stake penetrations, tears, punctures from walking on the aggregate layer, etc.). These occurrences should be limited as much as possible during construction.

Thicker membranes are generally more resistant to accidental puncture than thinner ones. Products specifically designed for use as moisture/vapor retarders may also be more puncture resistant. Although the CBC specifies a 6-mil vapor retarder membrane, it is GeoTek's opinion that a minimum 10-mil thick membrane with joints properly overlapped and sealed should be considered, unless otherwise specified by the slab design professional.

Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and environmental conditions. Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e., thickness, composition, strength, and permeability) to achieve the desired performance level. Consideration should be given to consulting with an individual possessing specific expertise in this area for additional evaluation.

Moisture retarders can reduce, but not eliminate, moisture vapor rise from the underlying soils up through the slab. Moisture retarders should be designed and constructed in accordance with applicable American Concrete Institute, Portland Cement Association, Post-Tensioning Concrete Institute, ASTM and California Building Code requirements and guidelines.

GeoTek does not practice in the field of moisture vapor transmission evaluation/mitigation, since this does not fall under the geotechnical disciplines. Therefore, we recommend that a qualified person, such as the flooring contractor, structural engineer, and/or architect be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. That person (or persons) should provide recommendations for mitigation of potential adverse impact of moisture vapor transmission on various components of the structures as deemed appropriate. In addition, the recommendations in this report and our services in general are not intended to address mold prevention, since we along with geotechnical consultants in general, do no practice in areas of mold prevention. If specific recommendations are desired, a professional mold prevention consultant should be contacted.

5.3.2 Miscellaneous Foundation Recommendations

- To reduce moisture penetration beneath the slab on grade areas, utility trenches should be backfilled with engineered fill, lean concrete, or concrete slurry where they intercept the perimeter footing or thickened slab edge.

- Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.
- Under-slab utility trenches should be compacted to project specifications. Compaction should be achieved with a mechanical compaction device. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

5.3.3 Foundation Setbacks

Minimum setbacks for all foundations should comply with the *2019 CBC* or City of San Jacinto/County of Riverside requirements, whichever is more stringent. Improvements not conforming to these setbacks are subject to the increased likelihood of excessive lateral movements and/or differential settlements. If large enough, these movements can compromise the integrity of the improvements. The following recommendations are presented:

- The outside bottom edge of all footings should be set back a minimum of H/2 (where H is the slope height) from the face of any ascending slope. The setback should be at least 5 feet and need not to exceed 15 feet. Where a retaining wall is constructed at the toe of the slope, the height of the slope should be measured from top of the wall to the top of the slope.
- The outside bottom edge of all footings should be set back a minimum of H/3 from the face of any descending slope. The setback should be at least 7 feet and need not to exceed 40 feet.
- If pools are planned, pool setback should be one-half of the building footing setback.
- The bottom of any proposed foundations for structures should be deepened so as to extend below a 1:1 projection upward from the bottom of the nearest excavation.
- The bottom of all footings for new structures near retaining walls should be deepened so as to extend below a 1:1 projection upward from the bottom inside edge of the wall foundation.

5.3.4 Retaining Wall Design and Construction

5.3.4.1 General Design Criteria

Recommendations presented in this report apply to typical masonry or concrete vertical retaining walls. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Retaining wall foundations should be designed in accordance with Section 6.3.1 of this report. A minimum embedment of 12 inches into engineered compacted fill and a minimum footing width of 12 inches is recommended. Structural needs may govern and should be evaluated by the project structural engineer.

All earth retention structure plans, as applicable, should be reviewed by this office prior to finalization.

The backfill material placement for all earth retention structures should meet the requirement of Section 6.3.4.4 in this report.

In general, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the wall to the base of the footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls, and walls braced at top, such as typical basement walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (h:v) projection from the surcharge on the footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

5.3.4.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific

slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events, or adverse geologic conditions.

ACTIVE EARTH PRESSURES	
Surface Slope of Retained Materials (h:v)	Equivalent Fluid Pressure (pcf) Native Backfill*
Level	40
2:1	65

* The design pressures assume the backfill material has an expansion index less than or equal to 20. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

5.3.4.3 Restrained Retaining Walls

Retaining walls that will be restrained prior to placing and compacting backfill material, or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of 60 pcf, plus any applicable surcharge loading, for native backfill and level back slope condition. For areas of male or reentrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner, or a distance otherwise determined by the project structural engineer.

5.3.4.4 Retaining Wall Backfill and Drainage

Retaining wall backfill should consist of materials with expansion index (EI) ≤ 20 and free of deleterious and/or oversized materials. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or approved equivalent). The rock should be placed immediately adjacent to the back of wall and extend up from the back drain to within approximately 12 inches of finish grade. The upper 12 inches should consist of compacted onsite materials. Presence of other materials might necessitate revision to the parameters provided and modification of wall designs. The backfill materials should be placed in lifts no greater than eight-inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557. Proper surface drainage needs to be provided and maintained. Bracing of the walls during backfilling and compaction may also be necessary.

All earth retention structures should be provided with an adequate pipe and gravel back drain system to reduce the potential for hydrostatic pressure build up. As a minimum, backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or

approved equivalent) embedded in a minimum of one cubic foot per lineal foot of ¾- to 1-inch clean crushed rock or equivalent, wrapped in filter fabric (Mirafi 140N or approved equivalent). The drain system should be connected to a suitable outlet, as determined by the civil engineer. Drain outlets should be maintained over the life of the project and should not be obstructed or plugged by adjacent improvements. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Proper surface drainage needs to be provided and maintained. Water should not be allowed to pond behind retaining walls. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

5.3.4.5 Other Design Considerations

- Retaining and garden wall foundation elements should be designed in accordance with building code setback requirements.
- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.
- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.

5.3.5 Pavement Design Considerations

Pavement design for proposed street improvements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. Based on Traffic Indices (TIs) generally associated with these types of improvements and based on an assumed design R-value of 40, the following preliminary sections were calculated:

PRELIMINARY PAVEMENT SECTIONS			
TI	R-Value	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.0	50	3	4
6.0	50	3-½	6

Traffic Indices (TIs) used in our pavement design are considered a reasonable value for the proposed street areas and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a

deep curb or other cutoff to separate landscaping from the paving may result in premature pavement failure. Traffic parameters used for design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study.

The recommended pavement sections provided are intended as a minimum guideline and final selection of pavement cross section parameters should be made by the project civil engineer, based upon the local laws and ordinates, expected subgrade and pavement response, and desired level of conservatism. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. Final pavement design should be checked by testing of soils exposed at subgrade (the upper 12 inches) after final grading has been completed.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively. Pavement base should be compacted to at least 95 percent of the ASTM D1557 laboratory maximum dry density (modified proctor).

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with the City of San Jacinto specifications, and under the observation and testing of GeoTek and a City Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

Deleterious material, excessive wet or dry pockets, oversized rock fragments, and other unsuitable yielding materials encountered during grading should be removed. Once existing compacted fill are brought to the proposed pavement subgrade elevations, the subgrade should be proof-rolled in order to check for a uniform and unyielding surface. The upper 12 inches of pavement subgrade soils should be scarified, moisture conditioned at or near optimum moisture content, and recompacted to at least 95 percent of the laboratory maximum dry density (ASTM D1557). If loose or yielding materials are encountered during construction, additional evaluation of these areas should be carried out by GeoTek. All pavement section changes should be properly transitioned.

5.3.6 Soil Corrosivity

Based on the chemical test results performed on two samples collected from the site as presented in Appendix B, the corrosivity test results indicate that the on-site soils are

"corrosive" to "moderately corrosive" to buried ferrous metal. This corrosion classification is obtained from "Handbook of Corrosion Engineering," by Pierre R. Roberge, 2nd Edition, 2000. Recommendations for protection of buried ferrous metal should be provided by a corrosion engineer. Additional corrosion testing should be performed at the time of site grading to assess the corrosion of potential of the as-graded soils.

5.3.7 Soil Sulfate Content

The sulfate content was determined in the laboratory for two representative onsite soil samples. The results indicate that the water-soluble sulfate is less than 0.1 percent by weight which is considered "not applicable" (i.e. negligible) as per Table 4.2.1 of ACI 318. Based upon the test results, no special concrete mix design is required by Code for sulfate attack resistance.

5.3.8 Concrete Construction

5.3.8.1 General

Concrete construction should follow the 2019 CBC and ACI guidelines regarding design, mix placement, and curing of the concrete. If desired, we could provide quality control testing of the concrete during construction.

5.3.8.2 Concrete Mix Design

As indicated in Section 6.3.7, the site will not require a particular concrete mix design to resist sulfate attack.

5.3.8.3 Concrete Flatwork

Exterior concrete flatwork (sidewalks, driveways, patios, etc.) should have a minimum thickness of four inches. No specific reinforcement is required due to the non-structural nature and the presence of "very low" expansive soil conditions. However, the use of some reinforcement should be considered. Some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices commonly utilized in residential construction.

"Very low" expansive subgrade soils below exterior concrete flatwork should be pre-saturated to at least 100 percent of optimum moisture content. Minimum depth of pre-saturation should be 12 inches.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the City of San Jacinto/County of Riverside specifications, and under the observation and testing of GeoTek and a City/County inspector, if necessary.

5.3.8.4 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are essentially unnoticeable to more than 0.125-inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete can also undergo chemical processes that are dependent upon a wide range of variables, which are difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced they are. GeoTek suggests that control joints be placed in two orthogonal directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

5.4 POST CONSTRUCTION CONSIDERATIONS

5.4.1 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. Care should be taken when adding soil amendments to avoid excessive watering. An abatement program to control ground-burrowing rodents should be implemented and maintained. This is critical as burrowing rodents can decrease the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundation. This type of landscaping should be avoided.

5.4.2 Drainage

The need to maintain proper surface drainage and subsurface systems cannot be overly emphasized. Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the structure or into a closed pipe system which outfalls to the street gutter pan or directly to the storm drain system. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

It is the owner's responsibility to maintain and clean drainage devices on or contiguous to their lot. In order to be effective, maintenance should be conducted on a regular and routine schedule and necessary corrections made prior to each rainy season.

5.5 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

We recommend that foundation plans for the site be reviewed by this office prior to construction to check for conformance with the recommendations of this report. We also recommend that GeoTek representatives be present during construction of foundation and other improvements to observe and document proper implementation of the geotechnical recommendations. The owner/developer should verify that GeoTek representatives perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.
- Evaluate the suitability of onsite and import materials for fill placement and collect soil samples for laboratory testing where necessary.
- Observe the fill for uniformity during placement, including utility trenches.

- Perform field density testing of the fill materials.
- Observe and probe foundation excavations to confirm suitability of bearing materials.

If requested, a construction observation and compaction report can be provided by GeoTek, which can comply with the requirements of the governmental agencies having jurisdiction over the project.

6 INTENT

It is the intent of this report to aid in the design and construction of the proposed development. Implementation of the advice presented in this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our report is limited to the boundaries of the subject property. This update does not and should in no way be construed to encompass any areas beyond the specific area of the proposed construction as indicated to us by our client. Further, no evaluation of any existing site improvements is included. The scope is based on our understanding of the project and the client's needs, our fee estimate (Proposal No. P-0404621-CR) date April 12, 2021 and geotechnical engineering standards normally used on similar projects in this locality at the present.

7 LIMITATIONS

Our findings are based on site conditions observed and the stated sources. Thus, our comments are professional opinions that are limited to the extent of the available data.

GeoTek has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report.

Since our recommendations are based on the site conditions observed and encountered, and laboratory testing, our conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty of any kind is expressed or implied. Standards of care/practice are subject to change with time.

8 SELECTED REFERENCES

American Concrete Institute (ACI), 2006, Publication 302.2R-06, Guide for Concrete Slabs That Receive Moisture Sensitive Flooring Materials.

_____, 2010, Publications 360R-10, Guide to Design of Slabs-On-Ground.

American Society of Civil Engineers (ASCE), 2017, "Minimum Design Loads for Buildings and Other Structures," ASCE/SEI 7-16.

Bowles, J.E., 1977, "Foundation Analysis and Design", second edition.

California Code of Regulations, Title 24, 2019, "California Building Code," 2 volumes.

California Division of Mines and Geology (CDMG), 2008, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," Special Publication 117A.

California Division of Mines and Geology (CDMG), 2008, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," Special Publication 117A.

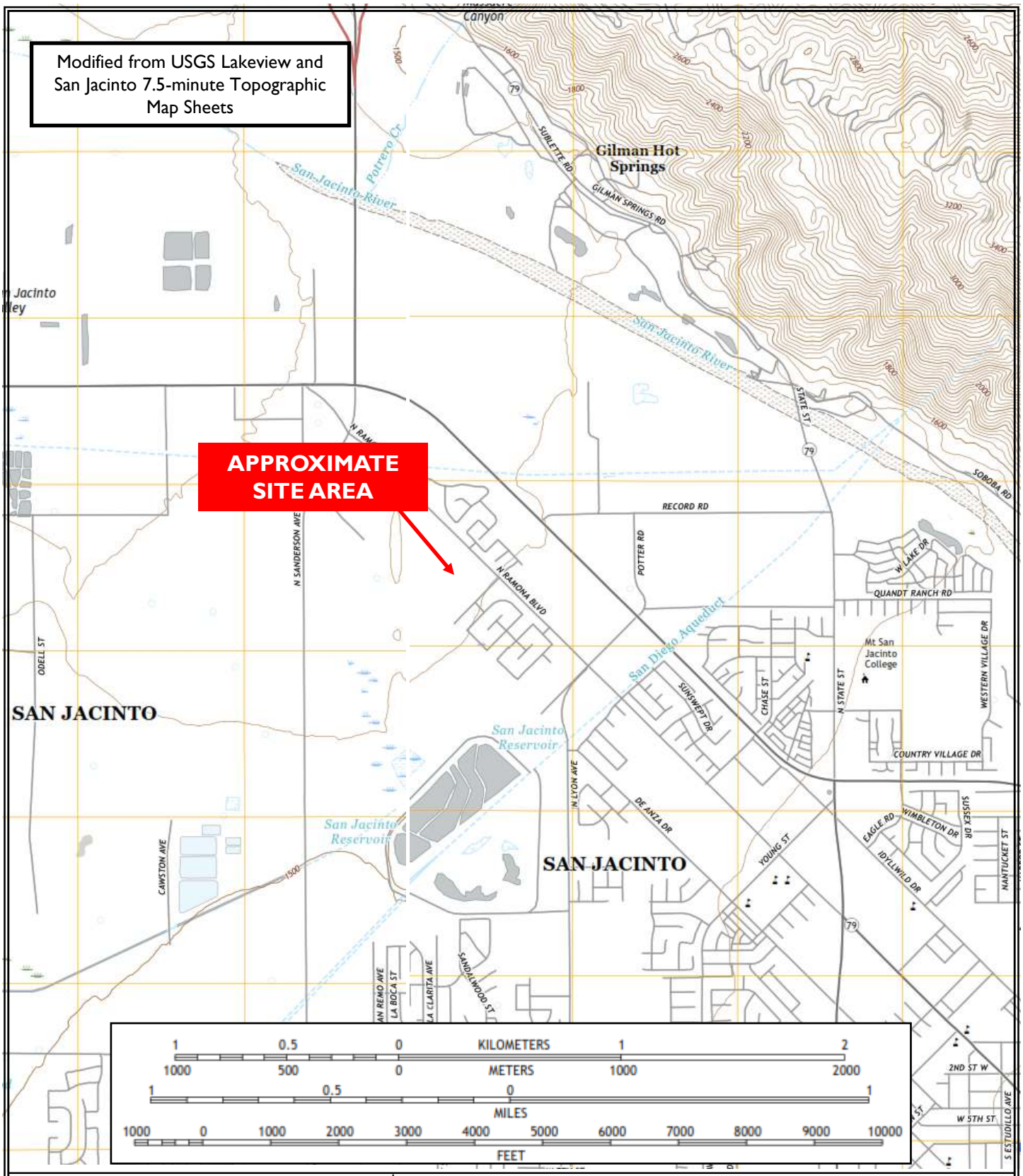
Dibblee, T.W. and Minch, J.A. 2003, "Geologic Map of the San Jacinto Quadrangle," Dibblee Geological Foundation Map DF-116.

Geologismiki, 2006, "Computer Program Cliq version 3.3.1.14".

GeoTek, Inc., In-house proprietary information.

Riverside County, Map My County webpage (https://gis.countyofriverside.us/)

Terzaghi, K. and Peck, R., 1967, "Soil Mechanics in Engineering Practice", second edition.



Golden Ocean Realty, LLC
Tract No. 38066
San Jacinto, Riverside County, California

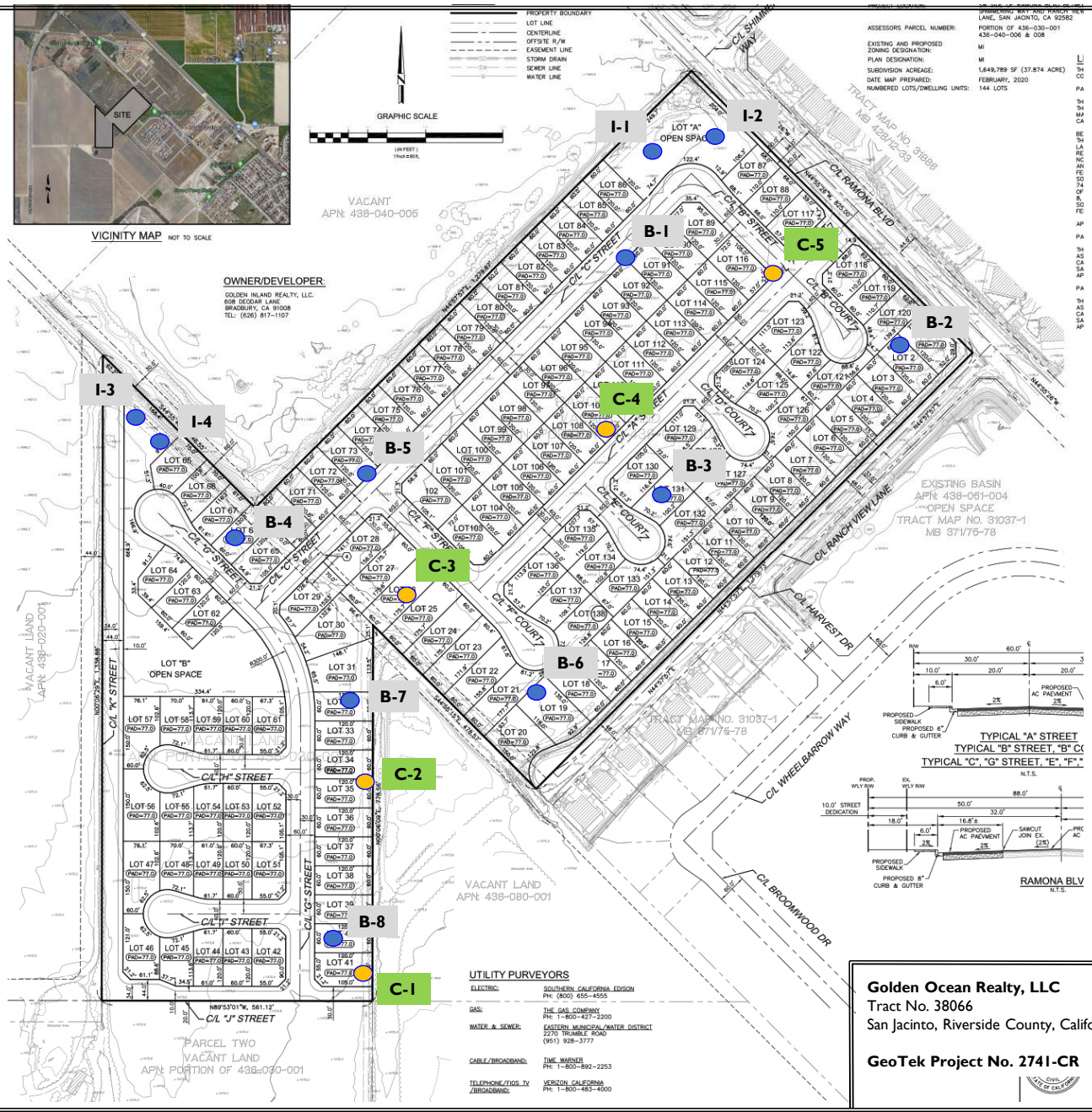
Project No. 2741-CR

NORTH

Figure 1

Site Location and Topography Map

GEOTEK


VICINITY MAP NOT TO SCALE
SITE
OWNER/DEVELOPER:
GOLDEN INLAND REALTY, LLC.
608 DEODAR LANE
BRADBURY, CA 91008
TEL: (626) 817-1107
GRAPHIC SCALE
PROPERTY BOUNDARY
LOT LINE
CENTERLINE
OFFSITE R/W
EASEMENT LINE
STORM DRAIN
SEWER LINE
WATER LINE
ASSESSORS PARCEL NUMBER: PORTION OF 436-030-001 436-040-006 & 008
EXISTING AND PROPOSED ZONING DESIGNATION: MI
PLAN DESIGNATION: MI
SUBDIVISION ACREAGE: 1,649,789 SF (37.874 ACRE)
DATE MAP PREPARED: FEBRUARY, 2020
NUMBERED LOTS/DWELLING UNITS: 144 LOTS
I-1
I-2
I-3
I-4
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
C-1
C-2
C-3
C-4
C-5
VACANT APN: 438-040-005
VACANT LAND APN: 438-020-001
VACANT LAND APN: 438-080-001
EXISTING BASIN APN: 438-061-004 OPEN SPACE TRACT MAP NO. 31037-1 MB 371/75-78
TRACT MAP NO. 31888 MB 428/32-33
TRACT MAP NO. 31037-1 MB 371/75-78
LOT "A" OPEN SPACE
LOT "B" OPEN SPACE
C/L RAMONA BLVD
C/L BANCH VIEW LANE
C/L HARVEST DR
C/L WHEELBARROW WAY
C/L BROOMWOOD DR
C/L "A" STREET
C/L "B" STREET
C/L "C" STREET
C/L "D" COURT
C/L "E" COURT
C/L "F" COURT
C/L "G" STREET
C/L "H" STREET
C/L "I" STREET
C/L "J" STREET
C/L "K" STREET
PARCEL TWO VACANT LAND APN: PORTION OF 436-030-001
UTILITY PURVEYORS
ELECTRIC: SOUTHERN CALIFORNIA EDISON PH: (800) 655-4555
GAS: THE GAS COMPANY PH: 1-800-427-2200
WATER & SEWER: EASTERN MUNICIPAL/WATER DISTRICT 2270 TRUMBLE ROAD (951) 928-3777
CABLE/BROADBAND: TIME WARNER PH: 1-800-892-2253
TELEPHONE/FIOS TV /BROADBAND: VERIZON CALIFORNIA PH: 1-800-483-4000
TYPICAL "A" STREET
TYPICAL "B" STREET, "B" C
TYPICAL "C", "G" STREET, "E", "F",
RAMONA BLV
N.T.S.
NORTH
Legend
Boring Locations
CPT Locations
Golden Ocean Realty, LLC
Tract No. 38066
San Jacinto, Riverside County, California
GeoTek Project No. 2741-CR
GEOTEK
Figure 2
Exploration Location Map

APPENDIX A

LOGS OF BORINGS AND CPT SOUNDINGS

Geotechnical and Infiltration Evaluation
Tract 38066
San Jacinto, California
Project No. 2741-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Modified Split-Barrel Sampler (Ring)

The ring sampler is driven into the ground in accordance with ASTM Test Method D 3550. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the logs of borings. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)

These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)

These are plastic bag samples which are normally airtight and contain less than five pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – BORING

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of borings:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
……..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of boring

(Additional denotations and symbols are provided on the logs of borings).

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-1 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
		5 8 9		SM	Silty f-c SAND, light gray, moist, medium dense	11.3	95.9	
5		6 9 10			Silty f-m SAND, light brown/gray, slightly moist, medium dense	7.2	106.4	Collapse
		7 15 20			Silty f-m SAND, light brown/gray, slightly moist, medium dense	5.1	108.0	
10		9 10 13			Silty f-m SAND, light brown/gray, slightly moist, medium dense			
15		9 12 16			No recovery			
					BORING TERMINATED AT 16.5 FEET			
					Backfilled with spoils No groundwater encountered			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f-c SAND, light gray/brown, slightly moist, loose			SH, MD, EI, SR EI=0
		5 6 8				1.1	101.3	
5		5 7 10		SC	Silty f-m SAND with clay, gray/brown, moist, medium dense	10.4	105.8	
		6 7 7		ML	Clayey SILT, dark brown/gray, moist, stiff	20.8	97.0	
10		7 9 11		SM	Silty f SAND, dark brown/gray, moist, medium dense			
15		10 18 32			Silty f-m SAND, gray, moist, dense			
20		5 11 12		ML	Clayey SILT, dark gray, moist, very stiff			
					BORING TERMINATED AT 21.5 FEET Backfilled with spoils No groundwater encountered			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-3 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f-c SAND, light gray/brown, slightly moist, loose			
		5 7 7				2.7	103.7	Collapse
5								
		7 9 11		ML	Clayey SILT, dark brown, moist, stiff	15.9	104.6	Collapse
		6 7 10		SM	Silty f-m SAND, dark brown, moist, medium dense	11.5	114.0	
10								
		7 9 9			Same as above			
15								
		6 10 11		ML	Clayey SILT, dark brown/black, moist, stiff			
					BORING TERMINATED AT 16.5 FEET			
					Backfilled with spoils No groundwater encountered			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

BORING NO.: B-4

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f-m SAND, brown/gray, moist, loose to medium dense			
	■	5 9 11				15.1	114	
	■	6 8 11			Silty f SAND with clay, light gray, moist, medium dense	13.6	90.9	
5								
	■	7 9 10			Silty f-m SAND, brown/gray, slightly moist, medium dense	6.9	111.7	
10								
	■	10 13 14			Silty f-c SAND, light gray, slightly moist, medium dense			
15	■	5 9 7			Same as above			
					BORING TERMINATED AT 16.5 FEET			
					Backfilled with spoils No groundwater encountered			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

BORING NO.: B-5

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				ML	**Alluvium:** Clayey SILT, dark brown, moist, very stiff			SH, MD, EI, SR EI=0
		9 12 13				9.4	94.6	
5		6 6 4			No recovery			
		8 12 16		SP	F-c SAND, light brown/gray, moist, medium dense	13.1	107.5	Collapse
10		9 14 17			F-m SAND, light gray, slightly moist, medium dense			% Passing #200 = 3.2
15		9 16 20			F-c SAND, light gray, slightly moist, medium dense			
20		7 9 10		ML	Sandy SILT, dark brown, moist, stiff	21.8	121.8	% Passing #200 = 56.3 Non-Plastic
25		3 8 12		SM	Silty f-m SAND with clay, dark brown/gray, moist, medium dense			% Passing #200 = 15.7
					▽ Groundwater at 29.5 feet			
30		4 6 12			Silty f SAND, dark brown/gray, wet, medium dense			

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-5 (cont.) / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
35		3 5 5		SM	Silty f-m SAND with clay, dark gray/brown, moist, loose			
40		5 6 10			Silty f-m SAND, dark brown/gray, very moist, medium dense			% Passing # 200 = 16.4
45		5 5 8			Same as above			
50		5 6 7			Same as above			
					BORING TERMINATED AT 51.5 FEET Boring backfilled with spoils Groundwater encountered at 29.5 feet			
55								
60								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

BORING NO.: B-6

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f SAND, light brown/gray, slightly moist, medium dense			
		7 11 12				3.1	98.5	
5		6 8 9			Same as above	4.7	109.5	Collapse
		9 13 18			Silty f-c SAND, light gray, slightly moist, medium dense	1.2	94.9	
10		9 12 12			No recovery			
15		8 12 18		ML	Clayey SILT, dark brown, moist, very stiff			
20		4 6 6		SM	Silty f-c SAND, dark brown/gray, moist, loose			
					BORING TERMINATED AT 21.5 FEET Backfilled with spoils No groundwater encountered			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: B-7** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f SAND, dark brown, slightly moist, medium dense			
		5 9 10				9.7	114	
5		6 6 11			Silty f-c SAND, light gray/brown, slightly moist, medium dense	5.2	119.0	
		5 7 6			Silty f-c SAND with clay, brown/gray, slightly moist, loose	1.6	101.8	
10		4 6 7		ML	Sandy SILT, dark brown/gray, slightly moist, stiff			
15		11 13 20		SM	Silty f-m SAND, light brown/gray, slightly moist, medium dense			
20		11 9 11		ML	Clayey SILT, dark brown/black, slightly moist, stiff			
					BORING TERMINATED AT 21.5 FEET Backfilled with spoils No groundwater encountered			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-8 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Alluvium:** Silty f-c SAND, light brown/gray, slightly moist, loose			
		5 7 7				2.7	90.8	
		3 4 4		ML	Sandy SILT, dark brown, moist, medium stiff	16.1	98.6	Collapse
5								
		4 5 10		SM	Silty f-m SAND with clay, light brown/gray to dark brown, slightly moist, medium dense	5.7	100.0	
10		4 4 5			Silty f-m SAND, light gray, slightly moist, loose			
15		6 8 26		SM	Silty f-m SAND, light gray, slightly moist, medium dense			
					BORING TERMINATED AT 16.5 FEET Backfilled with spoils No groundwater encountered			
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: I-1 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
				SM	Silty f-m sand, light brown/gray, slightly moist			
5					**BORING TERMINATED AT 5 FEET**			
					No groundwater encountered Pipe with sock placed in gravel			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: I-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
				SM	Silty f-m sand, light brown/gray, slightly moist			
5					**BORING TERMINATED AT 5 FEET**			
					No groundwater encountered Pipe with sock placed in gravel			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: I-3 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
				SM	Silty f-m sand, dark brown, slightly moist			
5					**BORING TERMINATED AT 5 FEET**			
					No groundwater encountered Pipe with sock placed in gravel			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Golden Ocean Realty, LLC	**DRILLER:**	2R	**LOGGED BY:**	GP
PROJECT NAME:	TR 38066	**DRILL METHOD:**	Hollow Stem Auger	**OPERATOR:**	Juan
PROJECT NO.:	2741-CR	**HAMMER:**	140 lbs. - 30 inches	**RIG TYPE:**	CME 75
LOCATION:	San Jacinto, CA			**DATE:**	4/23/2021

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: I-4 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Alluvium:			
				SM	Silty f-m sand, dark brown, slightly moist			
5					**BORING TERMINATED AT 5 FEET**			
					No groundwater encountered Pipe with sock placed in gravel			
10								
15								
20								
25								
30								

LEGEND

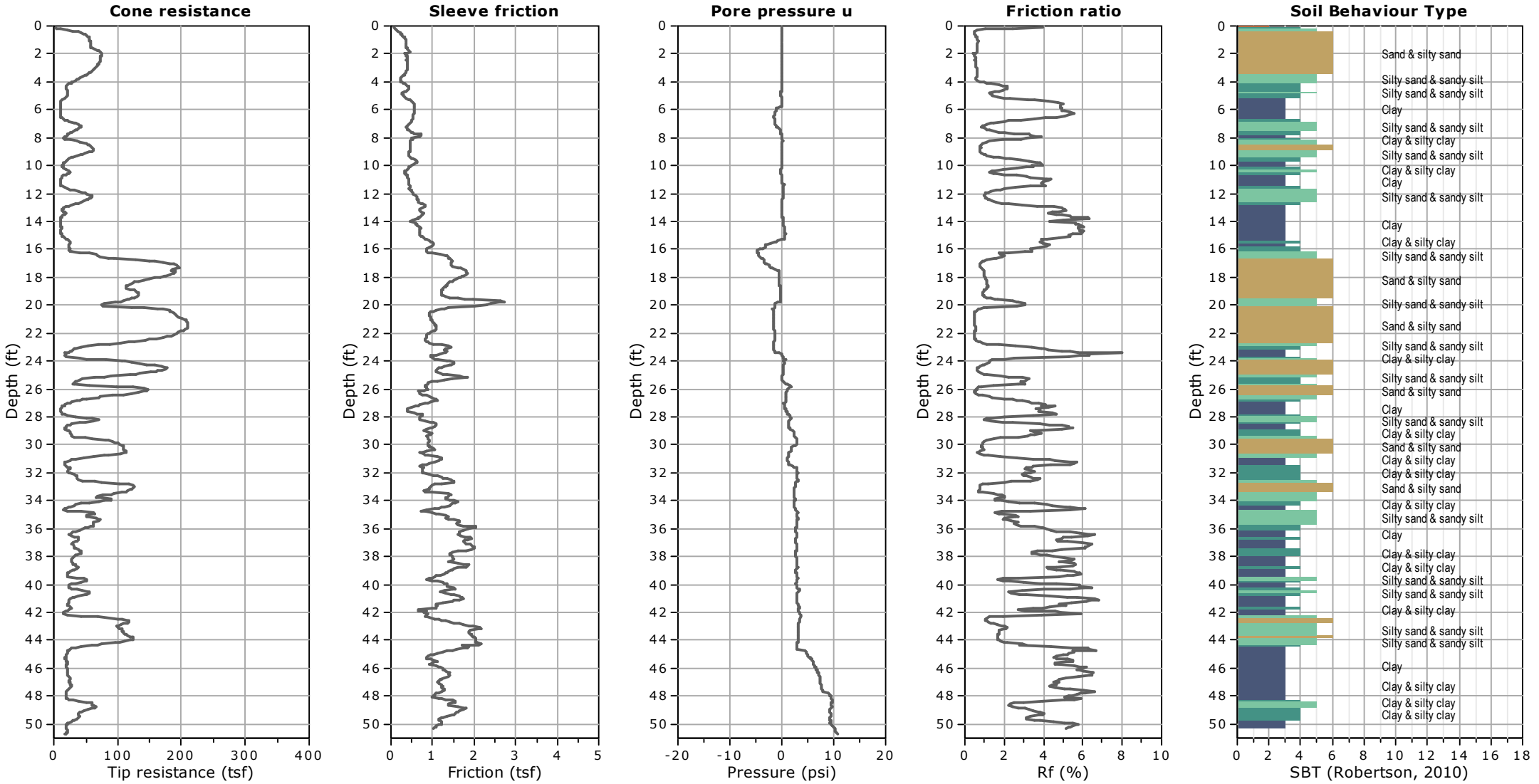
Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **GeoTek / Tract No. 38066**
Location: **San Jacinto, CA**

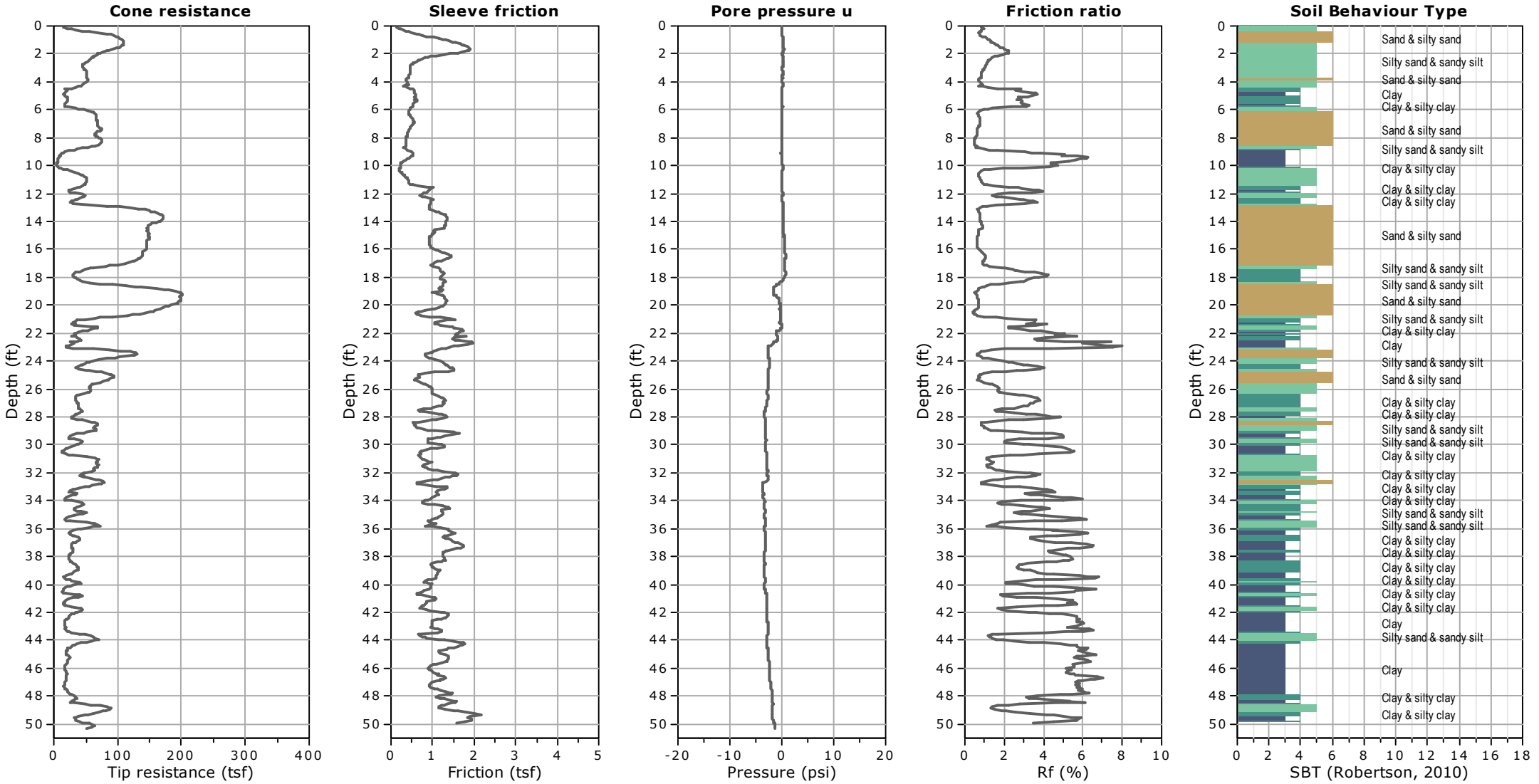
CPT-1
Total depth: 50.73 ft, Date: 5/19/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **GeoTek / Tract No. 38066**
Location: **San Jacinto, CA**

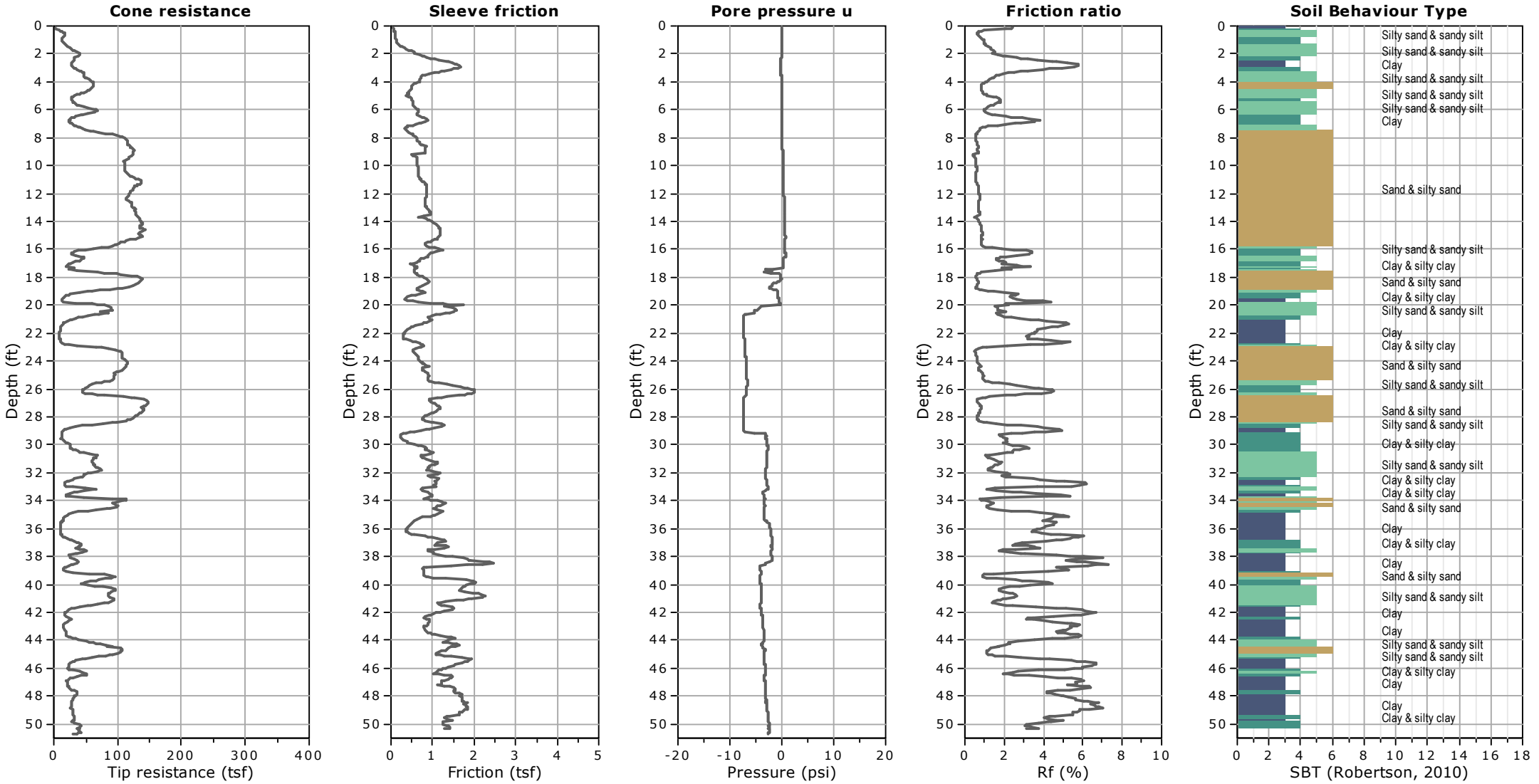
CPT-2
Total depth: 50.32 ft, Date: 5/19/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Tract No. 38066
Location: San Jacinto, CA

