



# **CITY OF MOORPARK CONTRACT DOCUMENTS**

**FOR**

**NEW MOORPARK CITY LIBRARY PROJECT**

**IDENTIFICATION NO. P&R-2025-01**

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**NOTICE INVITING BIDS  
FOR**

**New Moorpark City Library  
Identification number P&R-2025-01**

**NOTICE IS HEREBY GIVEN** that the City of Moorpark, California ("City") invites sealed Bids for the Project. The City will receive such Bids at the City Clerk's office, City Hall, 323 Science Drive, Moorpark, California 93021 up to **2:00\_p.m.** local time on **July 1, 2025**, at which time they will be publicly opened and read aloud. The City Clerk's official bid clock will be conclusive as to the time of bid receipt. Bids must be submitted on the City's Bid Forms.

**SCOPE OF WORK.** The Project includes, without limitation, furnishing all necessary labor, materials, equipment and other incidental and appurtenant Work necessary to satisfactorily complete the Project, as more specifically described in the Contract Documents. This Work will be performed in strict conformance with the Contract Documents, permits from regulatory agencies with jurisdiction, and applicable regulations. The quantity of Work to be performed and materials to be furnished are approximations only, being given as a basis for the comparison of Bids. Actual quantities of Work to be performed may vary at the discretion of the Parks and Recreation Director.

The New Moorpark City Library is proposed as a new 17,500 sf single story building. The project includes all associated site amenities including parking areas, pedestrian access, and landscaping. The scope of construction of the new building includes structural, mechanical, electrical, plumbing, low voltage systems, site grading, and drainage.

The Moorpark City Library will be constructed in Two Phases, **Phase I** will consist of completing the site preparation and construction of the Library with associated utility tie-ins, hardscape and landscape. This phase is estimated to take 18 months, including site clearing, earthwork, and soils mitigation. **Phase II** will consist of the demolition of the existing Library and West Parking lot and removal of the existing utilities, relocation of a gas line, site clearing, and site preparation and completion of construction of the new parking lot. This phase is estimated to take 6 months.

**OBTAINING BID DOCUMENTS.** Bidders may obtain free copies of the Plans, Specifications and other Contract Documents by e-mailing [jsandifer@moorparkca.gov](mailto:jsandifer@moorparkca.gov). Please provide name, company and e-mail address when requesting plans. After registration information is taken, the link will be sent to access the plans online. Plans can also be obtained at the following bidding sites.

Bidnet Direct  
[www.bidnetdirect.com](http://www.bidnetdirect.com)

Ventura County Contractors Association  
[www.vccainc.com](http://www.vccainc.com)

Dodge Data & Analytics  
[www.construction.com](http://www.construction.com)

Tri-Co Reprographics  
[www.tricoblue.com](http://www.tricoblue.com)

**PREQUALIFICATION.** The City will only accept Bids from Bidders who have been prequalified for the Project. See prequalification list on the City's website. Any Bid received from a Bidder who has not been prequalified for the Project will be returned unopened.

**MANDATORY PRE-BID MEETING AND SITE VISIT.** A mandatory pre-bid meeting will be held on **June 12, 2025 at 10:00 a.m.** at **83 West High Street, Moorpark California 93021**, followed by a mandatory site visit. Every Bidder is required to attend the pre-bid meeting and Project site visit. Failure of a Bidder to attend will render that Bidder's Bid non-responsive. No allowances for cost adjustments will be made if a Bidder fails to adequately examine the Project site before submitting a Bid.

**REGISTRATION WITH THE DEPARTMENT OF INDUSTRIAL RELATIONS.** In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5 [with limited exceptions for bid purposes only under Labor Code Section 1771.1(a)].

**PREVAILING WAGES.** In accordance with Labor Code Section 1770 *et seq.*, the Project is a "public work." The selected Bidder (Contractor) and any Subcontractors shall pay wages in accordance with the determination of the Director of the Department of Industrial Relations ("DIR") regarding the prevailing rate of per diem wages. Copies of those rates are on file with the Director of Public Works, and are available to any interested party upon request. The Contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This Project is subject to compliance monitoring and enforcement by the DIR.

**BONDS.** Each Bid must be accompanied by a cash deposit, cashier's check, certified check or Bidder's Bond issued by a Surety insurer, made payable to the City and in an amount not less than ten percent (10%) of the total Bid submitted. Personal or company checks are not acceptable. Upon Contract award, the Contractor shall provide faithful performance and payment Bonds, each in a sum equal to the Contract Price. All Bonds must be issued by a California admitted Surety insurer using the forms set forth in the Contract Documents, or in any other form approved by the City Attorney. Failure to enter into the Contract with the City, including the submission of all required Bonds and insurance coverages, within fifteen (15) Days after the date of the mailing of written notice of contract award to the Bidder, shall subject the Bid security to forfeiture to the extent provided by law.

**LICENSES.** Each Bidder shall possess a valid Class B Contractor's license issued by the California State Contractors License Board at the time of the Bid submission, unless this Project has any federal funding, in which case the successful Bidder must possess such a license at the time of Contract award. The successful Contractor must also possess a current City business license.

**RETENTION SUBSTITUTION.** Five percent (5%) of any progress payment will be withheld as retention. In accordance with Public Contract Code Section 22300, and at the request and expense of the Contractor, securities equivalent to the amount withheld may be deposited with the City or with a State or federally chartered bank as escrow agent, which shall then pay such moneys to the Contractor. Upon satisfactory completion of the Project, the securities shall be returned to the Contractor. Alternatively, the Contractor may request that the City make payments of earned retentions directly to an escrow agent at the Contractor's expense. No such substitutions shall be accepted until all related documents are approved by the City Attorney.

**BIDDING PROCESS.** The City reserves the right to reject any Bid or all Bids, and to waive any irregularities or informalities in any Bid or in the bidding, as deemed to be in its best interest.

By:

\_\_\_\_\_  
Parks and Recreation Director

\_\_\_\_\_  
Date

## **INSTRUCTIONS TO BIDDERS**

**FORM OF BID.** Bids shall be made on the Bid forms found herein. Bidders shall include all forms and fill in all blank spaces, including inserting "N/A" (for not applicable) where necessary. Each Bid must be submitted in a sealed envelope bearing the Bidder's name and addressed to the City Clerk with the Project name and identification number (as described in the Notice Inviting Bids) typed or clearly printed on the lower left corner of the envelope.

**DELIVERY OF BIDS.** The Bid shall be delivered and must be actually received by the City Clerk's office by the time and date specified in the Notice Inviting Bids. No oral, faxed, emailed, or telephonic Bids or alternatives will be considered. The time of delivery shall be conclusively determined by the City Clerk's office based on the City Clerk's official bid clock. Bidders are solely responsible for ensuring that their Bids are received in proper time, and Bidders assume all risks arising out of their chosen means of delivery. Any Bid received after the Bid submission deadline shall be returned unopened. Bidders are invited to be present for Bid opening. Accepted Bids shall become the property of the City.

**AMENDED BIDS.** Unauthorized conditions, limitations or provisos attached to a Bid may cause the Bid to be deemed incomplete and non-responsive.

**WITHDRAWAL OF BID.** A Bid may be withdrawn without prejudice upon written request by the Bidder filed with the City Clerk before the Bid submission deadline. Bids must remain valid and shall not be subject to withdrawal for sixty (60) Days after the Bid opening date.

**BIDDER'S SECURITY.** Each Bid shall be accompanied by cash, a certified or cashier's check payable to the City, or a satisfactory Bid Bond in favor of the City executed by the Bidder as principal and an admitted surety insurer as Surety, in an amount not less than ten percent (10%) of the amount set forth in the Bid. The cash, check or Bid Bond shall be given as a guarantee that, if selected, the Bidder will execute the Contract in conformity with the Contract Documents, and will provide the evidence of insurance and furnish the specified Bonds, within fifteen (15) Days after the date of delivery of the Contract Documents to the Bidder. In case of the Bidder's refusal or failure to do so, the City may award the Contract to the next lowest responsible bidder, and the cash, check, or Bond (as applicable) of the lowest Bidder shall be forfeited to the City to the extent permitted by law. No Bid Bond will be accepted unless it conforms substantially to the form provided in these Contract Documents.

**QUANTITIES APPROXIMATE.** Any quantities shown in the Bid form or elsewhere herein shall be considered as approximations listed to serve as a general indication of the amount of Work or materials to be performed or furnished, and as basis for the Bid comparison. The City does not guarantee that the actual amounts required will correspond with those shown. As deemed necessary or convenient, the City may increase or decrease the amount of any item or portion of Work or material to be performed or furnished or omit any such item or portion, in accordance with the Contract Documents.

**ADDENDA.** The City may, from time to time, issue Addenda to the Contract Documents. Bidders are responsible for ensuring that they have received any and all Addenda. Each Bidder is responsible for verifying that it has received all Addenda issued, if any. Bidders must acknowledge receipt of all Addenda, if any, in their bids. Failure to acknowledge receipt of all Addenda may cause a Bid to be deemed incomplete and non-responsive.

**EMAIL ADDRESS.** Bidders shall supply the City with an email address to facilitate transmission of Addenda and other information related to these Contract Documents. Addenda will also be posted on the City website <http://www.moorparkca.gov/Bids.aspx>. A Bidder shall be responsible for all Addenda regardless of whether Bidder received any such email, and a Bidder shall have no recourse due to not receiving such email.

**DISCREPANCIES IN BIDS.** Each bidder shall set forth as to each item of Work, in clearly legible words and figures, a unit or line item Bid amount for the item in the respective spaces provided for this purpose.

In case of discrepancy between the unit price and the extended amount set forth for the item, the unit price shall prevail. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or if the unit price is the same amount as the entry in the "extended amount" column, then the amount set forth in the "extended amount" column for the item shall prevail in accordance with the following:

- (1) As to lump sum items, the amount set forth in the "extended amount" column shall be the unit price.
- (2) As to unit price items, the amount set forth in the "extended amount" column shall be divided by the estimated quantity for the item set forth in the Bid documents, and the price thus obtained shall be the unit price.

In case of discrepancy between words and figures, the words shall prevail.

**COMPETENCY OF BIDDERS.** In evaluating Bidder responsibility, consideration will be given not only to the financial standing, but also to the general competency of the Bidder for the performance of the Project. Each Bidder shall set forth in the designated area of the Bid form a statement of its experience. No Contract will be executed with a Bidder that is not licensed and registered with the DIR in accordance with State law, and with any applicable specific licensing requirements specified in these Contract Documents. These licensing and registration requirements for Contractors shall also apply to all Subcontractors.

**BIDDER'S EXAMINATION OF SITE AND CONTRACT DOCUMENTS.** Each Bidder must carefully examine the Project site and the entirety of the Contract Documents. Upon submission of a Bid, it will be conclusively presumed that the Bidder has thoroughly investigated the Work and is satisfied as to the conditions to be encountered and the character, quality, and quantities of Work to be performed and materials to be furnished. Upon Bid submission, it also shall be conclusively presumed that the Bidder is familiar with and agrees to the requirements of the Contract Documents, including all Addenda. No information derived from an inspection of records or investigation will in any way relieve the Contractor from its obligations under the Contract Documents nor entitle the Contractor to any additional compensation. The Contractor shall not make any claim against the City based upon ignorance or misunderstanding of any condition of the Project site or of the requirements set forth in the Contract Documents. No claim for additional compensation will be allowed which is based on a lack of knowledge of the above items. Bidders assume all risks in connection with performance of the Work in accordance with the Contract Documents, regardless of actual conditions encountered, and waive and release the City with respect to any and all claims and liabilities in connection therewith, to the extent permitted by law.

**TRADE NAMES OR EQUALS.** Requests to substitute an equivalent item for a brand or trade name item must be made by written request submitted no later than the date specified in Section

4-6 of the General Provisions. Requests received after this time shall not be considered. Requests shall clearly describe the product for which approval is requested, including all data necessary to demonstrate acceptability.

**DISQUALIFICATION OF BIDDERS.** No Person shall be allowed to make, file or be interested in more than one Bid for the Project, unless alternate Bids are specifically called for. A Person that has submitted a sub-bid to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from making a prime Bid. If there is a reason to believe that collusion exists among the Bidders, all affected Bids will be rejected.

**RETURN OF BID SECURITY.** The successful Bidder's Bid security shall be held until the Contract is executed. Unless requested to be returned to the Bidder, bid security for unsuccessful bidders shall be destroyed sixty (60) days after the successful Bidder has signed the Contract.

**AWARD OF CONTRACT.** The City reserves the right to reject any or all Bids or any parts thereof or to waive any irregularities or informalities in any Bid or in the bidding. The Contract award, if made, will be to the lowest responsible, responsive Bidder and is anticipated to occur within sixty (60) Days after the Bid opening. The Contract award may be made after that period if the selected Bidder has not given the City written notice of the withdrawal of its Bid.

**DETERMINATION OF LOWEST BID.** In accordance with Public Contract Code Section 20103.8, the **lowest Bid shall be determined as follows: the lowest bid price on the base contract without consideration of the prices on the additive or deductive items.**

**TRENCHING.** Pursuant to Labor Code Section 6707, if the Project involves the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five (5) feet deep or more, then each Bidder must submit, as a Bid item, adequate sheeting, shoring, and bracing, or an equivalent method, for the protection of life or limb, which shall conform to applicable safety orders. This final submission must be accepted by the City in advance of excavation and must include a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from caving ground during the excavation Work. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

**LISTING SUBCONTRACTORS; SELF-PERFORMANCE.** Each Bidder shall submit a list of the proposed Subcontractors on the Project, as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100, *et seq.*). Contractor shall self-perform **not less than 25% of the Work.**

**EXECUTION OF CONTRACT.** The selected Bidder shall execute the Contract in the form included in these Contract Documents within fifteen (15) Days from the date of delivery of the Contract Documents to the Bidder. Additionally, the selected Bidder shall also secure all insurance and Bonds as herein specified, and provide copies to the City, within fifteen (15) Days from the date of delivery of the Contract Documents to the Bidder. Failure or refusal to execute the Contract or to conform to any of the stipulated requirements shall be just cause for the annulment of the award and forfeiture of the Bidder's security. In such event, the City may declare the Bidder's security forfeited to the extent permitted by law, and the City may award the Contract to the next lowest responsible Bidder or may reject all bids.

**NO COMPENSATION FOR COSTS INCURRED PRIOR TO CONTRACT EXECUTION.** All costs incurred by the selected Bidder prior to Contract award and execution of the Contract by the City shall be at the Bidder's sole risk. City shall have no liability for costs incurred prior to its execution of the Contract.

**SIGNATURES.** The Bidder shall execute all documents requiring signatures, and shall cause to be notarized all documents that indicate such a requirement. Bids submitted as joint ventures must so state and be signed by each joint venturer. The Bidder shall provide evidence satisfactory to the City, such as an authenticated resolution of its board of directors, a certified copy of a certificate of partnership acknowledging the signer to be a general partner, or a power of attorney, indicating the capacity of the person(s) signing the Bid to bind the Bidder to the Bid and any Contract arising therefrom. Alternatively, Bids submitted by corporations must be executed as specified in Corporations Code Section 313, and Bids submitted by partnerships must be executed by all partners comprising the partnership.

**INSURANCE AND BONDS.** The Contractor shall not begin Work until it has given the City evidence of all required insurance coverage (including all additional insured endorsements), a Bond guaranteeing the Contractor's faithful performance of the Contract, and a Bond securing the payment of claims for labor and materials.

**TELEPHONES.** Bidders are hereby notified that the City will not provide telephones for their use at the time of Bid submission.

**INTERPRETATION OF CONTRACT DOCUMENTS.** Any Bidder that is in doubt as to the intended meaning of any part of the Contract Documents, or that finds discrepancies in or omissions from the Contract Documents, may submit to the City a written request for an interpretation or correction no later than **5:00 p.m. June 23, 2025** before the Bid submission deadline. Requests for clarification received after this date will be disregarded. Please indicate the Project and identification number in the request for clarification. Telephonic requests will not be taken. Any interpretation or correction of the Contract Documents will be made only by a written Addendum. No oral interpretation of any provision in the Contract Documents shall be binding.

**TAXES.** Except as may be otherwise specifically provided herein, all sales and/or use taxes assessed by federal, State or local authorities on materials used or furnished by the Contractor in performing the Work shall be paid by the Contractor. The Bidder shall calculate payment for all sales, unemployment, pension and other taxes imposed by federal, State, and local law and shall include these payments in computing the Bid.

**Requests for Information or clarification can be sent to [ralamillo@balfourbeattyus.com](mailto:ralamillo@balfourbeattyus.com)**

## CHECKLIST FOR BIDDERS

The following information is required of all Bidders at the time of Bid submission:

- \_\_\_\_\_ Completed and Signed Bid Cover Form
- \_\_\_\_\_ Completed and Signed Bid Sheets
- \_\_\_\_\_ Completed and Signed Questionnaire
- \_\_\_\_\_ Completed References Form
- \_\_\_\_\_ Resume of General Construction Superintendent/On-Site Construction Manager
- \_\_\_\_\_ Completed Subcontractor Designation Form
- \_\_\_\_\_ Completed and Signed Industrial Safety Record Form
- \_\_\_\_\_ Completed, Signed and Notarized Bid Bond or Other Security Form
- \_\_\_\_\_ Signed Noncollusion Declaration Form
- \_\_\_\_\_ Evidence satisfactory to the City indicating the capacity of the person(s) signing the Bid to bind the Bidder

Failure of the Bidder to provide all required information in a complete and accurate manner may cause the Bid to be considered non-responsive.

I hereby certify and declare under penalty of perjury under the laws of the State of California that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder \_\_\_\_\_

Signature \_\_\_\_\_

Name and Title \_\_\_\_\_

Dated \_\_\_\_\_



**BID**  
**CITY OF MOORPARK**  
**NEW MOORPARK CITY LIBRARY PROJECT [P&R-2025-01]**

TO THE HONORABLE MAYOR AND CITY COUNCIL OF THE CITY OF MOORPARK:

The undersigned, as Bidder, declares that: (1) this Bid is made without collusion with any other person and that the only persons or parties interested as principals are those named herein; (2) the undersigned has carefully examined the Contract Documents (including all Addenda) and the Project site; and (3) the undersigned has investigated and is satisfied as to the conditions to be encountered, the character, quality and quantities of Work to be performed, and the materials to be furnished. Furthermore, the undersigned agrees that submission of this Bid shall be conclusive evidence that such examination and investigation have been made and agrees, in the event the Contract be awarded to it, to execute the Contract with the City of Moorpark to perform the Project in accordance with the Contract Documents in the time and manner therein prescribed, and to furnish or provide all materials, labor, tools, equipment, apparatus and other means necessary so to do, except as may otherwise be furnished or provided under the terms of the Contract Documents, for the following stated unit prices or lump-sum price as submitted on the Bid herein.

Bidder acknowledges receipt of all addenda, as follows:

Addendum No. \_\_\_\_\_ Date: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date: \_\_\_\_\_

The undersigned submits as part of this Bid a completed copy of its Industrial Safety Record. This Safety Record includes all construction Work undertaken in California by the undersigned and any partnership, joint venture or corporation that any principal of the undersigned participated in as a principal or owner for the last five (5) calendar years and the current calendar year before the date of Bid submittal. Separate information is being submitted for each such partnership, joint venture, or corporate or individual Bidder. The undersigned may attach any additional information or explanation of data that it would like to be taken into consideration in evaluating the Safety Record. An explanation of the circumstances surrounding any and all fatalities is attached.

Accompanying this Bid is cash, a cashier's check, a certified check or a Bid Bond in an amount equal to at least ten percent (10%) of the total aggregate Bid price based on the quantities shown and the unit prices quoted. The undersigned further agrees that, should it be awarded the Contract and thereafter fail or refuse to execute the Contract and provide the required evidence of insurance and Bonds within fifteen (15) Days after delivery of the Contract to the undersigned, then the cash, check or Bid Bond shall be forfeited to the City to the extent permitted by law.

The undersigned certifies to have a minimum of three (3) consecutive years of current experience in the type of Work related to the Project and that this experience is in actual operation of the firm with permanent employees performing a part of the Work as distinct from a firm operating entirely

by subcontracting all phases of the Work. The undersigned also certifies to be properly licensed by the State as a contractor to perform this type of Work. The undersigned possesses California Contractor's License Number \_\_\_\_\_, Class \_\_\_\_\_, which expires on \_\_\_\_\_.

Bidder's Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

**CITY OF MOORPARK**  
**BID SHEETS FOR**  
**NEW MOORPARK CITY LIBRARY [P&R-2025-01]**

Bidder's Name: \_\_\_\_\_

To the Honorable Mayor and Members of the City Council:

In compliance with the Notice Inviting Bids, the undersigned hereby agrees to execute the Contract to furnish all labor, materials, equipment and supplies for the Project in accordance with the Contract Documents to the satisfaction and under the direction of the City Engineer, at the following prices:

**BASE AMOUNT:**

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>EXTENDED AMOUNT</b>
1.	Mobilization (Maximum ___% of total bid amount)	LS	\$
2.	Ground Improvements – Vibro Stone Columns	LS	\$
3.	Base Amount - Phase 1	LS	\$
4.	Base Amount - Phase 2	LS	\$
5.	<b>TOTAL BASE AMOUNT (Items #1-4)</b>	LS	\$ _____

**ADDITIVE OR DEDUCTIVE ITEM (if applicable):**

ITEM NO.	DESCRIPTION	UNIT	EXTENDED AMOUNT
1.	Battery Back-up System – 200KWH Reference Sheet G0.20	LS	\$
2.	Ground Improvement – Deep Soil Mixing	LS	\$
<b>TOTAL ADDITIVE OR DEDUCTIVE ITEM:</b>			\$ _____

Note: Items may be adjusted or deleted. No adjustment in the prices will be allowed. The City reserves the right to not use any of the estimated quantities; and if this right is exercised, the Contractor will not be entitled to any additional compensation. Cost of all export of material shall be included in the above unit costs; no additional compensation will be granted for such expenses.

**TOTAL BID PRICE AMOUNT**

**TOTAL BID PRICE IN DIGITS:** \$ \_\_\_\_\_

**TOTAL BID PRICE IN WORDS:** \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

## QUESTIONNAIRE FORM

Fill out all of the following information. Attach additional sheets if necessary.

- (1) Bidder's Name: \_\_\_\_\_
- (2) If the Bidder's name is a fictitious name, who or what is the full name of the registered owner? If the Bidder's name is not a fictitious name, write "N/A" in the response to this question. If you are doing business under a fictitious name, provide a copy of the filed valid Fictitious Business Name Statement.  
\_\_\_\_\_
- (3) Business Address: \_\_\_\_\_
- (4) Telephone: \_\_\_\_\_ Facsimile: \_\_\_\_\_
- (5) Type of Firm – Individual, Partnership, LLC or Corporation: \_\_\_\_\_
- (6) Corporation organized under the laws of the State of: \_\_\_\_\_
- (7) California State Contractor's License Number and Class: \_\_\_\_\_  
Original Date Issued: \_\_\_\_\_ Expiration Date: \_\_\_\_\_
- (8) DIR Contractor Registration Number: \_\_\_\_\_
- (9) List the name and title of the person(s) who inspected the Project site for your firm:  
\_\_\_\_\_
- (10) List the name and title of the person(s) who attended the mandatory pre-Bid meeting for your firm, including the mandatory site visit (if any): \_\_\_\_\_
- (11) Number of years' experience the company has as a contractor in construction work: \_\_\_\_\_
- (12) List the names, titles, addresses and telephone numbers of all individuals, firm members, partners, joint venturers, and company or corporate officers having a principal interest in this Bid:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (13) List all current and prior D.B.A.'s, aliases, and fictitious business names for any principal having interest in this Bid:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (14) List the dates of any voluntary or involuntary bankruptcy judgments against any principal having an interest in this Bid:

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- (15) For all arbitrations, lawsuits, settlements and the like (in or out of court) that the company or any principal having an interest in this Bid has been involved with in the past five (5) years:

- a. List the names, addresses and telephone numbers of contact persons for the parties:

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- b. Briefly summarize the parties' claims and defenses:

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- c. State the tribunal (e.g., Superior Court, American Arbitration Association, etc.), the matter number, and the outcome:

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- (16) Has the company or any principal having an interest in this Bid ever had a contract terminated by the owner or agency? If yes, explain.

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- (17) Has the company or any principal having an interest in this Bid ever failed to complete a project? If yes, explain.

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- (18) Has the company or any principal having an interest in this Bid ever been terminated for cause, even if it was converted to a "termination of convenience"? If yes, explain.

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- (19) For projects that the company or any principal having an interest in this Bid has been involved with in the last five (5) years, did you have any claims or actions:

- a. By you against the owner? Circle one: Yes No
- b. By the owner against you? Circle one: Yes No
- c. By any outside agency or individual for labor compliance?  
Circle one: Yes No
- d. By Subcontractors? Circle one: Yes No
- e. Are any of these claims or actions unresolved or outstanding?  
Circle one: Yes No

If your answer is "yes" to any part or parts of this question, explain.

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- (20) List the last three (3) projects you have worked on or are currently working on for the City of Moorpark:

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Upon request of the City, the Bidder shall furnish evidence showing a notarized financial statement, financial data, construction experience, or other additional information.

Failure to provide truthful answers to the questions above or in the following References Form may result in the Bid being deemed non-responsive.

The Bidder certifies under penalty of perjury under the laws of the State of California that the information provided above is true and correct.

Company

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_



## REFERENCES FORM

Bidder hereby declares under penalty of perjury under the laws of the State of California, as follows:

- ☐ (i) All reference information submitted by Bidder as part of the prequalification process, remains true and correct; or
- ☐ (ii) All reference information submitted by Bidder as part of the prequalification process, remains true and correct except as follows:

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### Bidder

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**NOTE:** The City reserves the right to determine, based on subsequently discovered or provided information, that a “prequalified” Bidder is no longer qualified to bid on the Project. The affected Bidder shall have three business days, beginning on the date of notification of the determination, within which to request in writing a hearing to rebut the City’s determination. The hearing shall be conducted by the City Manager or designee within three (3) business days of receipt of the Bidder’s hearing request, and that decision will be final. Failure to timely request a hearing shall constitute a waiver of the right to a hearing.

**DESIGNATION OF SUBCONTRACTORS**  
**[Public Contract Code Section 4104]**

List all Subcontractors who will perform Work or labor or render service to the Contractor in or about the construction of the Work or improvement, or a Subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the Plans and Specifications, in an amount in excess of one-half percent (0.5%) of the Contractor's total Bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half percent (0.5%) of the Contractor's total Bid or \$10,000, whichever is greater. If all Subcontractors do not fit on this page, attach another page listing all information for all other Subcontractors.

Name under which Subcontractor is Licensed and Registered	CSLB License Number(s) and Class(es)	DIR Contractor Registration Number	Address and Phone Number	Type of Work (e.g., Electrical)	Percentage of Total Bid (e.g., 10%)*

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\* The percentage of the total Bid shall represent the "portion of the work" for the purposes of Public Contract Code Section 4104(b).

## INDUSTRIAL SAFETY RECORD FORM

Bidder's Name \_\_\_\_\_

	Current Year of Record	2024	2023	2022	2021	2020	Total
Number of contracts							
Total dollar amount of contracts (in thousands of dollars)							
Number of fatalities							
Number of lost workday cases							
Number of lost workday cases involving permanent transfer to another job or termination of employment							

The above information was compiled from the records that are available to me at this time and I declare under penalty of perjury under the laws of the State of California that the information is true and accurate within the limitations of those records.

