

**SUMMARY REPORT PURSUANT TO
SECTION 52201 OF
CALIFORNIA GOVERNMENT CODE
IN CONNECTION WITH THE SALE OF PROPERTY
BY AND BETWEEN THE CITY OF CYPRESS AND SP ACQUISITION, LLC**

The City of Cypress (“City”) is considering the approval of the proposed sale and disposition of a ~13.29-acre property located at 5095-5275 Katella Avenue in the City of Cypress, California (APNs 241-091-022 through -026) (“Property”) to create an economic opportunity.

The Property is vacant, unimproved land and was originally acquired by the former Cypress Redevelopment Agency (“RDA”) in November 2006 and was sold and title transferred to the City in 2011 prior to the dissolution of the RDA. The subject Property is described in greater detail herein and is also identified and defined as such in the proposed Disposition and Development Agreement (“DDA”) proposed to be entered into by and between the City and SP Acquisition, LLC, a California limited liability company (the “Developer”).

This summary report (“Report”) for the proposed sale of the Property has been prepared by the City of Cypress (“City”) pursuant to California Government Code Section 52201(a)(2)(B). This Report sets forth certain details of the proposed DDA.

I. BACKGROUND

Section 52201(a)(2)(B) of the California Government Code provides that a city, county, or city and county may sell or lease property to create an economic opportunity. The acquisition, sale, or lease shall first be approved by the legislative body by resolution after a legally noticed public hearing. The city, county, or city and county shall also make available a copy of a report that describes and contains specific elements of the proposed transaction(s) for public inspection prior to the public hearing.

Pursuant to 52201(a)(2)(B), the Report must include the following information:

- A copy of the proposed acquisition, sale, or lease agreement.
- A summary that describes and specifies all of the following:
 - The cost of the agreement to the city, county, or city and county, including land acquisition costs, clearance costs, relocation costs, the costs of any improvements to be provided by the city, county, or city and county, plus the expected interest on any loans or bonds to finance the agreements.
 - For the sale or lease of property, the estimated value of the interest to be conveyed or leased, determined at the highest and best uses permitted under the general plan or zoning.
 - For the sale or lease of property, the estimated value of the interest to be conveyed or leased, determined at the use and with the conditions, covenants, and development costs required by the sale or lease. The purchase price or present value of the lease payments which the lessor will be required to make during the term of the lease. If the sale price or total rental amount is less than the fair market value of the interest to be conveyed or leased, determined at the highest and best

use, then the city, county, or city and county shall provide as part of the summary an explanation of the reasons for the difference.

- An explanation of why the acquisition, sale, or lease of the property will assist in the creation of economic opportunity, with reference to all supporting facts and materials relied upon in making this explanation.

This Report outlines the primary details of the proposed sale and disposition of the Property between the City and Developer as outlined in the proposed DDA and addresses the requirements pursuant to Government Code Section 52201.

II. REPORT ORGANIZATION

This Report is based upon information provided in connection with the proposed sale and disposition of the City Parcels and is organized into the following sections:

- **Summary of the Proposed Sale & Disposition** – This section includes a description of and other relevant information pertaining to the proposed conveyance of the subject Property between the City and Developer under the DDA;
- **Cost of the Agreement to the City** – This section summarizes the cost of the agreement to the City, including land acquisition costs, clearance costs, relocation costs, the costs of any improvements to be provided by the City, plus the expected interest on any loans or bonds to finance the agreements;
- **Estimated Value of the Interest to be Conveyed Determined at the Highest and Best Use Permitted Under the General Plan or Zoning** – This section estimates the value of the interest to be conveyed, determined at the highest and best use permitted under the general plan or zoning for the subject Property;
- **Estimated Value of the Interest to be Conveyed Determined at the Use and with the Conditions, Covenants, and Development Costs Required by the Sale** – This section estimates the value of the property interest to be conveyed determined at the use and with the conditions, covenants, and development costs required by the sale or lease of the Property; The purchase price or present value of the lease payments which the lessor will be required to make during the term of the lease, as applicable;
- **Consideration Received and Comparison with the Established Value** - This section includes an explanation of the reasons for the difference If the sale price or total rental amount of the Property is less than the fair market value of the interest to be conveyed or leased, determined at the highest and best use;
- **Economic Opportunity** – This section describes the existing condition of the Property and includes an explanation of why the sale or lease of the Property will assist in the creation of economic opportunity.

This Summary Report sets forth certain details of the proposed sale and disposition of the Property by the City to the Developer. A copy of the proposed DDA, which prospective Developer

will be required to execute, in substantially the attached form, to effectuate the conveyance of the Property is attached to this Summary Report (see Attachment "A"). This Summary Report is made available for public inspection and copying on the date that the first notice of the joint public hearing is published, which is Monday, September 30, 2019. The public hearing relating to the proposed sale of the Property is scheduled for Monday, October 14, 2019 at 7:00 p.m., in the City Council Chambers, at 5275 Orange Avenue, Cypress, CA 90630.

III. SUMMARY OF PROPOSED SALE AND DISPOSITION OF THE PROPERTY

Under the terms of the DDA, the City would sell the Property, at fair market value, to the Developer in "As-Is" condition for a purchase price of \$15,250,000 ("Purchase Price") to effectuate the development of a neighborhood-serving mixed-use commercial and residential project. The Developer's proposed project, as outlined in the DDA, is a high-quality mixed-use commercial and residential project that generally consists of approximately two hundred fifty-one (251) luxury multi-family dwelling units; one (1) hotel with approximately one hundred twenty (120) keys that reflects a widely recognized chain flag and offers a national reservation system, and approximately sixty three thousand nine hundred seventy-five (63,975) square feet of commercial retail, restaurant and luxury cinema uses ("Project").

The Project, as proposed, would help stimulate substantial economic growth in the City, specifically:

- Provide a land use and infrastructure plan that will support the expansion of a major job center in the City;
- Help to establish City as a prime location for hotel, retail and entertainment uses;
- Provide a balanced approach to City's fiscal viability, economic expansion and environmental integrity;
- Significantly improve City's jobs to housing balance;
- Provide new, local construction jobs as well as permanent employment opportunities; and
- Provide multi-family housing to address the needs and demands of the City's residents and region.

A summary of the salient points of the DDA are as follows:

- Developer hereby agrees to purchase from City, and City hereby agrees to sell to Developer all of City's rights, title and interests in the Site upon the terms and conditions hereinafter set forth in the DDA.
- Developer to acquire fee title to the Property for a purchase price of \$15,250,000 to be paid in full at the close of escrow pursuant to the DDA.
- The Developer's proposed Project is currently not entitled, and Developer will be required to obtain the entitlements necessary for the proposed Project, including all required

environmental review and analysis under the California Environmental Quality Act (“CEQA”), as a condition to the sale of the Property to the Developer.

- Acknowledgement and agreement by City and Developer that the ultimate sale of the Property under the DDA is expressly conditioned upon the review and approval of all necessary findings and conclusions which the City Council of the City of Cypress (“City Council”) is required to make, including all necessary review, findings and determinations required under CEQA as applicable under relevant state and local land use provisions and the City has full discretion with regards to such matters that is in no way constrained by the DDA.
- Developer’s obligation to purchase the Site and to close escrow shall be mandatory and irrevocable once all of the closing conditions have occurred as outlined in the DDA; said conditions are solely for the benefit of Developer and shall be fulfilled or waived in writing within the time periods provided for herein and in any event, no later than the Outside Closing Date (subject to any applicable extension(s) and Excused Delay(s)) as defined in the DDA.
- City’s reservation of the right to exercise its discretion as to all matters with respect to the DDA, the entitlements, and the Project which City is, by law, entitled or required to exercise, at its discretion.
- For a period of five (5) years from the date of issuance of the Certificate of Occupancy for the core and shell for the Project’s first (1st) building, Developer shall own the Site and operate the Project; provided, however, the foregoing restriction shall be subject to any and all Permitted Transfer(s) and/or other Transfer(s) to Future User(s) receiving City consent pursuant to Section 303 of the DDA.
- City is not providing any direct or indirect financial assistance to Developer that would make any part of the Project a “public work” “paid for in whole or in part out of public funds,” as described in California Labor Code Section 1720, such that it would cause Developer to be required to pay prevailing wages for any aspect of the Project.

Other DDA Terms:

- Escrow Opening Date: Within thirty (30) days following the effective date of DDA
- Due Diligence Period: As stated in the DDA, Developer has conducted its due diligence and has previously notified City of its desire to proceed with negotiating the DDA.
- Conveyance Instrument Deposit: \$400,000 shall be non-refundable and released to the City in installments pursuant to the DDA. The first two installments of the Conveyance Instrument Deposit of Fifty Thousand Dollars (\$50,000) each, totaling One Hundred Thousand Dollars (\$100,000), have been released to the City. The timing for the Three Hundred Thousand (\$300,000) balance of the Conveyance Instrument Deposit shall comport to the following timelines:

- The first One Hundred Fifty Thousand Dollars (\$150,000) of the Conveyance Instrument Deposit shall be nonrefundable and released to City, but applicable to the Purchase Price, no later than three (3) days following the expiration of all applicable statute of limitations periods for any potential legal challenge of City's approval of this Agreement and/or the related CEQA determination;
- The second One Hundred Fifty Thousand Dollars (\$150,000) of the Conveyance Instrument Deposit shall be nonrefundable and released to City, but applicable to the Purchase Price, concurrently upon City's issuance of the required public notice of City's consideration of the Project Entitlements, as evidenced by submittal to a local newspaper or other distribution.
- Escrow Closing Date: Escrow shall Close within fifteen (15) days of satisfaction (or written waiver by the benefited party) of the City Closing Conditions and the Developer Closing Conditions pursuant to the DDA, but not later than December 31, 2020 ("Outside Closing Date"), unless extended as further outlined in the DDA.

IV. COST OF THE AGREEMENT TO THE CITY

This section outlines the costs of the DDA to the City, including land acquisition costs, clearance costs, relocation costs, the costs of any improvements to be provided by the City, plus the expected interest on any loans or bonds to finance the agreements. For the purpose of this Report, the City's costs under the proposed conveyance of the Property in accordance with the DDA are comprised of land acquisition costs of the Property.

A. Land Acquisition Costs

The Property was originally acquired by the former RDA, prior to the dissolution of the RDA, in November 2006 and was subsequently sold to the City in March 2011 for a purchase price of \$18,580,000. The purpose of the acquisition was to encourage the expansion of retail and commercial development along a major commercial corridor (Katella Avenue) in the City. However, subsequent to the City's acquisition of the Property, the State Department of Finance ("DOF") and State Controller's Office ("SCO") challenged the purchase price and transfer of the Property from the RDA to the City in 2013 and 2015, respectively.

The City and Successor Agency to the former RDA ("Successor Agency") formerly filed a lawsuit challenging the DOF and SCO rulings on the transfer of the sale of the Property from the former RDA to the City. As part of the negotiations, the City commissioned a broker opinion of value report ("BOV") in November 2015 to determine the estimated fair market value of the land, which resulted in a land value of approximately \$12,500,000, which was accepted by the DOF and SCO. In February 2017, the City and Successor Agency formerly entered into a Settlement Agreement with the DOF and SCO ("Settlement Agreement"), which acknowledged that the City could ultimately retain ownership of the Property. The City's plan is to further the economic development goals and objectives with the ultimate disposition and development of the Property, as authorized under the Settlement Agreement and contemplated under the DDA between the City and the Developer.

V. ESTIMATED VALUE OF THE INTEREST TO BE CONVEYED DETERMINED AT THE HIGHEST AND BEST USE PERMITTED UNDER THE GENERAL PLAN AND ZONING

The Property falls under the Planned Business Park Zone and is located in Area 5 (“Professional Office”) of the Amended Cypress Business and Professional Center Specific Plan, which allows for a variety of office and service uses as well as any other use permitted under the Industrial section of the City Municipal Code including commercial shopping centers. In 2008, the City specifically approved a Conditional Use Permit for the construction of a proposed 146,300 square foot shopping center.

In 2016, the City marketed the Site through a competitive bid process as well as a follow-on “request for qualifications” (“RFQ”) process that took place in 2018, from which City received approximately 20 purchase offers and/or proposals from a group of qualified development companies including the selected Developer. During the most recent RFQ process (2018), the City received multiple purchase offers and proposals for commercial only developments consistent with the current General Plan and zoning code for a purchase price of approximately \$10,000,000 for the Property.

However, through the negotiation and selection process undertaken in 2016, a Geotechnical Evaluation Study of the Property was conducted by Leighton Consulting, Inc. (“Study”) and provided to the City for review as part of the Developer’s due diligence efforts, which is attached as Attachment B. The Study specifically identified certain negative soils conditions and onsite storm water detention and filtration requirements for the development of the Property, which would require certain mitigation measures substantially increasing the cost of development and negatively affecting the land value of the Property, which results in an approximate range of a ~\$4,000,000 to ~\$5,000,000 negative cost adjustment.

Therefore, the estimated value of the interest to be conveyed for the Property, determined at the highest and best use permitted under the current General Plan and zoning code and considering specific negative cost adjustments to address soil and other geotechnical conditions associated with the Property is estimated within the range of \$5,000,000 - \$6,000,000.

VI. ESTIMATED VALUE OF THE INTEREST TO BE CONVEYED AT THE USE AND WITH THE CONDITIONS, COVENANTS, AND DEVELOPMENT COSTS REQUIRED BY THE SALE

As described throughout this Report, the City is proposing to sell the Property to the Developer under the terms of the DDA for the proposed commercial and residential mixed-use Project. If the DDA is approved, the Property will be sold in its current “as is” condition and no express or implied representations have been made to the prospective Developer by the City regarding suitability for desired use, zoning and land use, subsurface compaction and/or the existence or non-existence of toxic waste, hazardous materials, and/or undesirable substances in or on the Property.

The prospective Developer will also be required under the DDA to secure any and all land use and other entitlements, permits and approvals for the Project, which may be required by the City and any other governmental agency having jurisdiction over the Property, including all environmental review and analysis required in connection with any development project entitlement application submitted by the prospective Developer.

The estimated value of the interest to be conveyed at the use and with the conditions, covenants, and development costs required by the DDA for the Property is a purchase price of \$15,250,000, which is significantly higher than the estimated value as determined at the highest and best use permitted under the City's current General Plan and zoning. It should be noted that the purchase offer also includes the specific negative cost adjustments to address soil and other geotechnical conditions associated with the Property, as identified in Section V.

VII. CONSIDERATION RECEIVED AND COMPARISON WITH THE ESTIMATED VALUE OF THE INTEREST TO BE CONVEYED AT HIGHEST AND BEST USE

Pursuant to this Section, the City must provide an explanation of the reasons for the difference If the sale price of the Property is less than the estimated value of the interest to be conveyed, determined at the highest and best use. The Property, will be sold for a purchase price of \$15,250,000, which is significantly higher than the estimated value of the Property as determined at the highest and best use permitted under the City's General Plan and zoning, as identified in Section V.

VIII. ECONOMIC OPPORTUNITY

The former RDA (in 2006) and City (in 2011) sought to acquire the Property for the purpose of enhancing and stimulating private investment and the economic vitality of existing businesses as well as encouraging the expansion of retail and commercial development along a major commercial corridor (Katella Avenue). However, the 2008 economic recession as well as the State's dissolution of redevelopment and subsequent dissolution procedures hampered the City's ability to facilitate and effectuate the disposition and development of the Property.

Today, the Property remains underutilized, falling significantly short of its residential, commercial, retail, entertainment, revenue-generating and job-generating potential. The City has considered the Property location and characteristics, the public costs of transferring the Property for development and return on investment, and the kinds of uses necessary to produce a successful residential and commercial mixed-use Project of the type desired by City and Developer and as described in this Report and described further in the DDA.

The City envisions the development of the Property as an integral component of the Katella Avenue commercial corridor, which, if developed as envisioned in the DDA, would create an attractive and quality mixed-use commercial and residential Project and provide City residents, youth, and visitors with a lively day and nighttime environment and further the City's efforts to improve and enhance its local economic base.

The proposed sale of the Property to the Developer, as described herein, will create an economic opportunity by facilitating the development of the Property in alignment with the economic development goals and objectives of the City, thereby increasing its revenue base (e.g. property tax, sales tax, transient occupancy tax, etc.), promoting the increase in the supply of housing, stimulating economic activity and job growth within the City, providing necessary infrastructure and public improvements, and ultimately serving as a catalyst for the continued growth and development of the City's Katella Avenue commercial corridor.

DUE DILIGENCE GEOTECHNICAL EVALUATION
PROPOSED COMMERCIAL DEVELOPMENT
NORTHEAST CORNER OF KATELLA AVENUE AND
SIBONEY STREET
CYPRESS, CALIFORNIA

Prepared for:

Shea Properties, Inc.
130 Vantis, Suite 200
Aliso Viejo, California 92656

Project No. 11829.001

November 14, 2017



Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY



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A LEIGHTON GROUP COMPANY

November 14, 2017

Project No. 11829.001

Shea Properties, Inc.
130 Vantis
Aliso Viejo, California 92656

Attention: Mr. Michael Lawson, Development Director

**Subject: Due Diligence Geotechnical Evaluation
Proposed Commercial Development
Northeast Corner of Katella Avenue and Siboney Street
Cypress, California**

In accordance with our proposal, dated May 24, 2017, and revised June 1, 2017, Leighton Consulting, Inc. (Leighton) has performed a due diligence geotechnical evaluation for the subject project. The purpose of this study is to provide you with our professional opinion with respect to the feasibility of developing the site for its intended use from a geotechnical standpoint, and to provide you with the required information for budgeting and cost analysis. Our study included limited geotechnical laboratory testing of near-surface site soils to preliminarily evaluate soil expansion potential and to provide preliminary pavement design recommendations. In addition, our study included 12 Cone Penetrometer Test (CPT) soundings to evaluate the liquefaction potential at the site.

We appreciate the opportunity to provide our services for this project. We trust that the information contained herein meets your objectives.

If you have any questions or concerns, please contact us at your convenience. The undersigned can be reached at **(866) LEIGHTON**, specifically at the phone extension and e-mail address listed below.



Respectfully submitted,

LEIGHTON CONSULTING, INC.

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1.0 INTRODUCTION

1.1 Site Description and Proposed Development

The project site is located at the northeast corner of Siboney Street and West Katella Avenue in the City of Cypress, California. The site location (latitude 33.8041°, longitude -118.0420°) and immediate vicinity are shown on Figure 1, *Site Location Map*. The project site is rectangular in shape and covers an area of approximately 13.3 acres. The site is currently vacant and paved with asphalt concrete (AC) over a majority of the property with the exception of the northeastern portion of the property which is unpaved. The property is understood to be used as a parking lot for the Los Alamitos Race Track located to the north of the site. Several light poles are located throughout the site and landscaped areas that include several large trees line the southern and southwestern margins of the site. The site is bordered by Katella Avenue to the south, Siboney Street to the west, Winners Circle and existing commercial property to the east, and existing AC paved parking areas to the north. Based on review of aerial photographs (NETR, 2017), the site was vacant and appeared to be used for agricultural purposes in 1952 and 1953. By 1963, a majority of the site appears to have been paved in conjunction with initial development of the race track. By approximately 1994, entry to the race track, or Siboney Street, appears to have been constructed generally to its current configuration, and by 2002, Winners Circle appears to have been constructed generally to its current configuration.

Review of the United States Geological Survey (USGS) *7.5-Minute Los Alamitos Quadrangle* (USGS, 1981) indicates the site is relatively flat at approximate elevation (El.) +30 feet mean sea level (msl) with sheet flow generally directed to the southwest.

Based on review of the *Proposed Site Plan (AMC + Planet Fitness)* for the project prepared by DLR Group and dated October 5, 2017, the planned development consists of a 4-story hotel in the northwest corner, a 40,005 square-foot AMC theater building in the north, an 18,200 square-foot Planet Fitness building in the northeast corner, and four (4) retail or restaurant buildings between 4,500 and 9,000 square feet in size along the southern margin, all generally surrounding a central parking area.

At the time of this writing, information on the types of planned structures and column loading were not yet available for review. We have assumed that there are no subterranean levels proposed as a part of the current development concept. However, we understand that the hotel may include partial or full subterranean mechanical basements.

1.2 **Purpose and Scope**

The purpose of our work was to evaluate the subsurface conditions at the site relative to the proposed development and provide preliminary geotechnical recommendations to aid in project planning. The scope of this evaluation included the following tasks:

- **Background Review** – We reviewed readily available geotechnical reports, literature, aerial photographs, and maps relevant to the site available from our in-house library or in the public domain. We evaluated geological hazards and potential geotechnical issues that may significantly impact the site. The documents reviewed are listed in Appendix A, *References*.
- **Field Exploration** – Our field exploration was performed on October 25, 2017, and consisted of 12 Cone Penetrometer Test (CPT) soundings advanced at the site (designated CPT-1 through CPT-12), each to an approximate depth of 50 feet below ground surface (bgs). Shear wave velocity measurements were taken at CPT-1 to develop seismic design parameters. The approximate locations of the CPTs are shown on Figure 2, *Exploration Location Map*. Prior to the field exploration, the CPT locations were marked and Underground Service Alert (USA) was notified for utility clearance. In addition, we hand-auger drilled the upper 5 feet at each location prior to advancement of the CPT in an effort to avoid underground utilities. Representative bulk samples were collected from the upper 5 feet at 4 locations (CPT-1, CPT-6, CPT-11 and CPT-12) and transported to our laboratory for testing.

The CPT soundings were performed in accordance with ASTM D5778 advanced by a 30-ton CPT rig in which a standard Cone equipped with a 15 cm² tip advanced at a constant rate of approximately 1 inch per second.

The CPT provides a continuous record of the subsurface stratigraphy via data regarding tip and sleeve resistance which is continuously recorded electronically as the probe is advanced through the subsurface stratigraphy.

The recorded data is processed yielding interpretations of soil type based upon the anticipated engineering behavior of the various soil strata through which the probe penetrates. Graphical logs of the interpreted soil conditions at the CPT sounding locations are included in Appendix B, *Cone Penetrometer Test (CPT) Logs*.

- Laboratory Testing – Laboratory tests were performed on selected bulk soil samples at our in-house geotechnical laboratory to preliminarily evaluate the near-surface site soils for expansion potential and preliminary pavement design recommendations. The following laboratory tests were performed:
 - Expansion Index (ASTM D4829); and
 - R-value (California Test Method 301).

The results of the laboratory tests are presented in Appendix C, *Laboratory Test Results*.

- Engineering Analysis – The data obtained from our background review and subsurface field exploration were evaluated and analyzed to develop conclusions and preliminary recommendations for the proposed development.
- Report Preparation – This report presents our findings, conclusions and preliminary recommendations for the proposed development.

2.0 GEOTECHNICAL FINDINGS

2.1 Regional Geology

The site is located within the Peninsular Ranges geomorphic province of California in the southwestern margin of the Los Angeles Basin and east of the Palos Verdes Peninsula. The Peninsular Ranges province extends approximately 900 miles southward from the Santa Monica Mountains to the tip of Baja California (Yerkes, et al., 1965) and is characterized by elongated, northwest-trending mountain ridges and sediment-floored valleys. The province includes numerous northwest trending fault zones, most of which either die out, merge with, or are terminated by faults that form the southern margin of the Transverse Ranges province. These northwest trending fault zones include the San Jacinto, Whittier-Elsinore, Palos Verdes, and Newport-Inglewood fault zones.

Approximately 65 million years ago (at the end of the Cretaceous Period) a deep, structural trough existed off the coast of southern California (Yerkes, 1972). Over time the trough was filled with sediments eroded from the surrounding highlands and mountains. About 7 million years ago the boundary between the Pacific and North American plates shifted to its present position and the geologically modern Los Angeles basin began to form. The deepest part of the Los Angeles basin contains Tertiary to Quaternary-aged (65 million years and younger) marine and nonmarine sedimentary rocks that are about 24,000 feet thick (Yerkes, et al, 1965; Wright, 1991). During the Pleistocene epoch (the last two million years) the region was flooded as the sea level rose in response to the worldwide melting of the Pleistocene glaciers depositing sediments across the Los Angeles Basin during transgression and regression of sea level.

The project site is located approximately 2.7 miles to the east of the confluence of San Gabriel River and Coyote Creek channels. Regional geologic mapping of the project site and vicinity indicates that near-surface native soils beneath the site consist of Quaternary age young alluvial fan deposits comprised of varying proportions of sand, silt and clay (Saucedo et al., 2003; CGS, 2010). The surficial geologic units mapped in the vicinity of the project site are shown on Figure 3, *Regional Geology Map*.

2.2 Subsurface Conditions

The site is underlain by a relatively thin veneer of artificial fill materials overlying Quaternary-age young alluvial fan deposits. The stratigraphy of the subsurface soils as interpreted in each CPT is presented on the logs included in Appendix B, and a general description of the interpreted earth materials as encountered during the CPT exploration are described below:

2.2.1 Subsurface Soils

Based on review of the CPT interpretations (CPT-1 through CPT-12), the subsurface soils to the depth explored (50 feet bgs) contain a mixture of interbedded clay, silty clay, sandy silt, silty sand, and sand. Isolated layers of silty sand and sand on the order of less than 1 foot to approximately 10 feet thick exist at various depths primarily between approximately 25 and 45 feet bgs.

The near surface artificial fill materials across the site are generally anticipated to be on the order of 5 feet or less across the site. Localized thicker accumulations of fill materials should be anticipated during future earthwork construction. The existing artificial fill materials at the site are likely associated with the existing improvements and initial development of the site to its current configuration. However, records documenting observation and testing during fill placement were not available for review. Therefore, for purposes of this report all fill material is considered undocumented and unsuitable in its current configuration for structural support.

2.2.2 Shear Wave Velocity Profile

Shear wave velocities were measured in CPT-1, see Figure 2 for location. Results are presented in Appendix A. Based on the average shear wave velocity of about 620 feet per second recorded at CPT-1, from the ground surface down to about 50 feet bgs, the site was classified as Site Class D.

2.2.3 Groundwater Conditions

According to groundwater information obtained through the California Geological Survey (CGS) and presented in the Seismic Hazard Zone Report for the Los Alamitos Quadrangle (CGS, 1998), the historically

shallowest groundwater depth in the vicinity of the project site is between approximately 10 and 20 feet bgs. However, based on review of available groundwater information from the California Department of Water Resources Water Data Library (DWR, 2017) for a nearby groundwater monitoring well (0.7 mile west of the site, State Well # 04S11W20K002S), the groundwater levels were measured between approximately 39 and 88 feet bgs for a monitoring period between April 1995 and October 2010. In addition, for another nearby groundwater monitoring well (0.8 mile southeast of the site, State Well # 04S11W27D001S), the groundwater levels were measured between approximately 10 and 83 feet bgs for a monitoring period between December 1934 and February 1991. The shallowest groundwater levels were generally in the 1940's.

Based on the currently proposed development scheme, groundwater may pose a constraint during and after construction should subterranean levels be planned. In addition, localized zones of perched water or elevated moisture in near-surface soils may be encountered during earthwork construction. More detailed evaluation of the current groundwater level at the site should be performed during future subsurface exploration of the site in support of design level foundation studies.

2.3 Surface Fault Rupture

Our review of available in-house literature indicates that no known active faults have been mapped across the site, and the site is not located within a designated Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007). Therefore, the potential for surface fault rupture at the site is expected to be low and a surface fault rupture hazard evaluation is not mandated for this site.

The location of the closest active faults to the site was evaluated using the United States Geological Survey (USGS) Earthquake Hazards Program National Seismic Hazard Maps (USGS, 2008c). The closest active faults to the site are the Newport-Inglewood Fault Zone, Puente Hills fault, San Joaquin Hills fault and the Elsinore Fault Zone located approximately 4.7 miles, 5.8 miles, 9.7 miles and 11.8 miles from the site, respectively. The Puente Hills and San Joaquin Hills faults are blind thrust faults that are concealed at depth, without the potential for surface fault rupture. The San Andreas fault, which is the largest active fault in California, is approximately 44 miles northeast of the site. Major regional faults

with surface expression in proximity to the site are shown on Figure 4, *Regional Fault and Historic Seismicity Map*.

2.4 **Seismicity and Ground Shaking**

The principal seismic hazard to the site is ground shaking resulting from an earthquake occurring along any of several major active and potentially active faults in southern California. The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, the distance from the seismic source, and the site response characteristics. The site should be expected to experience strong ground shaking after the proposed project is developed resulting from an earthquake occurring along one or more of the major active faults (Figure 4). Accordingly, the project should be designed in accordance with all applicable current codes and standards utilizing the appropriate seismic design parameters to reduce seismic risk as defined by California Geological Survey (CGS) Chapter 2 of Special Publication 117a (CGS, 2008). The 2016 edition of the CBC is the current edition of the code. Through compliance with these regulatory requirements and the utilization of appropriate seismic design parameters selected by the design professionals, potential effects relating to seismic shaking can be reduced.

The following parameters should be considered for design under the 2016 CBC:

2016 CBC Seismic Design Parameters

Categorization/Coefficients	Code-Based ^{(1) (2) (3)}
Site Longitude (decimal degrees) West	-118.0420°
Site Latitude (decimal degrees) North	33.8041°
Site Class	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s	1.498
Mapped Spectral Response Acceleration at 1s Period, S_1	0.546
Short Period Site Coefficient at 0.2s Period, F_a	1.0
Long Period Site Coefficient at 1s Period, F_v	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.498
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.819
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	0.999
Design Spectral Response Acceleration at 1s Period, S_{D1}	0.546
1. All were derived from the USGS web page: http://earthquake.usgs.gov/designmaps/us/application.php 2. All coefficients in units of g (spectral acceleration) 3. $S_1 < 0.75g$, a site-specific evaluation is not required.	

2.5 Liquefaction Potential

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density, fine, clean sandy soils; and 3) high-intensity ground motion. Studies indicate that saturated, loose and medium dense, near-surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential.

In general, liquefaction hazards are the most severe in the upper 50 feet bgs. As shown on the State of California Seismic Hazard Zones map for the Los Alamitos Quadrangle (CGS, 1999), the project site **is** located within an area that has been identified by the State of California as being potentially susceptible to liquefaction, see Figure 5, *Seismic Hazard Map*. Accordingly, a preliminary liquefaction analysis was performed for the site. Results indicate that the potential for liquefaction at the site is moderate. The 3 CPT locations in the center of the site, within the planned parking areas, are classified as having high liquefaction potential. The rest of the CPT locations classify as having low liquefaction potential. Details are presented in Appendix D, *Liquefaction Analysis*.

2.6 Seismically-Induced Settlement

Seismically-induced settlement consists of dynamic settlement of unsaturated soil (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily within low density sandy soil due to reduction in volume during and shortly after an earthquake event.

Based on the results of our analysis, seismically-induced settlement at the site due to dry dynamic settlement (above groundwater) and settlement due to soil liquefaction (below groundwater) at the site was estimated to be on the order of ½ inch to 1¾ inches across the site. The differential settlement can be taken as one-half the total estimated settlement over a horizontal distance of 30 feet.

2.7 **Seismically-Induced Lateral Ground Displacements**

Results of the liquefaction analysis suggest that the site soils are susceptible to lateral ground displacement. Based on anticipated finish site grade having a relatively level surface, the potential for lateral ground displacement is low.