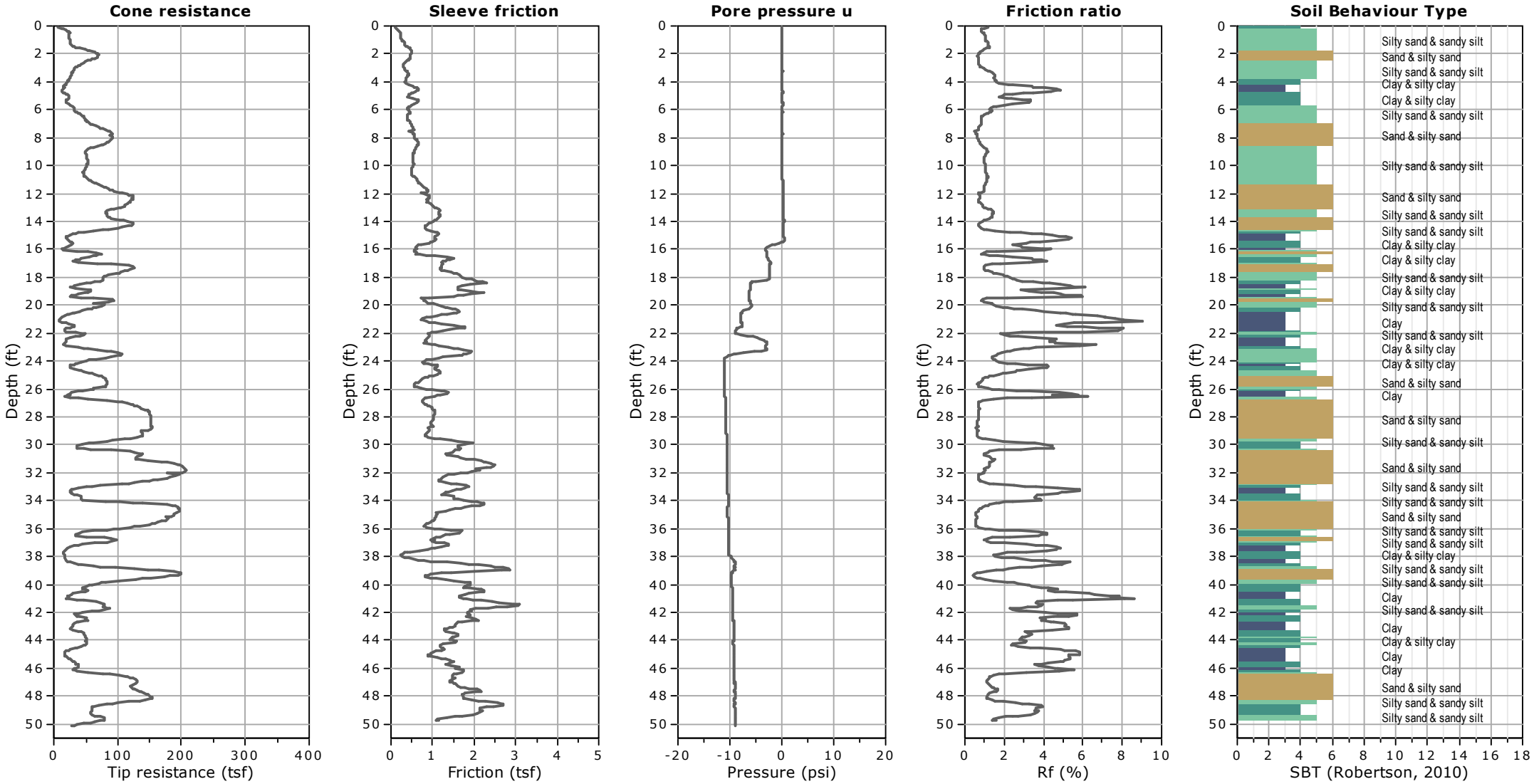
CPT-3
Total depth: 50.72 ft, Date: 5/19/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **GeoTek / Tract No. 38066**
Location: **San Jacinto, CA**

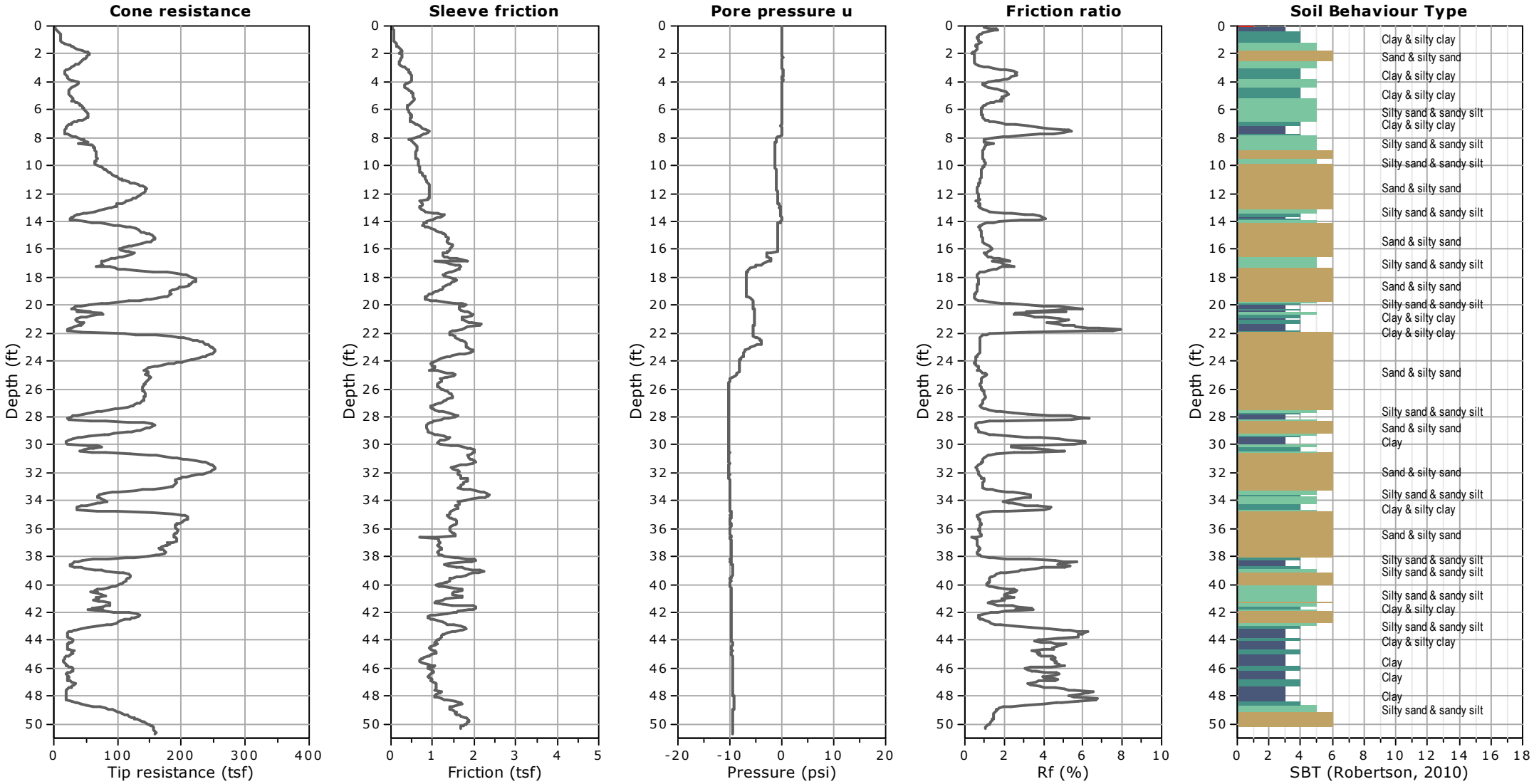
CPT-4
Total depth: 50.15 ft, Date: 5/19/2021



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: GeoTek / Tract No. 38066
Location: San Jacinto, CA

CPT-5
Total depth: 50.69 ft, Date: 5/19/2021



APPENDIX B

LABORATORY TEST RESULTS

Geotechnical and Infiltration Evaluation
Tract 38066
San Jacinto, California
Project No. 2741-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

Atterberg Limits

Laboratory testing to determine the liquid and plastic limits was performed in general accordance with ASTM D4318. The results of the testing are included on the boring logs in Appendix A.

Classification

Soils were classified visually in general accordance with the Unified Soil Classification System (ASTM Test Method D 2487). The soil classifications by GeoTek are shown on the logs of exploratory borings in Appendix A.

Collapse

Collapse tests were conducted in substantial conformance with ASTM D5333. The results of these tests are presented in Appendix B.

Direct Shear

Direct shear testing was performed on remolded samples of the surficial soils according to ASTM Test Method D 3080. The test results are presented in Appendix B.

Expansion Index

Expansion Index testing was performed on two soil samples collected from the site. Testing was performed in general accordance with ASTM Test Method D 4829. The test results are presented in Appendix B.

In Situ Moisture Content and Unit Weight

The field moisture content was measured in the laboratory on selected samples collected during the field investigation. The field moisture content is determined as a percentage of the dry unit weight. The dry density was measured in the laboratory on selected ring samples. The results are shown on the logs of exploratory borings in Appendix A.

Moisture-Density Relationship

Laboratory testing was performed on two samples collected during the subsurface exploration. The laboratory maximum dry density and optimum moisture content for the soil types were determined in general accordance with test method ASTM Test Procedure D 1557. The results are included in Appendix B.

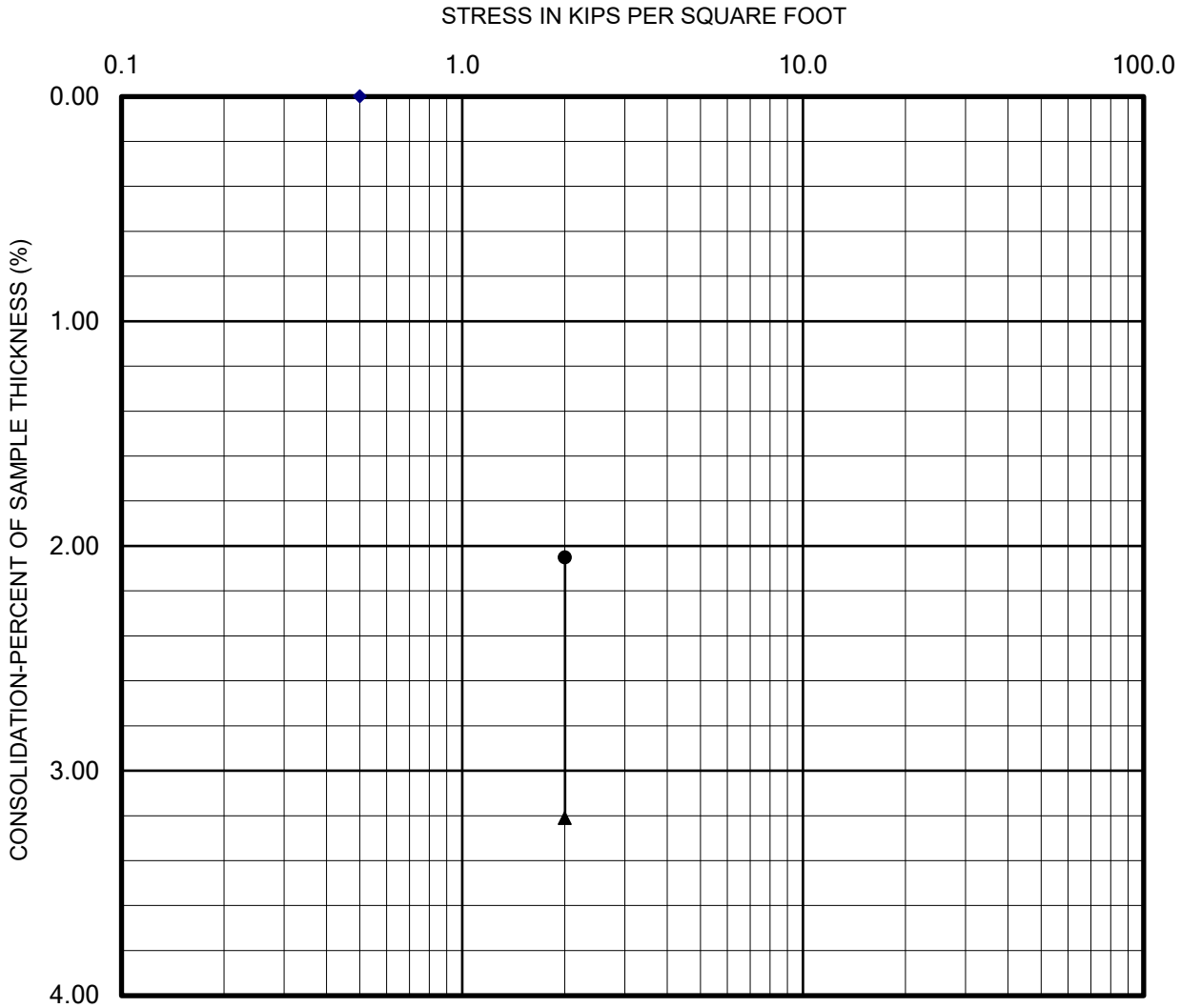
Materials Finer Than the No. 200 Sieve

A #200 sieve wash was performed on selected samples of the soils according to ASTM Test Method D 1140. The results of this testing are presented on the boring logs in Appendix A.

Sulfate Content, Resistivity and Chloride Content

Testing to determine the water-soluble sulfate content, resistivity testing and the chloride content was performed by others. The results of the testing are provided below and in Appendix B.

Boring No.	Depth (ft.)	pH ASTM G51	Chloride ASTM D4327 (ppm)	Sulfate ASTM D4327 (% by weight)	Resistivity ASTM G187 (ohm-cm)
B-2	0-5	9.2	17.1	0.0026	5,963
B-8	0-5	8.2	36.6	0.0038	4,288



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

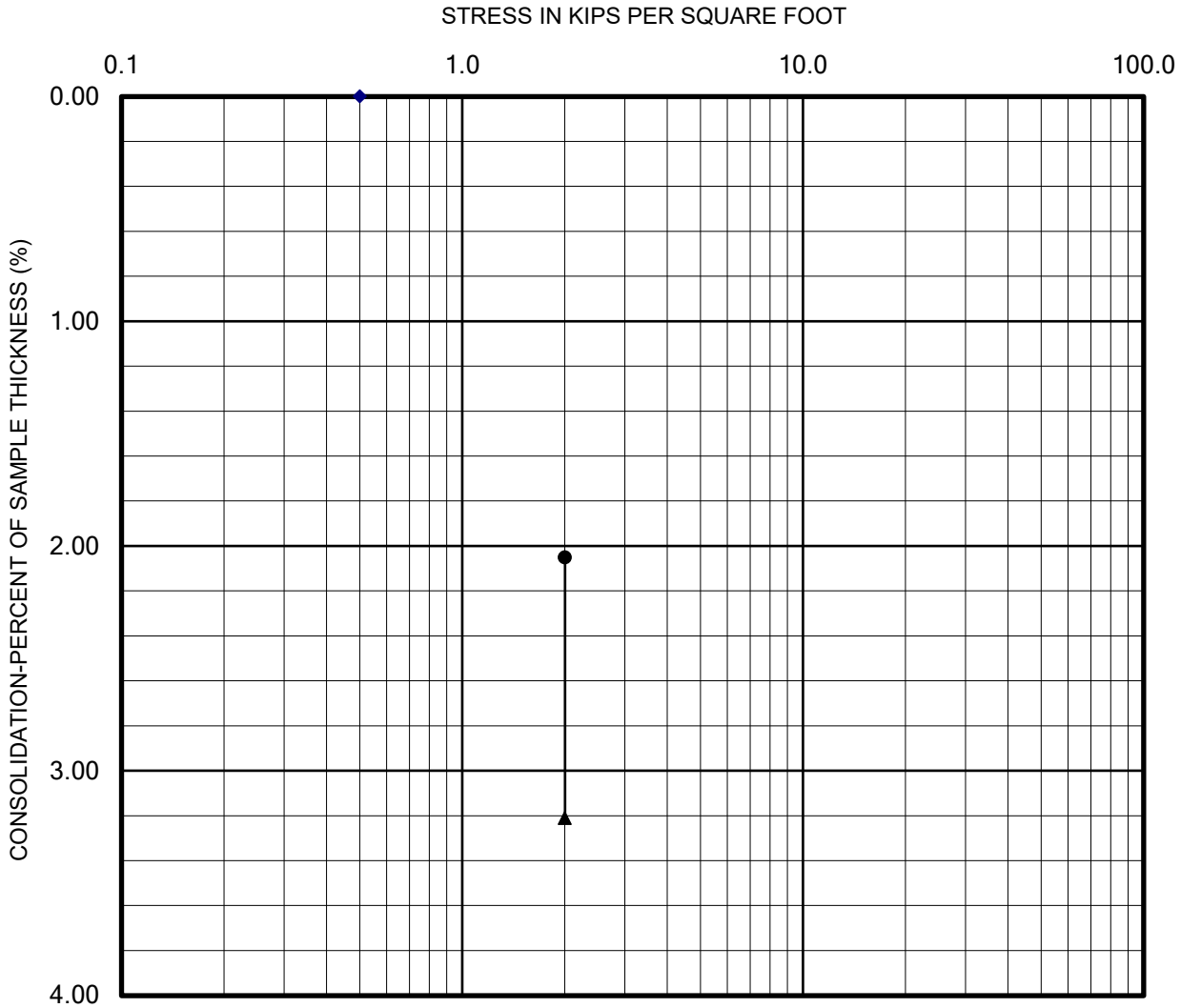
CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

Sample: B-1 @ 5 feet

Tract No. 38066
San Jacinto, California

Plate B-1



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

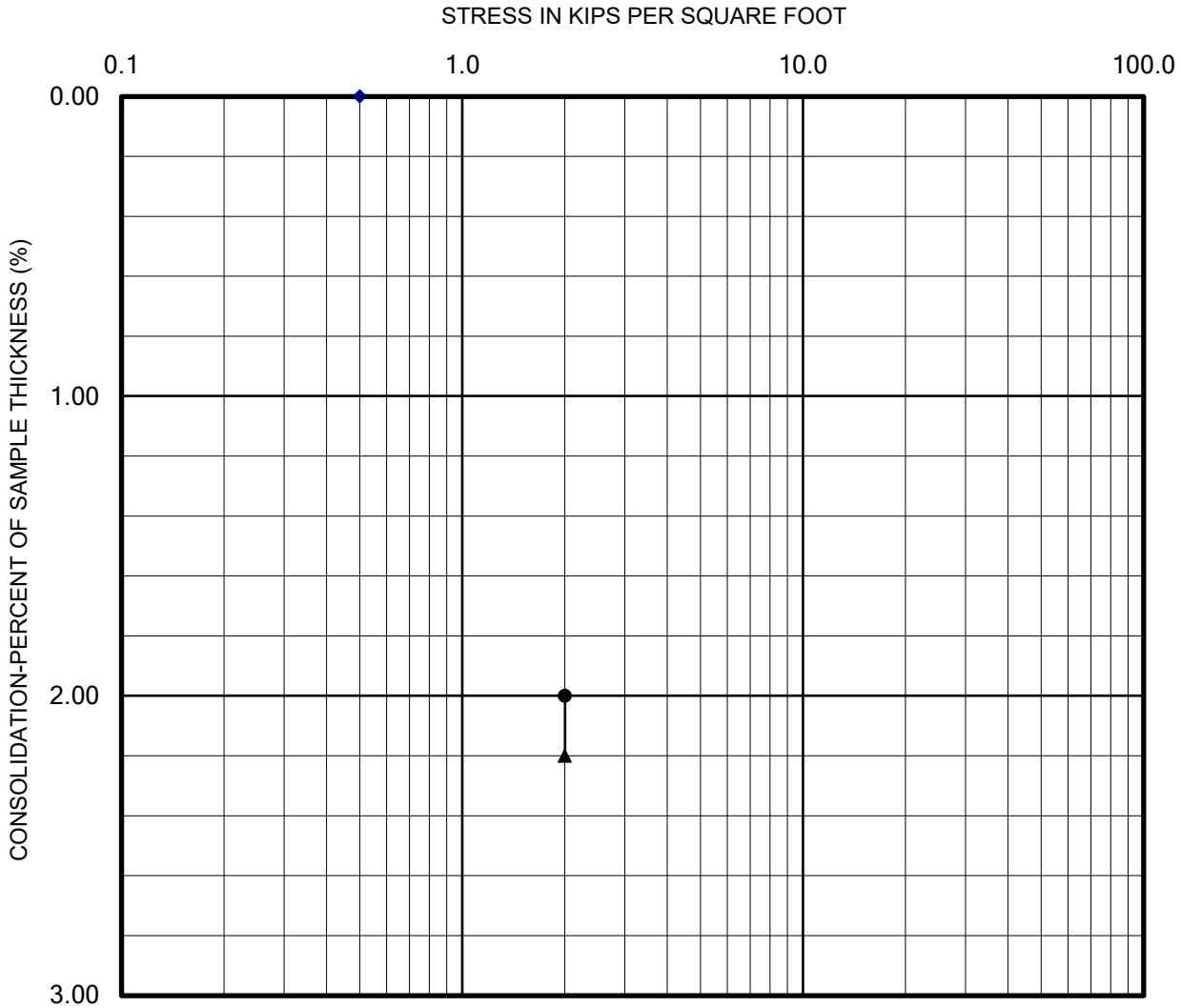
CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

Sample: B-3 @ 3 feet

Tract No. 38066
San Jacinto, California

Plate B-2



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

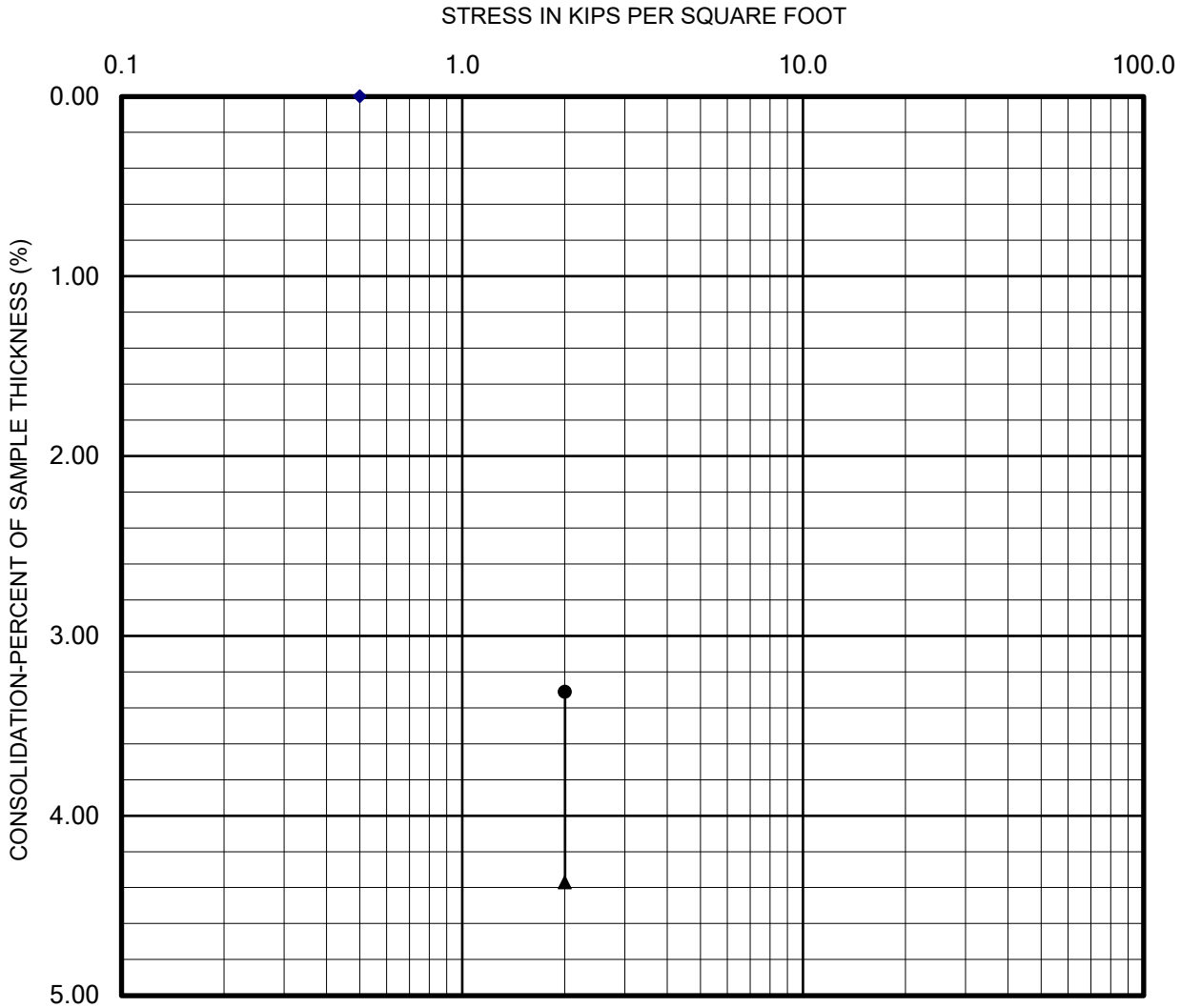
CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

Sample: B-3 @ 6 feet

Tract No. 38066
San Jacinto, California

Plate B-3



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

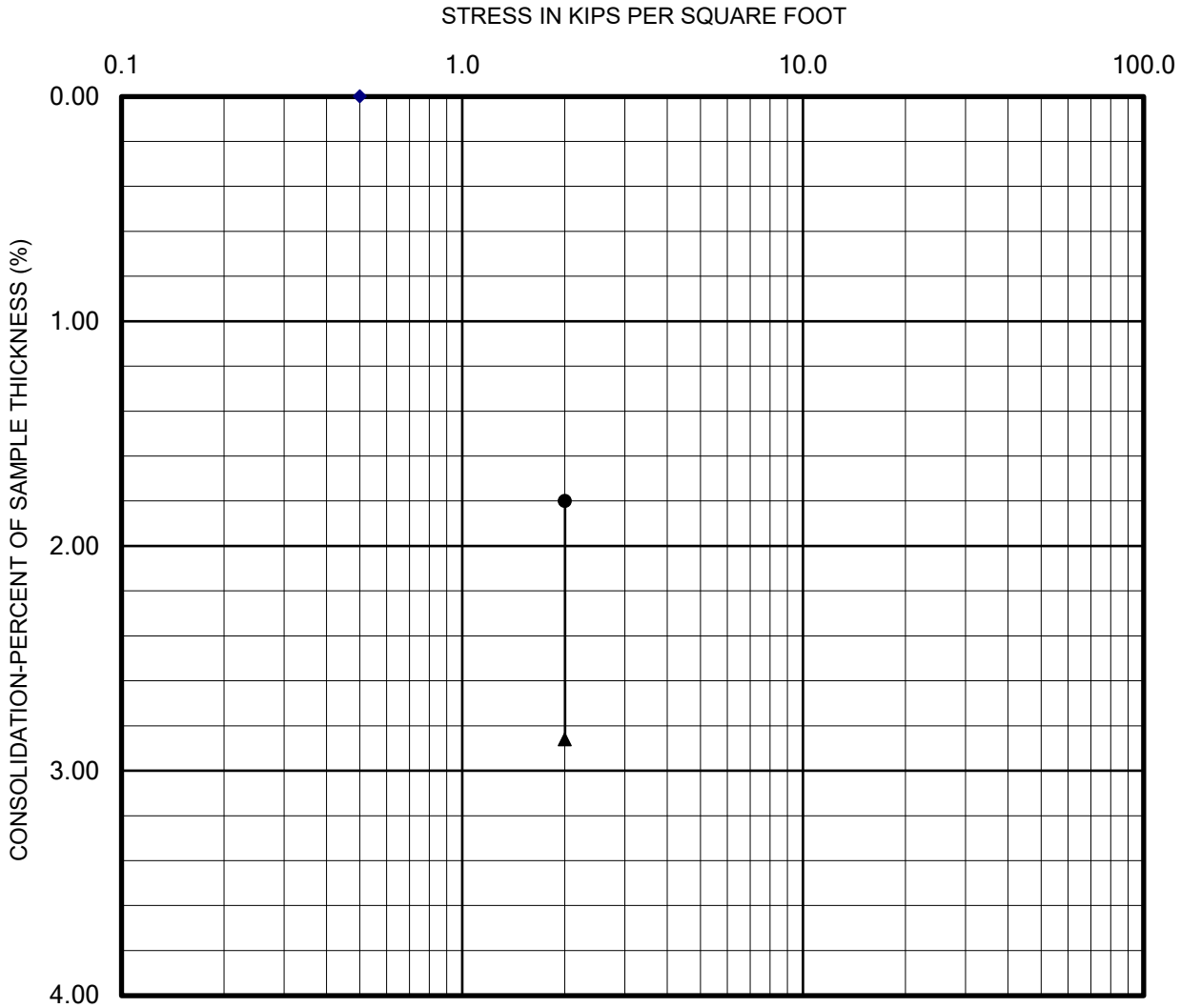
CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

Sample: B-5 @ 7 feet

Tract No. 38066
San Jacinto, California

Plate B-4



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

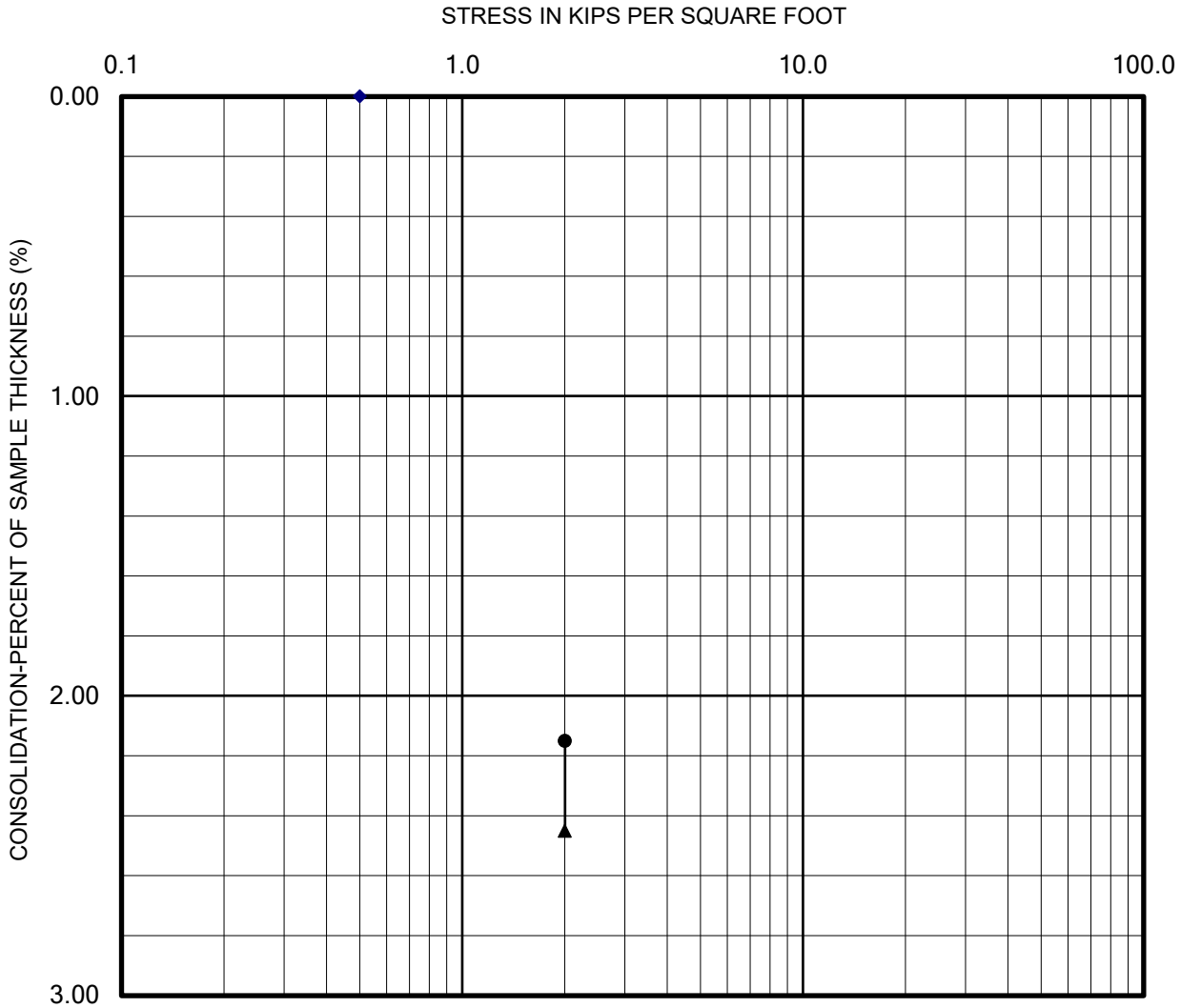
CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

Sample: B-6 @ 4 feet

Tract No. 38066
San Jacinto, California

Plate B-5



Seating Cycle
Loading Prior to Inundation
Loading After Inundation
Rebound Cycle

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4546

GEOTEK

CHECKED BY: RJ	Lab: Corona
PROJECT NO.: 2741-CR	Date: 5-10-21

COLLAPSE REPORT

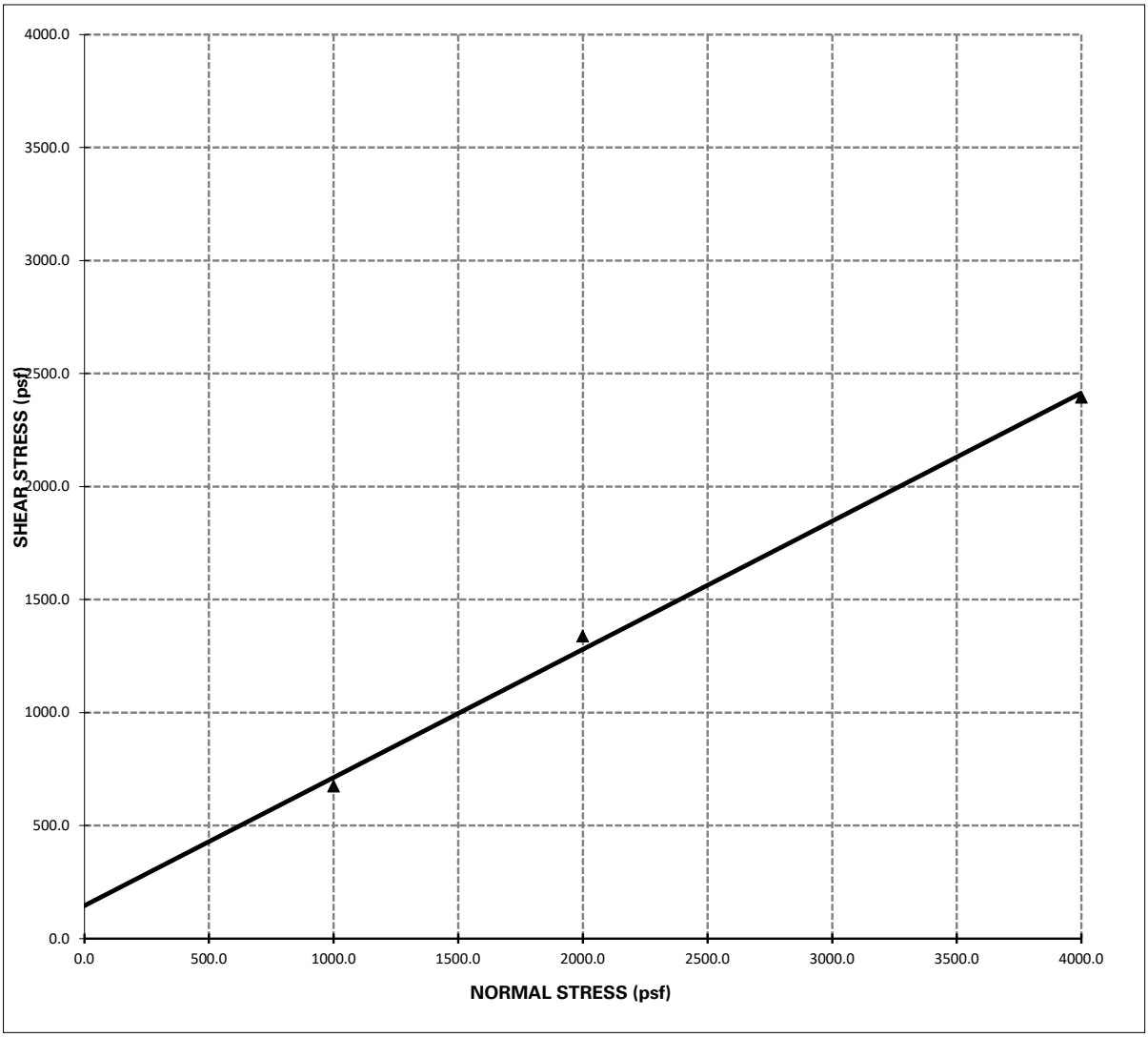
Sample: B-8 @ 4 feet

Tract No. 38066
San Jacinto, California

Plate B-6

DIRECT SHEAR TEST

Project Name:	Golden Ocean Realty, LLC	***Sample Location:***	B2 @ 0-5'
Project Number:	2741-CR	***Date Tested:***	5/12/2021



Shear Strength: Φ = **30°** , **C = 146 psf**

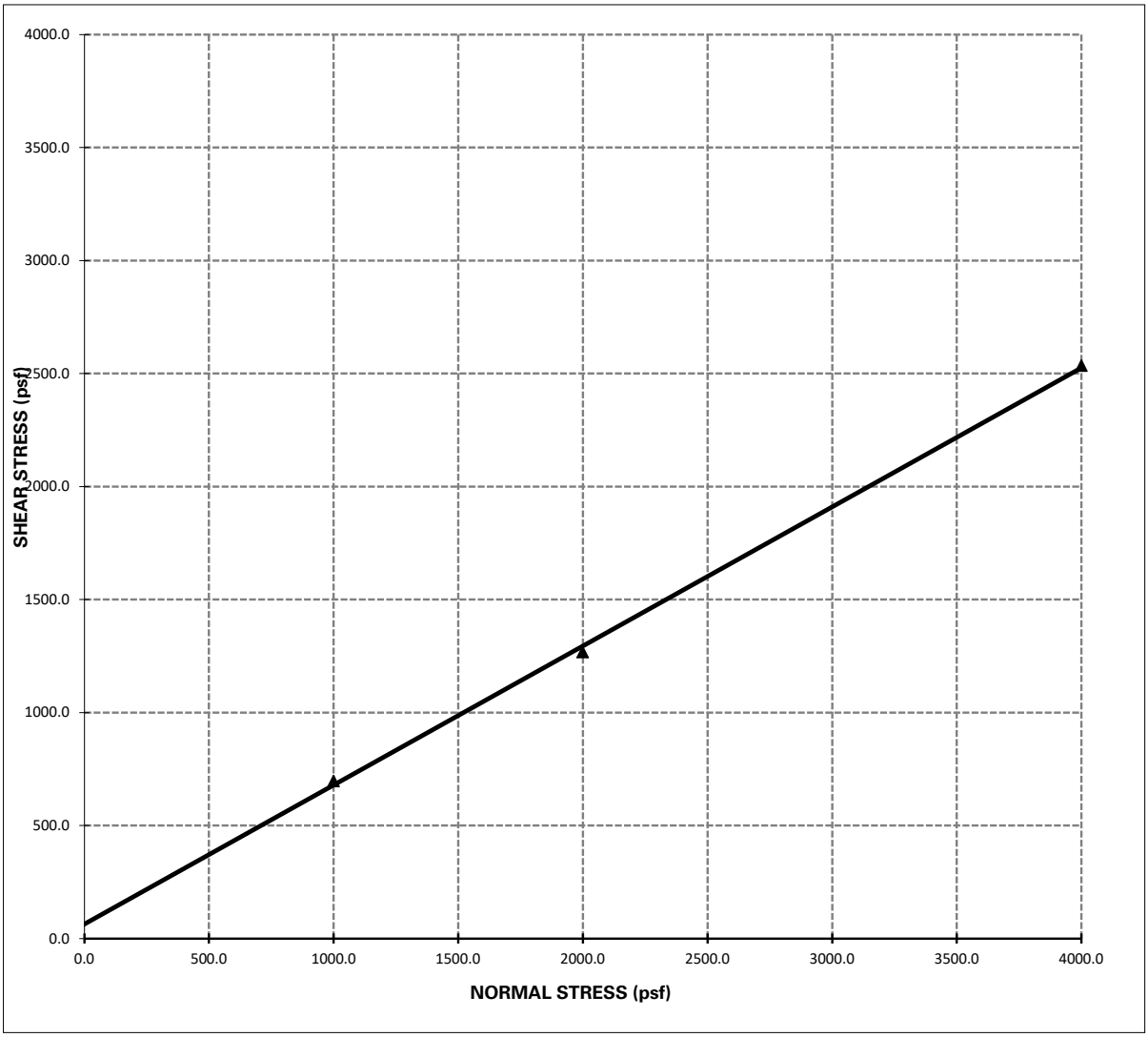
Notes: 1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.

2 - The above reflect direct shear strength at saturated conditions.

3 - The tests were run at a shear rate of 0.035 in/min.

DIRECT SHEAR TEST

Project Name:	Golden Ocean Realty, LLC	***Sample Location:***	B5 @ 0-5'
Project Number:	2741-CR	***Date Tested:***	5/11/2021



Shear Strength: Φ = **32°** , **C = 64 psf**

Notes: 1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.

2 - The above reflect direct shear strength at saturated conditions.

3 - The tests were run at a shear rate of 0.035 in/min.