Signature: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Signature: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Bond No. \_\_\_\_\_

**BID BOND**

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Moorpark ("City"), has issued an invitation for Bids for the Work described as follows: \_\_\_\_\_

WHEREAS \_\_\_\_\_  
(Name and address of Bidder)

("Principal"), desires to submit a Bid to City for the Work.

WHEREAS, Bidders are required to furnish a form of Bidder's security with their Bids.

NOW, THEREFORE, we, the undersigned Principal, and \_\_\_\_\_

\_\_\_\_\_  
(Name and address of Surety)

("Surety"), a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City in the penal sum of \_\_\_\_\_

Dollars (\$ \_\_\_\_\_), being not less than ten percent (10%) of the total Bid price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal is awarded the Contract for the Work by the City and, within the time and in the manner required by the bidding specifications, enters into the written form of Contract included with the bidding specifications, furnishes the required Bonds (one to guarantee faithful performance and the other to guarantee payment for labor and materials), and furnishes the required insurance coverage, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

In case suit is brought upon this instrument, Surety further agrees to pay all court costs incurred by the City in the suit and reasonable attorneys' fees in an amount fixed by the court. Surety hereby waives the provisions of Civil Code Section 2845.

IN WITNESS WHEREOF, this instrument has been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: \_\_\_\_\_

“Principal”

“Surety”

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

By: \_\_\_\_\_  
Its: \_\_\_\_\_

By: \_\_\_\_\_  
Its: \_\_\_\_\_

By: \_\_\_\_\_  
Its: \_\_\_\_\_

By: \_\_\_\_\_  
Its: \_\_\_\_\_

*Note: This Bond must be dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.*

**NONCOLLUSION DECLARATION FORM**  
**TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID**  
**[Public Contract Code Section 7106]**

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing Bid.

The Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The Bid is genuine and not collusive or sham. The Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham Bid. The Bidder has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham Bid, or to refrain from bidding. The Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the Bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the Bid price, or of that of any other Bidder. All statements contained in the Bid are true. The Bidder has not, directly or indirectly, submitted his or her Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, Bid depository, or to any member or agent thereof, to effectuate a collusive or sham Bid, and has not paid, and will not pay, any Person or entity for such purpose.

Any person executing this declaration on behalf of a Bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the Bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_ [date], at \_\_\_\_\_ [city], \_\_\_\_\_ [state].

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

## **CHECKLIST FOR EXECUTION OF CONTRACT**

TO BE SUBMITTED BY SUCCESSFUL BIDDER:

- \_\_\_\_\_ Two (2) executed and notarized copies of the Contract
- \_\_\_\_\_ Evidence satisfactory to the City indicating the capacity of the person(s) signing the Contract to bind the Contractor
- \_\_\_\_\_ Payment Bond in amount of the Contract
- \_\_\_\_\_ Performance Bond in amount of the Contract
- \_\_\_\_\_ Workers' Compensation Certificate
- \_\_\_\_\_ Liability insurance certificate in the amounts and form specified in Exhibit "A" to the Agreement
- \_\_\_\_\_ Automobile insurance certificate in the amount and form specified in Exhibit "A" to the Agreement
- \_\_\_\_\_ Copy of City business license
- \_\_\_\_\_ Additional insured endorsement – comprehensive general liability
- \_\_\_\_\_ Additional insured endorsement – automobile liability
- \_\_\_\_\_ Additional insured endorsement – excess liability

## CONTRACT

### CONSTRUCTION AGREEMENT BETWEEN THE CITY OF MOORPARK AND \_\_\_\_\_, FOR CONSTRUCTION OF NEW MOORPARK CITY LIBRARY

THIS AGREEMENT, executed as of \_\_\_\_\_, is between the City of Moorpark, a municipal corporation ("City") and \_\_\_\_\_, a \_\_\_\_\_ ("Contractor"). In consideration of the mutual covenants and conditions set forth herein, the parties agree as follows:

WHEREAS, City has the need for construction services related to construction of New Moorpark City Library; and

WHEREAS, Contractor specializes in providing such services and has the proper work experience, certifications, and background to carry out the duties involved; and

WHEREAS, on \_\_\_\_\_ the City Council of the City of Moorpark authorized the City Manager to enter into this Agreement after public bidding in accordance with California Public Contract Code Section 22030, et seq.

NOW, THEREFORE, in consideration of the mutual covenants, benefits, and premises herein stated, the parties hereto agree as follows:

#### 1. TERM

The term of the Agreement shall be from the date of execution until completion of the work identified in the Scope of Services and in conformance with Exhibit \_\_\_\_\_, unless this Agreement is terminated or suspended consistent with Section 6 of this Agreement.

#### 2. SCOPE OF SERVICES

City does hereby retain Contractor in a contractual capacity to provide construction services related to construction of **New Moorpark City Library**, as set forth in Exhibit "\_\_\_\_", Contractor's Bid for the Project, including all required forms, certifications, and certificates, dated \_\_\_\_\_, attached hereto and incorporated by reference ("Bid"), the Project Plans and Specifications dated \_\_\_\_\_ ("Plans and Specifications"), and Exhibit "\_\_\_\_", which includes (i) Insurance Requirements; (ii) Performance and Payment Bond forms; (iii) General Provisions (incorporating and amending the Standard Specifications; and (iv) Special Provisions (all of which are attached hereto and incorporated herein by this reference as though set forth in full. The provisions of Section 3-7.2 of the Standard Specifications establish the precedence of documents in the event of any conflict between the Contract Documents, including any document incorporated by reference herein, and/or regulatory document.

Contractor shall perform the tasks described and set forth in the Contract Documents. Contractor shall complete the tasks according to the schedule of performance which is also set forth in Exhibit \_\_\_\_\_.



Compensation for the services to be performed by Contractor shall be in accordance with Exhibit \_\_\_\_\_. Compensation shall not exceed the rates or total amount of XXXXXX dollars (\$XXXX) as stated in Exhibit \_\_\_\_\_, without a written amendment to the Agreement executed by both parties. Payment by City to Contractor shall be as referred to in this Agreement.

City and Contractor acknowledge that this project is a public work to which prevailing wages apply, and that a public work project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations (DIR). Contractor agrees to comply with and be bound by all the terms, rules and regulations described in (a) Division 2, Part 7, Chapter 1 (commencing with § 1720) of the California Labor Code, including without limitation Labor Code § 1771 and (b) the rules and regulations established by the DIR implementing such statutes, as though set forth in full herein, including any applicable amendments made thereto during the term of this Agreement. For every subcontractor who will perform work on this project, Contractor shall be responsible for subcontractor's compliance with (a) and (b) and Contractor shall take all necessary actions to ensure subcontractor's compliance. Labor Code § 1725.5 requires contractors and subcontractors to annually register with the DIR before bidding or performing on any public work contract.

### 3. PERFORMANCE

Contractor shall at all times faithfully, competently, and to the best of Contractor's ability, experience, and talent, perform all tasks described herein. Contractor shall employ, at a minimum, generally accepted standards and practices utilized by persons engaged in providing similar services as are required of Contractor hereunder in meeting its obligations under this Agreement.

### 4. MANAGEMENT

The individual directly responsible for Contractor's overall performance of the Agreement provisions herein above set forth and to serve as principal liaison between City and Contractor shall be \_\_\_\_\_, and no other individual may be substituted without the prior written approval of the City Manager.

The City's contact person in charge of administration of this Agreement, and to serve as principal liaison between Contractor and City, shall be the City Manager or the City Manager's designee.

### 5. PAYMENT

The City agrees to pay Contractor monthly, in accordance with the terms and the schedule of payment as set forth in Exhibit \_\_\_\_\_, attached hereto and incorporated herein by this reference as though set forth in full, based upon actual time spent on the above tasks. This amount shall not exceed XXXXX dollars (\$XXXXXXXX) for the total term of the Agreement unless additional payment is approved as provided in this Agreement.

Contractor shall not be compensated for any additional services rendered in connection with its performance of this Agreement, unless such additional services and compensation are authorized, in advance, in a written amendment to this Agreement executed by both parties. The City Manager, if authorized by City Council, may approve additional work not to exceed ten percent (10%) of the amount of the Agreement.

Contractor shall submit invoices monthly for actual services performed. Invoices shall be

submitted on or about the first business day of each month, or as soon thereafter as practical, for services provided in the previous month. Payment shall be made within thirty (30) days of receipt of each invoice as to all non-disputed fees. If the City disputes any of Contractor's fees it shall give written notice to Contractor within thirty (30) days of receipt of any disputed fees set forth on the invoice. Contractor shall provide appropriate documentation, as determined by the City, for all reimbursable expenses.

#### 6. TERMINATION OR SUSPENSION WITHOUT CAUSE

The City may at any time, for any reason, with or without cause, suspend, or terminate this Agreement, or any portion hereof, by serving upon the Contractor at least ten (10) days prior written notice. Upon receipt of said notice, the Contractor shall immediately cease all work under this Agreement, unless the notice provides otherwise. If the City suspends or terminates a portion of this Agreement such suspension or termination shall not make void or invalidate the remainder of this Agreement.

The Contractor may terminate this Agreement only by providing City with written notice no less than thirty (30) days in advance of such termination. In the event of such termination, Contractor shall be compensated for such services up to the date of termination. Such compensation for work in progress shall be prorated as to the percentage of progress completed at the date of termination.

If the City Manager or the City Manager's designee determines that the Contractor is in default in the performance of any of the terms or conditions of this Agreement, the City may proceed in the manner set forth in Section 6-4 of the Greenbook.

#### 7. DEFAULT OF CONTRACTOR

The Contractor's failure to comply with the provisions of this Agreement shall constitute a default. In the event that Contractor is in default for cause under the terms of this Agreement, City shall have no obligation or duty to continue compensating Contractor for any work performed after the date of default and can terminate this Agreement immediately by written notice to the Contractor. If such failure by the Contractor to make progress in the performance of work hereunder arises out of causes beyond the Contractor's control, and without fault or negligence of the Contractor, it shall not be considered a default.

If the City Manager or the City Manager's designee determines that the Contractor is in default in the performance of any of the terms or conditions of this Agreement, he/she shall cause to be served upon the Contractor a written notice of the default. The Contractor shall have five (5) working days after service upon it of said notice in which to

cure the default by rendering a satisfactory performance. In the event that the Contractor fails to cure its default within such period of time, the City shall have the right, notwithstanding any other provision of this Agreement, to terminate this Agreement without further notice and without prejudice to any other remedy to which it may be entitled at law, in equity or under this Agreement.

#### 8. LIQUIDATED DAMAGES

If the Contractor fails to complete the work, or any portion thereof, within the time period required by this Agreement or as duly extended in writing by the City Manager, Contractor shall forfeit and pay to the City, as liquidated damages, the sum of one thousand dollars (**\$250.00**) per

each calendar day the work, or portion thereof, remains uncompleted after the above specified completion date. Liquidated damages shall be deducted from any payments due or to become due to the Contractor under the terms of this Agreement [Government Code Sec. 53069.85]. Progress payments made by the City after the above specified completion date shall not constitute a waiver of liquidated damages by the City.

#### 9. OWNERSHIP OF DOCUMENTS

Contractor shall maintain complete and accurate records with respect to sales, costs, expenses, receipts, and other such information required by City that relate to the performance of services under this Agreement. Contractor shall maintain adequate records of services provided in sufficient detail to permit an evaluation of services. All such records shall be maintained in accordance with generally accepted accounting principles and shall be clearly identified and readily accessible. Contractor shall provide free access to the representatives of City or its designees at reasonable times to such books and records; shall give the City the right to examine and audit said books and records; shall permit City to make transcripts therefrom as necessary; and shall allow inspection of all work, data, documents, proceedings, and activities related to this Agreement. Notification of audit shall be provided at least thirty (30) days before any such audit is conducted. Such records, together with supporting documents, shall be maintained for a period of ten (10) years after receipt of final payment.

Upon completion of, or in the event of termination or suspension of this Agreement, all original documents, designs, drawings, maps, models, computer files, surveys, notes, and other documents prepared in the course of providing the services to be performed pursuant to this Agreement are deemed to be "works made for hire" for the benefit of the City, and together with all intellectual property rights arising out of their creation, shall become the sole property of the City and may be used, reused, or otherwise disposed of by the City without the permission of the Contractor. With respect to computer files, Contractor shall make available to the City, at the Contractor's office and upon reasonable written request by the City, the necessary computer software and hardware for purposes of accessing, compiling, transferring, and printing computer files.

#### 10. INDEMNIFICATION AND HOLD HARMLESS

Contractor shall indemnify, defend with legal counsel approved by City, and hold harmless City, its officers, officials, employees, agents, and volunteers ("Indemnitees") from and against all claims, liabilities, losses, damages stop notices, expenses, costs (including without limitation reasonable legal counsels' fees, expert fees and all other costs and fees of litigation) of every nature arising out of or in connection with Contractor's and/or Contractor's owners', employees', subcontractors', and/or agents' ("Contractor Parties") acts, omissions, negligence, recklessness or willful misconduct in the performance of work hereunder or any failure to comply with any of its obligations contained in this Agreement, except to the extent such loss or damage is caused by the sole or active negligence or willful misconduct of any of the Indemnitees. Should conflict of interest principles preclude a single legal counsel from representing both City and Contractor, or should City otherwise find Contractor's legal counsel unacceptable, then Contractor shall reimburse the City its costs of defense, including without limitation reasonable legal counsels' fees, expert fees and all other costs and fees of litigation. The Contractor shall promptly pay any final judgment rendered against the City or other Indemnitees with respect to claims requiring indemnification by Contractor pursuant to this section. It is expressly understood and agreed that

the foregoing provisions are intended to be as broad and inclusive as is permitted by the laws of the state of California and will survive termination of this Agreement.

Contractor obligations under this section apply regardless of whether or not such claim, charge, damage, demand, action, proceeding, loss, stop notice, cost, expense, judgment, civil fine or penalty, or liability was caused in part or contributed to by an Indemnitee. However, without affecting the rights of City under any provision of this Agreement, Contractor shall not be required to indemnify and hold harmless City for liability attributable to the sole or active negligence or willful misconduct of any of the Indemnitees, provided such active negligence is determined by agreement between the parties or by the findings of a court of competent jurisdiction. In instances where City is shown to have been actively negligent and where City active negligence accounts for only a percentage of the liability involved, the obligation of Contractor will be for that entire portion or percentage of liability not attributable to the active negligence of City.

Contractor agrees to obtain executed indemnity agreements with provisions identical to those set forth here in this Section from each and every subcontractor or any other person or entity involved by, for, with, or on behalf of Contractor in the performance of this Agreement. In the event Contractor fails to obtain such indemnity obligations from others as required here, Contractor agrees to be fully responsible according to the terms of this Section.

Failure of City to monitor compliance with these requirements imposes no additional obligations on City and will in no way act as a waiver of any rights hereunder. This obligation to indemnify and defend City and other Indemnitees as set forth herein is binding on the successors, assigns, or heirs of Contractor and shall survive the termination of this Agreement or Section.

This Indemnity is in addition to any other rights or remedies that the Indemnitees may have under the law or under any of the Contract Documents. In the event of any claim or demand made against any party which is entitled to be indemnified hereunder, City may, in its sole discretion, reserve, retain, or apply any monies otherwise due to the Contractor under this Agreement, for the purpose of resolving such claims; provided, however, City may release such funds if the Contractor provides City with reasonable assurance of protection of the Indemnitees' interests. City shall, in its sole discretion, determine whether such assurances are reasonable.

#### 11. INSURANCE

Contractor shall maintain prior to the beginning of and for the duration of this Agreement insurance coverage as specified in **Exhibit A** attached hereto and incorporated herein by this reference as though set forth in full.

#### 12. INDEPENDENT CONTRACTOR

Contractor is and shall at all times remain as to the City a wholly independent Contractor. The personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Neither City nor any of its officers, employees, or agents shall have control over the conduct of Contractor or any of Contractor's officers, employees, or agents, except as set forth in this Agreement. Contractor shall not at any time or in any manner represent that it or any of its officers, employees, or agents are in any manner officers, employees, or agents of the City. Contractor shall not incur or have the power to

incur any debt, obligation, or liability against City, or bind City in any manner.

No employee benefits shall be available to Contractor in connection with the performance of this Agreement. Except for the fees paid to Contractor as provided in the Agreement, City shall not pay salaries, wages, or other compensation to Contractor for performing services hereunder for City. City shall not be liable for compensation or indemnification to Contractor for injury or sickness arising out of performing services hereunder, to the extent provided by law.

13. LEGAL RESPONSIBILITIES

The Contractor shall keep itself informed of local, state, and federal laws and regulations which in any manner affect those employed by it or in any way affect the performance of its service pursuant to this Agreement. The Contractor shall at all times observe and comply with all such laws and regulations, including, but not limited to, the Americans with Disabilities Act and Occupational Safety and Health Administration laws and regulations. . The City, and its officers and employees, shall not be liable at law or in equity occasioned by failure of the Contractor to comply with this Section.

14. ANTI DISCRIMINATION

Neither the Contractor, nor any subcontractor under the Contractor, shall discriminate in employment of persons upon the work because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of such person; or any other basis protected by applicable federal, state, or local law, except as provided in § 12940 of the Government Code. .

15. UNDUE INFLUENCE

Contractor declares and warrants that no undue influence or pressure is used against or in concert with any officer or employee of the City in connection with the award, terms, or implementation of this Agreement, including any method of coercion, confidential financial arrangement, or financial inducement. No officer or employee of the City will receive compensation, directly or indirectly from Contractor, or any officer, employee, or agent of Contractor, in connection with the award of this Agreement or any work to be conducted as a result of this Agreement. Violation of this Section shall be a material breach of this Agreement entitling the City to any and all remedies at law or in equity.

16. NO BENEFIT TO ARISE TO LOCAL EMPLOYEES

No member, officer, or employee of the City, or their designees or agents, and no public official who exercises authority over or responsibilities with respect to the Project during his/her tenure or for one (1) year thereafter, shall have any interest, direct or indirect, in any agreement or sub-agreement, or the proceeds thereof, for work to be performed in connection with the Project performed under this Agreement.

17. CONFLICT OF INTEREST

Contractor covenants that neither they nor any officer or principal of their firm have any interests, nor shall they acquire any interest, directly or indirectly, which will conflict in any manner or degree with the performance of their services hereunder. Contractor further covenants that in

the performance of this Agreement, they shall employ no person having such interest as an officer, employee, agent, or subcontractor. Contractor further covenants that Contractor has not contracted with nor is performing any services directly or indirectly, with the developer(s) and/or property owner(s) and/or firm(s) and/or partnership(s) and/or public agency(ies) owning property and/or processing an entitlement application for property in the City or under its control, now or within the past one (1) year, and further covenants and agrees that Contractor and/or its subcontractors shall provide no service or enter into any contract with any developer(s) and/or property owner(s) and/or firm(s) and/or partnership(s) and/or public agency(ies) owning property and/or processing an entitlement application for property in the City or under its control, while under contract with the City and for a one (1) year time period following termination of this Agreement.

18. NOTICE

Any notice to be given pursuant to this Agreement shall be in writing, and all such notices and any other document to be delivered shall be delivered by personal service or by deposit in the United States mail, certified or registered, return receipt requested, with postage prepaid, and addressed to the party for whom intended as follows:

To: City Manager  
City of Moorpark  
323 Science Drive  
Moorpark, CA 93021

To: SIGNOR  
CONTRACTOR  
ADDRESS  
CITY, STATE ZIP

Either party may, from time to time, by written notice to the other, designate a different address or contact person, which shall be substituted for the one above specified. Notices, payments and other documents shall be deemed delivered upon receipt by personal service or as of the third (3rd) day after deposit in the United States mail.

19. CHANGE IN NAME

Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify the City in order that proper steps may be taken to have the change reflected in the Agreement documents.

20. ASSIGNMENT

Contractor shall not assign this Agreement or any of the rights, duties, or obligations hereunder. It is understood and acknowledged by the parties that Contractor is uniquely qualified to perform the services provided for in this Agreement.

21. LICENSES

At all times during the term of this Agreement, Contractor shall have in full force and effect, all licenses required of it by law for the performance of the services in this Agreement.

22. VENUE AND GOVERNING LAW

This Agreement is made, entered into, and executed in Ventura County, California, and any action filed in any court or for arbitration for the interpretation, enforcement or other action of the terms, conditions, or covenants referred to herein shall be filed in the applicable court in Ventura County, California. The City and Contractor understand and agree that the laws of the state of California, without regard for conflicts of laws principles, shall govern the rights, obligations, duties, and liabilities of the parties to this Agreement and also govern the interpretation of this Agreement.

23. ENTIRE AGREEMENT

This Agreement contains the entire understanding between the parties relating to the subject matter of this Agreement. All prior or contemporaneous agreements, understandings, representations, and statements, oral or written, are merged into this Agreement and shall be of no further force or effect. Each party is entering into this Agreement based solely upon the representations set forth herein and upon each party's own independent investigation of any and all facts such party deems material.

24. CAPTIONS OR HEADINGS

The captions and headings of the various Articles, Paragraphs, Sections, and Exhibits of this Agreement are for convenience and identification only and shall not be deemed to limit or define the content of the respective Articles, Paragraphs, Sections, and Exhibits hereof.

25. AMENDMENTS

Any amendment, modification, or variation from the terms of this Agreement shall be in writing and shall be effective only upon approval by both parties to this Agreement.

26. TIME IS OF THE ESSENCE

City and Contractor agree that time is of the essence in this Agreement.

27. PRECEDENCE

Contractor is bound by the contents of City's Bid Package and Proposal, Exhibit "\_\_\_" attached hereto and incorporated herein by this reference as though set forth in full. In the event of conflict, the requirements of the City's Bid Package and this Agreement shall take precedence over those contained in the Proposal.

28. INTERPRETATION OF AGREEMENT

Should interpretation of this Agreement, or any portion thereof, be necessary, it is deemed that this Agreement was prepared by the parties jointly and equally, and shall not be interpreted against either party on the ground that the party prepared the Agreement or caused it to be prepared.

29. WAIVER

No waiver of any provision of this Agreement shall be deemed, or shall constitute, a waiver of any other provision, whether or not similar, nor shall any such waiver constitute a continuing or subsequent waiver of the same provision. No waiver shall be binding unless executed in writing by the party making the waiver.

30. AUTHORITY TO EXECUTE

The person or persons executing this Agreement on behalf of the Contractor warrants and represents that he/she has the authority to execute this Agreement on behalf of the Contractor and has the authority to bind Contractor to the performance of obligations hereunder.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first above written.

CITY OF MOORPARK

CONTRACTOR

\_\_\_\_\_  
Troy Brown, City Manager

\_\_\_\_\_  
AUTHORIZED SIGNOR

Attest:

\_\_\_\_\_  
Ky Spangler, City Clerk



## EXHIBIT A

### INSURANCE REQUIREMENTS

Prior to the beginning of and throughout the duration of the Work, Contractor will maintain insurance in conformance with the requirements set forth below. Contractor will use existing coverage to comply with these requirements. If that existing coverage does not meet the requirements set forth here, it will be amended to do so. Contractor acknowledges that the insurance coverage and policy limits set forth in this section constitute the minimum amount of coverage required. Any insurance proceeds available to City in excess of the limits and coverage required in this Agreement and which is applicable to a given loss, will be available to the City.

**Contractor shall provide the following types and amounts of insurance:**

<u>Type of Insurance</u>	<u>Limits</u>
Commercial General Liability	\$3000,000 / \$6,000,000 Aggregate Business
Automobile Liability	\$1,000,000
Workers' Compensation	Statutory Limits

Insurance procured pursuant to these requirements shall be written by insurers that are authorized carriers in the state of California and with **A.M. Best rating of A- or better** and a **minimum financial size category class VII**.

**Commercial General Liability Insurance** shall be provided by an Insurance Services Office "Commercial General Liability" policy form CG 00 01 or the exact equivalent. Defense costs must be paid in addition to limits. There shall be no cross liability exclusion for claims or suits by one insured against another. Limits shall be no less than **\$3,000,000 per occurrence** for all covered losses and no less than **\$6,000,000 general aggregate**, and **\$6,000,000 completed operations aggregate**. The policy must include contractual liability that has not been amended. Any endorsement restricting standard ISO "insured contract" language will not be accepted.

Contractor's policy shall contain no endorsements limiting coverage beyond the basic policy coverage grant for any of the following:

- a. Explosion, collapse or underground hazard (XCU)
- b. Products and completed operations
- c. Pollution liability
- d. Contractual liability

Coverage shall be applicable to City for injury to employees of contractors, subcontractors, or others involved in the project. Policy shall be endorsed to provide a separate limit applicable to this project.

**Business Automobile Liability Insurance** coverage on ISO Business Auto Coverage form CA 00 01 06 92 including symbol 1 (Any Auto) or the exact equivalent shall be provided. Limits shall be no less than **\$1,000,000 combined single limit per accident**. If Contractor owns no vehicles, this requirement may be satisfied by a non-owned auto endorsement to the general liability policy described above. If Contractor or Contractor's employees will use personal autos in any way on this project, Contractor shall provide evidence of personal auto liability coverage for each such person.

**Workers' Compensation** Contractor shall maintain Workers' Compensation Insurance (Statutory Limits) and Employer's Liability Insurance (with limits of at least \$1,000,000) for Contractor's employees in accordance with the laws of the State of California, Section 3700 of the Labor Code. In addition, Contractor shall require each subcontractor to similarly maintain Workers' Compensation Insurance and Employer's Liability Insurance in accordance with the laws of the State of California, Section 3700 for all of the subcontractor's employees.

Contractor shall submit to Agency, along with the certificate of insurance, a Waiver of Subrogation endorsement in favor of Agency, its officers, agents, employees, and volunteers.

**Excess or Umbrella Liability Insurance** (Over Primary) if used to meet limit requirements, shall provide coverage at least as broad as specified for the underlying coverages. Coverage shall be provided on a "pay on behalf" basis, with defense costs payable in addition to policy limits. There shall be no cross liability exclusion precluding coverage for claims or suits by one insured against another. Coverage shall be applicable to City for injury to employees of contractor, subcontractors, or others involved in the Work. The scope of coverage provided is subject to the approval of City following receipt of proof of insurance as required herein. Limits are subject to review but in no event less than \$2,000,000 aggregate.

General conditions pertaining to provision of insurance coverage by Contractor. Contractor and City agree with the following with respect to insurance provided by Contractor:

1. Contractor agrees to endorse the third party general liability coverage required herein to include as additional insureds City, its officials, employees, agents, using standard ISO endorsement **CG 2010 and CG 2037**, or equivalent, with edition acceptable to the City. Contractor also agrees to require all contractors, subcontractors, and any one else involved in any way with the project contemplated by this Agreement to do likewise.
2. Any waiver of subrogation express or implied on the part of the City to any party involved in this Agreement or related documents applies only to the extent of insurance proceeds actually paid. City, having required that it be named as an additional insured to all insurance coverage required herein, expressly retains the right to subrogate against any party for sums not paid by insurance. For its part, Contractor agrees to **waive subrogation** rights against City regardless of the applicability of any insurance proceeds, and to require all contractors, subcontractors, or others involved in any way with the project contemplated by this Agreement to do likewise.