2.8 **Seismically-Induced Landsliding**

The potential for seismically-induced landsliding to occur at the site is considered low due to the absence of slopes at the site. In addition, based on review of the State of California Seismic Hazard Zones Map for the Los Alamitos Quadrangle (CGS, 1999), the site is **not** located within an area that has been identified by the State of California as being potentially susceptible to seismically induced landslides (Figure 5). Proposed slopes, if any, should be engineered and constructed at a gradient of 2:1 (horizontal:vertical) or flatter.

2.9 **Flooding**

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2008), the project site is located within a flood hazard area identified as "Zone X", which is defined as areas of 0.2% annual chance floodplain; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. Regionally, storm runoff flow is generally directed to the west to the San Gabriel River and Coyote Creek channels. As shown on Figure 6, *Flood Hazard Zone Map*, the site is located within a 500-year flood hazard zone.

2.10 **Seiches and Tsunamis**

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. Based on the absence of an enclosed water body near the site and the inland location of the site, seiche and tsunami risks at the site are considered negligible.

2.11 **Sedimentation and Erosion**

The erosion characteristics of the unconsolidated alluvial deposits exposed on any future slopes onsite are expected to be moderately susceptible to erosion.

These materials will be particularly prone to erosion during excavation and site development, especially during heavy rains.

The potential for erosion can be mitigated through the application of best management practices (BMPs) and other Storm Water Pollution Prevention Plan (SWPPPs), such as temporary catchment basins and/or sandbagging to control runoff and contain sediment transport within the project site during construction. Following completion of the project, the site is anticipated to be improved with structures, hardscape, landscaping and appropriate drainage infrastructure. Therefore, sedimentation and erosion impacts upon completion of construction are considered less than significant.

3.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

No evidence of adverse geological or geotechnical hazards was noted at the site that will preclude the development of the project as currently planned. Presented below is a summary of findings based upon the results of our due diligence geotechnical evaluation of the site:

- The site is likely underlain by a relatively thin veneer of artificial fill anticipated to be on the order of 5 feet or less overlying Quaternary age young alluvial fan deposits. However, localized thicker accumulations of fill materials should be anticipated during future earthwork construction.
- Based on review of groundwater information obtained through the California Geological Survey (CGS) and presented in the Seismic Hazard Zone Report for the Los Alamitos Quadrangle, the historically shallowest groundwater depth in the vicinity of the project site is between approximately 10 and 20 feet bgs.
- The site is not located in a designated Alquist-Priolo Earthquake Fault Zone. The nearest fault to the site with the potential for ground surface rupture is the Newport-Inglewood Fault Zone which is located approximately 4.7 miles from the site. The site is expected to experience moderate to strong ground shaking resulting from an earthquake from one of the major regional faults located in the southern California region.
- The site is located within an area shown as susceptible to liquefaction based on the California Seismic Hazard Zones Map for the Los Alamitos Quadrangle. Based on our analysis, the potential for liquefaction to occur at the site is moderate to high. Analysis of data obtained from our CPTs indicates that the seismically-induced settlement potential is estimated to be on the order of ½ inch to 1¾ inches across the site.
- The site is not located within an area shown as susceptible to seismically-induced landslides based on the California Seismic Hazard Zones Map for the Los Alamitos Quadrangle; therefore, the potential for this hazard to occur at the site is negligible.

It should be noted that a design-level geotechnical exploration, including soil borings, laboratory testing and engineering analysis is recommended and will be required during the design phase of the project to confirm our preliminary findings and to develop design geotechnical recommendations for the project suitable for submittal to the reviewing agency in pursuit of building permits. In addition, the geotechnical consultant should review the grading plan, foundation plan and specifications as they become

available to verify that the geotechnical recommendations presented in the future design-level studies for the project have been incorporated into the plans. Subsurface conditions encountered during field exploration indicate the soils underlying the site are potentially compressible when subject to heavy structural loads. Some of the clayey soil may also be susceptible to settlement over time. The settlement of the native soil under the new buildings or engineered fill should be evaluated when the building and grading plans become available. Building loads should be provided when available for the various structures such that settlement analysis can be performed during design level foundation studies.

4.0 PRELIMINARY RECOMMENDATIONS

Presented below are the preliminary geotechnical recommendations for planning purposes. A geotechnical investigation that includes additional subsurface explorations may be required once the proposed design, building loads and project plan become available for review. Design of the project in accordance with standard engineering practice, including requirements of the 2016 California Building Code (CBC), and the recommendations of the project civil and structural engineers, geotechnical consultant and others will reduce the potential for adverse geotechnical conditions impacting the proposed improvements.

The proposed structures may be supported on shallow spread-type foundations established in engineered fill. The basement floor slab (if applicable) may be supported on engineered fill. The planned excavation may require shoring to protect adjacent improvements should subterranean levels be proposed. There may be existing underground utilities that will also be impacted. Information on these utilities should be provided to Leighton for evaluation. All existing undocumented fill is recommended to be removed beneath any planned improvements. The excavation may require dewatering during construction if it extends more than approximately 5 feet bgs. Conversely, saturated subgrade soils may be encountered at this depth requiring mitigation. Any planned basement floor slab and basement walls will have to be designed for hydrostatic pressure if the basement level extends more than 5 feet bgs. A permanent dewatering system may be implemented as an alternative.

4.1 Earthwork

All site earthwork grading should be performed in accordance with the applicable local codes and in accordance with the project specifications that are prepared by the appropriate design professionals.

4.1.1 Site Preparation

Prior to construction, the site should be cleared of any vegetation, trash and/or debris within the area of proposed grading. These materials should be removed from the site. Any underground obstructions onsite should be removed. Efforts should be made to locate any existing utility lines to be removed or rerouted where interfering with the proposed construction. Any resulting cavities should be properly backfilled and compacted. After the site is cleared, the soils should be carefully observed for the removal of all unsuitable deposits. All unsuitable deposits should be excavated

and removed from proposed building/structure footprint prior to fill placement.

4.1.2 Site Grading

A majority of the project area is likely covered with artificial fill on the order of up to 5 feet bgs. Localized thicker accumulations of undocumented fill materials should be anticipated during future earthwork construction. To provide a uniform support and reduce the potential for differential settlement, all existing fill should be removed to expose suitable native soils and replaced as engineered fill to provide supports for the proposed building and other structural improvements. Removals should be performed such that a minimum of 3 feet of engineered fill is established below the bottom of all new foundations. Where feasible, overexcavation and recompaction should extend a minimum horizontal distance of 3 feet from the edges of the foundations (i.e., a 1:1 projection line down from the bottom edges of the foundations).

4.1.3 Subgrade Preparation

After excavating as recommended, the moisture content of the soils should be determined, and the soils slowly and uniformly moistened (or dried) as necessary to bring the soils to a uniform moist condition. The moisture content of the clayey soils should be brought to about 4 percent over optimum moisture content to a depth of 18 inches. The moisture content of any relatively non-expansive and predominantly granular soils should be brought to about 2 percent over optimum moisture content to a depth of 18 inches. The moisture content of the subgrade should be checked and approved by Leighton prior to placing the required fill.

All concrete slabs on grade, including floor slabs and Portland cement concrete paving, should be underlain by at least 2 feet of non-expansive fill (EI<20).

4.1.4 Fill Materials

The on-site soils are cohesive and expansive. Expansion Index (EI) testing of near surface soil collected from CPT-11 (EI=68) indicates site soils are expansive. If on-site soils are used as fill, care must be used during grading and construction to not allow the soils to become dry or

desiccated. Soils that become dry should be removed and replaced with compacted fill or properly moisture conditioned. Any imported fill soil should be approved by the geotechnical engineer prior to placement as fill.

4.1.5 Fill Placement and Compaction

Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned to at least 2 percent above optimum moisture content for sandy soils and at least 4 percent above optimum moisture content for clayey soils, and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. Aggregate base should be compacted to a minimum of 95 percent relative compaction.

4.1.6 Construction Dewatering

Due to the potentially shallow groundwater conditions that may exist at the site and the reported historic high groundwater level at the site as shallow as 10 feet bgs (CGS, 1998), temporary dewatering may be required during earthwork construction and/or construction of subterranean portions of the project (if applicable). To minimize the potential for impacting the surrounding improvements, we recommend using localized sump pumps within the excavation to remove the groundwater that enters the excavation. It is the responsibility of the contractor to design and install the dewatering system should it be required. The contractor should anticipate that continuous pumping of groundwater may be required during the excavation. Discharge of groundwater during excavation should comply with all environmental regulations and under proper National Pollutant Discharge Elimination System (NPDES) permitting. In addition, a gravel or rock layer may be needed to stabilize the excavation bottoms, reduce the potential for piping, and provide a firm working surface. Additional site-specific information to better characterize the groundwater levels at the site should be obtained during the design-level geotechnical investigation recommended to be performed during the design phase of the project.

4.2 Foundation Design

Mat foundations may be used to support the proposed structures. Spread footings may be used if the seismic and static settlements can be accommodated. Ground improvement will likely be required to enable support of planned structures on spread footings.

4.2.1 Conventional Spread Footings

Footings should be embedded a minimum 18 inches below the lowest adjacent grade. An allowable soil bearing pressure of 3,000 psf may be used for footings with a minimum width of 12 inches for continuous footings and 18 inches for isolated footings. A one-third increase in the bearing value for short duration loading, such as wind or seismic forces may be used. The ultimate bearing capacity can be taken as 9,000 psf, which does not incorporate a factor of safety. A resistance factor of 0.5 should be used for initial bearing capacity evaluation with factored loads.

The allowable bearing capacity for shallow footings is based on a total static settlement of 1 inch. Differential settlement can be taken as half the total settlement over a horizontal distance of 30 feet. Since settlement is a function of footing size and contact bearing pressure, differential settlement can be expected between adjacent columns or walls where a large differential loading condition exists. Leighton should review the settlement estimates when final foundation plans and loads for the proposed structures become available.

Resistance to lateral loads will be provided by a combination of friction between the soil and structure interface and passive pressure acting against the vertical portion of the footings structures. For calculating lateral resistance, a passive pressure of 300 psf per foot of depth to a maximum of 2,000 psf and a frictional coefficient of 0.30 may be used. Note that the passive and frictional coefficients do not include a factor of safety. The frictional resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

4.2.2 Mat Foundations

A mat foundation may be designed using an allowable bearing capacity 2,000 pounds per square foot (psf) and a modulus of subgrade reaction of 50 pounds per cubic inch (pci). Differential settlement of the mat foundation due to the static loads is expected to be on the order of ½ inch over a distance of 30 feet. The bearing capacity may be increased by one-third for wind or seismic loading. The perimeter of the mat foundation

should have a minimum embedment of 12 inches below the lowest adjacent grade.

The ultimate bearing capacity can be taken as 6,000 psf, which does not incorporate a factor of safety. A resistance factor of 0.5 should be used for initial bearing capacity evaluation with factored loads. The recommended bearing values are net value, and the weight of concrete in the footings can be taken as 50 pounds per cubic foot (pcf); the weight of soil backfill can be neglected when determining the downward loads.

4.3 Slabs-on-Grade

Concrete slabs may be designed using a modulus of subgrade reaction of 100 pci provided the subgrade is prepared as described in Section 3.1. From a geotechnical standpoint, we recommend slab-on-grade be a minimum 5 inches thick with No. 3 rebar placed at the center of the slab at 24 inches on center in each direction. The structural engineer should design the actual thickness and reinforcement based on anticipated loading conditions. Where moisture-sensitive floor coverings or equipment is planned, the slabs should be protected by a minimum 10-mil-thick vapor barrier between the slab and subgrade. A coefficient of friction of 0.35 can be used between the floor slab and the vapor barrier.

Minor cracking of concrete after curing due to drying and shrinkage is normal and should be expected; however, concrete is often aggravated by a high water/cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking. Additionally, our experience indicates that the use of reinforcement in slabs and foundations can generally reduce the potential but not eliminate for concrete cracking.

To reduce the potential for excessive cracking, concrete slabs-on-grade should be provided with construction or weakened plane joints at frequent intervals. Joints should be laid out to form approximately square panels.

4.4 Temporary Excavation and Shoring Design

All temporary excavations, including utility trenches, retaining wall excavations and foundation excavations should be performed in accordance with project plans, specifications, and all OSHA requirements. Excavations 5 feet or deeper should be laid back or shored in accordance with OSHA requirements before personnel are allowed to enter.

No surcharge loads should be permitted within a horizontal distance equal to the height of cut or 5 feet, whichever is greater from the top of the cut, unless the cut is shored appropriately. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any adjacent existing site foundation should be properly shored to maintain support of the adjacent structure.

Typical cantilever shoring should be designed based on the active fluid pressure of 35 pcf. If excavations are braced at the top and at specific design intervals, the active pressure may then be approximated by a rectangular soil pressure distribution with the pressure per foot of width equal to $25H$, where H is equal to the depth of the excavation being shored.

Adjacent to existing buildings, shoring should be designed to accommodate the surcharge pressure from existing foundations. A uniform horizontal pressure equal to $\frac{1}{2}$ of the foundation bearing pressure may be assumed for preliminary design.

4.5 Drainage and Landscaping

Building walls below grade should be waterproofed or at least dampproofed, depending upon the degree of moisture protection desired and the depth below grade. Surface drainage should be designed to direct water away from foundations and toward approved drainage devices. Irrigation of landscaping should be controlled to maintain, as much as possible, consistent moisture content sufficient to provide healthy plant growth without overwatering.

4.6 Pavement Design

To provide support for paving, the subgrade soils should be prepared as recommended in Section 3.1, *Earthwork*, of this report. The preparation of the paving area subgrade should be performed immediately prior to placement of the base course. Proper drainage of the paved areas should be provided since this

will reduce moisture infiltration into the subgrade and increase the life of the paving.

The recommended pavement sections for regular vehicles (Traffic Index up to 6) and fire apparatus (infrequent use with gross weight up to 72,000 pounds) are as follows:

Preliminary Asphalt Concrete Pavement Structural Sections

Traffic Index (TI)	Asphalt Concrete (inches)	Base (inches)
4	3	6
5	3	8
6	4	10

An R-value of 20 was assumed for the sections above. Pavement sections were estimated using methods described in the Caltrans Highway Design Manual.

Preliminary Portland Cement Concrete Pavement Structural Sections

Traffic Index (TI)	Portland Cement Concrete (inches)	Base (inches)
4	6½	4
5	7	4
6	7½	4

We have assumed that the Portland cement concrete will have a compressive strength (f'_c) of at least 3,000 pounds per square inch (psi).

All pavement construction should be performed in accordance with the Standard Specifications for Public Works Construction or Caltrans Specifications. Field observation and periodic testing, as needed during placement of the base course materials, should be undertaken to ensure that the requirements of the standard specifications are fulfilled. If the pavement is to be constructed prior to construction of the structures, we recommend that the full depth of the pavement section be placed to support heavy construction traffic.

Concrete pavement should be provided with expansion joints at regular intervals no more than 15 feet in each direction. Load transfer devices, such as dowels or

keys, are recommended at joints in the paving to reduce possible offsets. The paving sections in the above table have been developed based on the strength of unreinforced concrete. Steel reinforcing may be added to the paving to reduce cracking and to prolong the life of the paving.

5.0 LIMITATIONS

Leighton Consulting, Inc.'s work was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in California at this time. No other warranty, express or implied, is made as to the conclusions and professional opinions included in this report.

This report is issued with the understanding that it is the responsibility of the owner or a duly authorized agent acting on behalf of the owner, to ensure that information and preliminary recommendations contained herein are brought to the attention of the necessary design consultants for this project and incorporated into plans and specifications.

Until reviewed and accepted by the local governing Agency, this report may be subject to change. Changes may be required as part of the Agency review process. Leighton Consulting, Inc. assumes no risk or liability for consequential damages that may arise due to design work progressing before this report is reviewed and accepted by the reviewing Agency.

The findings of this report are considered valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the work of man on the subject or adjacent properties. In addition, changes in standards of practice may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may at some future time be invalidated wholly or partially by changes outside Leighton's control. Conditions revealed in construction excavations may be at variance with preliminary findings. If this occurs, the changed conditions must be evaluated by Leighton Consulting, Inc. and additional recommendations may be warranted based on additional observations and findings.

The conclusions and recommendations in this report are based in part upon data that were obtained from a necessarily limited number of observations, site visits, excavations, samples and testes. Such information can be obtained only with respect to the specific locations explored, and therefore may not completely define all subsurface conditions throughout the site. The nature of many sites is that differing geotechnical and/or geological conditions can occur within small distances and under varying climatic conditions. Furthermore, changes in subsurface conditions can and do occur over time. Therefore, the findings, conclusions, and recommendations presented in this report should be considered preliminary if unanticipated conditions are


encountered and additional explorations, testing and analyses may be necessary to develop alternative recommendations.



Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 2,000'	Date: November 2017
Base Map: ESRI ArcGIS Online 2017	
Thematic Information: Leighton	
Author: Leighton Geomatics (btran)	

SITE LOCATION MAP
 Proposed Commercial/Retail Development Project
 Northeast Corner of Katella Avenue and Siboney Street
 Cypress, California

Figure 1



Leighton

Figure 2

EXPLORATION LOCATION MAP

Proposed Commercial/Retail Development Project
 Northeast Corner of Katella Avenue and Siboney Street
 Cypress, California

Proj: 11829.001

Eng/Geol: CCK/JMP

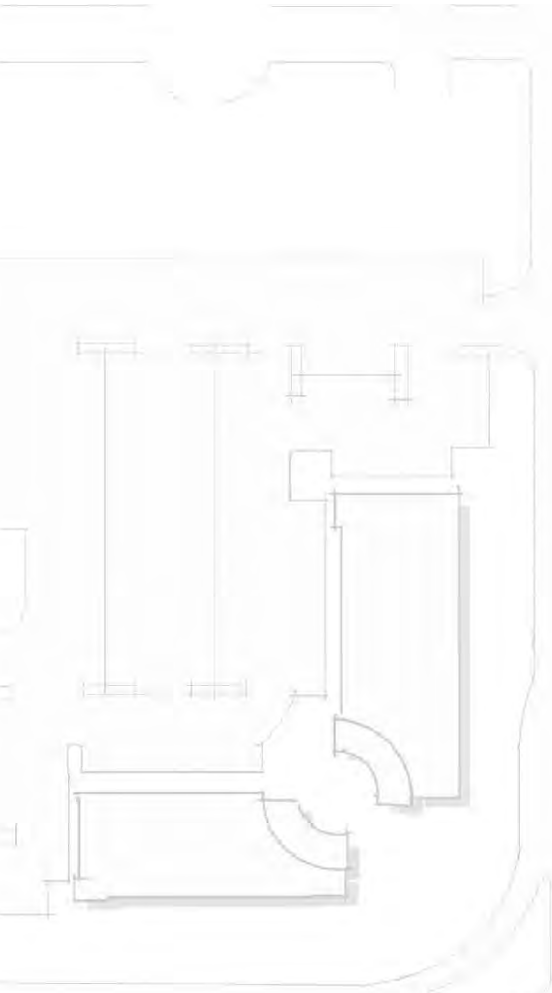
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Date: November 2017

Drafted By: BOT Checked By: BOT V:\DRAWING\11829001\CAD\2017\11-01\1182901_P02_ELM_2017-11-02.DWG (11-02-17 10:14:27AM) Plotted by: brm

LEGEND

CPT-12 Approximate location of cone penetrometer test (CPT) sounding showing total depth (T.D.) in feet below existing grade.



SUMMARY

RETAIL PARCEL	±10.89 AC
CINEMA (AMC)	± 40,005 S.F.
FITNESS (PLANET FITNESS)	± 18,200 S.F.
PADS WITH DRIVE-THRU	± 9,500 S.F.
IN-LINE RETAIL (60%)	± 10,800 S.F.
IN-LINE F&B (40%)	± 7,200 S.F.
GLA	± 85,705 S.F.

PARKING REQUIRED

CINEMA (@1/3SEATS X ±1,164 SEATS)	388 STALLS
FITNESS (@5/1000 X 18.2)	91 STALLS
RESTAURANTS (@10/1000 X 16.7K)	167 STALLS
RETAIL (@4/1000 X 10.8K)	44 STALLS
TOTAL REQ.	690 STALLS
PARKING PROVIDED	±685 STALLS
OVERALL RATIO	7.9/1000

HOTEL PARCEL

HOTEL PARCEL	±2.4 AC
#FLOOR	4-STORY
#ROOM	±100 ROOMS
PARKING PROVIDED	±106 STALLS

LEGEND

▽ PROPOSED SIGNAGE LOCATION



KATELLA AVE & SIBONEY ST.
 CYPRESS, CA

PROPOSED SITE PLAN: (AMC + PLANET FITNESS)

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OCTOBER - 5 - 2017

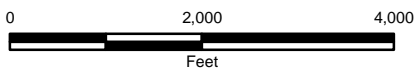
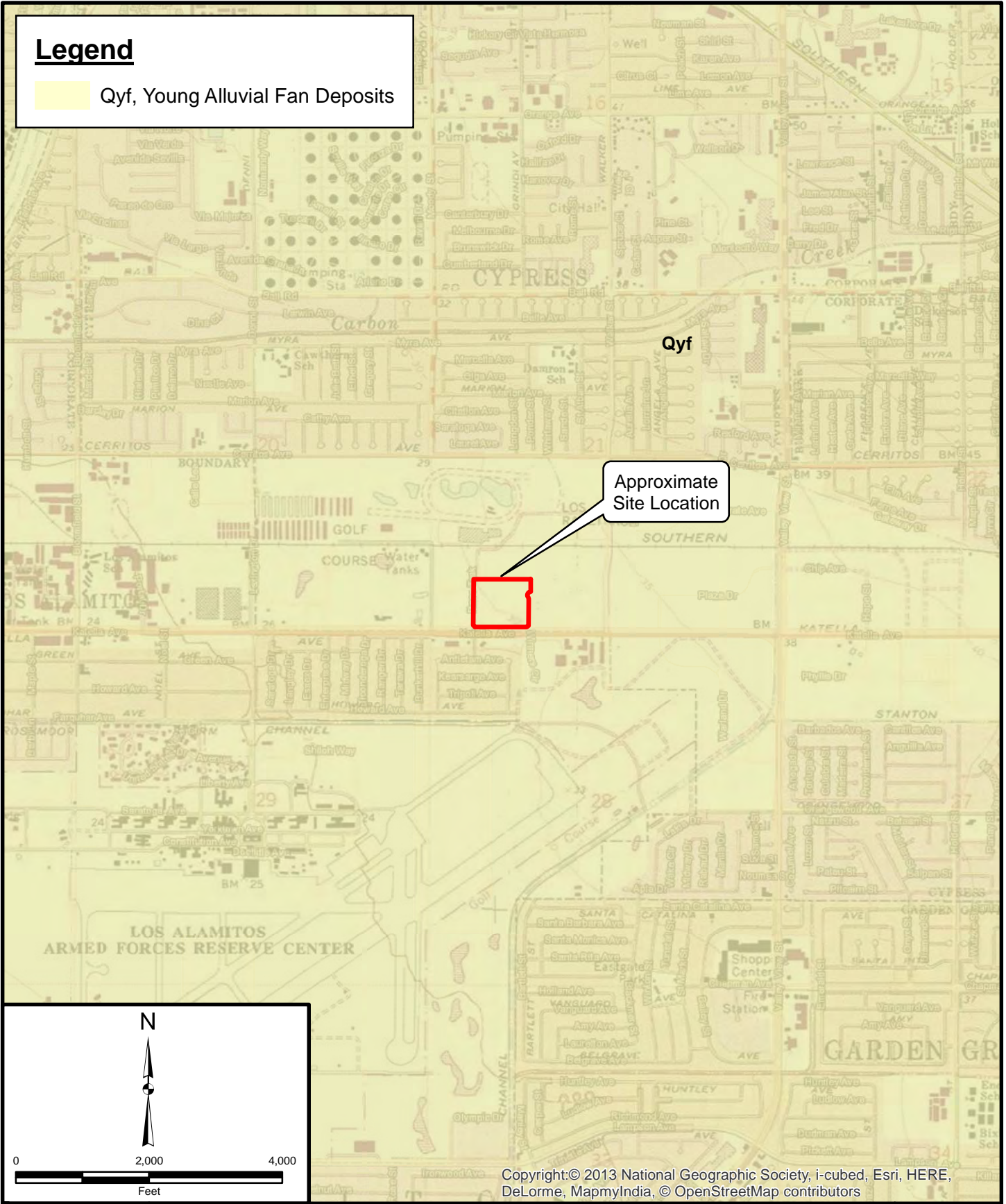
00-0000-00

700 S FLOWER ST
 22ND FLOOR
 LOS ANGELES, CA 90017



Legend

 Qyf, Young Alluvial Fan Deposits



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Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 2,000'	Date: November 2017

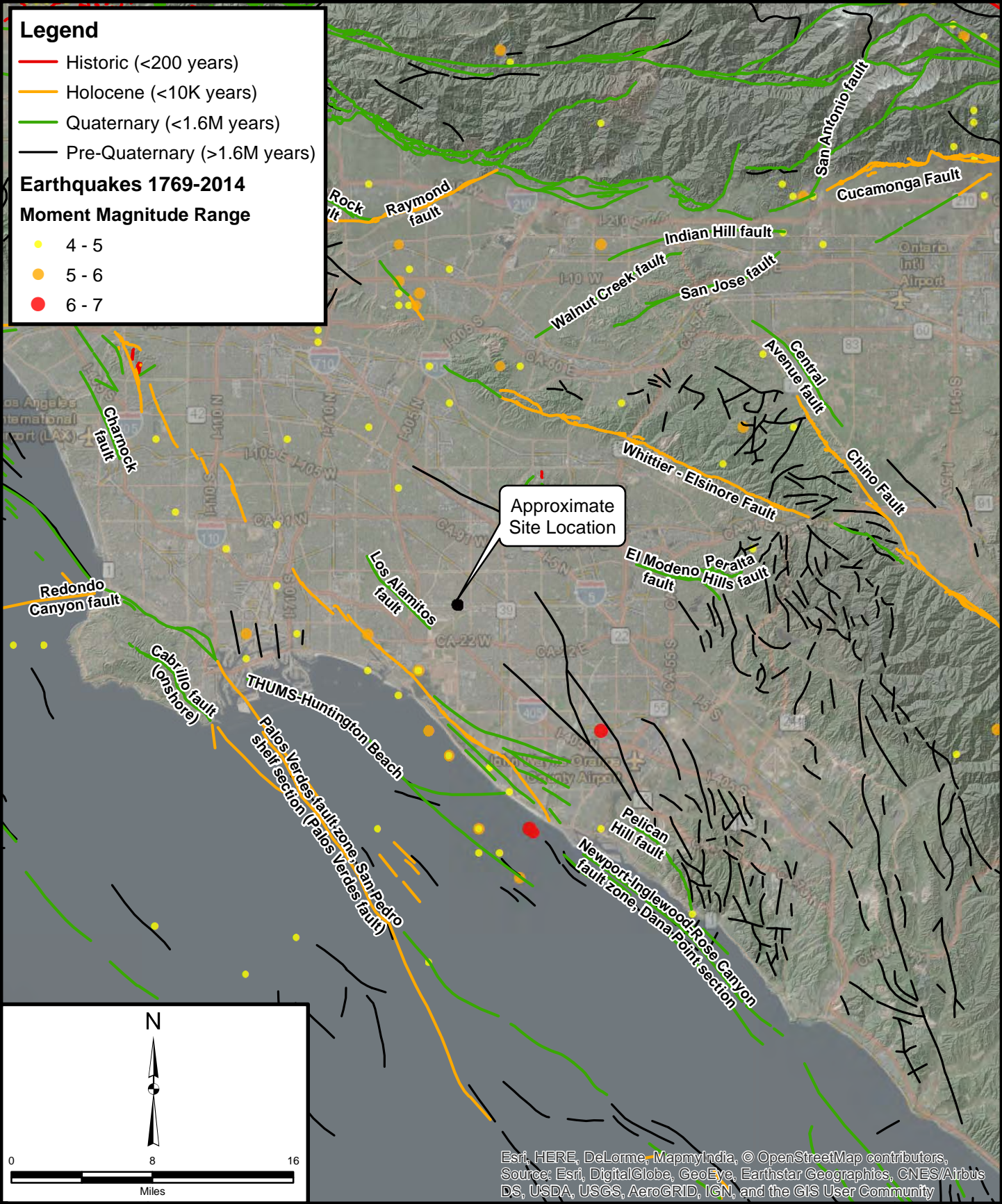
Base Map: ESRI ArcGIS Online 2017
 Thematic Information: Leighton, USGS
 Author: Leighton Geomatics (btran)

REGIONAL GEOLOGY MAP
 Proposed Commercial/Retail Development Project
 Northeast Corner of Katella Avenue and Siboney Street
 Cypress, California

Figure 3



Leighton



Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 8 miles	Date: November 2017
Base Map: ESRI ArcGIS Online 2017 Thematic Information: Leighton, CGS, Bryant 2010 Author: Leighton Geomatics (btran)	

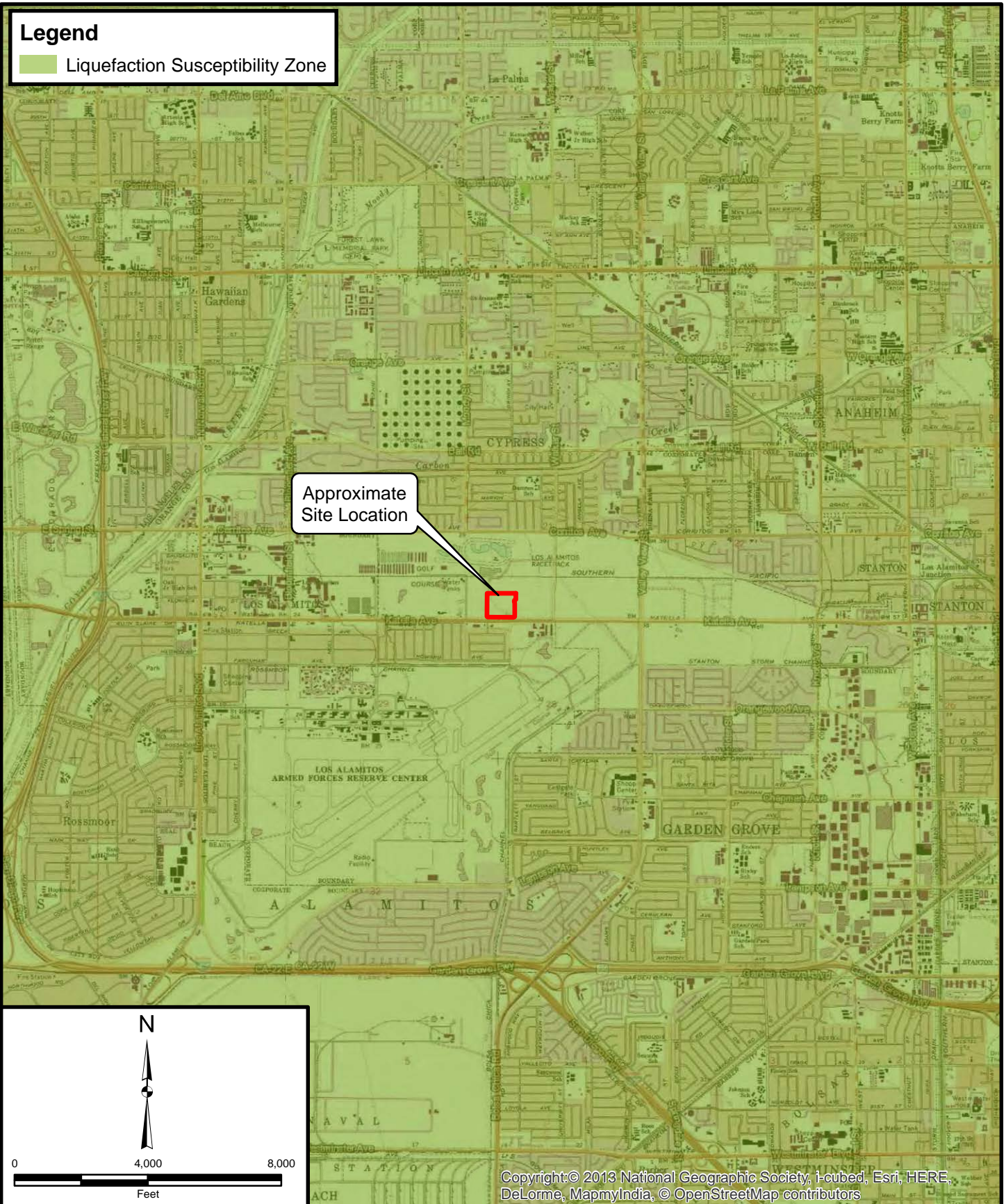
**REGIONAL FAULT AND
 HISTORIC SEISMICITY MAP**
 Proposed Commercial/Retail Development Project
 Northeast Corner of Katella Avenue and Siboney Street
 Cypress, California