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Golden Ocean	***Tested/ Checked By:***	RL Lab No Corona
Project Number:	2741-CR	***Date Tested:***	5/7/2021
Project Location:	San Jacinto	***Sample Source:***	B2 @ 0-5'
		Sample Description:	

Ring #: _____ Ring Dia. : 4.01" Ring Ht. 1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	757.9
B	Weight of ring (gm)	364.0
C	Net weight of sample (gm)	**393.9**
D	Wet Density, lb / ft3 (C*0.3016)	**118.8**
E	Dry Density, lb / ft3 (D/1.F)	**107.2**

SATURATION DETERMINATION

F	Moisture Content, %	10.8
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**51.0**

READINGS

DATE	TIME	READING	
5/7/2021		0.0635	Initial
5/7/2021		0.0635	10 min/Dry
5/8/2021		0.0635	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
725.6	**2.6**

EXPANSION INDEX = 0

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client:	Golden Ocean	***Tested/ Checked By:***	RL Lab No Corona
Project Number:	2741-CR	***Date Tested:***	5/7/2021
Project Location:	San Jacinto	***Sample Source:***	B5 @ 0-5'
		Sample Description:	

Ring #: _____ Ring Dia. : 4.01" Ring Ht. 1"

DENSITY DETERMINATION

A	Weight of compacted sample & ring (gm)	757.8
B	Weight of ring (gm)	364.3
C	Net weight of sample (gm)	**393.5**
D	Wet Density, lb / ft3 (C*0.3016)	**118.7**
E	Dry Density, lb / ft3 (D/1.F)	**107.2**

SATURATION DETERMINATION

F	Moisture Content, %	10.7
G	Specific Gravity, assumed	**2.70**
H	Unit Wt. of Water @ 20 °C, (pcf)	**62.4**
I	% Saturation	**50.5**

READINGS

DATE	TIME	READING	
5/7/2021		0.0233	Initial
5/7/2021		0.0233	10 min/Dry
5/8/2021		0.0230	Final

FINAL MOISTURE

Final Weight of wet sample & tare	% Moisture
781.0	**16.6**

EXPANSION INDEX = 0

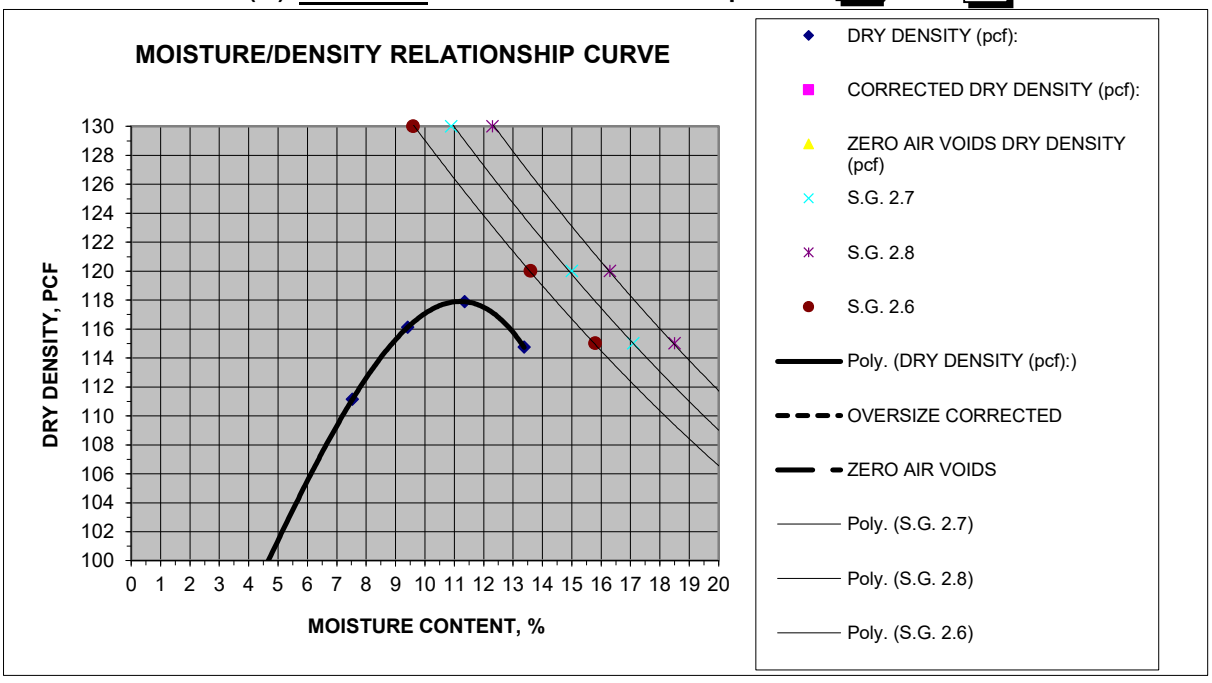
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client:	Golden Ocean Realty, LLC	**Job No.:**	2741-CR
Project:	TR 38066	**Lab No.:**	Corona
Location:	San Jacinto		
Material Type:	Brown Sandy Silt/ Silty Sand		
Material Supplier:	-		
Material Source:	-		
Sample Location:	B2 @ 0-5'		
	-		
Sampled By:	GP	**Date Sampled:**	4/27/2021
Received By:	RJ	**Date Received:**	4/27/2021
Tested By:	CD	**Date Tested:**	5/11/2021
Reviewed By:	RJ	**Date Reviewed:**	5/12/2021

Test Procedure: ASTM D1557 **Method:** A

Oversized Material (%): 0.0 **Correction Required:** [ ] yes [x] no



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	118.0	**@ Optimum Moisture, %**	11.5
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	% Gravel (retained on No. 4)
	% Sand (Passing No. 4, Retained on No. 200)
	% Silt and Clay (Passing No. 200)

Atterberg Limits:

	Liquid Limit, %
	Plastic Limit, %
	Plasticity Index, %

Classification:

Unified Soils Classification:

AASHTO Soils Classification:

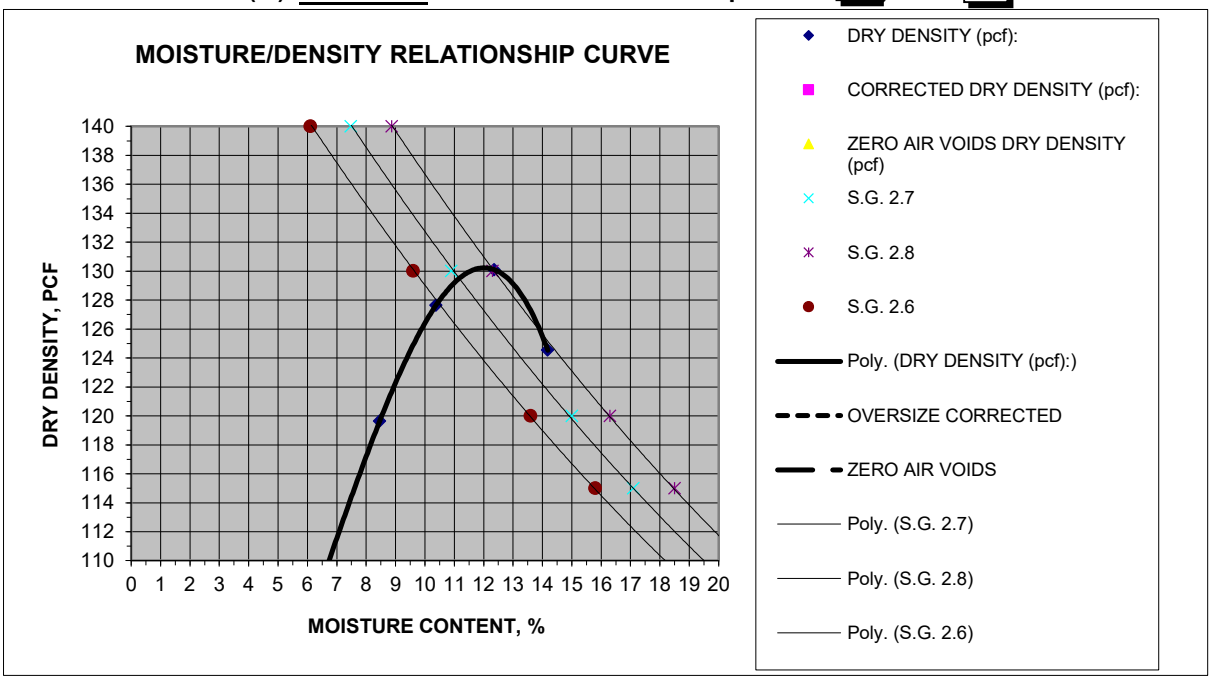
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client:	Golden Ocean Realty, LLC	**Job No.:**	2741-CR
Project:	TR 38066	**Lab No.:**	Corona
Location:	San Jacinto		
Material Type:	Brown Silty Sand		
Material Supplier:	-		
Material Source:	-		
Sample Location:	B5 @ 0-5'		
	-		
Sampled By:	GP	**Date Sampled:**	4/27/2021
Received By:	RJ	**Date Received:**	4/27/2021
Tested By:	CD	**Date Tested:**	5/7/2021
Reviewed By:	RJ	**Date Reviewed:**	5/10/2021

Test Procedure: ASTM D1557 **Method:** A

Oversized Material (%): 1.2 **Correction Required:** [ ] yes [x] no



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	130.5	**@ Optimum Moisture, %**	12.0
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	% Gravel (retained on No. 4)
	% Sand (Passing No. 4, Retained on No. 200)
	% Silt and Clay (Passing No. 200)

Atterberg Limits:

	Liquid Limit, %
	Plastic Limit, %
	Plasticity Index, %

Classification:

Unified Soils Classification:

AASHTO Soils Classification:

Results Only Soil Testing for Golden Ocean

May 11, 2021
Prepared for:

Anna Scott
GeoTek, Inc.
1548 North Maple Street
Corona, CA 92280
ascott@geotekusa.com

Project X Job#: S210507C
Client Job or PO#: 2741-CR

Respectfully Submitted,

Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Soil Analysis Lab Results

Client: GeoTek, Inc.
Job Name: Golden Ocean
Client Job Number: 2741-CR
Project X Job Number: S210507C
May 11, 2021

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM D4972	ASTM G200	SM 4500-S2-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
B 8 @	0-5 Bulk	38.3	0.0038	36.6	0.0037	16,080	4,288	8.2	118	<0.01	41.2	29.7	ND	52.8	9.4	25.1	282.1	1.2	17.5
B 2 @	0-5 Bulk	25.8	0.0026	17.1	0.0017	58,290	5,963	9.2	103	<0.01	53.2	34.5	ND	98.9	43.3	21.5	240.1	1.0	5.8

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

APPENDIX C

PERCOLATION/INFILTRATION TEST DATA

Geotechnical and Infiltration Evaluation

Tract 38066

San Jacinto, California

Project No. 2741-CR

GEOTEK

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR

Test Hole No.: I-1, Tested By: DVG, Date: 4/23,24/2021

Depth of Hole As Drilled: 60", Before Test: 60", After Test: 60"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
	—— ——							PRESOAK 5 GAL 4/23/2021
	858 923	25	60	20	14	6		BEGIN 4/24/2021 1ST 25 MIN.
	925 950	25	60	20	14 1/4	5 3/4		2ND 25 MIN.
	952 1022	30	60	20	13 1/4	6 3/4		1ST 30 MIN.
	1024 1054	30	60	20	13 1/2	6 1/2		2ND 30 MIN.
	1056 1126	30	60	20	13 1/2	6 1/2		3RD 30 MIN.
	1128 1158	30	60	20	13 3/4	6 1/4		4TH 30 MIN.
	1200 1230	30	60	20	14	6		5TH 30 MIN.
	1232 102	30	60	20	14 1/4	5 3/4		6TH 30 MIN.
	104 134	30	60	20	14 1/2	5 1/2		7TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR.

Test Hole No.: I-1, Tested By: DVG, Date: 4/23, 24/2021.

Depth of Hole As Drilled: 60", Before Test: 60", After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
	136		60	20				
	206	30			14 1/2	5 1/2		8TH 30 MIN.
	208		60	20				
	238	30			14 3/4	5 1/4		9TH 30 MIN.
	240		60	20				
	310	30			14 3/4	5 1/4		10TH 30 MIN.
	312		60	20				
	342	30			15	5		11TH 30 MIN.
	344		60	20				
	414	30			15	5		12TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR.

Test Hole No.: I-2, Tested By: DVG, Date: 4/23, 24/2021.

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
								PRESOAK 5 GAL 4/23/2021
	851		60	20				BEGIN 4/24/2021
	916	25			14 1/2	5 3/4		1ST 25 MIN.
	918		60	20				
	943	25			14 3/4	5 1/4		2ND 25 MIN.
	945		60	20				
	1015	30			14	6		1ST 30 MIN.
	1017		60	20				
	1047	30			14	6		2ND 30 MIN.
	1049		60	20				
	1119	30			14	6		3RD 30 MIN.
	1121		60	20				
	1151	30			14 1/4	5 3/4		4TH 30 MIN.
	1153		60	20				
	1223	30			14 1/4	5 3/4		5TH 30 MIN.
	1225		60	20				
	1255	30			14 1/2	5 1/2		6TH 30 MIN.
	1257		60	20				
	127	30			14 3/4	5 1/4		7TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO Job No.: 2741-CR.

Test Hole No.: I-2 Tested By: DVG Date: 4/23, 24/2021

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
	129		60	20				
	159	30			14 3/4	5 1/4		8TH 30 MIN.
	201		60	20				
	231	30			15	5		9TH 30 MIN.
	233		60	20				
	303	30			15	5		10TH 30 MIN.
	305		60	20				
	335	30			15 1/4	4 3/4		11TH 30 MIN.
	337		60	20				
	407	30			15 1/4	4 3/4		12TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR.

Test Hole No.: I-3, Tested By: DVG, Date: 4/23,24/2021.

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
								PRESOAK 5 GAL 4/23/2021
	844 / 909	25	60	20	14	6		BEGIN 4/24/2021 1ST 25 MIN.
	911 / 936	25	60	20	14 1/2	5 1/2		2ND 25 MIN.
	938 / 1008	30	60	20	14	6		1ST 30 MIN.
	1010 / 1040	30	60	20	14 1/4	5 3/4		2ND 30 MIN.
	1042 / 1112	30	60	20	14 1/2	5 1/2		3RD 30 MIN.
	1114 / 1144	30	60	20	14 3/4	5 1/4		4TH 30 MIN.
	1146 / 1216	30	60	20	14 3/4	5 1/4		5TH 30 MIN.
	1218 / 1248	30	60	20	15	5		6TH 30 MIN.
	1250 / 120	30	60	20	15	5		7TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR.

Test Hole No.: I-3, Tested By: DVG, Date: 4/23,24/2021.

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
	122		60	20				
	152	30			15 1/4	4 3/4		8TH 30 MIN.
	154		60	20				
	224	30			15 1/4	4 3/4		9TH 30 MIN.
	226		60	20				
	256	30			15 1/2	4 1/2		10TH 30 MIN.
	258		60	20				
	328	30			15 1/2	4 1/2		11TH 30 MIN.
	330		60	20				
	400	30			15 1/2	4 1/2		12TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO

Job No.: 2741-CR

Test Hole No.: I-4 Tested By: OVG

Date: 4/23, 24/2021

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60"

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
								PRESOAK 5 GAL 4/23/2021
	837 / 902	25	60	20	14 1/4	5 3/4		BEGIN 4/24/2021 1ST 25 MIN.
	904 / 929	25	60	20	14 1/2	5 1/2		2ND 25 MIN.
	931 / 1001	30	60	20	14	6		1ST 30 MIN.
	1003 / 1033	30	60	20	14 1/4	5 3/4		2ND 30 MIN.
	1035 / 1105	30	60	20	14 1/4	5 3/4		3RD 30 MIN.
	1107 / 1137	30	60	20	14 1/2	5 1/2		4TH 30 MIN.
	1139 / 1209	30	60	20	14 3/4	5 1/4		5TH 30 MIN.
	1211 / 1241	30	60	20	14 3/4	5 1/4		6TH 30 MIN.
	1243 / 113	30	60	20	15	5		7TH 30 MIN.

PERCOLATION DATA SHEET

Project: TRACT 38066 SAN JACINTO, Job No.: 2741-CR.

Test Hole No.: I-4, Tested By: DVG, Date: 4/23,24/2021.

Depth of Hole As Drilled: 60" Before Test: 60" After Test: 60".

Reading No.	Time	Time Interval (Min)	Total Depth of Hole (Inches)	Initial Water Level (Inches)	Final Water Level (Inches)	Δ In Water Level (Inches)	Rate (minutes per inch)	Comments
	115		60	20				
	145	30			15	5		8TH 30 MIN.
	147		60	20				
	217	30			15	5		9TH 30 MIN.
	219		60	20				
	249	30			15 1/4	4 3/4		10TH 30 MIN.
	251		60	20				
	321	30			15 1/4	4 3/4		11TH 30 MIN.
	323		60	20				
	353	30			15 1/2	4 1/2		12TH 30 MIN.

Client:	**Golden Ocean Realty, LLC**
Project:	**Tract 38066**
Project No:	**2741-CR**
Date:	**4/23/2021**

Boring No. **I-1**

Percolation Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	45
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	40
Total Test Hole Depth, D_T =	60

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20
$H_F = D_T - D_F$ =	15
$\Delta H = \Delta D = H_O - H_F$ =	5
$H_{avg} = (H_O+H_F)/2$ =	17.5

I_t = 1.03 **Inches per Hour**

GEOTEK

Client:	**Golden Ocean Realty, LLC**
Project:	**Tract 38066**
Project No:	**2741-CR**
Date:	**4/23/2021**

Boring No. **I-2**

Percolation Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	44.75
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	40
Total Test Hole Depth, D_T =	60

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20
$H_F = D_T - D_F$ =	15.25
$\Delta H = \Delta D = H_O - H_F$ =	4.75
$H_{avg} = (H_O+H_F)/2$ =	17.625

I_t = 0.97 **Inches per Hour**

GEOTEK

Client:	**Golden Ocean Realty, LLC**
Project:	**Tract 38066**
Project No:	**2741-CR**
Date:	**4/23/2021**

Boring No. **I-3**

Percolation Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	44.5
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	40
Total Test Hole Depth, D_T =	60

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20
$H_F = D_T - D_F$ =	15.5
$\Delta H = \Delta D = H_O - H_F$ =	4.5
$H_{avg} = (H_O+H_F)/2$ =	17.75

I_t = 0.91 **Inches per Hour**

GEOTEK

Client:	**Golden Ocean Realty, LLC**
Project:	**Tract 38066**
Project No:	**2741-CR**
Date:	**4/23/2021**

Boring No. **I-4**

Percolation Rate (Porchet Method)

Time Interval, Δt =	30
Final Depth to Water, D_F =	44.5
Test Hole Radius, r =	4
Initial Depth to Water, D_O =	40
Total Test Hole Depth, D_T =	60

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20
$H_F = D_T - D_F$ =	15.5
$\Delta H = \Delta D = H_O - H_F$ =	4.5
$H_{avg} = (H_O+H_F)/2$ =	17.75

I_t = 0.91 **Inches per Hour**

GEOTEK

APPENDIX D

LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSES

Geotechnical and Infiltration Evaluation

Tract 38066

San Jacinto, California

Project No. 2741-CR

GEOTEK

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

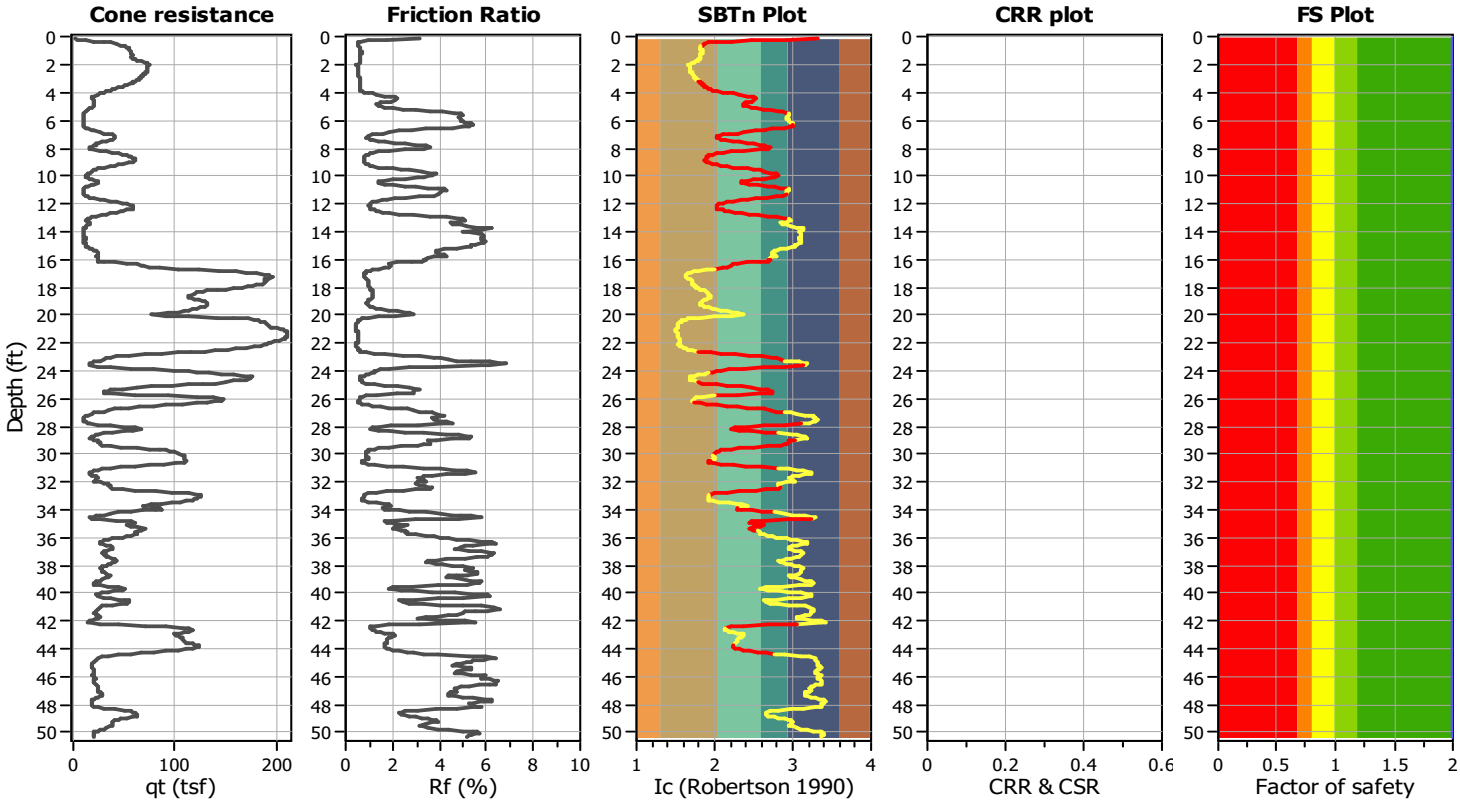
LIQUEFACTION ANALYSIS REPORT

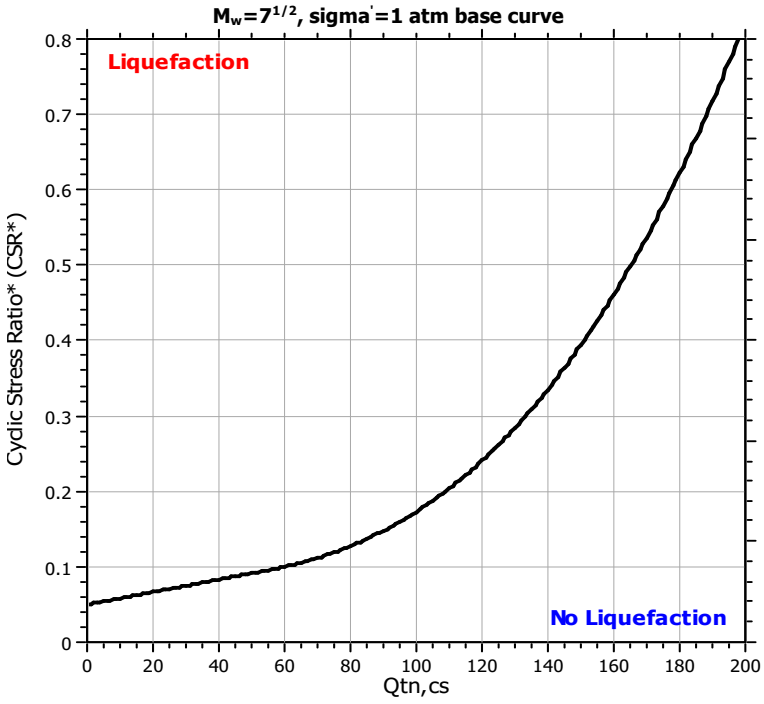
Project title : Tract 38066 **Location : San Jacinto, California**

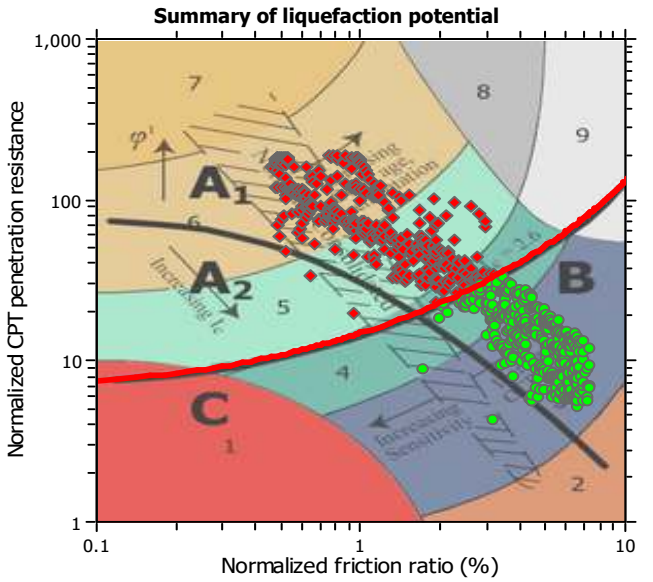
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

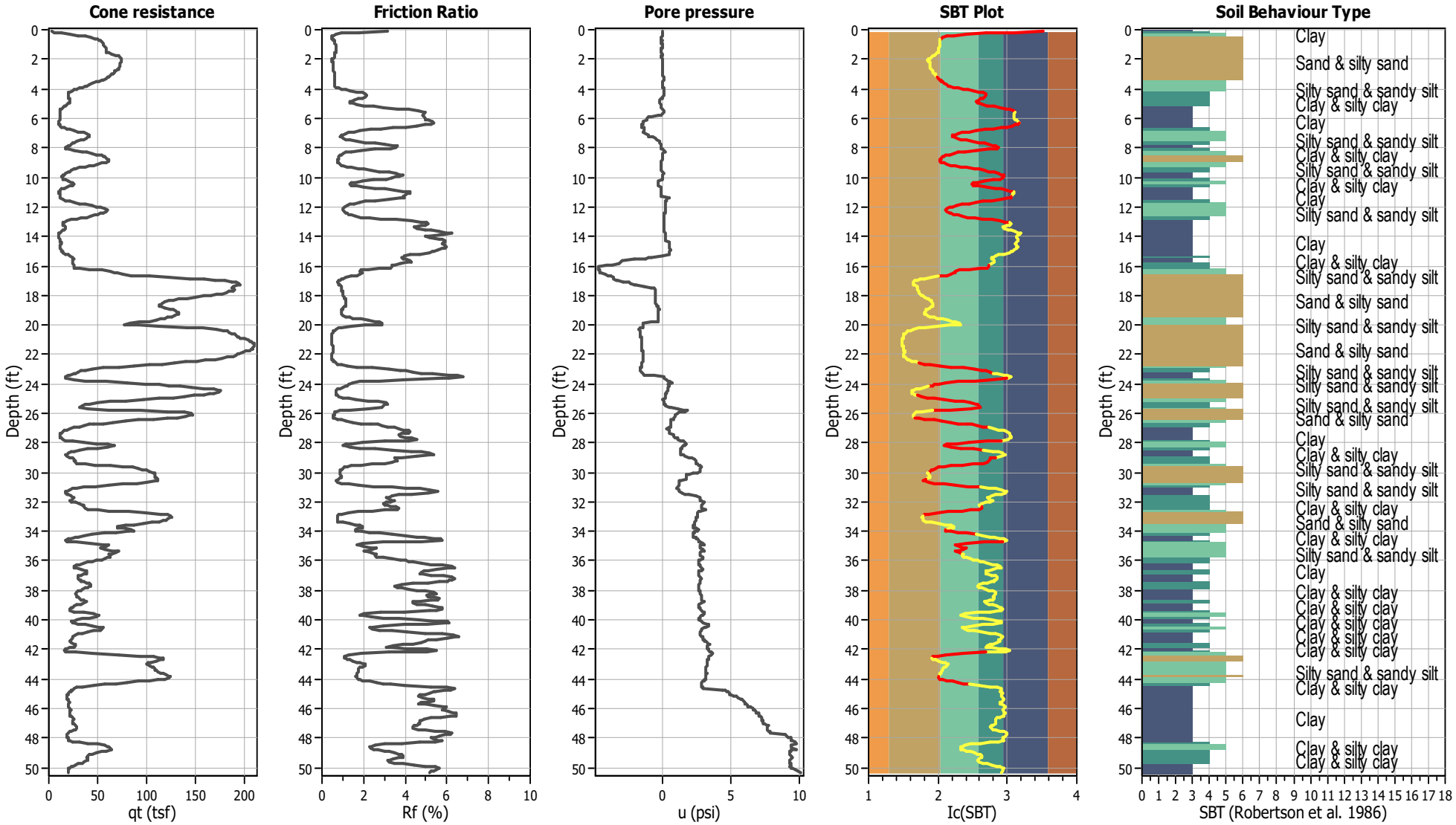






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



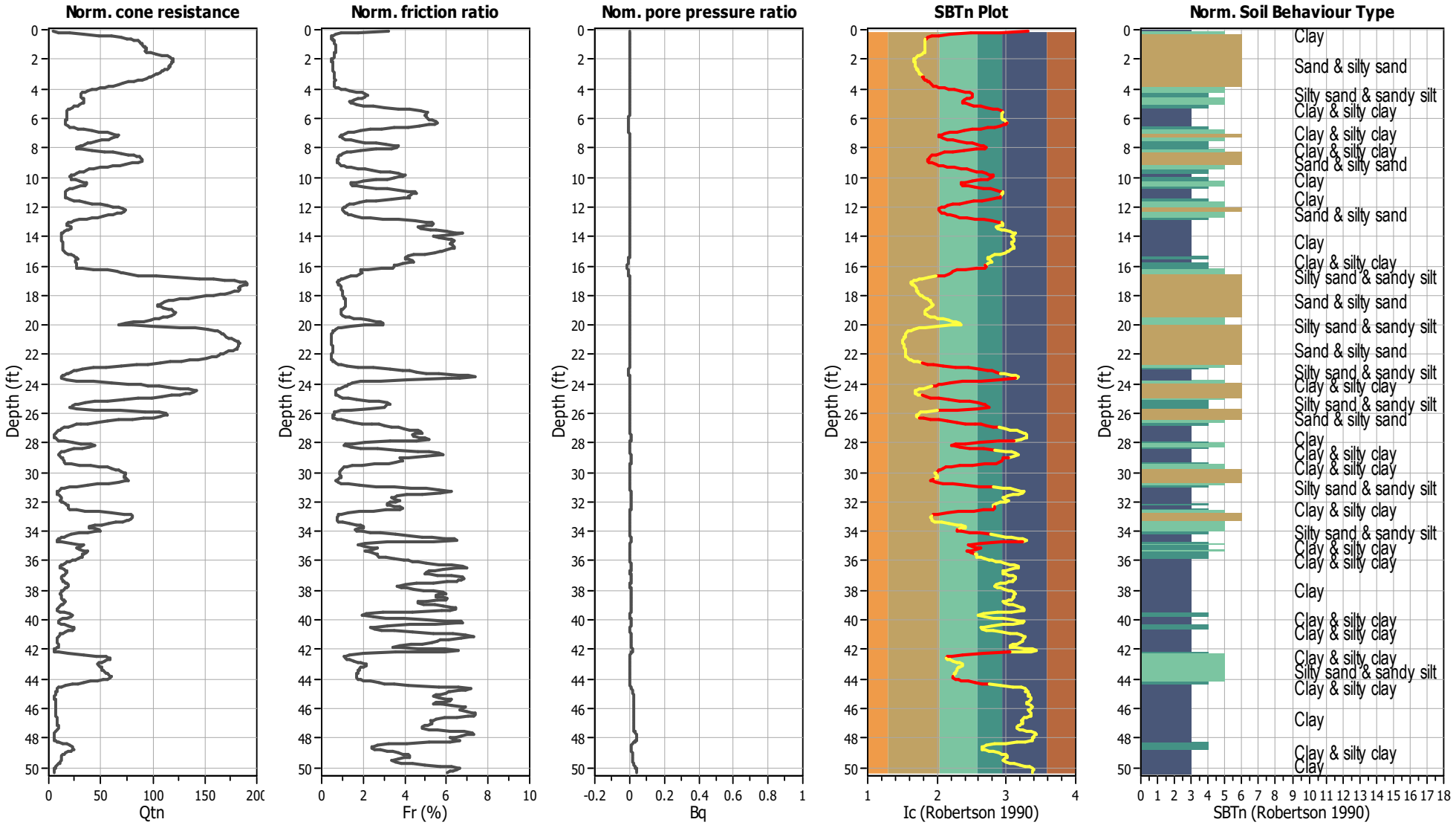
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



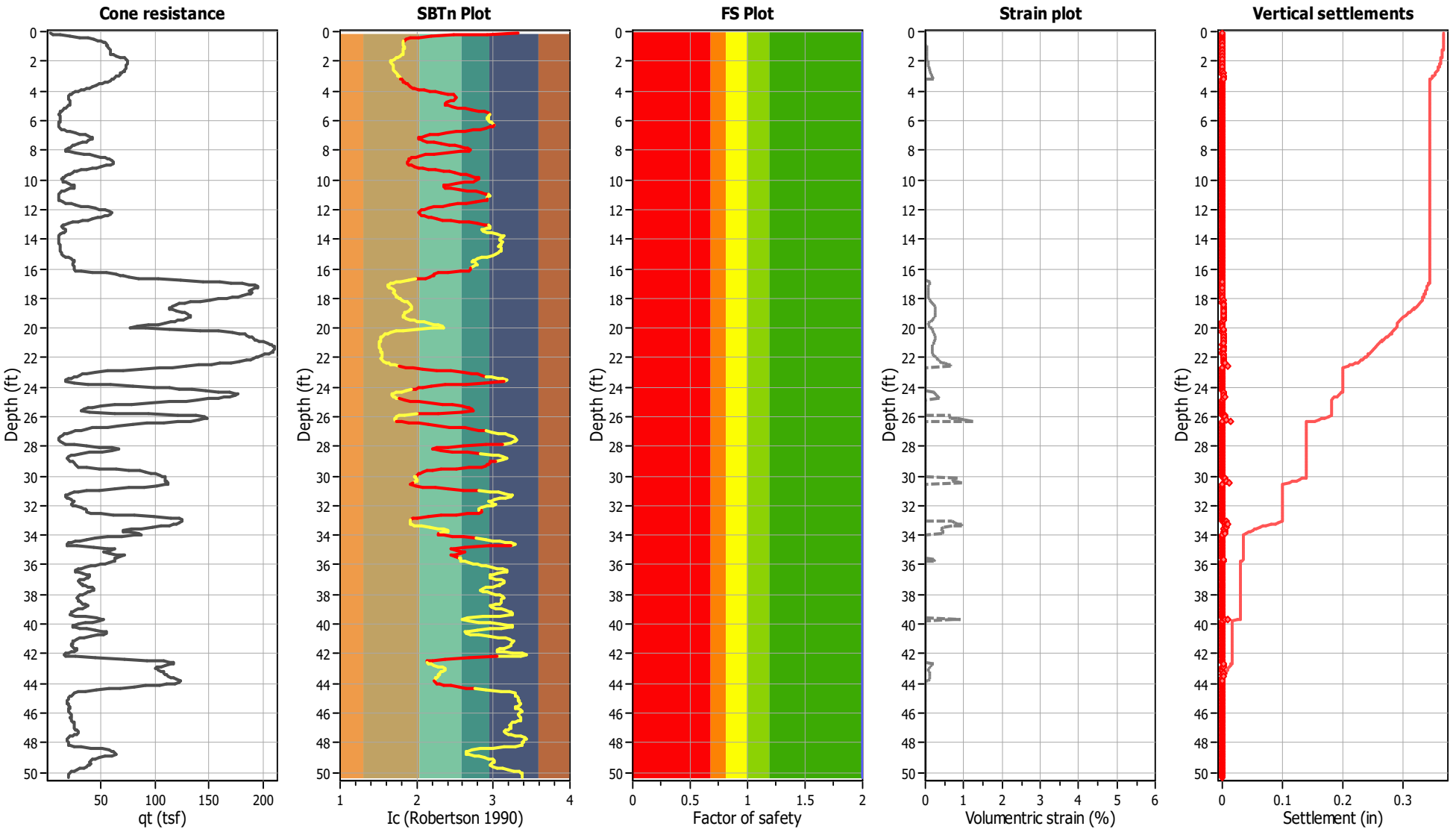
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

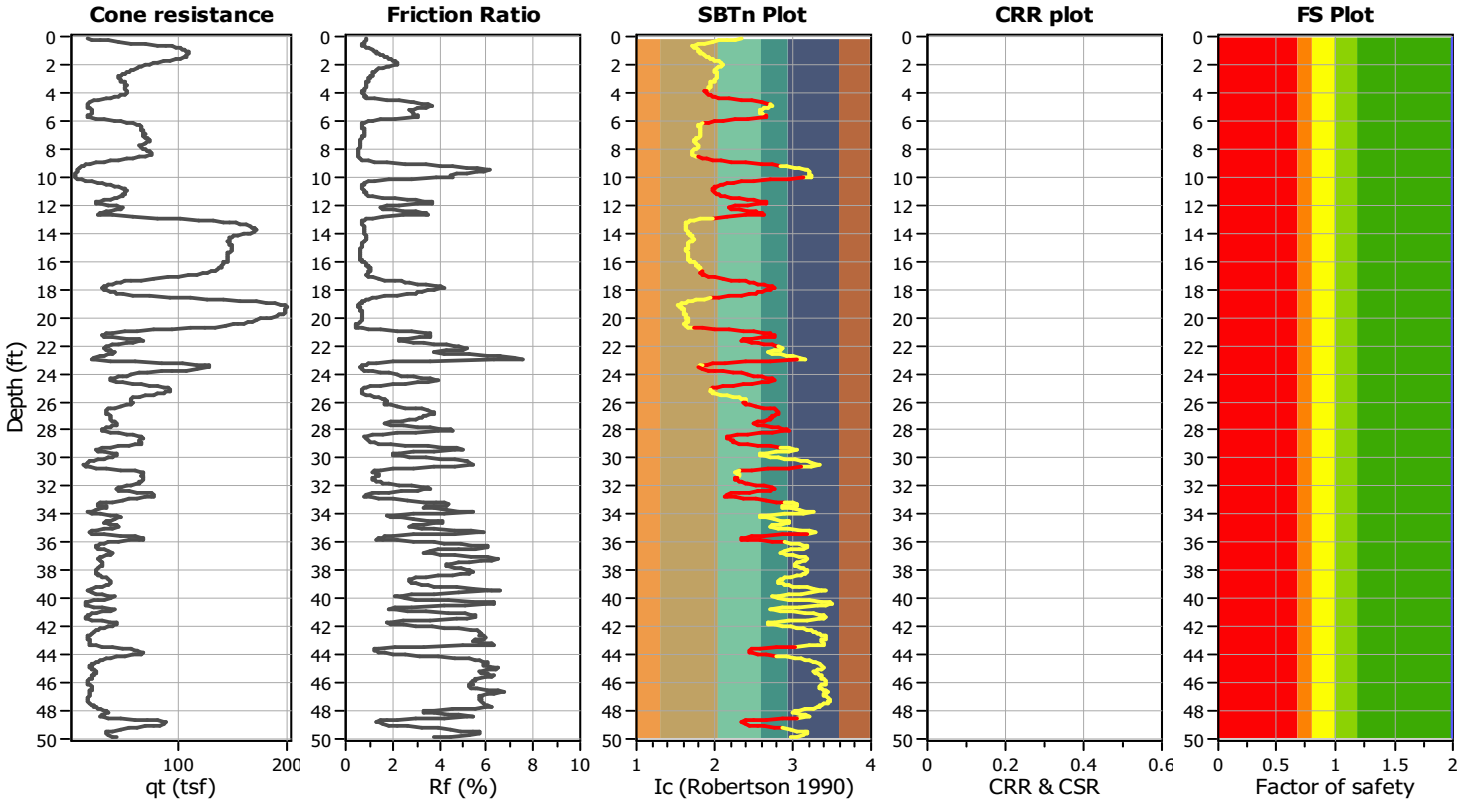
LIQUEFACTION ANALYSIS REPORT

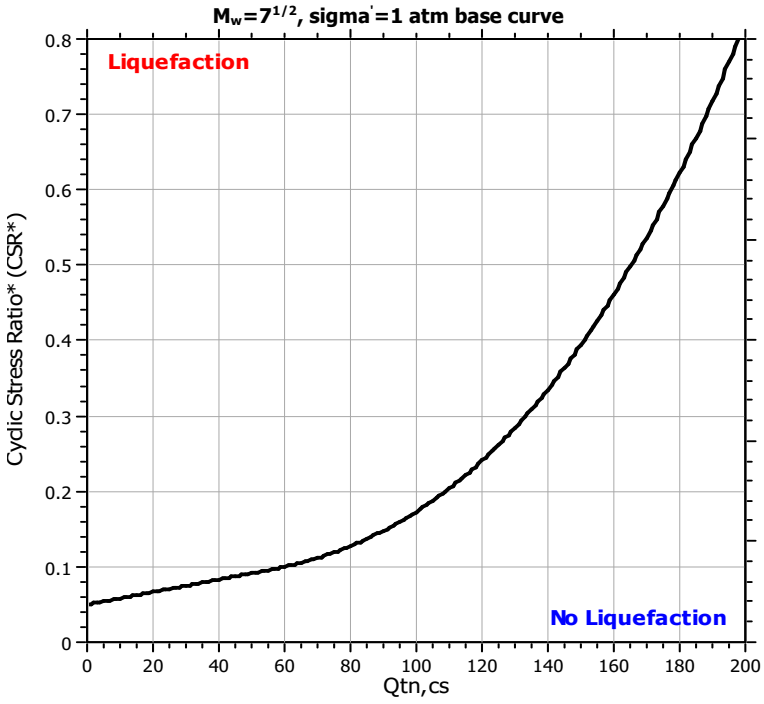
Project title : Tract 38066 **Location : San Jacinto, California**

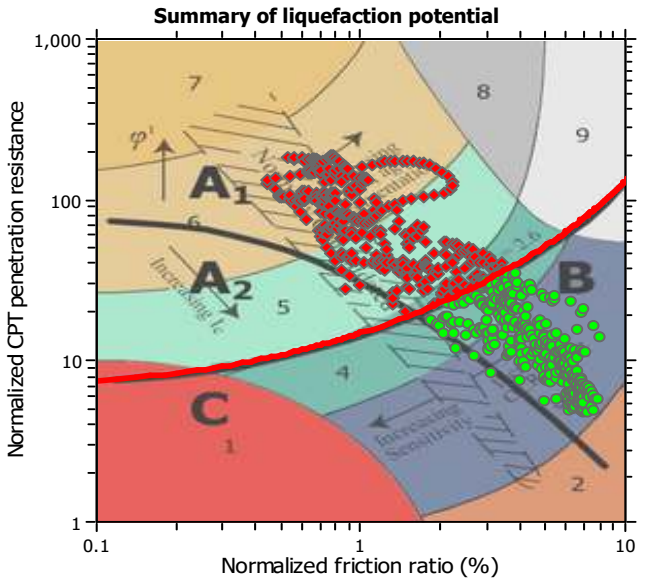
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