3. All insurance coverage maintained or procured by Contractor or required of others by Contractor pursuant to this Agreement shall be endorsed to delete the subrogation condition as to the city, or to specifically allow Contractor or others providing insurance herein to waive subrogation prior to a loss. This endorsement shall be obtained regardless of existing policy wording that may appear to allow such waivers.
4. It is agreed by Contractor and City that insurance provided pursuant to these requirements is not intended by any party to be limited to providing coverage for the vicarious liability of City, or to the supervisory role, if any, of City. All insurance coverage provided pursuant to this or any other Agreement (express or implied) in any way relating to City is intended to apply to the full extent of the policies involved. Nothing referred to here or contained in any agreement involving City in relation to the project contemplated by this Agreement is intended to be construed to limit the application of insurance coverage in any way.
5. None of the coverages required herein will be in compliance with these requirements if they include any limiting endorsement of any kind that has not been first submitted to City and approved of in writing.
6. All coverage types and limits required are subject to approval, modification, and additional requirements by the City, as the need arises. Contractor shall not make any reductions in scope of coverage (e.g. elimination of contractual liability or reduction of discover period) that may affect City's protection without City's prior written consent.
7. Proof of compliance with these insurance requirements, consisting of binders of coverage, or endorsements, or certificates of insurance, shall be delivered to City at or prior to the execution of this Agreement. In the event such proof of insurance is not delivered as required, or in the event such insurance is canceled or reduced at any time and no replacement coverage is provided, City has the right, but not the duty, to obtain any insurance it deems necessary to protect its interests under this or any other Agreement and to pay the premium. Any premium so paid by City shall be charged to and promptly paid by Contractor or deducted from sums due Contractor, at City option.
8. Contractor agrees to endorse, and to required others to endorse, the insurance provided pursuant to these requirements, to require 30 days notice to City and the appropriate tender prior to cancellation or reduction of such liability coverage and notice of any material alteration or non-renewal of any such coverage, and to require contractors, subcontractors, and any other party in any way involved with the project contemplated by this Agreement to do likewise.
9. It is acknowledged by the parties of this Agreement that **all insurance coverage** required to be provided by Contractor or any subcontractor, and any other party involved with the project who is brought onto or involved in the project by Contractor, is intended to apply first and on **a primary and non-contributing** basis in relation to any other insurance or self insurance available to the City.
10. Contractor agrees to ensure that subcontractors, and any other party involved with the project who is brought onto or involved in the project by Contractor, provide the same minimum insurance coverage required of Contractor. Contractor agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this Agreement. Contractor agrees that

upon request, all agreements with subcontractors and others engaged in this project will be submitted to City for review.

11. Contractor agrees not to self-insure or to use any self-insured retentions or deductibles on any portion of the insurance required herein and further agrees that it will not allow any contractor, subcontractor, architect, engineer, or other entity or person in any way involved in the performance of Work on the project contemplated by this Agreement to self-insure its obligations to City. If Contractor's existing coverage includes a deductible or self-insured retention, the deductible or self-insured retention must be declared to the City. At that time the City shall review options with the Contractor, which may include reduction or elimination of the deductible or self-insured retention, substitution of other coverage, or other solutions.
12. The City reserves the right at any time during the term of this Agreement to change the amounts and types of insurance required by giving the Contractor 90 days advance written notice of such change. If such change results in substantial additional cost to the Contractor, the City will negotiate additional compensation proportional to the increased benefit to City.
13. For purposes of applying insurance coverage only, all contracts pertaining to the project will be deemed to be executed when finalized and any activity commences in furtherance of performance under this Agreement.
14. Contractor acknowledges and agrees that any actual or alleged failure on the part of City to inform Contractor of non-compliance with any insurance requirement in no way imposes any additional obligations on City nor does it waive any rights hereunder in this or any other regard.
15. Contractor will renew the required coverage annually as long as City, or its employees or agents face an exposure from operations of any type pursuant to this Agreement. This obligation applies whether or not the Agreement is canceled or terminated for any reason. The insurance shall include but not be limited to products and completed operations and discontinued operations, where applicable. Termination of this obligation is not effective until City executes a written statement to that effect.
16. Contractor agrees to waive its statutory immunity under any workers' compensation statute or similar statute, in relation to the City, and to require all subcontractors and any other person or entity involved in the project contemplated by this Agreement to do likewise.
17. Requirements of specific coverage features are not intended as limitations on other requirements or as a waiver of any coverage normally provided by any given policy. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue, and is not intended by any party or insured to be all-inclusive.
18. Any provision in any of the construction documents dealing with the insurance coverage provided pursuant to these requirements, is subordinate to and superseded by the requirements contained herein. These insurance requirements are intended to be separate and distinct from any other provision in this Agreement and are intended by the parties to be interpreted as such.

19. All liability coverage provided according to these requirements must be endorsed to provide a separate aggregate limit for the project that is the subject of this Agreement and evidencing products and completed operations coverage for not less than two years after issuance of a final certificate of occupancy by all appropriate government agencies or acceptance of the completed work by City.
20. Contractor agrees to be responsible for ensuring that no contract used by any party involved in any way with the project reserves the right to charge City or Contractor for the cost of additional insurance coverage required by this Agreement. Any such provisions are to be deleted with reference to City. It is not the intent of City to reimburse any third party for the cost of complying with these requirements. There shall be no recourse against City for payment of premiums or other amounts with respect thereto.
21. Contractor agrees to obtain and provide to City a copy of Professional Liability coverage for Architects or Engineers on this project, when required by City. City shall determine the liability limit.

Bond No. \_\_\_\_\_

**PAYMENT BOND  
(LABOR AND MATERIALS)**

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Moorpark ("City"), State of California, has awarded to \_\_\_\_\_

(“Principal”)

(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

---

(Project name)

WHEREAS, under the terms of the Contract, the Principal is required before entering upon the performance of the Work, to file a good and sufficient payment Bond with the City to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

NOW, THEREFORE, we, the undersigned Principal, and \_\_\_\_\_

(Name and address of Surety)

(“Surety”) a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the Contract and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code in the penal sum of \_\_\_\_\_

Dollars (\$ \_\_\_\_\_), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to this Work or labor, that the Surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this Bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by City in successfully enforcing this obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this Bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this Bond.

Upon expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1741, and upon expiration of the time within which a joint labor management committee may commence an action against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code

Section 1771.2, if the condition of this Bond be fully performed, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

The Surety hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or the Specifications accompanying the same shall in any manner affect its obligations on this Bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: \_\_\_\_\_

“Principal”

“Surety”

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

(Seal)

(Seal)

*Note: This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached. **DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.** Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.*

Bond No. \_\_\_\_\_

## PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Moorpark ("City"), has awarded to \_\_\_\_\_

(“Principal”)

(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

(Project name)

WHEREAS, Principal is required under the terms of the Contract to furnish a Bond for the faithful performance of the Contract.

NOW, THEREFORE, we, the undersigned Principal, and \_\_\_\_\_

(Name and address of Surety)

(“Surety”) a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City in the penal sum of \_\_\_\_\_

Dollars (\$ \_\_\_\_\_), this amount being not less than the total Contract Price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors executors and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal, his, her or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and provisions in the Contract and any alteration thereof made as therein provided, on the Principal's part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers, agents and employees, as therein stipulated, then this obligation shall become null and void one year after the recordation of the Notice of Completion and expiration of all Warranties required by the Contract Documents; otherwise, it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered. Surety hereby waives any statute of limitations as it applies to an action on this Bond.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or of the Work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the



Contract or to the Work or to the specifications. Surety hereby waives the provisions of California Civil Code Sections 2845 and 2849. The City is the principal beneficiary of this Bond and has all rights of a party hereto.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: \_\_\_\_\_

“Principal”

“Surety”

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

By: \_\_\_\_\_  
Its

(Seal)

(Seal)

*Note: This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached. **DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.** Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.*

PLEASE PROVIDE CONTACT INFORMATION FOR THE SURETY AND THE BROKER IN THE SPACE PROVIDED BELOW.

SURETY – Contact Information	BROKER – Contact Information
_____	_____
Attn:_____	Attn:_____
Address:_____	Address:_____
City State Zip_____	City State Zip_____
Phone#:_____	Phone#:_____

## **GENERAL PROVISIONS**

### **SECTION 0. GENERAL PROVISIONS DEFINED**

#### **0-1 STANDARD SPECIFICATIONS**

The "Standard Specifications for Public Works Construction (Greenbook)" ("Standard Specifications"), **latest edition with amendments** at Bid time is incorporated into the Contract Documents by this reference. The Work described herein shall be done in accordance with the provisions of the Standard Specifications, as amended herein and by the Contract Documents.

#### **0-2 NUMBERING OF SECTIONS**

The number of sections and subsections in these General Provisions are compatible with the numbering in the Standard Specifications.

#### **0-3 SUPPLEMENTATION OF STANDARD SPECIFICATIONS**

The Sections that follow supplement, but do not replace, the corresponding provisions in Part 1 (General Provisions) of the Standard Specifications, except as otherwise indicated herein. In the event of any conflict between the Standard Specifications and these General Provisions, these General Provisions shall control.

### **SECTION 1. GENERAL, TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS**

#### **1-2 TERMS AND DEFINITIONS**

Whenever in the Standard Specifications or in the Contract Documents the following terms are used, they shall be understood to mean the following:

Agency – The City of Moorpark.

Board – The City Council of the City of Moorpark.

Contract Documents – As defined in Standard Specifications Section 1-2, but also including these General Provisions.

Director – The Parks and Recreation Director, acting either directly or through properly authorized agents. Such agents shall act within the scope of the particular duties entrusted to them.

Inspector – An authorized representative of the City, assigned by the City to make inspections of Work performed by or materials supplied by the Contractor.

Laboratory – A laboratory authorized by the City to test materials and Work involved in the Contract.

Notice of Completion – The notice authorized by Civil Code Section 9204.

Project – See Work.

Submittal – Any drawing, calculation, specification, product data, samples, manuals, requests for substitutes, spare parts, photographs, survey data, traffic control plans, record drawings, Bonds or similar items required to be submitted to the City under the terms of the Contract.

### 1-3.3 Institutions

The institutions listed in Section 1-3.3 of Part 1 of the Standard Specifications shall be supplemented by the list below:

<b><u>Abbreviation</u></b>	<b><u>Word or Words</u></b>
AAN .....	American Association of Nurserymen
AGCA .....	Associated General Contractors of America
APWA .....	American Public Works Association
CRSI .....	Concrete Reinforcing Steel Institute
CSI .....	Construction Specifications Institute
NEC .....	National Electric Code
NFPA .....	National Fire Protection Association
SSS .....	State of California Standard Specifications, Latest edition, Department of Transportation
SSP .....	State of California Standard Plans, Latest edition, Department of Transportation

### 1-7.2 CONTRACT BONDS

The Faithful Performance Bond shall remain in force until the date of recordation of the Notice of Completion and the end of all warranty periods set forth in the Contract Documents. The Material and Labor Bond shall remain in force until expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1741, and until the expiration of the time within which a joint labor management committee may commence an action against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1771.2.

All Bonds must be submitted using the required forms, which are in the Contract Documents, or on any other form approved by the City Attorney.

## **SECTION 2. SCOPE OF THE WORK**

### 2.2 PERMITS

Before starting any construction work, the Contractor will be required to obtain all necessary permits from the City, County, or State which may include obtaining a no fee encroachment permit for Work within the public right-of-way, as well as all other permits required from all other agencies. Should this Project require construction of trenches or excavations which are five (5) feet or deeper and into which a person is required to descend, the Contractor shall obtain a Cal/OSHA permit and furnish the City with a copy before Work can commence on this Project. Contractor shall bear all cost for fees for all agencies except for the City's permit fees.

## 2.4 COOPERATION AND COLLATERAL WORK

The Contractor shall be responsible for coordinating all Work with the City's street sweeping, trash pick-up, and street maintenance contractors, emergency services departments, utility companies' crews, and others when necessary. Payment for conforming to these requirements shall be included in other items of Work, and no additional payment shall be made thereof.

### 2-5.4 Haul Routes

Subsection 2-5.4 of Part 1 of the Standard Specifications shall be deleted and replaced as follows:

The Contractor must obtain the City Engineer's approval before using any haul routes. Further detail requirements for haul traffic are delineated in the Special Provisions.

## 2-7 CHANGES INITIATED BY THE AGENCY

### 2-7.1 General.

The City reserves the right, without notice to the Surety, to increase or decrease the quantity of any item or portion of the Work described in the Contract Documents or to alter or omit portions of the Work so described, as may be deemed necessary or expedient by the City, without in any way making the Contract void. Such increases, alterations or decreases of Work shall be considered and treated as though originally contracted for, and shall be subject to all the terms, conditions and provisions of the original Contract. The Contractor shall not claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease, alteration or omission of any kind of Work to be done.

## 2-8 EXTRA WORK

New and unforeseen work will be classified as Extra Work only when the Work is not covered And cannot be paid for under any of the various items or combination of items for which a Bid price appears on the Bid. The Contractor shall not do any Extra Work except upon written order from the City.

### 2-8.1 Work Directive Change

City may direct changes in the Work by issuing a Work Directive given in writing to Contractor's representative or on-site superintendent or foreman in charge of the particular Work for which the Work Directive is given. A Work Directive shall describe the work to be undertaken and any change in the Work. A Work Directive shall only be used when the Work to be added or deleted must be accomplished before the Change Order procedure can be accomplished.

THE CONTRACT PRICE AND CONTRACT TIME MAY ONLY BE ADJUSTED BY CHANGE ORDER AND MAY NOT BE ADJUSTED BY WORK DIRECTIVE. TO THE EXTENT THE WORK DIRECTIVE RESULTS IN A CHANGE TO THE CONTRACT PRICE OR THE CONTRACT TIME, CONTRACTOR MUST TIMELY REQUEST A CHANGE ORDER AND COMPLY WITH ALL CHANGE ORDER PROCEDURES IN ACCORDANCE WITH THIS SECTION.

Notwithstanding issuance of a Work Directive, failure to timely request a Change Order shall constitute a waiver by Contractor of any adjustment to the Contract Price or Contract Time for the

Work performed under the Work Directive. City shall not be liable to Contractor for Work performed or omitted by Contractor in reliance on verbal orders.

#### 2-8.2 Change Order Work

The City, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, and the Contract Price and Contract Time shall be adjusted accordingly. All such changes in the Work shall be authorized by Change Order and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including any adjustment in the Contract Price or the Contract Time, and the full and final settlement of all costs (direct, indirect, and overhead) related to the Work authorized by the Change Order.

All requests for additional compensation to the Contractor shall be presented in writing before the expense is incurred and will be adjusted as provided herein. No work shall be allowed to lag pending such adjustment, but shall be promptly executed as directed, even if a dispute arises. No request for a change will be considered after the work in question has been done unless a written contract change order has been issued or a timely written notice of change or delay has been made by Contractor. Contractor shall not be entitled to claim or to bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions, and provisions of the original Contract.

#### 2-8.3 Notice of Delay or Change

With respect to any matter that may involve or require an adjustment to the Contract Time or the Contract Price, Contractor shall provide written notice of the underlying facts and circumstances that gave rise to the proposed change, within the following times:

1. If due to unknown subsurface or latent physical conditions, within three (3) days from the discovery date or prior to the alterations of the conditions, whichever is earlier.
2. If due to any other matter that may involve an adjustment to the Contract Time or the Contract Price, within seven (7) days from the discovery date.

#### 2-8.4 Request for Extension or Change

Within twenty-one (21) days from providing the notice of delay or change, and prior to incurring any expense, Contractor shall submit a Change Order Request. The Change Order Request shall identify the amount of the adjustment to the Contract Price or the Contract Time, or both.

The Change Order Request shall contain all supporting documentation for the proposed changes, including but not limited to data showing the hours worked, cost estimates, invoices, and schedules. If the Change Order Request includes a request for an extension of the Contract Time, the Change Order Request shall include a time impact analysis showing the impact of the underlying facts and circumstances to the critical path. City may request, and Contractor shall provide, any additional information supporting the Change Order Request, including but not limited to native electronic format version of schedules and time impact analyses.

If any added costs or information cannot be determined at the time of the Change Order Request, Contractor shall identify the reason the costs or information cannot be determined. For any costs or information that cannot be determined at the time Contractor submits the Change Order Request, Contractor shall submit to City notice of the costs or information and all supporting documentation within three (3) days of when the costs or information become subject to determination.

Whenever possible, any changes to the Contract Price shall be in a lump sum mutually agreed by the Contractor and the City.

Price quotations from the Contractor shall be accompanied by such detailed supporting documentation, including but not limited to estimates and quotations from subcontractors or material suppliers, as City may reasonably request.

If the Contractor fails to submit a complete cost proposal within the twenty-one (21) Day period (or as requested), the City has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the Contract Price in accordance with the City's estimate of cost. If the change is issued based on the City estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following receipt of the City's estimate, the Contractor presents written proof that the City's estimate was in error.

Estimates for lump sum quotations and accounting for cost-plus-percentage work shall be limited to direct expenditures necessitated specifically by the extra work, and shall be segregated as follows:

1. Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State, or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

2. Materials. The cost of materials reported shall be at the lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight, and delivery. Materials costs shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of costs are not furnished within the time required for requesting a change of the Contract Price or Contract Time, then the City may determine the materials cost, at its sole discretion, or may determine that the Contractor waived all rights to payment for material costs pursuant to Section 2-8.5.

3. Tool and Equipment Use. Regardless of ownership, the rates to be used in determining equipment use shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the work is performed. The Contractor shall furnish cost data supporting the establishment of the rental rate. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the City for the total period of use. The City shall make the final determination as to an equitable rental rate for the equipment. No payment will be made for the use of small tools, which have a replacement value of \$1,000 or less.

i. The rental time to be paid for equipment shall be the time the equipment is in productive operation on the extra work being performed. Rental time will not be allowed while equipment is inoperative due to breakdowns.

ii. All equipment shall, in the opinion of the City, be in good working condition and suitable for the purpose for which the equipment is to be used. Equipment with no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

iii. Before construction equipment is used on any extra work, the Contractor shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the City, in duplicate, a description of the equipment and its identifying number.

iv. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour greater than 30 minutes will be considered one hour of operation. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation.

4. Allowed Mark-up. The allowed mark-up for any and all overhead (including supervision and home and field office costs) and profit on work added to the Contract shall be determined in accordance with the following provisions:

i. "Net Cost" is defined as the actual costs of labor, materials and tools and equipment only, excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up. Contractor shall provide City with documentation of the costs, including but not limited to payroll records, invoices, and such other information as City may reasonably request.

ii. For Work performed by the Contractor's forces the allowed mark-up shall not exceed fifteen (15%) percent of Labor costs, ten percent (10%) of Material costs, and ten percent (10%) of the cost of Tools and Equipment use.

iii. For Work performed by a subcontractor or sub-subcontractor, the allowed mark-up shall not exceed ten (5%) percent of the subcontractor's or sub-subcontractor's Net Cost of the Work.

For added or deducted Work by subcontractors, the Contractor shall furnish to the City the subcontractor's signed detailed records of the cost of labor, material, and equipment, including the subcontractor markup for overhead and profit. Subcontractor mark-up shall be 10%. The same requirement shall apply to sub- subcontractors.

For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to the City a detailed record of the cost to the Contractor, signed by such vendor or supplier.

Contractor shall not be entitled to any compensation for Work subject to a change order except as expressly set forth in this Section. The mark-up added in instances of extra or additional work shall constitute the entire amount of profit, any mark-ups, any field or home office overhead costs,



including personnel, equipment or office space, any materials, or any costs of equipment idle time for such work.

Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the Change Order. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify the City's Change Order form in an attempt to reserve additional rights.

If the City disagrees with the proposal submitted by Contractor, it will notify the Contractor, and the City will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with the City, a change order will be issued by the City. If no agreement can be reached, the City shall have the right to issue a unilateral change order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to the City within fifteen (15) Days of the issuance of the unilateral change order, disputing the terms of the unilateral change order and providing such supporting documentation for its position as the City may reasonably require.

No dispute, disagreement, or failure of the parties to reach agreement on the terms of the Change Order shall relieve the Contractor from the obligation to proceed with performance of the changed work, including extra work, promptly and expeditiously.

Any alterations, extensions of time, extra work, deductions in work, or any other changes may be made without securing consent of the Contractor's surety or sureties.

## 2-8.5 Waiver of Rights of Contractor

Failure by contractor to provide timely notice and request where such notice and request is required by this Section shall constitute a waiver by Contractor of the right to a contract adjustment on account of such circumstances and a waiver of any right to further recourse or recovery by reason of or related to such change by means of the claims dispute resolution process or by any other legal process otherwise provided for under applicable laws.

## **SECTION 3. CONTROL OF THE WORK**

### 3-1 ASSIGNMENT

Any purported assignment without written consent of the City shall be null, void, and of no effect, and the Contractor shall hold harmless, defend and indemnify the City and its officers, officials, employees, agents and representatives with respect to any claim, demand or action arising from or relating to any unauthorized assignment.

If the City opts to consent to assignment, the City's consent shall be contingent upon: (1) a letter from the Surety agreeing to the assignment and assigning all of the Bonds to the assignee without any reduction, or the assignee supplying all new Bonds in the amounts originally required under the Contract Documents; and (2) the assignee supplying all of the required insurance in the amounts required in the Contract Documents. Until the Surety assigns all of the Bonds or the assignee supplies all of the new Bonds, and until the assignee supplies all of the required insurance, an assignment otherwise consented to in writing by the City shall not be effective.

Even if the City consents to assignment, no assignment shall relieve the Contractor of liability under the Contract.

### 3-5 INSPECTION

The Contractor shall arrange and pay for all off-site inspection of the Work required by any ordinance or governing authorities. The Contractor shall also arrange and pay for other inspections, including tests in connection therewith, as may be assigned or required.

### 3.7 CONTRACT DOCUMENTS

#### 3-7.1 General

In addition to the requirements under Section 3-7.1 in the Standard Specifications, the Contractor shall maintain a control set of Plans and Specifications on the Project site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on the control set to show the as-built conditions. This control set of Plans shall also be edited for all Addenda, Requests for Information, Change Orders, field changes not involving cost, and any other variation that occurred during construction. Upon completion of all Work, the Contractor shall return the control set to the City. Final payment will not be made until this requirement is met.

Where a work feature is shown on the drawings or identified in the Specifications but is not specifically indicated as an item in the Bid sheets, and there is no ambiguity regarding the requirement to construct, install, or construct and install that work feature, the Contractor is required to complete the work feature. All costs to the Contractor for constructing, installing, or both constructing and installing such a work feature shall be included in the Bid.

#### 3-7.2 Precedence of the Contract Documents

With regard to Section 3-7.2 in the Standard Specifications, the order of precedence shall be as follows:

1. Permits issued by regulatory agencies with jurisdiction.
2. Change Orders and Supplemental Agreements, whichever occurs last.
3. Contract/Agreement.
4. Addenda.
5. Notice Inviting Bids.
6. Instructions to Bidders.
7. Bid/Proposal.
8. Special Provisions.
9. General Provisions.
10. Plans.
11. Standard Plans.
12. Standard Specifications.
13. Reference Specifications.

### 3-9 SUBSURFACE DATA

If the City or its consultants have made investigations of subsurface conditions in areas where the Work is to be performed, such investigations shall be deemed made only for the purpose of

study and design. If a geotechnical or other report has been prepared for the Project, the Contractor may inspect the records pertaining to such investigations subject to and upon the conditions hereinafter set forth. The inspection of the records shall be made in the office of the City. It is the Contractor's sole responsibility to determine whether such investigations exist, and the City makes no affirmative or negative representation concerning the existence of such investigations.

The records of any such investigations are made available solely for the convenience of the Contractor. It is expressly understood and agreed that the City, their agents, consultants or employees assume no responsibility whatsoever with respect to the sufficiency or accuracy of any investigations, the records thereof, and the interpretations set forth therein. No warranty or guarantee is expressed or implied that the conditions indicated by any such investigations or records are representative of those existing in the Project area. The Contractor agrees to make such independent investigations and examination as necessary to be satisfied of the conditions to be encountered in the performance of the Work.

The Contractor represents that it has studied the Plans, Specifications and other Contract Documents, and all surveys and investigation reports of subsurface and latent physical conditions, has made such additional surveys and investigations as necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents, and that it has correlated the results of all such data with the requirements of the Contract Documents. No claim of any kind shall be made or allowed for any error, omission or claimed error or omission, in whole or in part, of any geotechnical exploration or any other report or data furnished or not furnished by the City.

### 3-10 SURVEYING

#### 3-10.1 General

The Contractor shall verify all dimensions on the drawings and shall report to the City any discrepancies before proceeding with related Work. The Contractor shall perform all survey and layout Work per the benchmark information on the Project Plans. All surveying Work must conform to the Professional Land Surveyors' Act (Business and Professions Code Section 8700 *et seq*). All Project surveying notes and "cut-sheets" are to be provided to the City after the completion of each surveying activity and all final surveying notes shall be provided before final payment to the Contractor.

Construction stakes shall be set and stationed by Contractor at its expense. Unless otherwise indicated in the Special Provisions, surveying costs shall be included in the price of items bid. No separate payment will be made. Re-staking and replacement of construction survey markers damaged as a result of the Work, vandalism, or accident shall be at the Contractor's expense.

### 3-11 CONTRACT INFORMATION SIGNS

The names, addresses and specialties of the Contractor, Subcontractors, architects or engineers may not be displayed on any signage within the public right-of-way. This signage prohibition includes advertising banners hung from truck beds or other equipment.

### 3-12 WORKSITE MAINTENANCE

#### 3-12.1 General.

Clean-up shall be done as Work progresses at the end of each day and thoroughly before weekends. The Contractor shall not allow the Work site to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction operation. Materials which need to be disposed shall not be stored at the Project site, but shall be removed by the end of each Working Day. If the job site is not cleaned to the satisfaction of the City, the cleaning will be done or contracted by the City and shall be back-charged to the Contractor and deducted from the Contract Price.

The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the City will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final clean-up of the Project site.

#### 3.12.4 Storage of Equipment and Materials.

##### 3-12.4.1 General

The Contractor shall make arrangements for storing its equipment and materials. The Contractor shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the Work. Approved areas within Work site may be used for temporary storage; however, the Contractor shall be responsible for obtaining any necessary permits from the City. In any case, the Contractor's equipment and personal vehicles of the Contractor's employees shall not be parked on the traveled way or on any section where traffic is restricted at any time.

The Contractor shall deliver, handle, and store materials in accordance with the manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at the Project site and overcrowding of construction spaces. In particular, the Contractor shall provide delivery and installation coordination to ensure minimum holding or storage times for materials recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.

Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure materials are undamaged and are maintained under required conditions.

All costs associated with the clean-up and storage required to complete the Project shall be the sole responsibility of the Contractor.

##### 3-12.4.2 Storage in Public Streets

The first sentence of Section 3-12.4.2 shall not be incorporated and shall instead be replaced with the following:

Construction materials and equipment shall not be stored in Streets, roads, or highways unless otherwise specified in the Special Provisions or approved by the City Engineer.