Figure 4

Leighton

Legend

Liquefaction Susceptibility Zone



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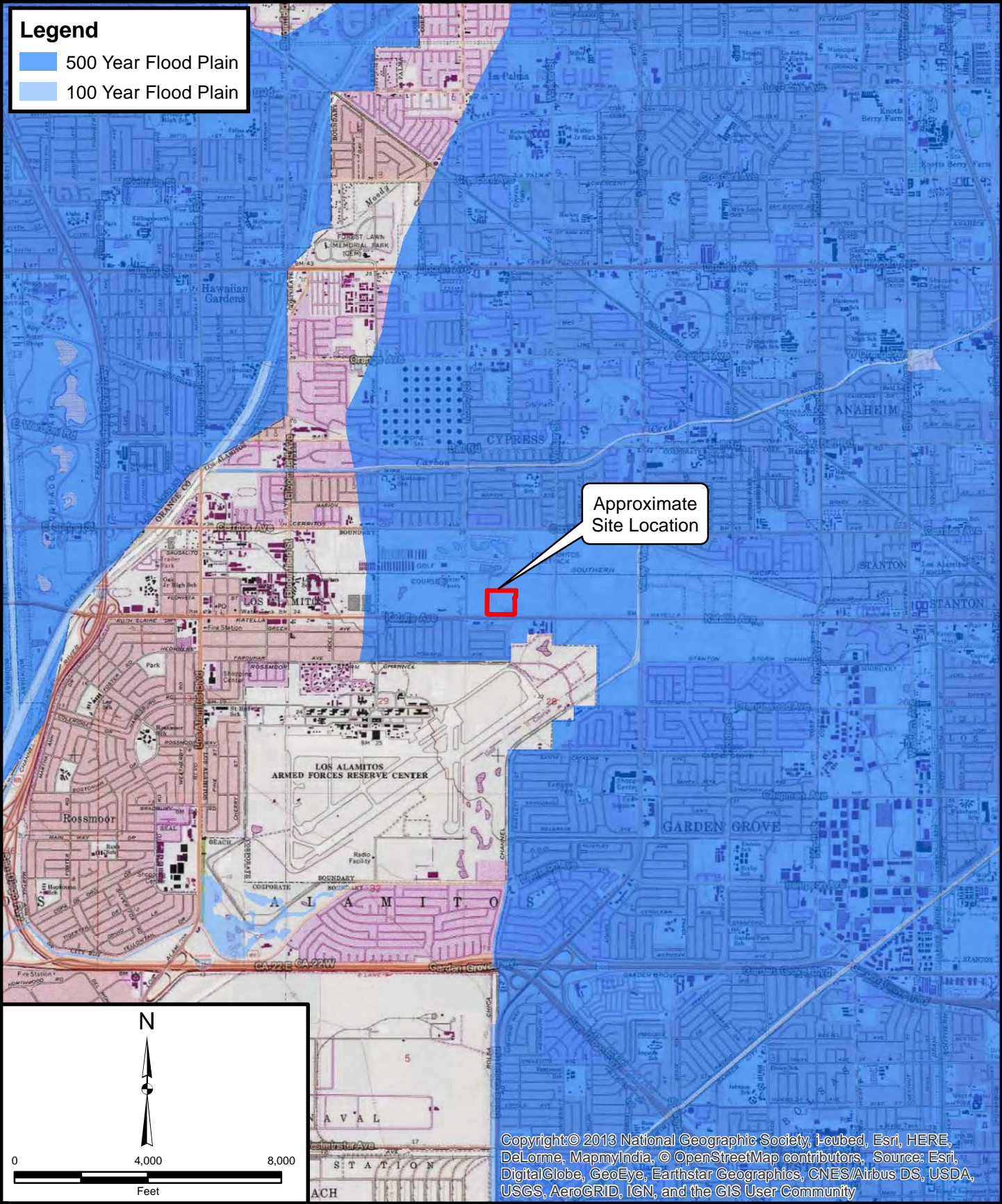
Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 4,000'	Date: November 2017
Base Map: ESRI ArcGIS Online 2017 Thematic Information: Leighton, CGS Author: Leighton Geomatics (btran)	

SEISMIC HAZARD MAP

Proposed Commercial/Retail Development Project
Northeast Corner of Katella Avenue and Siboney Street
Cypress, California

Figure 5

Leighton



Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 4,000'	Date: November 2017
Base Map: ESRI ArcGIS Online 2017	
Thematic Information: Leighton, CA DWR, FEMA	
Author: Leighton Geomatics (btran)	

FLOOD HAZARD ZONE MAP

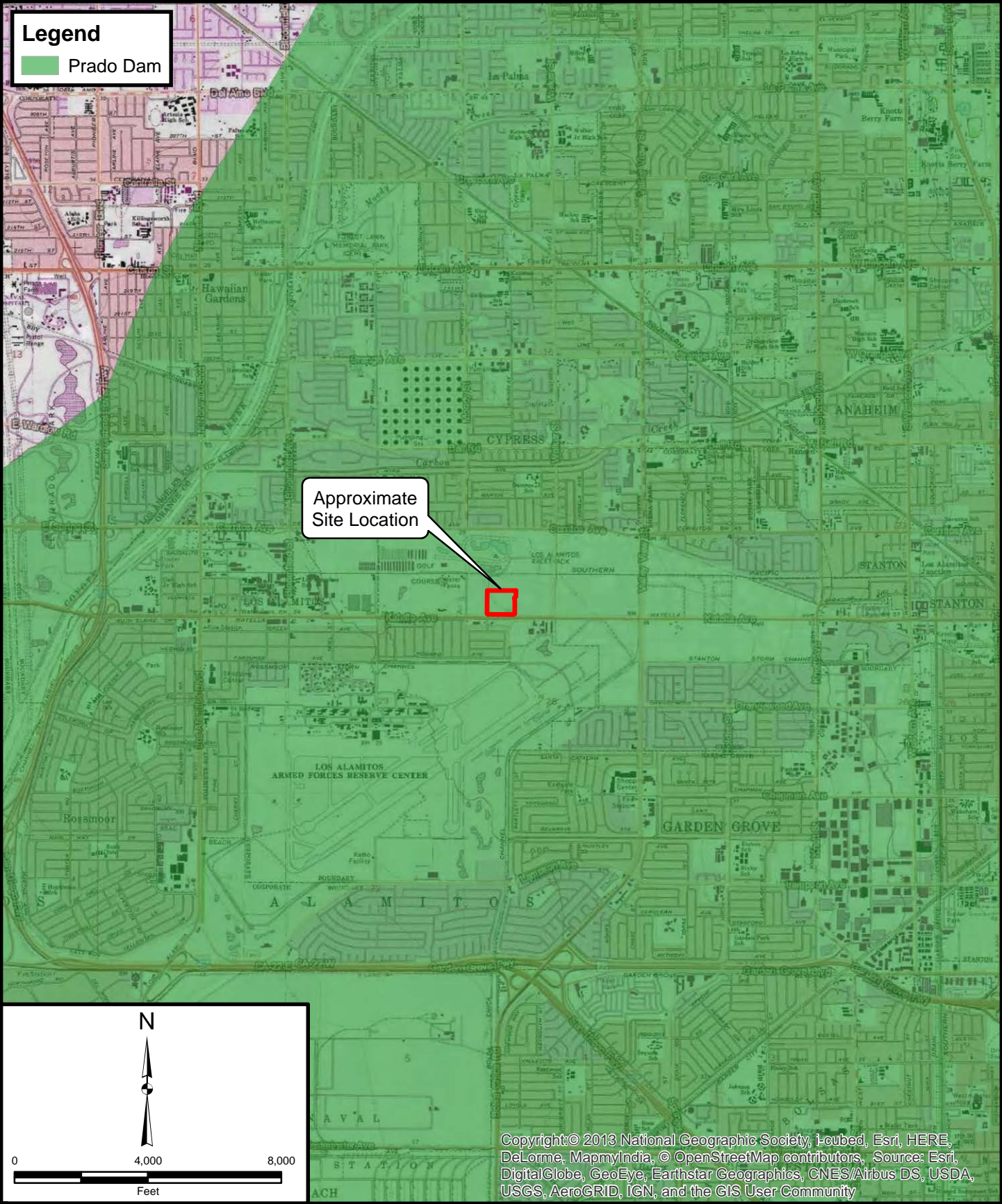
Proposed Commercial/Retail Development Project

Northeast Corner of Katella Avenue and Siboney Street Cypress, California

Figure 6

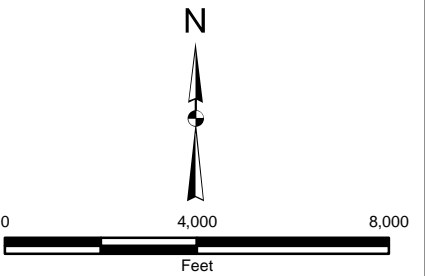
Leighton

Copyright: © 2013 National Geographic Society, i-cubed, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend
 Prado Dam

Approximate Site Location



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Project: 11829.001	Eng/Geol: CCK/JMP
Scale: 1" = 4,000'	Date: November 2017
Base Map: ESRI ArcGIS Online 2017 Thematic Information: Leighton, CA DWR, FEMA Author: Leighton Geomatics (btran)	

DAM INUNDATION MAP

Proposed Commercial/Retail Development Project
 Northeast Corner of Katella Avenue and Siboney Street
 Cypress, California

Figure 7



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APPENDIX A REFERENCES



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APPENDIX A

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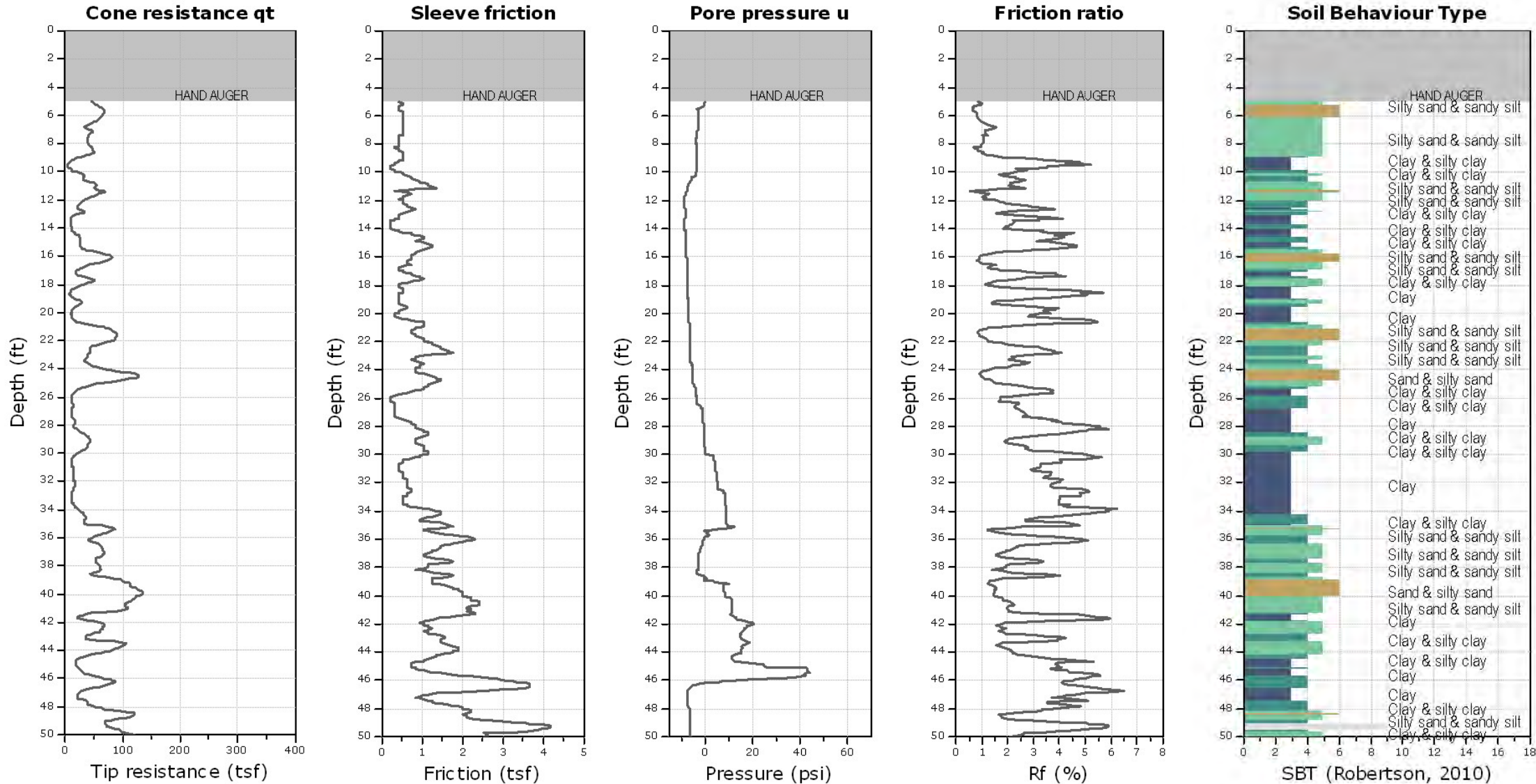
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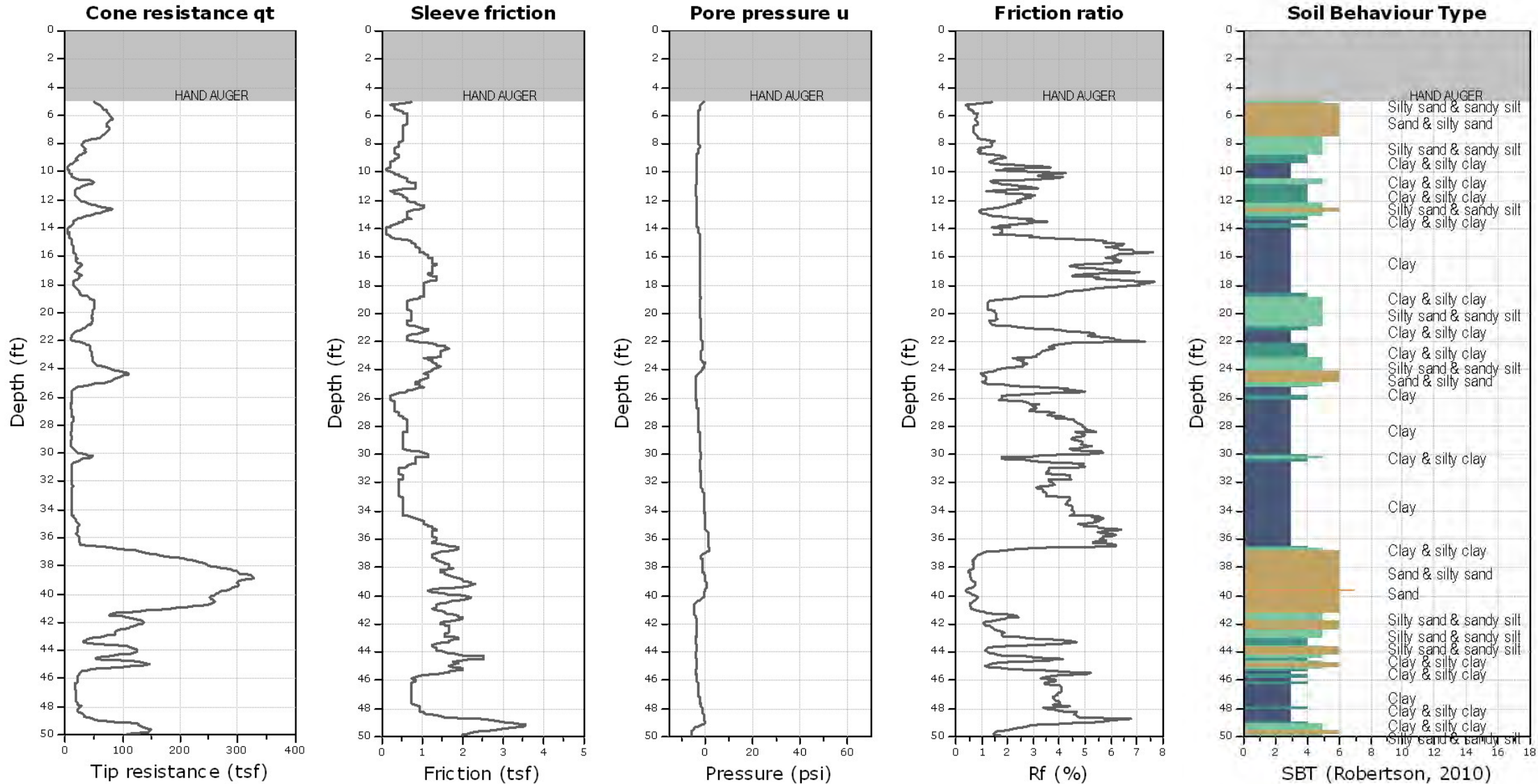
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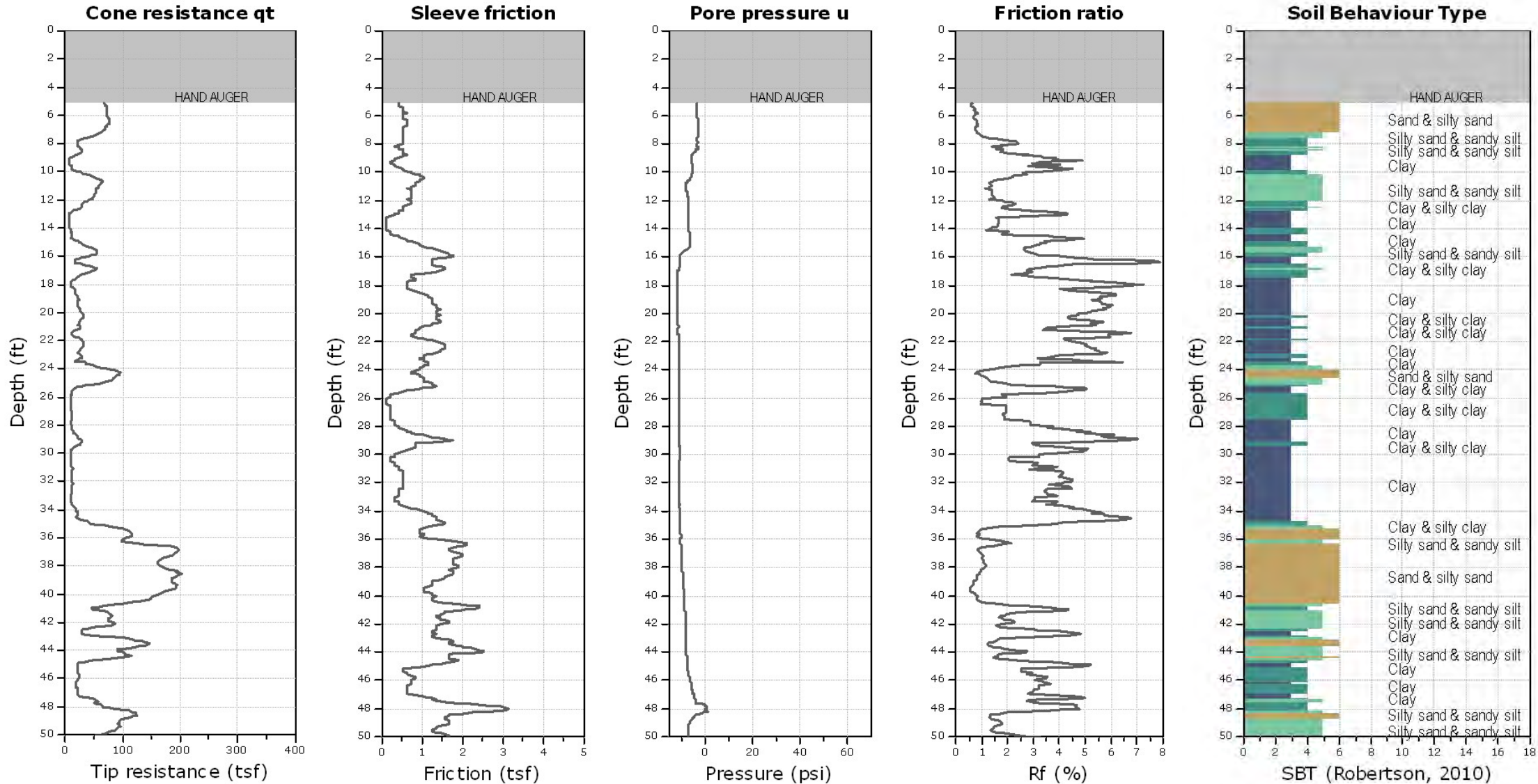
APPENDIX B
CONE PENETROMETER TEST (CPT) LOGS

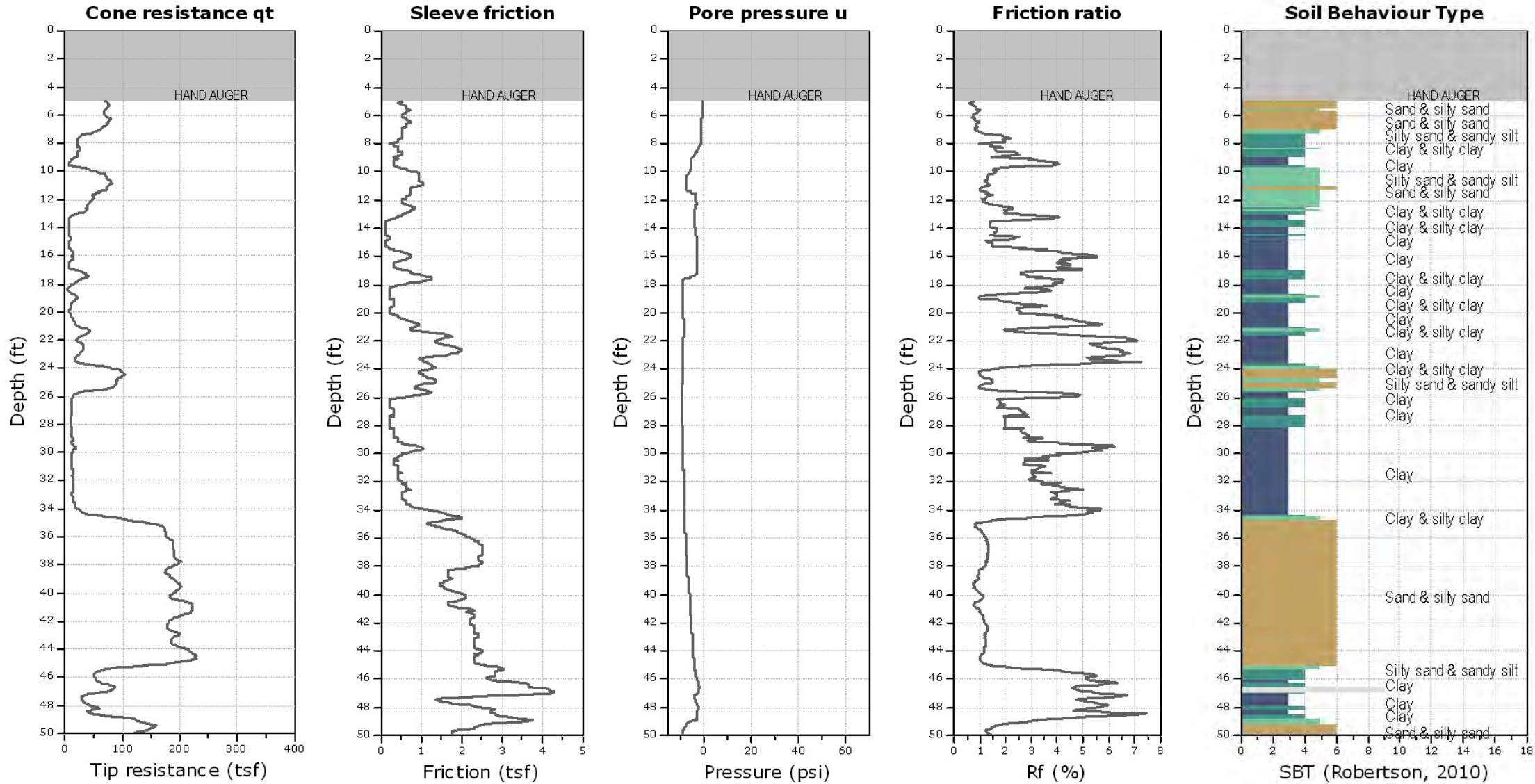


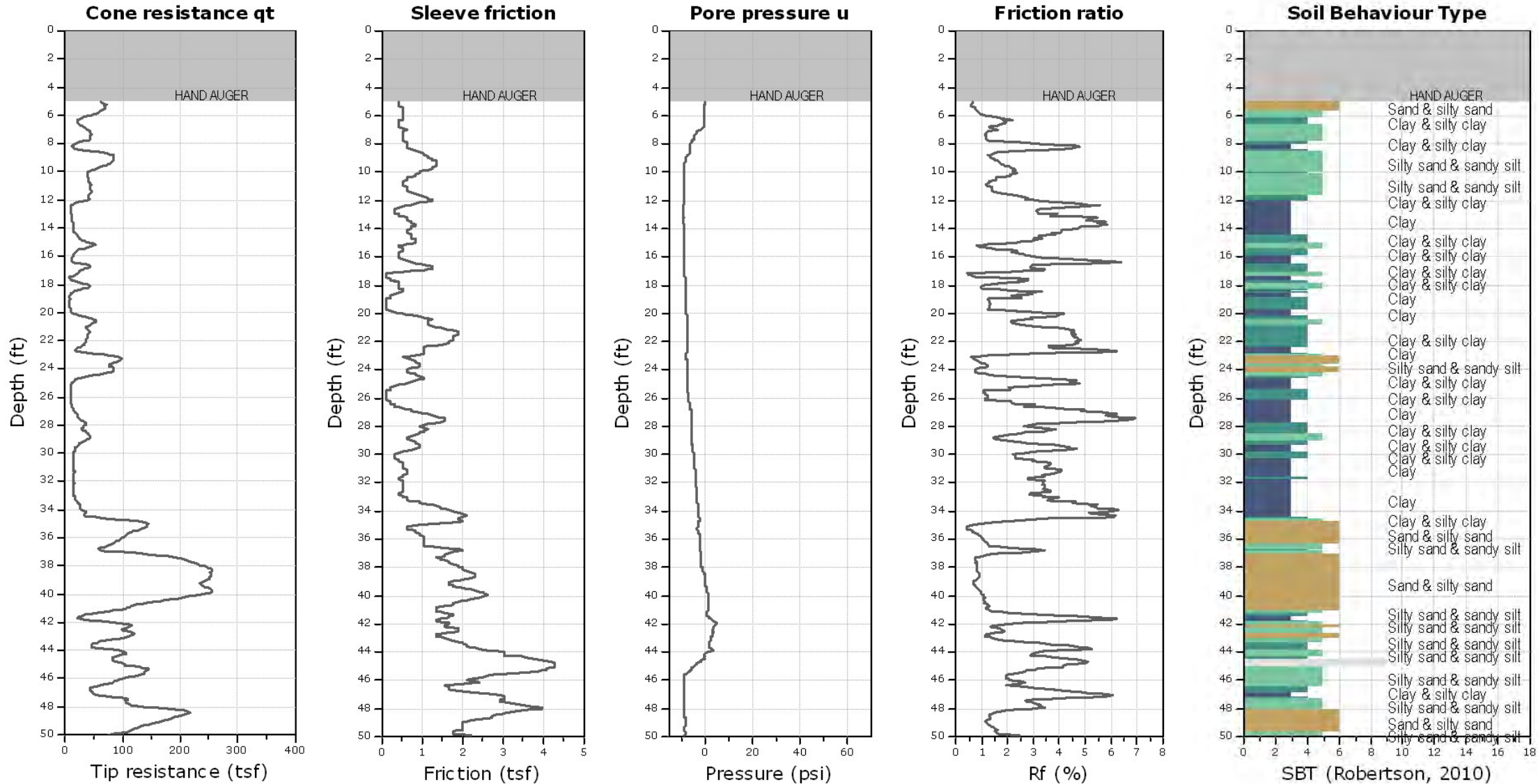
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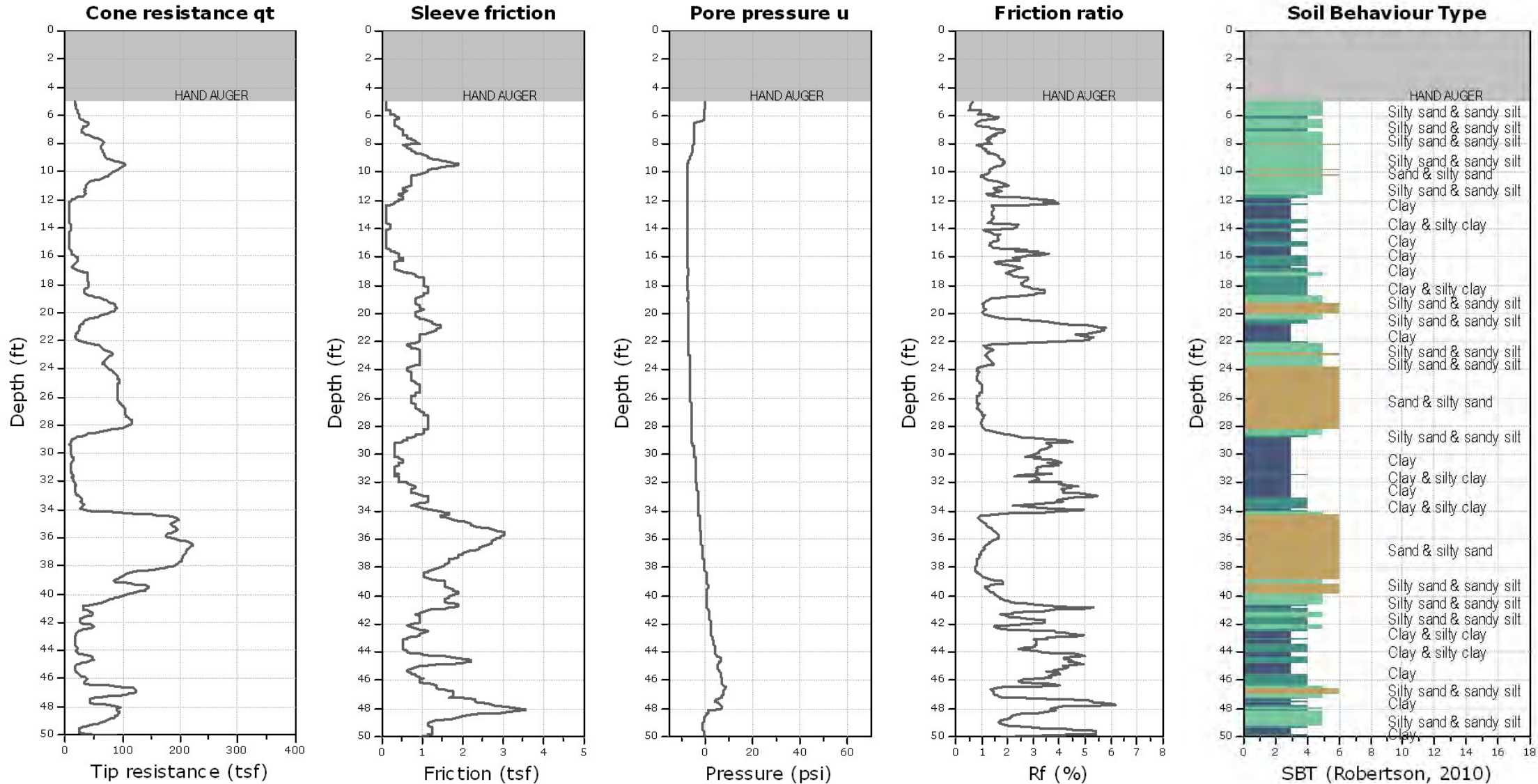