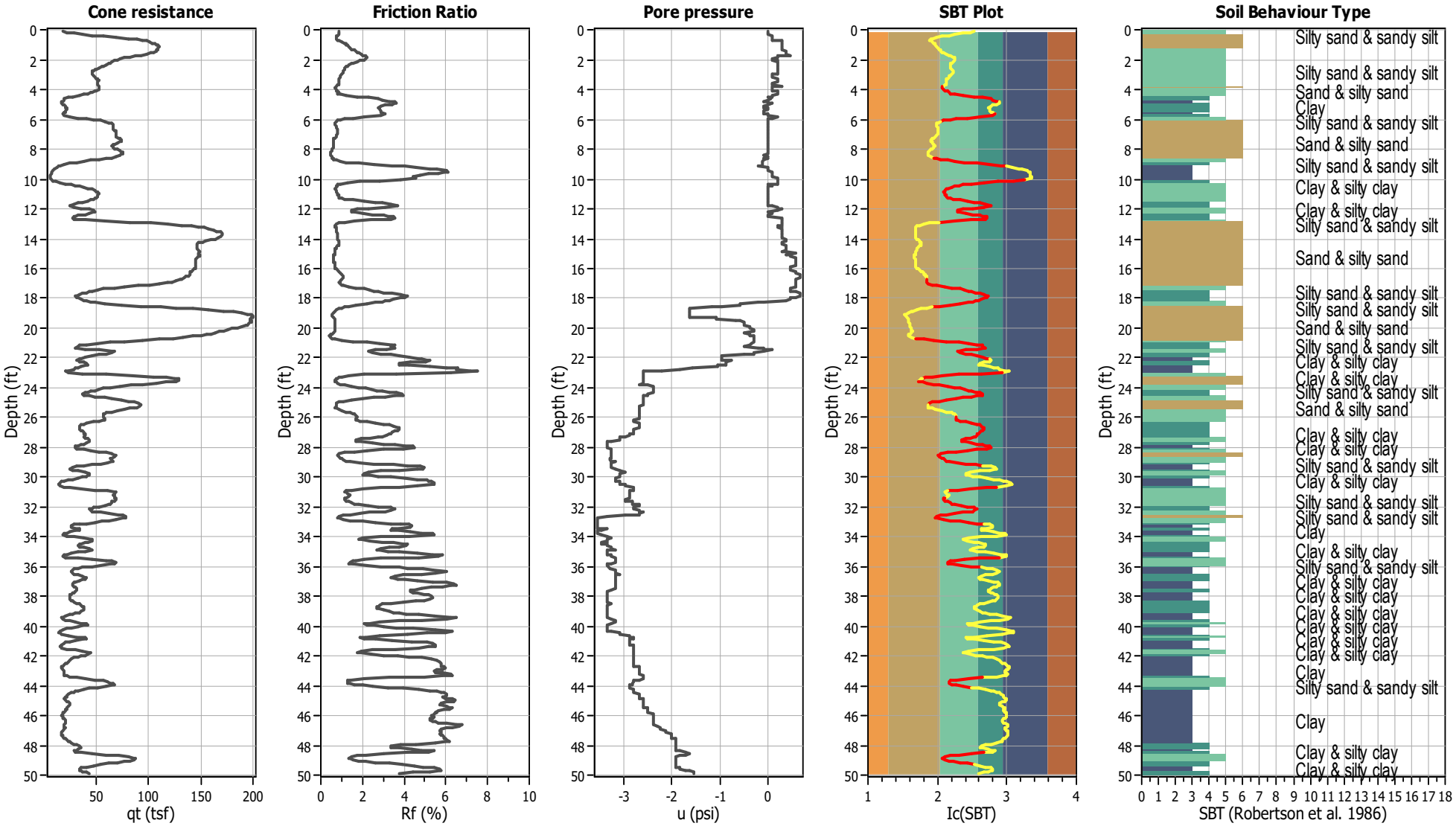






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



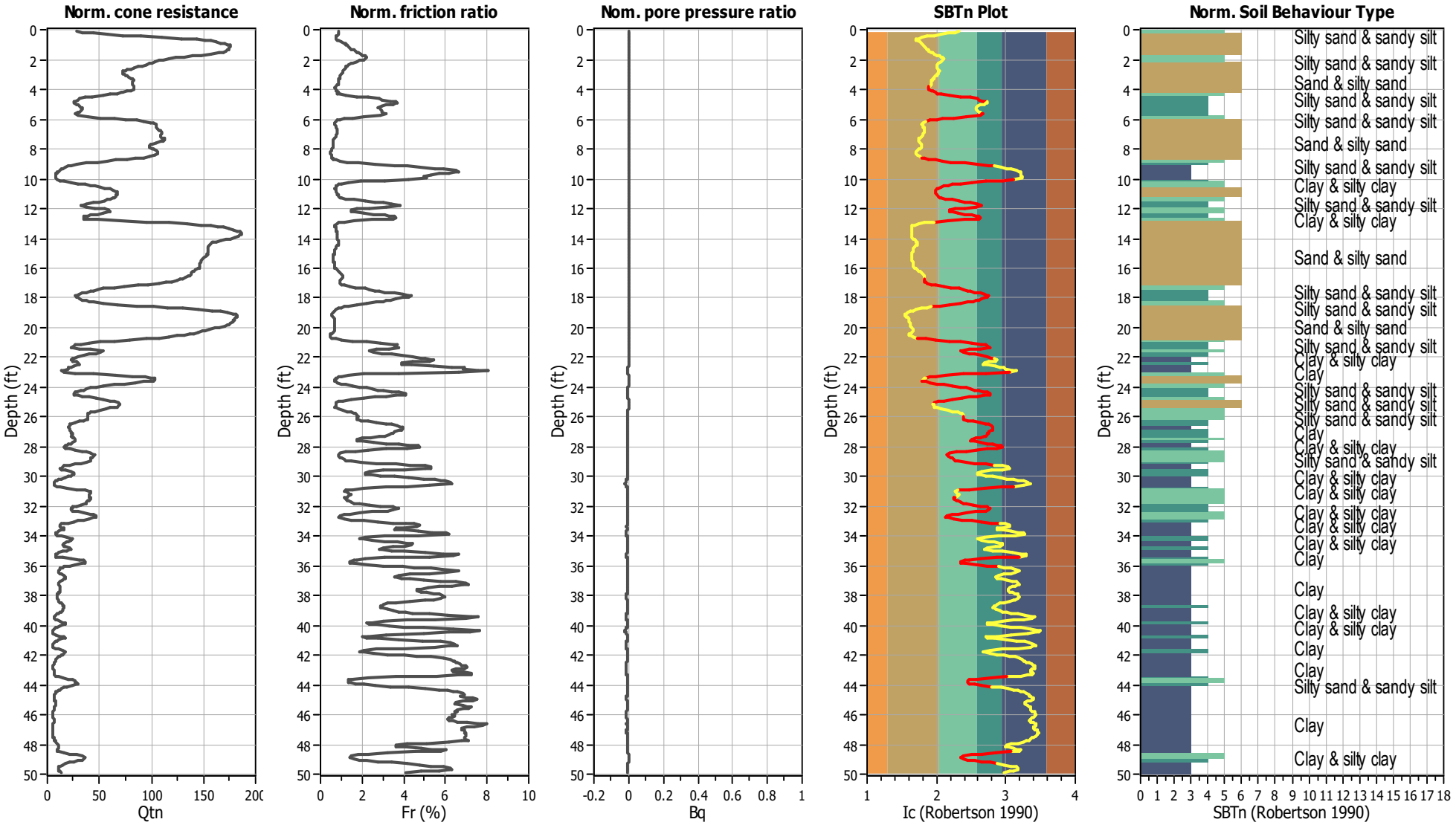
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



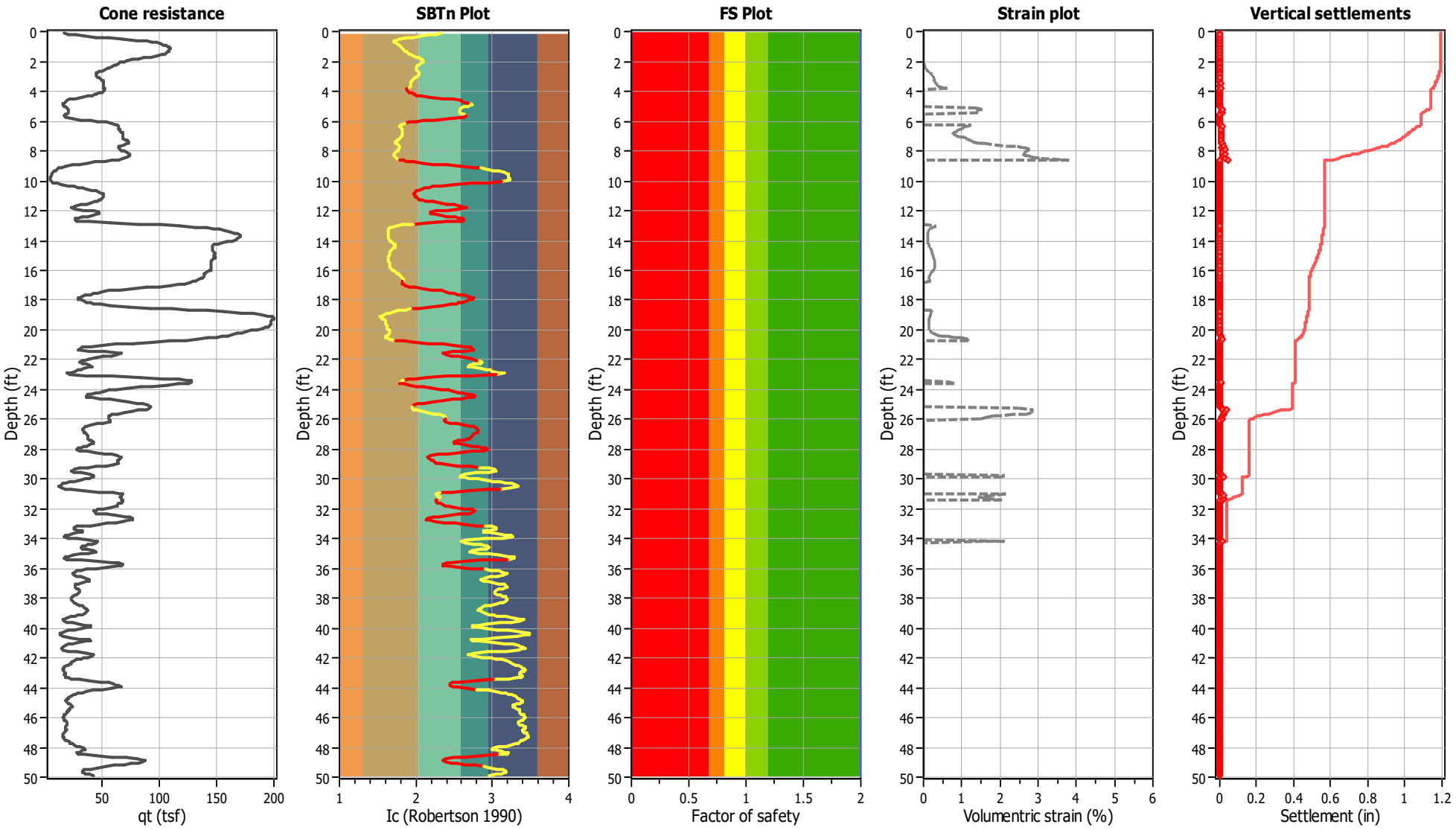
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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LIQUEFACTION ANALYSIS REPORT

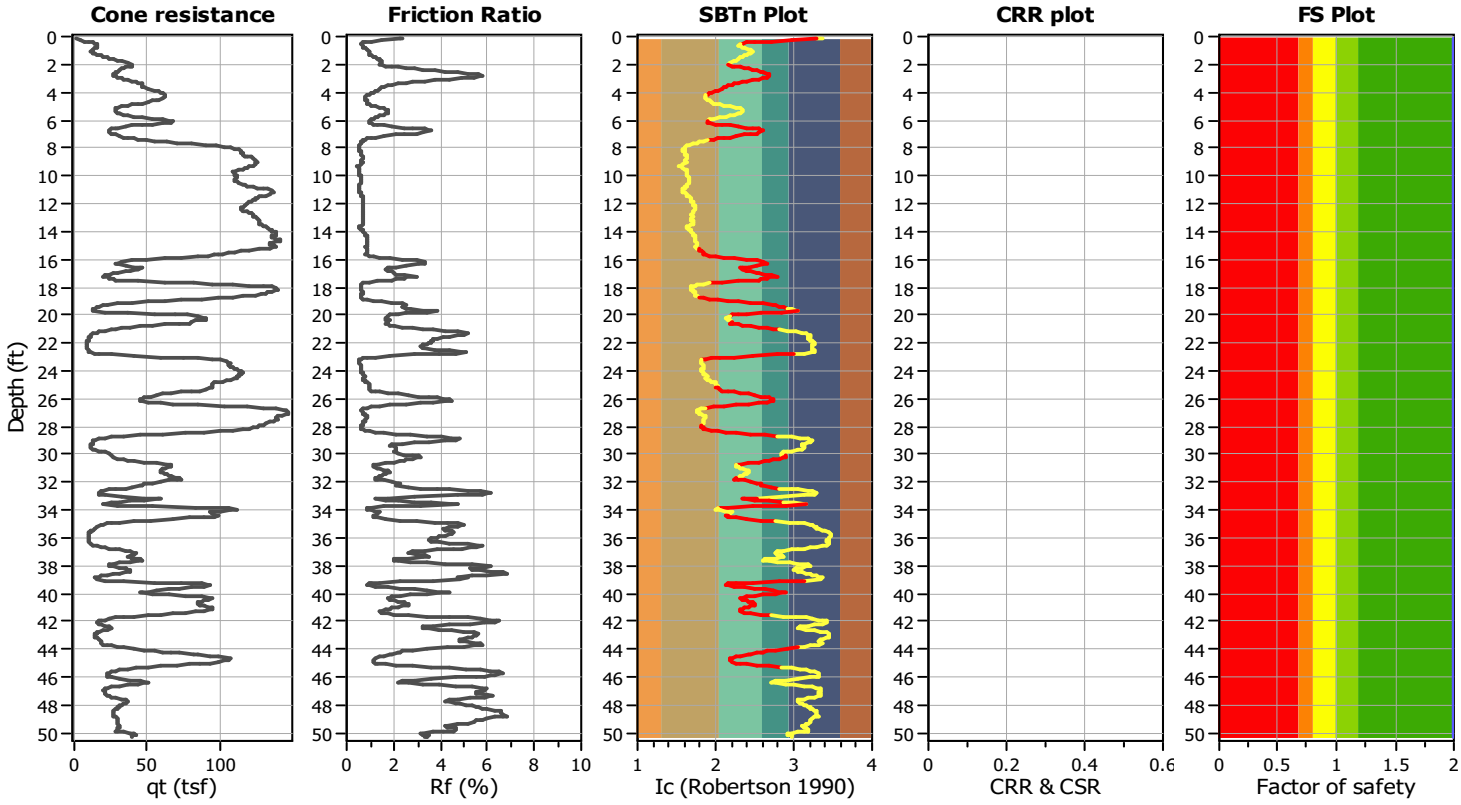
Project title : Tract 38066

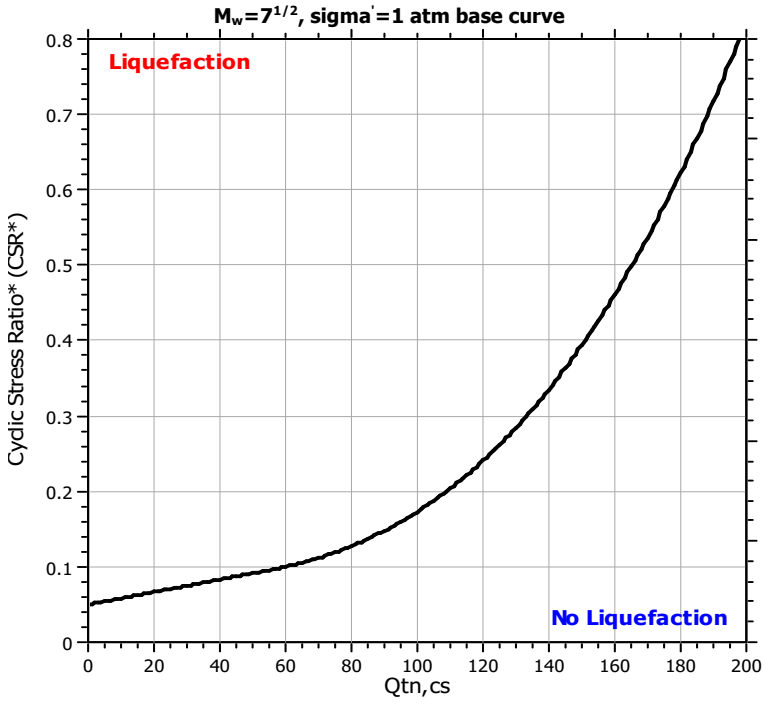
Location : San Jacinto, California

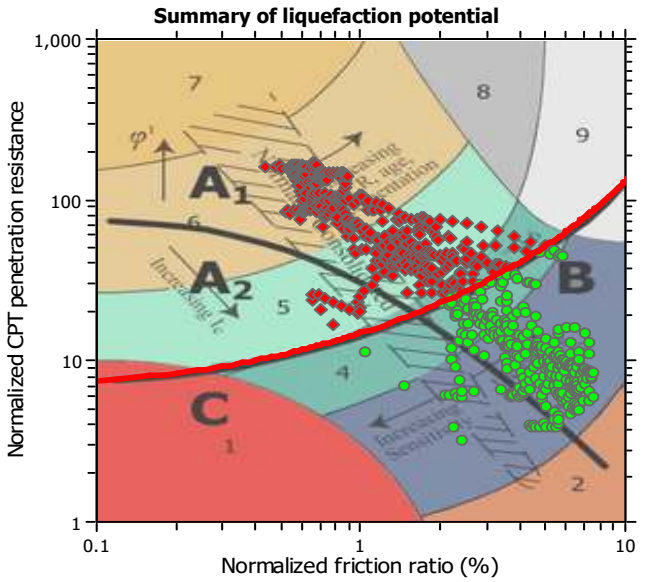
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

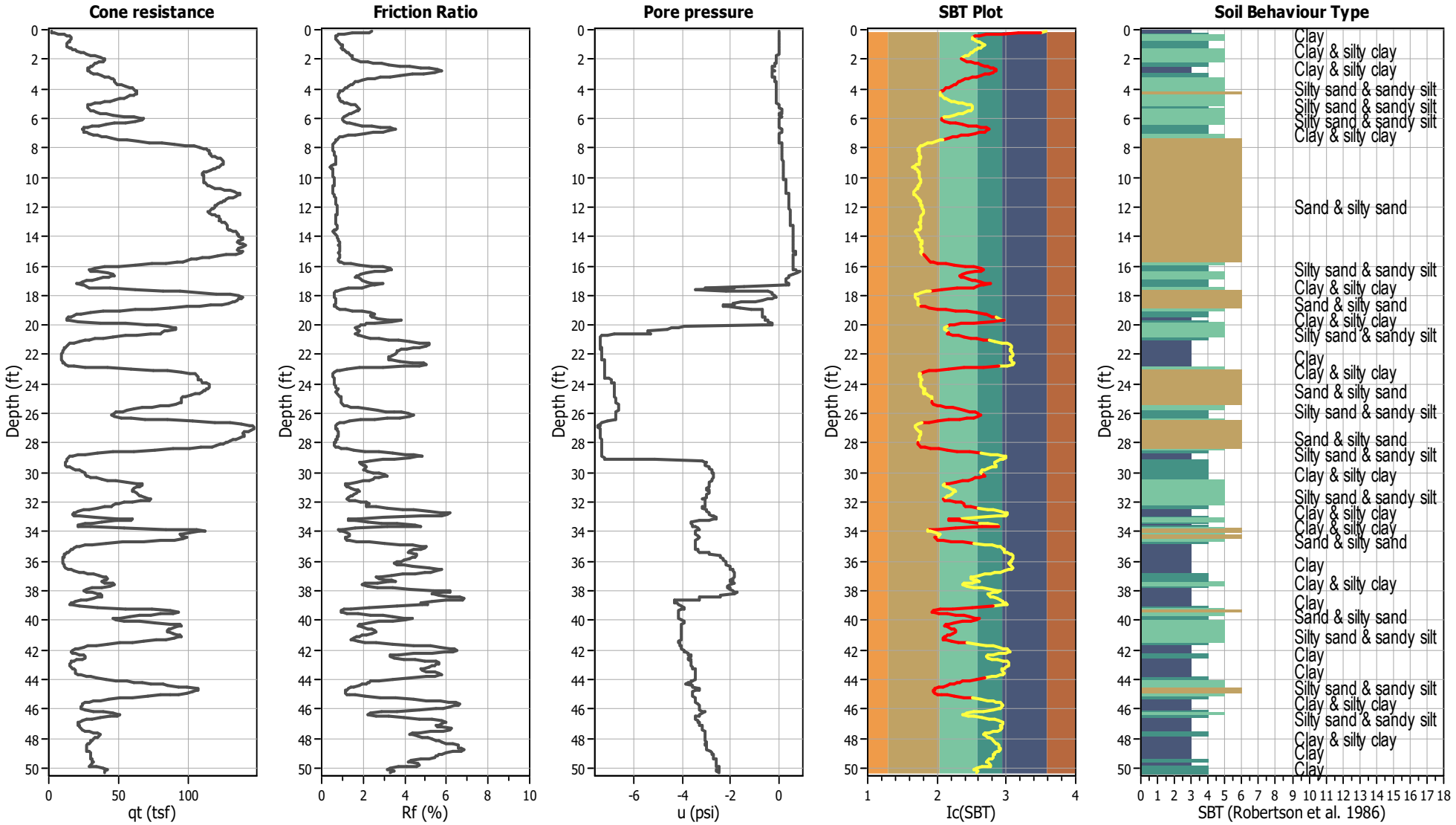






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



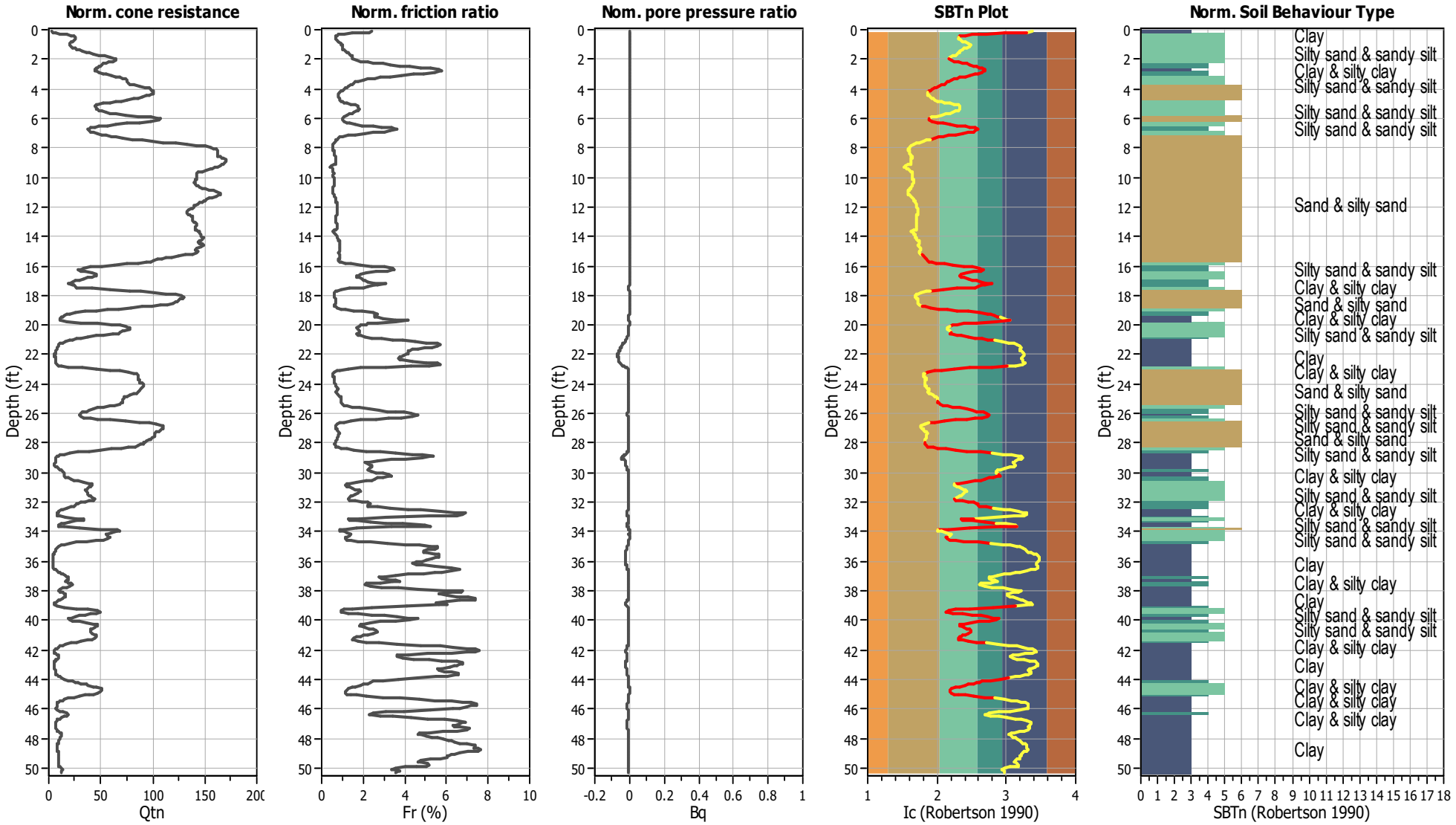
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



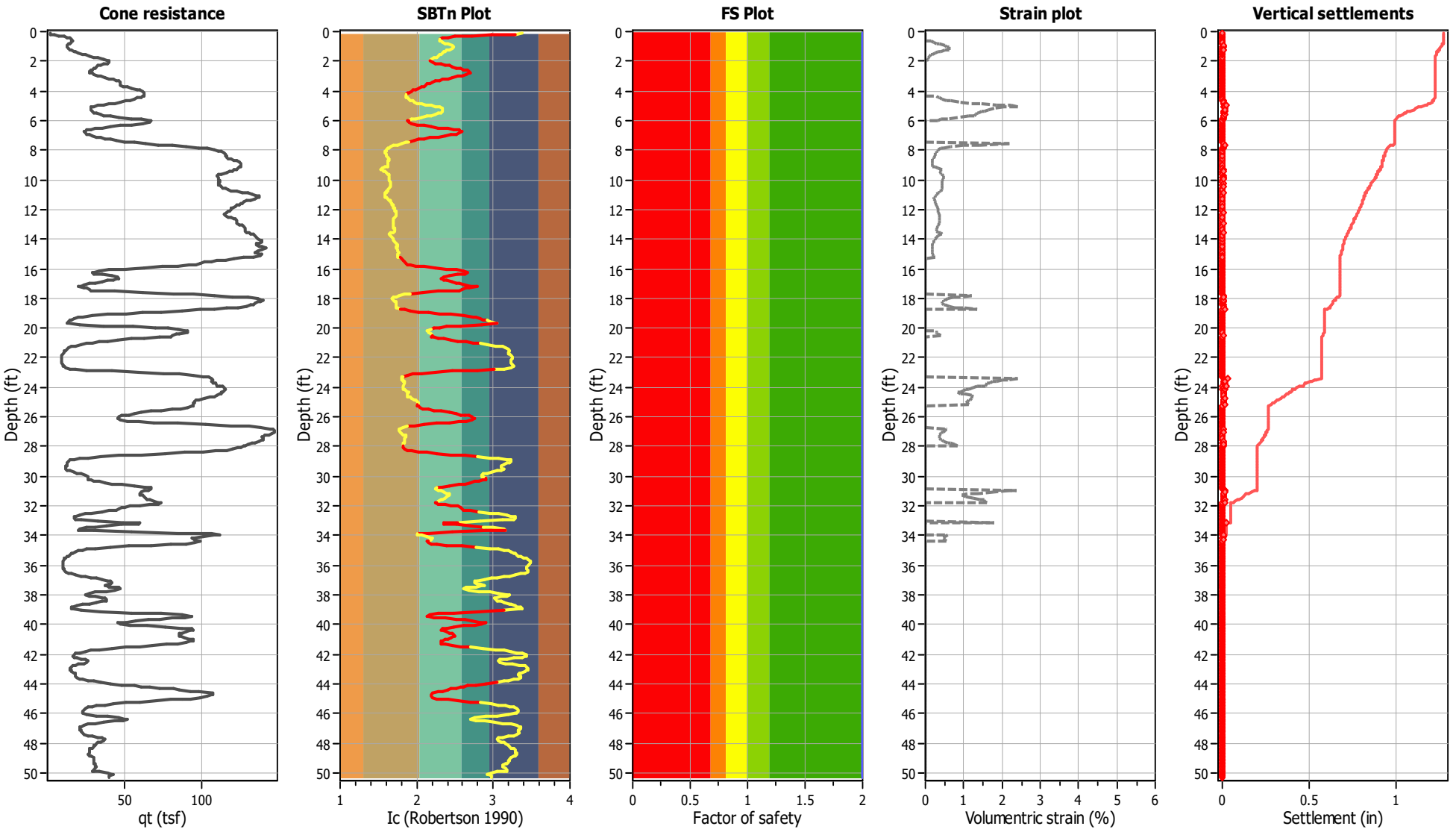
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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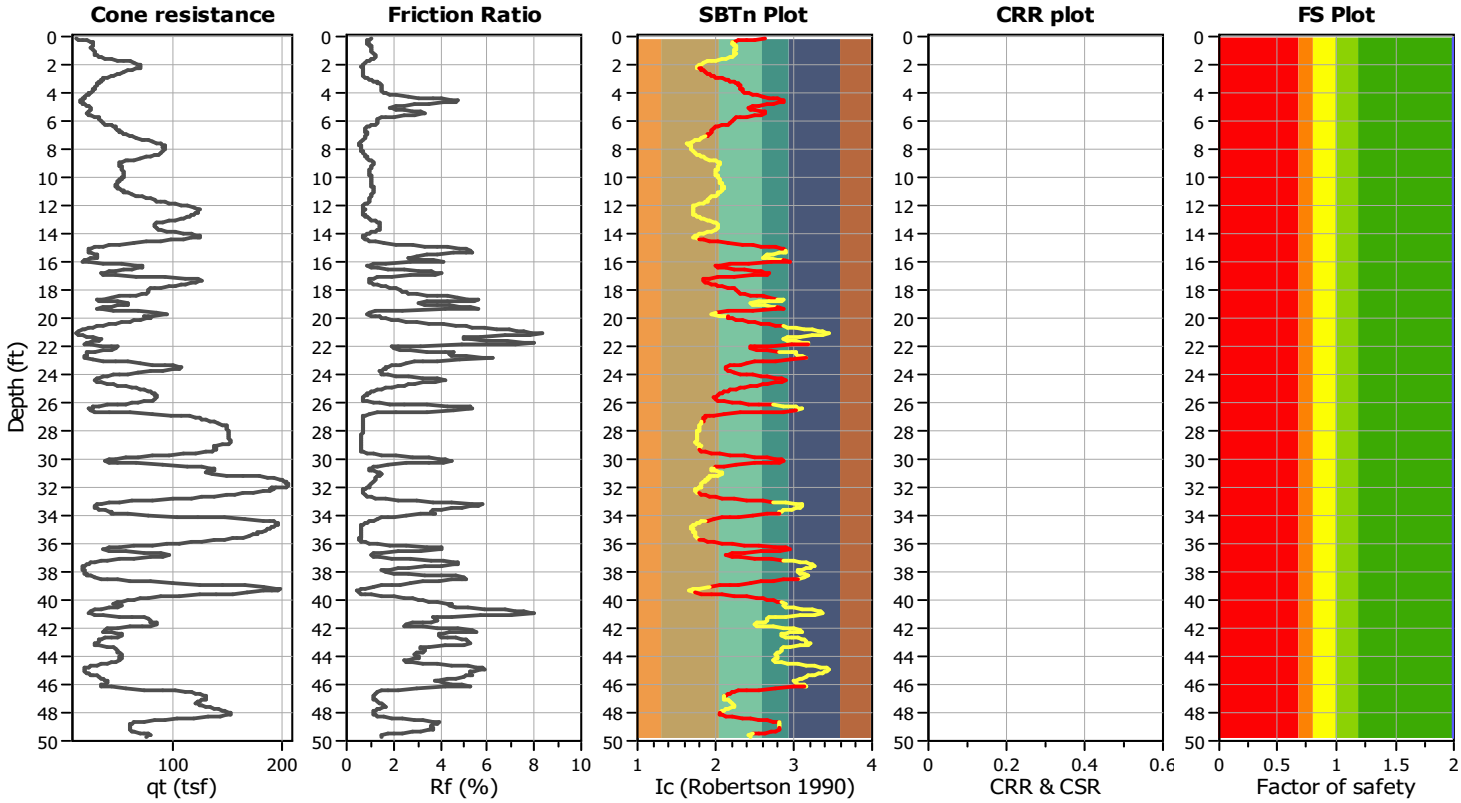
LIQUEFACTION ANALYSIS REPORT

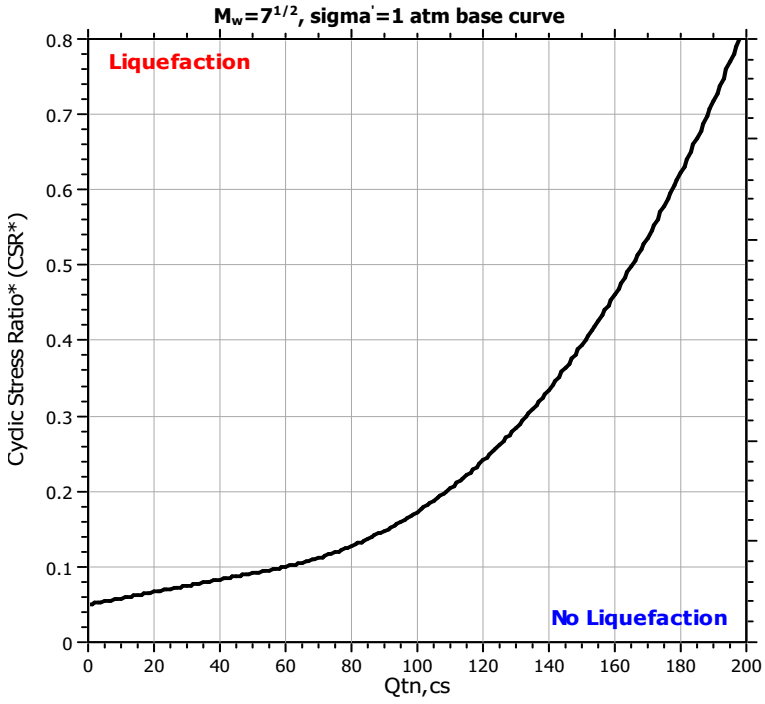
Project title : Tract 38066 **Location : San Jacinto, California**

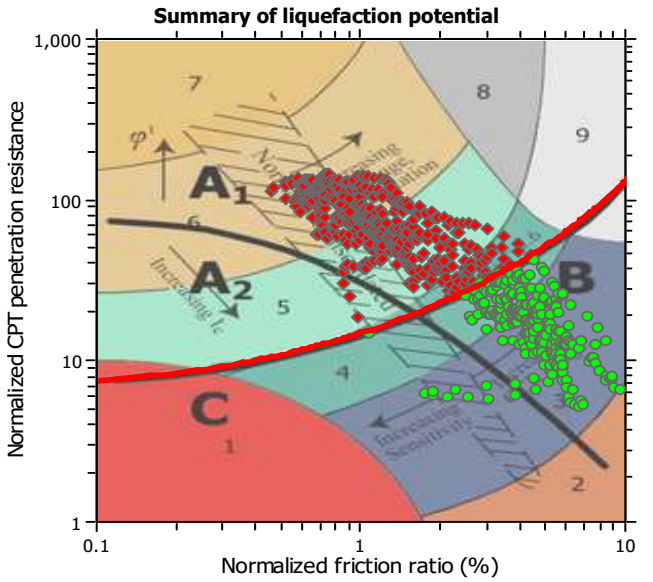
CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

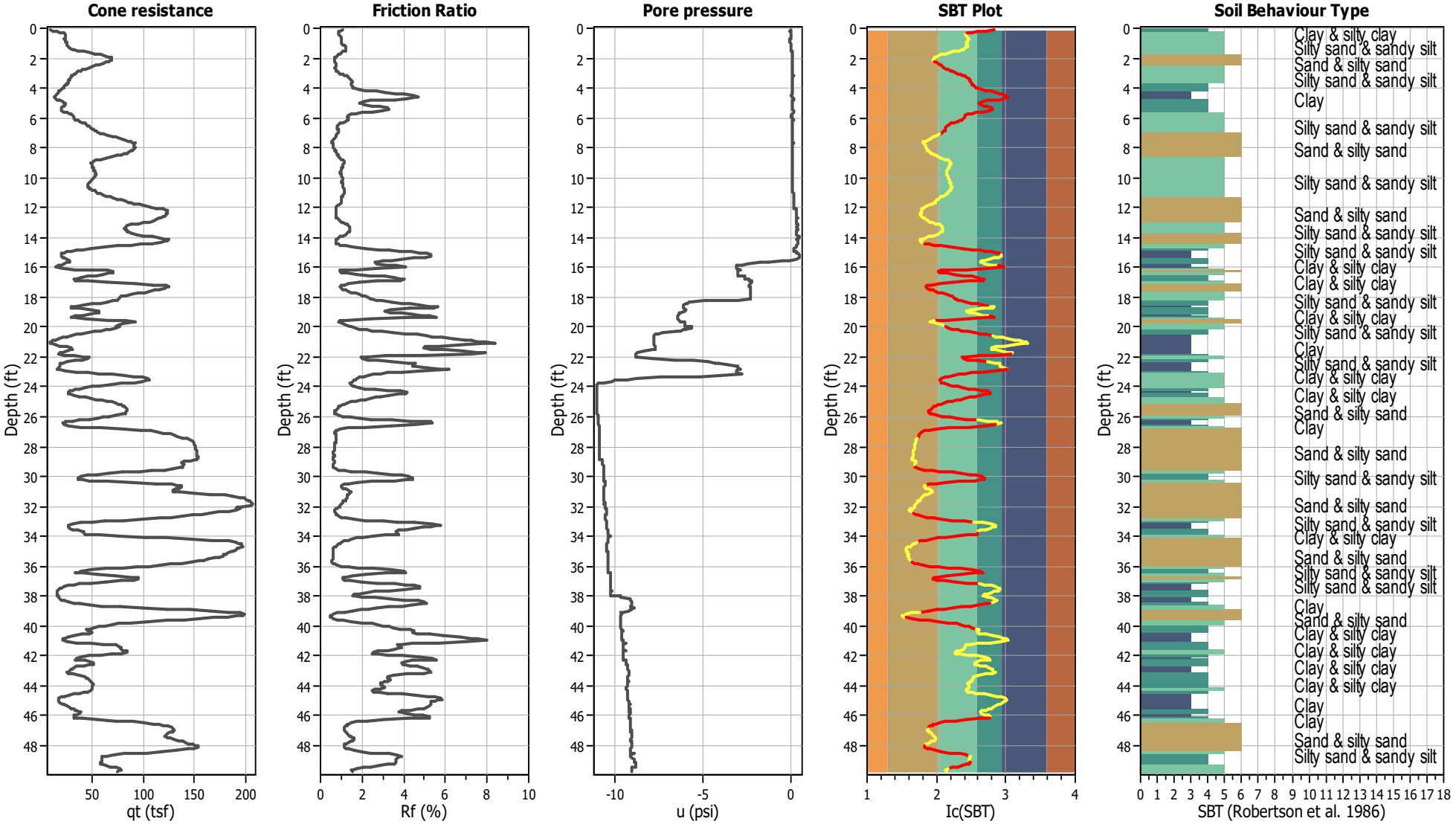






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



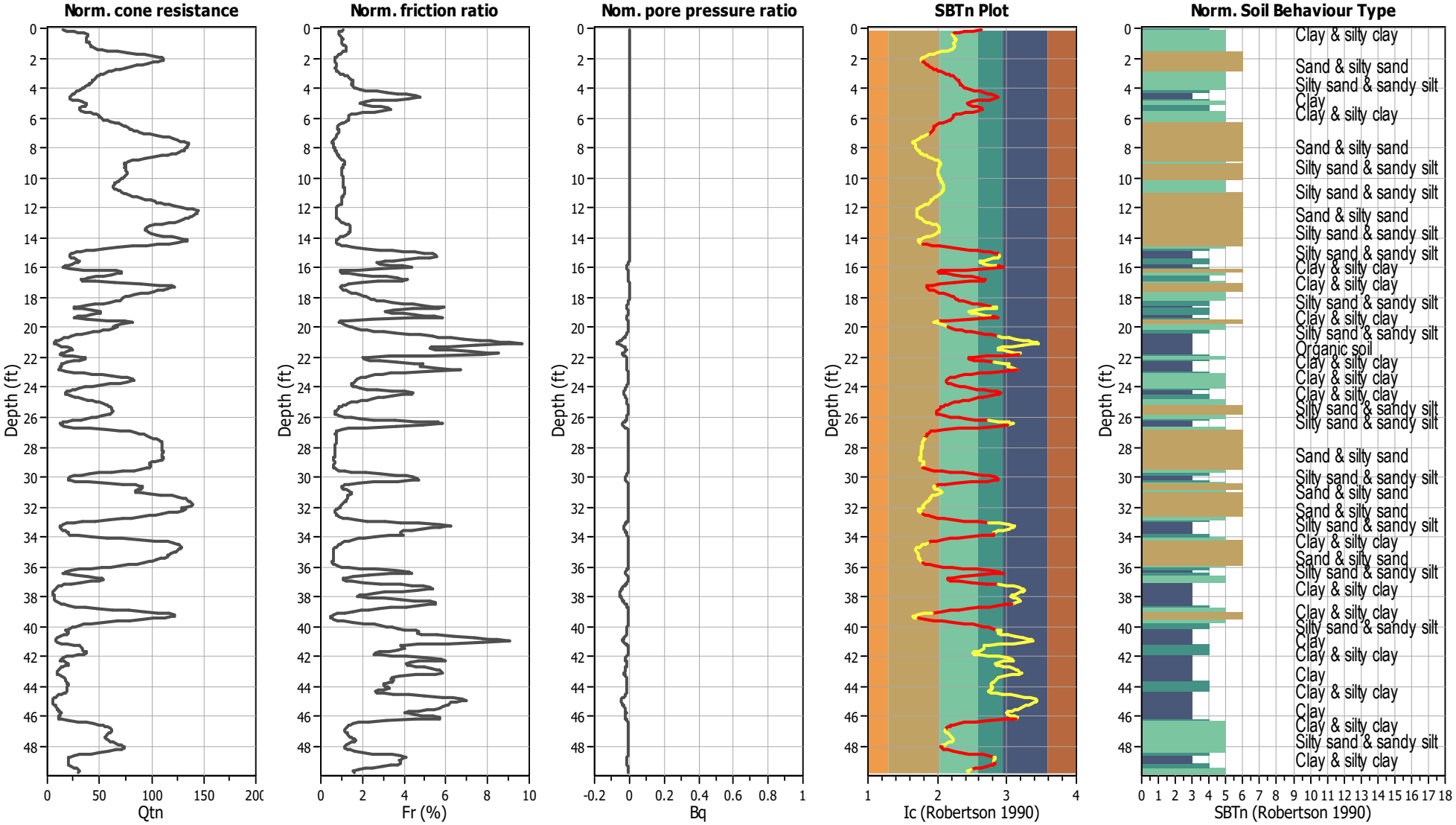
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