### 3-13 COMPLETION, ACCEPTANCE, AND WARRANTY

#### 3-13.1 Completion.

The Contractor shall complete all Work under the Contract within **30 Months** Including weekends and holidays, **Phase I** must be complete withing **24 Months**, and **Phase II** within **6 Months** from the Notice to Proceed date.

#### 3-13.2 Acceptance

The Project will not be considered complete and ready for City Council direction to staff regarding recordation of the Notice of Completion until all required Work is completed, the Work site is cleaned up in accordance with Section 3-12 of Part 1 of the Standard Specifications and the Special Provisions, and all of the following items have been received by the City Engineer:

1. A form of Notice of Completion, with all information required by the California Civil Code;
2. All written guarantees and warranties;
3. Evidence that the Performance Bond has been extended and will remain in effect for the period specified in Section 1-7.2 of the Standard Specifications, as modified by these General Provisions;
4. All "as-builts";
5. Duplicate copies of all operating instructions and manufacturer's operating catalogs and data, together with such field instructions as necessary to fully instruct City personnel in correct operation and maintenance procedures for all equipment installed listed under the electrical, air conditioning, heating, ventilating and other trades. This data and instructions shall be furnished for all equipment requiring periodic adjustments, maintenance or other operation procedures.

The Contractor shall allow at least seven (7) Working Days' notice for final inspection. Such notice shall be submitted to the City in writing.

#### 3-13.3 Warranty

For the purposes of the calculation of the start of the warranty period, the Work shall be deemed to be completed upon the date of recordation of the Notice of Completion. If that direction is contingent on the completion of any items remaining on a punchlist, the Work shall be deemed to be completed upon the date of the City's acceptance of the final item(s) on that punchlist.

The Contractor shall repair or replace defective materials and workmanship as required in this Section 3-13.3 at its own expense. Additionally, the Contractor agrees to defend, indemnify and hold the City harmless from claims of any kind arising from damage, injury or death due to such defects.

The parties agree that no certificate given shall be conclusive evidence of the faithful performance of the Contract, either in whole or in part, and that no payment shall be construed to be an acceptance of any defective Work or improper materials. Further, the certificate or final payment shall not terminate the Contractor's obligations under the warranty herein. The Contractor agrees

that payment of the amount due under the Contract and the adjustments and payments due for any Work done in accordance with any alterations of the same, shall release the City, the City Council and its officers and employees from any and all claims or liability on account of Work performed under the Contract or any alteration thereof.

## **SECTION 4. CONTROL OF MATERIALS**

### **4-1 GENERAL**

The Contractor and all Subcontractors, suppliers, and vendors shall guarantee that the Work will meet all requirements of this Contract as to the quality of materials, equipment, and workmanship.

### **4-4 TESTING**

Except as elsewhere specified, the City shall bear the cost of testing materials and workmanship that meet or exceed the requirements indicated in the Standard Specifications and the Special Provisions. The cost of all other tests, including the retesting of material or workmanship that fails to pass the first test, shall be borne by the Contractor.

### **4-6 TRADE NAMES**

If the Contractor requests to substitute an equivalent item for a brand or trade name item, the burden of proof as to the comparative quality and suitability of alternative equipment or articles or materials shall be upon the Contractor, and the Contractor shall furnish, at its own expense, all information necessary or related thereto as required by the City Engineer. All requests for substitution shall be submitted, together with all documentation necessary for the City to determine equivalence, no later than ten (10) working days after the award of Contract, unless a different deadline is listed in the Special Provisions.

## **SECTION 5. LEGAL RELATIONS AND RESPONSIBILITIES**

### **5-3 LABOR**

#### **5-3.1 Public Work**

The Contractor acknowledges that the Project is a “public work” as defined in Labor Code Section 1720 *et seq.* (“Chapter 1”), and that this Project is subject to (a) Chapter 1, including without limitation Labor Code Section 1771 and (b) the rules and regulations established by the Director of Industrial Relations (“DIR”) implementing such statutes. The Contractor shall perform all Work on the Project as a public work. The Contractor shall comply with and be bound by all the terms, rules and regulations described in (a) and (b) as though set forth in full herein.

#### **5-3.2 Copies of Wage Rates**

Pursuant to Labor Code Section 1773.2, copies of the prevailing rate of per diem wages for each craft, classification, or type of worker needed to perform the Project are available on the Department of Industrial Relations website at <https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. By initiating any Work, the Contractor acknowledges receipt of a copy of the DIR determination of such prevailing rate of per

diem wages, and the Contractor shall post such rates at each job site covered by these Contract Documents.

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1774 and 1775 concerning the payment of prevailing rates of wages to workers and the penalties for failure to pay prevailing wages. The Contractor shall, as a penalty paid to the City, forfeit two hundred dollars (\$200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the DIR for the work or craft in which the worker is employed for any public work done pursuant to these Contract Documents by the Contractor or by any Subcontractor.

### 5-3.3 Payroll Records

The Contractor shall comply with and be bound by the provisions of Labor Code Section 1776, which requires the Contractor and each Subcontractor to (1) keep accurate payroll records and verify such records in writing under penalty of perjury, as specified in Section 1776, (2) certify and make such payroll records available for inspection as provided by Section 1776, and (3) inform the City of the location of the records. The Contractor has ten (10) days in which to comply subsequent to receipt of a written notice requesting these records, or as a penalty to the City, the Contractor shall forfeit one hundred dollars (\$100) for each Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

The Contractor and each Subcontractor shall comply with and be bound by the provisions of Labor Code Section 1771.4(a)(3), which requires that each Contractor and each Subcontractor shall furnish the records specified in Section 1776 directly to the Labor Commissioner at least monthly, in a format prescribed by the Labor Commissioner.

### 5-3.4 Hours of Labor

The Contractor acknowledges that eight (8) hours labor constitutes a legal day's work. The Contractor shall comply with and be bound by Labor Code Section 1810. The Contractor shall comply with and be bound by the provisions of Labor Code Section 1813 concerning penalties for workers who work excess hours. The Contractor shall, as a penalty paid to the City, forfeit twenty-five dollars (\$25) for each worker employed in the performance of this Project by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one calendar week in violation of the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code. Pursuant to Labor Code Section 1815, work performed by employees of the Contractor in excess of eight (8) hours per day, and forty (40) hours during any one week shall be permitted upon public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

### 5-3.5 Apprentices

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1777.5, 1777.6 and 1777.7 and California Code of Regulations Title 8, Section 200 *et seq.* concerning the employment of apprentices on public works projects. The Contractor shall be responsible for compliance with these Sections for all apprenticeable occupations. Before commencing Work on this Project, the Contractor shall provide the City with a copy of the information submitted to any applicable apprenticeship program. Within sixty (60) Days after concluding Work, Contractor and

each of its Subcontractors shall submit to the City a verified statement of the journeyman and apprentice hours performed under this Contract.

#### 5-3.6 Debarment or Suspension

The Contractor shall not perform Work with any Subcontractor that has been debarred or suspended pursuant to California Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. The Contractor and Subcontractors shall not be debarred or suspended throughout the duration of this Contract pursuant to Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. If the Contractor or any Subcontractor becomes debarred or suspended during the duration of the Project, the Contractor shall immediately notify the City.

#### 5-3.7 Registration with the DIR

In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5.

#### 5-3.8 Compliance Monitoring and Posting Job Sites

This Project is subject to compliance monitoring and enforcement by the DIR. The Contractor shall post job site notices, as prescribed by regulation.

#### 5-3.9 Subcontractors

For every Subcontractor who will perform Work on the Project, the Contractor shall be responsible for such Subcontractor's compliance with Chapter 1 and Labor Code Sections 1860 and 3700, and the Contractor shall include in the written Contract between it and each Subcontractor a copy of the provisions in this Section 5-3 of the General Provisions and a requirement that each Subcontractor shall comply with those provisions. The Contractor shall be required to take all actions necessary to enforce such contractual provisions and ensure Subcontractor's compliance, including without limitation, conducting a periodic review of the certified payroll records of the Subcontractor and upon becoming aware of the failure of the Subcontractor to pay its workers the specified prevailing rate of wages. The Contractor shall diligently take corrective action to halt or rectify any failure.

#### 5-3.10 Prevailing Wage Indemnity

To the maximum extent permitted by law, the Contractor shall indemnify, hold harmless and defend (at the Contractor's expense with counsel reasonably acceptable to the City) the City, its officials, officers, employees, agents and independent contractors serving in the role of City officials, and volunteers from and against any demand or claim for damages, compensation, fines, penalties or other amounts arising out of or incidental to any acts or omissions listed in Section 5-3 of the General Provisions by any Person (including the Contractor, its Subcontractors, and each of their officials, officers, employees and agents) in connection with any Work undertaken or in connection with the Contract Documents, including without limitation the payment of all consequential damages, attorneys' fees, and other related costs and expenses. All duties of the Contractor under this Section 5-3.10 shall survive expiration or termination of the Contract.



5-4 INSURANCE -The following provisions supplement or amend, as applicable, “Insurance Requirements” that are made a part of this Exhibit B.

#### 5-4.1 General

The first paragraph of Section 5-4.1 of Part 1 of the Standard Specifications shall not be incorporated and shall instead be replaced with the following:

The Contractor shall provide and maintain insurance naming the City, its elected and appointed officials, officers, employees, attorneys, agents, volunteers, and independent contractors in the role of City officials as insureds or additional insureds regardless of any inconsistent statement in the policy or any subsequent endorsement whether liability is attributable to the Contractor or the City. The insurance provisions shall not be construed to limit the Contractor’s indemnity obligations contained in the Contract. The City will not be liable for any accident, loss or damage to the Work prior to completion, except as otherwise specified in Section 6-5.

#### 5-4.2 General Liability Insurance

The Contractor shall at all times during the term of the Contract carry, maintain, and keep in full force and effect the insurance referenced in “Insurance Requirements” in this Exhibit B.

##### 5-4.2.1 Additional Insureds

The City, its elected and appointed officials, officers, employees, attorneys, agents, volunteers, and independent contractors in the role of City officials, shall be the insured or named as additional insureds covering the Work, regardless of any inconsistent statement in the policy or any subsequent endorsement, whether liability is attributable to the Contractor or the City.

##### 5-4.2.2 No Limitation on Indemnity

The insurance provisions shall not be construed to limit the Contractor’s indemnity obligations contained in these Contract Documents.

##### 5-4.2.3 Replacement Insurance

The Contractor agrees that it will not cancel, reduce or otherwise modify the insurance coverage. The Contractor agrees that if it does not keep the required insurance in full force and effect, and such insurance is available at a reasonable cost, the City may take out the necessary insurance and pay the premium thereon, and the repayment thereof shall be deemed an obligation of the Contractor and the cost of such insurance may be deducted, at the option of the City, from payments due the Contractor. This shall be in addition to all other legal options available to the City to enforce the insurance requirements.

##### 5-4.2.4 Certificates of Insurance with Original Endorsements

The Contractor shall submit to the City certificates of insurance with the original endorsements, both of which reference the same policy number, for each of the insurance policies that meet the insurance requirements prior to the signing of the Contract. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. Endorsements may be

executed on the City's standard forms titled "Additional Insured Endorsement," copies of which are provided in the Contract Documents, or on any other form that contains substantially the same terms and is approved by the City's Risk Manager. In any case, the endorsements must specifically name the City of Moorpark and its elected and appointed officials, officers, employees, attorneys, agents, volunteers, and independent contractors in the role of City officials as insureds or additional insureds. Current insurance certificates and endorsements shall be kept on file with the City at all times during the term of this Contract. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

#### 5-4.2.5 Subcontractors

The Contractor shall require each of its Subcontractors that perform services under the Contract to maintain insurance coverage that meets all of the requirements of this Section 5-4.

#### 5-4.5 Insurance Requirements not Limiting

If the Contractor maintains broader coverage and/or higher limits than the minimums required in this Section 5-4, the City requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the City.

### 5.7 SAFETY

#### 5-7.8 Steel Plate Covers

##### 5-7.8.1 General

The Contractor shall cover all openings, trenches and excavations at the end of each Work Day with steel plate covers.

Section 5-8 is hereby added to Section 1 of Part 1 of the Standard Specifications, as follows:

### 5-8 INDEMNIFICATION

The following indemnity provisions shall supersede the indemnity in Section 5-4.1 of the Standard Specifications.

#### 5-8.1 Contractor's Duty.

To the fullest extent permitted by law, the Contractor shall, at its sole cost and expense, defend, hold harmless and indemnify the City and its elected officials, officers, attorneys, agents, employees, volunteers, successors, assigns and those City agents serving as independent contractors in the role of City officials (collectively "Indemnitees"), from and against any and all damages, costs, expenses, liabilities, claims, demands, causes of action, proceedings, expenses, judgments, penalties, stop payment notices, liens, and losses of any nature whatsoever, including fees of accountants, attorneys, or other professionals and all costs associated therewith and the payment of all consequential damages (collectively "Liabilities"), in law or equity, whether actual, alleged or threatened, which arise out of, are claimed to arise out of, pertain to, or relate to the acts or omissions of the Contractor, its officers, agents, servants, employees, Subcontractors, materialmen, contractors or their officers, agents, servants or employees (or any entity or individual for whom the Contractor bears legal liability) in the performance of the Contract,

including the Indemnitees' active or passive negligence, except for Liabilities arising from the sole negligence or willful misconduct of the Indemnitees, as determined by court decision or by the agreement of the Parties. The Contractor shall defend the Indemnitees in any action or actions filed in connection with any Liabilities with counsel of the Indemnitees' choice, and shall pay all costs and expenses, including all attorneys' fees and experts' costs actually incurred in connection with such defense. The Contractor shall reimburse the Indemnitees for any and all legal expenses and costs incurred by Indemnitees in connection therewith. The City shall not be liable for any accident, loss, or damage to the Work prior to completion, except as otherwise specified in Section 6-5.

#### 5-8.1.1 Taxes and Workers' Compensation.

The Contractor shall pay all required taxes on amounts paid to the Contractor under the Contract, and indemnify and hold the City harmless from any and all taxes, assessments, penalties, and interest asserted against the City by reason of the independent contractor relationship created by the Contract. The Contractor shall fully comply with the Workers' Compensation law regarding the Contractor and the Contractor's employees. The Contractor shall indemnify and hold the City harmless from any failure of the Contractor to comply with applicable Workers' Compensation laws. The City may offset against the amount of any fees due to the Contractor under the Contract any amount due to the City from the Contractor as a result of the Contractor's failure to promptly pay to the City any reimbursement or indemnification arising under this Subsection 5-8.1.1.

#### 5-8.1.2 Subcontractor Indemnity Agreements.

The Contractor shall obtain executed indemnity agreements with provisions identical to those in this Section 5-8 from each and every Subcontractor or any other person or entity involved by, for, with or on behalf of the Contractor in the performance of the Contract. If the Contractor fails to obtain such indemnity obligations, the Contractor shall be fully responsible and indemnify, hold harmless and defend the Indemnitees from and against any and all Liabilities at law or in equity, whether actual, alleged or threatened, which arise out of, are claimed to arise out of, pertain to, or relate to the acts or omissions of the Contractor's Subcontractor, its officers, agents, servants, employees, Subcontractors, materialmen, contractors or their officers, agents, servants or employees (or any entity or individual for whom the Contractor's Subcontractor bears legal liability) in the performance of the Contract, including the Indemnitees' active or passive negligence, except for Liabilities arising from the sole negligence or willful misconduct of the Indemnitees, as determined by final court decision or by the agreement of the Parties.

#### 5-8.2 Workers' Compensation Acts not Limiting.

The Contractor's indemnifications and obligations under this Section 5-8, or any other provision of the Contract, shall not be limited by the provisions of any Workers' Compensation act or similar act. The Contractor expressly waives its statutory immunity under such statutes or laws as to the City, its officers, agents, employees and volunteers.

#### 5-8.3 Insurance Requirements not Limiting.

The City does not, and shall not, waive any rights that it may possess against the Contractor because of the acceptance by the City, or the deposit with the City, of any insurance policy or certificate required pursuant to the Contract. The indemnities in this Section 5-8 shall apply regardless of whether or not any insurance policies are determined to be applicable to the Liabilities, tax, assessment, penalty or interest asserted against the City.

#### 5-8.4 Civil Code Exception.

Nothing in this Section 5-8 shall be construed to encompass Indemnitees' sole negligence or willful misconduct to the limited extent that the underlying Contract is subject to Civil Code Section 2782(a) or the City's active negligence to the limited extent that the underlying Contract Documents are subject to Civil Code Section 2782(b), provided such sole negligence, willful misconduct or active negligence is determined by agreement between the parties or by the findings of a court of competent jurisdiction.

#### 5-8.5 Nonwaiver of Rights.

Indemnitees do not and shall not waive any rights that they may possess against the Contractor because the acceptance by the City, or the deposit with the City, of any insurance policy or certificate required pursuant to these Contract Documents. This indemnity provision is effective regardless of any prior, concurrent, or subsequent active or passive negligence by Indemnitees and shall operate to fully indemnify Indemnitees against any such negligence.

#### 5-8.6 Waiver of Right of Subrogation.

The Contractor, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all Claims arising out of or incident to the activities or operations performed by or on behalf of the Contractor regardless of any prior, concurrent or subsequent active or passive negligence by Indemnitees.

#### 5-8.7 Survival of Terms.

The Contractor's indemnifications and obligations under this Section 5-8 shall survive the expiration or termination of the Contract, are intended to be as broad and inclusive as is permitted by the law of the State, and are in addition to any other rights or remedies that Indemnitees may have under the law. Payment is not required as a condition precedent to an Indemnitee's right to recover under this indemnity provision, and an entry of judgment against the Contractor shall be conclusive in favor of the Indemnitee's right to recover under this indemnity provision.

### **SECTION 6. PROSECUTION AND PROGRESS OF THE WORK**

#### 6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK

##### 6-1.1 Construction Schedule

One (1) week before the scheduled pre-construction meeting, the Contractor must submit to the City for review and approval the construction schedule required by the first paragraph of Section 6-1.1. The Contractor shall make revisions as required by the City. The schedule must account for all subcontract work, as well as the work of the Contractor, submittals, coordination with the other contractors performing concurrent work and the Traffic Control Plan. The Contractor shall update this Construction Schedule when directed by the City, or when:

- a. A Change Order significantly affects the Contract completion date or the sequence of construction approach or activities; or

b. The actual sequence of the Work, or the planned sequence of the Work, is changed and does not conform to the Contractor's current accepted Project construction schedule.

The Contractor shall submit an updated construction schedule with its monthly invoice every month. Progress payments shall be contingent upon the receipt of monthly updated construction schedules.

#### 6-1.1.1 Pre-Construction Conference

Approximately within Fourteen (7) Calander days before the commencement of Work at the site, a pre-construction conference will be held at the City and shall be attended by the Contractor's Project manager, its on-site field superintendent, and any Subcontractors that the Contractor deems appropriate. Attendance by the Contractor and any Subcontractors designated is mandatory.

Contractor shall submit its twenty-four (24) hour emergency telephone numbers to the City for approval a minimum of two (2) Working Days before the pre-construction conference. Unless previously submitted to the City, the Contractor shall bring to the pre-construction conference copies of each of the following:

- 1) Construction Schedule in **P6 format**.
- 2) Procurement schedule of major equipment and materials and items requiring long lead time.
- 3) Shop drawing/sample submittal schedule.
- 4) Preliminary schedule of values (lump sum price breakdown) for progress payment purposes.
- 5) Written designation of the on-site field superintendent and the Project manager. Both daytime and emergency telephone numbers shall be included in the written designation.

The purpose of the conference is to designate responsible personnel and establish a working relationship. The parties will discuss matters requiring coordination and establish procedures for handling such matters. The complete agenda will be furnished to the Contractor before the meeting date. The Contractor shall be prepared to discuss all of the items listed below.

- 1) The Contractor's construction schedule.
- 2) Notification of local residents before starting any Work and keeping them informed throughout the Project.
- 3) Procedures for transmittal, review, and distribution of the Contractor's submittals.
- 4) Processing applications for payment.
- 5) Maintaining record documents.
- 6) Critical Work sequencing.
- 7) Maintaining sewage service during construction, including proposed by-passes.
- 8) NPDES requirements, if any.
- 9) Field decisions and Change Orders.
- 10) Use of Project site, office and storage areas, security, housekeeping, and the City's needs.
- 11) Major equipment deliveries and priorities.
- 12) Traffic control.
- 13) Any other item that the City representative states is relevant to the meeting.

#### 6-1.1.2 Weekly Progress Meetings

Progress meetings will be held each week during the course of the Project. The meeting location, day of the week and time of day will be mutually agreed to by the City and the Contractor. The Contractor shall provide a four (4) week “look ahead” schedule for each meeting. The construction manager will preside at these meetings and will prepare the meeting agenda, meeting minutes and will distribute minutes to all persons in attendance. As the Work progresses, if it is determined by agreement of the attendees, that weekly meetings are not necessary, the weekly progress meetings may be changed to bi-weekly progress meetings.

#### 6-1.2 Commencement of the Work

The Contractor shall not begin any construction activity at the site before the issuance of the Notice to Proceed. Any Work that is done by the Contractor in advance of the Notice to Proceed shall be considered as being done at the Contractor’s own risk and responsibility, and as a consequence will be subject to rejection.

Section 6-1.3 is hereby added to Section 6 of Part 1 of the Standard Specifications, as follows:

#### 6-1.3 Working Days And Hours

The Contractor shall do all Work between the hours of **7:00 a.m. to 4:00 p.m.**, Monday through Friday. No Work will be allowed on Saturdays, Sundays or holidays unless approved by City. See attached appendix for approved City Holidays.

A permit may have other hours or Days for the Contractor to do the Work, and those hours and Days shall supersede any hours and Days written in this Section.

Whenever the Contractor is permitted or directed to perform night Work or to vary the period during which Work is performed during the Working Day, the Contractor shall give twelve (12) hours’ notice to the City so that inspection may be provided. A charge may be made to the Contractor for approved overtime or weekend inspections requested by the Contractor.

### 6-4 DELAYS AND EXTENSIONS OF TIME

#### 6-4.1 General.

Unless otherwise agreed in writing, an adjustment to the Contract time by reason of a Change Order shall be agreed to at the time the Change Order is issued and accepted by Contractor. If the Change Order does not reserve the right of the parties, or either of them, to seek an adjustment to the Contract time, then the parties forever relinquish and waive such right and there shall be no further adjustments to the Contract time.

No extension of time will be granted for any event, including pandemics, leading to the issuance of a “stay at home” or similar kind of order by any local, State, or federal governmental authority, if the Work has been deemed, either by emergency order or proclamation, or operation of law, to be an essential service that is exempt from such stay at home or similar order.

#### 6-4.2 Extensions of Time

In the event it is deemed appropriate by the City to extend the time for completion of the Work, any such extension shall not release any guarantee for the Work required by the Contract Documents, nor shall any such extension of time relieve or release the Sureties on the Bonds executed. In executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such extensions of time. The amount of time allowed by an extension of time shall be limited to the period of the delay giving rise to the same as determined by the City. Notwithstanding any dispute which may arise in connection with a claim for adjustment of the Contract time, the Contractor shall promptly proceed with the Work.

#### 6-4.3 Payment for Delays

Notwithstanding any other terms and conditions of the Contract Documents, the City shall have no obligation whatsoever to increase the Contract Price or extend the time for delays.

Unless compensation and/or markup is agreed upon by the City, the Contractor agrees that no payment of compensation of any kind shall be made to the Contractor for damages or increased overhead costs caused by any delays in the progress of the Contract, whether such delays are avoidable or unavoidable or caused by any act or omission of the City or its agents. Any accepted delay claim shall be fully compensated for by an extension of time to complete the performance of the Work.

This Section shall not apply to compensable delays caused solely by the City. If a compensable delay is caused solely by the City, the Contractor shall be entitled to a Change Order that: (1) extends the time for completion of the Contract by the amount of delay caused by the City; and (2) provides equitable adjustment, as determined by the City, to the Contractor.

#### 6-8 TERMINATION OF THE CONTRACT FOR CONVENIENCE

The following sentence is added to Section 6-8:

In no event (including termination for impossibility or impracticability, due to conditions or events beyond the control of the City, for any other reason or for no reason) shall the total amount of money to Contractor exceed the amount which would have been paid to Contractor for the full performance of the services described in the Contract.

#### 6-9 LIQUIDATED DAMAGES

For the purposes of the calculation of the start of the liquidated damages, the Work shall be deemed to be completed when the same has been completed in accordance with the Plans and Specifications therefor and to the satisfaction of the City, and the City has certified such completion in accordance with Section 3-13.1 of Part 1 of the Standard Specifications.

### **SECTION 7. MEASUREMENT AND PAYMENT**

#### 7.3 PAYMENT

##### 7.3.1 General

The unit and lump sum prices to be paid shall constitute full compensation for all labor, equipment, materials, tools and incidentals required to complete the Project as outlined in these Contract Documents and as directed by the City. In accordance with Public Contract Code Section 7107,

if no claims have been filed and are still pending, the amount deducted from the final estimate and retained by the City will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be withheld for any other lawful purposes.

## 7-3.2 Partial and Final Payment

### 7-3.2.1 Monthly Closure Date and Invoice Date

For purposes of Section 7-3.2, the monthly closure date shall be the last Day of each month. A measurement of Work performed and a progress estimate of the value thereof based on the Contract and of the monthly payment shall be prepared by the Contractor and submitted to the City Engineer before the tenth (10th) Day of the following month for verification and payment consideration.

### 7-3.2.2 Payments

The City shall make payments within thirty (30) Days after receipt of the Contractor's undisputed and properly submitted payment request, including an updated construction schedule pursuant to Section 6-1.1 of the General Provisions. The City shall return to the Contractor any payment request determined not to be a proper payment request as soon as practicable, but not later than seven (7) Days after receipt, and shall explain in writing the reasons why the payment request is not proper.

### 7-3.2.3 Retention

The City shall withhold not less than five percent (5%) from each progress payment. However, at any time after fifty percent (50%) of the Work has been completed, if the City Council finds that satisfactory progress is being made, it may, at its discretion, make any of the remaining progress payments in full for actual Work completed. The City shall withhold not less than five percent (5%) of the Contract Price from the Final Payment Amount (defined in Section 7-3.2.4) until at least thirty-five (35) days after recordation of the Notice of Completion, or recordation of a notice of acceptance or cessation, but not later than the period permitted by Public Contract Code Section 7107.

### 7-3.2.4 Final Invoice and Payment

Whenever the Contractor shall have completely performed the Contract in the opinion of the City Engineer, the City Engineer shall notify the City Clerk that the Contract has been completed in its entirety. The Contractor shall then submit to the City Engineer a written statement of the final quantities of Contract items for inclusion in the final invoice. Upon receipt of such statement, the City Engineer shall check the quantities included therein and shall authorize a payment amount, which in the City Engineer's opinion shall be just and fair, covering the value of the total amount of Work done by the Contractor, less all previous payments and all amounts to be retained under the provisions of the Contract Documents ("Final Payment Amount"). The City Engineer shall then request that the City accept the Work and that the City Clerk be authorized to file, on behalf of the City in the office of the County Recorder, a Notice of Completion of the Work herein agreed to be done by the Contractor. In addition, the final payment will not be released until the



Contractor returns the control set of Plans and Specifications showing the redlined as-built conditions.