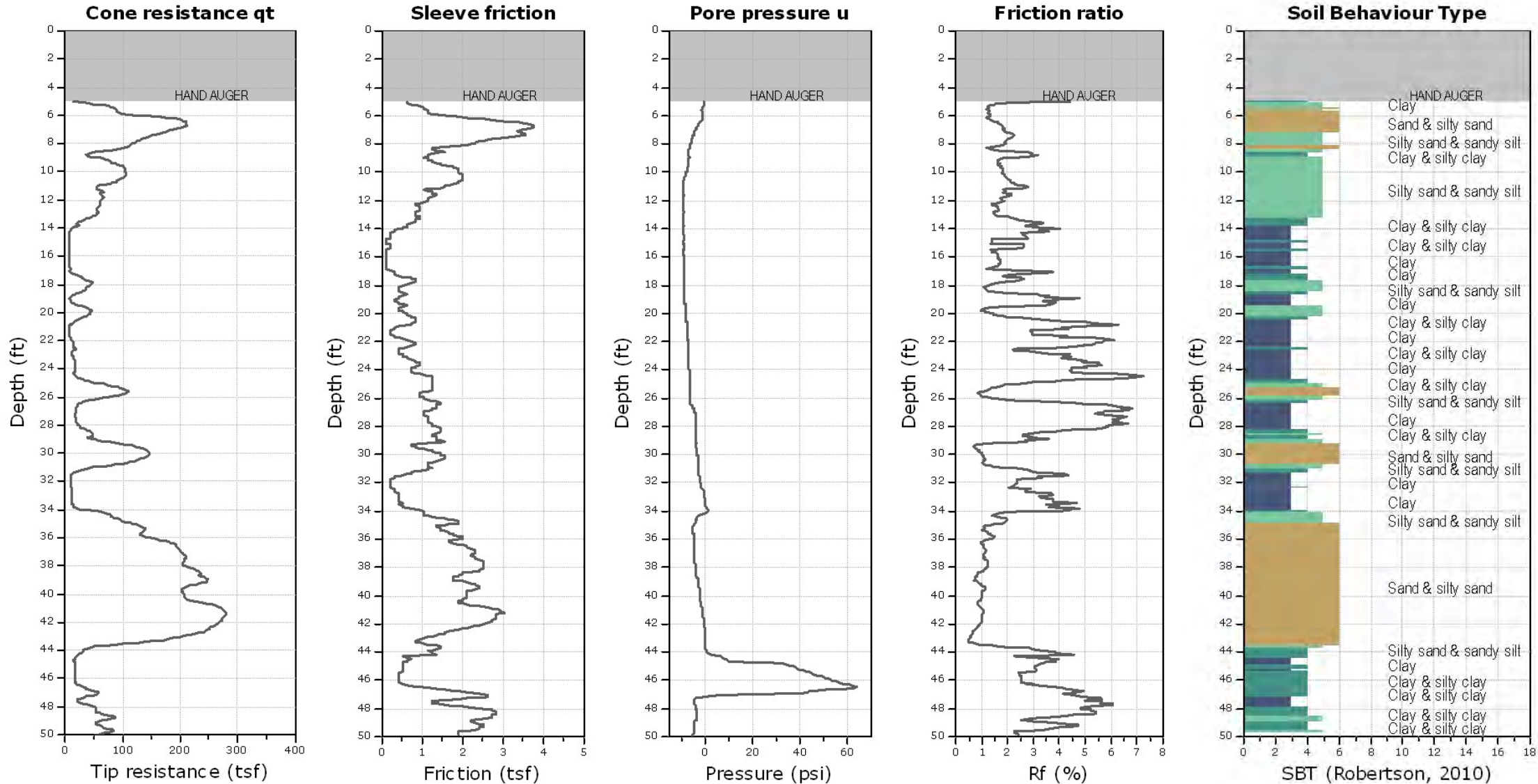


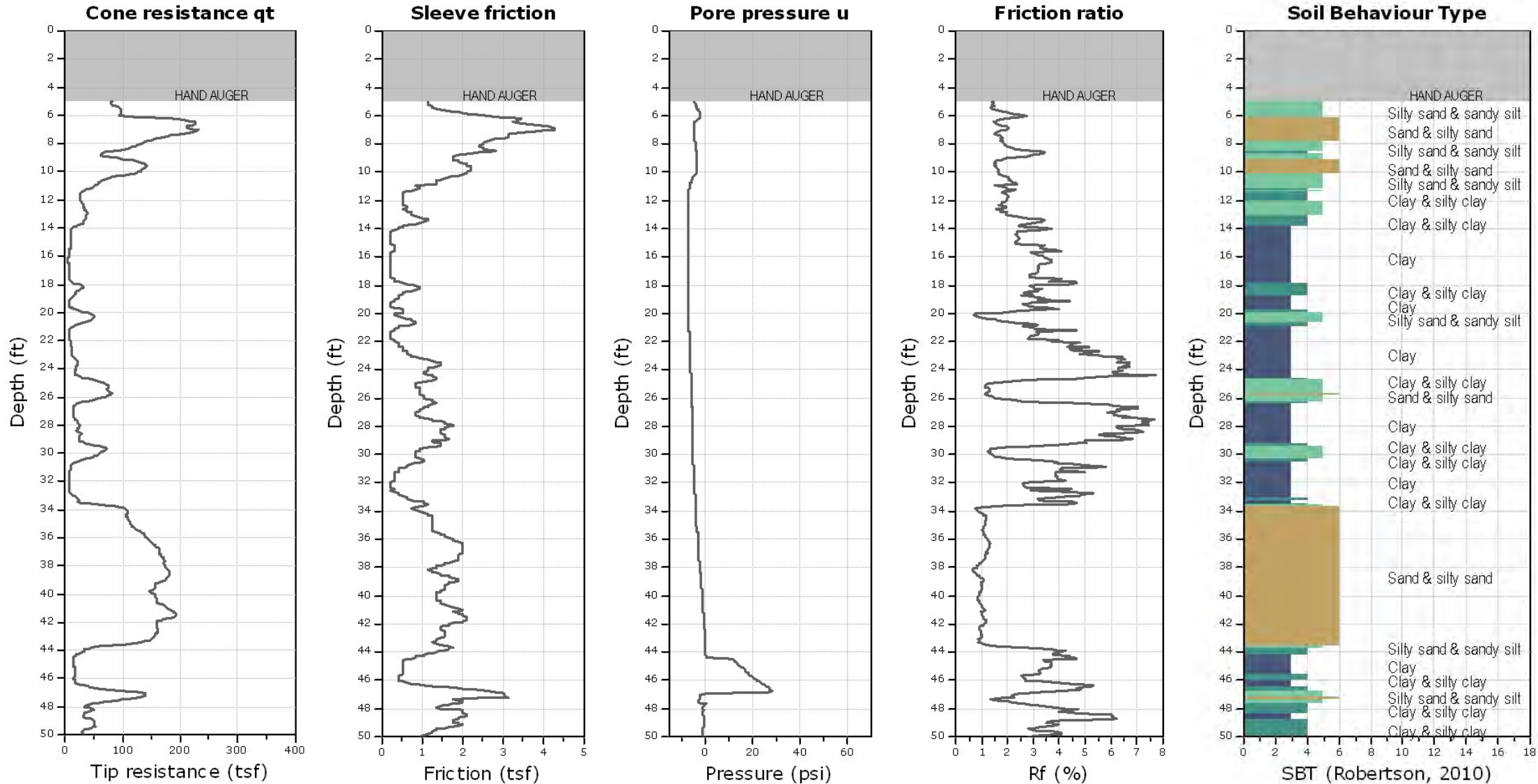


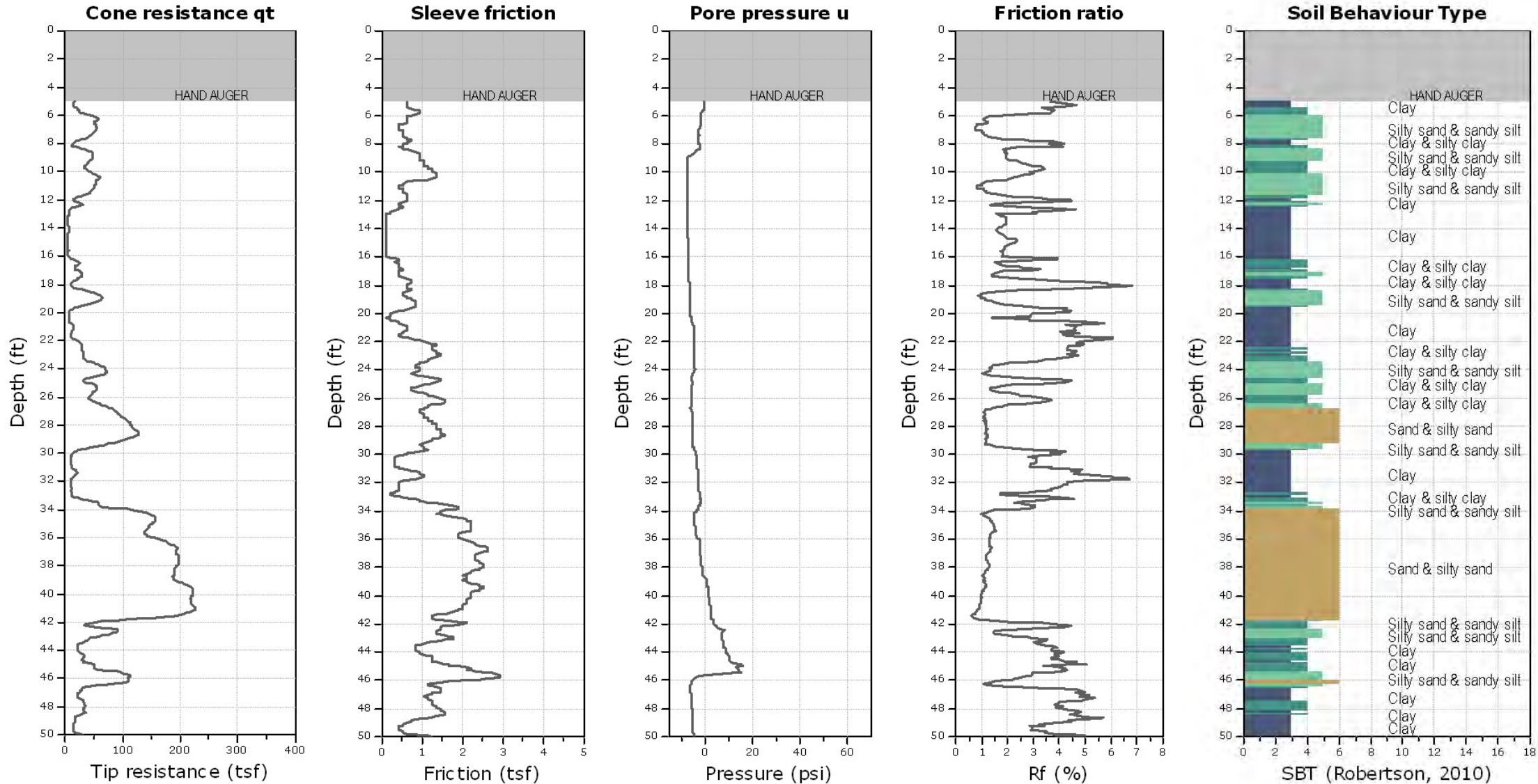


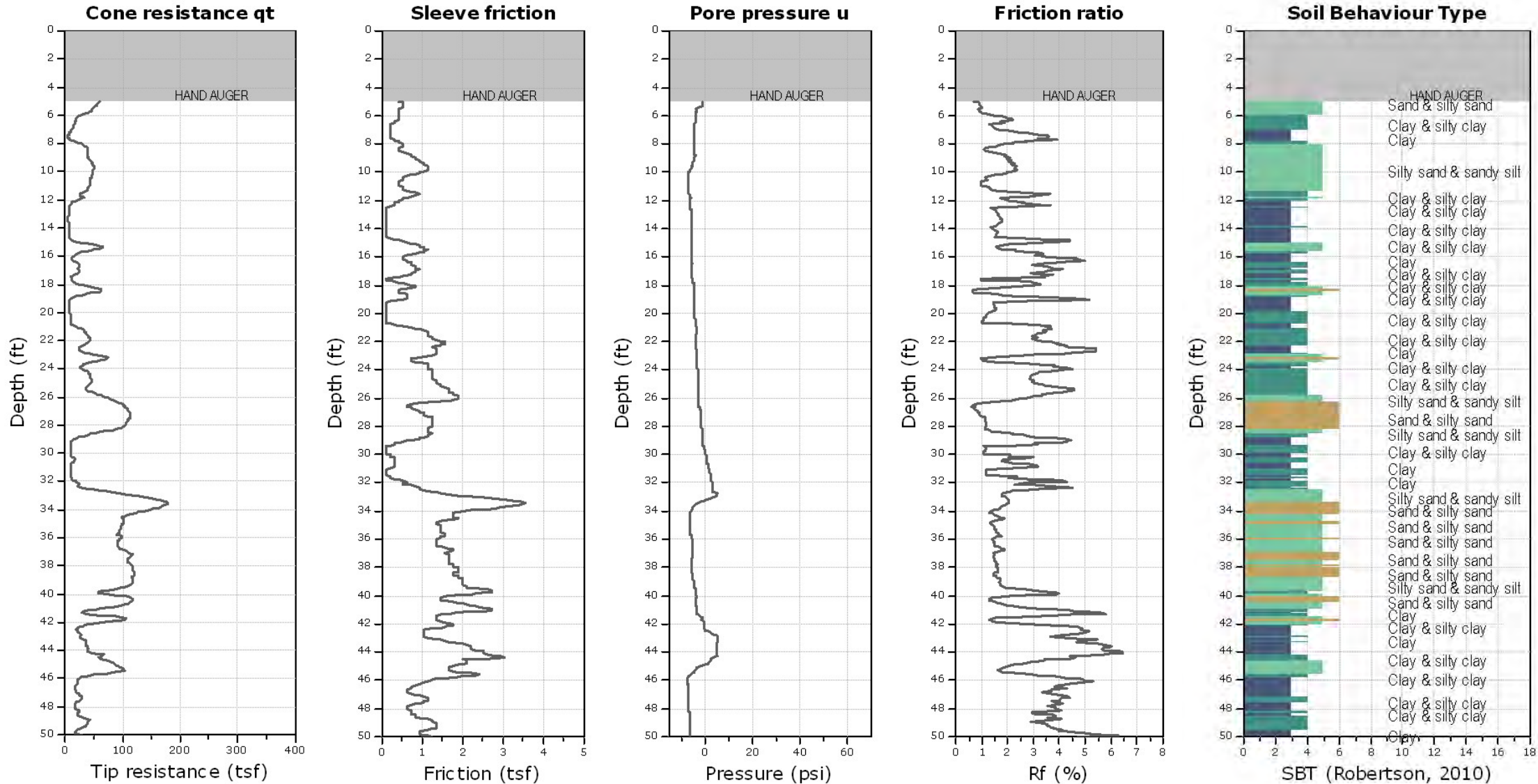


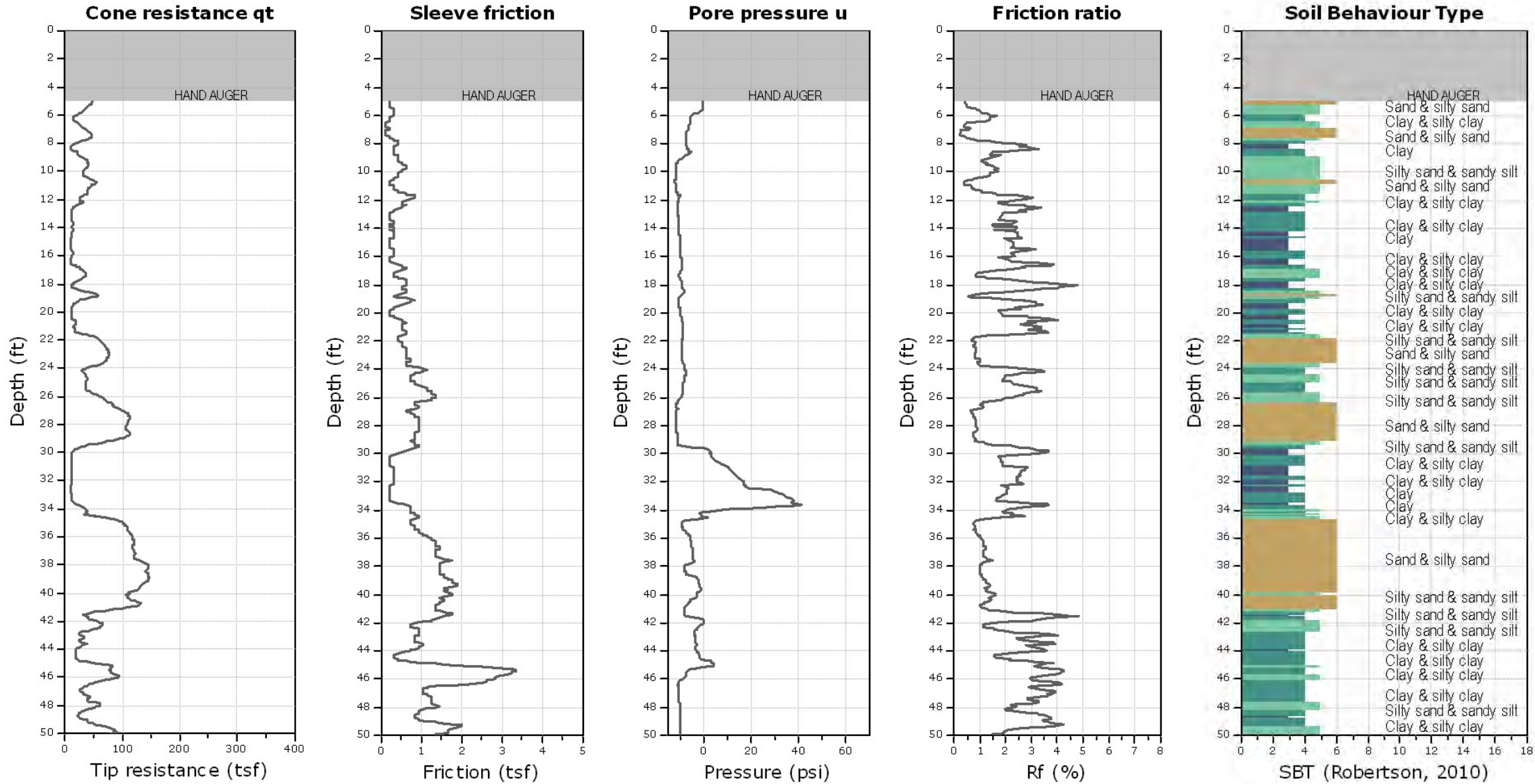


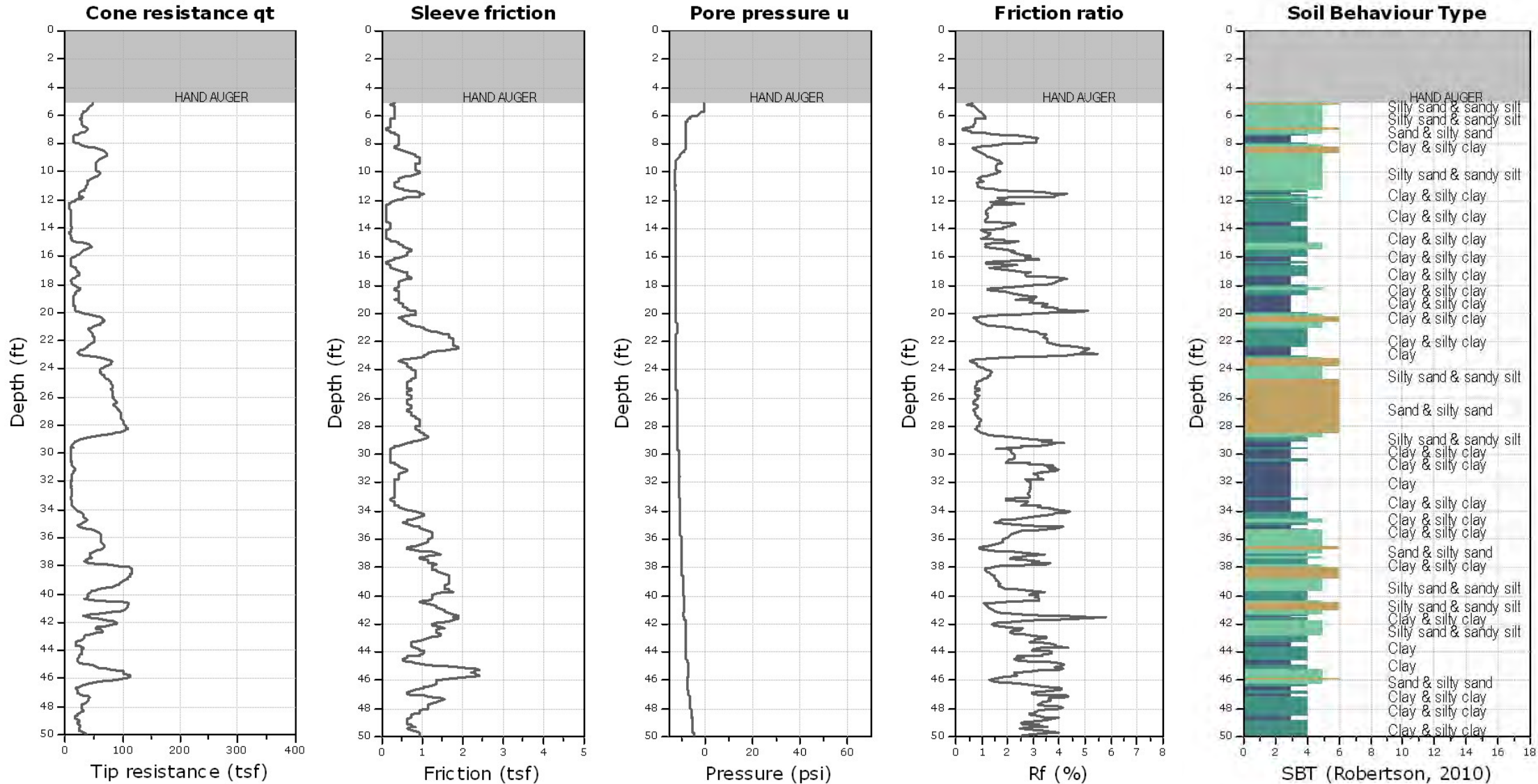












Siboney St & Katella Ave
Cypress, CA

CPT Shear Wave Measurements

	Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
CPT-1	5.15	4.15	6.50	9.32	697.20	
	10.07	9.07	10.36	17.96	576.66	446.64
	15.09	14.09	14.95	29.44	507.84	400.17
	20.05	19.05	19.70	38.64	509.71	515.69
	25.00	24.00	24.52	46.24	530.18	634.22
	30.05	29.05	29.48	53.52	550.77	681.57
	35.07	34.07	34.43	61.88	556.48	593.04
	40.09	39.09	39.41	68.52	575.14	749.03
	45.08	44.08	44.36	75.16	590.24	746.11
	50.00	49.00	49.25	81.16	606.88	815.30

Shear Wave Source Offset = 5 ft

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

APPENDIX C
LABORATORY TEST RESULTS



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EXPANSION INDEX of SOILS
ASTM D 4829

Project Name: Shea/Cypress Tested By: S. Felter Date: 10/30/17
 Project No.: 11829.001 Checked By: J. Ward Date: 10/31/17
 Boring No.: CPT-11 Depth (ft.): 0-5
 Sample No.: BB-1
 Soil Identification: Brown sandy lean clay s(CL)

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0665
Wt. Comp. Soil + Mold (g)	584.20	427.54
Wt. of Mold (g)	196.20	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	0	0
Wet Wt. of Soil + Cont. (g)	787.90	623.74
Dry Wt. of Soil + Cont. (g)	713.10	547.33
Wt. of Container (g)	0.00	196.20
Moisture Content (%)	10.49	21.76
Wet Density (pcf)	117.0	120.9
Dry Density (pcf)	105.9	99.3
Void Ratio	0.592	0.698
Total Porosity	0.372	0.411
Pore Volume (cc)	76.9	90.7
Degree of Saturation (%) [S _{meas}]	47.9	84.2

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
10/30/17	12:26	1.0	0	0.1010
10/30/17	12:36	1.0	10	0.1000
Add Distilled Water to the Specimen				
10/30/17	14:57	1.0	141	0.1255
10/31/17	6:31	1.0	1075	0.1675
10/31/17	7:37	1.0	1141	0.1675

Expansion Index (EI _{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	68
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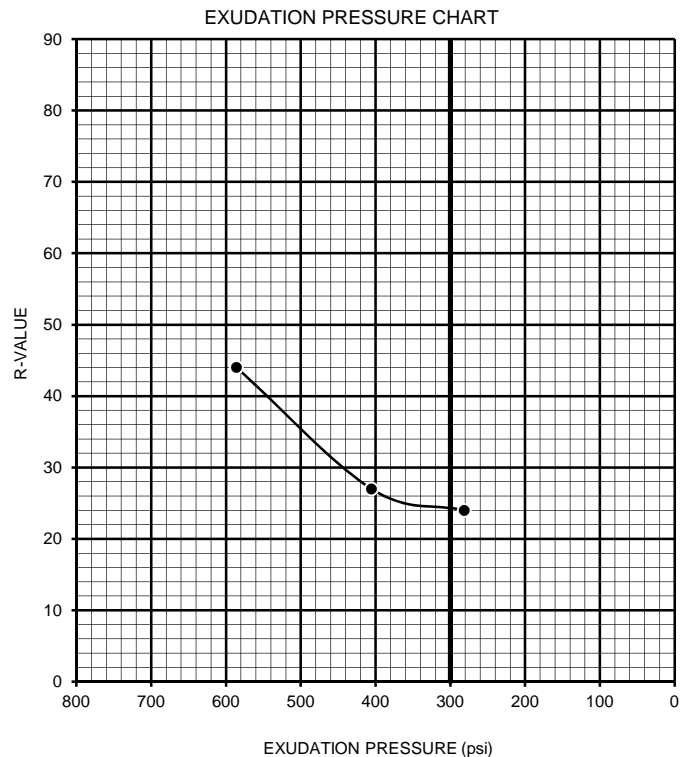
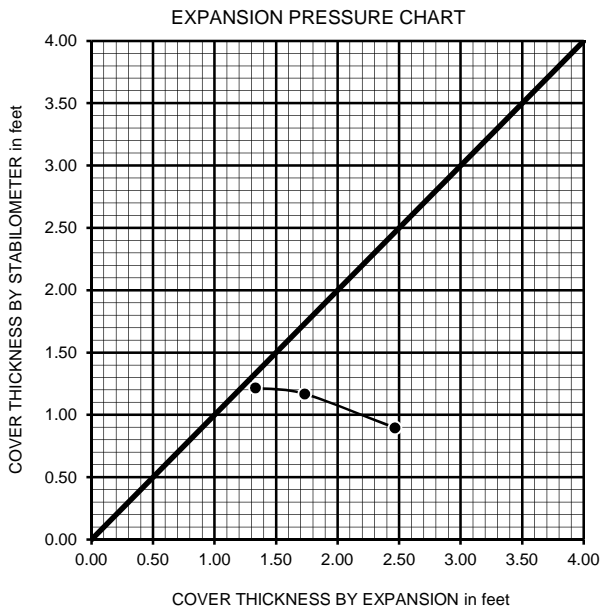
R-VALUE TEST RESULTS

DOT CA Test 301

PROJECT NAME: Shea/Cypress PROJECT NUMBER: 11829.001
 BORING NUMBER: CPT-11 DEPTH (FT.): 0-5
 SAMPLE NUMBER: BB-1 TECHNICIAN: S. Felter
 SAMPLE DESCRIPTION: Brown sandy lean clay s(CL) DATE COMPLETED: 10/31/2017

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	16.0	16.4	17.4
HEIGHT OF SAMPLE, Inches	2.48	2.44	2.44
DRY DENSITY, pcf	115.8	116.9	115.7
COMPACTOR PRESSURE, psi	300	225	75
EXUDATION PRESSURE, psi	586	405	281
EXPANSION, Inches x 10exp-4	74	52	40
STABILITY Ph 2,000 lbs (160 psi)	70	98	103
TURNS DISPLACEMENT	4.03	4.00	4.18
R-VALUE UNCORRECTED	44	28	25
R-VALUE CORRECTED	44	27	24

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.90	1.17	1.22
EXPANSION PRESSURE THICKNESS, ft.	2.47	1.73	1.33