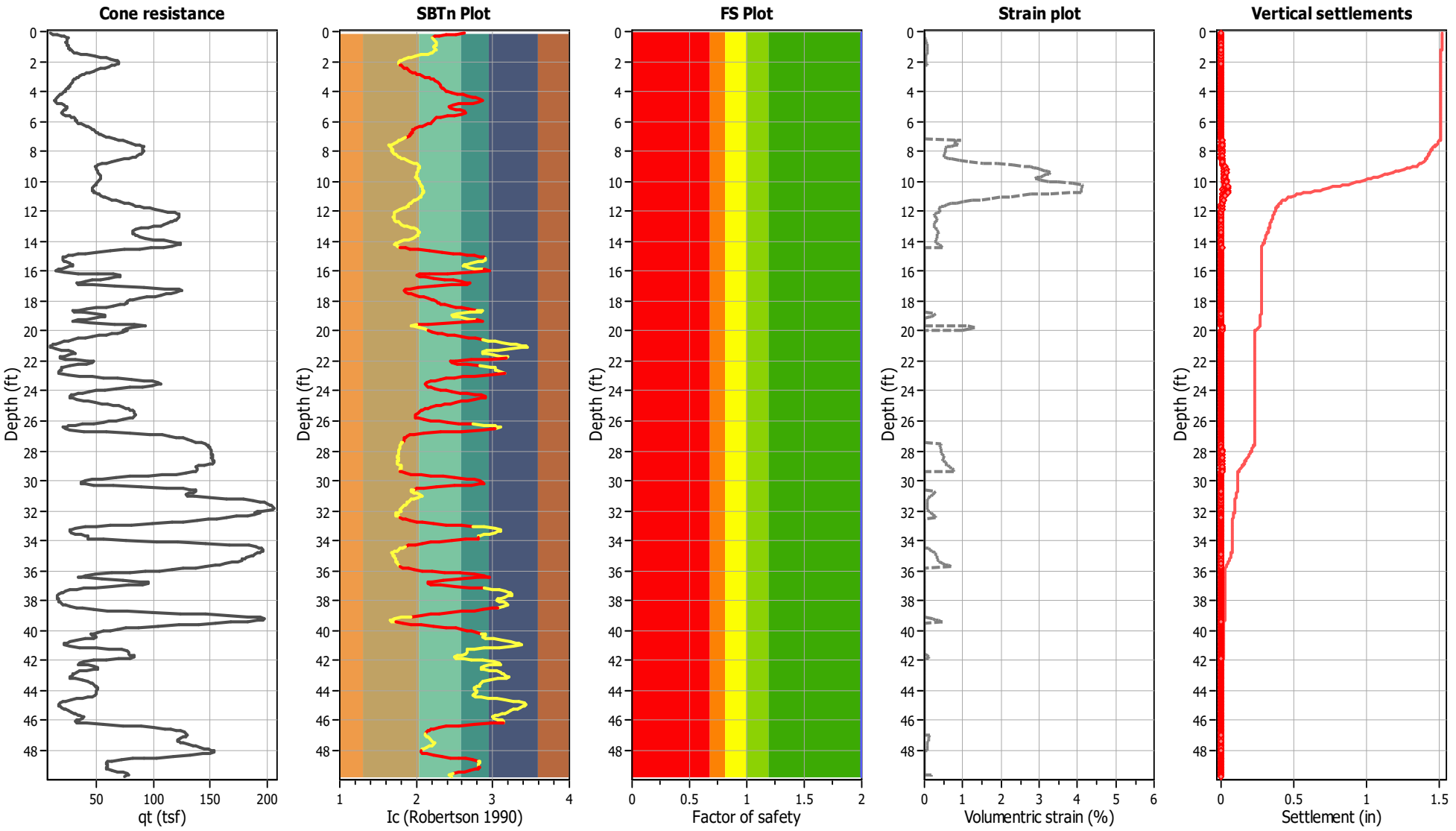
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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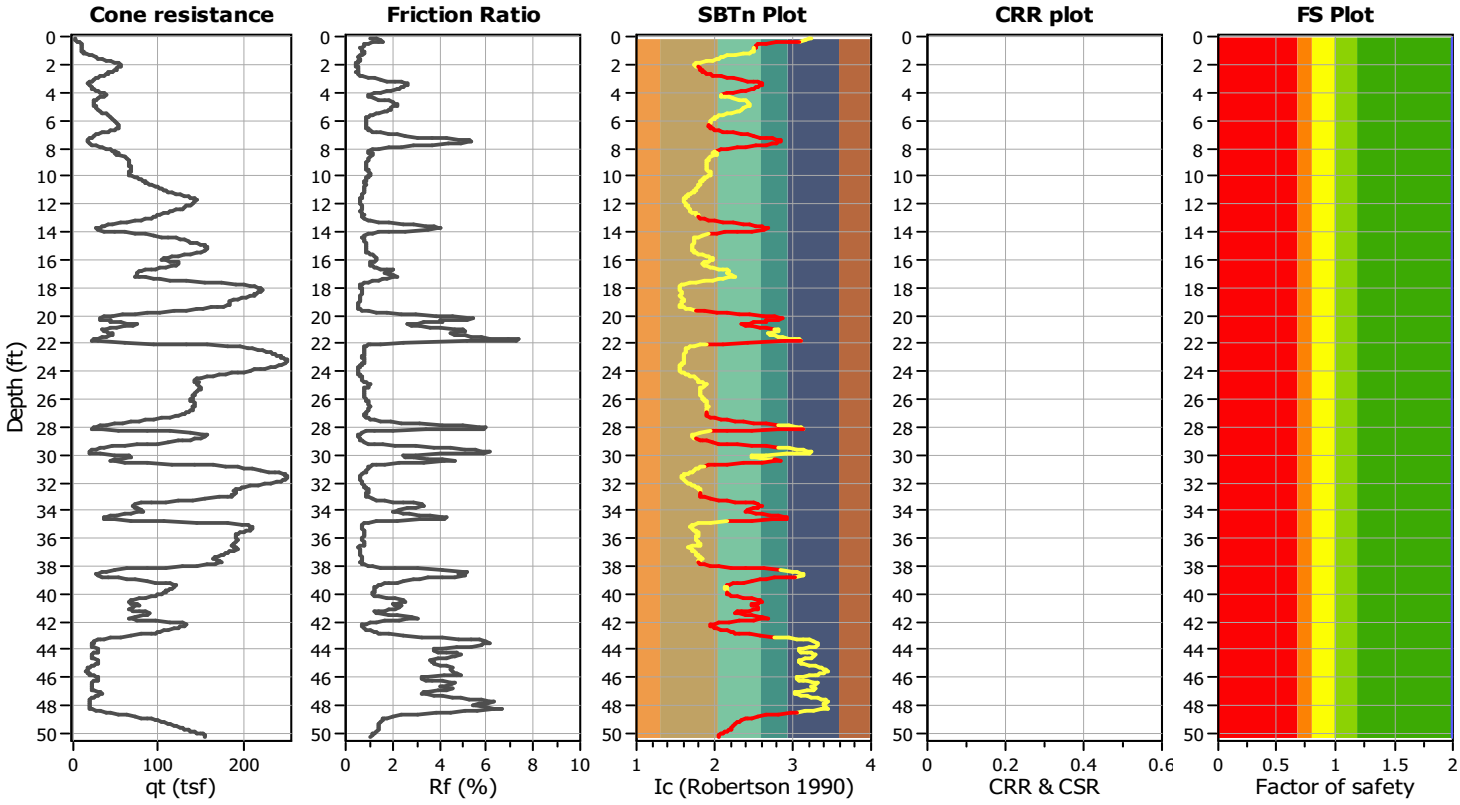
LIQUEFACTION ANALYSIS REPORT

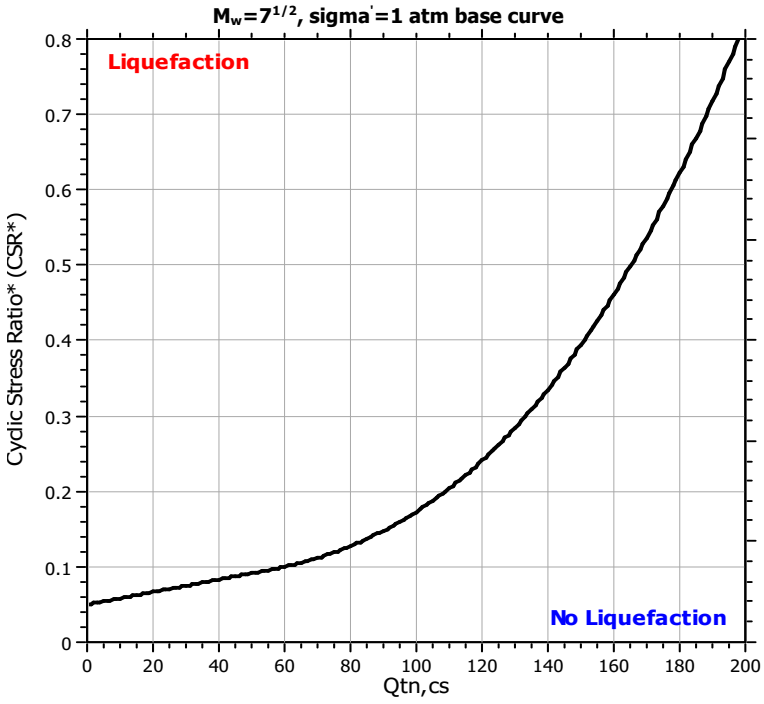
Project title : Tract 38066 **Location : San Jacinto, California**

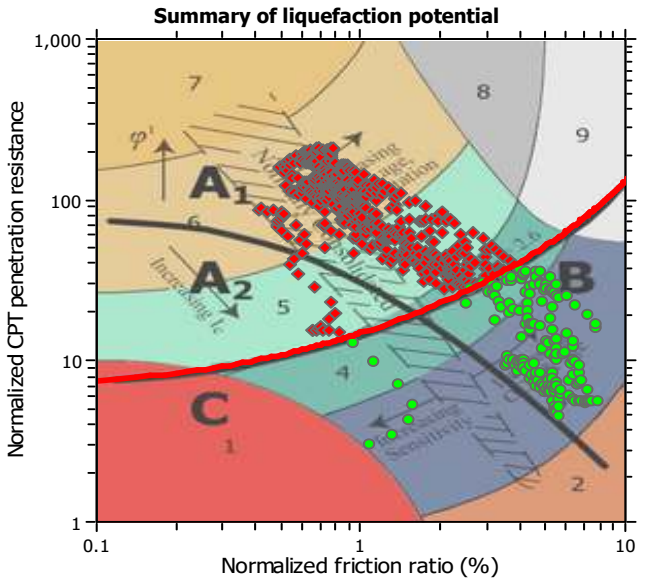
CPT file : CPT-5

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

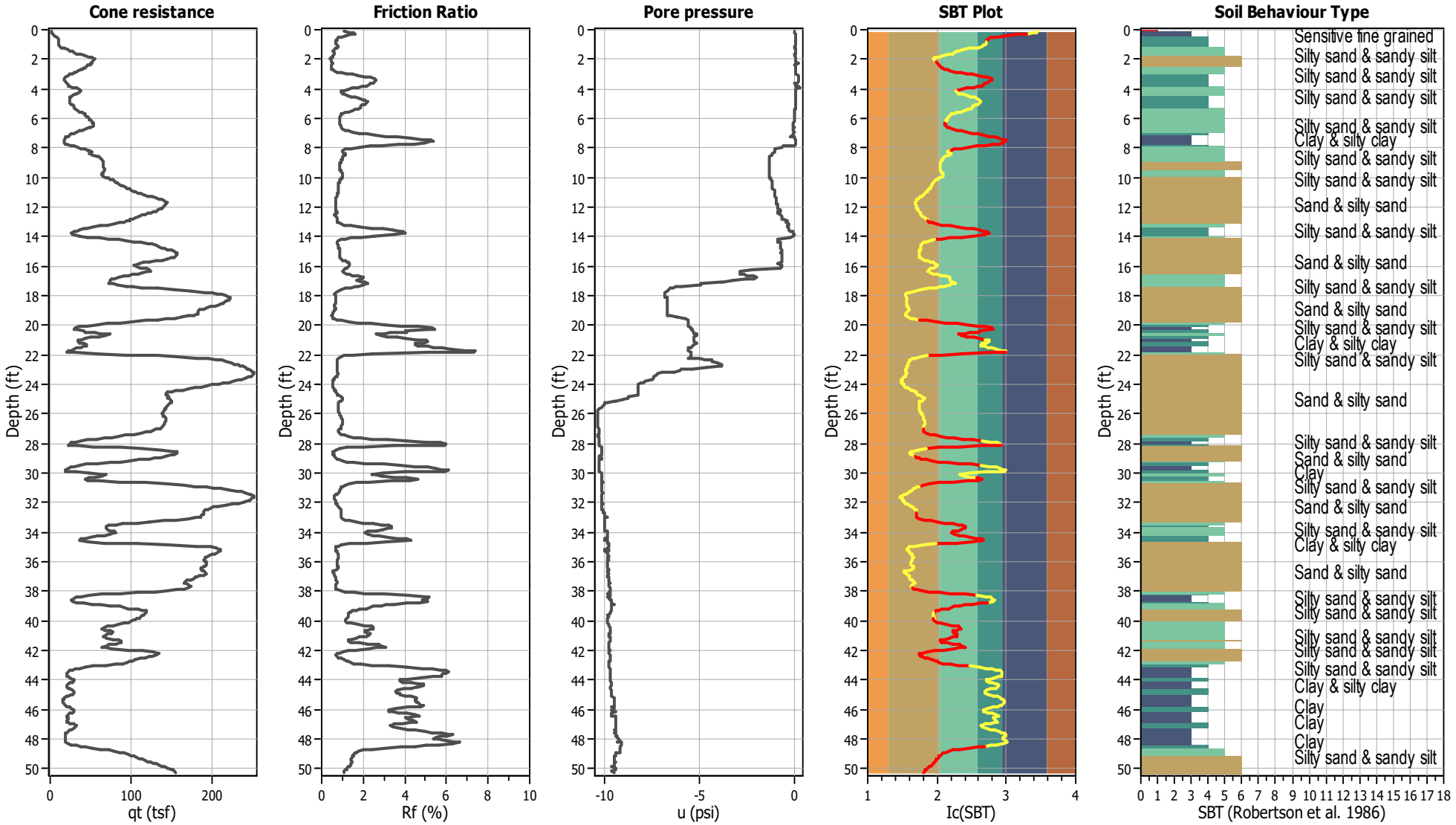






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



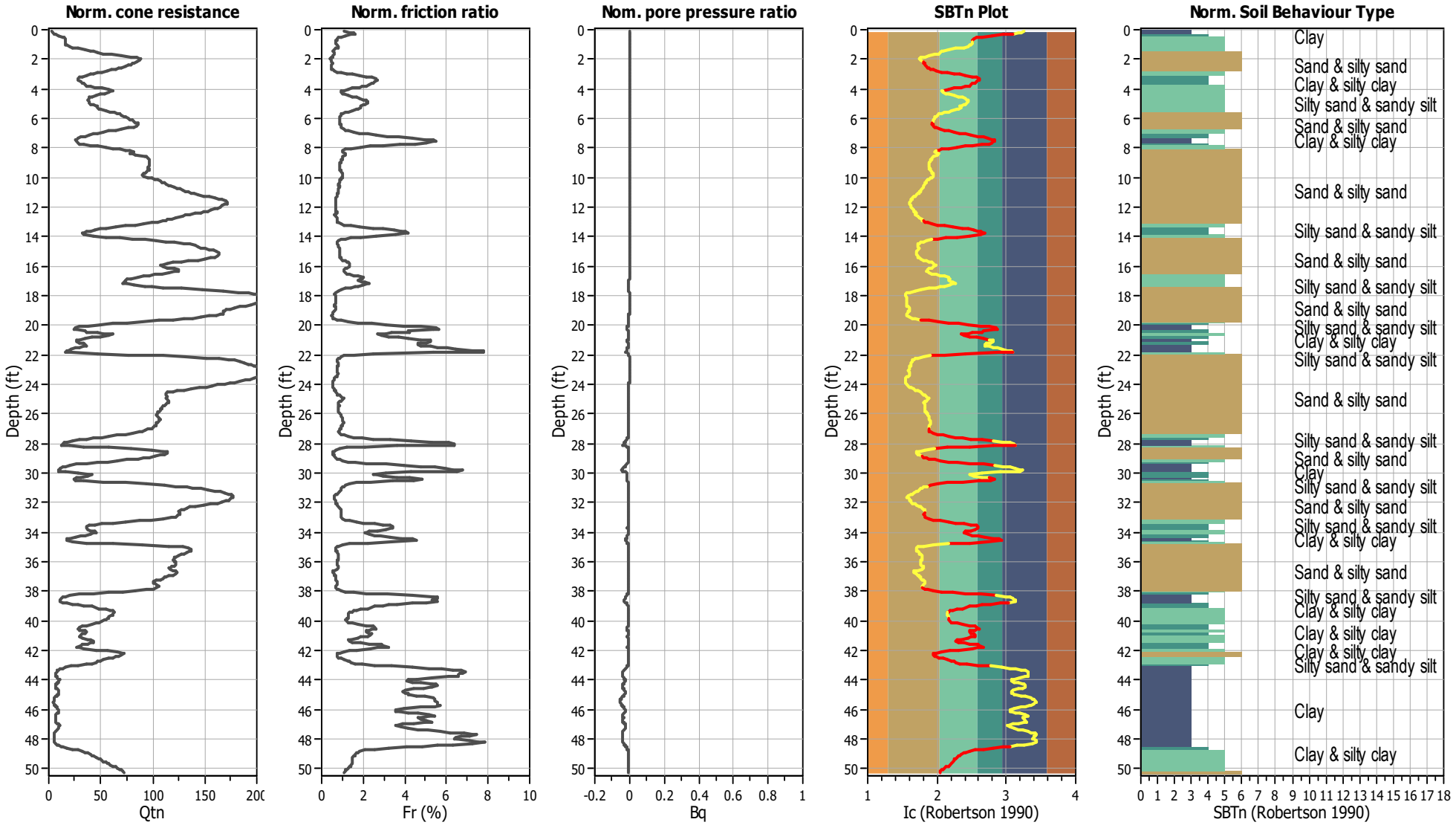
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



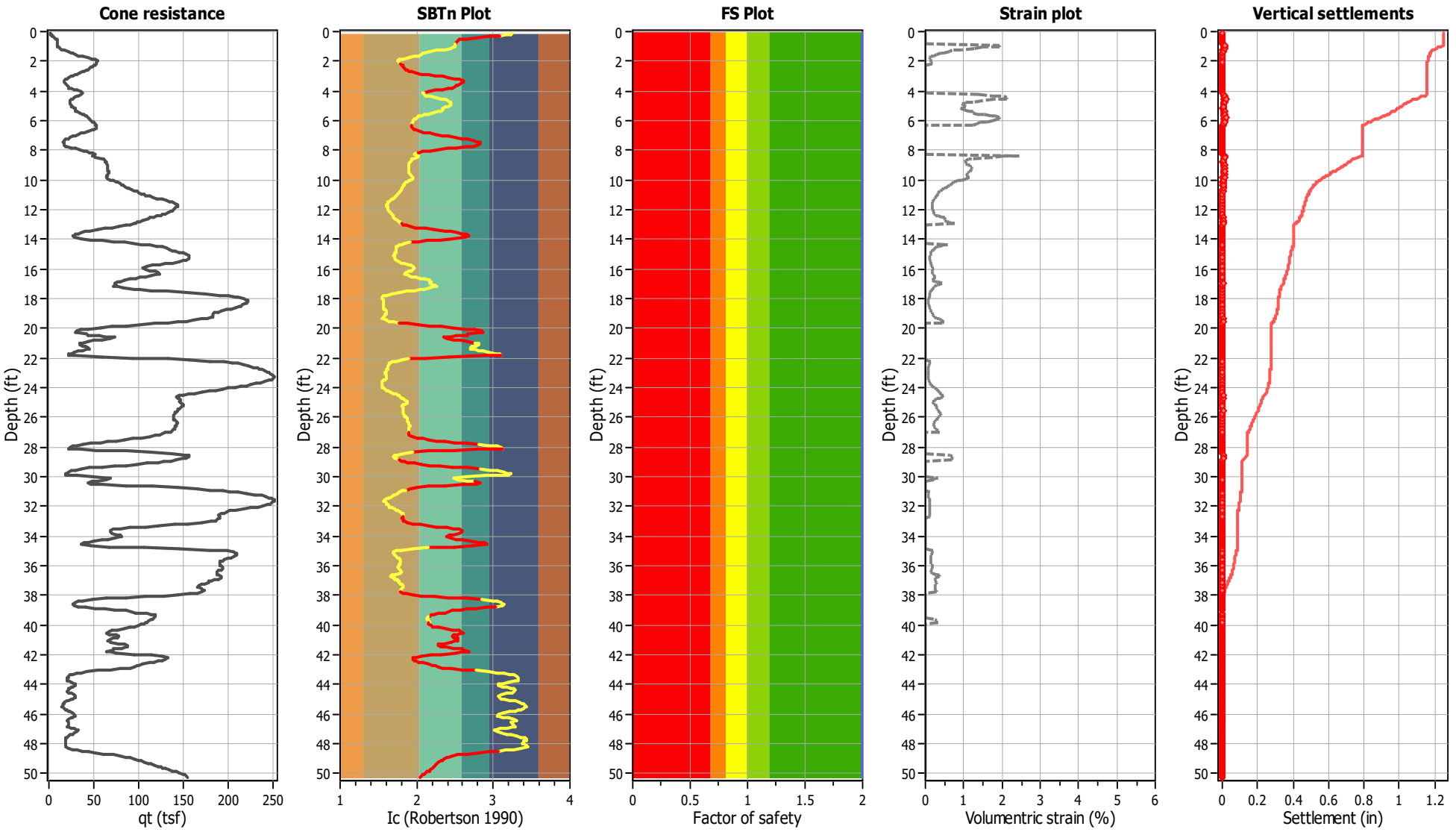
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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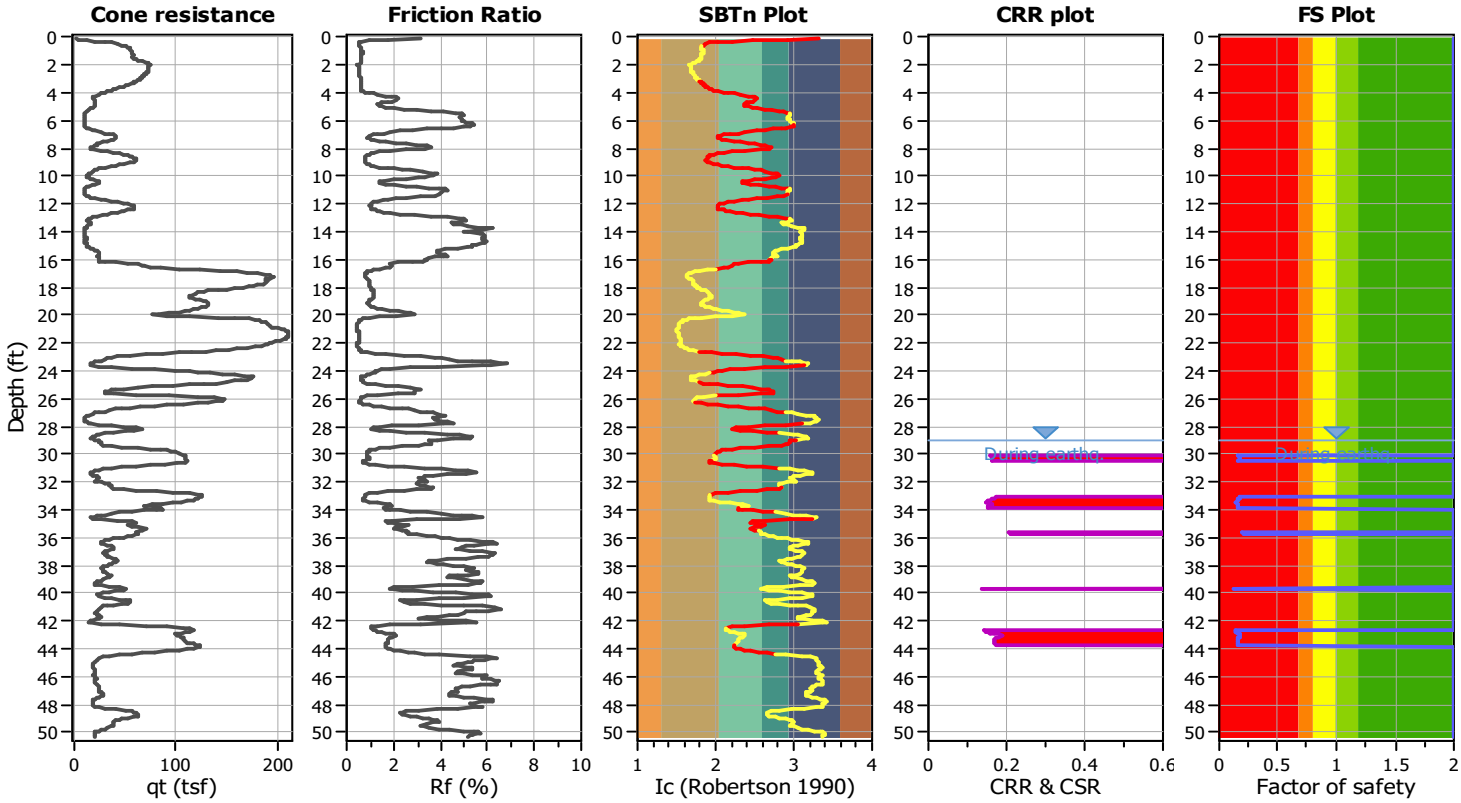
LIQUEFACTION ANALYSIS REPORT

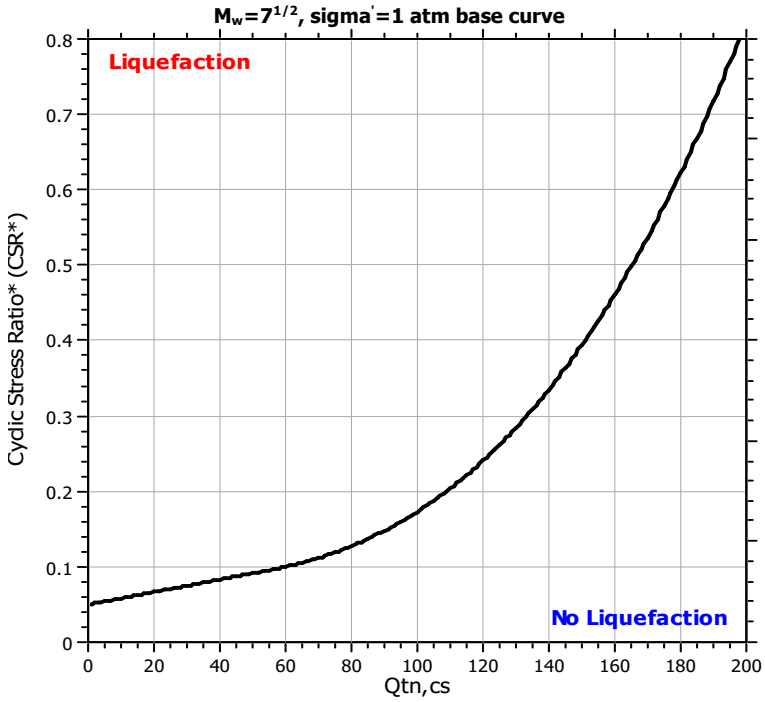
Project title : Tract 38066 **Location : San Jacinto, California**

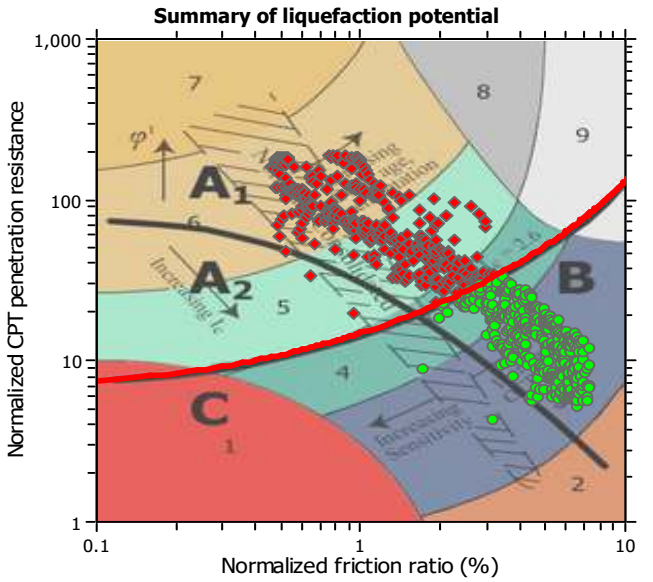
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	29.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

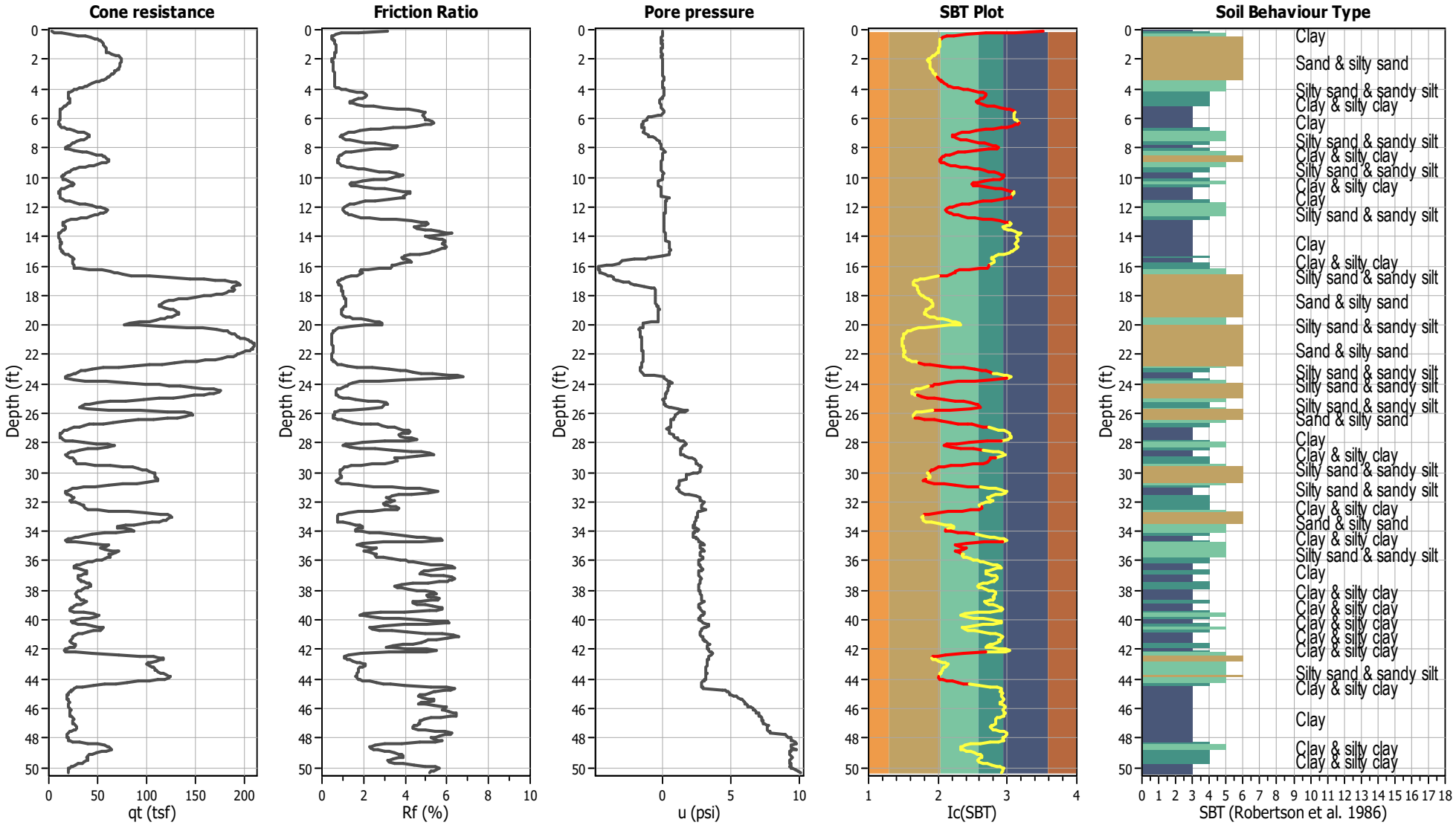






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



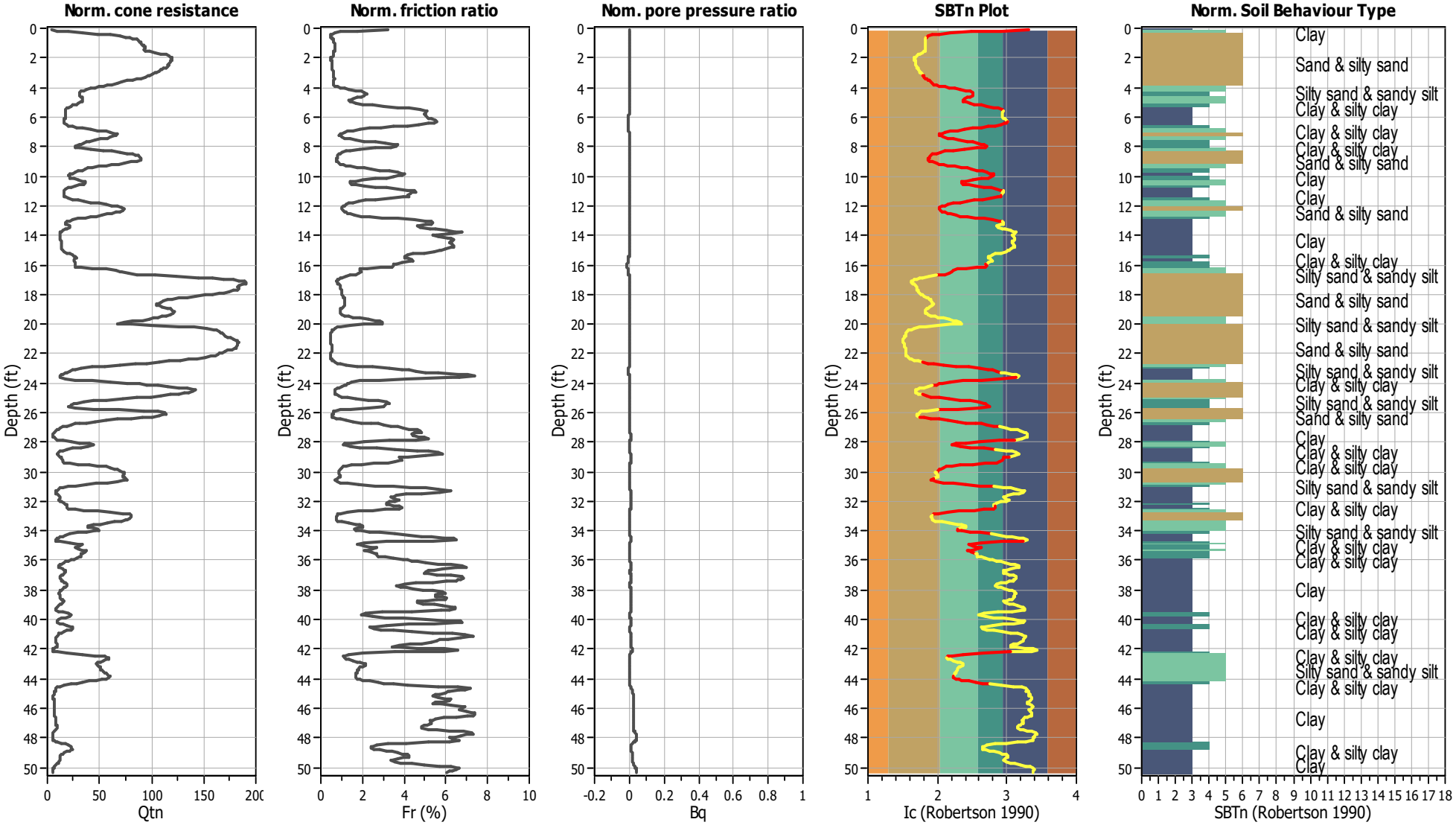
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



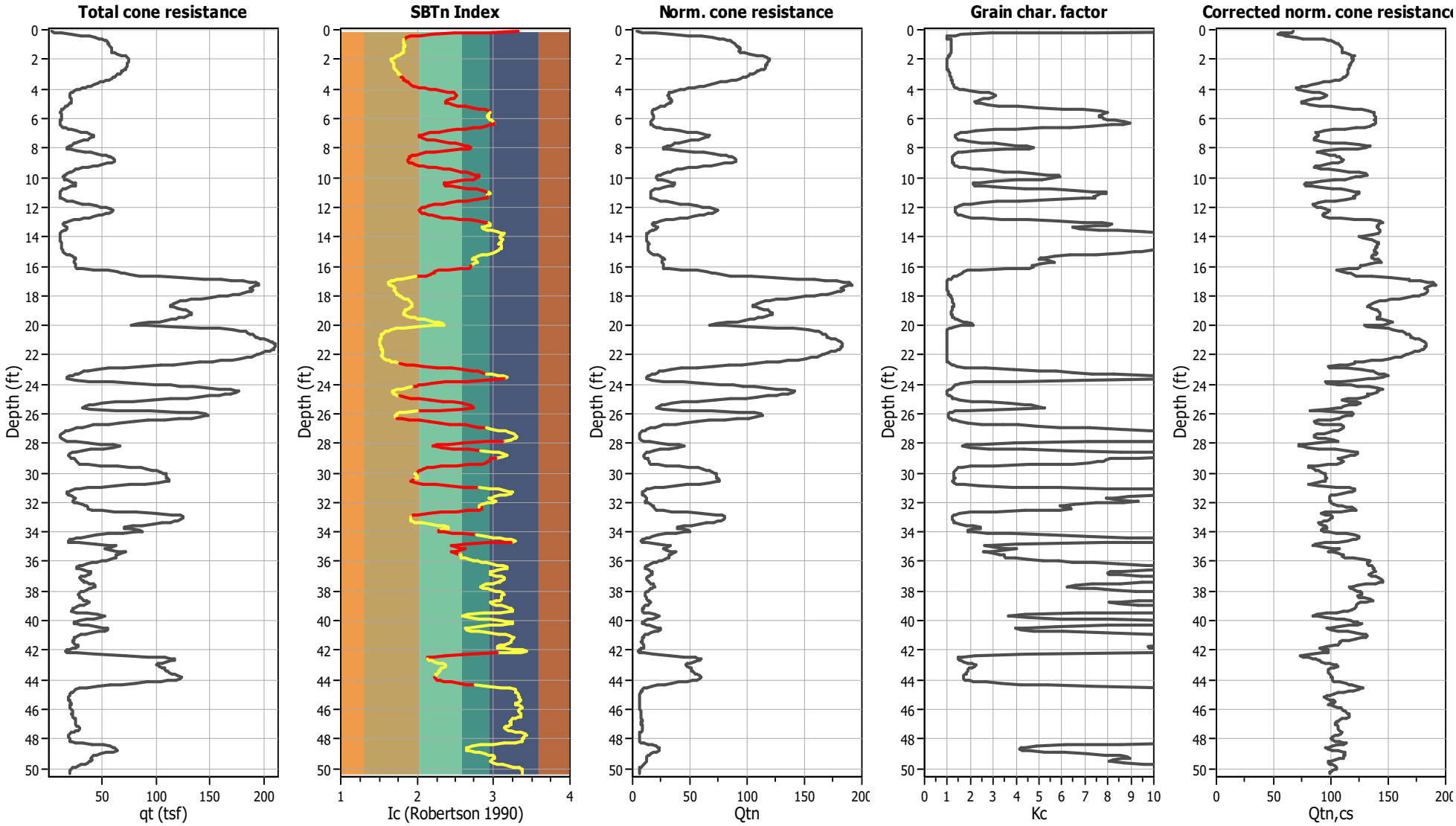
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

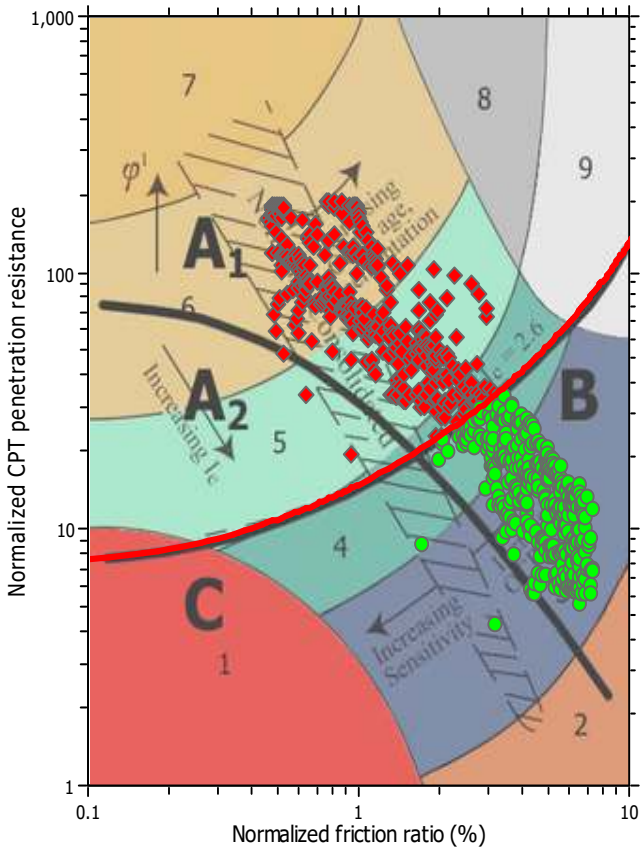
Liquefaction analysis overall plots (intermediate results)

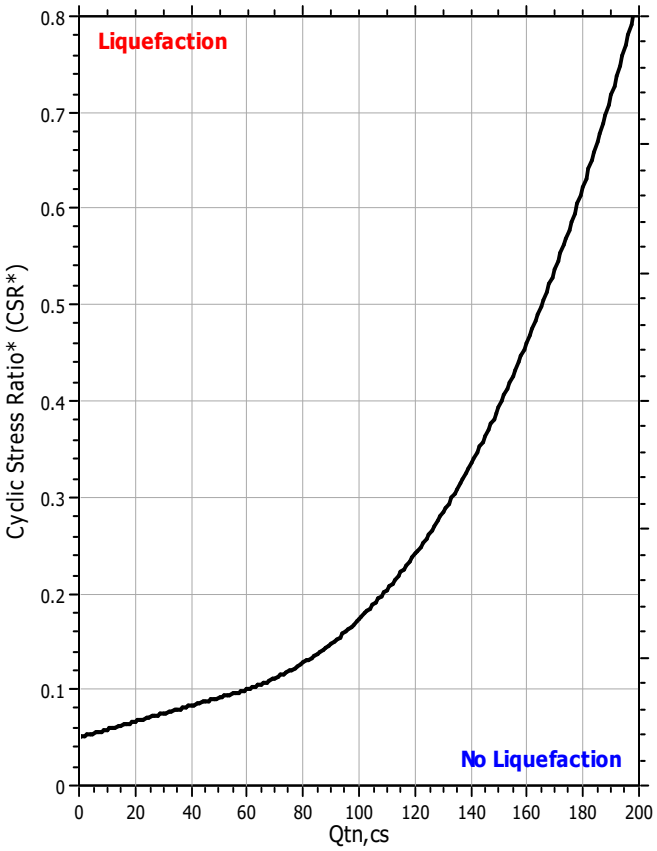


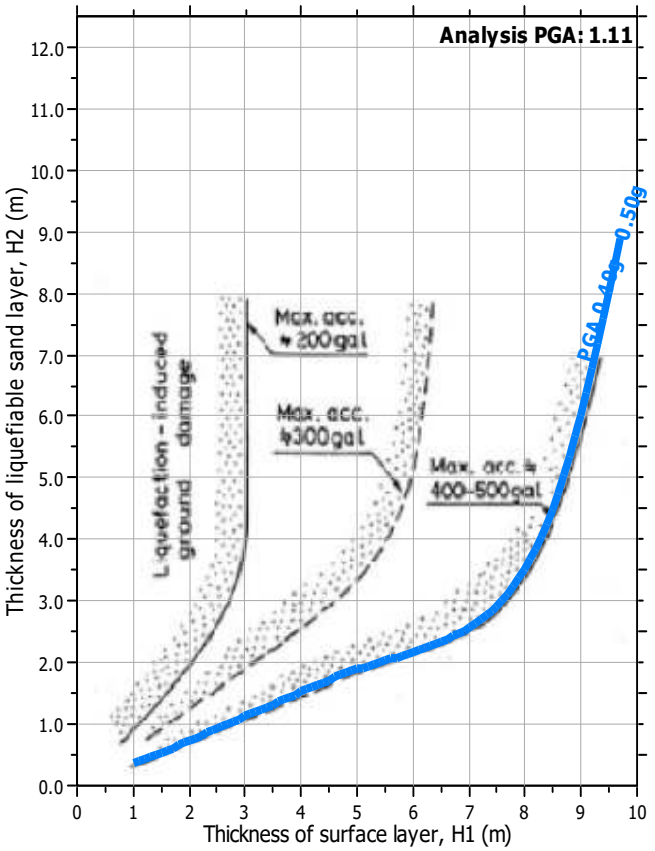
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis summary plots