#### 7-3.2.5 Substitute Security

In accordance with Public Contract Code Section 22300, the Contractor may request that it be permitted to substitute securities in lieu of having retention withheld by the City from progress payments when such payments become due or, in the alternative, the Contractor may request that the City make payments of earned retentions directly to an agreed upon designated escrow agent at the Contractor's expense. If the Contractor selects either one of these alternatives, the following shall control.

##### 7.3.2.5.1 Substitution of Securities for Performance Retention

At some reasonable time before any progress payment would otherwise be due and payable to the Contractor in the performance of Work under these Contract Documents, the Contractor may submit a request to the City in writing to permit the substitution of retentions with securities equivalent to the amount estimated by the City ("estimated amount of retention") to be withheld. The Contractor shall deposit such securities with the City or may, in the alternative, deposit such securities in escrow with a State or federally chartered bank in California, as the escrow agent, at the Contractor's expense. Such securities will be the equivalent or greater in value of the estimated amount of retention. If the Contract is modified by written Modifications or Change Orders or the Contractor otherwise becomes entitled to receive an amount more than the Contract Price at the time the securities are deposited, the Contractor shall, at the request of the City, deposit with the City or escrow agent, whichever is applicable, additional securities within a reasonable time so that the amount of securities on deposit with the City or escrow agent is equivalent or greater in value than the amount of retention the City would otherwise be entitled to withhold from progress payments due or to become due to the Contractor as the Work progresses. The City shall withhold any retention amount that exceeds the security amount until the additional securities are deposited and, if the deposit is with an escrow agent, the City has confirmation from that escrow agent of the new total value of securities. Upon satisfactory completion of the Contract, which shall mean, among other things, that the City is not otherwise entitled to retain proceeds from progress payments as elsewhere provided in the Contract or under applicable law, the securities shall be returned to the Contractor. The City shall, within its sole discretion, determine whether the amount of the securities on deposit with the City or escrow agent is equal to or greater than the amount of estimated retention of progress payments that could otherwise be held by the City if the Contractor had not elected to substitute same with securities.

##### 7-3.2.5.2 Deposit of Retention Proceeds with an Escrow Agent

As an alternative to the substitution of securities, as provided above, or the City otherwise retaining and holding retention proceeds from progress payments, the Contractor may request the City to make payments of retentions earned directly to an escrow agent with the same qualifications as required in Section 7-3.2.5.1 above and at the expense of the Contractor. At its sole expense, the Contractor may direct the investment of such retention payments into only such securities as mentioned in Section 7-3.2.5.4 below and shall be entitled to interest earned on such investments on the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the Contract, which shall mean when the City would not otherwise be entitled to withhold retention proceeds from progress payments had the Contractor not elected to have such proceeds deposited into escrow, the Contractor shall be allowed to receive from the escrow agent all securities, interest and payments deposited into escrow pursuant to the terms of

this Section. The Contractor shall pay to each Subcontractor, not later than ten (10) Days of receipt of payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount withheld to ensure performance of the Contractor.

#### 7-3.2.5.3 Subcontractor Entitlement to Interest

If the Contractor elects to receive interest on any moneys withheld in retention by the City, then the Subcontractor shall receive the identical rate of interest received by the Contractor on any retention moneys withheld from the Subcontractor by the Contractor, less any actual pro rata costs associated with administering and calculating that interest. In the event that the interest rate is a fluctuating rate, the rate for the Subcontractor shall be determined by calculating the interest rate paid during the time that retentions were withheld from the Subcontractor. If the Contractor elects to substitute securities in lieu of retention, then, by mutual consent of the Contractor and the Subcontractor, the Subcontractor may substitute securities in exchange for the release of moneys held in retention by the Contractor. The Contractor shall pay each Subcontractor, not later than ten (10) Days after receipt of escrow moneys, the amount owed to each Subcontractor from the moneys plus the respective amount of interest earned, net of costs attributed to the retention held from each Subcontractor, on the amount of retention withheld to ensure performance of the Subcontractor.

#### 7-3.2.5.4 Securities Eligible for Investment

Securities eligible for investment shall include those listed in Government Code Section 16430, bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed upon between the Contractor and the City. The Contractor shall be the beneficial owner of any securities substituted for any monies withheld and shall receive any interest thereon.

#### 7-3.2.5.5 Escrow Agreement for Security Deposits in Lieu of Retention

The escrow agreement that shall be used for the deposit of securities in lieu of retention shall substantially conform to the form prescribed in Public Contract Code Section 22300(f).

#### 7-3.2.5.6 Inconsistencies with Prevailing Statutory Requirements

If there is any inconsistency between or differences in Public Contract Code Section 22300 and the terms of this provision, or any future amendments thereto, Section 22300 shall control.

Section 7-3.9 is hereby added to Section 7-3 of Part 1 of the Standard Specifications, as follows:

#### 7-3.9 AUDIT

The City or its representative shall have the option of inspecting and/or auditing all records and other written materials used by the Contractor in preparing its billings to the City as a condition precedent to any payment to the Contractor or in response to a construction claim or a Public Records Act (Government Code Section 6250 *et seq.*) request. The Contractor will promptly furnish documents requested by the City at no cost. Additionally, the Contractor shall be subject to State Auditor examination and audit at the request of the City or as part of any audit of the City, for a period of three (3) years after final payment under the Contract. The Contractor shall include a copy of this Section 7-3.9 in all contracts with its Subcontractors, and the Contractor shall be responsible for immediately obtaining those records or other written material from its Subcontractors upon a request by the State Auditor or the City. If the Project includes other auditing requirements, those additional requirements will be listed in the Special Provisions.

### **SECTION 8 FACILITIES FOR AGENCY PERSONNEL**

#### 8-1 General

An office space will be required in the construction trailer for the City use or representative for the duration of the project. City personnel shall have the right to enter upon the Project at all times and shall be admitted to the offices of the Contractor to use the telephone, desk and sanitary facilities provided by the Contractor for its own personnel.

Section 9 is hereby added to Part 1 of the Standard Specifications, as follows:

### **SECTION 9. ADDITIONAL TERMS**

#### 9-1 NONDISCRIMINATORY EMPLOYMENT

The Contractor shall not unlawfully discriminate against any individual based on race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation or military and veteran status. The Contractor understands and agrees that it is bound by and will comply with the nondiscrimination mandates of all statutes and local ordinances and regulations.

### 9-3 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the final acceptance of the Work by the City Council in accordance with Section 3-13.2 of the General Provisions, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part of the Work by the action of the elements, criminal acts, or any other cause. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries or damages arising from the sole negligence or willful misconduct of the City, its officers, agents or employees. In the case of suspension of Work from any cause whatever, the Contractor shall be responsible for all materials and the protection of Work already completed, shall properly store and protect them if necessary, and shall provide suitable drainage and erect temporary structures where necessary.

### 9-4 PROCEDURE IN CASE OF DAMAGE TO PUBLIC PROPERTY

Any portions of curb, gutter, sidewalk or any other City improvement damaged by the Contractor during the course of construction shall be replaced by the Contractor at its own cost. The cost of additional replacement of curb, gutter or sidewalk in excess of the estimated quantities shown in the Bid form and Specifications, and found necessary during the process of construction (but not due to damage resulting from carelessness on the part of the Contractor during its operation), shall be paid to the Contractor at the unit prices submitted in his or her Bid.

### 9-5 REMOVAL OF INTERFERING OBSTRUCTIONS

The Contractor shall remove and dispose of all debris, abandoned structures, tree roots and obstructions of any character encountered during the process of excavation. It is understood that the cost of any such removals are made a part of the unit price bid by the Contractor under the item for excavation or removal of existing Work.

### 9-6 SOILS ENGINEERING AND TESTING

A certified materials testing firm may be retained by the City to perform materials tests during the Contractor's entire operation to ascertain compliance with the Contract requirements. The City shall be responsible for the first series of tests. If the initial tests do not meet the Contract requirements, the Contractor shall bear the cost of all subsequent tests.

If the City requires other tests or more specific requirements for testing regarding this Project, those details will be included in the Special Provisions.

### 9-7 ACCESS TO PRIVATE PROPERTY

Unless otherwise stated in the Special Provisions, the Contractor shall be responsible for all fees and costs associated with securing permission to access private property for any portion of the Project.

### 9-9 CLAIM DISPUTE RESOLUTION

In the event of any dispute or controversy with the City over any matter whatsoever, the Contractor shall not cause any delay or cessation in or of Work, but shall proceed with the performance of the Work in dispute. The Contractor shall retain any and all rights provided that pertain to the resolution of disputes and protests between the parties. The Disputed Work will be categorized

as an “unresolved dispute” and payment, if any, shall be as later determined by mutual agreement or a court of law. The Contractor shall keep accurate, detailed records of all Disputed Work, claims and other disputed matters.

All claims arising out of or related to the Contract Documents or this Project, and the consideration and payment of such claims, are subject to the Government Claims Act (Government Code Section 810 et seq.) with regard to filing claims. All such claims are also subject to Public Contract Code Section 9204 and Public Contract Code Section 20104 et seq. (Article 1.5), where applicable. This Contract hereby incorporates those provisions as though fully set forth herein. Thus, the Contractor or any Subcontractor must file a claim in accordance with the Government Claims Act as a prerequisite to filing a construction claim in compliance with Section 9204 and Article 1.5 (if applicable), and must then adhere to Section 9204 and Article 1.5 (as applicable), pursuant to the definition of “claim” as individually defined therein.

#### 9-10 THIRD PARTY CLAIMS

The City shall have full authority to compromise or otherwise settle any claim relating to the Project at any time. The City shall timely notify the Contractor of the receipt of any third-party claim relating to the Project. The City shall be entitled to recover its reasonable costs incurred in providing this notice.

#### 9-11 COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable federal, State and local laws, ordinances, codes and regulations in force at the time the Contractor performs pursuant to the Contract Documents.

#### 9-12 CONTRACTOR'S REPRESENTATIONS

By signing the Contract, the Contractor represents, covenants, agrees, and declares under penalty of perjury under the laws of the State of California that: (a) the Contractor is licensed, qualified, and capable of furnishing the labor, materials, and expertise necessary to perform the services in accordance with the terms and conditions set forth in the Contract Documents; (b) there are no obligations, commitments, or impediments of any kind that will limit or prevent its full performance under the Contract Documents; (c) there is no litigation pending against the Contractor that could adversely affect its performance of the Contract, and the Contractor is not the subject of any criminal investigation or proceeding; and (d) to the Contractor's actual knowledge, neither the Contractor nor its personnel have been convicted of a felony.

#### 9-13 CONFLICTS OF INTEREST

The Contractor agrees not to accept any employment or representation during the term of the Contract or within twelve (12) months after acceptance as defined in Section 3-13.2 of the General Provisions that is or may likely make the Contractor “financially interested,” as provided in Government Code Sections 1090 and 87100, in any decisions made by the City on any matter in connection with which the Contractor has been retained pursuant to the Contract Documents.

#### 9-14 APPLICABLE LAW

The validity, interpretation, and performance of these Contract Documents shall be controlled by and construed under the laws of the State of California, excluding California's choice of law rules.

Venue for any such action relating to the Contract shall be in the Superior Court with geographic jurisdiction over the City.

#### 9-15 TIME

Time is of the essence in these Contract Documents.

#### 9-16 INDEPENDENT CONTRACTOR

The Contractor and Subcontractors shall at all times remain, as to the City, wholly independent contractors. Neither the City nor any of its officials, officers, employees or agents shall have control over the conduct of the Contractor, Subcontractors, or any of their officers, employees, or agents, except as herein set forth, and the Contractor and Subcontractors are free to dispose of all portions of their time and activities that they are not obligated to devote to the City in such a manner and to such Persons that the Contractor or Subcontractors wish except as expressly provided in these Contract Documents. The Contractor and Subcontractors shall have no power to incur any debt, obligation, or liability on behalf of the City, bind the City in any manner, or otherwise act on behalf of the City as agents. The Contractor and Subcontractors shall not, at any time or in any manner, represent that they or any of their agents, servants or employees, are in any manner agents, servants or employees of the City. The Contractor and Subcontractors agree to pay all required taxes on amounts paid to them under the Contract, and to indemnify and hold the City harmless from any and all taxes, assessments, penalties, and interest asserted against the City by reason of the independent contractor relationship created by the Contract Documents. The Contractor shall include this provision in all contracts with all Subcontractors.

#### 9-17 CONSTRUCTION

In the event of any asserted ambiguity in, or dispute regarding the interpretation of any matter herein, the interpretation of these Contract Documents shall not be resolved by any rules of interpretation providing for interpretation against the party who causes the uncertainty to exist or against the party who drafted the Contract Documents or who drafted that portion of the Contract Documents.

#### 9-18 NON-WAIVER OF TERMS, RIGHTS AND REMEDIES

Waiver by either party of any one (1) or more of the conditions of performance under these Contract Documents shall not be a waiver of any other condition of performance under these Contract Documents. In no event shall the making by the City of any payment to the Contractor constitute or be construed as a waiver by the City of any breach of covenant, or any default that may then exist on the part of the Contractor, and the making of any such payment by the City shall in no way impair or prejudice any right or remedy available to the City with regard to such breach or default.

#### 9-19 TERM

The Contract is effective as of the Effective Date listed, and shall remain in full force and effect until the Contractor has fully rendered the services required by the Contract Documents or the Contract has been otherwise terminated by the City. However, some provisions may survive the term listed within this Section, as stated in those provisions.

#### 9-20 NOTICE

Except as otherwise required by law, any notice or other communication authorized or required by these Contract Documents shall be in writing and shall be deemed received on (a) the day of delivery if delivered by hand or overnight courier service during the City's regular business hours or (b) on the third (3rd) business day following deposit in the United States mail, postage prepaid, to the addresses listed on the Contractor's Bid and City Hall, or at such other address as one party may notify the other.

#### 9-21 SEVERABILITY

If any term or portion of these Contract Documents is held to be invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions of these Contract Documents shall continue in full force and effect.

## **SPECIAL PROVISIONS**

The Sections that follow supplement, but do not replace, the corresponding provisions in Part 3 (Construction Methods) and Part 4 (Existing Improvements) of the Standard Specifications, except as otherwise indicated herein. In the event of any conflict between the Standard Specifications and these Special Provisions, these Special Provisions shall control.

### **SECTION 306 - OPEN TRENCH CONDUIT CONSTRUCTION**

#### **306-3.1 GENERAL**

Pursuant to Public Contract Code Section 7104, if the project involves trenching more than four (4) feet deep, Contractor shall promptly and before the following conditions are disturbed notify the City in writing of any:

- a. Material that Contractor believes may be material that is hazardous waste, as defined in California Health and Safety Code Section 25117, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; and/or
- b. Subsurface or latent physical conditions at the site differing from those indicated; and/or
- c. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.
- d. As required by Labor Code Section 6705 and in addition thereto, whenever work under the Contract that involves an estimated expenditure in excess of twenty-five thousand dollars (\$25,000) for the excavation of any trench or trenches five (5) feet or more in depth, Contractor shall submit for acceptance by City in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered civil or structural engineer employed by Contractor, and all costs therefore shall be included in the price of the Contract. Nothing in this provision shall be deemed to allow the use of a shoring, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this provision shall be construed to impose tort liability on the City or on any City officer, agent, consultant, representative, or employee. All plans, processing and shoring costs are Contractor's responsibility and must be included in Contractor's bid.

### **SECTION 400 - PROTECTION AND RESTORATION**

#### **400-1 GENERAL**

All costs to the Contractor for protecting, removing, restoring, relocating, repairing, replacing, or reestablishing existing improvements shall be included in the Bid.



## **SECTION 402 - UTILITIES**

### **402-1 LOCATION**

The location and existence of any underground Utility or substructure has not been obtained. The methods used and costs involved to locate existing elements, points of connection and all construction methods are the Contractor's sole responsibility. Accuracy of information furnished, as to existing conditions, is not guaranteed by the City. The Contractor, at its sole expense, must make all investigations necessary to determine locations of existing elements, which may include contacting Underground Service Alert and other private underground locating firm(s), utilizing specialized locating equipment, hand trenching, or both. For every Dig Alert Identification Number issued by Underground Service Alert during the course of the Project, the Contractor must submit to the City the following form. The Contractor shall be responsible for preserving the integrity of the existing underground utilities at the site.

## UNDERGROUND SERVICE ALERT IDENTIFICATION NUMBER FORM

No excavation will be permitted until this form is completed and returned to the City.

Government Code Section 4216 *et seq.* requires a Dig Alert Identification Number to be issued before a permit to excavate will be valid.

To obtain a Dig Alert Identification Number, call Underground Service Alert at **811** a minimum of three (3) Working Days before scheduled excavation. For best response, provide as much notice as possible up to ten (10) Working Days.

**Dig Alert Identification Number:** \_\_\_\_\_

Dated: \_\_\_\_\_

\_\_\_\_\_  
("CONTRACTOR")

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Note: This form is required for every Dig Alert Identification Number issued by Underground Service during the course of the Work. Additional forms may be obtained from the City upon request.

### 402-1.3 Entry by Utility Owners

The right is reserved to the owners of public Utilities or franchises to enter the Project site for the purpose of making repairs or changes in their property that may be necessary as a result of the Work as well as any other reason authorized by the City. When the Contract Documents provide for the Utility owners to alter, relocate or reconstruct a Utility, or when the Contract Documents are silent in this regard and it is determined by the City that the Utility owners must alter, relocate or reconstruct a Utility, the Contractor shall schedule and allow adequate time for those alterations, relocations or reconstructions by the respective Utility owners. City employees and agents shall likewise have the right to enter upon the Project site at any time and for any reason or no reason at all.

### 402-2 PROTECTION

If Contractor damages or breaks the Utilities, it will be the Contractor's responsibility to repair the Utility at no cost to the Utility or the City.

### 402-3 REMOVAL

Facilities encountered during the prosecution of the Work that are determined to be abandoned shall be removed by the Contractor as required for the Work, unless directed otherwise by the City Engineer. The remaining portion of the existing Utility which is left in place shall be accurately recorded, in elevation and plan, on the control set of Contract Drawings.

### 402-4 RELOCATION

The Contractor shall cooperate fully with all Utility forces of the City or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities that interfere with the progress of the Work. The Contractor shall schedule the Work so as to minimize interference with the relocation, altering, or other rearranging of facilities.

### 402-6 COOPERATION

The Contractor's attention is directed to the fact that Work may be conducted at or adjacent to the site by other contractors during the performance of the Work under this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts. Compensation for compliance shall be included in the various items of the Work, and no additional compensation shall be allowed therefor.

### 402-7 NOTIFICATION

The Contractor shall notify the City and the owners of all Utilities and substructures not less than forty-eight (48) hours before starting construction. The following list of names and telephone numbers is intended for the convenience of the Contractor and is not guaranteed to be complete or accurate:

## **City, County and Utilities Company Contact List:**

**Link for Local Utilities:** <https://www.moorparkca.gov/382/Local-Utilities>

CITY ENGINEER (805) 517-6255

MOORPARK POLICE DEPARTMENT (805) 532-2700

CALIFORNIA HIGHWAY PATROL (805) 553-0800

MOORPARK TRANSIT DIVISION (805) 517-6233

VENTURA COUNTY WATERWORKS DISTRICT NO. 1 (805) 378-3000

CALLEGUAS MUNICIPAL WATER DISTRICT (805) 526-9323

SO. CALIFORNIA EDISON COMPANY (800) 655-4555

THE GAS COMPANY (800) 427-2200

MED TRANS AMBULANCE 911

SPECTRUM (855) 892-2253

AT & T (800) 310-2355

UNDERGROUND SERVICE ALERT 1-800-422-4133

UNION PACIFIC RAILROAD CO. (800) 336-9193

MOORPARK UNIFIED SCHOOL DIST. (805) 378-6300

VENTURA COUNTY FIRE PROTECTION DISTRICT (805) 389-9710

U.S. POST OFFICE (805) 529-3596

WASTE MGMT/GI RUBBISH (805) 522-9400

CALTRANS (805) 653-2584

SUNESYS

California Sales / Operations (951) 278-0400

# SITE SPECIFIC REQUIREMENTS

## PROJECT LOCATION

The project is located at 83 West High Street, Moorpark California 93021.

## PROJECT DESCRIPTION

The proposed Moorpark City Library will be a new, single-story facility encompassing approximately 17,500 square feet. The project includes all related site development features such as vehicular parking areas, pedestrian pathways, and landscaped spaces. The scope of work for the construction of the new building comprises all structural, mechanical, electrical, plumbing, and low-voltage systems, as well as site grading and drainage improvements.

## SITE CONDITIONS

The project is located at 83 West High Street, Moorpark California, the site has the potential for seismically-induced settlement to occur in the alluvial soils and mitigations are recommended to reduce settlement to meet code requirements. The amount of estimated total and differential settlements in the vicinity of the Moorpark Civic Center complex ranged from 12 to 36 inches and 6 to 18 inches, respectively. Also, estimated total and differential settlement ranged from 3 to 19 inches and 2 to 10 inches. To address these conditions, the mitigation plan specifies soil treatment to a depth of approximately 40 to 50 feet. This treatment aims to limit vertical settlement to no more than 4 inches and lateral displacement to no more than 18 inches, ensuring the site meets structural performance and safety standards, Contractor is to comply with Geotechnical Reports and limits per **Exhibit H(a), H(b), I(a), and I(b)**.

## CONSTRUCTION & PHASING (Reference **Exhibit A**)

The Moorpark City Library project will be completed in two phases, as illustrated in **Exhibit A**. **Phase I** will include site preparation and full construction of the new Library facility, including all utility connections, hardscape, and landscaping. This phase will also involve site clearing, earthwork, and implementation of soil mitigation measures. The anticipated duration of this phase is approximately **18 months**.

**Phase II** will involve demolition of the existing Library and West parking lot, removal of associated utilities, additional site clearing and preparation, and construction of the new parking lot. This phase is expected to take approximately **6 months**.

- A. During the construction period the Contractor shall have limited access to the premises for construction operations as indicated on the contract drawings.
- B. The City will be occupying the existing Library and West parking lot, North of the project site for the entire duration of Phase I and must not be interrupted with construction activities.
- C. Contractor will work normal working hours(code section 15.26.010), **between 7 a.m. and 4 p.m.** Monday through Saturday, unless otherwise agreed to in advance by Owner. Contractor must clean up work areas and return them to a usable and safe condition at the end of each work period per Section 3-12.1 Worksite maintenance of the General Provisions.

The Project site, structures, and construction process are designed to conform to applicable City and other agency regulations and policies, including measures for minimizing environmental effects. The Project is designed to meet or exceed **LEED GOLD** certification standards.

## GENERAL REQUIREMENTS

1. The staging and storage areas for this project are designated in the Site Logistics Plan (**Exhibit B**). These areas may be relocated as necessary throughout the project duration. The General Contractor (GC) shall manage all relocations of materials and controls at no additional cost to the City. The GC is responsible for all expenses related to staging and storage, including installing a perimeter chain-link fence with a blue windscreen for the entire project duration.

Install a chain-link fence with in-ground posts and a blue windscreen around the entire project site. Include double-access gates, a rumble rack at the entrance, and provide maintenance for the duration of the project (**Phases I & II**) as well as two (2) additional months per **Exhibit B**.

2. The GC shall supply a 12' x 60' construction trailer configured to include a conference room, three private offices, and a restroom to support project operations. In addition, provide A separate trailer, 10' X 40' with two office space, restroom and an area for a plan table, including two desks, four chairs and a plan table. This shall be used for City Staff (Inspector, Construction Manager) for the entire duration of the project. The GC shall provide all temporary utility connections (water, sewer, and electricity) and disconnections at the end of the project. This includes relocating the trailer and utility hookups after Phase I if required.
3. The GC and all subcontractors are responsible for supplying their own, storage facilities, and security measures to safeguard materials and equipment. The City will not be liable for any theft or loss incurred.
4. The GC shall use the designated Laydown Area and trailer location indicated on the Site Logistics Plan (**Exhibit B**). The GC must install protective barriers around all existing trees in the area and restore the site to its original condition upon completion of use.
5. Provide and install a plywood Project Sign (8' x 4') with secure posts anchored to the ground. Graphics and text will be provided by the City.
6. The GC shall utilize Procore as the construction management platform and ensure it is accessible to all project stakeholders.
7. Onsite electrical service may not be available. The GC and all subcontractors shall provide their own generators, and be responsible for all permits associated with the use of generators. If an existing power source is approved for use by the City, the GC will be responsible for all connection logistics, temporary poles, wiring, energy usage fees, and any related costs.
8. The GC and subcontractors shall be responsible for providing construction water. This includes water trucks, hoses, and any necessary piping from meters to the construction area. If access to a hydrant is required, the GC must secure a water meter from the appropriate water agency.
9. The GC shall maintain an onsite water truck or water buffalo to avoid laying fire hoses across pedestrian paths, traffic areas, or sidewalks. The GC is responsible for all fees and costs associated with temporary water supply and usage.
10. Onsite parking is limited. The GC and subcontractors must secure offsite parking for the duration of the project.

11. Prior to the commencement of construction, the GC is required to document all existing site conditions in areas that will be impacted by the scope of work. This documentation shall include both photographs and video recordings and must be submitted to the City as a formal submittal. Additionally, the GC is responsible for conducting a thorough site visit to inspect and assess all existing conditions in order to identify the full extent of demolition work required for site development. No change orders will be considered for demolition work that could have been identified through proper site inspection, regardless of whether such work is explicitly shown in the construction documents.

## **SAFETY, HEALTH AND ENVIRONMENT**

1. GC to provide **Jobsite security** for the entire duration of the project including surveillance cameras that must be accessible by the City and Construction Manager.
2. Temporary gates and site gates shall always be closed and locked. The GC is responsible for providing their own labor to open and close gates as needed to receive deliveries or for trucking operations.
3. GC shall furnish traffic control equipment including flagman, barricades, traffic signage, trench plate, etc. If work is required offsite/in a public right of way the GC shall obtain and pay for a traffic control and/or **Encroachment Permits** from the City or any other agency having jurisdiction.
4. GC shall furnish and install delineation measures (barricades, caution tape, safety tape, cones, snow fencing, etc.) to prevent unauthorized entry by the public, City personnel or other trades.
5. The GC is responsible for keeping the jobsite in a clean & tidy condition daily as outlined in City of Moorpark General Provisions Section 3-12.
6. The GC will furnish all waste disposal and recycling containers. Dumpsters and recycling bins shall be furnished in a timely fashion so that recyclables and waste do not accumulate on the site. Provide recycling and waste tonnage receipts to the City monthly per project specifications. The GC shall cover all dumpsters with a tarp if wind or rain is eminent.
7. The GC shall furnish and install drip tubs under all equipment and vehicles to prevent leaks from contacting the soil. Vehicle fueling and maintenance shall be performed in accordance with the *California Stormwater Quality Association* **CASQA** best management practices.
8. The GC is responsible for locating existing and new utilities prior to commencing underground work per section 402 – Utilities of the Special Provisions by obtaining a complete ground penetrating radar (**GPR**) survey, **Exhibit F** is the City's GPR's for reference only. The results of that survey must be submitted to Architect/City for approval.
9. The GC shall provide, install, maintain, and adjust all SWPPP Best Management Practices (BMPs) and temporary fencing as shown on Sheet C12, the Erosion Control Plan, and the Site Logistics Plan. BMPs must be based on the full project site and adjusted as conditions change. BMPs as needed to perform the work and must reinstall them by the end of each workday. A qualified SWPPP professional must be provided to conduct monthly inspections, update plans, perform rain event monitoring and stormwater testing. All reports and test results must be submitted to the City within 48 hours.