R-VALUE BY EXPANSION: 24
 R-VALUE BY EXUDATION: 24
 EQUILIBRIUM R-VALUE: 24

APPENDIX D
LIQUEFACTION ANALYSIS

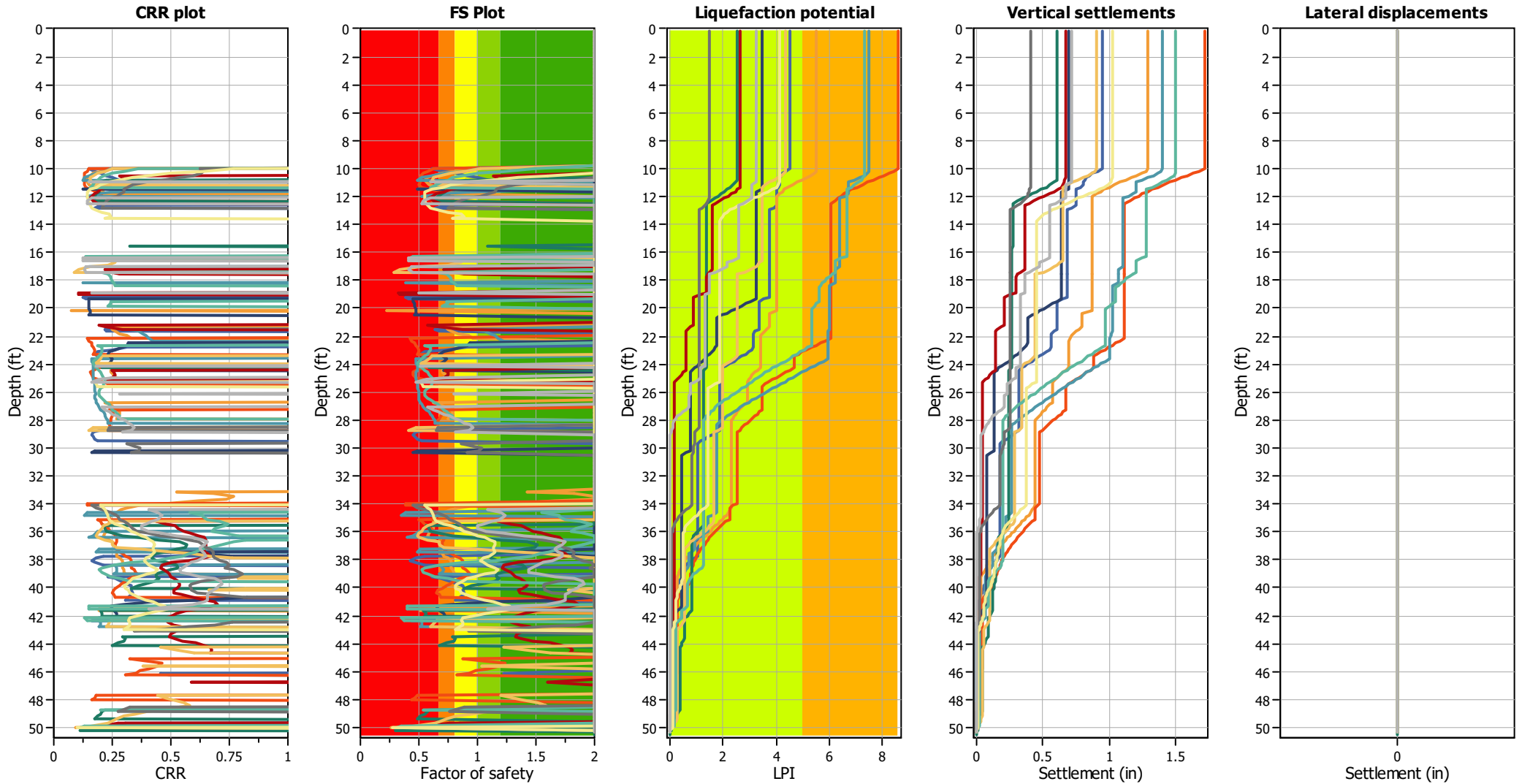


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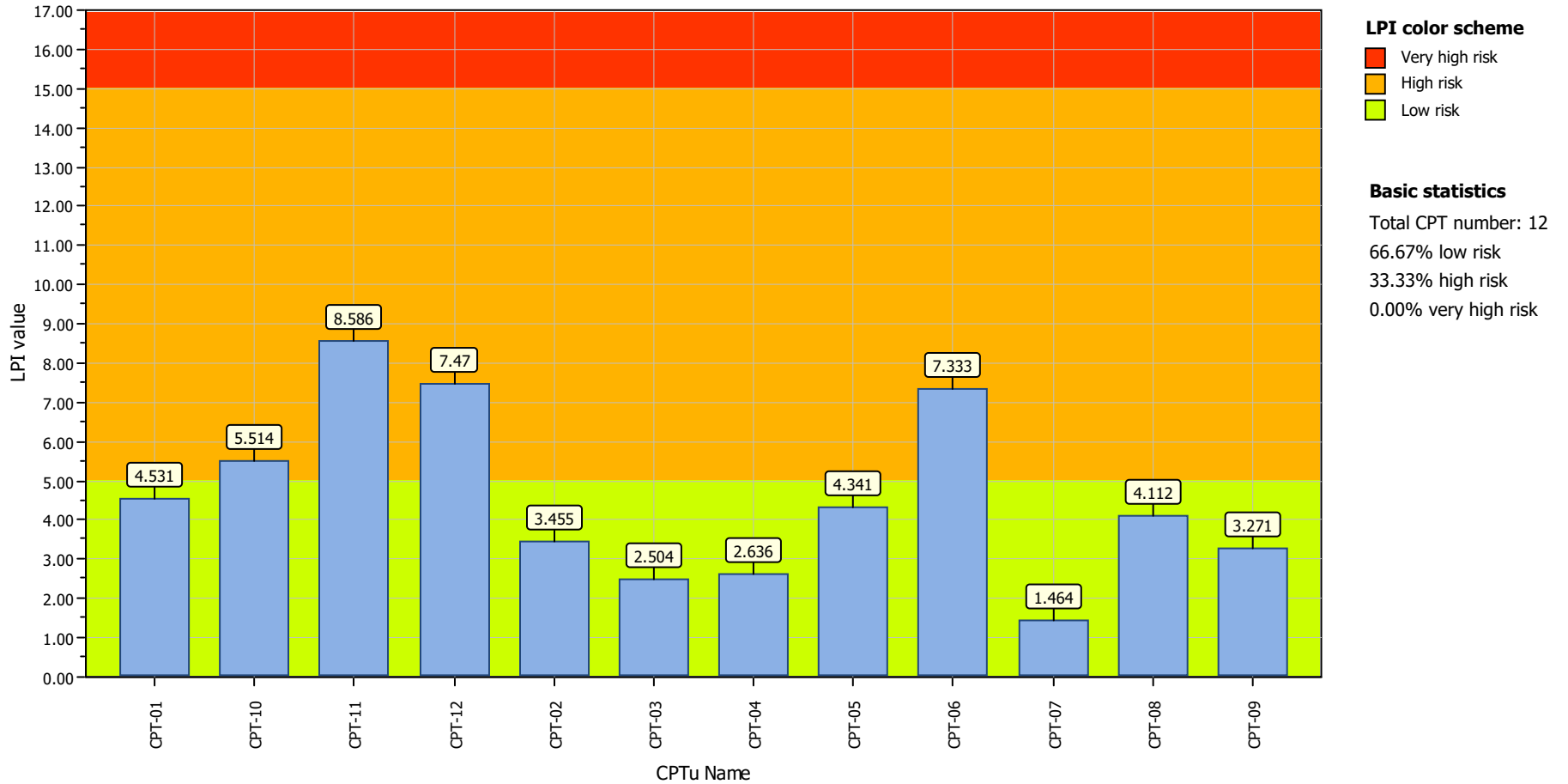
Project: Shea Properties - Cypress Project

Overlay Cyclic Liquefaction Plots



Project title : Shea Properties - Cypress Project
Location : Cypress, CA

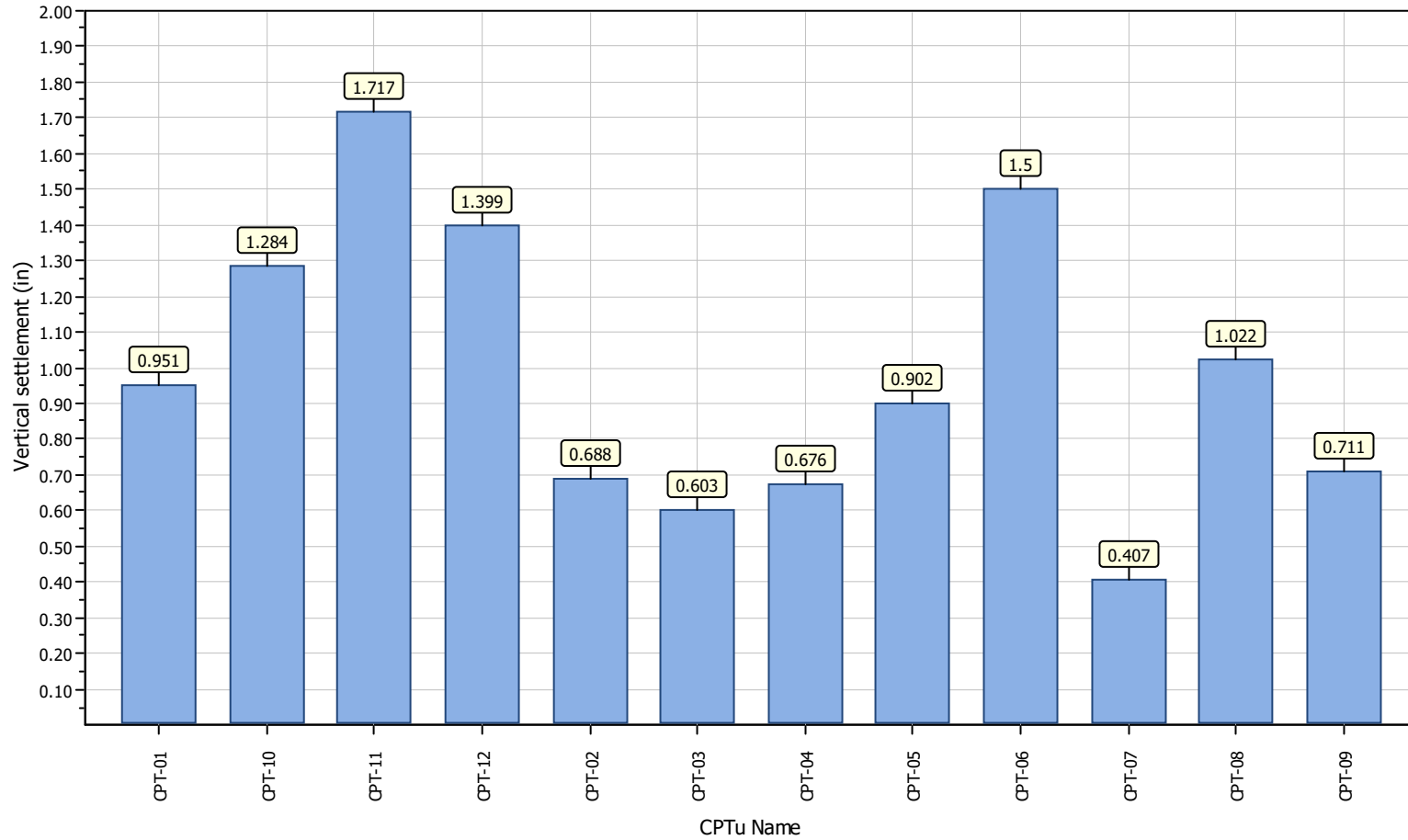
Overall Liquefaction Potential Index report



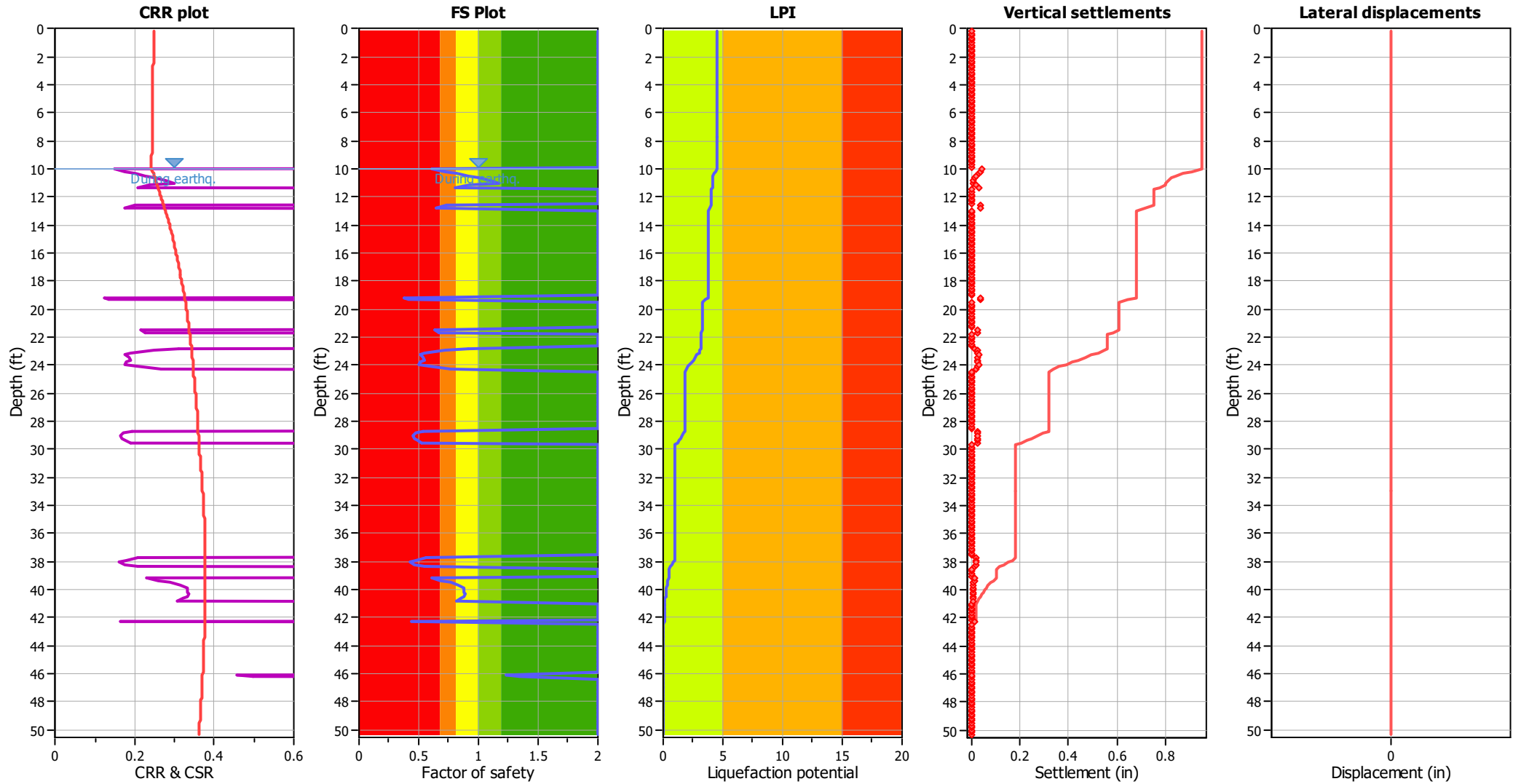
Project title : Shea Properties - Cypress Project

Location : Cypress, CA

Overall vertical settlements report



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

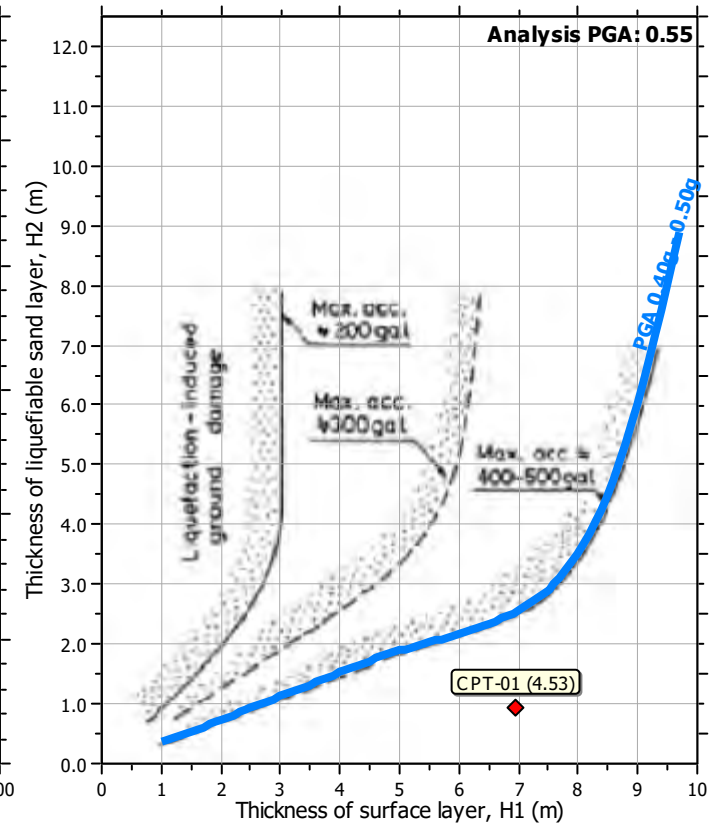
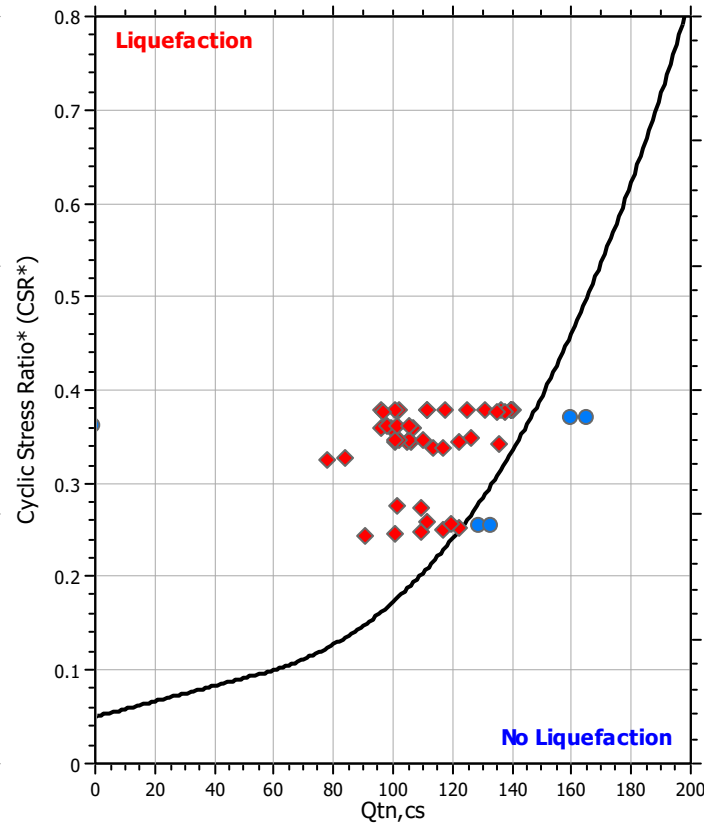
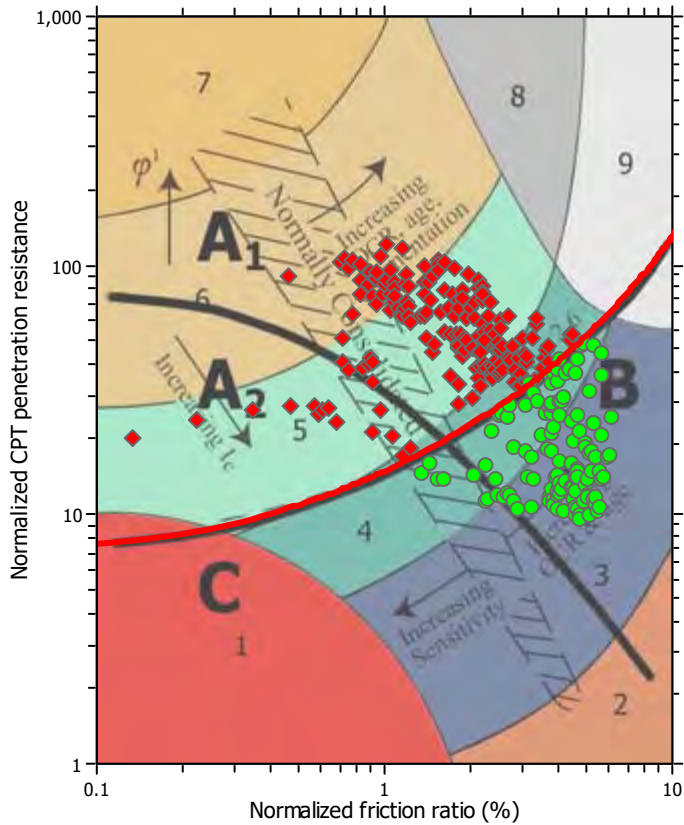
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

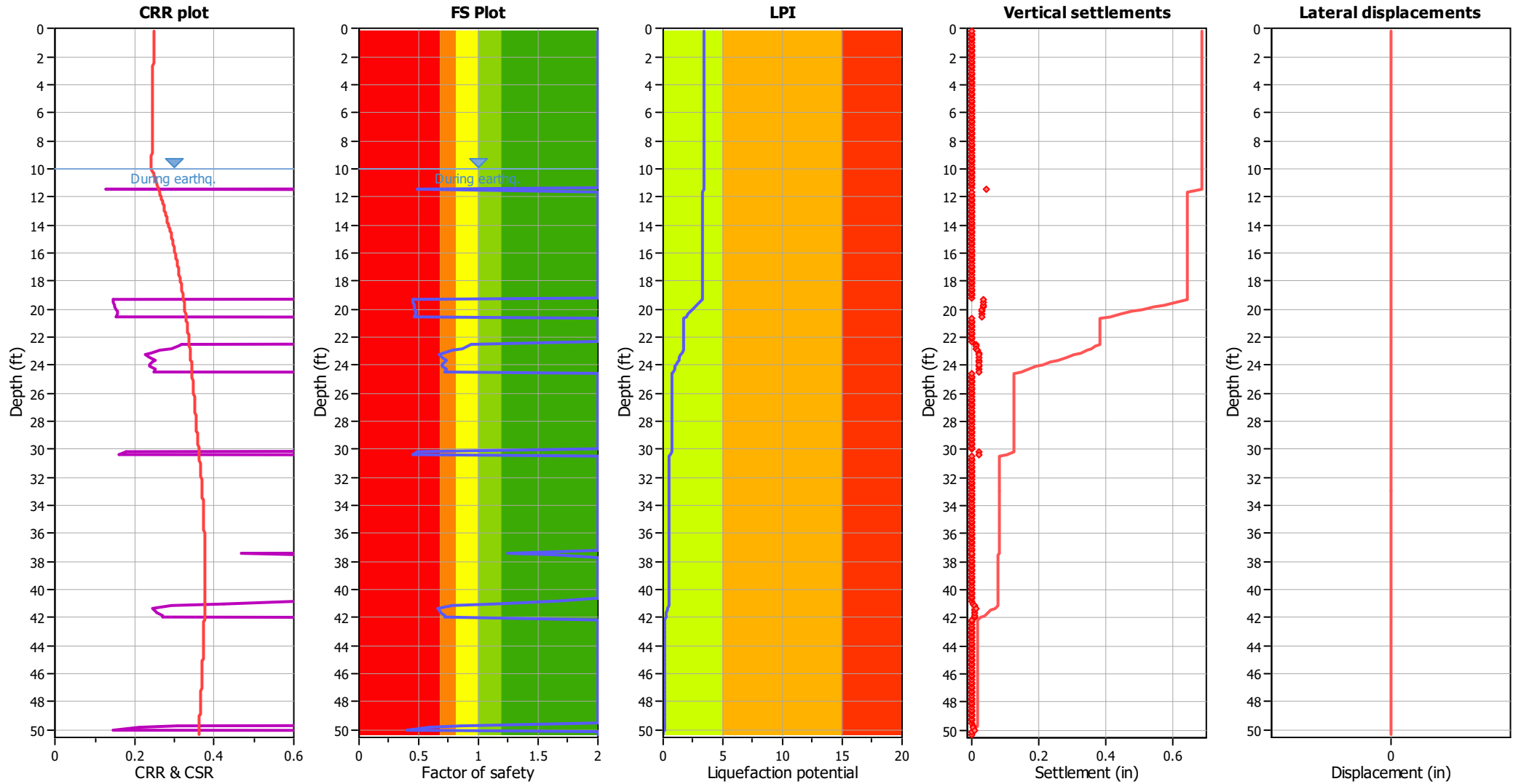
Liquefaction analysis summary plots



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Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
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Liquefaction analysis overall plots



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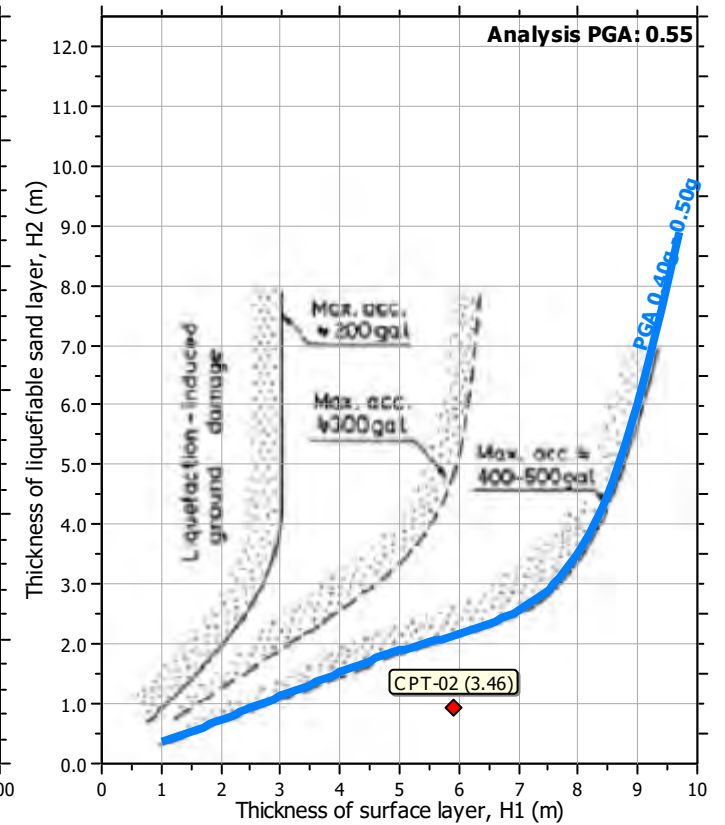
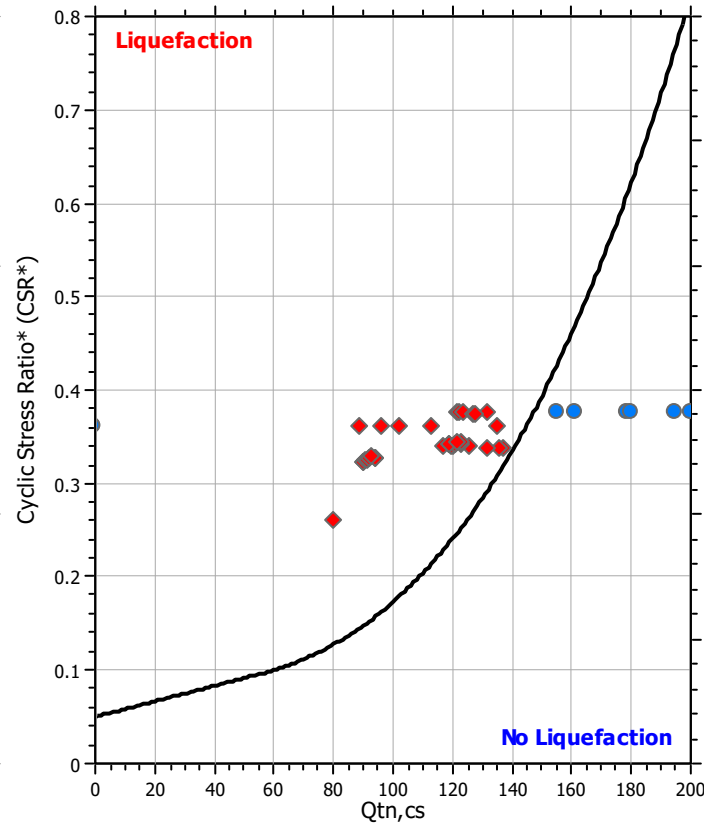
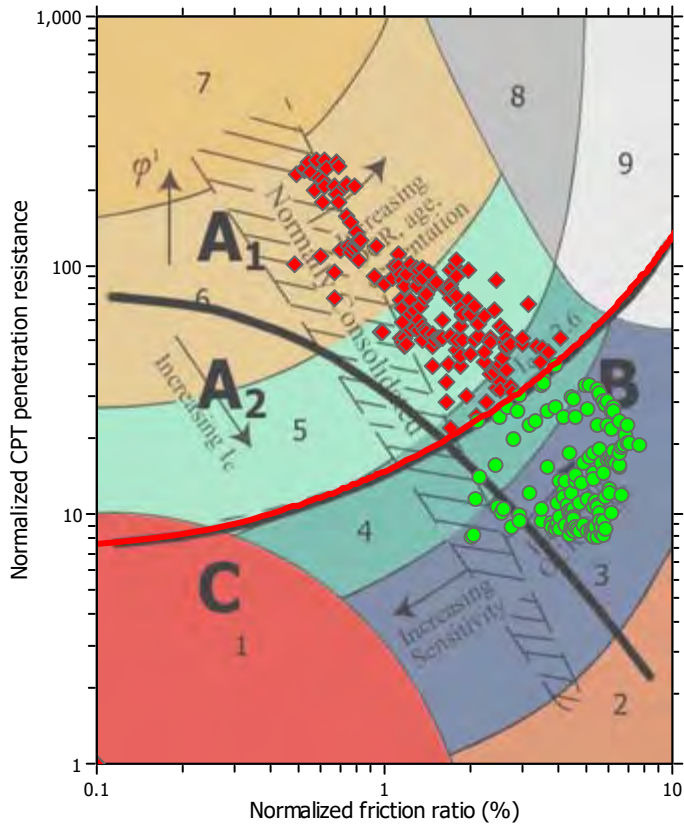
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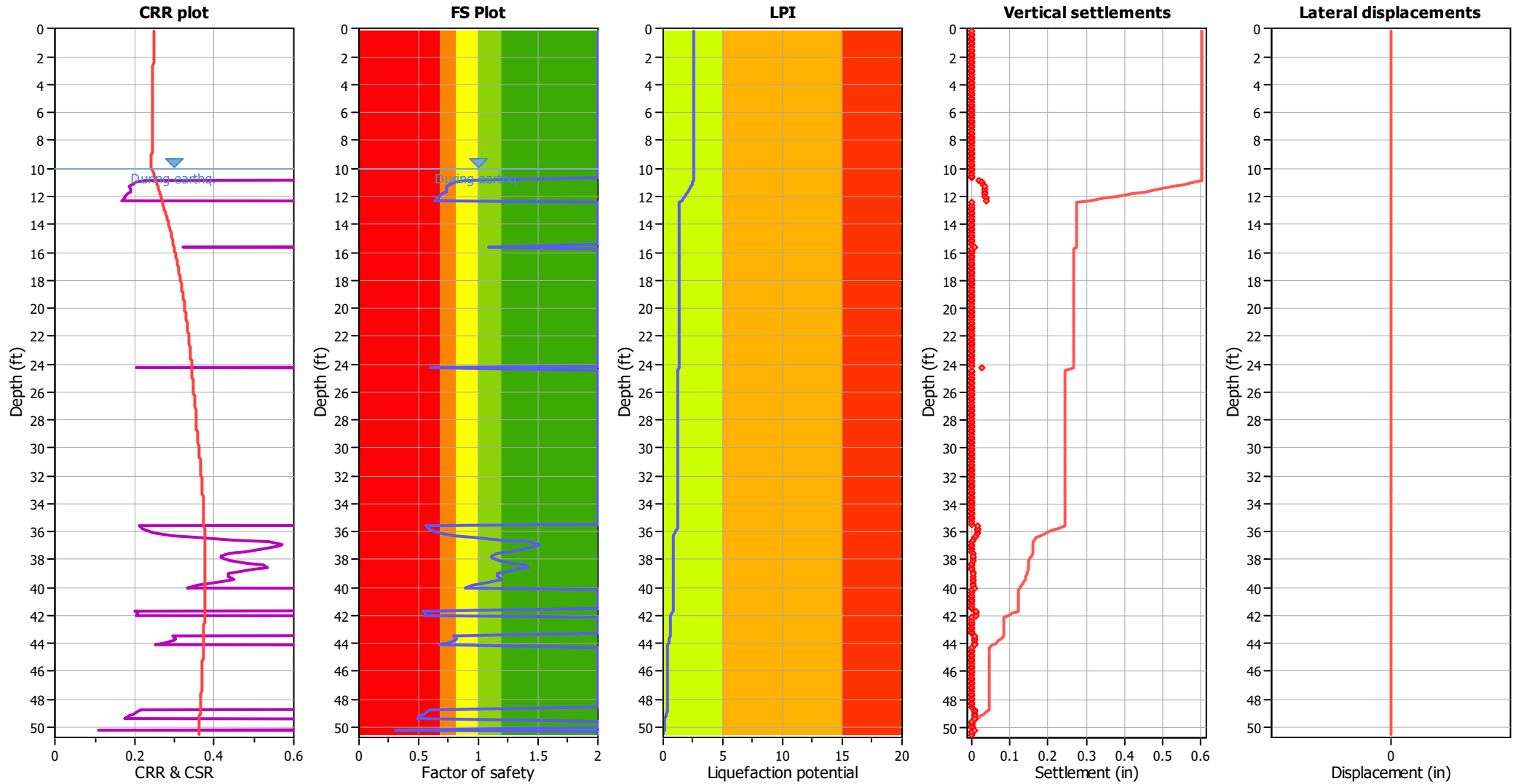
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Liquefaction analysis overall plots