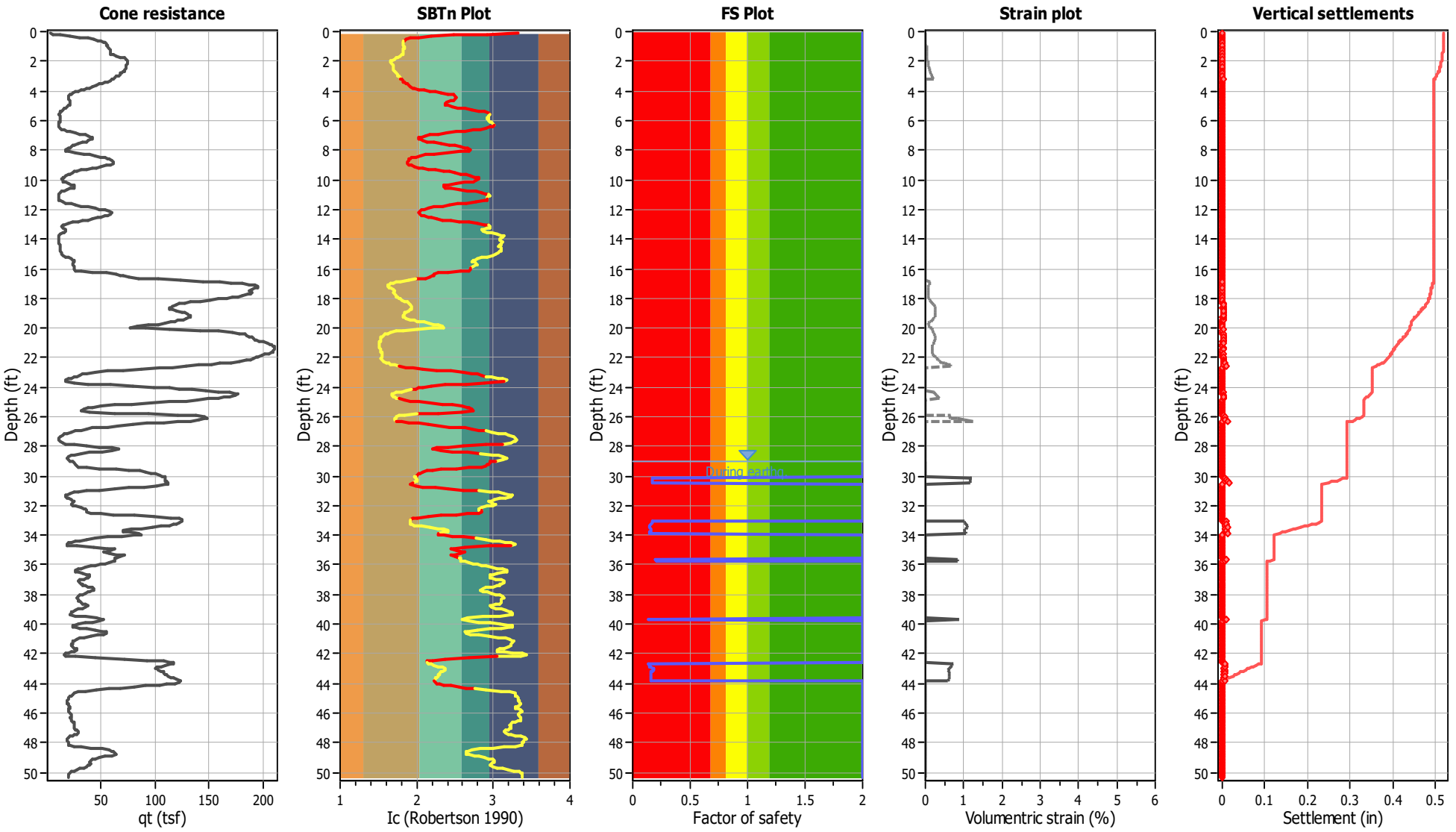




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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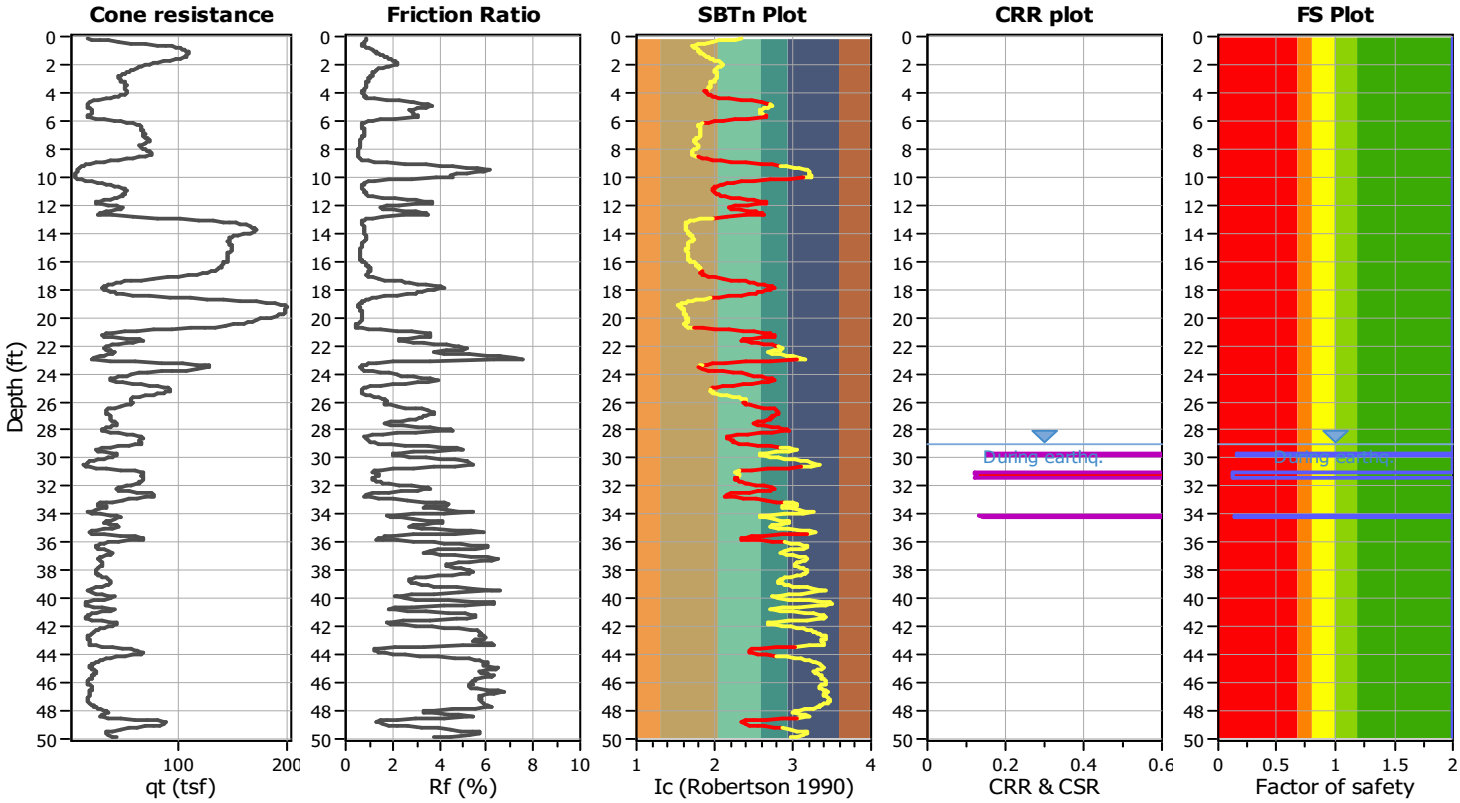
LIQUEFACTION ANALYSIS REPORT

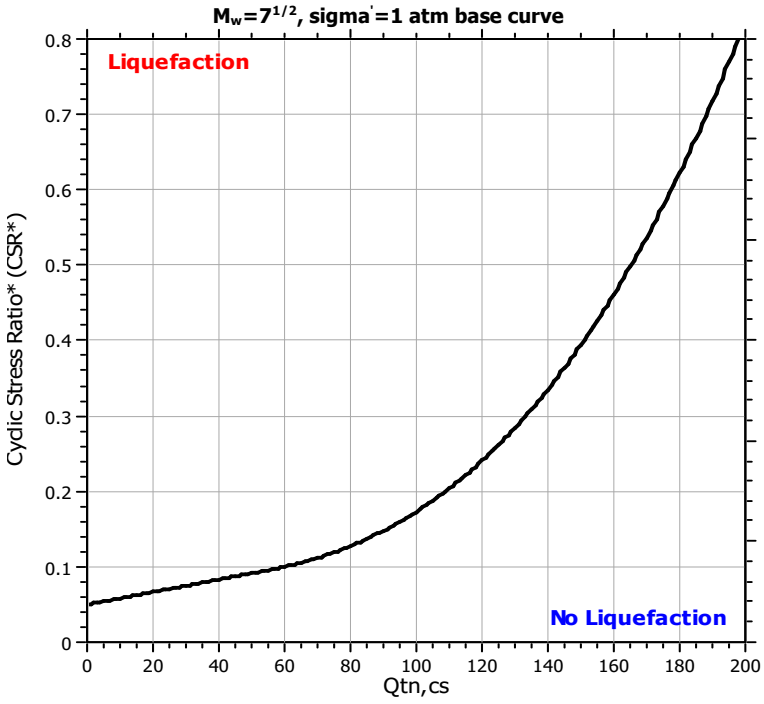
Project title : Tract 38066 **Location : San Jacinto, California**

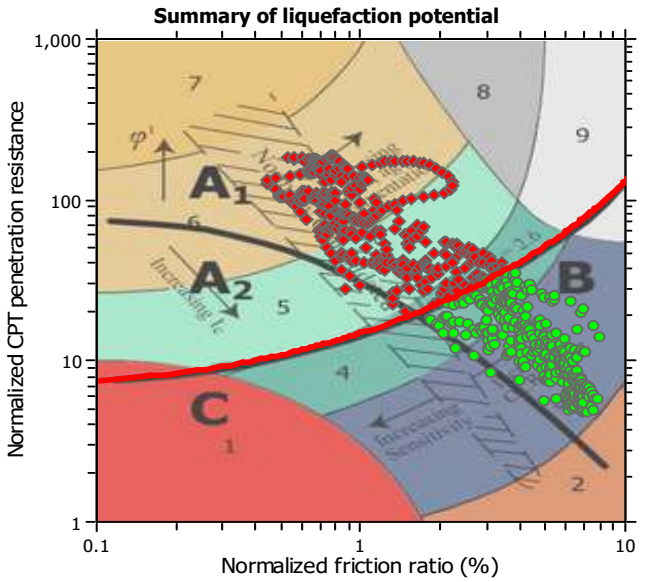
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	29.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

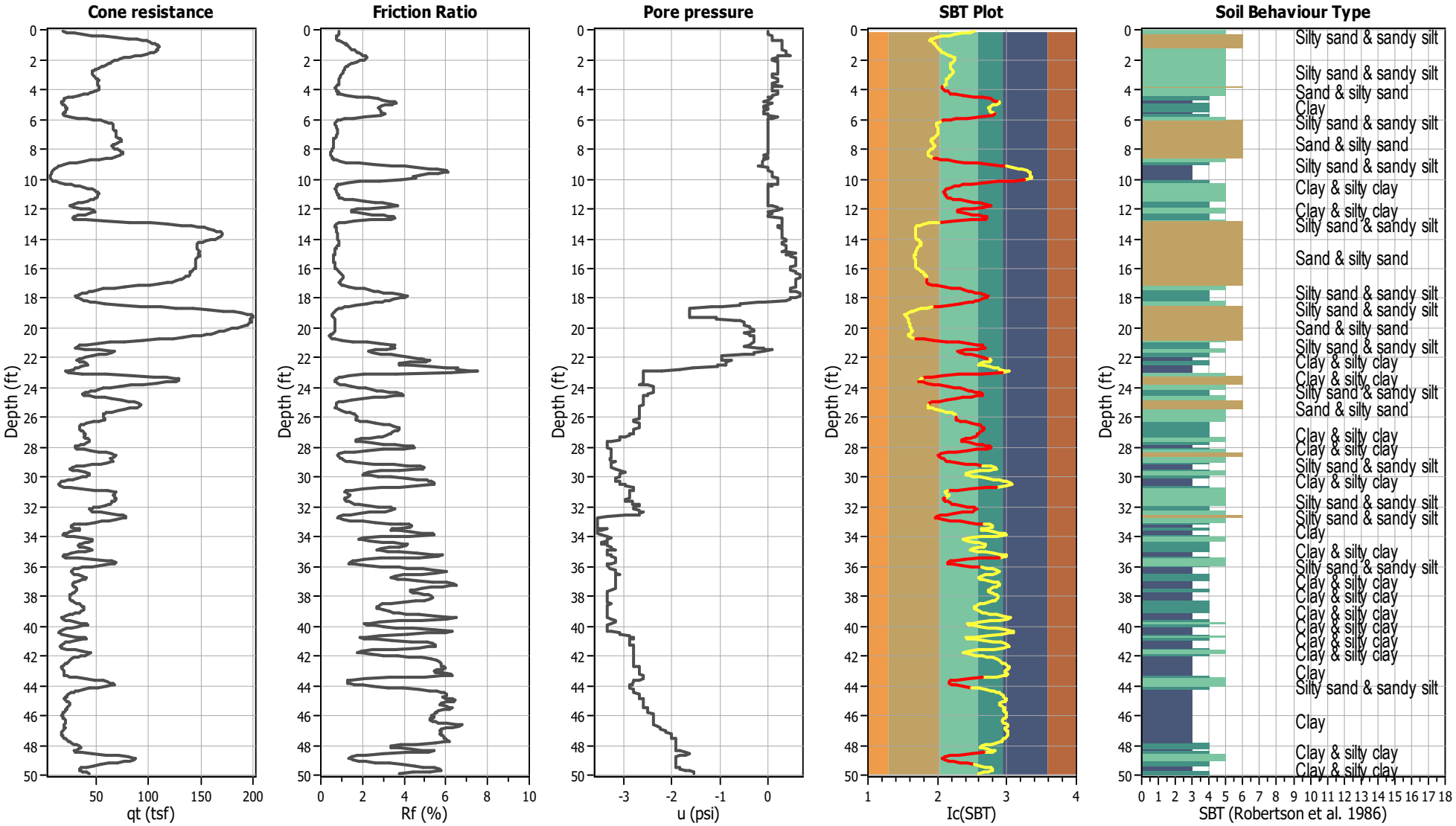






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



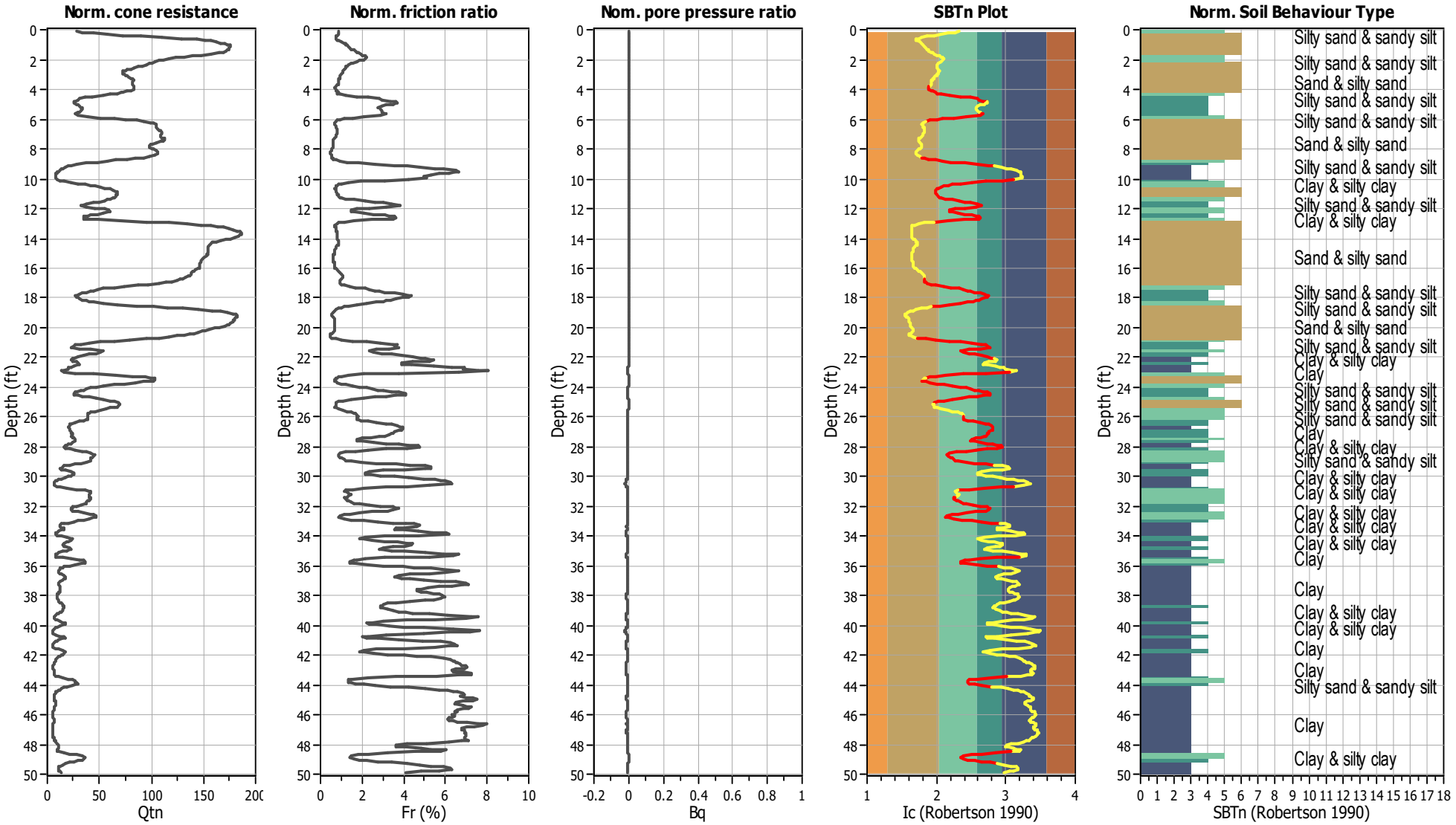
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



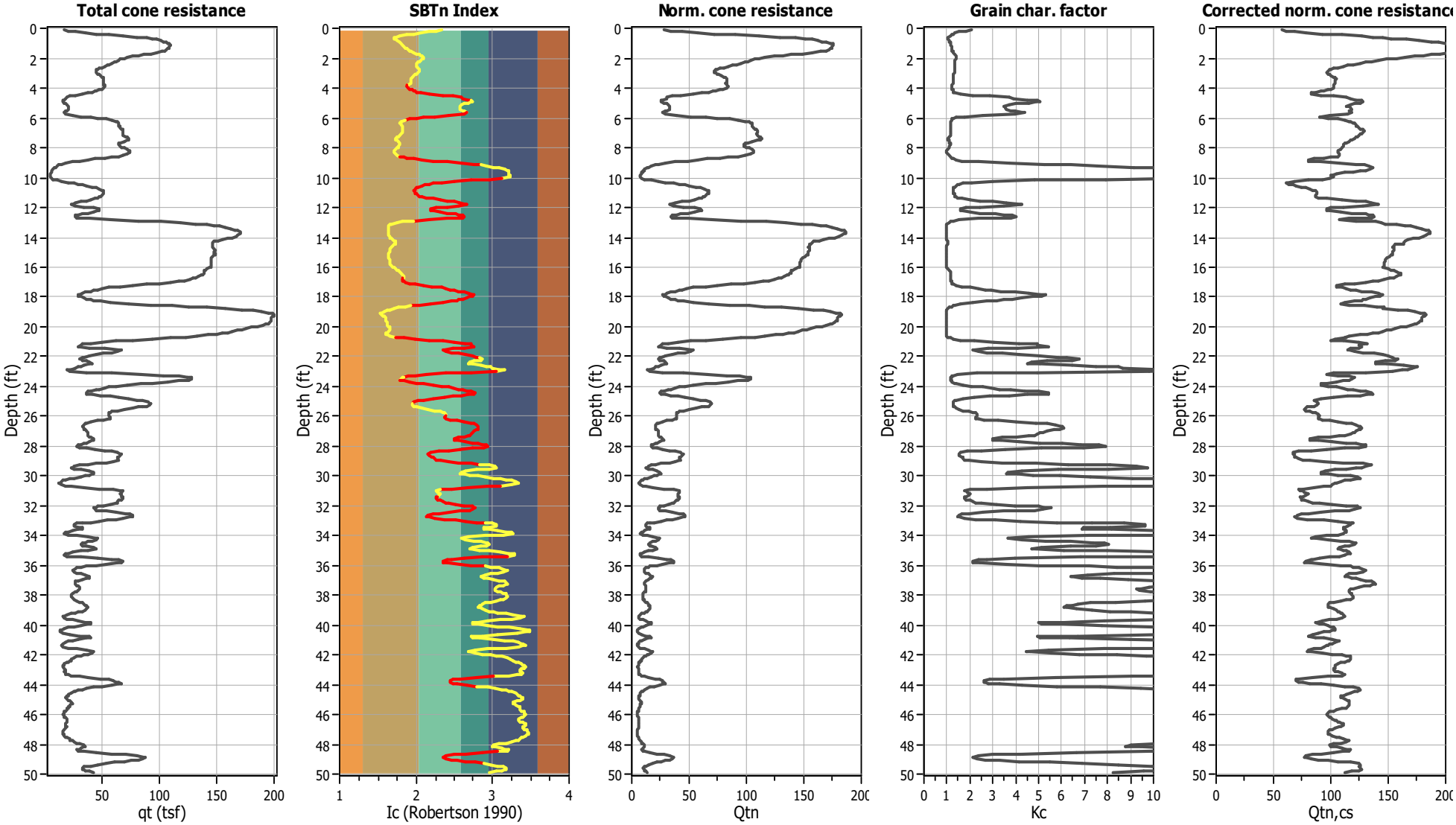
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

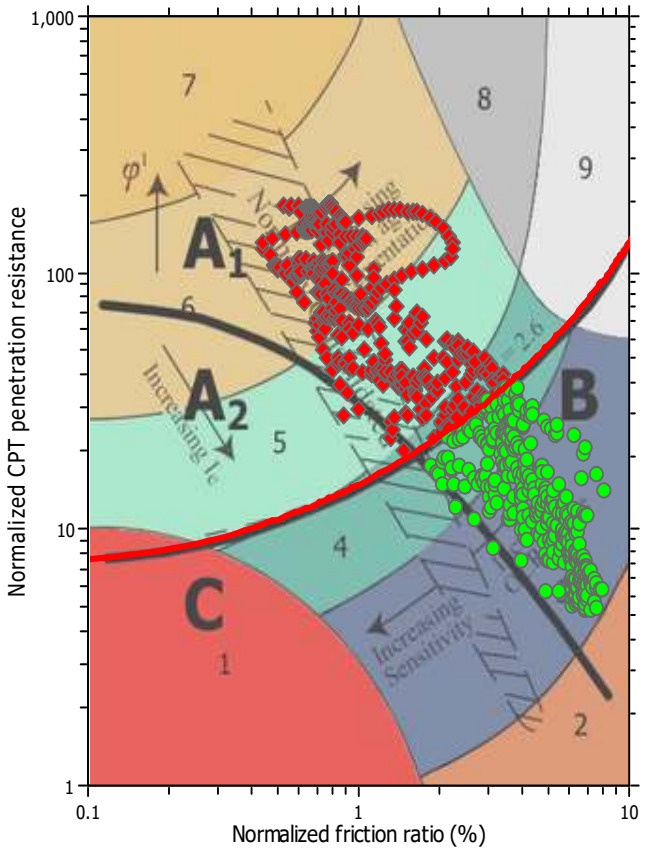
Liquefaction analysis overall plots (intermediate results)

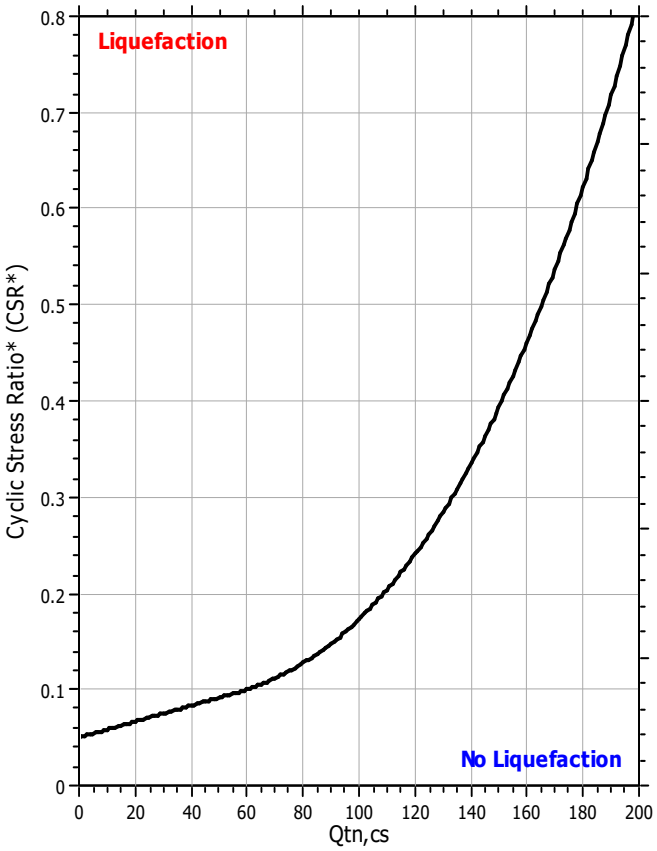


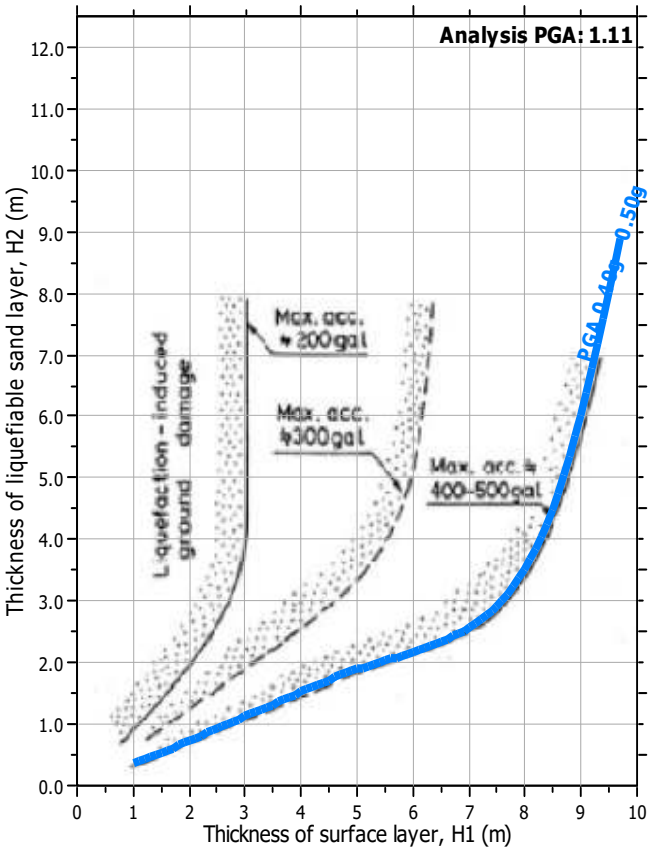
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis summary plots



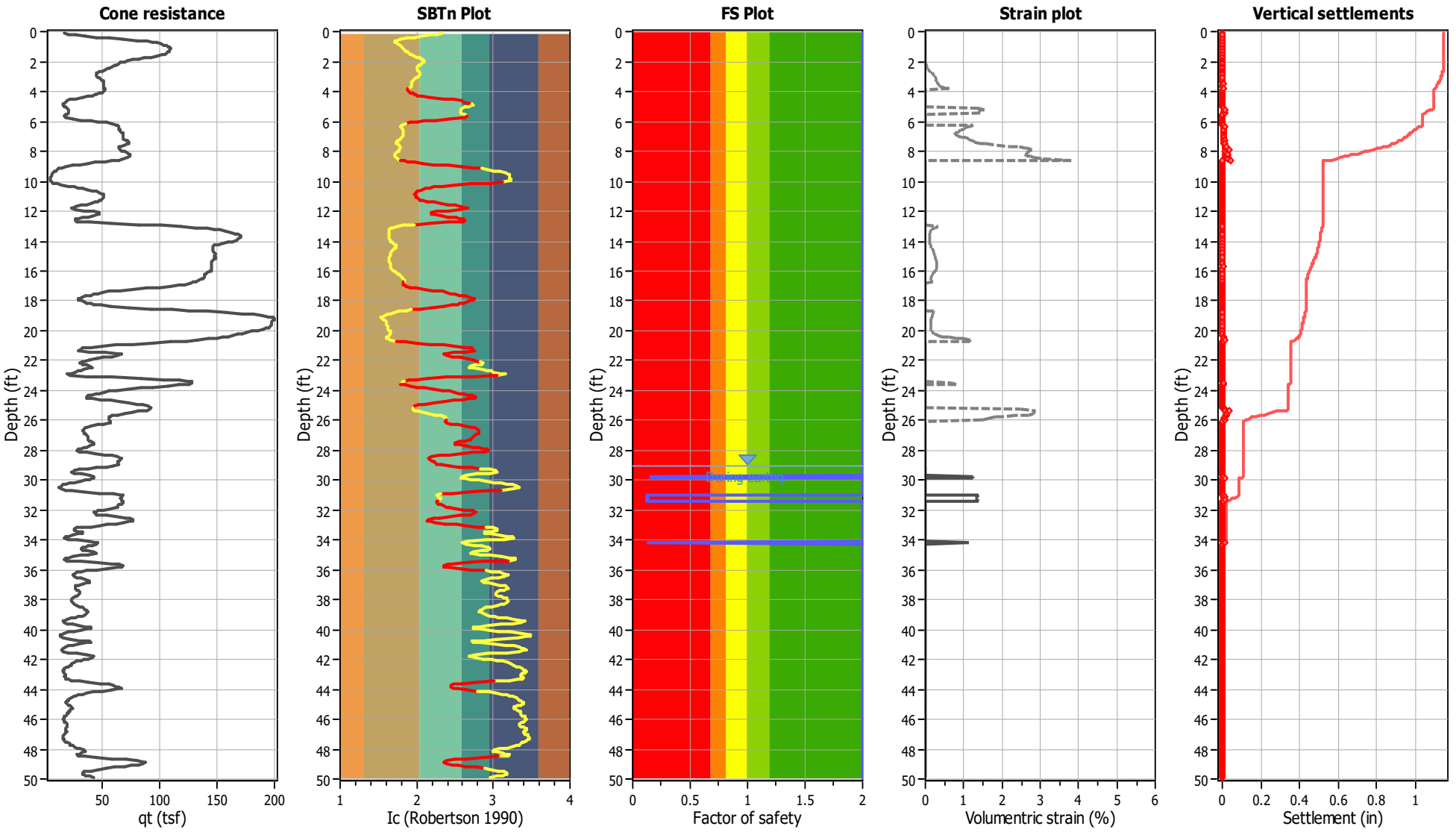




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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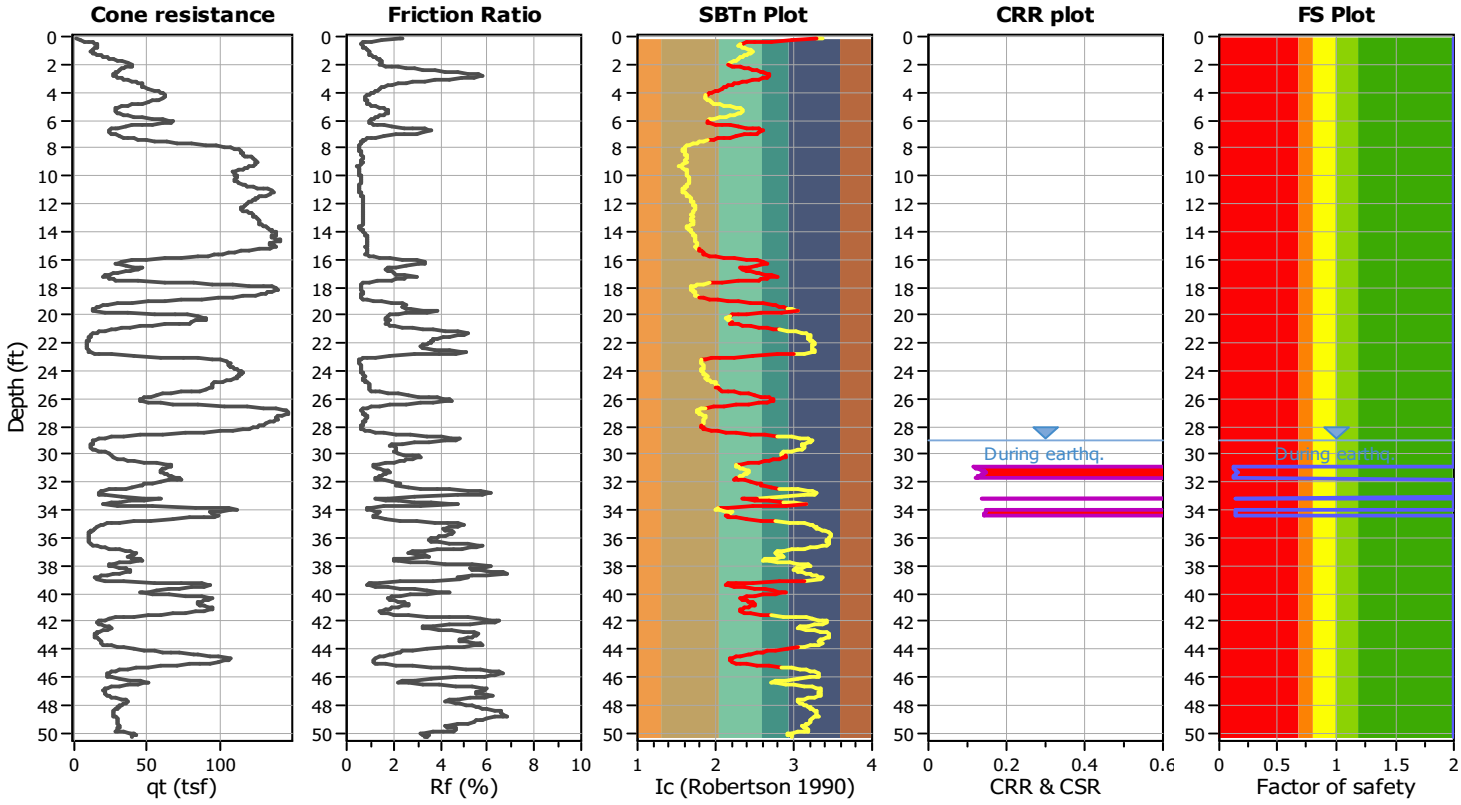
LIQUEFACTION ANALYSIS REPORT

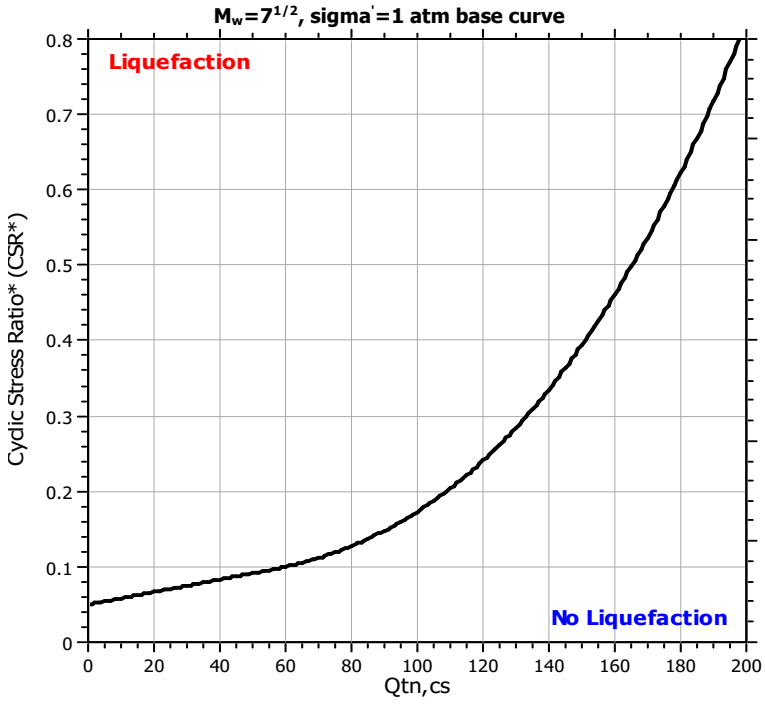
Project title : Tract 38066 **Location : San Jacinto, California**

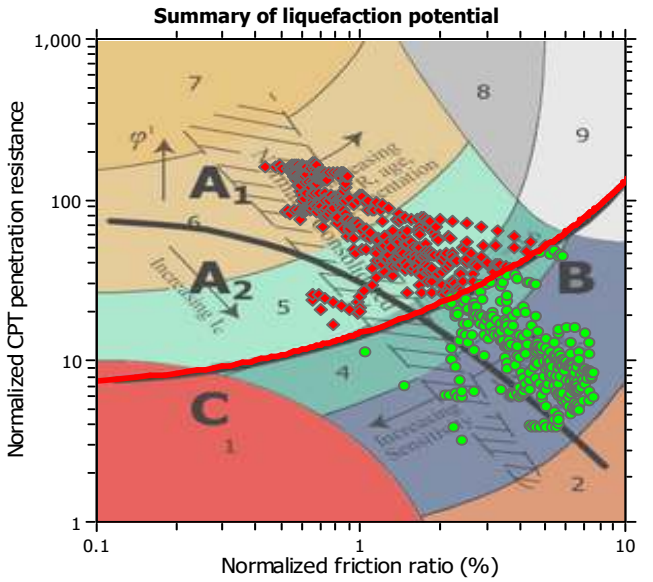
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	29.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