10. The GC to furnish, install and maintain the TC-3 drive approach. The TC-3 drive approach shall be cleaned once a week and twice a week if rain has occurred.
11. During all rough grading and backfill operations provide ongoing street sweeping. Any vehicle tracking within and exiting the project site must be swept up immediately by hand followed by a street sweeper.
12. The GC shall provide continuous dust control for the entire area(s) of construction. Regardless of heat or wind conditions, the GC will provide at the minimum site dust control once in the morning and once at the end of the workday throughout the course of construction, reference **Exhibit L** for full compliance.
13. The GC shall furnish and implement Wind Erosion Control (WE-1) best management practices for their earthen stockpiles and stored materials as required to comply with the Air Quality Management requirements of the County of Ventura, reference **Exhibit L** for full compliance.
14. The GC shall remove all surplus construction materials & equipment that are no longer needed from the site within one work week.
15. The GC shall furnish all concrete washout bins needed. Concrete washout bins that will not be used again within 48 hours shall be removed from the site within one business day. Install a tarp over the washout bins after work is completed
16. For trenching operations, outside of the fenced jobsite, the GC shall load, and transport generated spoils to a community stockpile area onsite.
17. Trenches shall not be left open overnight unless vehicle rated trench plates are installed. Excavations shall be delineated a minimum of 10' from the edge.
18. If the GC disturbs a finished grade or sub-grade that is or not part of the project scope during the work operation(s) must return that grade to its previous set grade elevations.
19. Do not sweep or spray debris into any landscape areas or down any catch basins, area drains, or other drainage inlet. All water shall be contained onsite.
20. Equipment and tools shall not be washed out nor cleaned on the project jobsite/campus.
21. GC must have Automated External Defibrillator (AED) at all time on the jobsite and must be checked regularly to ensure its good working order.
22. GC shall furnish drinking water and cups or bottled water for their work force.
23. GC must have a Cooling Station readily deployable when the jobsite temperatures are approaching 80 degrees Fahrenheit.
24. GC shall furnish their own portable restrooms and hand wash stations for the duration of the project. Provide a minimum of two services per week or more frequently if the size of the workforce is required.
25. Prior to site demolition and prior to any underground operations pre-dig conferences are to be scheduled by GC with the City present where the GPR survey will be reviewed and coordinated with the site layout drawings from the Electrical, Plumbing and Landscape tier



subcontractors.

26. The GC shall furnish their Company's Injury Illness and Safety Plan & Job Hazard Analysis information, in a binder form and an electronic version within (10) calendar days of the issuance of the Notice of Award prior to the start of any work on site.
27. The GC shall review, approve and implement Job Hazard Analysis (JHA) and Safety Task Assignment (STA) with all trades prior to starting each work activities.
28. GC to provide a Safety Program to ensure the safety and well-being of all workers and stakeholders on the project, The City requires that your company develop, implement, and enforce a comprehensive Safety Program that meets or exceeds the standards set by the Occupational Safety and Health Administration (OSHA). This program will be expected to cover all activities conducted at the job site and must be adhered to on a daily basis throughout the duration of the project. To include but not limited:
  - a. Written Safety Plan.
  - b. Compliance with OSHA Regulations.
  - c. Safety Orientation & Training.
  - d. Personal Protective Equipment (PPE).
  - e. Daily Safety Meetings (Toolbox Talks).
  - f. Hazard Communication Plan.
  - g. Emergency Response Procedures.
  - h. Incident Reporting and Investigation.
29. PERSONAL PROTECTIVE EQUIPMENT (PPE) MUST ALWAYS BE WORN ON THE JOBSITE. The GC, their tier subcontractors, and any auxiliary service and delivery company personnel shall wear high visibility vests (florescent shirts are acceptable when not around vehicles), hard hats, safety glasses, work boots and pants. Shorts or sleeveless shirts are not acceptable. All job specific PPE as called out by Cal-OSHA, such as hearing protection, face shields, respirators, 100% gloves etc. shall be worn where specified. Any person not following the PPE requirement shall be removed immediately and not allowed back on any City jobsite until the violation is corrected.
30. There will be NO SMOKING, NO DRUGS, NO ALCOHOL, NO FOUL LANGUAGE & NO LOUD MUSIC WHILE WORKING ON ANY CITY PROPERTY.

#### **SPECIFIC REQUIREMENTS:**

1. The GC shall include all necessary mobilizations, labor, overtime, and weekend work—both during and outside regular hours as required to complete Phases I and II within the project's milestone schedule outlined in **Exhibit G**.
2. This Project is subject to the Build America, Buy America Act(**BABA**) which requires certain covered materials to be sourced from American manufacturing facilities for the covered material. This project is subject to the requirement to source all iron and steel from American manufacturing facilities. There are some limited exceptions to the requirements. Contractor is required to notify the City during bidding, if it will be difficult to source the required amount of iron and steel from American manufacturing facilities or if the cost would be prohibitively expensive. See **Exhibit M** for the full BABA implementation guidance. Please review the document to understand the requirements of this program. Also reference this website [www.hud.gov/sites/dfiles/OCHCO/documents/2023-12cpdn.pdf](http://www.hud.gov/sites/dfiles/OCHCO/documents/2023-12cpdn.pdf) for guidelines as required by

this contract.

3. The Project is designed to meet or exceed **LEED GOLD** certification standards. The GC **MUST** comply with all of the requirements and documentation as specified in the contract document in order to achieve the certification.
4. GC must comply with all requirements of the latest version of **City of Moorpark Standard Specification** for all applicable scope of work reference
5. GC to include all costs associated in preparing **MOCK-UP(s)** including revision in order to obtain approval identified in the contract document.
6. The General Contractor must comply with ALL the requirement as Identified in RESOLUTION **NO. PC-2024-706(Exhibit K(a))** Certifying a Final Environmental Impact Report and with the **MITIGATION MONITORING AND REPORTING PROGRAM, APPROVAL OF CONDITIONAL USE PERMIT (Exhibit K(b))** and **PC 2025- 711, Modification of Conditions of Approval for CUP 2023-0013:**
7. GC Is required to comply with all **Mitigation Monitoring and Reporting Program (MMRP)(Exhibit L)** requirements and implementation and ensure compliance with all conditions of approvals to reduce or avoid significant environmental effects that are identified in the EIR. Including specific reporting and/or monitoring requirements that will be enforced during Project per Section 21082.3 of CEQA and Section 15097 of the State CEQA Guidelines.
8. GC is required to comply with **HUD Section 3 regulations(Exhibit N)** for this project, ensuring efforts are made to create economic opportunities for local residents and businesses. This includes actively pursuing local hiring and subcontracting, with a documented good faith effort to meet these requirements.
9. The GC is responsible for preparing, submitting, and maintaining a progress schedule in **Primavera Format (P6)** monthly. A four (4) week “look ahead” schedule is required for review at each of the weekly OAC meeting(s). Ensure compliance with the City’s Section 6 of the General Requirements and all associated subsections.
10. Provide **BIM** Coordination for all the MEPF, Structural, Concrete, and Site Utilities, Site Concrete scopes and incorporate the *following but not limited to (Revit Model will be provided to the successful Contractor)*.
  - a. Model Development and Review
  - b. Clash Detection and Resolution
  - c. Coordination Meetings
  - d. Documentation and Reporting
  - e. System Integration and Optimization
  - f. Quality Control and Compliance
11. The GC shall submit a copy of all certified payroll and all conditional and unconditional releases, for the GC and all tier-subcontractors, to the City at the time of each progress payment application. No payment to the Contractor shall be made until the certified payroll and releases for that billing period have been provided and are in the possession of the City.
12. The GC and their tier subcontractors shall upload all certified payroll to the Department of

Industrial Relations website for this project and provide proof for the approval and processing of the application for payment.

13. The GC shall assign a FULL TIME Superintendent to the project who is solely responsible and present at all times for managing all on-site work activities with all trades or subcontractors. The Superintendent shall not be a working foreman. The superintendent's sole purpose is to safely manage their work force to assure the project is completed in accordance with the contract documents and project schedule Milestone Schedule per **Exhibit G**. The Superintendent shall attend mandatory weekly Project meetings and produce detailed three (3) week look-a-head schedules updated at minimum on a weekly basis. The name, contact information and qualifications of the GC's Superintendent assigned to the project shall be provided to the City within (5) days of the issuance of the Notice of Award.
14. The GC shall submit their completed Daily Report, provided with the bid documents to City at the end of each workday. All sections of the Daily Report shall be filled in, which include the name of the company, the name of all workers, their job titles, their hours worked, the type and location of work performed, and any equipment used for that work. If the Contractor finds that there is an error or inaccuracies in a submitted daily report it must be retracted in writing. Maintain a sign-in sheet attached to the daily report. The Sign in sheet must be turned in at the end of each day with the Contractors daily report.
15. Prior to bidding, the GC shall field verify all existing site conditions, including but not limited to: site access, work area boundaries, adjacent structures, water and electrical sources, existing trees, slopes, fences, laydown and dumpster areas (GC to provide dumpster), utility shut-offs, fire lanes, existing and proposed utilities, parking availability, and overall site logistics.
16. GC must include in Bid the removal or relocation of any utilities (gas, water, sewer, fire water, electrical, data lines, light fixtures, and any other items as identified in the contract documents).
17. The GC is required to be aware of the type and condition of all substrates to ensure their bid is reflective of the amount of labor, materials and equipment that will be needed or required to complete the installation of the required work.
18. The GC is responsible to coordinate the work of all their tier subcontractors timely and workman like fashion to complete the contract work in accordance with the Bid Timeline and subsequent Construction schedule updates.
19. General Contractor shall include in Bid work to be completed after hours or weekend work in order to complete ALL scopes of work within the timeframe as identified in the Contract Documents.
20. The GC and each subcontractor shall provide as many move-in(s) and remobilizations at no additional cost to the City as needed to complete the full scope of work for Phase I & Phase II.
21. The GC is responsible for demolishing all existing structures, road, parking lot, hardscape and landscaping called out on contract documents and/or as necessary to complete the full scope of work. Perform all site and offsite demolition including but not limited to buried debris, asphalt & concrete paving, walks, curbing, utility poles, bollards, drainage structures, fencing, fence posts, and other structures called for demolition shown or NOT on the project

documents, a pre-job walk is mandatory to ensure GC includes all items required to be removed in Bib.

22. Perform all site and offsite grubbing including but not limited to the removal of all trees, sod, shrubs, stumps and rubbish from the project site as necessary to facilitate new construction. All disposals and haul-off must be in compliance with all applicable codes and laws and as noted in the contract documents.
23. The GC shall disconnect, safe-off, demolish, cut, cap, and/or relocate all existing utilities, including storm drain, sewer, water, electrical, data, irrigation, as required by the contract documents or as necessary to support new construction, while ensuring no disruption to adjacent building services, .
24. The GC shall provide excavation for removal of demolished items, re-grade as necessary, including backfill and compaction of holes created by demolition in order to keep area safe and or make ready for new improvements.
25. The General Contractor (GC) shall provide all necessary supervision, labor, materials, equipment, hoisting, tools, and supplies to complete the design and installation of all ground improvement work for the project. Prior to commencing any work, the GC must submit a Ground Improvement Plan for approval by the appropriate agency. Approval of this plan is a prerequisite for obtaining the Grading Permit. The plan should be in compliance align with the Contract Documents and adhere to the recommendations outlined in the following geotechnical reports:
  - a. Exhibit I(a): Oakridge Geoscience Preliminary Geotechnical Report dated June 17, 2017.
  - b. Exhibit I(b): Oakridge Geoscience Updated Summary of Interpreted Site Conditions dated October 12, 2019.
  - c. Exhibit H(a): LPA Inc. Geotechnical Exploration Report dated November 29, 2022.
  - d. Exhibit H(b): Addendum to the Geotechnical Exploration Report dated October 4, 2024.
26. The GC shall furnish and install all supplemental items, equipment, and materials that are required by that manufacturer to obtain that Manufacturer's warranty regardless of if that work or material(s) is not shown on the plans or specifications.
27. The GC is responsible for furnishing all submittals, including product data, shop drawings, mockups, samples and as-built drawings as specified and in accordance with the contract documents.
28. The GC and all tiered subcontractors must be licensed to do business in the City of Moorpark and County of Ventura.
29. GC shall obtain and pay for all City required **encroachment permits** and inspections as required for scope as identified in the Contract documents.
30. The GC is responsible for obtaining all necessary permits from the appropriate agencies, including but not limited to:
  - a. City of Moorpark – **Building / Grading Permits**
  - b. Ventura County Waterworks District #1 – **Public Sewer, Private Water/Sewer**
  - c. Ventura County Watershed Protection District – **Public Storm Drain**
  - d. Ventura County Fire Protection District – **Fire Protection System/Underground**

31. The GC is responsible for obtaining their own approved truck route from the City or County of Ventura prior to commencement of work.
32. The GC shall comply with the requirements of all regulatory agencies, trade organizations, or other governing bodies which may have jurisdiction over such work.
33. The GC must notify all regulatory agencies, including the City, and hold a pre-dig conference prior to starting any underground work.
34. The GC is required to perform weekly updates to their as-built documents and shall be reviewed by the project IOR/CM as a conditional requirement necessary to approve the progress billing(s).
35. All required inspections, testing and special inspections will be furnished by the City. The City reserves the right to bill the GC for any costs arising from a second inspection or test, albeit due to a failed inspection or untimely cancelation.
36. City Building & Safety Inspection requests after the permit is obtained can be done online(<https://www.moorparkca.gov/SHOP>) or by calling the Hotline number 805.517.6274 by 4 pm the prior business day of the requested inspect, please note that the City is closed every other Friday.
37. The GC is responsible to provide ALL survey for the entire project complete.
38. The GC shall furnish all extra/attic stock called out in the project documents. Extra/attic stock shall be scheduled with the City, transported to the City's location, and include an itemized transmittal.
39. The GC is responsible to perform all Owner training and instruction as called out in the project documents.
40. The GC shall furnish and transmit all close-out documentation as required by the project documents, including warranty's, guarantees, operation & maintenance manuals, etc. All closeout documentation shall be furnished to the City (15) working days prior to the Substantial completion date.
41. The GC shall perform a rough clean and a final clean of the buildings and all new site work. The interior scope of work includes wiping down all walls/dusting, cleaning glazing inside and out, vacuuming carpet, mopping VCT, waxing , cleaning all smudges from surfaces, removing all labels. The exterior scope of work includes pressure washing flatwork, cleaning windows, removing labels and residue, remove loose debris from planters, picking up screws and fasteners, debris removal from the roof, final street sweep of the fire lane and driveway entering and exiting the site. All SWPPP materials and fencing shall be removed, repair and surface damage and clean areas.
42. GC shall understand that this is a "turnkey" type project in which the contractor shall include in their bid all items required to complete the project for Final sign-off and certification as indicated in the contract documents.
43. GC shall coordinate with Southern California Edison (**SCE**) to ensure the timely installation of the new electrical service. The GC is responsible for providing all necessary underground but not limited to conduit, utility box extensions, manholes, and related accessories from the

transformer to SCE's existing Pull Box on the South Side of High Street, and complete tie-ins to the new switchgear, Main Switchboard (MSB) and FACP as specified in **Exhibit J(a) and Electrical Contract Documents** in accordance with the project schedule.

44. GC shall coordinate with **SCE** to implement the necessary pole and electrical modifications as detailed in **Exhibit J(b)** complete and in compliance with all applicable codes and requirements.
45. GC shall coordinate with **SCE** and remove electrical meter and service to the existing Library building and safe-off complete as noted in **Exhibit J(c)**.
46. GC shall coordinate with **SCE** to disconnect and remove the electrical meter and service from the existing Library building, ensuring complete safe-off complete per **Exhibit J(c)**.
47. GC to relocate Existing **GAS** line during Phase II to allow new improvements and not cause any interruptions to service(s) and make safe to allow for new improvements complete, including but not limited to coordination with the gas company.
48. GC must camera the **existing 10" Sanitary Sewer** at the start of the project and must take necessary measure to protect it and keep it in good working order for the duration of Phase 1 to service the existing Library and adjacent building(s). During **Phase II** the SS line can be removed and dispose properly adhering to all local, state or federal disposal requirements.
49. Upon completion of site clearing and grading, the GC shall construct the **Fire Department Access Lane** along the west side of the project site as shown in **Exhibit C**. This access road must comply with the **Ventura County Fire Department (VCFD)** Standard 501 and other applicable requirements outlined in **Exhibits D and E** and approval must be obtained by the County Fire Department.

## **Exhibits**

**All listed Exhibits are incorporated into the Contract Documents and form part of the overall project requirements.**

1. **Exhibit A** – Phasing Plan
2. **Exhibit B** – Site Logistics Plan – Need to Develop, staging area.
3. **Exhibit C** – Fire Lane Exhibit
4. **Exhibit D** – Ventura County Fire Department Standard 501 Fire Apparatus Access
5. **Exhibit E** – VCFPD Requirements for Construction
6. **Exhibit F** – GPRS Survey
7. **Exhibit G** – Moorpark Library Project Milestone Schedule
8. **Exhibit H(a)** – Carl Kim Geotechnical Report dated 11-29-22
9. **Exhibit H(b)** – Addendum to Carl Kim Geotechnical Exploration Report dated 10-04-24
10. **Exhibit I(a)** - Oakridge Prelim Geotechnical Report, dated 06-17-17
11. **Exhibit I(b)** - Oakridge Geoscience Report, dated 10-12-19
12. **Exhibit J(a)** - SCE - Line Extension
13. **Exhibit J(b)** - SCE - Pole Relocation
14. **Exhibit J(c)** - SCE - Removal of Meter & Service
15. **Exhibit K(a)** - RESOLUTION NO. PC-2024-706
16. **Exhibit K(b)** - RESOLUTION NO. PC-2025-711
17. **Exhibit L** - Mitigation Monitoring and Reporting Program
18. **Exhibit M** - Buy America Act
19. **Exhibit N** - Section 3 Local hire Requirements
20. **Exhibit O** - Contract Documents (Plans & Spec List)



Legend

Existing Library

Phase 1

Proposed 1 Story Public Library

Utilities

Domestic Water Line

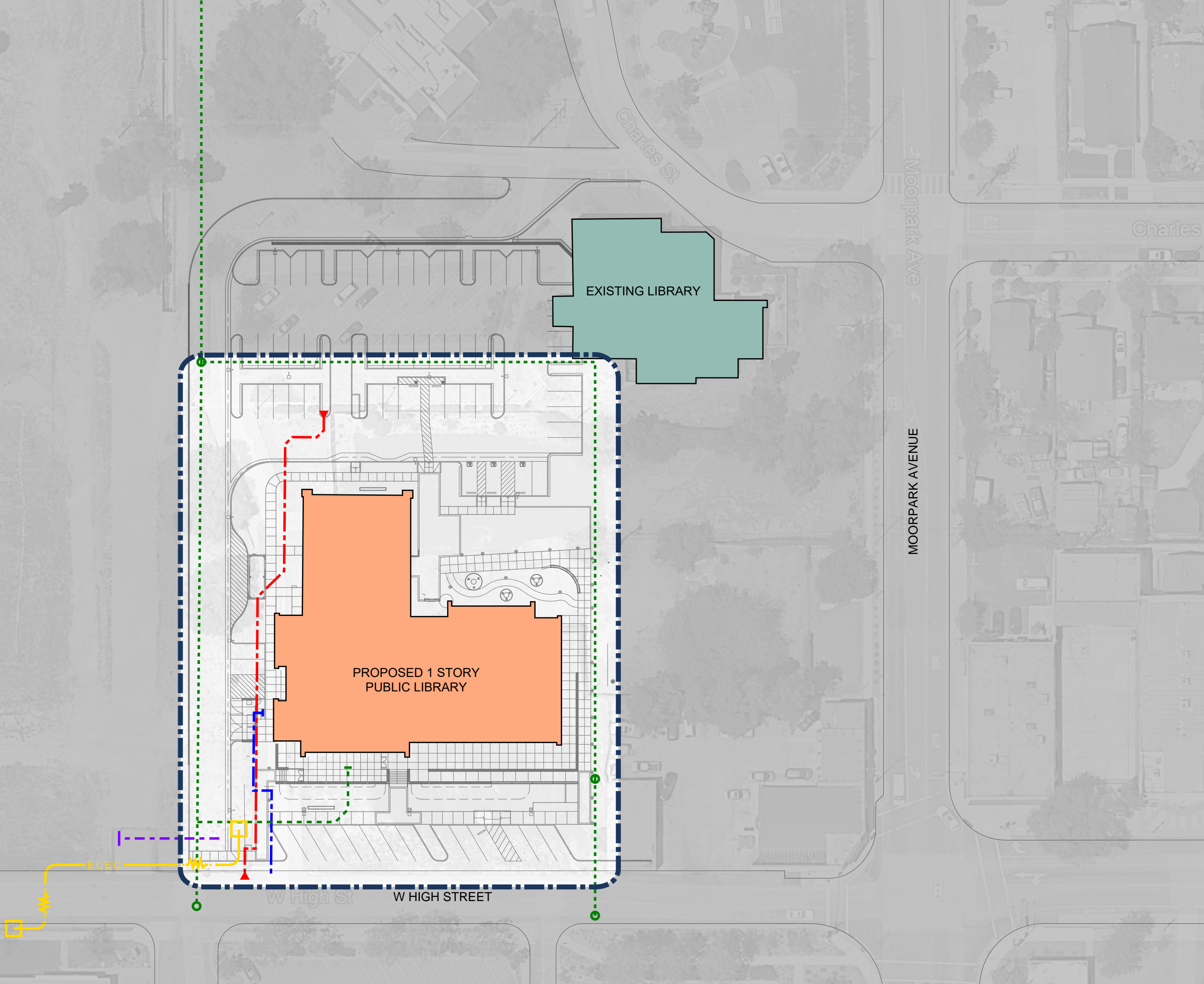
Electrical Line

Fire Water Line

Sanitary Sewer Line

Strom Drain Line

E ☐ HIBIT A - PHASING PLAN  
MOORPARK CITY LIBRARY  
PHASE 1





**Legend**

- Existing Library to be Demolished
- Phase 2
- Proposed 1 Story Public Library

**Utilities**

- Existing Domestic Water Line
- Existing Electrical Line
- Existing Fire Water Line
- Existing Gas Line
- Existing Sanitary Sewer Line

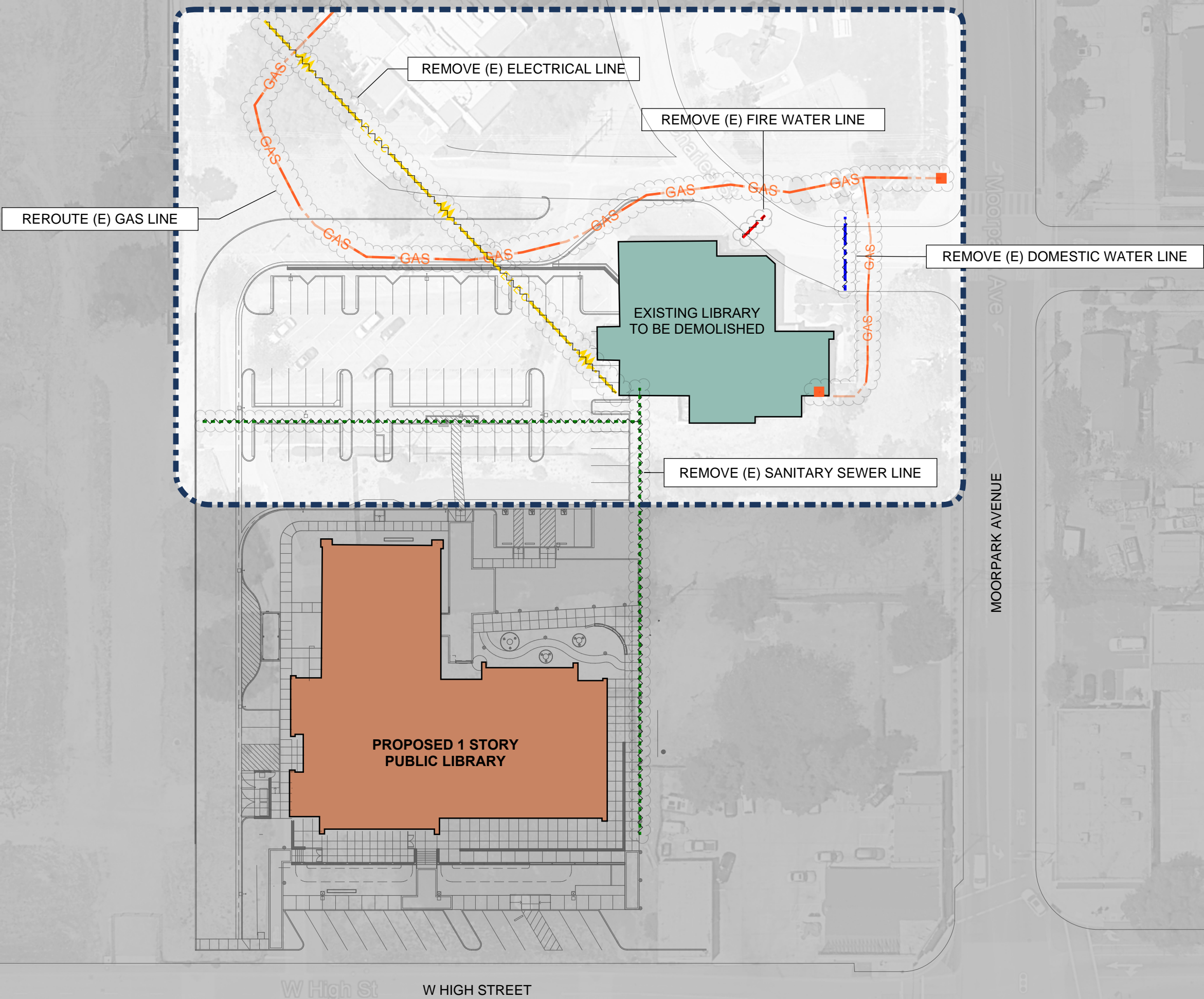


EXHIBIT A PHASING PLAN  
MOORPARK CITY LIBRARY  
PHASE 2



Legend

Existing Library

Proposed 1 Story Public Library

Site Logistics

Contractor Access Road

Contractor Lay-down Area

Evacuation Area

First Aid

Office Trailer

Portable Toilets

Temp Fence

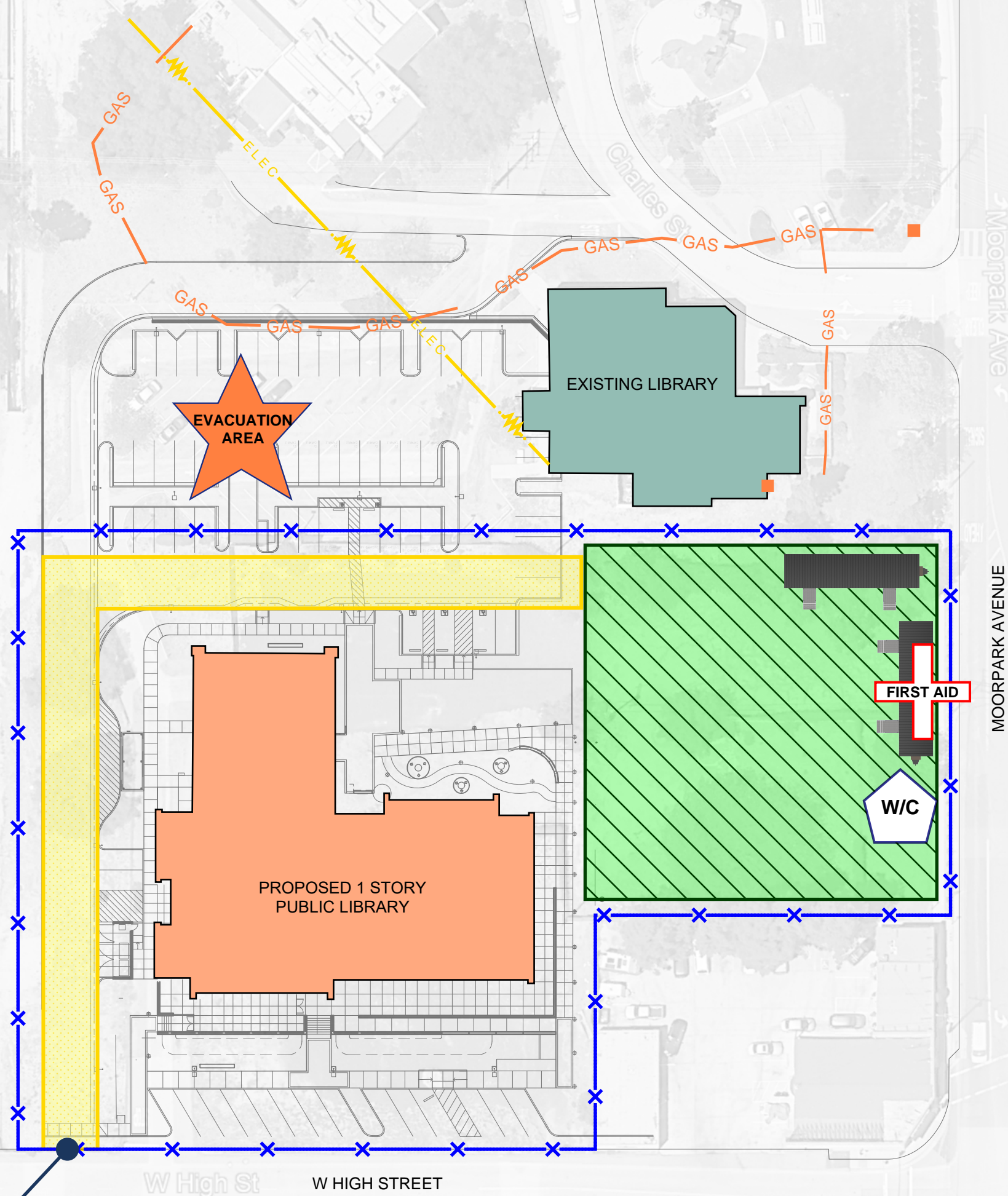
Utilities

Existing Electrical Line

Existing Gas Line

EXHIBIT B - SITE LOGISITCS  
MOORPARK CITY LIBRARY  
PHASE 1

CONSTRUCTION  
ENTRANCE / EXIT





Legend

Existing Library to be Demolished

Proposed 1 Story Public Library

Site Logistics

Contractor Access Road

Contractor Lay-down Area

First Aid

Muster Area

Office Trailer

Portable Toilets

Temp Fence

Utilities

Existing Electrical Line

Existing Gas Line

EXHIBIT B

SITE LOGISITCS

MOORPARK CITY LIBRARY

PHASE 2

The map illustrates the site logistics for the Moorpark City Library Phase 2. Key features include:

- Existing Library to be Demolished:** A teal-colored building located in the upper right quadrant.
- Proposed 1 Story Public Library:** An orange-colored building located in the lower center.
- Contractor Access Road:** A yellow-colored road running horizontally across the middle of the site.
- Contractor Lay-down Area:** A green hatched area located to the right of the access road.
- Construction Entrance / Exit:** A black dot located at the top center of the site.
- Muster Area:** An orange star-shaped area located on the left side of the site.
- First Aid:** A red cross symbol located on the right side of the site.
- Office Trailer:** A black rectangular symbol located on the right side of the site.
- Portable Toilets:** A white hexagon symbol with 'W/C' text located on the right side of the site.
- Temp Fence:** A blue line with 'X' markers surrounding the site.
- Utilities:** Yellow lines with lightning bolts represent existing electrical lines, and orange lines with squares represent existing gas lines.

Surrounding streets include W High Street to the south, Moorpark Avenue to the east, and Charles St to the north.



Legend

Existing Library

Proposed 1 Story Public Library

Site Logistics

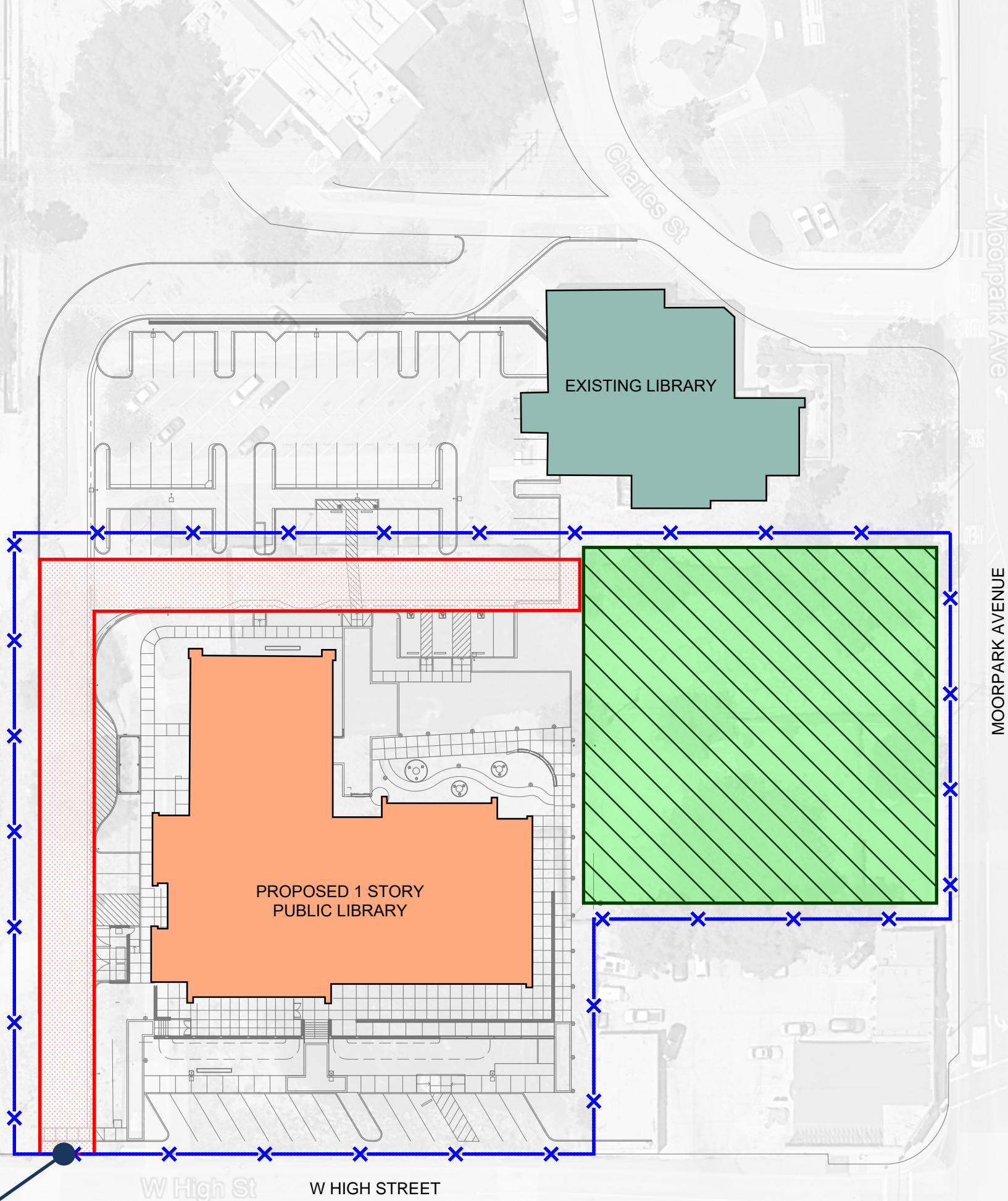
Contractor Lay-down Area

Fire Access Drive Aisle

Temp Fence

EXHIBIT C - FIRE LANE  
MOORPARK CITY  
LIBRARY  
PHASE 1

CONSTRUCTION  
ENTRANCE / EXIT





Legend

Existing Library to be Demolished

Proposed 1 Story Public Library

Site Logistics

Contractor Lay-down Area

Fire Access Drive Aisle

Temp Fence

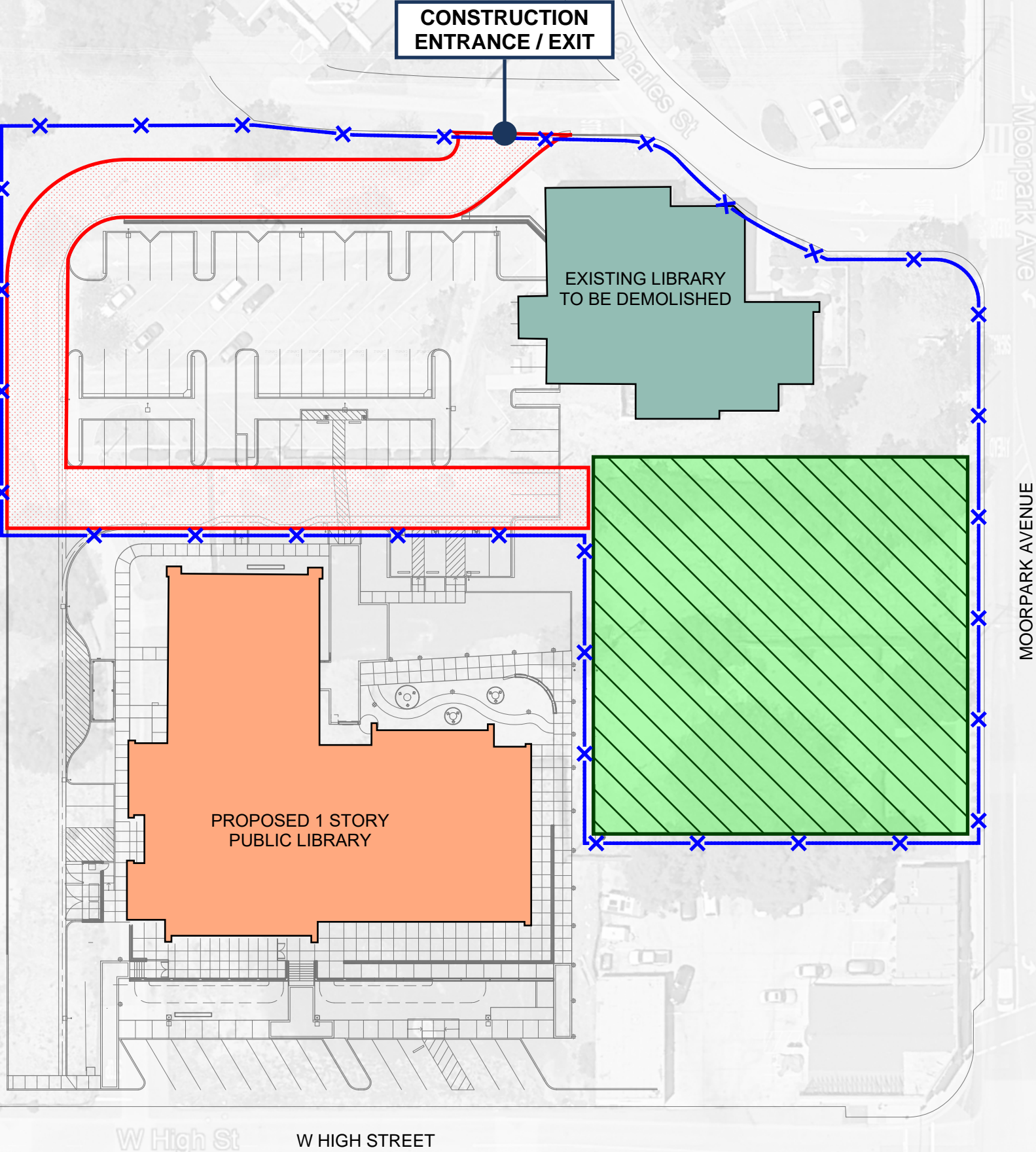


EXHIBIT C FIRE LANE  
MOORPARK CITY LIBRARY  
PHASE 2



## STANDARD 501 FIRE APPARATUS ACCESS

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*Please note that the District assumes no liability for any damages incurred directly or indirectly as a result of any errors, omissions, or discrepancies between this standard and any applicable law. It is the sole responsibility of the person or persons conducting any work pursuant to this standard to ensure their work complies with any and all applicable codes, ordinances, and regulations.*

**Supersedes:** VCFPD Standards 14.6.5, 14.6.6, 14.6.7, 14.6.8, 14.6.9 and 14.6.11

### CHAPTER 1 – ADMINISTRATION

**1.1 Purpose.** The purpose of this standard shall be to provide clarification of requirements and establish and assign an acceptable level of quality and minimum level of mandatory controls to provide and maintain required fire department access to premises in compliance with the *Ventura County Fire Code*. The provisions of this standard are general in nature and are not intended to override the specific requirements of the *Ventura County Fire Apparatus Access Code*.

**1.2 Scope.** This standard provides a method of providing for and maintaining adequate and unobstructed emergency access for fire department apparatus and personnel to buildings, structures, hazardous occupancies or other premises, as may be required by the *fire code official* and the *Ventura County Fire Code*.

The District Access Standards are minimum standards and are normally increased due to cumulative effect of previously submitted, approved or completed development within a given area. Public Road Standards allow for more restrictive limitations and shall apply when necessary.

**1.3 Applicability.** This standard shall apply to all premises within the jurisdictional boundaries of the Ventura County Fire Protection District. For public school access requirements see 504 – Public Schools Water and Access Standard. For access only Group U occupancies, see 505 – Group U Occupancy Standard.

## CHAPTER 2 – DEFINITIONS

**Access Point.** The point along a *fire apparatus access road* where fire and emergency equipment is located within 150' of all portions of the grade level of a structure as measured along an approved route.

**All-Weather Access Road.** A road capable of supporting a 20 ton axle vehicle in a 10 year storm as certified by a State of California registered civil engineer.

**Aerial Apparatus Access.** A *fire apparatus access road* constructed to allow fire apparatus with aerial ladders to ladder a building and provide an additional 10 foot traffic lane.

**Building.** Any structure used or intended for supporting or sheltering any use or occupancy that is defined in the California Building Code.

**Driveway (LRA Only).** A private right-of-way serving not more than 2 residential parcels, serving not more than 4 dwelling units, and any number of accessory structures.

**Dead-end Road.** A road that has only one point of ingress/egress, including cul-de-sacs and looped roads.

**Dwelling unit:** Any *building* or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and/or sanitation for not more than one family.

**Existing Parcel.** Parcels, including those located in a SRA area that were legally created and recorded prior to October 1, 1980.

**Existing Road.** Existing roads, including those located in a SRA area, shall be *fire apparatus access roads* legally recorded and constructed prior to October 1, 1980.

**Fire Apparatus Access Road.** A Roadway that provides fire apparatus access from a fire station or other staging area to a facility, building, structure or portion thereof. This is a general term inclusive of all similar terms such as fire lane, public street, private street, parking lot lane, access roadway and driveway. A fire apparatus access road, in addition to providing access for fire apparatus, may provide ingress and egress for the general public during emergency events and normal use.

**Fire Lane.** A *fire apparatus access road* developed to allow for passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than a fire apparatus.

**Most Weather Road.** A road capable of supporting a 20 ton vehicle during most weather conditions for firefighting or rescue operations.

**Off-Site Access.** An access road that is outside the boundaries of the property being served.

**On-Site Driveway.** An access road serving not more than 4 single family dwellings and is located within the boundaries of the properties being served.

**Primary Access.** A road used routinely for access into and out of an area.

**Roads, streets, private lanes (Roads).** Vehicular access, inclusive of roadway structures, that provides access to;

- (a) more than two parcels.
- (b) more than 4 dwelling units.
- (c) any industrial or commercial occupancy.



**Roadway.** Any surface designed, improved, or ordinarily used for vehicle travel.

**Roadway Structures.** Bridges, culverts, and other appurtenant structures which supplement the roadway bed or shoulders.

**Same Practical Effect.** An exception or alternative with the capability of applying accepted fire suppression strategies and tactics, and provisions for fire fighter safety and public safety, including all of the following;

- (a) access for emergency fire equipment,
- (b) safe civilian evacuation,
- (c) signing that avoids delays in emergency equipment response,
- (d) available and accessible water to effectively attack fire or defend a structure from wildfire,
- (e) fuel modification sufficient for civilian and fire fighter safety.

**Secondary Access.** A secondary road used for access into and out of an area in which the construction standard is the same as the primary access.

**State Responsibility Area Existing Parcel, Road, Structure or Use.** For the purposes of CCR Title 14, Sections 1270 – 1273.11, SRA Fire Safe Access Regulations, existing parcels, roads, structures or uses shall be those legally divided, constructed, installed or uses in legally in effect prior to September 1, 1981. See CCR Title 14, Section 1270.02.

**State Responsibility Area Driveway (SRA Driveway).** A vehicular access that serves no more than two buildings, with no more than 3 dwelling units on a single parcel, and any number of accessory buildings (*SRA*).

**Structure:** That which is built or constructed, an edifice or *building* of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

**Traffic lane:** The portion of a roadway that provides a single lane of vehicle travel.

**Turnaround:** A roadway, unobstructed by parking, which allows for a safe opposite change of direction for emergency equipment. Design of such area may be a hammerhead/T or terminus bulb.

**Turnouts:** A widening in a roadway to allow vehicles to pass or emergency equipment to stage off the roadway traffic lane.

**Vertical clearance:** The minimum clearance area above the roadway to any overhead projection or obstruction.

## CHAPTER 3 – GENERAL REQUIREMENTS

**3.1 General.** *Fire apparatus access roads* shall be provided and maintained in accordance with the Ventura County Fire Apparatus Access Code of the Ventura County Fire Protection District Ordinance Code.

**3.2 Fire Department Access.** *Fire apparatus access roads*, whether public or private, primary or secondary, shall provide for safe access for emergency equipment and civilian evacuation concurrently, and shall provide for unobstructed traffic circulation during a fire or other emergency.



**3.2.1 Maintenance.** Private *fire apparatus access roads* shall be designed and maintained in accordance with public road standards. When the road or driveway serves 2 or more parcels, provisions for maintenance of the road shall be assured by a permanent homeowners association or equivalent organization and a deed restriction requiring this is recorded on each parcel. A covenant shall be placed upon multiple parcels served by the same *fire apparatus access roads* that are under the same ownership.

**3.2.2 Location.** *Fire apparatus access roads* shall be constructed within the dedicated right-of-way, common area parcels or recorded access easements.

**3.2.3 Timing.** *Fire apparatus access roads* shall be provided prior to construction and maintained throughout the life of the development.

**3.2.4 Obstructions.** *Fire apparatus access roads* shall be maintained clear width and unobstructed at all times.

**3.2.4.1 Permit Required.** Plans shall be submitted for review and approval prior to the construction of any obstruction along *fire apparatus access roads*.

**3.2.5 Surfacing.** All *fire apparatus access roads* shall meet the requirements for an *all-weather* road.

**3.2.5.1 Fair Weather Crossings.** Existing crossings that do not exceed 1 foot depth of flow during a 10 year storm may be considered all-weather if the surface of the crossing is concrete and has a history of withstanding normal flow. Existing crossings shall be certified by a Registered Civil Engineer, and a copy of the engineer's report shall be provided to the District. New crossings shall be designed by a Registered Civil Engineer above the 10 year flow level, with documentation submitted to the District for approval. Length of fair weather crossings shall not exceed 50 feet.

**3.2.6 Parking.** Parking shall not be permitted within the required *fire apparatus access roads* and appurtenances, unless additional space is provided as outlined within this Standard.

**3.2.7 Cross Slope.** *Fire apparatus access roads* shall be designed with a maximum cross slope of 5% on any section of the access.

**3.3 Where Required.** *Fire apparatus access roads* shall be provided for every facility, *building* or structure hereafter constructed or relocated.

**3.3.1 Modifications.** When *fire apparatus access roads* cannot be installed due to practical difficulties, the fire code official shall have the authority to grant modifications for individual cases, provided the *fire code official* shall first find that special individual reasons make the strict letter of this standard impractical and the modification is in compliance with the intent, purpose and same practical effect of this code. The details of action granting such modification should be recorded on the parcel deed.

**3.4 Access Point(s) to Buildings or Structures.** *Fire apparatus access roads* shall be provided such that any portion of the exterior walls, at grade level, of a *building* or structure is not more than 150 ft. (46 M) from *fire apparatus access road* as measured by an approved route around the exterior of the *building* or structure. The fire code official is authorized to increase the distance, as specified in this standard.

**3.4.1 Roadway Extensions.** Where roadways extend beyond the access point, the extended roadway shall comply with all requirements of the *fire apparatus access roads*.

**3.5 Dead-Ends.** Turnarounds shall be provided on all dead-end *fire apparatus access roads* in excess of 150 feet. The fire code official is authorized to increase the length of a dead-end *fire apparatus access road* to a length of 250 feet as specified in this standard.

**3.6 Additional Fire Apparatus Access Roads.** The fire code official is authorized to require more than one *fire apparatus access road* based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

**3.7 Distance Measurements.** All specified or referenced distances are measured along the ground along the center-line of the access, unless otherwise stated.

**3.8 Bridges and Elevated Surfaces.** Where fire apparatus must cross over a bridge or elevated surface the bridge shall be constructed and maintained in accordance with AASHTO HB-17. Surfaces shall be designed for a live load sufficient to carry the imposed loads of not less than that required by HS-20 Loading.

**3.8.1 Posting of Load Limits.** Load limit signs shall be posted at both entrances to bridges or road accesses over a below-grade structure as required by the Fire Code Official. Load limit signs shall be constructed of weather resistant materials, posted in obvious locations and shall be maintained legible.

**3.8 Gates/Traffic Calming Across Fire Apparatus Access Roads.** Gate(s) and other traffic calming devices installed across fire apparatus access *roads* shall comply with the requirements specified in Chapter 9 of this standard.

**3.9 Secondary Access for Existing Roads and New Subdivisions.** Secondary access, in accordance with Chapter 12, shall be provided where a new subdivision of land is served from an existing dead-end access road that exceeds allowable dead-end lengths as specified elsewhere in this standard. Secondary access shall be provided for the proposed subdivision regardless of where the new parcels take access along the existing dead-end access road. The intent is not to further increase the density on a dead-end road that exceeds allowable dead-end lengths.

## CHAPTER 4 – RESIDENTIAL FIRE APPARATUS ACCESS ROADS (LRA)

**4.1 General Application for Residential Fire Apparatus Access Roads within the Local Responsibility Area (LRA).** This section shall apply to parcels containing Group R-3 (one and two-family dwellings) and associated Group U Occupancy's as defined in the current adopted edition of the California Building Code.

**4.1.1 Vertical Clearance.** *Fire apparatus access roads* shall have a clear and unobstructed height of 13 feet 6 inches along the entire road width.

**4.1.2 Vertical Curve.** The vertical curve of a driveway shall not allow for transitions between grades that exceed 6% elevation change along any 10 foot section. These transitions shall include; angle of approach, angle of departure and high centering of fire apparatus.

**4.2 Local Responsibility Area Driveways.** *Driveways* located within the Local Responsibility Area shall comply with the requirements of Chapter 3 and Sections 4.2.1 through Section 4.2.8 of this standard.

**4.2.1 Driveway Width.** The minimum clear width of a driveway providing fire apparatus access shall be 15 feet.

**Exception:** When approved by the fire code official, driveway width can be reduced to not less than 12 feet in areas where full width cannot be installed due to topography or other natural obstructions. When driveway widths are approved at less than 15 feet, all of the following shall be required;

1. Fire sprinklers shall be installed throughout all structures, regardless of use, inclusive of bathrooms, closets and combustible concealed spaces not otherwise required by NFPA 13D.
2. A statement shall be recorded with the County Recorder as a public record and a certified copy shall be provided to the Fire District prior to final occupancy. Recorded statement shall be the following; "The minimum required access has been modified due to topography or other natural obstructions. Emergency vehicle response may be delayed."

**4.2.2 Driveway Surface, Construction and Grade Limitations.** *Driveways* shall have a structural cross section and surface complying with one of the following based upon grade limitations as indicated below:

1. Alternate surfaced driveway constructed in accordance with Chapter 10 shall be permitted to be installed where grades do not exceed 10%. **All alternate surfaced driveways shall be certified by a State of California registered civil engineer.**
2. Grades up to 20% shall be asphalt or concrete. Structural sections shall be in accordance approved public road standards for the jurisdiction the structure will be constructed. When there are no approved road standards, the Ventura County Road Standards shall apply.
3. Grades up to 25% shall be concrete. Structural sections shall be in accordance approved public road standards for the jurisdiction the structure will be constructed. When there is no approved road standards, the Ventura County Road Standards shall apply.

**4.2.3 Driveway Length Limitations.** *Driveways* shall have length limitations based upon grades as indicated below:

1. *Driveways* with grades not more than 16.0% shall not have distance limitations.
2. *Driveways* or sections of *driveways* with grades between 16.1% and 20.0% shall have a maximum cumulative distance of 1000 feet.
3. *Driveways* or sections of *driveways* with grades between 20.1% and 25.0% shall have a maximum cumulative distance of 200 feet.

**4.2.5 Driveway Horizontal Turn Radius.** No driveway shall have a centerline horizontal radius curvature of less than 40 feet. When transitioning from one curve to another curve in the opposite direction, a recovery distance of not less than 40 feet shall be provided.

**4.2.6 Driveway Turnaround.** Turnarounds in accordance with Chapter 8 shall be provided where dead-end *driveways* exceed 150 feet.

**Exception:** When all of the following exist, a turnaround is not required;

1. the *driveway* does not exceed 250 feet in length,
2. no portion of the *driveway* exceeds 5% grade,
3. the *driveway* width is not less than 15 feet,
4. the inside turn radius of all turns is not less than 80 feet.

**4.2.6.1 Driveway Turnaround Location.** *Turnarounds* shall be located within 150 feet of the termination of the *driveway*.

**4.2.6.2 Additional Driveway Turnarounds.** Additional *turnarounds* shall be installed where *dead-end driveways* exceed 1 mile in length, at ½ mile intervals.

**4.2.7 Driveway Turnouts.** *Turnouts* shall be provided in accordance with Chapter 8 on all *driveways* in excess of 300 feet as specified below:

1. At the midpoint of *driveways* less than 800 feet.
2. Every 400 feet on *driveways* greater than 800 feet.
3. Where drafting hydrants are installed along the *driveway*.