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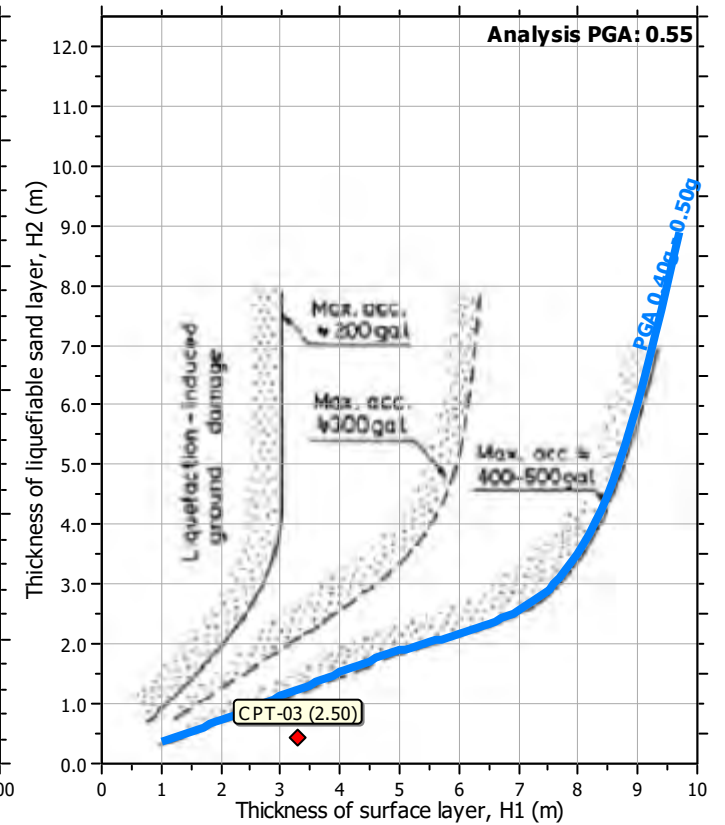
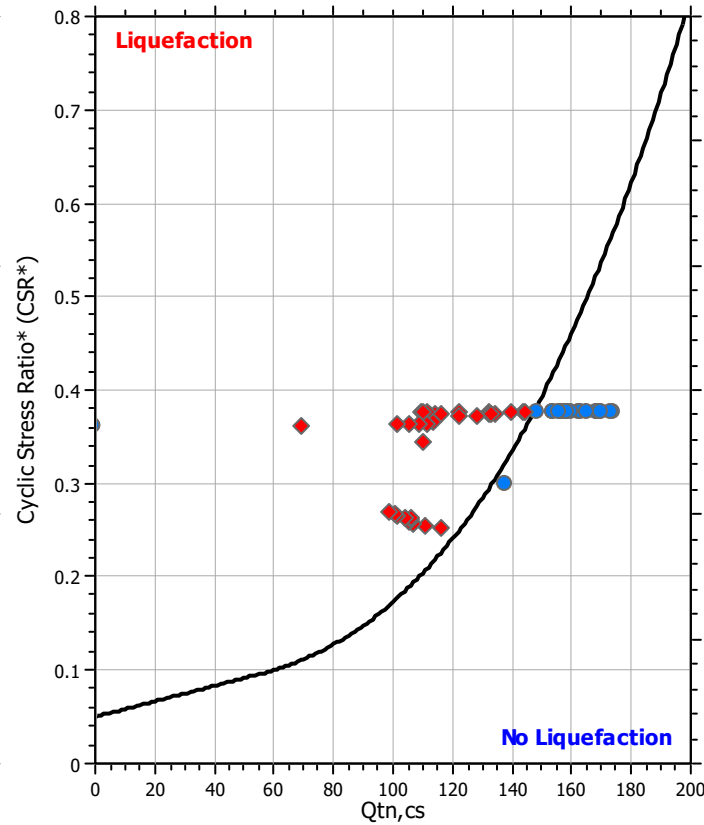
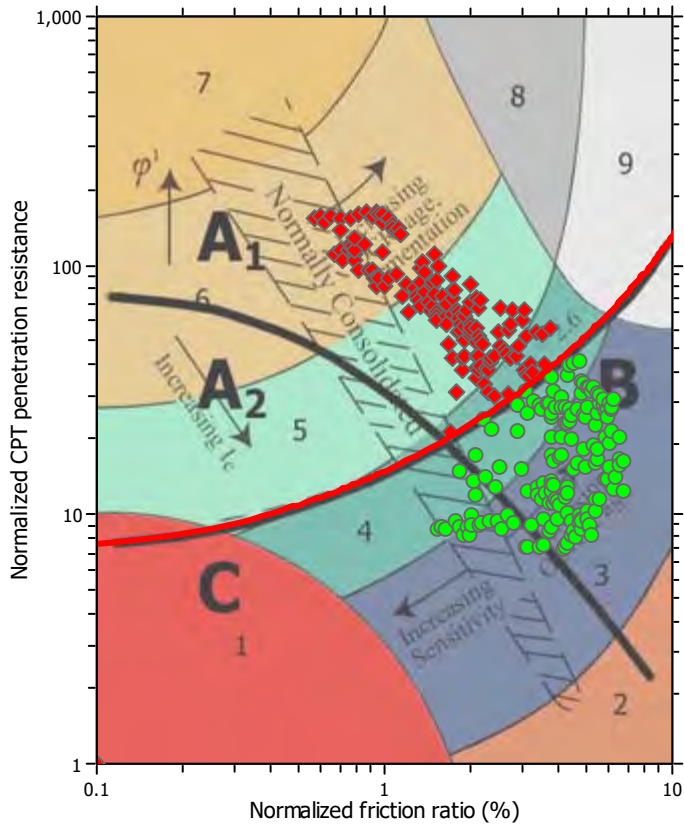
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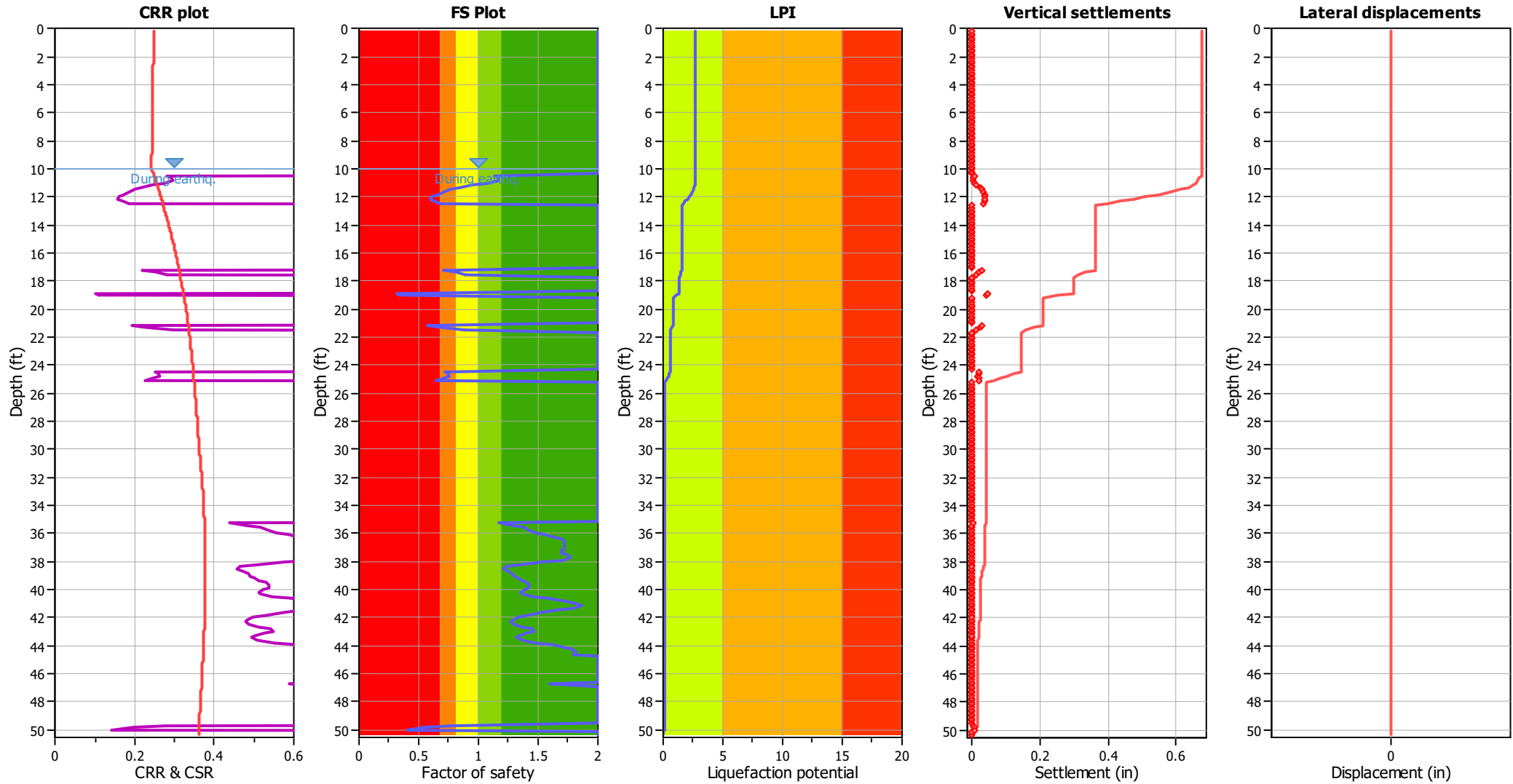
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Liquefaction analysis overall plots



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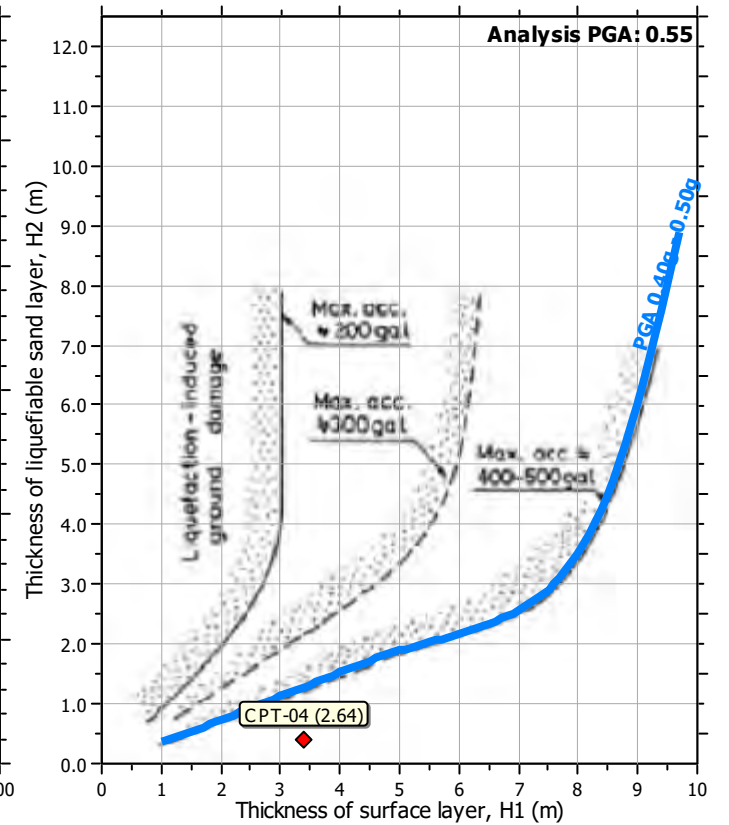
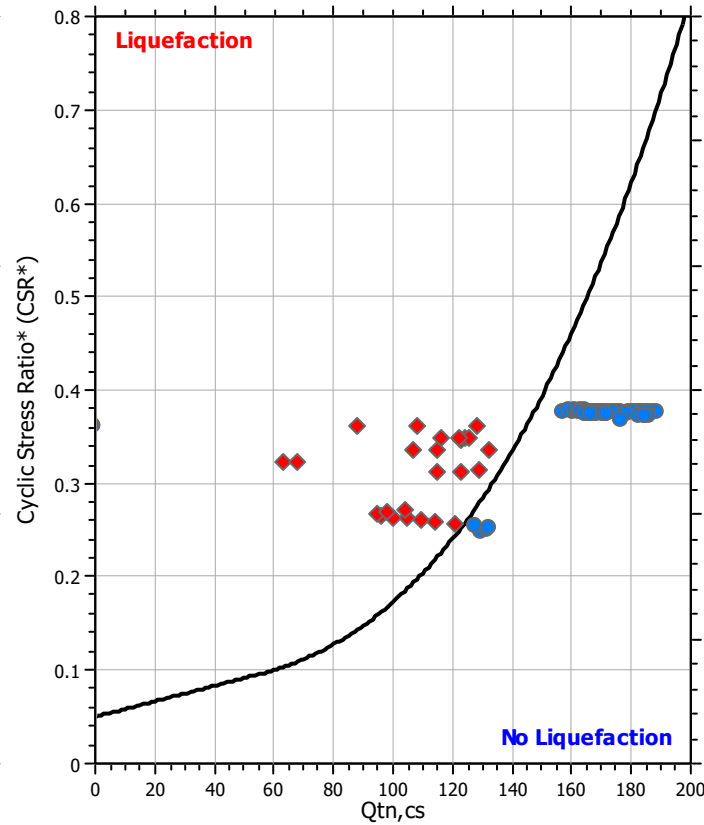
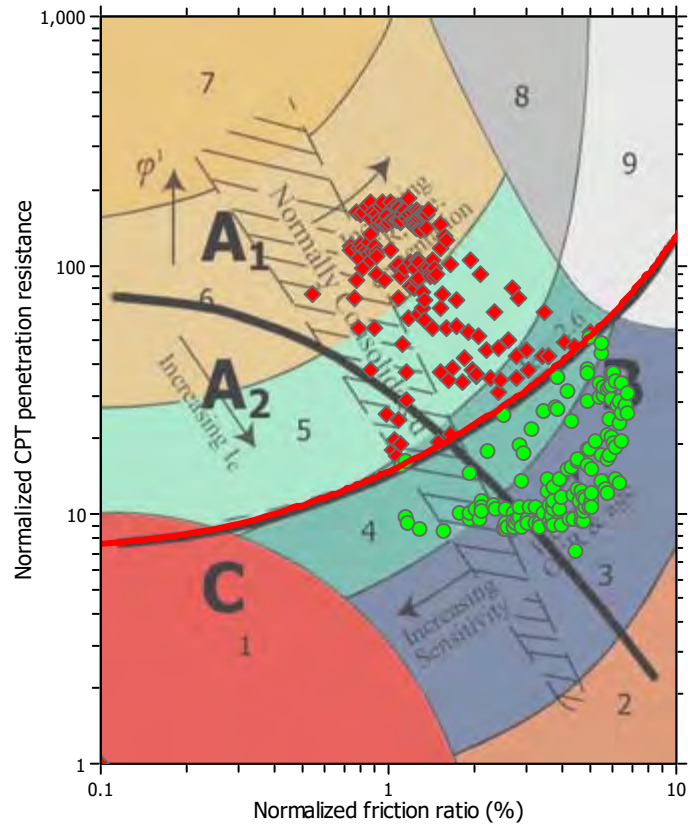
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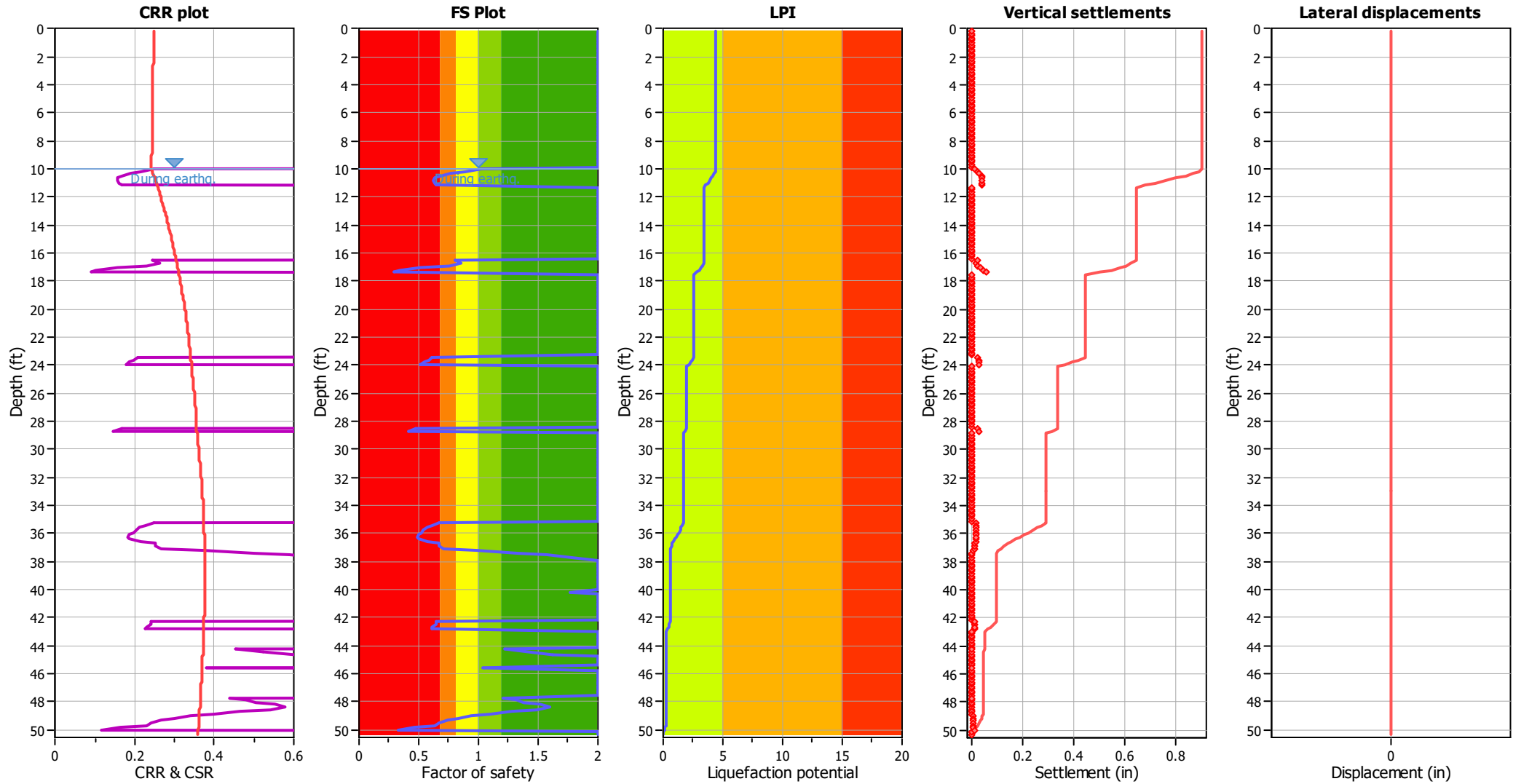
Liquefaction analysis summary plots



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Liquefaction analysis overall plots



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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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

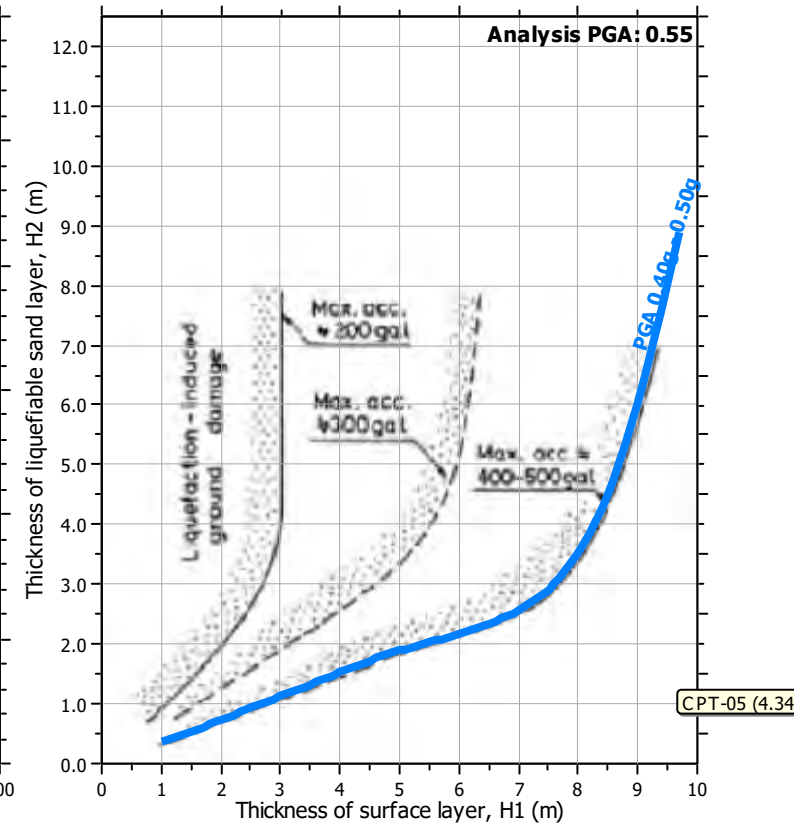
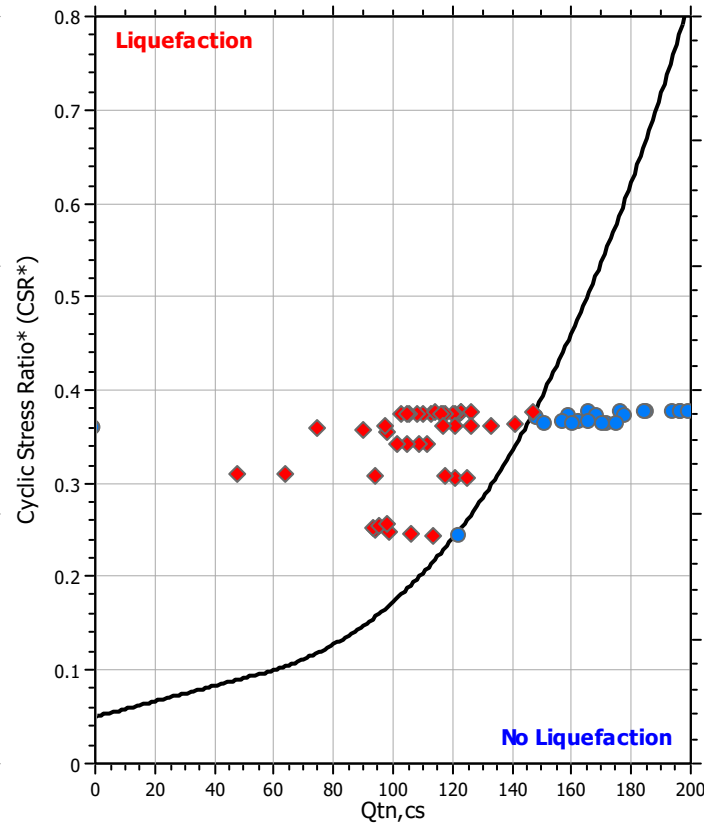
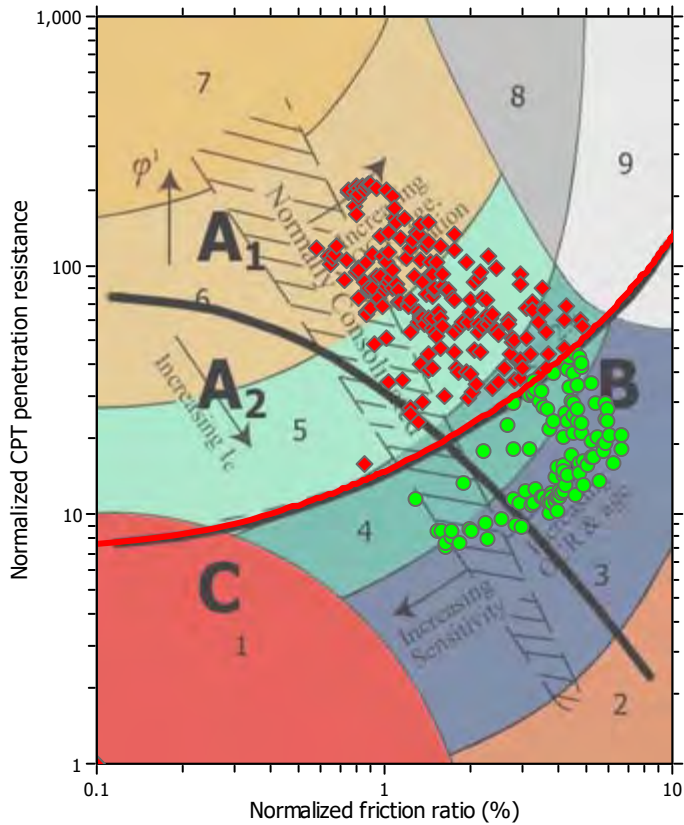
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

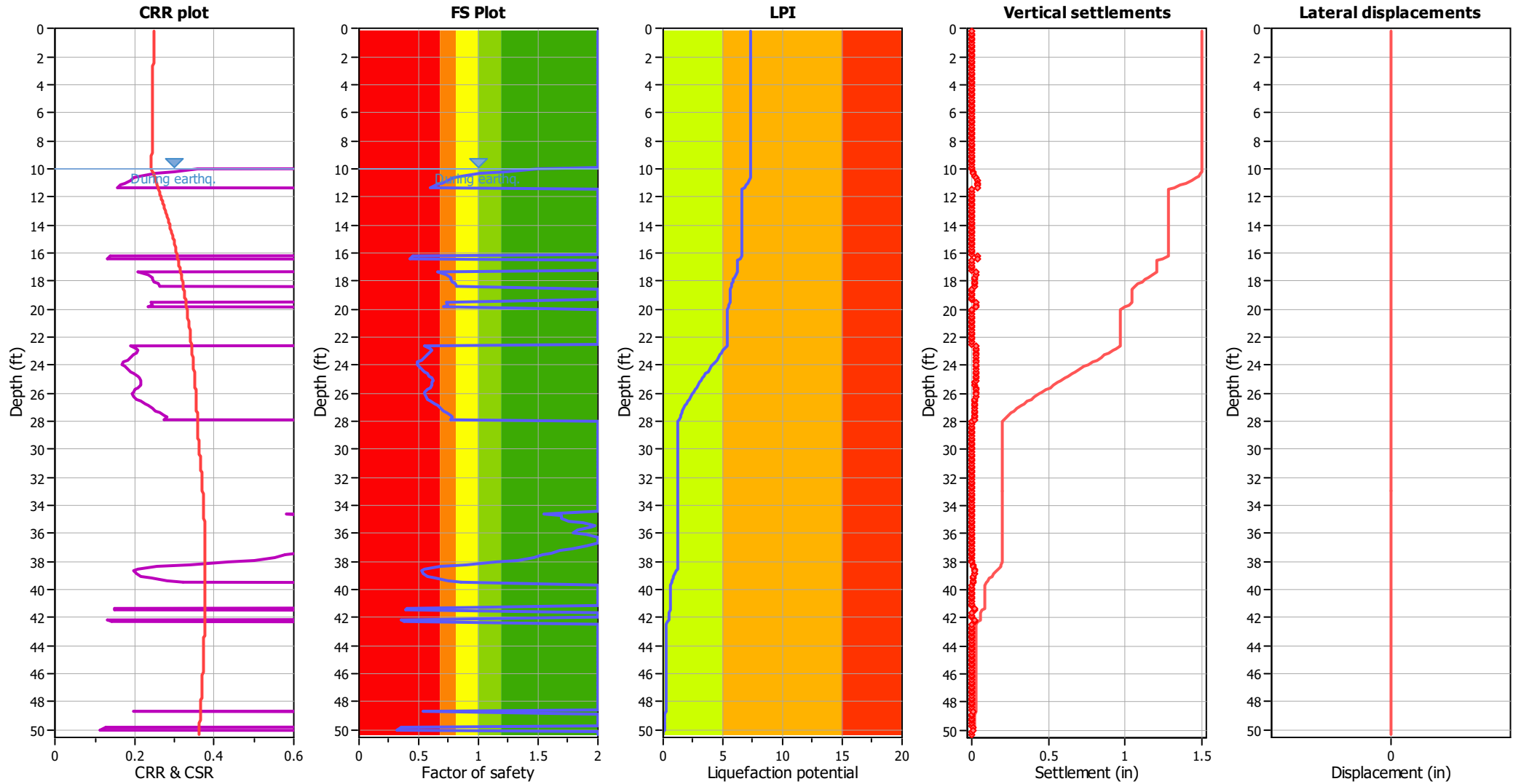
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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 _v applied:	Yes
Earthquake magnitude M _w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
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Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