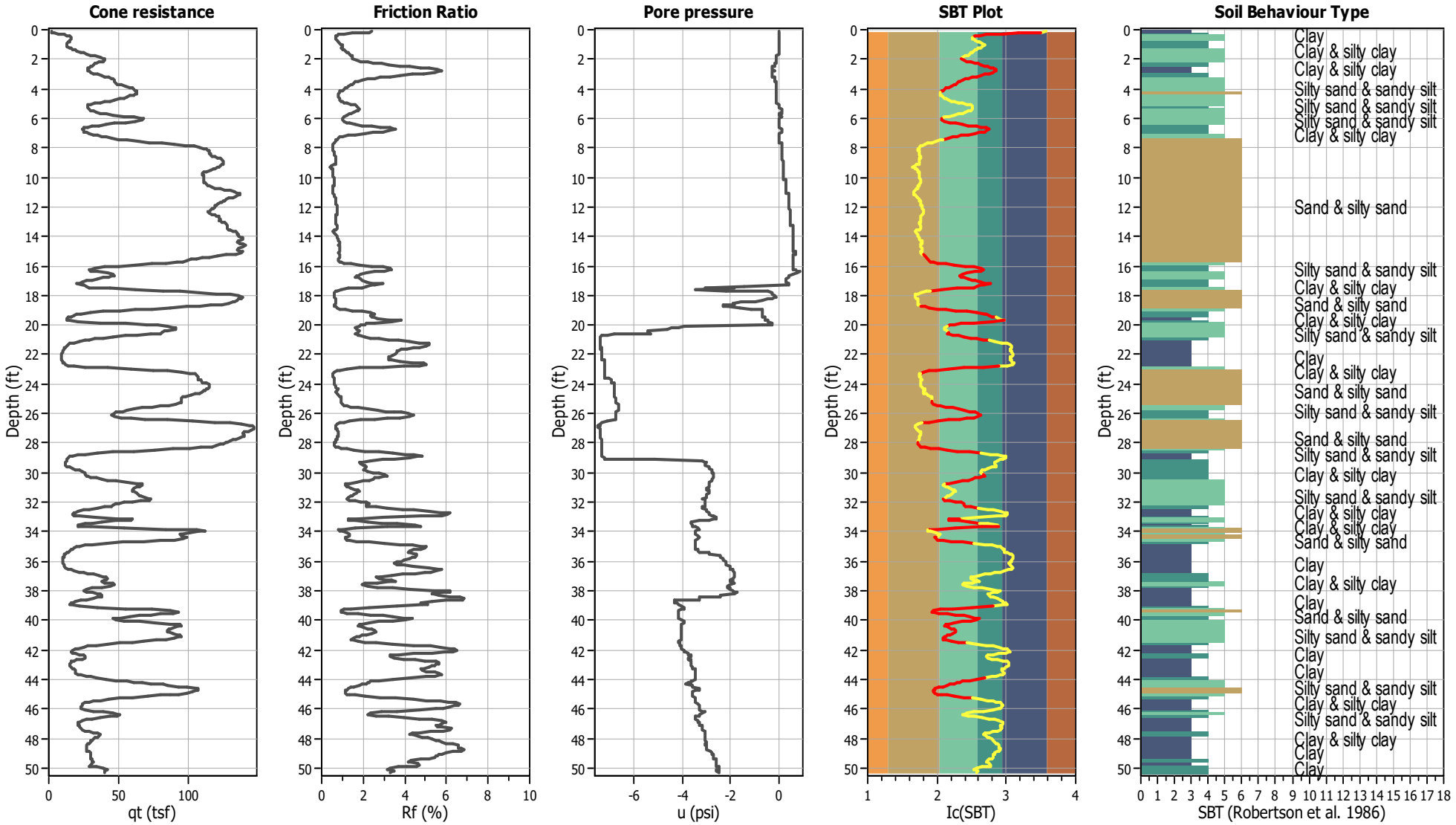






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



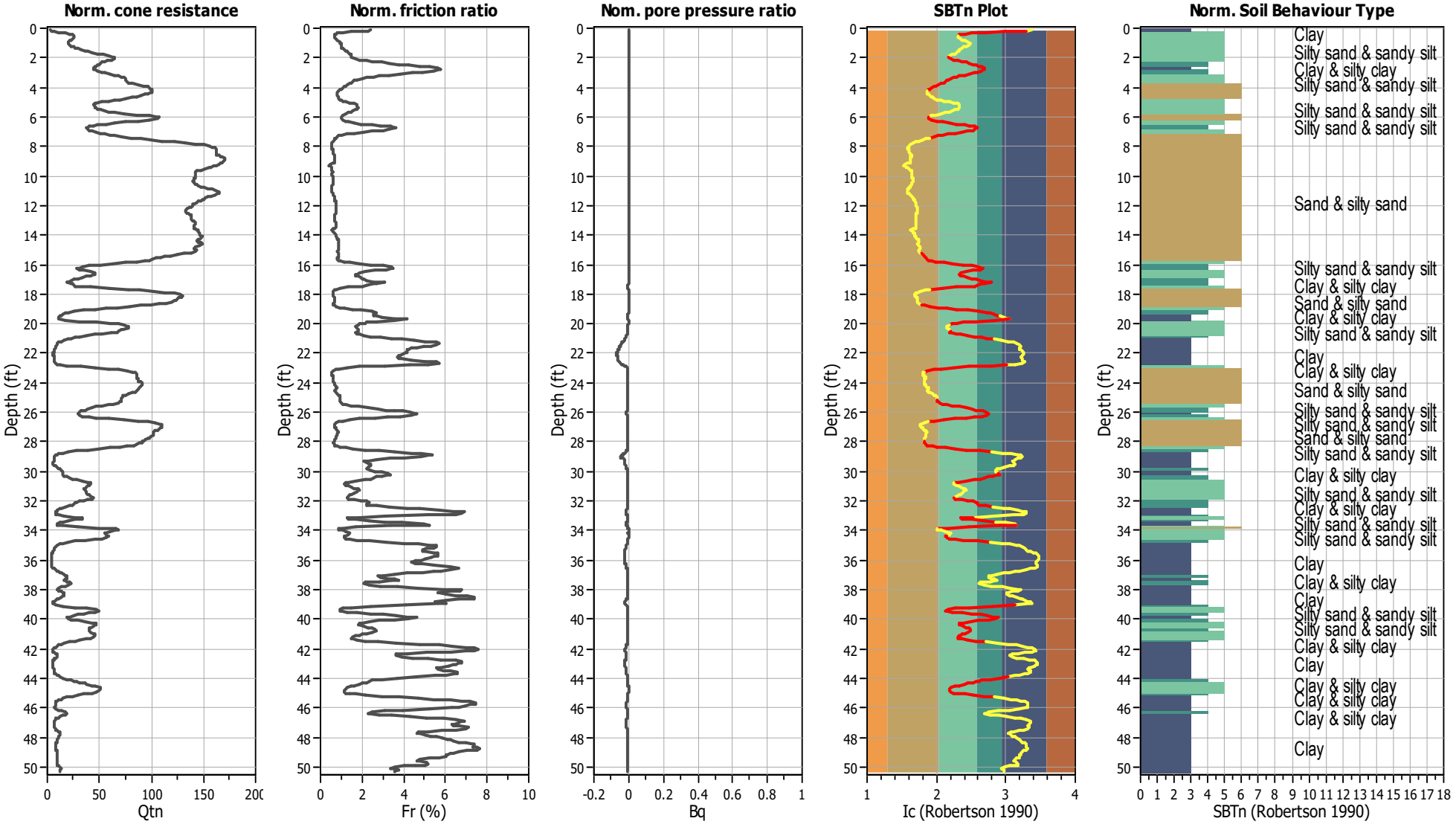
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
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6. Clean sand to silty sand
7. Gravely sand to sand
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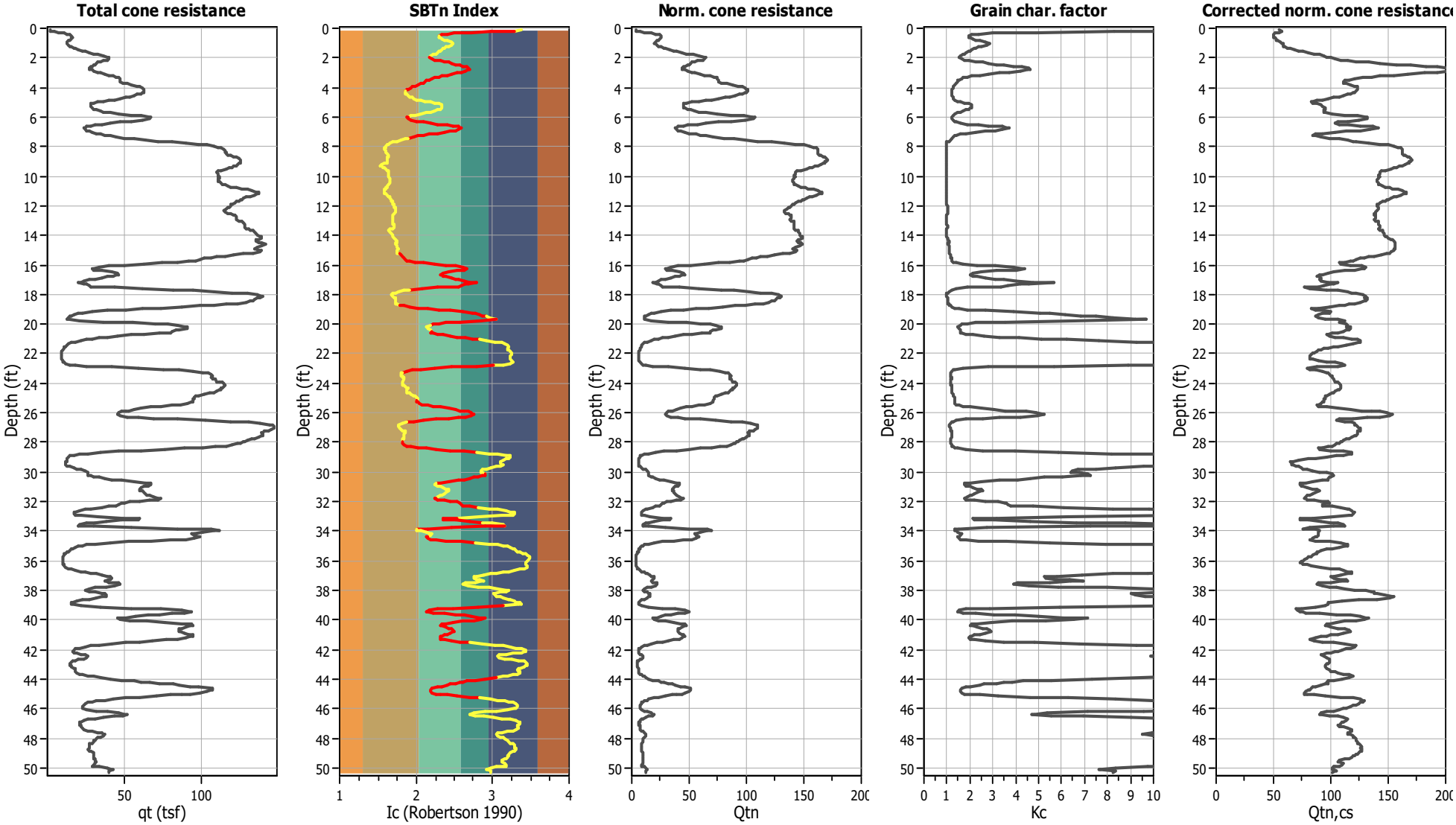
9. Very stiff fine grained

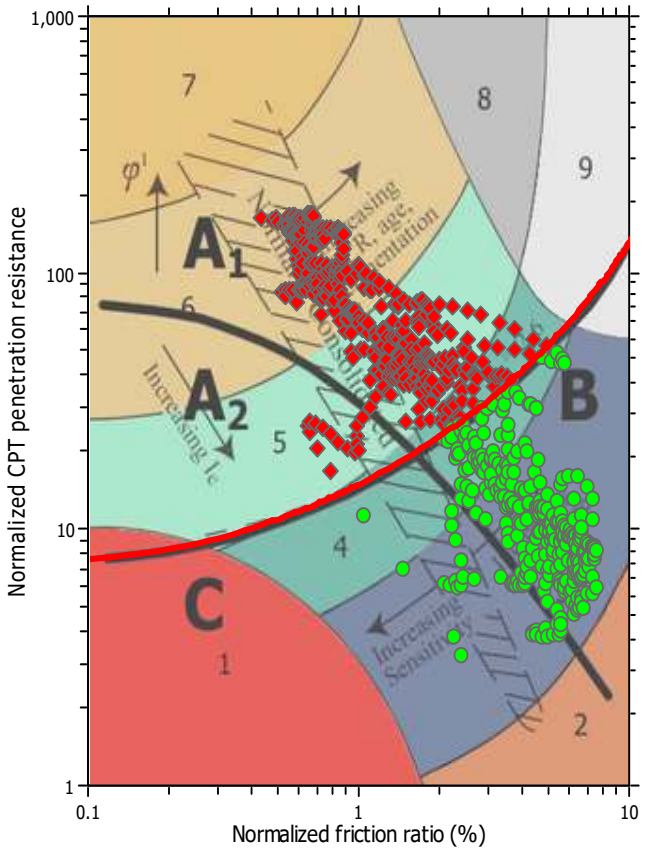
Liquefaction analysis overall plots (intermediate results)

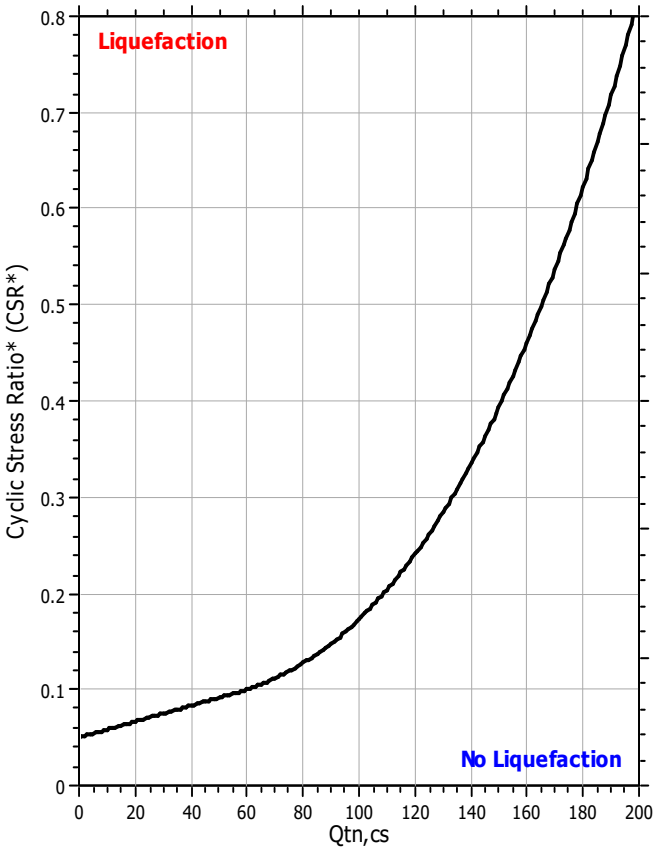


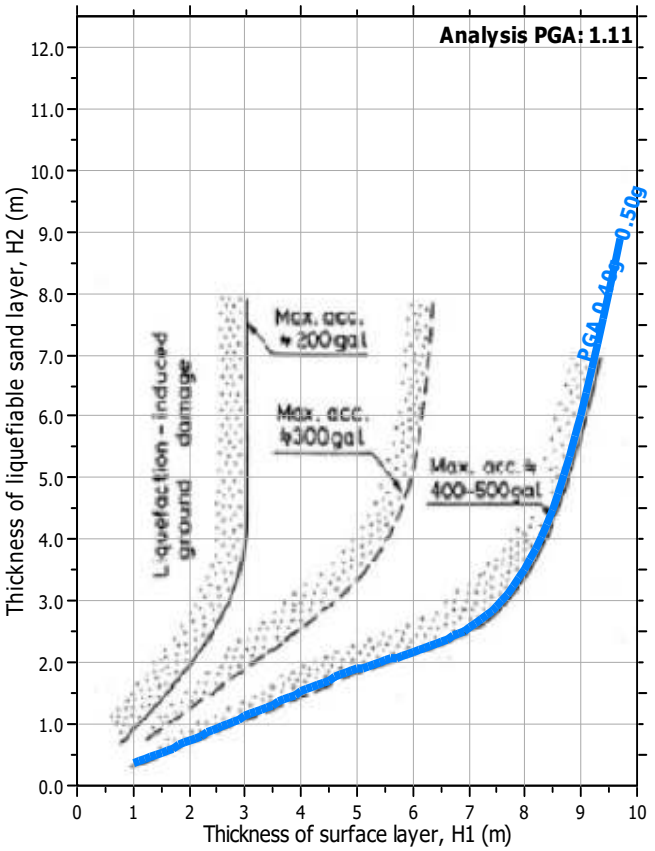
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis summary plots



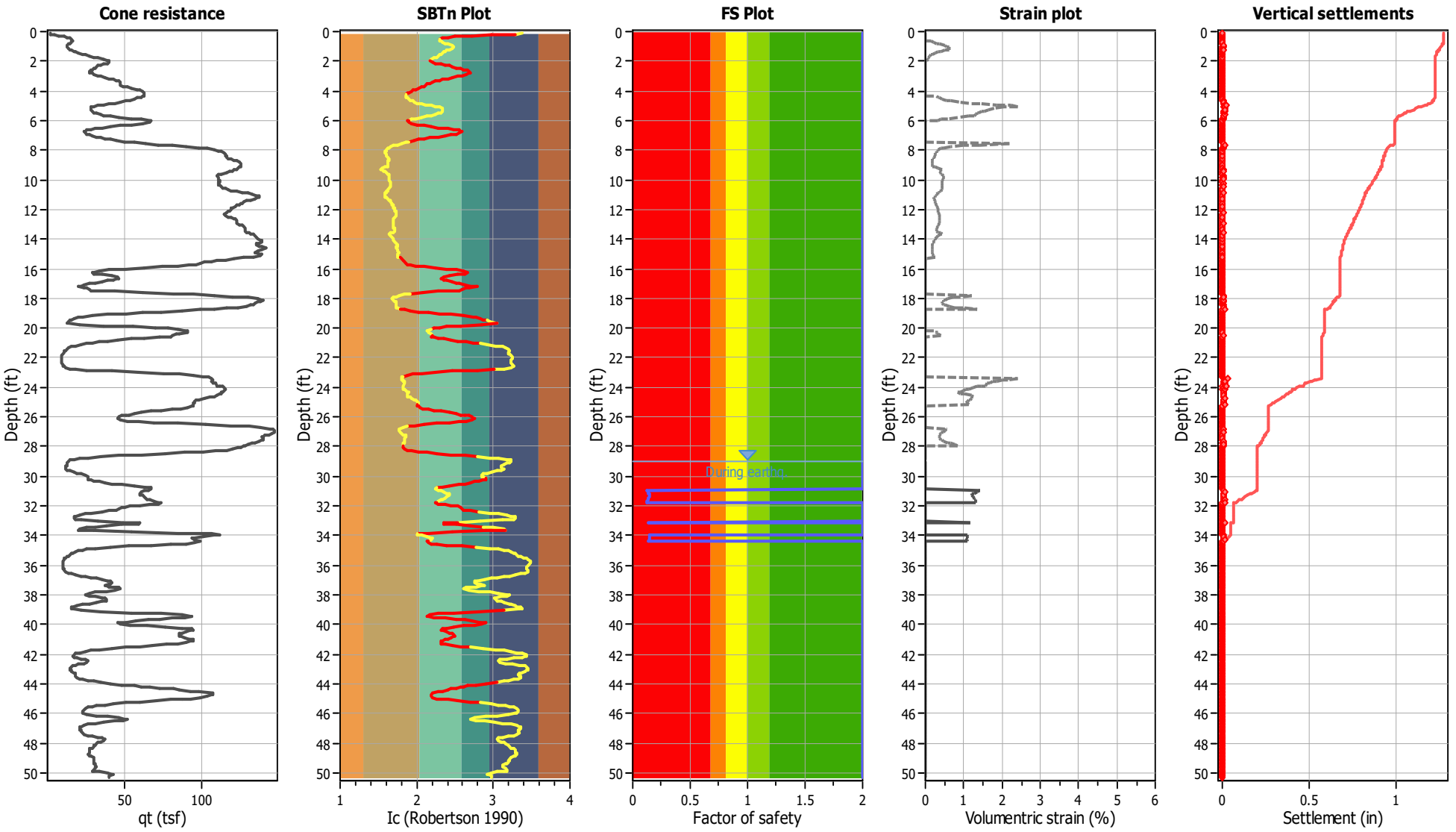




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

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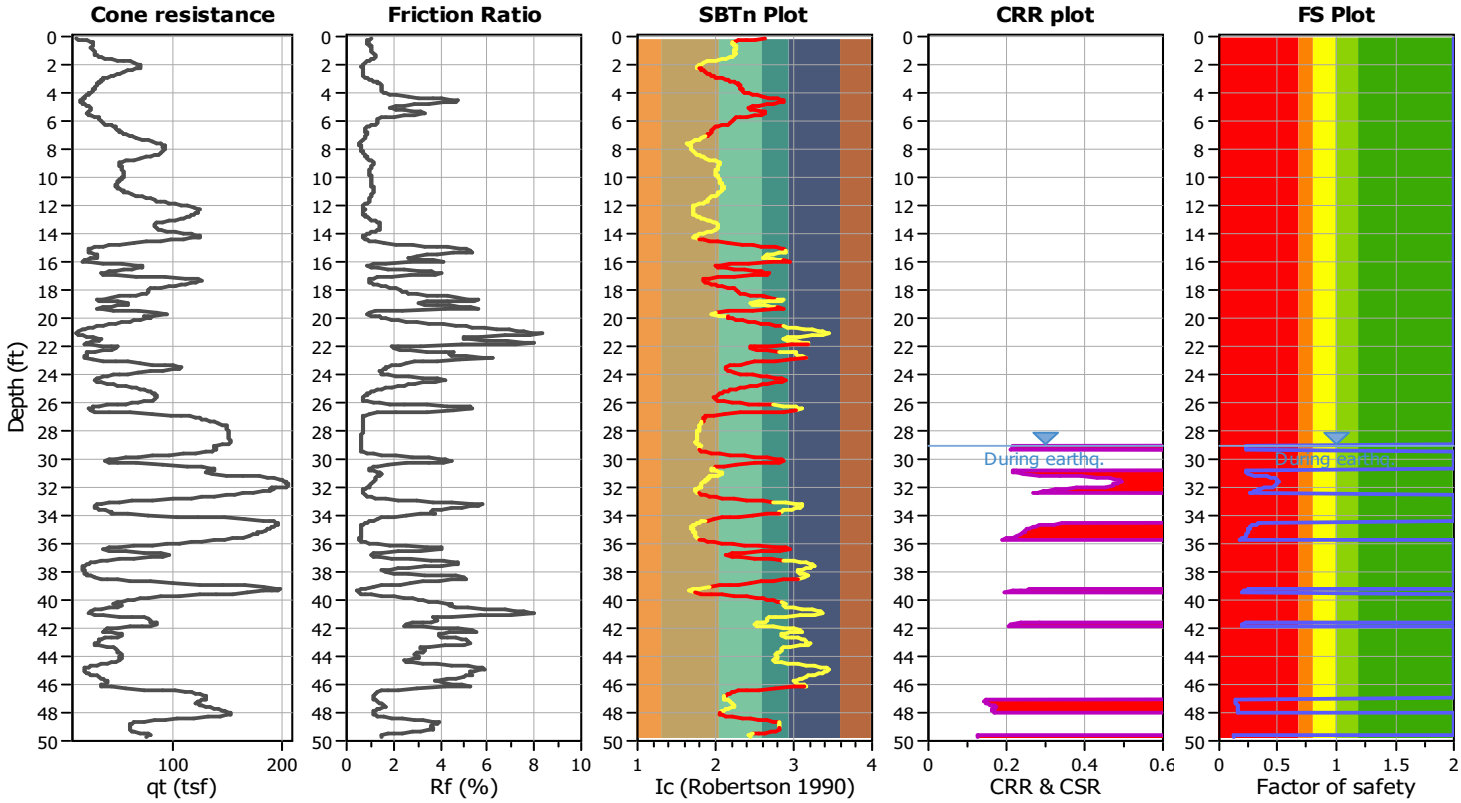
LIQUEFACTION ANALYSIS REPORT

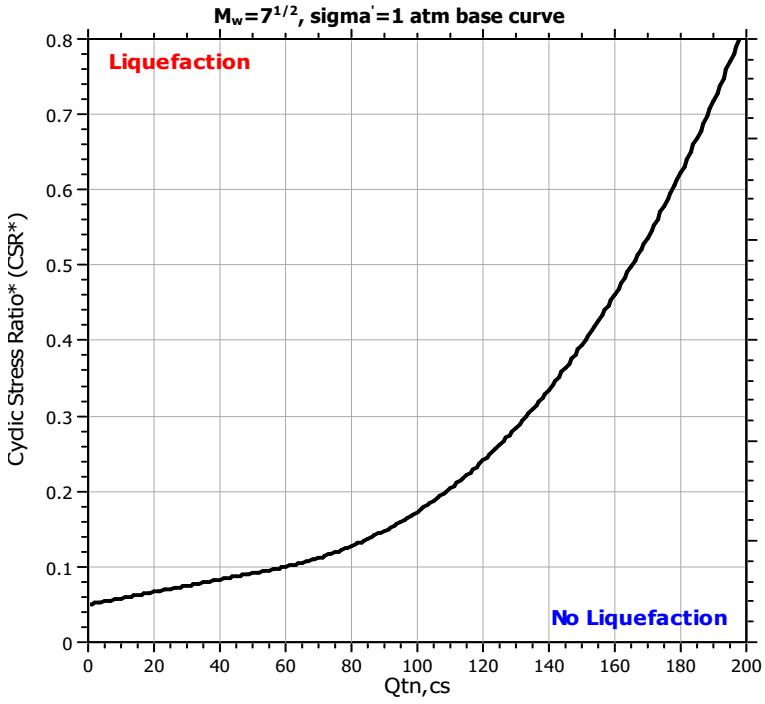
Project title : Tract 38066 **Location : San Jacinto, California**

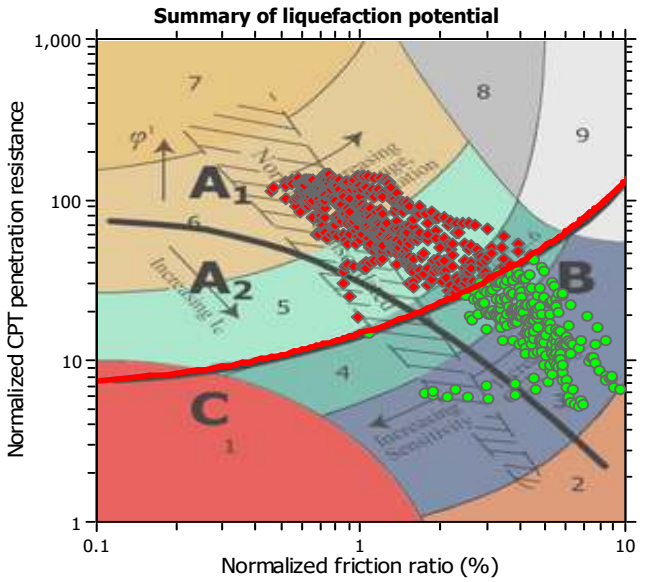
CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	29.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

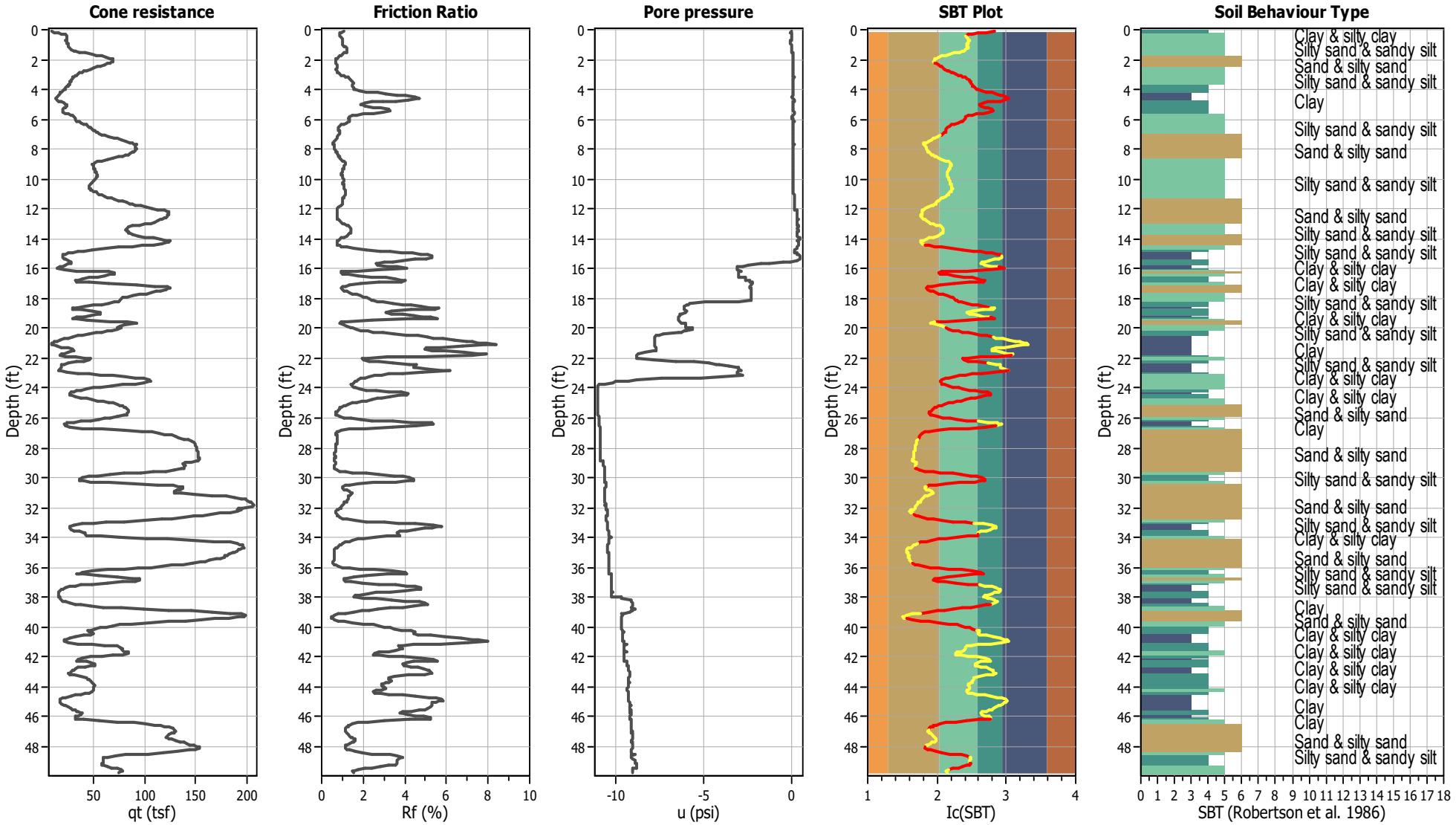






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



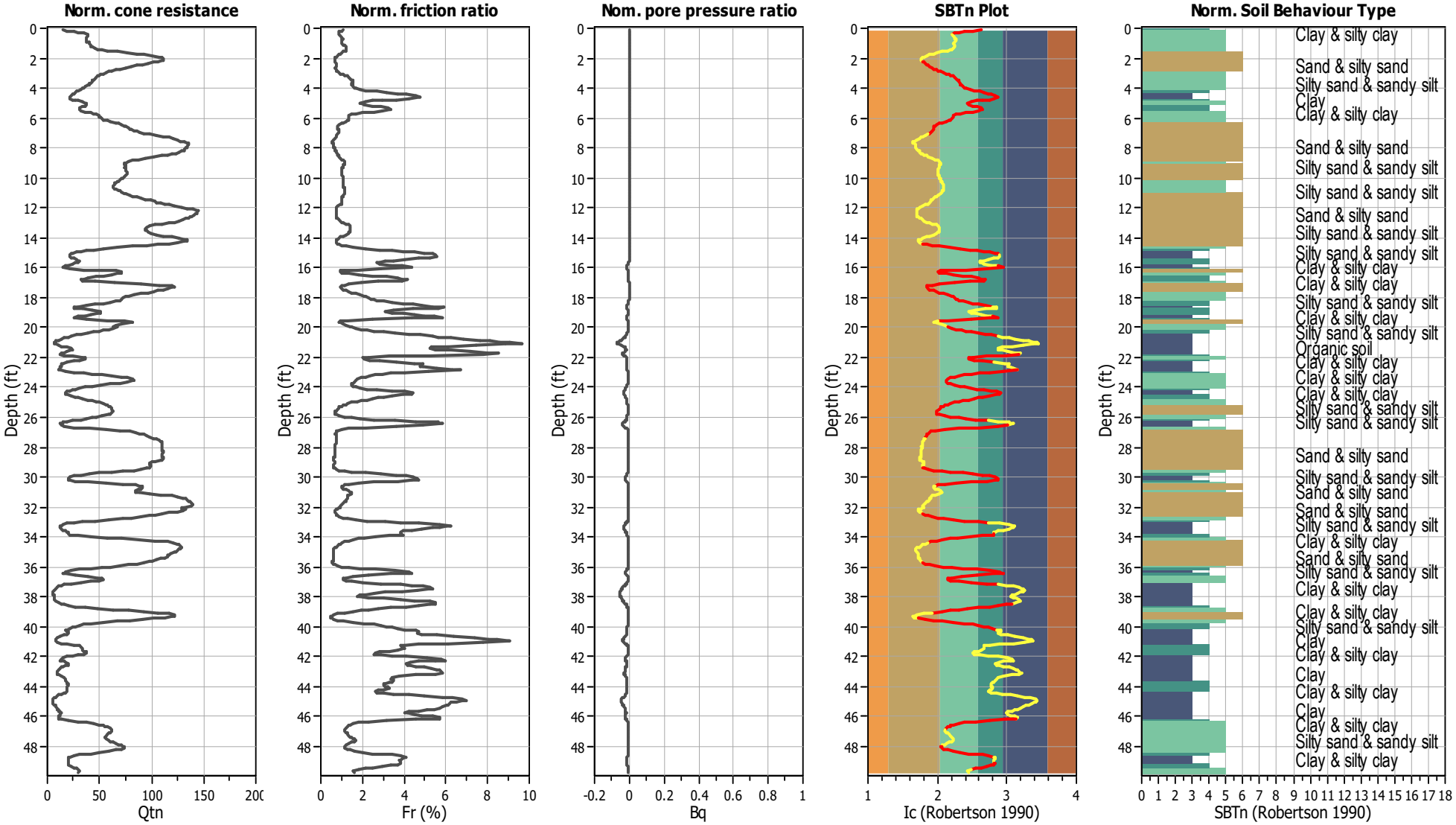
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



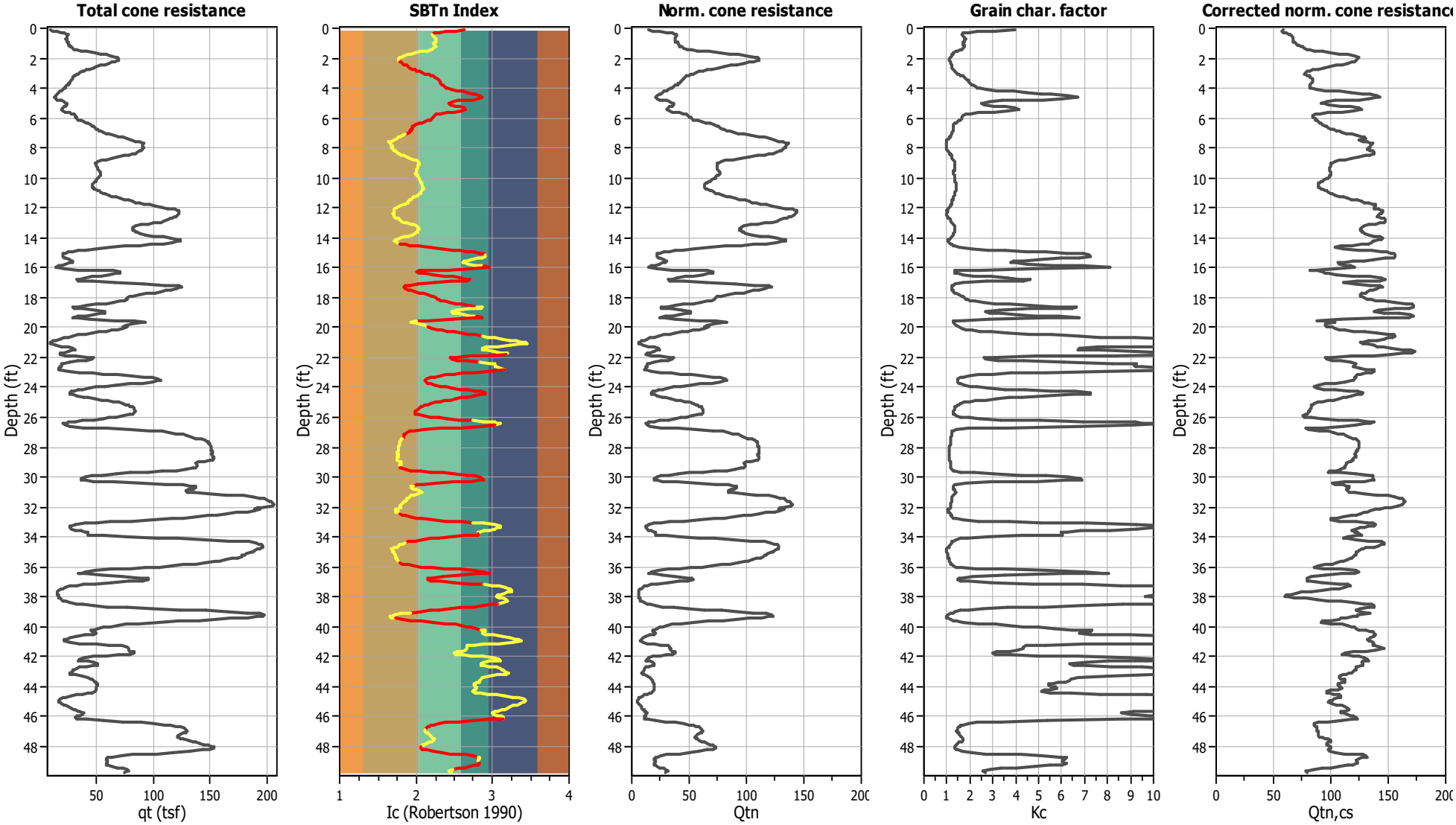
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

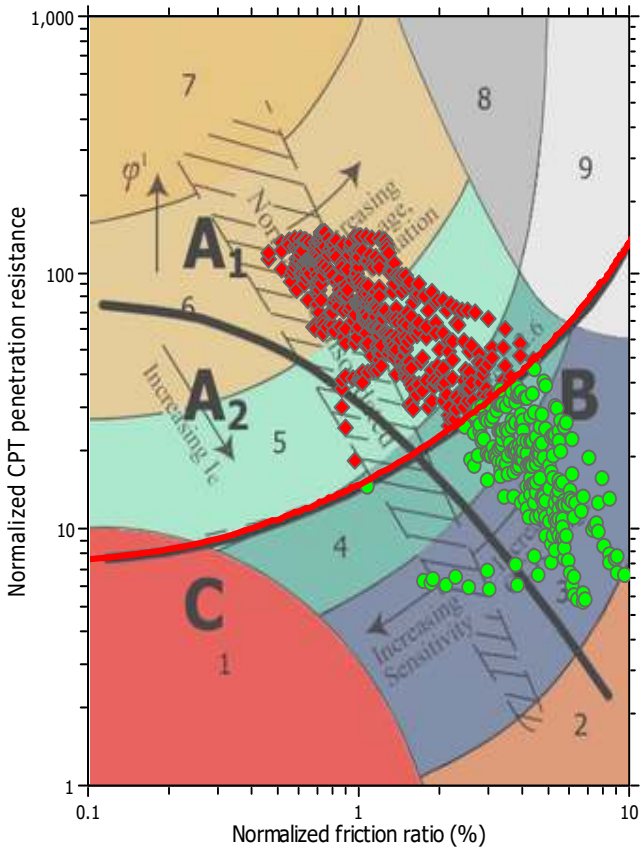
Liquefaction analysis overall plots (intermediate results)

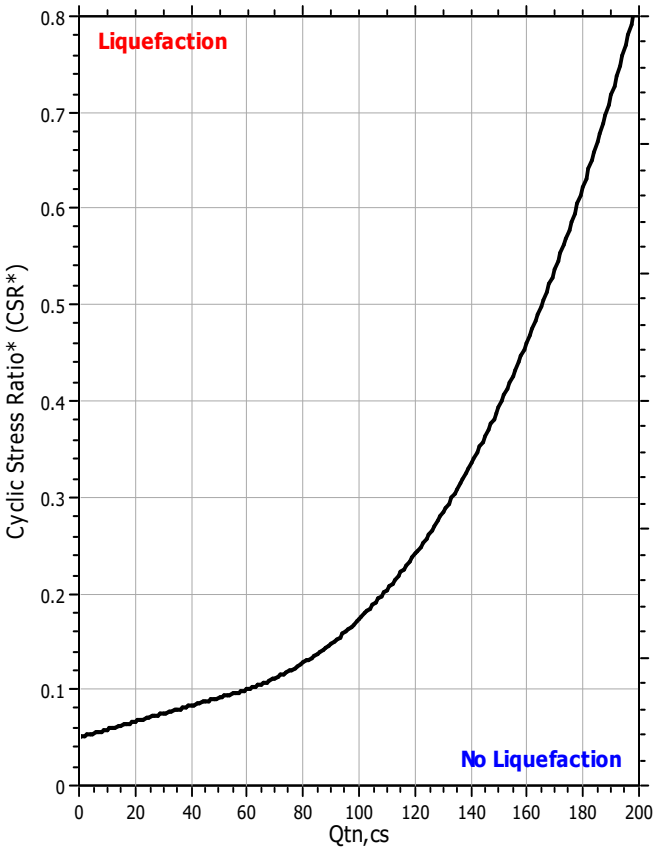


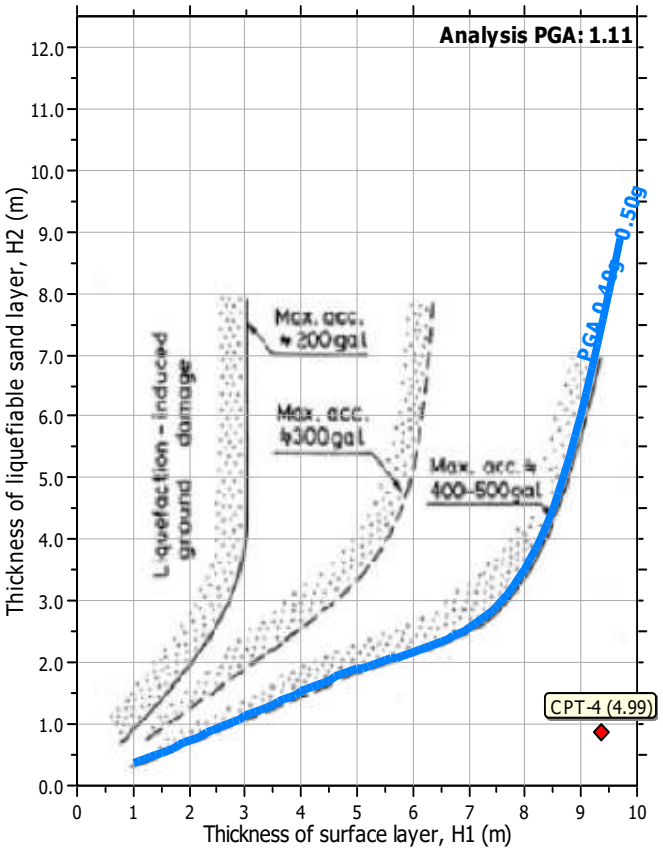
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	29.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.47	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis summary plots







Input parameters and analysis data

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Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
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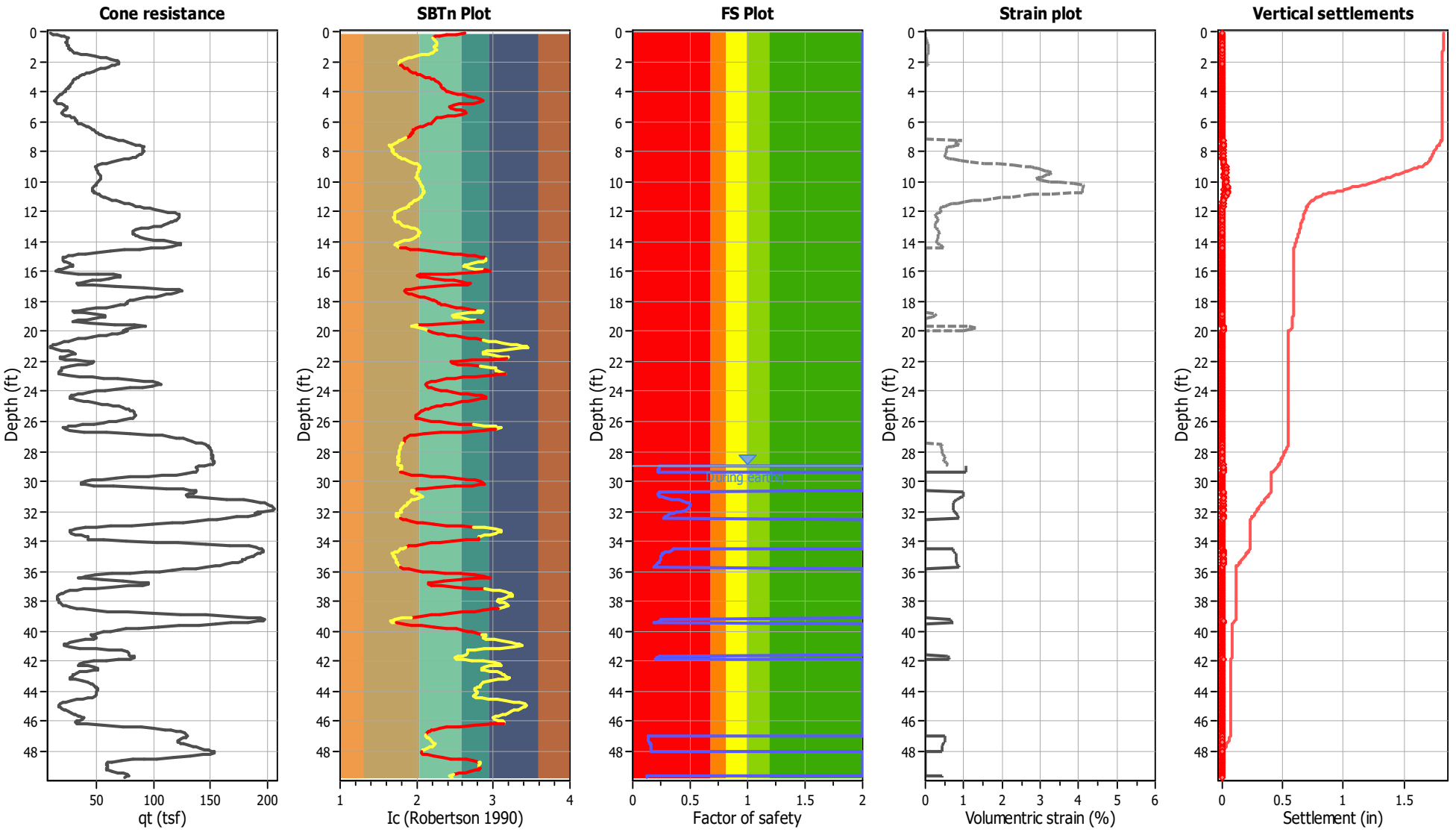
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92878
951-710-1160, www.geotekusa.com

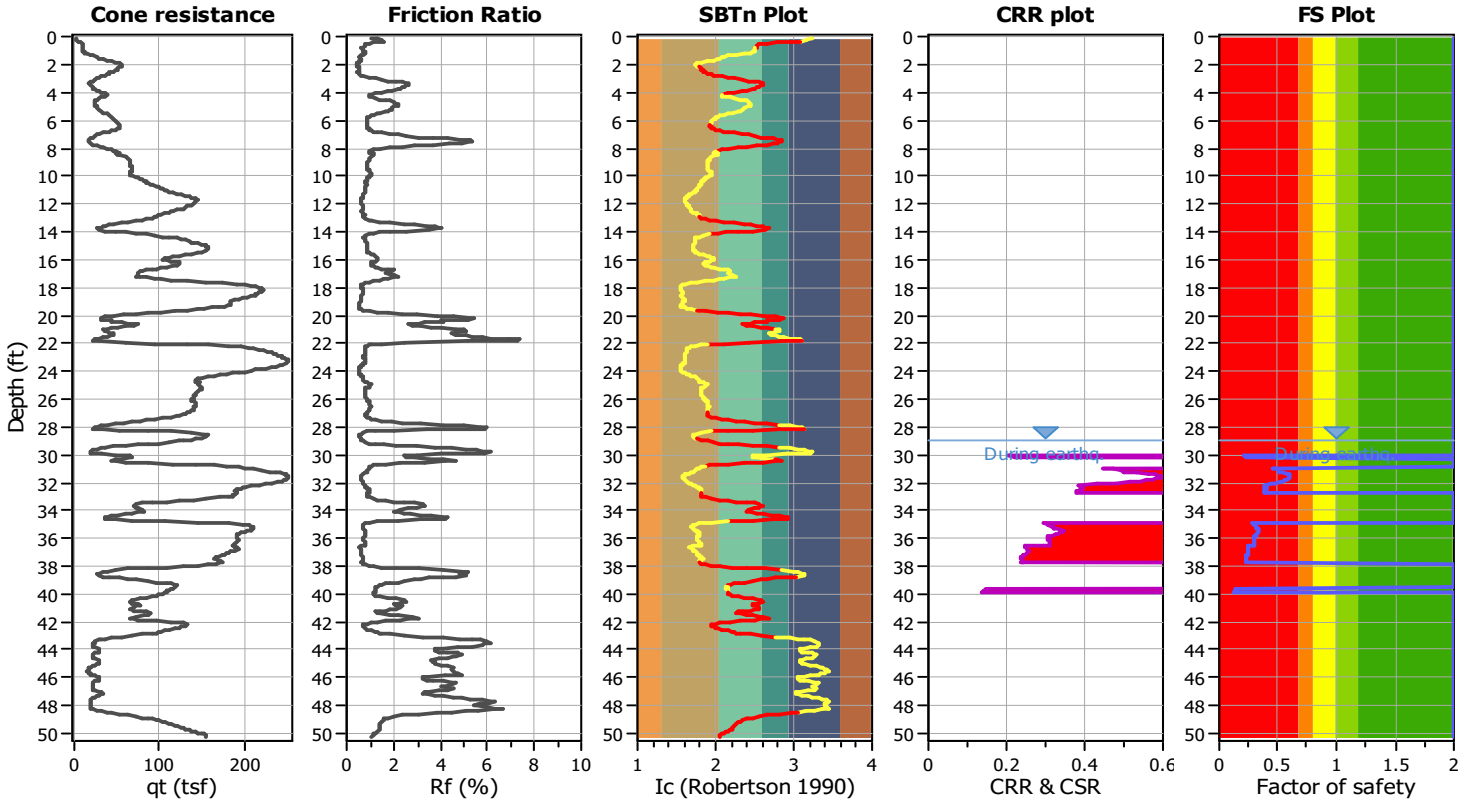
LIQUEFACTION ANALYSIS REPORT

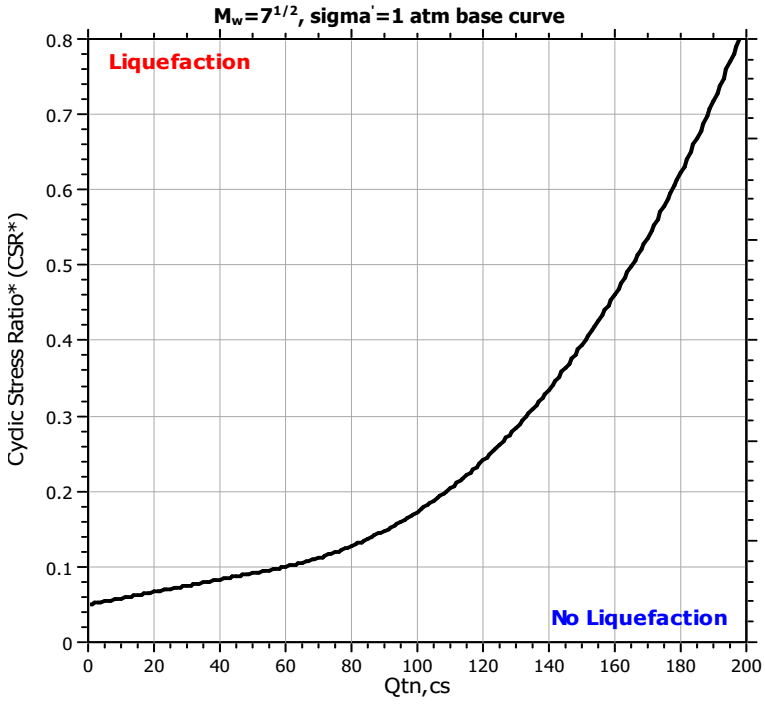
Project title : Tract 38066 **Location : San Jacinto, California**

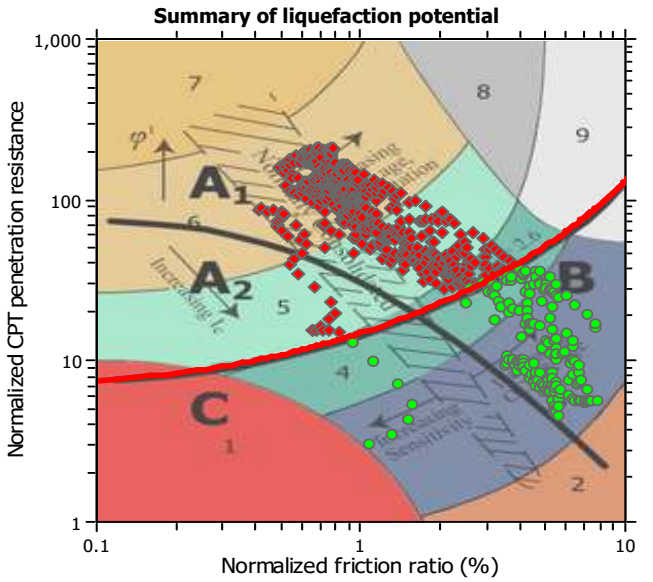
CPT file : CPT-5

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	29.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude M_w:	7.47	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.11	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based

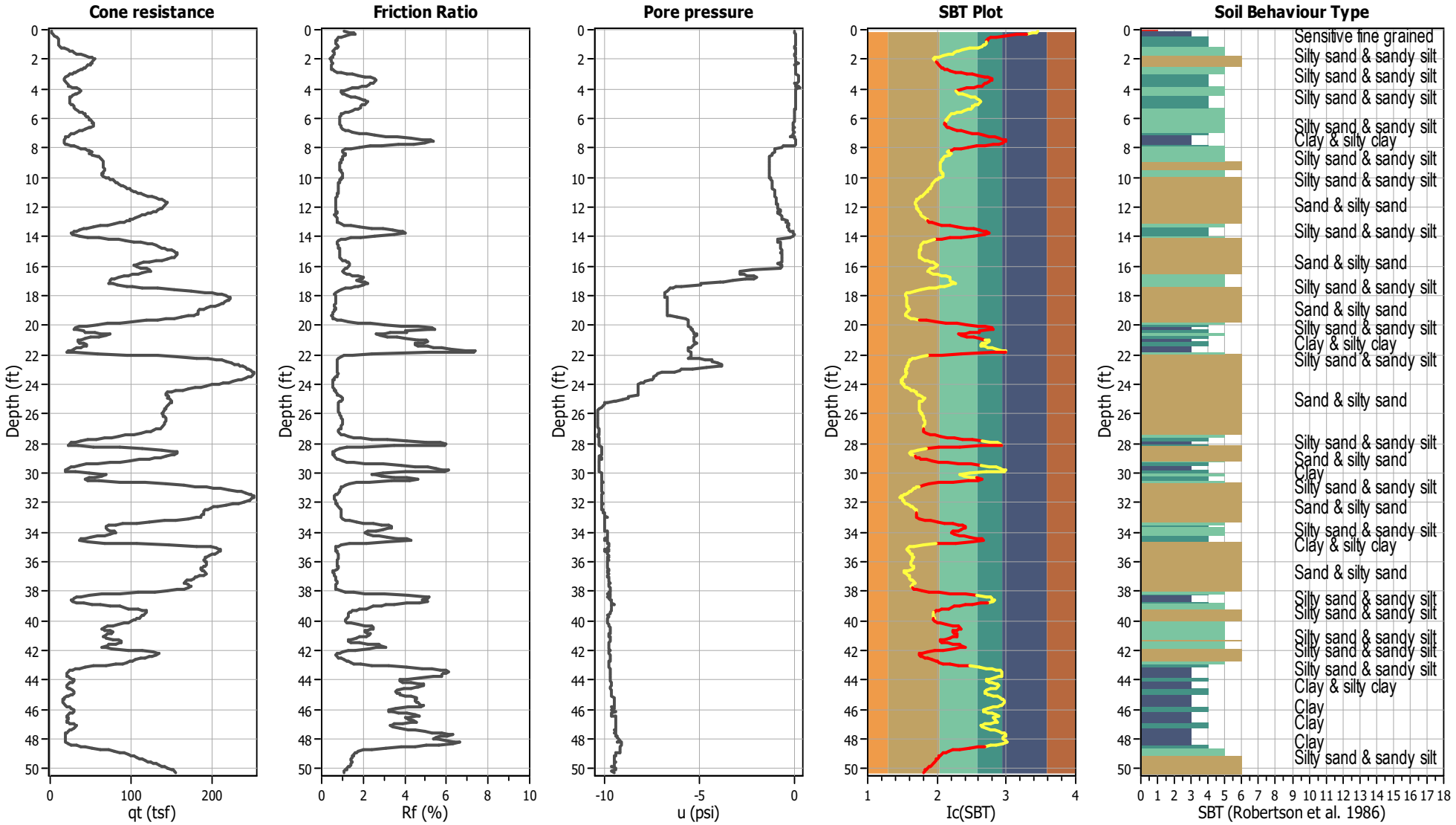






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



Input parameters and analysis data

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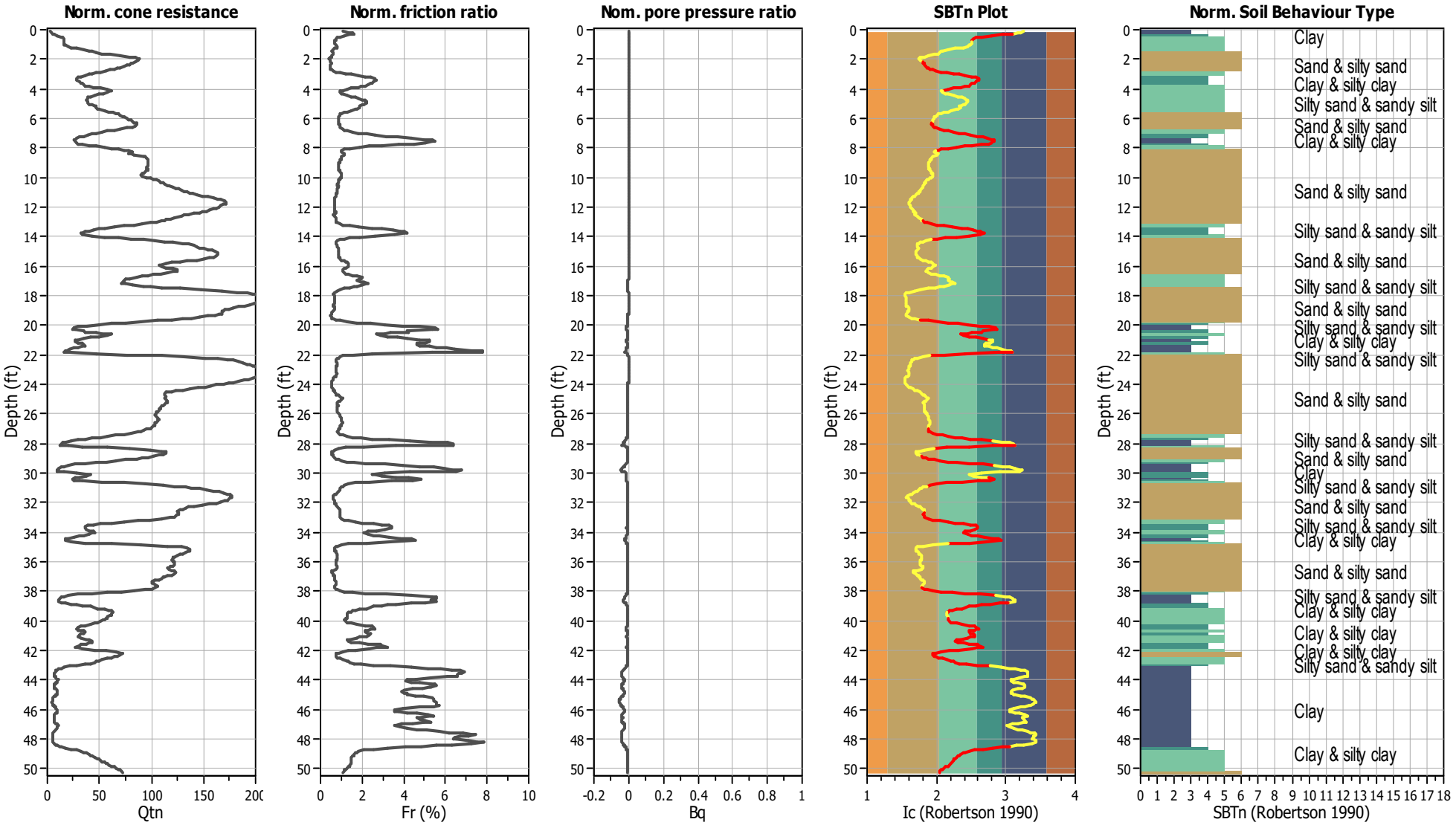
Peak ground acceleration:	1.11	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



Input parameters and analysis data

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Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
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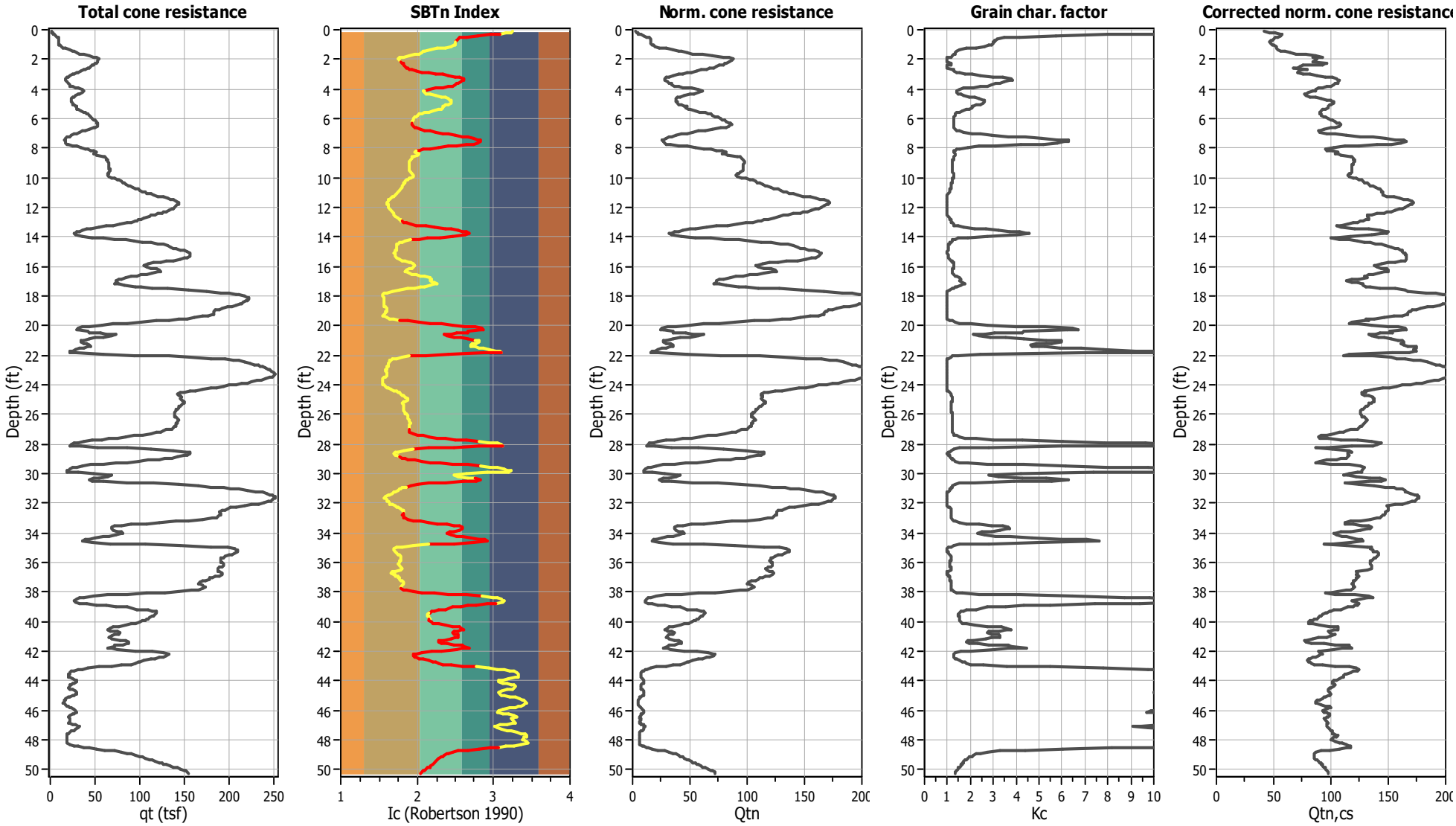
Liquefaction analysis overall plots (intermediate results)



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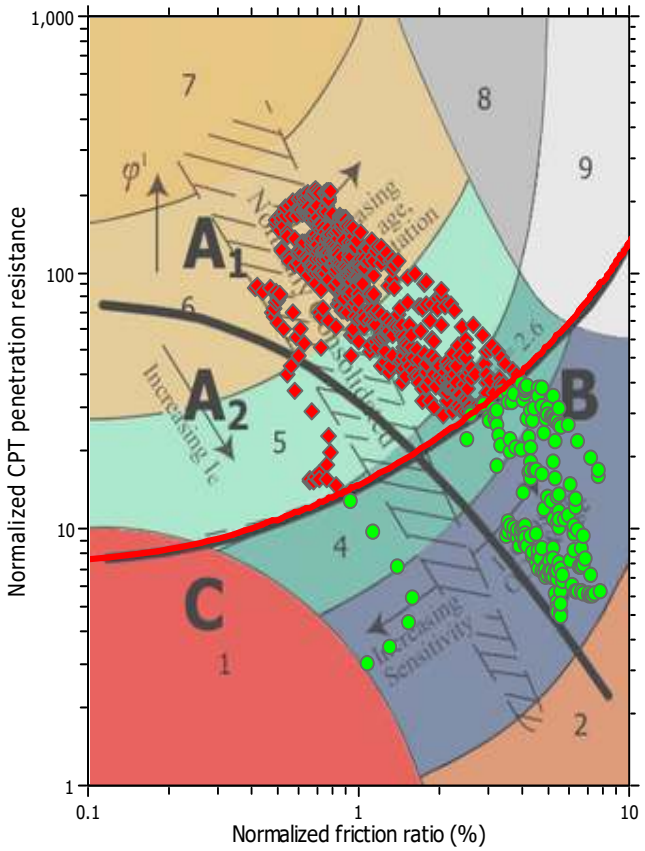
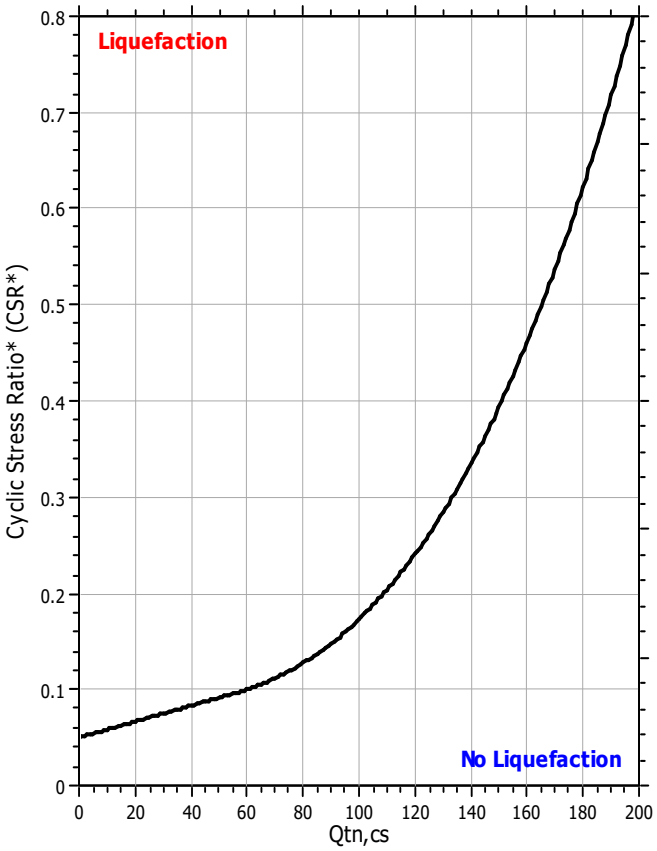
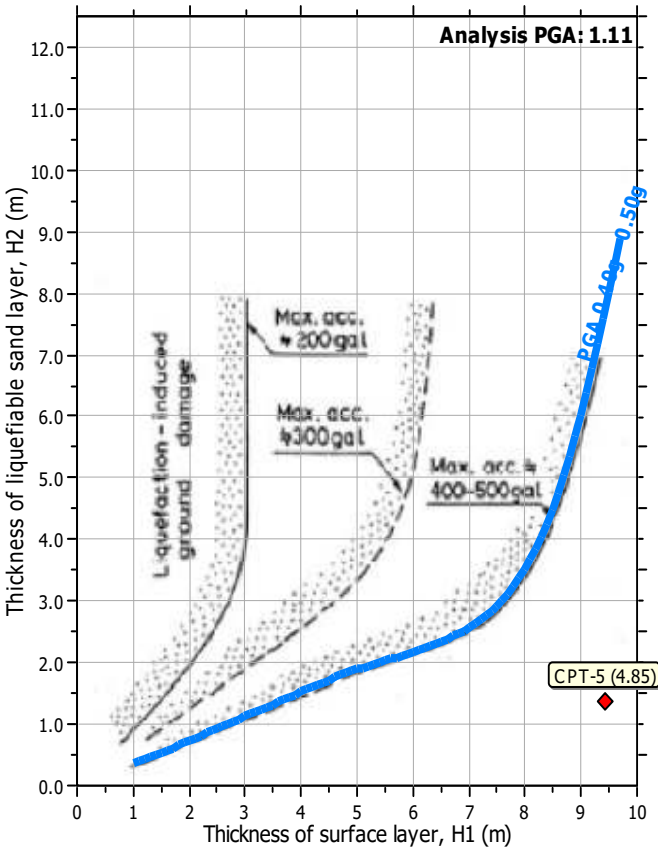
Liquefaction analysis summary plots







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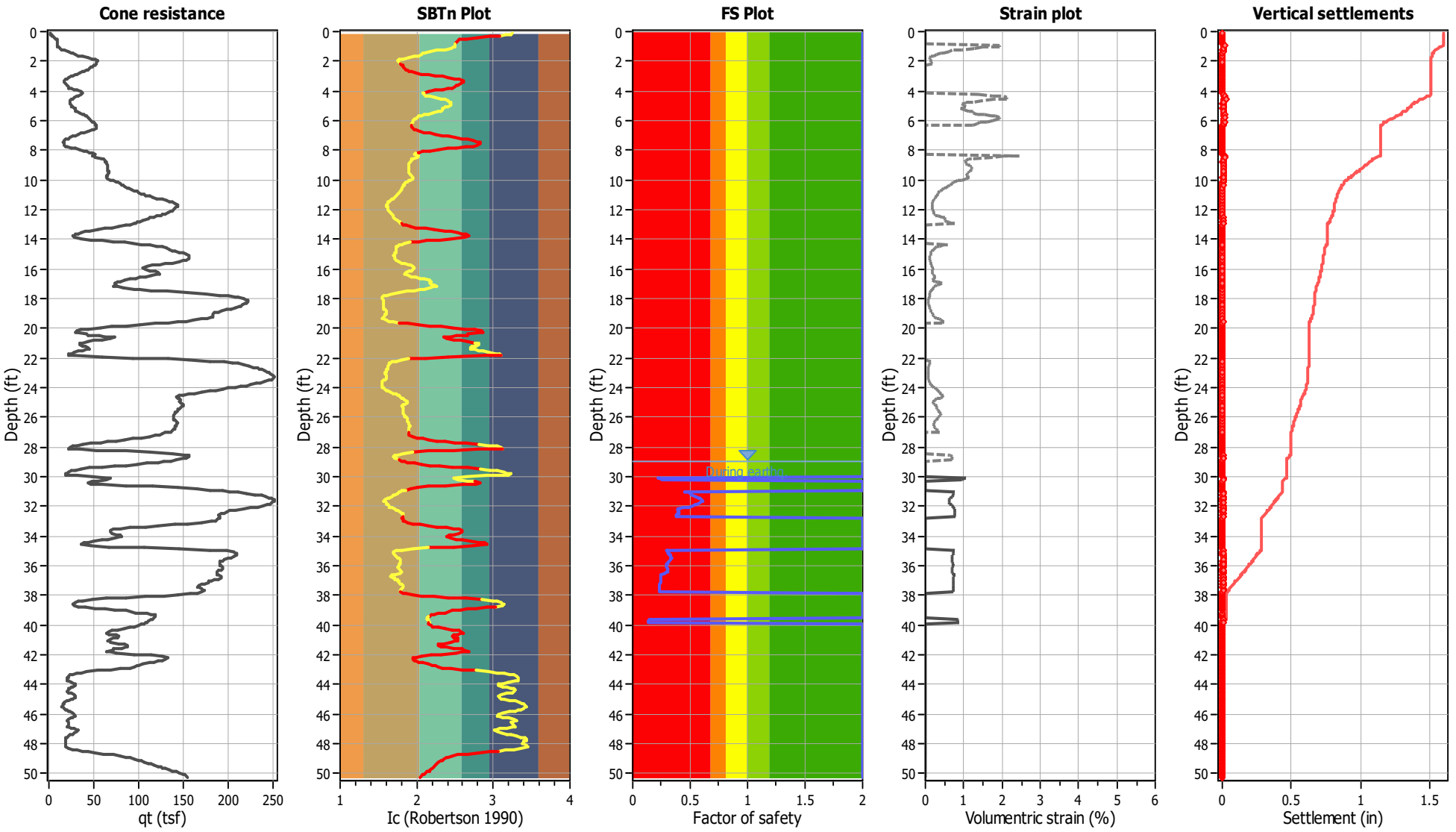

Abbreviations

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APPENDIX E

GENERAL GRADING GUIDELINES

Geotechnical and Infiltration Evaluation
Tract 38066
San Jacinto, California
Project No. 2741-CR

GEOTEK

GENERAL GRADING GUIDELINES

Guidelines presented herein are intended to address general construction procedures for earthwork construction. Specific situations and conditions often arise which cannot reasonably be discussed in general guidelines, when anticipated these are discussed in the text of the report. Often unanticipated conditions are encountered which may necessitate modification or changes to these guidelines. It is our hope that these will assist the contractor to more efficiently complete the project by providing a reasonable understanding of the procedures that would be expected during earthwork and the testing and observation used to evaluate those procedures.

General

Grading should be performed to at least the minimum requirements of governing agencies, Chapters 18 and 33 of the Uniform Building Code, CBC (2019) and the guidelines presented below.

Preconstruction Meeting

A preconstruction meeting should be held prior to site earthwork. Any questions the contractor has regarding our recommendations, general site conditions, apparent discrepancies between reported and actual conditions and/or differences in procedures the contractor intends to use should be brought up at that meeting. The contractor (including the main onsite representative) should review our report and these guidelines in advance of the meeting. Any comments the contractor may have regarding these guidelines should be brought up at that meeting.

Grading Observation and Testing

1. Observation of the fill placement should be provided by our representative during grading. Verbal communication during the course of each day will be used to inform the contractor of test results. The contractor should receive a copy of the "Daily Field Report" indicating results of field density tests that day. If our representative does not provide the contractor with these reports, our office should be notified.
2. Testing and observation procedures are, by their nature, specific to the work or area observed and location of the tests taken, variability may occur in other locations. The contractor is responsible for the uniformity of the grading operations; our observations and test results are intended to evaluate the contractor's overall level of efforts during grading. The contractor's personnel are the only individuals participating in all aspect of site work. Compaction testing and observation should not be considered as relieving the contractor's responsibility to properly compact the fill.
3. Cleanouts, processed ground to receive fill, key excavations, and subdrains should be observed by our representative prior to placing any fill. It will be the contractor's responsibility to notify our representative or office when such areas are ready for observation.

4. Density tests may be made on the surface material to receive fill, as considered warranted by this firm.
5. In general, density tests would be made at maximum intervals of two feet of fill height or every 1,000 cubic yards of fill placed. Criteria will vary depending on soil conditions and size of the fill. More frequent testing may be performed. In any case, an adequate number of field density tests should be made to evaluate the required compaction and moisture content is generally being obtained.
6. Laboratory testing to support field test procedures will be performed, as considered warranted, based on conditions encountered (e.g. change of material sources, types, etc.) Every effort will be made to process samples in the laboratory as quickly as possible and in progress construction projects are our first priority. However, laboratory workloads may cause in delays and some soils may require a **minimum of 48 to 72 hours to complete test procedures**. Whenever possible, our representative(s) should be informed in advance of operational changes that might result in different source areas for materials.
7. Procedures for testing of fill slopes are as follows:
   a) Density tests should be taken periodically during grading on the flat surface of the fill, three to five feet horizontally from the face of the slope.
   b) If a method other than over building and cutting back to the compacted core is to be employed, slope compaction testing during construction should include testing the outer six inches to three feet in the slope face to determine if the required compaction is being achieved.
8. Finish grade testing of slopes and pad surfaces should be performed after construction is complete.

Site Clearing

1. All vegetation, and other deleterious materials, should be removed from the site. If material is not immediately removed from the site it should be stockpiled in a designated area(s) well outside of all current work areas and delineated with flagging or other means. Site clearing should be performed in advance of any grading in a specific area.
2. Efforts should be made by the contractor to remove all organic or other deleterious material from the fill, as even the most diligent efforts may result in the incorporation of some materials. This is especially important when grading is occurring near the natural grade. All equipment operators should be aware of these efforts. Laborers may be required as root pickers.
3. Nonorganic debris or concrete may be placed in deeper fill areas provided the procedures used are observed and found acceptable by our representative.

Treatment of Existing Ground

1. Following site clearing, all surficial deposits of alluvium and colluvium as well as weathered or creep effected bedrock, should be removed unless otherwise specifically indicated in the text of this report.
2. In some cases, removal may be recommended to a specified depth (e.g. flat sites where partial alluvial removals may be sufficient). The contractor should not exceed these depths unless directed otherwise by our representative.
3. Groundwater existing in alluvial areas may make excavation difficult. Deeper removals than indicated in the text of the report may be necessary due to saturation during winter months.
4. Subsequent to removals, the natural ground should be processed to a depth of six inches, moistened to near optimum moisture conditions and compacted to fill standards.
5. Exploratory back hoe or dozer trenches still remaining after site removal should be excavated and filled with compacted fill if they can be located.

Fill Placement

1. Unless otherwise indicated, all site soil and bedrock may be reused for compacted fill; however, some special processing or handling may be required (see text of report).
2. Material used in the compacting process should be evenly spread, moisture conditioned, processed, and compacted in thin lifts six (6) to eight (8) inches in compacted thickness to obtain a uniformly dense layer. The fill should be placed and compacted on a nearly horizontal plane, unless otherwise found acceptable by our representative.
3. If the moisture content or relative density varies from that recommended by this firm, the contractor should rework the fill until it is in accordance with the following:
    a) Moisture content of the fill should be at or above optimum moisture. Moisture should be evenly distributed without wet and dry pockets. Pre-watering of cut or removal areas should be considered in addition to watering during fill placement, particularly in clay or dry surficial soils. The ability of the contractor to obtain the proper moisture content will control production rates.
    b) Each six-inch layer should be compacted to at least 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency. In most cases, the testing method is ASTM Test Designation D 1557.
4. Rock fragments less than eight inches in diameter may be utilized in the fill, provided:
    a) They are not placed in concentrated pockets;
    b) There is a sufficient percentage of fine-grained material to surround the rocks;
    c) The distribution of the rocks is observed by, and acceptable to, our representative.

5. Rocks exceeding eight (8) inches in diameter should be taken off site, broken into smaller fragments, or placed in accordance with recommendations of this firm in areas designated suitable for rock disposal. On projects where significant large quantities of oversized materials are anticipated, alternate guidelines for placement may be included. If significant oversize materials are encountered during construction, these guidelines should be requested.
6. In clay soil, dry or large chunks or blocks are common. If in excess of eight (8) inches minimum dimension, then they are considered as oversized. Sheepsfoot compactors or other suitable methods should be used to break up blocks. When dry, they should be moisture conditioned to provide a uniform condition with the surrounding fill.

Slope Construction

1. The contractor should obtain a minimum relative compaction of 90 percent out to the finished slope face of fill slopes. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment.
2. Slopes trimmed to the compacted core should be overbuilt by at least three (3) feet with compaction efforts out to the edge of the false slope. Failure to properly compact the outer edge results in trimming not exposing the compacted core and additional compaction after trimming may be necessary.
3. If fill slopes are built "at grade" using direct compaction methods, then the slope construction should be performed so that a constant gradient is maintained throughout construction. Soil should not be "spilled" over the slope face nor should slopes be "pushed out" to obtain grades. Compaction equipment should compact each lift along the immediate top of slope. Slopes should be back rolled or otherwise compacted at approximately every 4 feet vertically as the slope is built.
4. Corners and bends in slopes should have special attention during construction as these are the most difficult areas to obtain proper compaction.
5. Cut slopes should be cut to the finished surface. Excessive undercutting and smoothing of the face with fill may necessitate stabilization.

UTILITY TRENCH CONSTRUCTION AND BACKFILL

Utility trench excavation and backfill is the contractors responsibility. The geotechnical consultant typically provides periodic observation and testing of these operations. While efforts are made to make sufficient observations and tests to verify that the contractors' methods and procedures are adequate to achieve proper compaction, it is typically impractical to observe all backfill procedures. As such, it is critical that the contractor use consistent backfill procedures.

Compaction methods vary for trench compaction and experience indicates many methods can be successful. However, procedures that "worked" on previous projects may or may not prove effective on a given site. The contractor(s) should outline the procedures proposed, so that we may discuss them **prior** to construction. We will offer comments based on our knowledge of site conditions and experience.

1. Utility trench backfill in slopes, structural areas, in streets and beneath flat work or hardscape should be brought to at least optimum moisture and compacted to at least 90 percent of the laboratory standard. Soil should be moisture conditioned prior to placing in the trench.
2. Flooding and jetting are not typically recommended or acceptable for native soils. Flooding or jetting may be used with select sand having a Sand Equivalent (SE) of 30 or higher. This is typically limited to the following uses:
   a) shallow (12 + inches) under slab interior trenches and,
   b) as bedding in pipe zone.

   The water should be allowed to dissipate prior to pouring slabs or completing trench compaction.
3. Care should be taken not to place soils at high moisture content within the upper three feet of the trench backfill in street areas, as overly wet soils may impact subgrade preparation. Moisture may be reduced to 2% below optimum moisture in areas to be paved within the upper three feet below sub grade.
4. Sand backfill should not be allowed in exterior trenches adjacent to and within an area extending below a 1:1 projection from the outside bottom edge of a footing, unless it is similar to the surrounding soil.
5. Trench compaction testing is generally at the discretion of the geotechnical consultant. Testing frequency will be based on trench depth and the contractors procedures. A probing rod would be used to assess the consistency of compaction between tested areas and untested areas. If zones are found that are considered less compact than other areas, this would be brought to the contractors attention.

JOB SAFETY

General

Personnel safety is a primary concern on all job sites. The following summaries are safety considerations for use by all our employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading construction projects. The company recognizes that construction activities will vary on each site and that job site safety is the contractor's responsibility. However, it is, imperative that all personnel be safety conscious to avoid accidents and potential injury.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of our field personnel on grading and construction projects.

1. Safety Meetings: Our field personnel are directed to attend the contractor's regularly scheduled safety meetings.
2. Safety Vests: Safety vests are provided for and are to be worn by our personnel while on the job site.
3. Safety Flags: Safety flags are provided to our field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

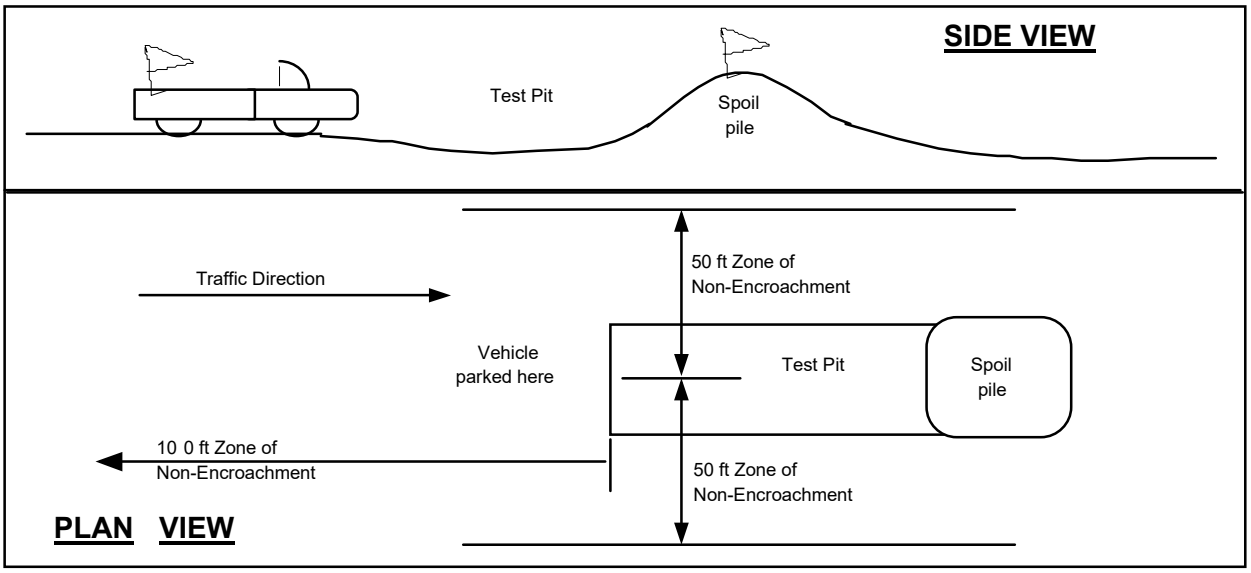
Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. The primary concern is the technician's safety. However, it is necessary to take sufficient tests at various locations to obtain a representative sampling of the fill. As such, efforts will be made to coordinate locations with the grading contractors authorized representatives (e.g. dump man, operator, supervisor, grade checker, etc.), and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative should direct excavation of the pit and safety during the test period. Again, safety is the paramount concern.

Test pits should be excavated so that the spoil pile is placed away from oncoming traffic. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates that the fill be maintained in a drivable condition. Alternatively, the contractor may opt to park a piece of equipment in front of test pits, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits (see diagram below). No grading equipment should enter this zone during the test procedure. The zone should extend outward to the sides approximately 50 feet from the center of the test pit and 100 feet in the direction of traffic flow. This zone is established both for safety and to avoid excessive ground vibration, which typically decreases test results.

TEST PIT SAFETY PLAN



Slope Tests

When taking slope tests, the technician should park their vehicle directly above or below the test location on the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location.

Trench Safety

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed. Trenches for all utilities should be excavated in accordance with CAL-OSHA and any other applicable safety standards. Safe conditions will be required to enable compaction testing of the trench backfill.

All utility trench excavations in excess of 5 feet deep, which a person enters, are to be shored or laid back. Trench access should be provided in accordance with OSHA standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

Our personnel are directed not to enter any excavation which;

1. is 5 feet or deeper unless shored or laid back,
2. exit points or ladders are not provided,
3. displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or

4. displays any other evidence of any unsafe conditions regardless of depth.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraws and notifies their supervisor. The contractors representative will then be contacted in an effort to effect a solution. All backfill not tested due to safety concerns or other reasons is subject to reprocessing and/or removal.

Procedures

In the event that the technician's safety is jeopardized or compromised as a result of the contractor's failure to comply with any of the above, the technician is directed to inform both the developer's and contractor's representatives. If the condition is not rectified, the technician is required, by company policy, to immediately withdraw and notify their supervisor. The contractor's representative will then be contacted in an effort to effect a solution. No further testing will be performed until the situation is rectified. Any fill placed in the interim can be considered unacceptable and subject to reprocessing, recompaction or removal.

In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor bring this to technicians attention and notify our project manager or office. Effective communication and coordination between the contractors' representative and the field technician(s) is strongly encouraged in order to implement the above safety program and safety in general.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

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