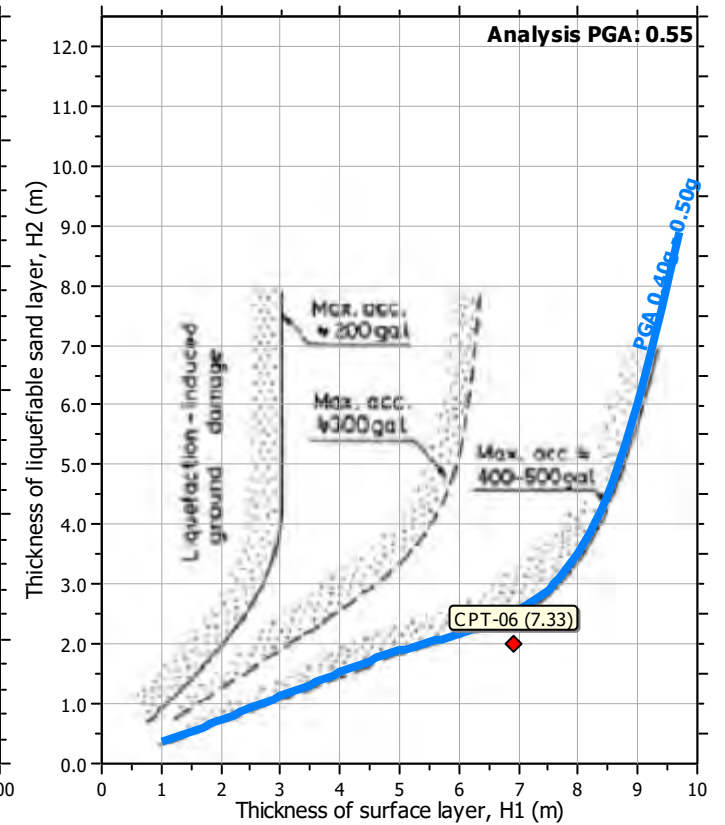
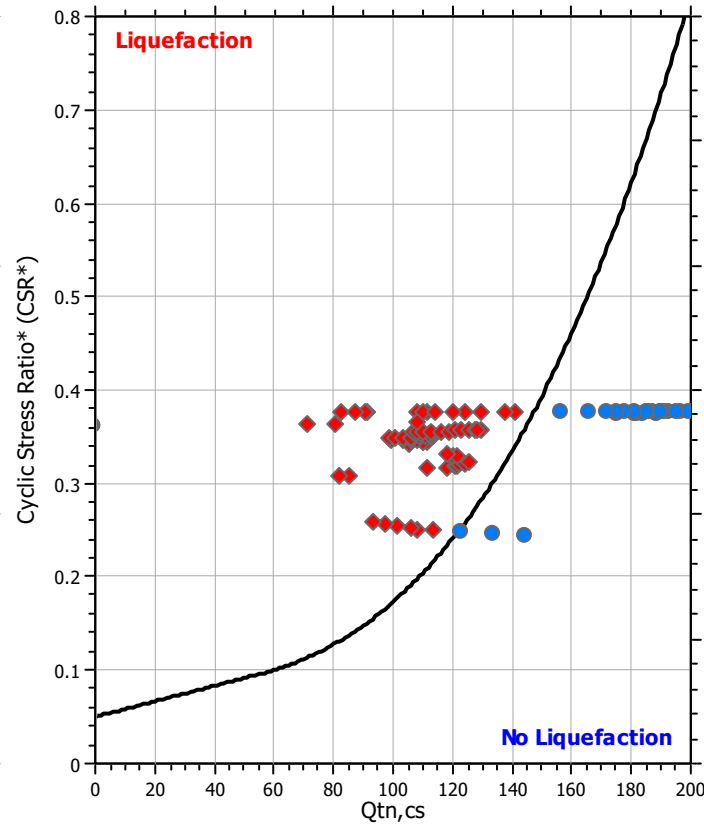
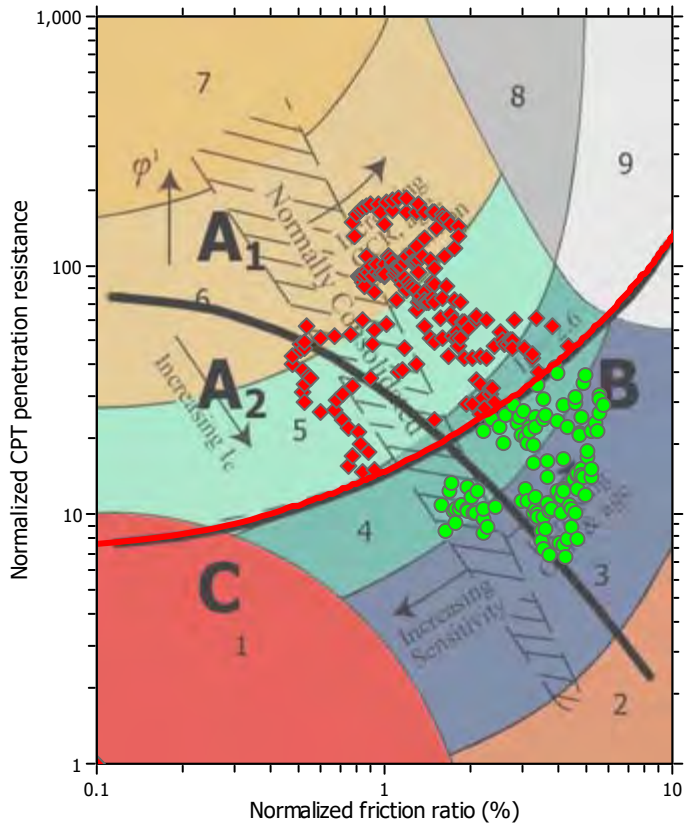
F.S. color scheme

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LPI color scheme

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- High risk
- Low risk

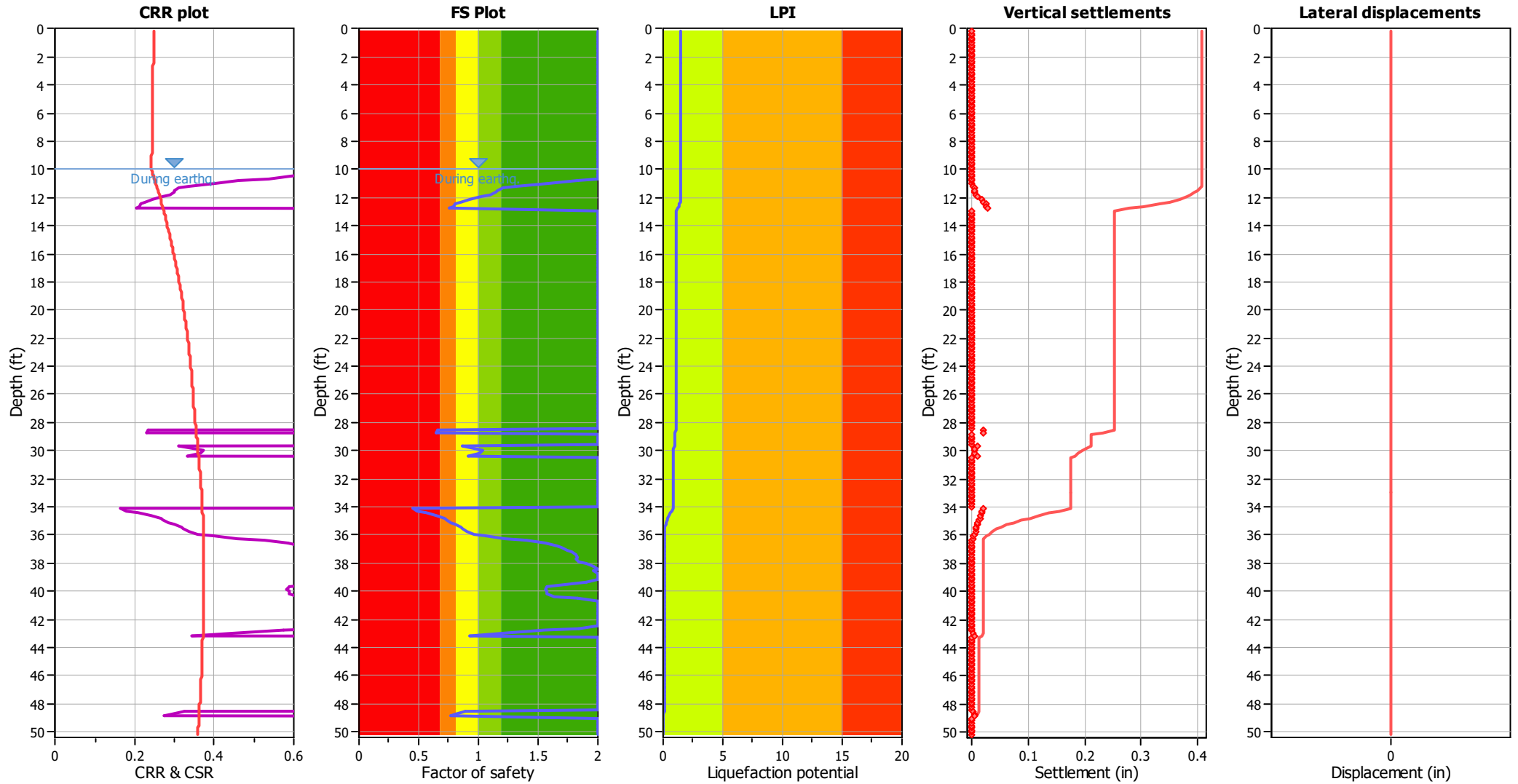
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on I_c value	I_c cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

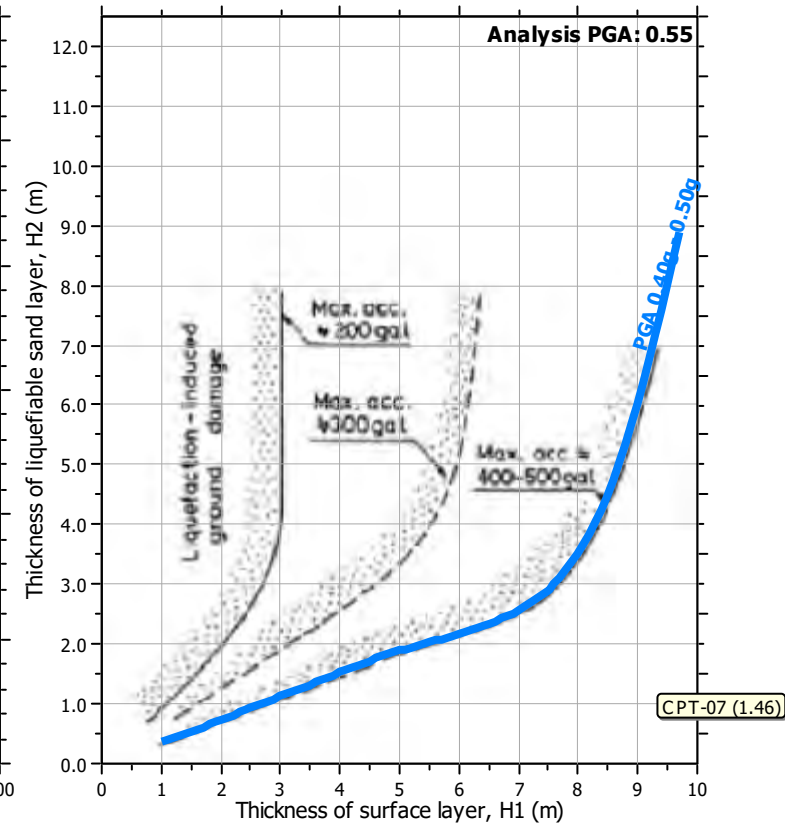
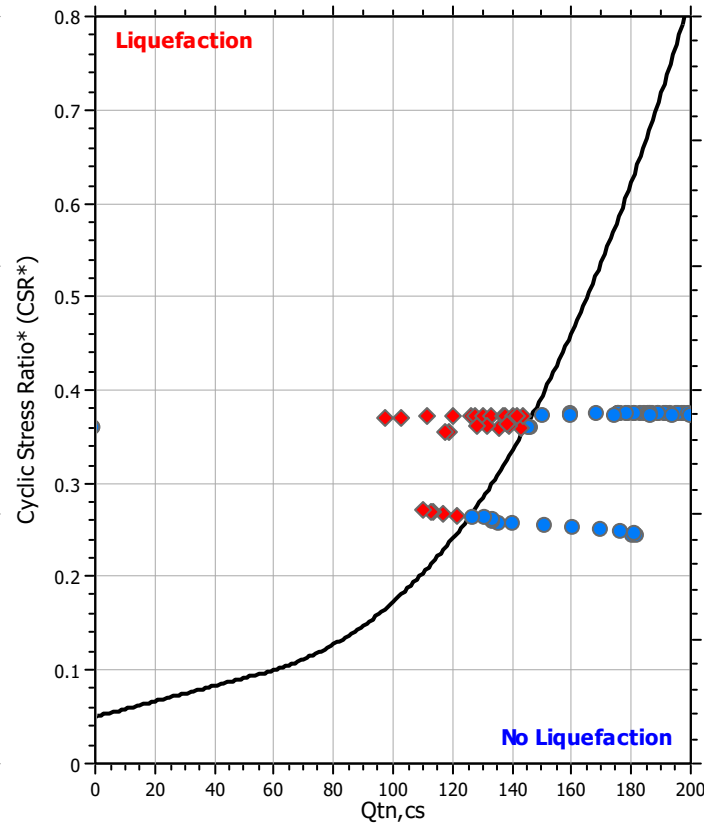
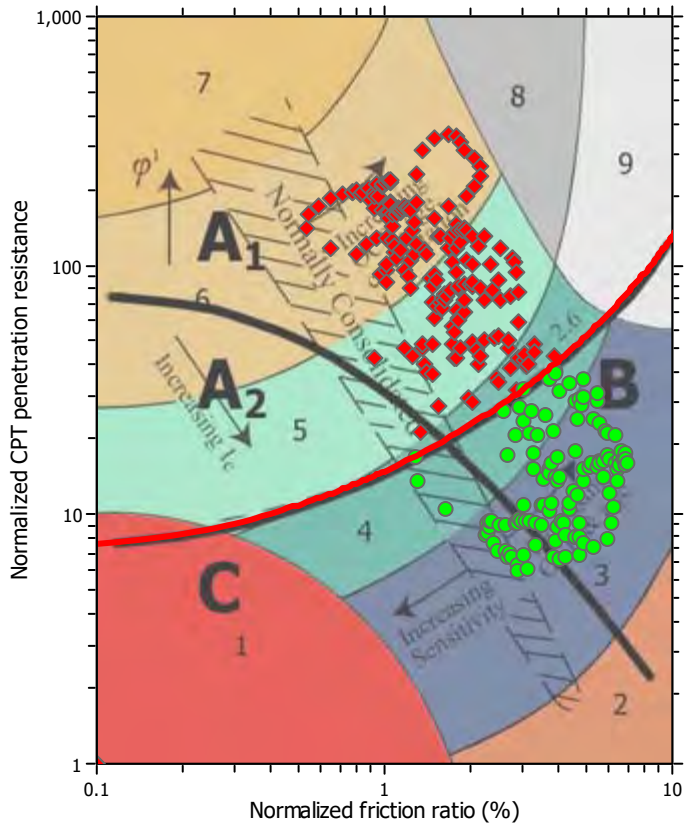
F.S. color scheme

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LPI color scheme

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- High risk
- Low risk

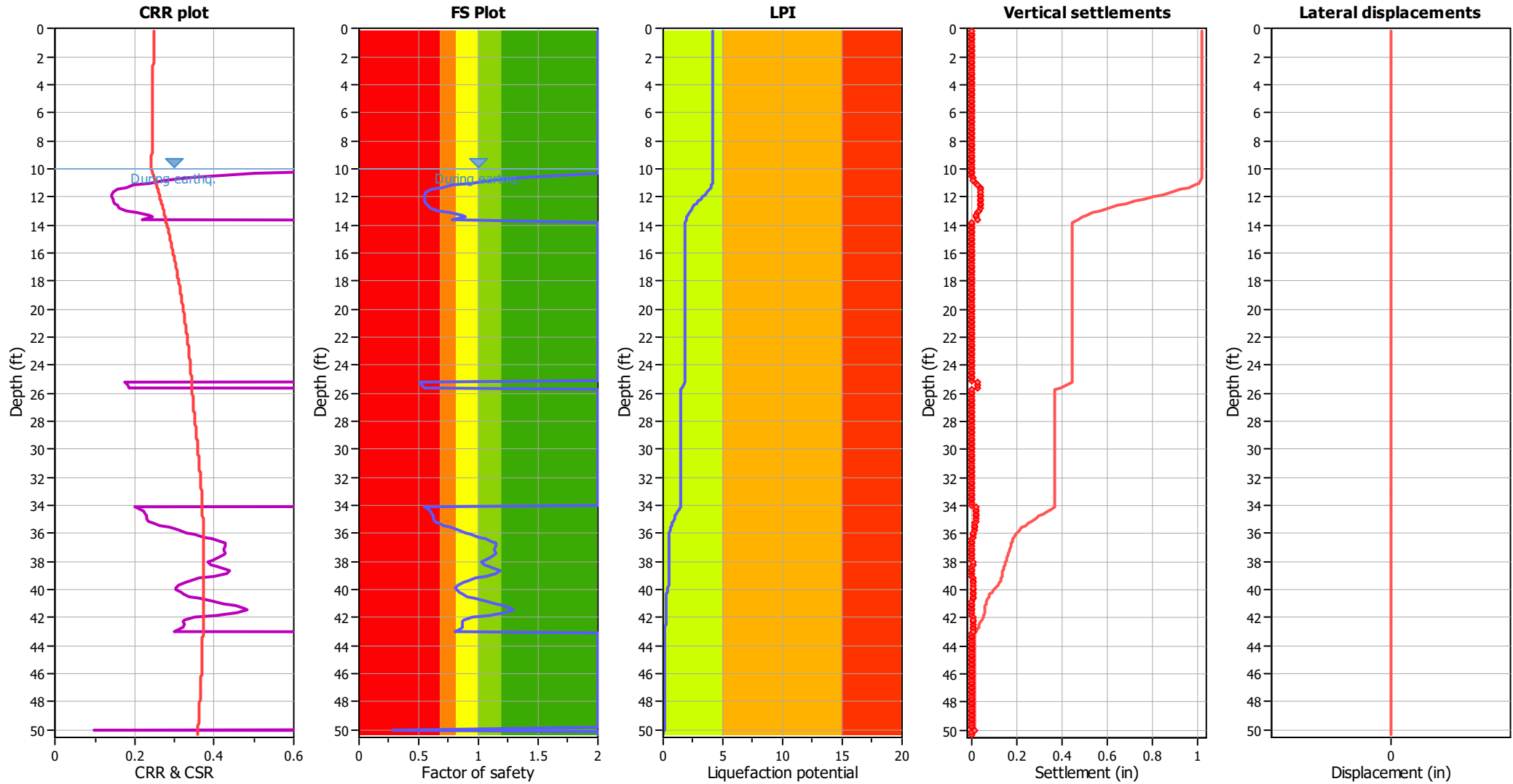
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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_v applied:	Yes
Earthquake magnitude M_w :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
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Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

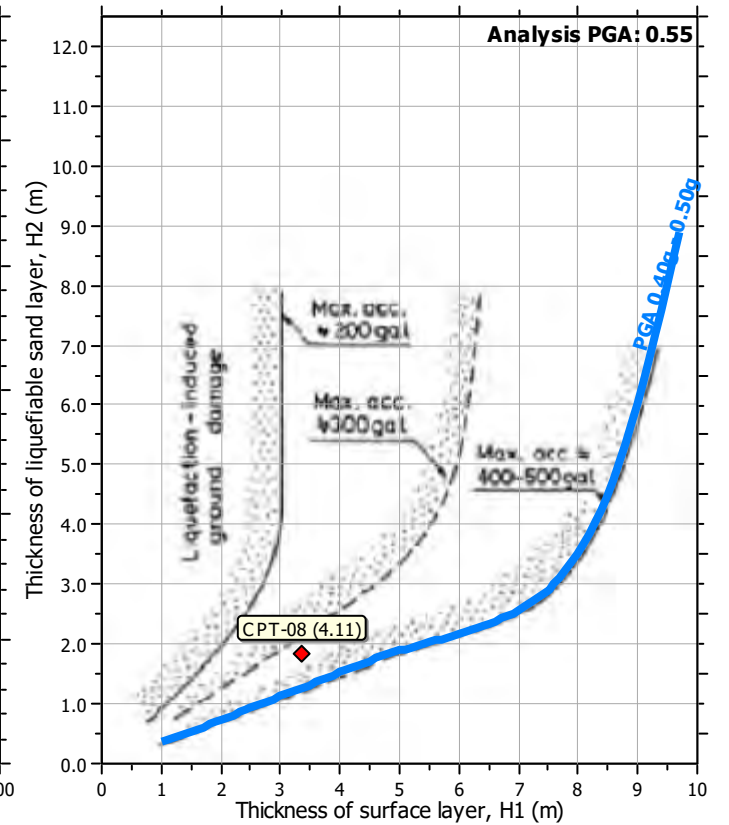
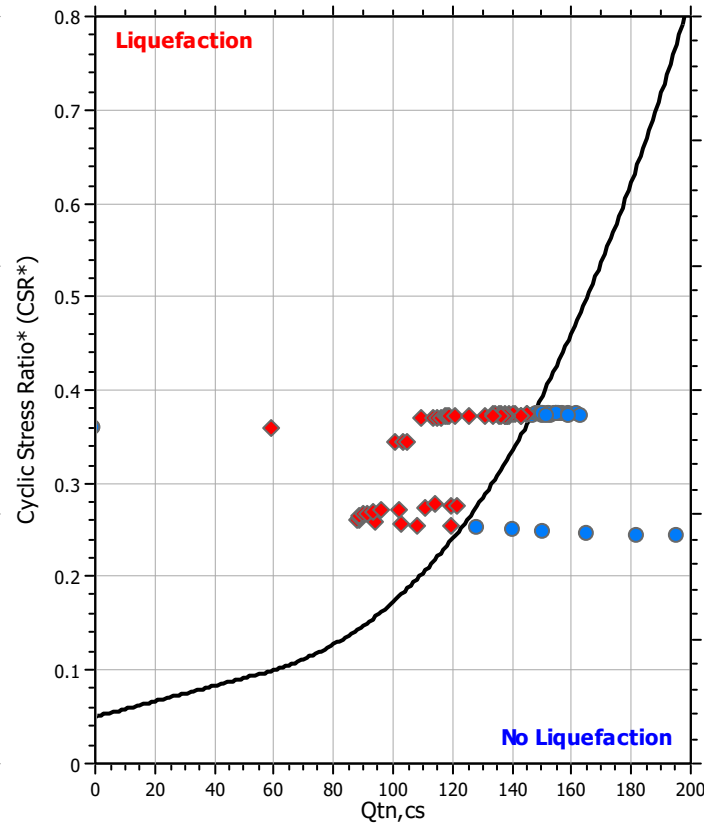
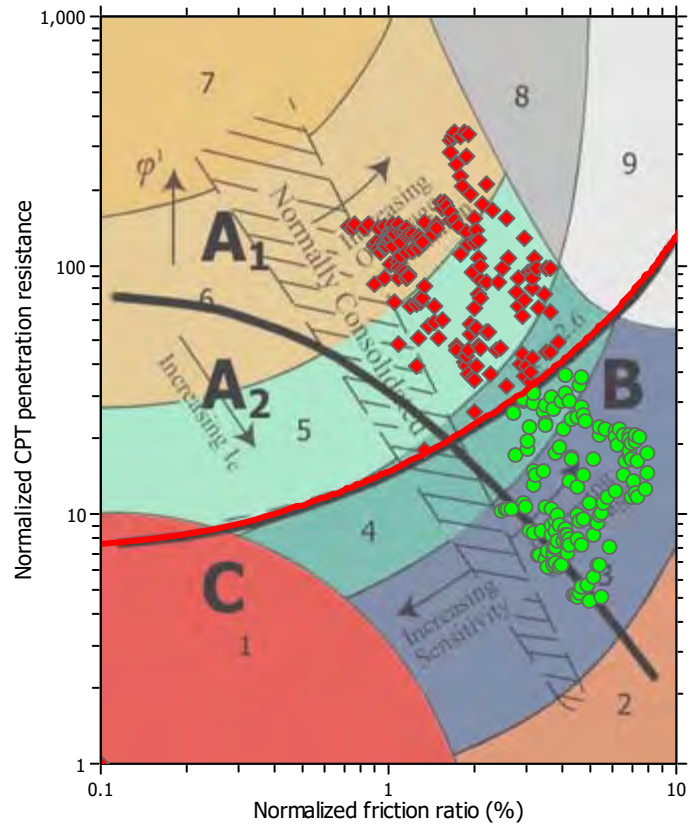
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LPI color scheme

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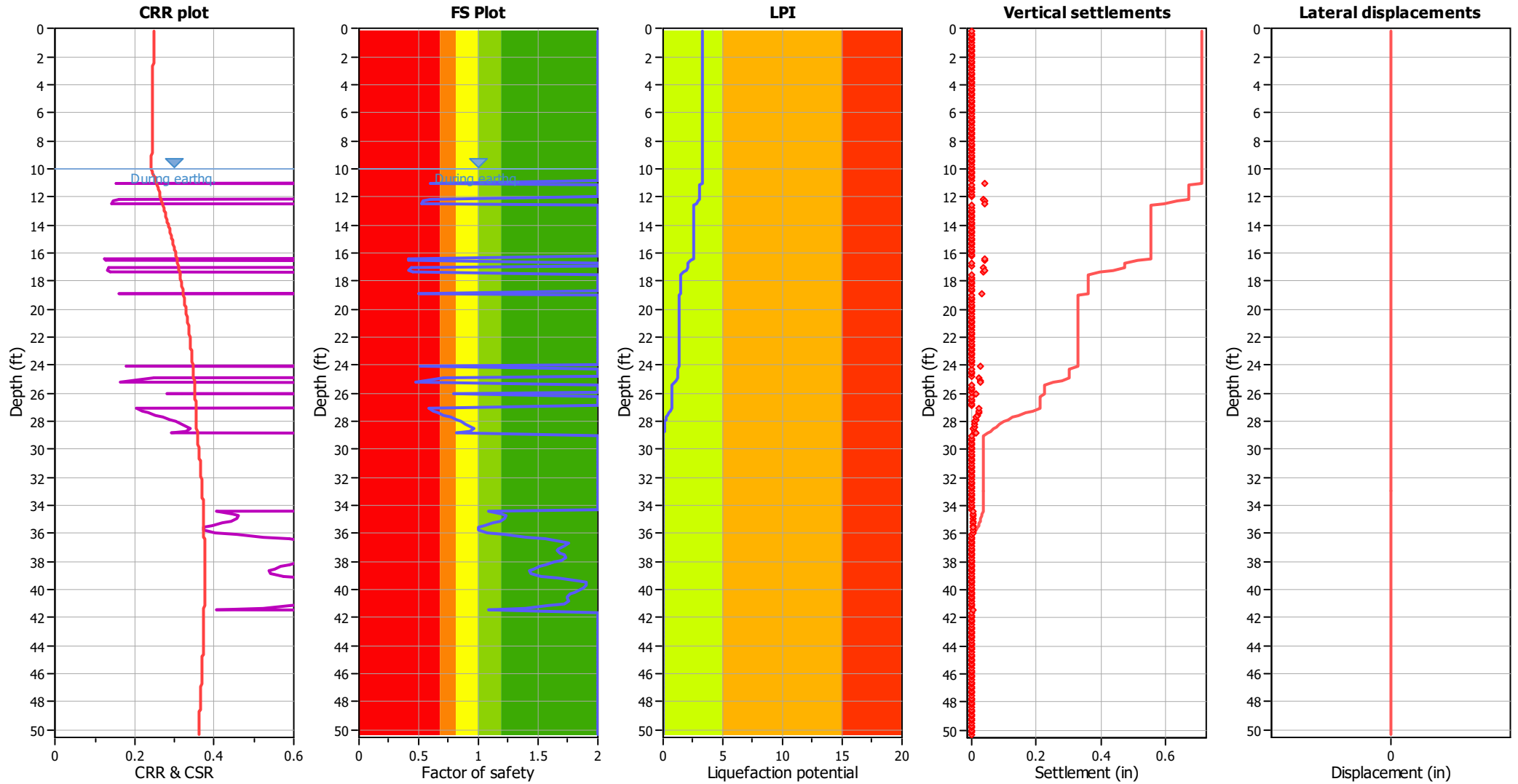
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	10.00 ft	Fill weight:	N/A
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Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

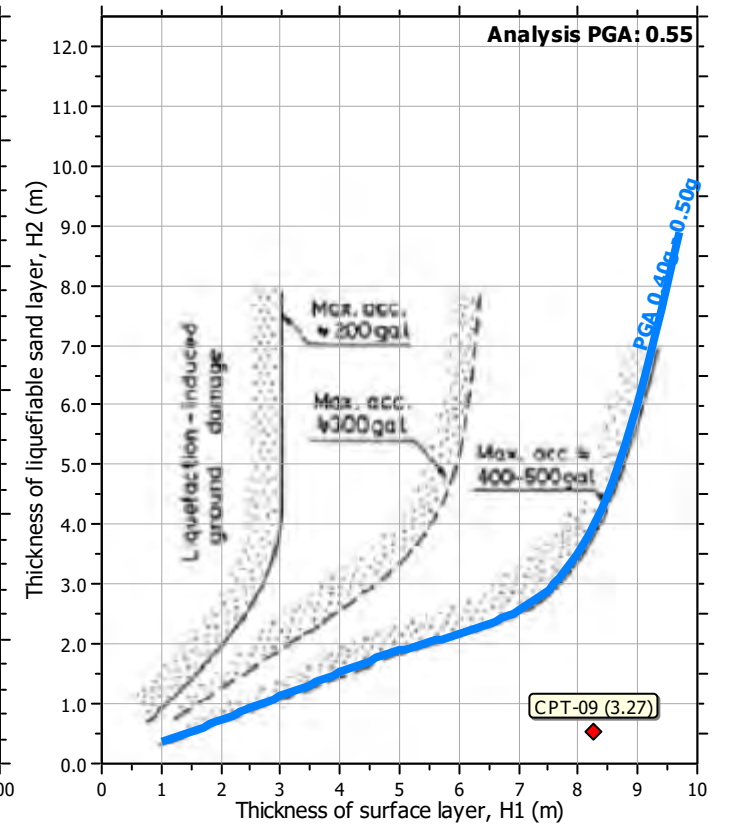
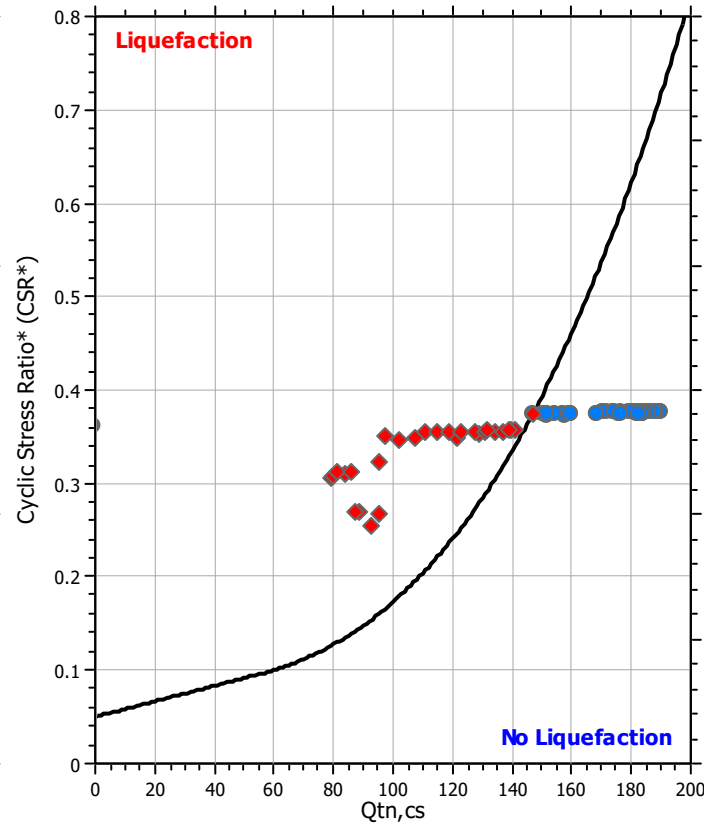
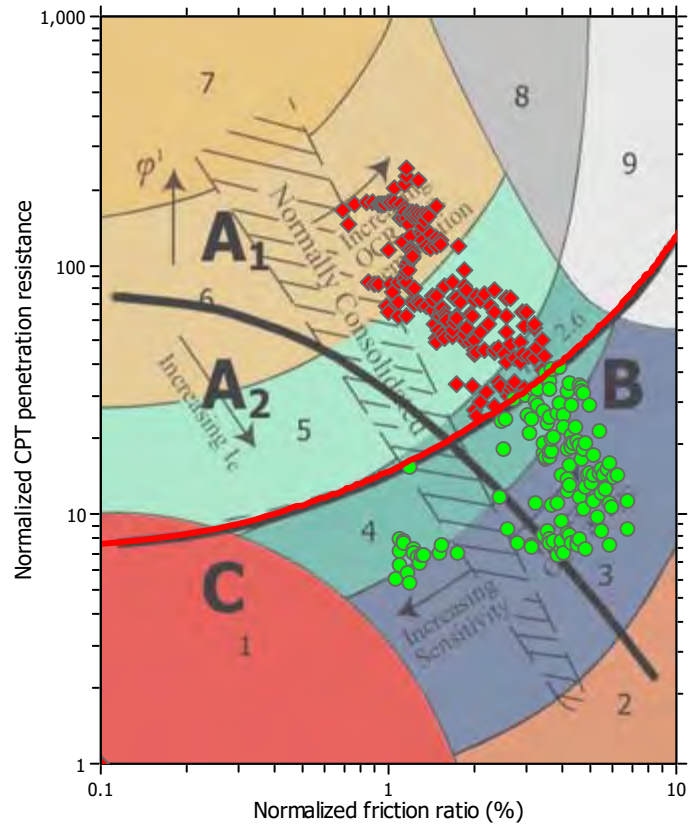
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LPI color scheme

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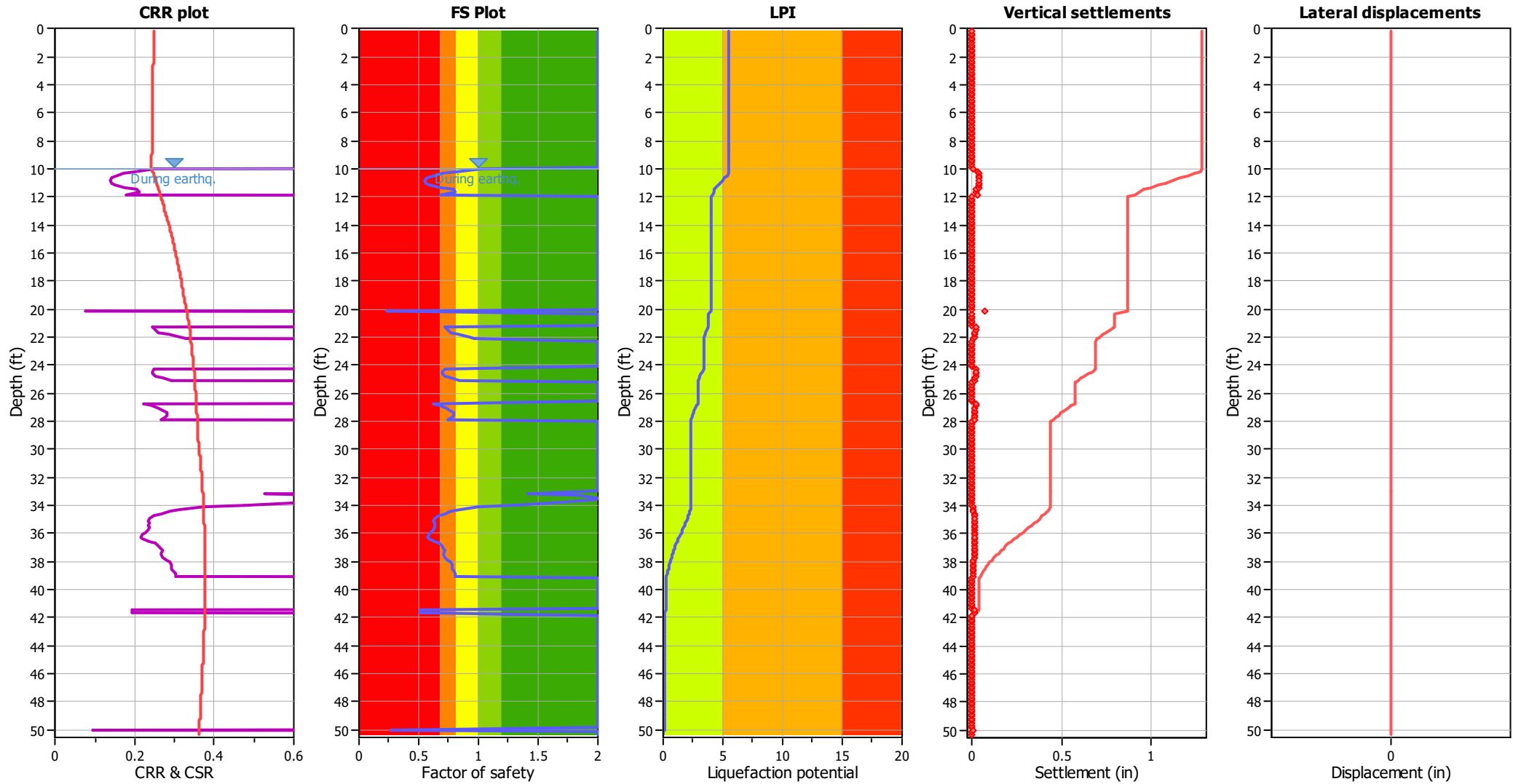
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
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Liquefaction analysis overall plots



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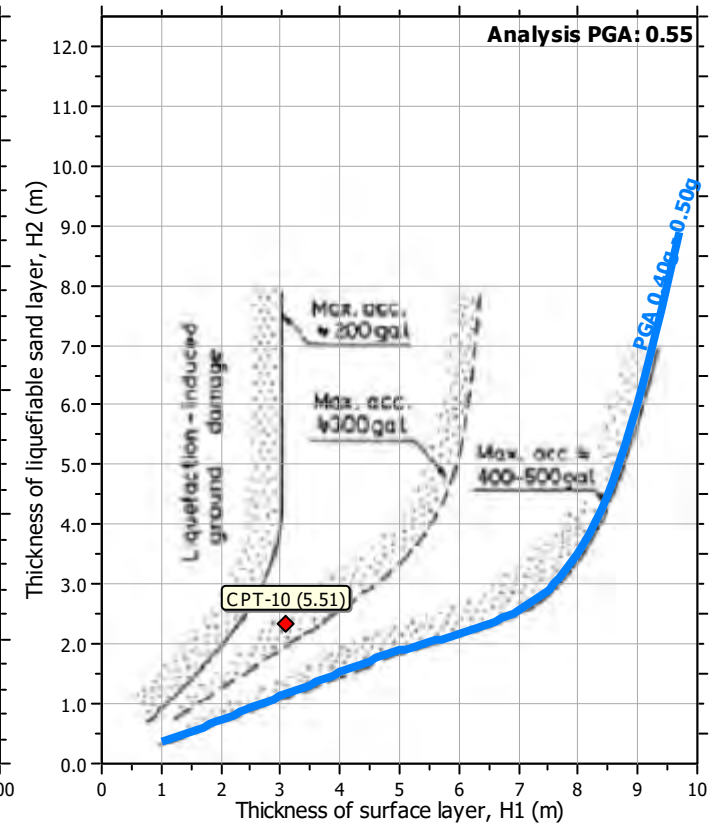
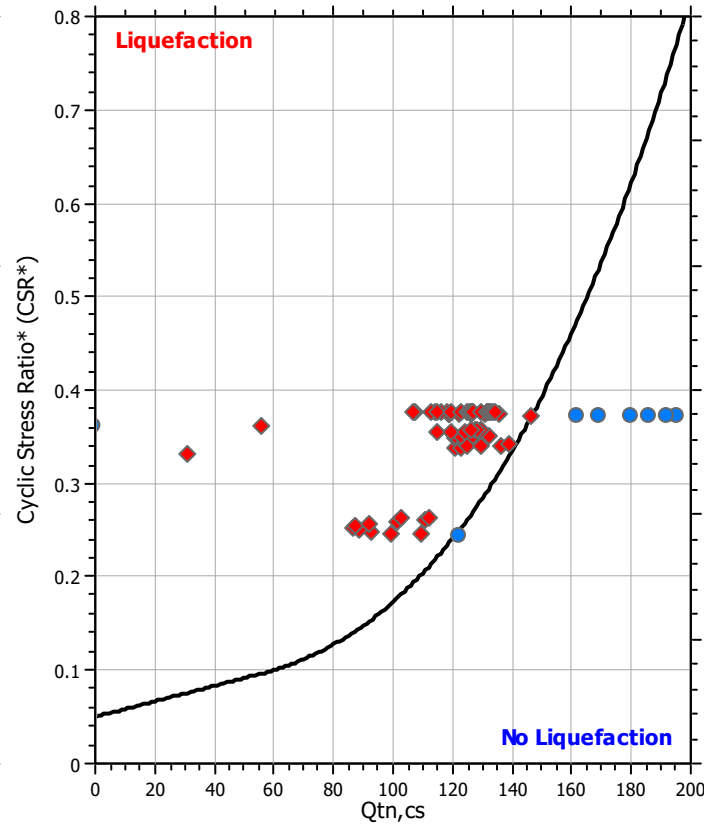
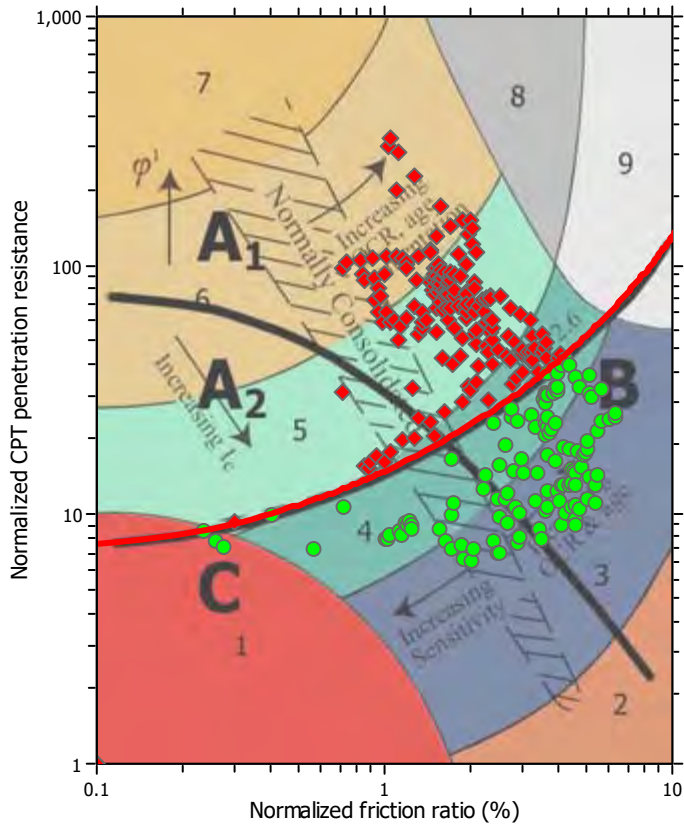
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LPI color scheme

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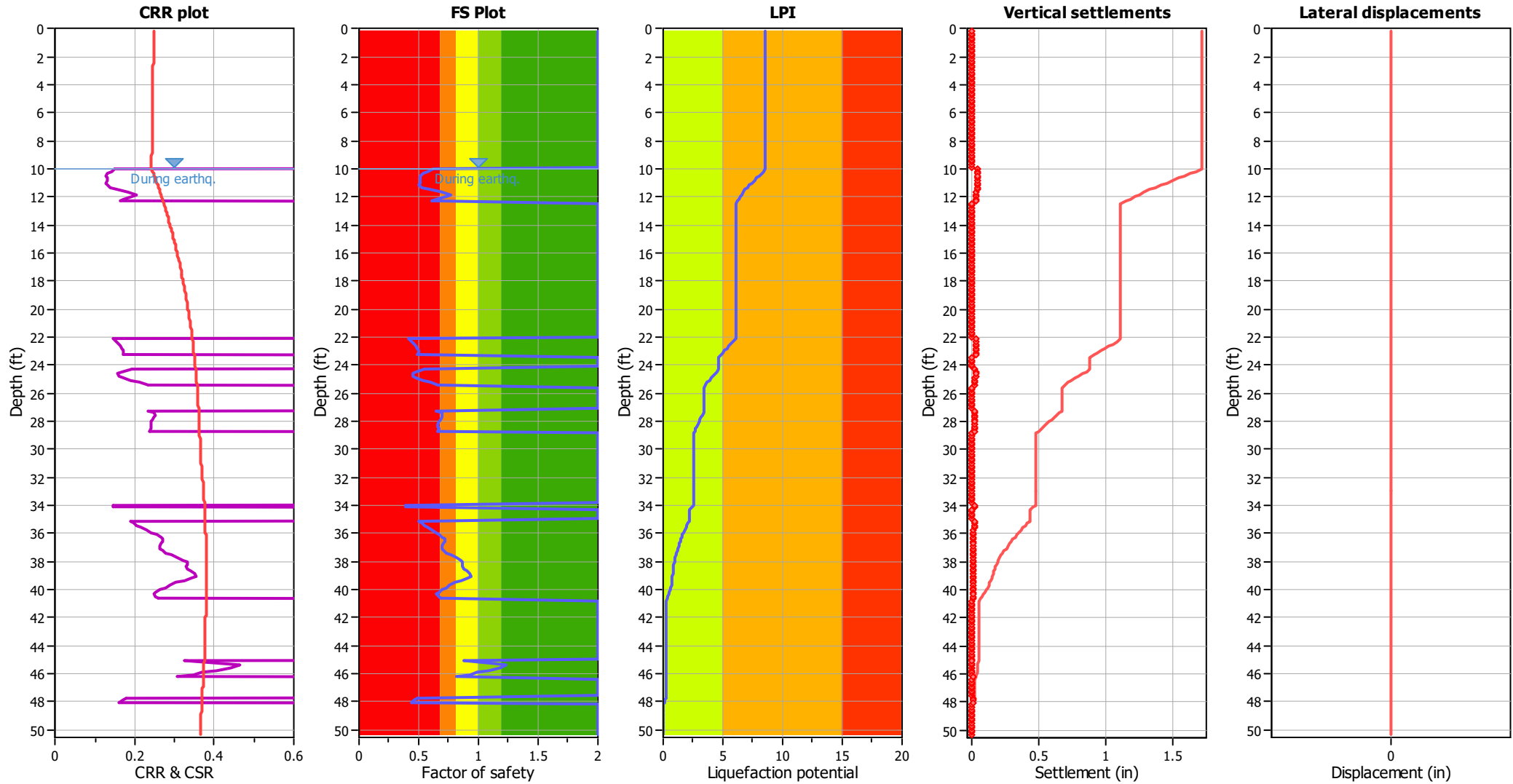
Liquefaction analysis summary plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 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 :	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
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Liquefaction analysis overall plots



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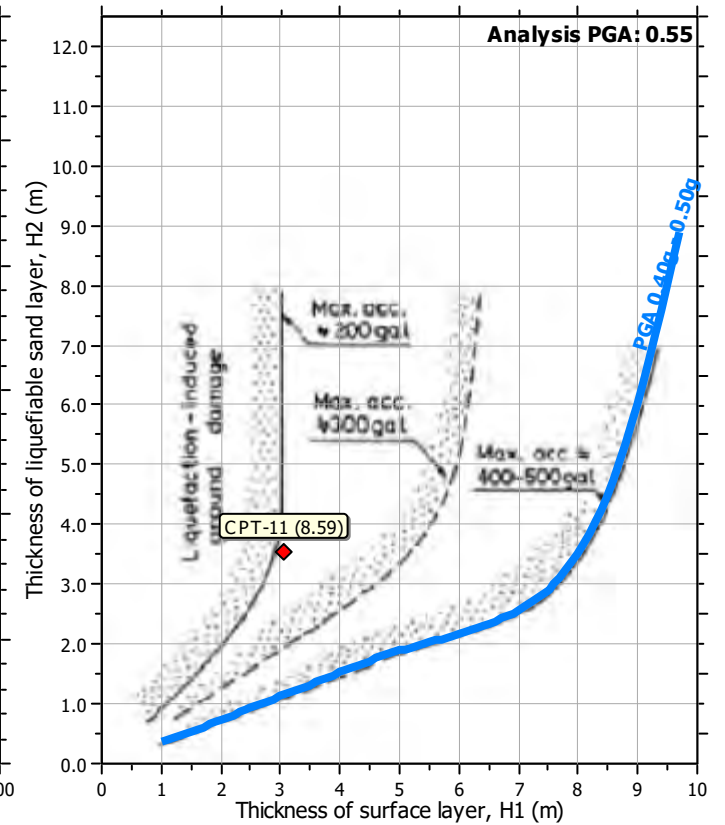
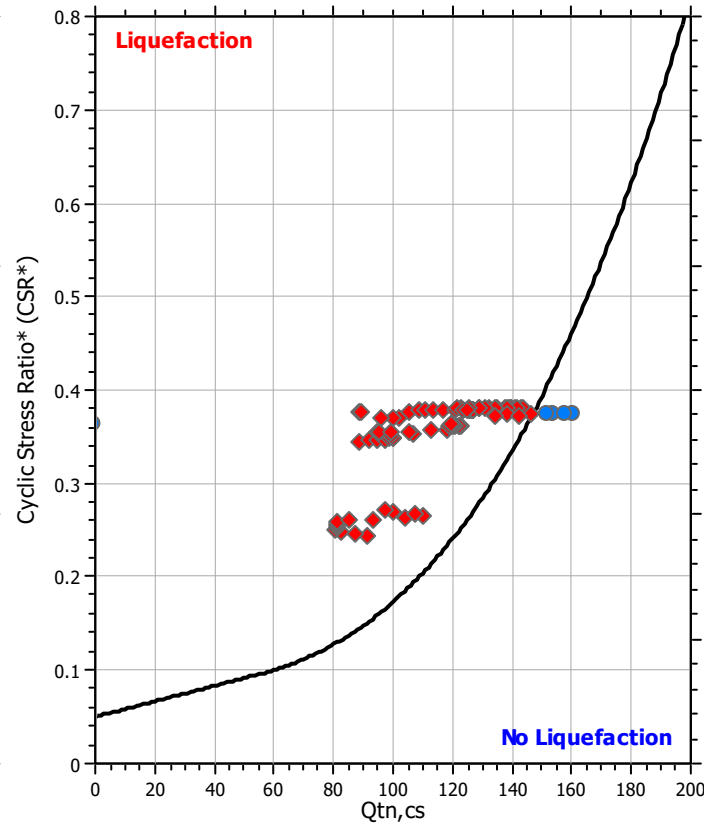
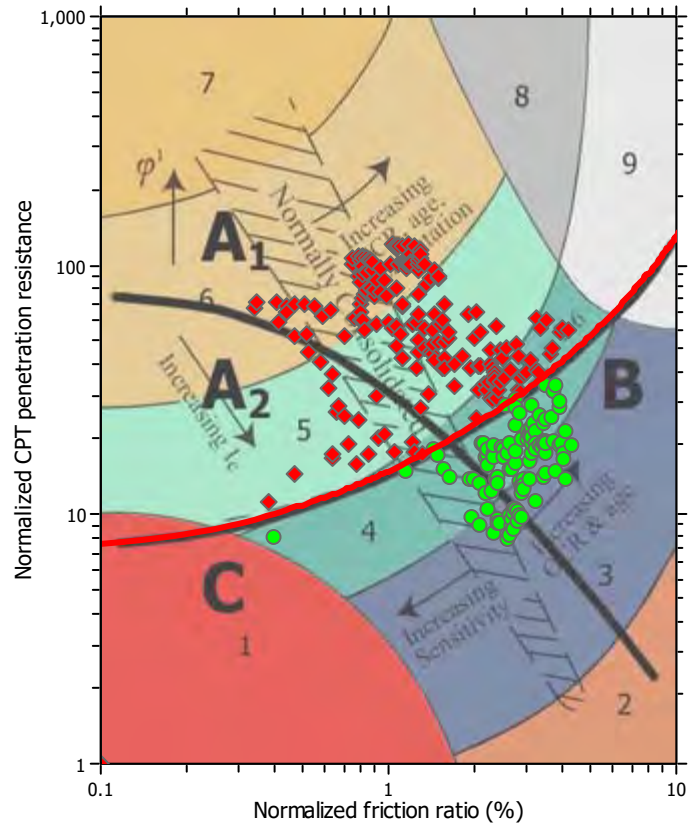
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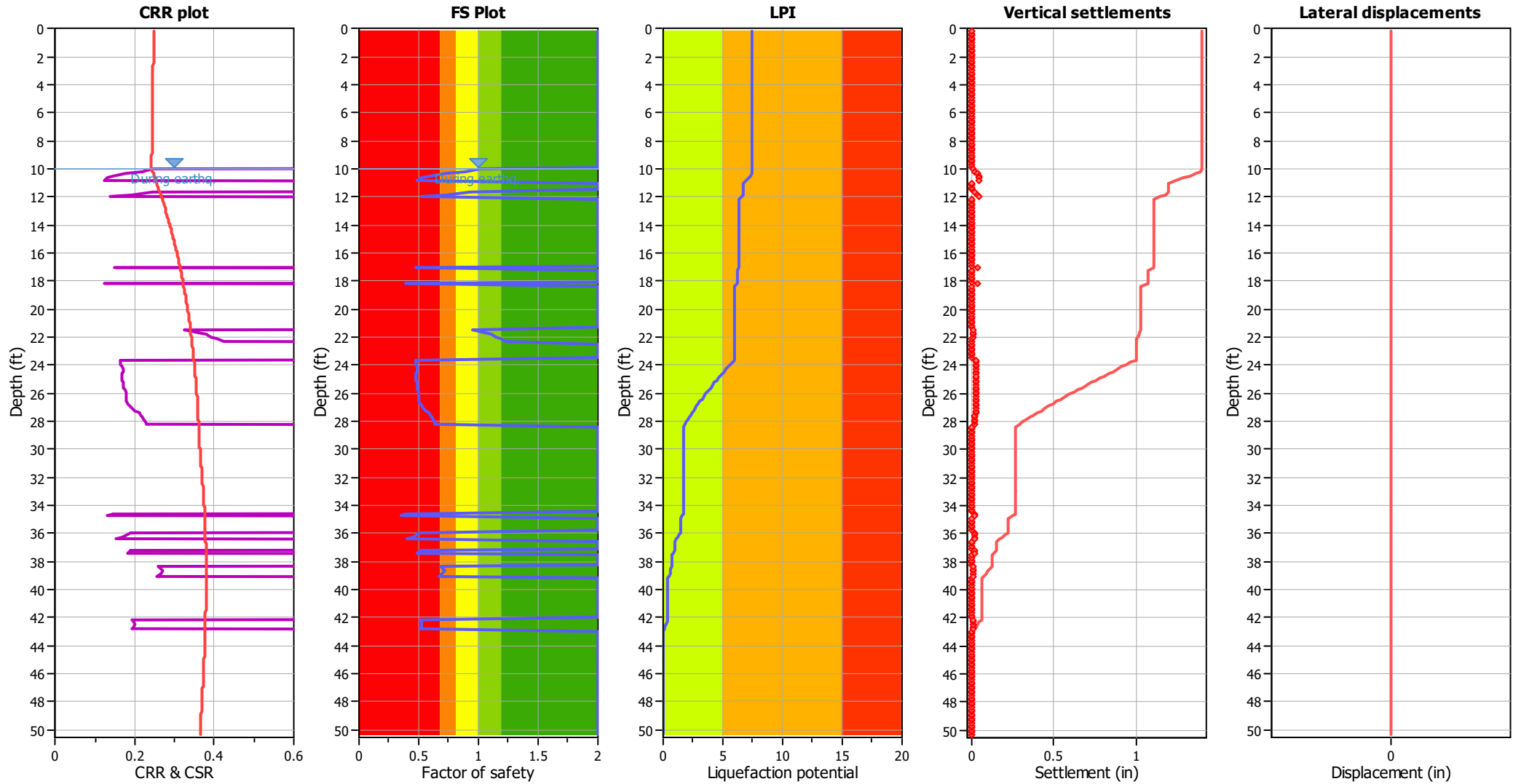
Liquefaction analysis summary plots



Input parameters and analysis data

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Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K _σ applied:	Yes
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Liquefaction analysis overall plots



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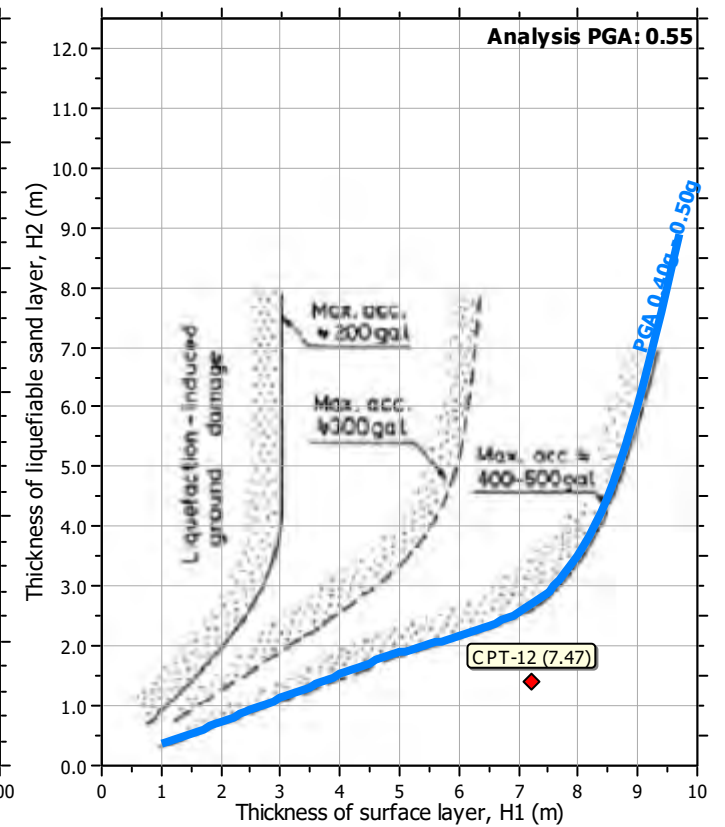
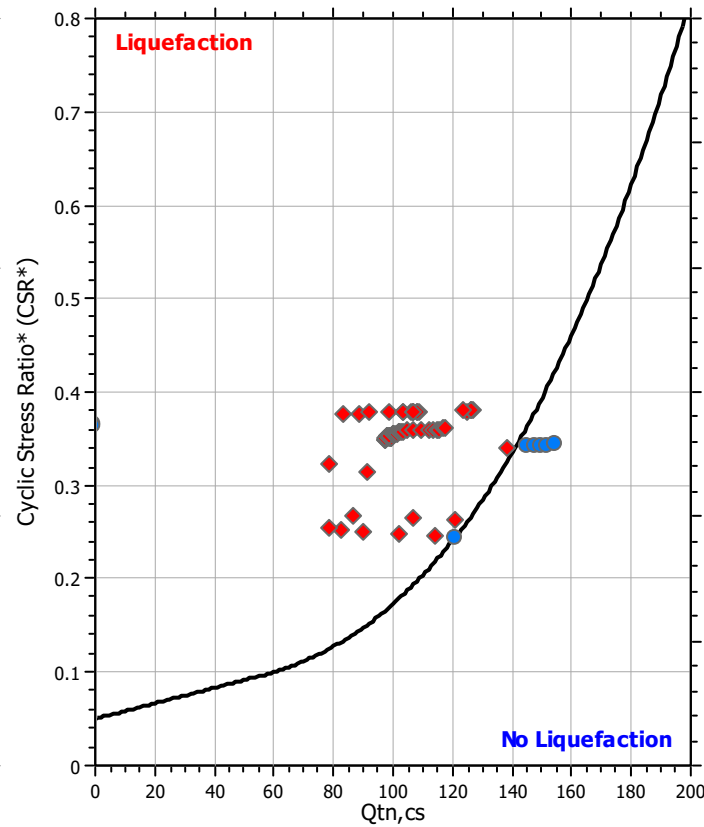
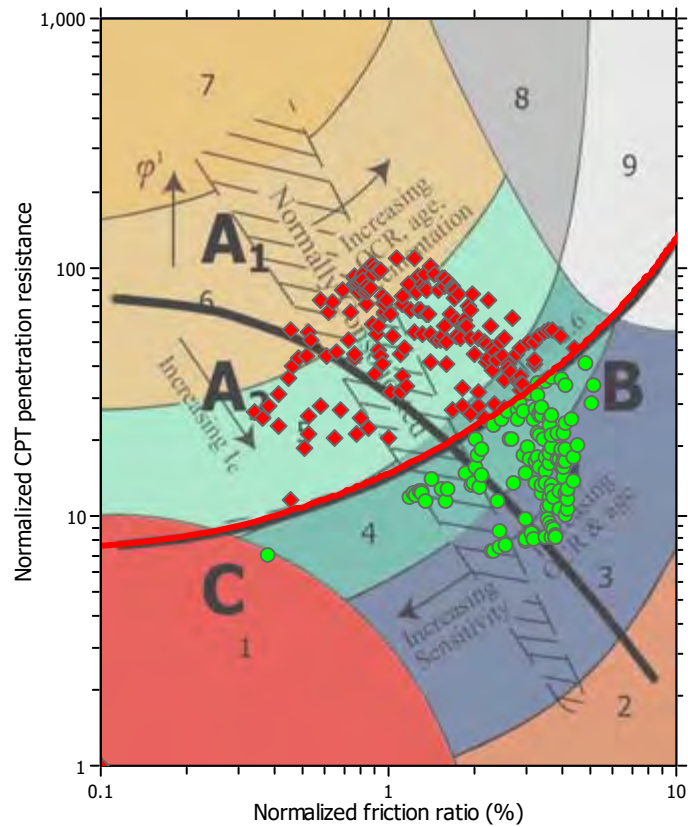
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Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
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