**4.2.7.1 Substitution for Driveway Turnouts.** Approved *turnarounds* can be substituted for a *turnouts* where approved by the *fire code official*.

**4.2.8 Access Point(s) on Driveways.** *Driveways* shall be provided such that any portion of the exterior walls, at grade level, is not more than 150 feet from the *driveway(s)* as measured by an approved route around the exterior of the *building*.

**Exception:** The distance shall be permitted to be extended to 250 feet when the building is protected by an automatic fire sprinkler system in accordance with NFPA 13D and provided with an approved access walkway leading from the *driveway* to the exterior openings around the structure.

**4.3 Roads, Streets, Private Lanes (Roads).** *Roads, Streets, Private Lanes* shall be identified by the term *Road(s)* within this section. *Roads* serving Group R-3 (one and two-family dwellings) and associated Group U Occupancy's shall comply with the requirements of Chapter 3 and Sections 4.3.1 through 4.3.6 of this standard.

**4.3.1 Road Width.** Roads shall be installed in accordance with the minimum requirements of the road standards of the jurisdiction in which the road is to be constructed but not less than the dimensions indicated in Table 4.3.1.

**Table 4.3.1**

Roads, Streets, Private Lanes	Minimum Improved Width	Parking
One-Way Traffic	20 feet	No Parking Permitted
Two-Way Traffic <sup>a</sup>	24 feet	No Parking Permitted
Two-Way Traffic	32 feet	Parking Permitted on (1) Side
Two-Way Traffic	36 feet	Parking Permitted on (2) Sides

- a. *Existing parcels* as defined in this standard shall be permitted to be served by a *Road* width of not less than 20 feet. Where existing roads have been constructed, prior to issuance of a building permit, on an *existing parcel*, roads shall be improved to 20 feet for a length equal to the property line frontage as approved by the *fire code official*.

**4.3.2 Road Surface, Construction and Grade Limitations.** *Roads* shall have a structural cross section and surface complying with the public road standards for the jurisdiction in which the project is located and grades shall not exceed 16%. Where there is no public road standard, Ventura County Public Road Standards shall apply.

**4.3.3 Road Length Limitations, Dead-end Roads and Secondary Access.** The maximum length of dead-end roads shall not exceed the cumulative lengths established in this section. Where dead-end roads exceed length limitations, developments shall provide *secondary access* in accordance with Chapter 12 of this standard.

1. *Dead-end roads* serving up to 20 parcels and not more than 40 dwelling units shall not exceed 5280 feet.
2. *Dead-end roads* serving up to 30 parcels and not more than 60 dwelling units shall not exceed 2,640 feet.
3. *All other Dead-end roads* shall not exceed 800 feet.

**4.3.4 Horizontal Turn Radius.** Horizontal turn radius shall be determined by public road standards based upon street width and speed and no road shall have a centerline horizontal radius curvature of less than 40 feet. When transitioning from one curve to another curve in the opposite direction, a recovery distance of not less than 80 feet shall be provided.

**4.3.5 Road Turnaround.** Turnarounds in accordance with Chapter 8 shall be provided where dead-end roads exceed 150 feet.

**Exception:** When all of the following exist, a turnaround is not required;

1. the *road* does not exceed 250 feet in length,
2. no portion of the *road* exceeds 5% grade,
3. the *road* width is not less than 20 feet,
4. the inside turn radius of all turns is not less than 80 feet.

**4.3.6 Existing Road Turnouts.** In addition to the required improvements specified in Table 4.3.1, *turnouts* in accordance with Figure 8.3(2) shall be provided, within the right-of-way or easement, on all *existing roads* where road width is less than 20 feet clear and road lengths are in excess of 300 feet as specified below;

1. At the midpoint of *roads* less than 800 feet.
2. every 400 feet on *roads* greater than 800 feet.
3. where hydrants are installed along the *road*.

**4.3.6.1 Existing Road Turnout Improvements.** It is the intent of Section 4.3.6 to require *road* improvements along an existing, legal, non-conforming *road* when new structures are constructed that will increase the amount of vehicle traffic. Where improvements are partial or incomplete, each new development shall continue the improvement of the access as approved by the *fire code official*. This improvement shall be inclusive but not limited to new primary or second dwellings.

## CHAPTER 5 – FIRE APPARATUS ACCESS ROADS (SRA)

**5.1 General Application for Fire Apparatus Access Roads within the State Responsibility Area (SRA).** This section shall apply to parcels located within the State Responsibility Area (SRA) as required by Title 14 of the California Code of Regulations and VCFPD Access Code as identified below:

1. The perimeters and access to all residential, commercial, and industrial building construction within SRA approved after January 1, 1991 except as set forth below:

**Exception:** These regulations do not apply where an application for a building permit is filed after January 1, 1991 for building construction on a parcel that was formed from a parcel map or tentative map (if the final map for the tentative map is approved within the time prescribed by the local ordinance) approved prior to January 1, 1991, ***to the extent that conditions relating to the perimeters and access to the buildings were imposed by the parcel map or final tentative map approved prior to January 1, 1991.***

2. All Tentative and parcel maps or other developments approved after January 1, 1991.
3. Applications for building permits on a parcel approved in a pre-1991 parcel or tentative map to the extent that conditions relating to the perimeters and access to the buildings were not imposed as part of the approval of the parcel or tentative map.

**5.1.1 Affected Activities.** The affected activities include, but are not limited to:

1. Permitting or approval of new parcels, excluding lot line adjustments as specified in Government Code (GC) section 66412(d).
2. Application for a building permit for new construction, not relating to an existing structure.
3. Application for a use permit.
4. The siting of manufactured homes (manufactured homes are as defined by the National Fire Protection Association, National Fire Code, section 501A, Standard for Fire Safety Criteria for Manufactured Home Installations, Sites and Communities, chapter 1, section 1-2, Definitions, page 4, 1987 edition and Health and Safety Code sections 18007, 18008, and 19971).
5. Road construction, including construction of a road that does not currently exist, or extension of an existing road.

**5.1.2 Vertical Clearance in SRA.** *Fire apparatus access roads* shall have a clear and unobstructed height of 15 feet along the entire road width.

**5.1.3 Vertical Curve in SRA.** The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water, shall be not less than 100 feet.

**5.1.4 Horizontal Turn Radius in SRA.** *Fire apparatus access roads* shall have a minimum horizontal **inside** radius curvature of 50 feet.

**5.1.5 Design Capacity in SRA.** *Fire apparatus access roads* shall be designed and maintained to support the imposed load of fire apparatus weighing at least 75,000 pounds and provide an aggregate base.

**5.2 SRA Driveway.** *SRA Driveways* shall comply with the requirements of Chapter 3 and Sections 5.2.1 through Section 5.2.5.

**5.2.1 SRA Driveway Width.** The minimum clear width of a *SRA driveway* providing fire apparatus access shall be 15 feet.

**Exception:** When approved by the fire code official, *SRA driveway* width can be reduced to not less than 12 feet in areas where full width cannot be installed due to topography or other natural obstructions. When driveway widths are approved at less than 15 feet, all of the following shall be required;

1. Fire sprinklers shall be installed throughout all structures, regardless of use, inclusive of bathrooms, closets and combustibles concealed spaces not otherwise required by NFPA 13D.
2. A statement shall be recorded with the County Recorder as a public record and a certified copy shall be provided to the Fire District prior to final occupancy. Recorded statement shall be the following; "The minimum required access has been modified due to topography or other natural obstructions. Emergency vehicle response may be delayed."

**5.2.2 SRA Driveway Surface, Construction and Grade Limitations.** *SRA Driveways* shall have a structural cross section and surface complying with one of the following based upon grade limitations as indicated below:

1. Alternate surfaced driveways constructed in accordance with Chapter 10 shall be permitted to be installed where grades do not exceed 10%. **All alternate surfaced driveways shall be certified by a State of California registered civil engineer.**
2. Grades up to 16% shall be asphalt or concrete. Structural sections shall be in accordance approved public road standards for the jurisdiction the structure will be constructed. When there are no approved road standards, the Ventura County Road Standards shall apply.

**5.2.3 SRA Driveway Length Limitations.** *Driveways* shall have length limitations based upon grades as indicated below:

1. *SRA Driveways* with grades not more than 16.0% shall not have distance limitations.
2. *SRA Driveways with grades more than 16.0% are not permitted.*

**5.2.4 SRA Driveway Turnaround.** *Turnarounds* in accordance with Chapter 8 shall be provided where dead-end *SRA driveways* exceed 150 feet and shall be located within 50 feet of the *building*.

**5.2.5 SRA Driveway Turnouts.** *Turnouts* in accordance with Chapter 8 shall be provided on all *SRA driveways* in excess of 150 feet as specified below:

1. At the midpoint of *SRA Driveway* less than 800 feet.
2. Every 400 feet on *SRA Driveway* greater than 800 feet.
3. Where hydrants are installed along the *SRA Driveway*.

**5.3 Roads, Streets, Private Lanes in SRA (SRA Roads).** *Roads, Streets, Private Lanes* in the SRA shall be identified by the term *SRA Road(s)* within this section. *SRA Roads* serving Group R-3 (one and two-family dwellings) and associated Group U Occupancy's shall comply with the requirements of Chapter 3 and Sections 5.3.1 through 5.3.4 of this standard.

**5.3.1 SRA Road Width.** *SRA Roads* shall be installed in accordance with the minimum requirements of the road standards of the jurisdiction in which the road is to be constructed but not less than the dimensions indicated in Table 5.3.1.

**Table 5.3.1**

<b>Roads, Streets, Private Lanes</b>	<b>Minimum Improved Width</b>	<b>Parking</b>
One-Way Traffic	20 feet	No Parking Permitted
Two-Way Traffic <sup>a</sup>	24 feet	No Parking Permitted
Two-Way Traffic	32 feet	Parking Permitted on (1) Side
Two-Way Traffic	36 feet	Parking Permitted on (2) Sides

- a. *Existing parcels* as defined in this standard shall be permitted to be served by a *Road* width of not less than 20 feet. Where existing roads have been constructed, prior to issuance of a building permit, on an *existing parcel*, roads shall be improved to 20.

**5.3.2 Road Surface, Construction and Grade Limitations.** *SRA Roads* shall have a structural cross section and surface complying with the public road standards for the jurisdiction in which the project is located and grades shall not exceed 16%.

**5.3.3 Road Length Limitations, Dead-end Roads and Secondary Access.** The maximum length of dead-end roads shall not exceed the cumulative lengths established in Table 5.3.3. Where dead-end roads exceed length limitations, developments shall provide *secondary access* in accordance with Chapter 12 of this standard.

**Table 5.3.3 <sup>a</sup>**

<b>Size of Parcel(s) Served</b>	<b>Length Limitation</b>
parcels zoned for less than one acre	800 feet
parcels zoned for 1 acre to 4.99 acres	1320 feet
parcels zoned for 5 acres to 19.99 acres	2640 feet
parcels zoned for 20 acres or larger	5280 feet

- a. All lengths shall be measured from the edge of the roadway surface at the intersection that begins the road to the end of the road surface at its farthest point. Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply.

**5.4 SRA Road Turnaround.** *Turnarounds* in accordance with Chapter 8 shall be provided on all dead-end *SRA roads* within 150 feet of the termination of the *road*. Where parcels are zoned 5 acres or larger, *turnarounds* shall be provided at a maximum of 1,320 foot intervals.

## **CHAPTER 6 – COMMERCIAL ACCESS REQUIREMENTS**

**6.1 General Application for Commercial/Industrial Fire Apparatus Access Roads.** This section shall apply to parcels containing **all occupancies groups** other than Group R-3 and Group U occupancies as defined in the current adopted edition of the California Building Code.



**6.2 Vertical Clearance.** *Fire apparatus access roads* serving commercial and industrial occupancies shall have a clear and unobstructed height of 13' 6" feet along the entire road width.

**6.3 Vertical Curve.** The vertical curve of a *fire apparatus access roads* serving commercial and industrial occupancies shall not allow for transitions between grades that exceed 6% elevation change along any 10 foot section. These transitions shall include; angle of approach, angle of departure and high centering of fire apparatus.

**6.4 Horizontal Turn Radius.** Horizontal turn radius shall be determined by public road standards based upon street width and speed and no road shall have a centerline horizontal radius curvature of less than 40 feet. When transitioning from one curve to another curve in the opposite direction, a recovery distance of not less than 80 feet shall be provided.

**6.4 Road Width.** Roads shall be installed in accordance with the minimum requirements of the road standards of the jurisdiction in which the road is to be constructed but not less than the dimensions indicated in Table 6.4.

**Table 6.4**

Roads, Streets, Private Lanes	Minimum Improved Width	Parking
One-Way Traffic	20 feet	No Parking Permitted
Two-Way Traffic	24 feet	No Parking Permitted
Two-Way Traffic	32 feet	Parking Permitted on (1) Side
Two-Way Traffic	36 feet	Parking Permitted on (2) Sides

**6.5 Road Surface, Construction and Grade Limitations.** *Fire apparatus access roads* serving commercial and industrial occupancies shall have a structural cross section and surface complying with the public road standards for the jurisdiction in which the project is located and grades shall not exceed 10%.

**6.6 Road Length Limitations, Dead-end Roads and Secondary Access.** The maximum length of dead-end roads shall not exceed the cumulative lengths established in this section. Where dead-end roads exceed limitations, developments shall provide *secondary access* in accordance with Chapter 12 of this standard.

1. *Dead-end roads* shall not exceed 800 feet.
2. *Dead-end roads* shall not serve more than 100 dwelling units or 200 guest rooms or combination thereof. Combination calculation shall utilize percentage of units (i.e. 50 dwelling units equals 50% and 100 guest rooms equals 50% for a total of 100%)

**6.7 Road Turnaround.** *Turnarounds* in accordance with Chapter 8 shall be provided where dead-end roads exceed 150 feet.

**Exception:** When all of the following exist, a turnaround is not required;

1. the *road* does not exceed 250 feet in length,
2. no portion of the *road* exceeds 5% grade,
3. the *road* width is not less than 20 feet,
4. the inside turn radius of all turns is not less than 80 feet.

**6.8 Aerial Apparatus Access General.** *Aerial fire apparatus access* shall be required when the vertical distance between any grade plane and the highest roof surface exceeds 30 feet. One *aerial apparatus access roads* shall be provided per 50,000 square feet of building area.

**Exceptions:** Aerial fire apparatus access shall not be required when any of the following apply:

1. Non accessible roofs with pitched greater than 8:12 when building is protected by an automatic fire sprinkler system in accordance with NFPA 13.
2. Limited architectural features such as canopies and towers without habitable floor space below the roof when building is protected by an automatic fire sprinkler system in accordance with NFPA 13.

**6.8.1 Determination of Height.** For the purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

**6.8.2 Width of Aerial Apparatus Access.** *Aerial apparatus access roads* shall have a minimum unobstructed width of 30 feet, exclusive of shoulders.

**6.8.3 Proximity to Building.** A minimum of one required *aerial apparatus access road* shall be located within a minimum of 15 feet and a maximum of 30 feet from the building.

**6.8.4 Position of Aerial Apparatus Access.** *Aerial apparatus access roads* shall be positioned such that they are parallel to the entire side of the building. The side of the building on which the *aerial fire apparatus access road* is positioned shall be along the longest side of the building, unless otherwise approved by the *fire code official*.

**6.8.5 Obstructions.** Obstructions between *aerial apparatus access roads* and the buildings they serve shall be reviewed and approved by the *fire code official*.

**6.8.5.1 Overhead Utilities.** Overhead utility and power lines shall not be located along or within *aerial fire apparatus access roads* and shall not be permitted between *aerial fire apparatus access roads* and the buildings they serve.

**6.8.5.2 Trees.** Trees and other similar obstructions planted between the *aerial fire apparatus access* and the building shall comply with the following requirements:

1. Shall be spaced so there will be a minimum 30 foot separation between canopies at maturity.
2. Shall not be placed within 45 feet of the ends of a building along the access.

**Exception:** Trees with expected maturity height to be less than that which would impact laddering operations from the *aerial fire apparatus access* to the building along an approved angle.

**6.8.6 Mitigations to Aerial Apparatus Access Roads.** The *fire code official* is authorized to reduce the required width to not less than 24 feet when all of the following are provided;

1. Automatic fire sprinklers are installed throughout the structure in accordance with NFPA 13,
2. fire sprinkler standpipes are provided on all floors and through to the roof.
3. two or more roof access points are provided through 2-hour fire rated stairs separated a distance not less than half of the diagonal of the structure.

**6.9 Access Point(s) on Roads.** Roads shall be provided such that any portion of the exterior walls, at grade level, of a *building* or structure, is not more than 150 feet from a *road* as measured by an approved route around the exterior of the *building* or structure.

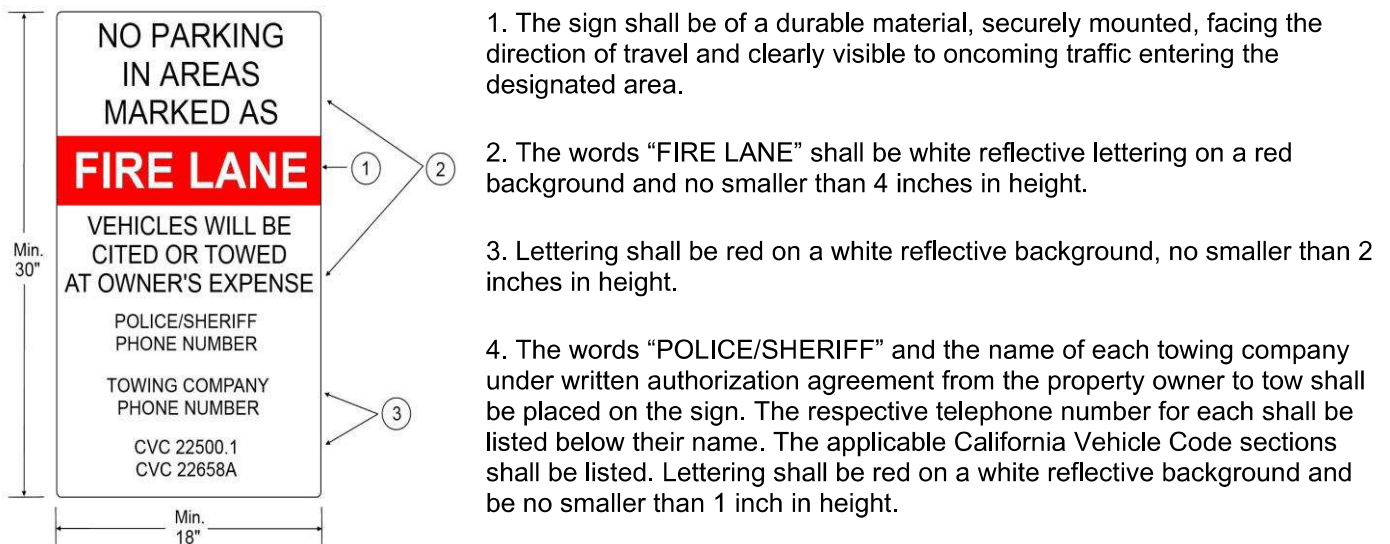
**Exception:** The distance shall be permitted to be extended to 250 feet when the building is protected by an automatic fire sprinkler system in accordance with NFPA 13 and provided with an approved access walkway leading from the *driveway* to the exterior openings around the structure.

## CHAPTER 7 – FIRE LANES

**7.1 General Fire Lane.** *Fire apparatus access roads* and fire protections equipment shall comply with this section. *Fire apparatus access roads* designated as *fire lanes* shall be posted with fire lane markings/signs in accordance with this Standard, Caltrans Traffic Manual and CVC Sections 22500.1 and 22658(a).

**7.1.1 Fire Lane Enforcement Notification.** All entrances to properties with designated *fire lanes* shall be posted with signs as indicated in Figure 7.1.1.

**Figure 7.1.1**



1. The sign shall be of a durable material, securely mounted, facing the direction of travel and clearly visible to oncoming traffic entering the designated area.

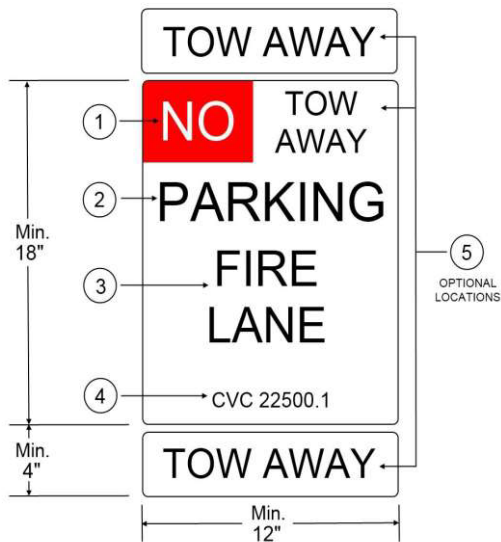
2. The words "FIRE LANE" shall be white reflective lettering on a red background and no smaller than 4 inches in height.

3. Lettering shall be red on a white reflective background, no smaller than 2 inches in height.

4. The words "POLICE/SHERIFF" and the name of each towing company under written authorization agreement from the property owner to tow shall be placed on the sign. The respective telephone number for each shall be listed below their name. The applicable California Vehicle Code sections shall be listed. Lettering shall be red on a white reflective background and be no smaller than 1 inch in height.

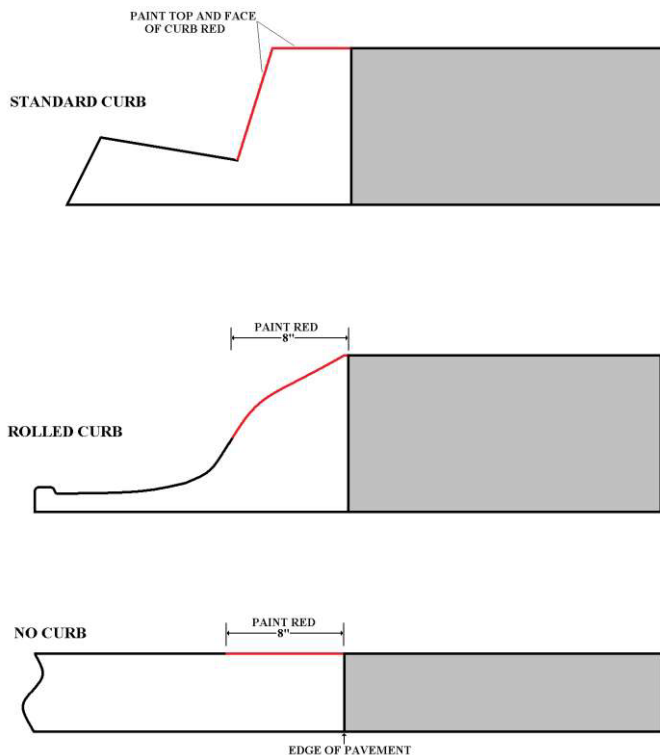
**7.1.2 Fire Lane Identification.** *Fire lanes* shall be posted with one of the following methods (Some situations may not allow a choice):

- Signs as indicated in Figure 7.1.2(1) shall be placed along the length of the fire lane, every 150 feet or portion thereof. Each section and/or direction shall have at least one sign.
- All curbing which outlines the fire lanes shall be painted red. White lettering reading "NO PARKING – FIRE LANE – TOW AWAY" shall be a minimum of 4 inches tall and placed every 50 feet or portion thereof. The lettering shall be placed on top of the curb and at least once on each section and/or direction as indicated in Figure 7.1.2(2).

**Figure 7.1.2(1)**

The sign shall be of durable material, securely mounted, facing the direction of travel and clearly visible to oncoming traffic.

1. The word "NO" shall be white reflective on a red background and no smaller than 3-1/2 inches in height.
2. Lettering shall be red on a white reflective background, no smaller than 3 inches in height.
3. Lettering shall be red on a white reflective background, no smaller than 2-1/2 inches in height.
4. Lettering shall be red on a white reflective background, no smaller than 1 inch in height.
5. The words "TOW AWAY" shall be in one of the three optional locations. The lettering shall be red on a white reflective background, no smaller than 2-1/2 inches in height.

**Figure 7.1.2(2)**

"NO PARKING – FIRE LANE – TOW AWAY" shall be painted on the top of the curb with white 4 inch high lettering every 50 feet or portion thereof.

**7.1.3 Enforcement.** When properly posted, violating vehicles may be removed (towed) in accordance with CVC Section 22658, including any required notifications.

**7.2 Posting of Roads.** Roads shall be posted in accordance with Section 7.1.2 as follows;

1. Roads less than 32 feet in clear width from curb face to curb face shall be posted on both-sides of the access.
2. Roads 32 feet to 36 feet in clear width from curb face to curb face shall be posted on one-side of the access.
3. Aerial apparatus access roads less than 38 feet in clear width from curb face to curb face shall be posted on both-sides of the access.
4. Aerial apparatus access roads 38 feet to 44 feet in clear width from curb face to curb face shall be posted on one-side of the access.
5. Turnarounds as specified in Chapter 8 of this standard.

**7.3 Posting for Fire Protection Equipment.** Fire protection equipment shall be posted in accordance with Section 7.1.2 as follows;

1. Fire hydrants located along roads shall be posted for a distance of 5 feet in each direction from the center of the hydrant.
2. Fire department connections (FDC) along roads shall be posted for a distance of 5 feet in each direction from the center of the FDC.

**7.4 Plan Review and Approval of Fire Lanes.** A fire lane location plan check is required for all projects where new buildings or additions to buildings are proposed and the project is not exempt from providing fire department access. Plans shall be submitted to VCFPD, Fire Prevention Bureau as indicated in this standard.

**7.5 Fire Lane Plans.** Prior to final inspection by VCFPD, submit 2 copies of a scaled site plan with appropriate application and fees to VCFPD. This application can be included with the original "Form-126-A" or a deferred submittal. Plans shall indicate the following:

1. Location of all buildings and structures inclusive of overhangs
2. Location of all fire apparatus access roads serving the site
3. Location of any gates or barriers
4. Location of sidewalks and parking rows
5. Location of fire hydrants
6. Location of FDC's
7. Locations of any existing fire lanes and sign locations
8. Clear designation where private roads connect with public roads

**7.5.1 Plan Marking.** Do not mark any fire lane or sign locations on the plans (with exception of existing lanes and signs). The fire code official will mark all each set of plans with red ink to indicate where the lanes and signs are required. The fire lane signs and accompanying tow-away zone signs shall be placed on the property, by the owner or owner's agent, as indicated on the plans by the fire code official.

## CHAPTER 8 – TURNAROUNDS, TURNOUTS AND 90° TURNS

**8.1 General.** This chapter applies to the design and installation of access turnarounds, turnouts, and 90° turns within the Jurisdiction of the Ventura County Fire Protection District (VCFPD).

**8.2.1 Parking Restricted.** No parking shall be permitted within the required components of this chapter unless additional spaces is provided, and parking is approved by the *fire code official*.

**8.2.1.1 Fire Lane Signage.** Fire lane signs shall be required as determined by the *fire code official*.

**8.2 Turnarounds.** *Turnarounds* required by other chapters of this standard shall be designed in accordance with Section 8.2.1 through 8.2.3.

**8.2.1 Turnaround Maximum Grade.** *Turnarounds* shall not have a grade greater than 5% in any direction.

**8.2.2 Turnaround Location.** Unless specified elsewhere in this standard, *turnaround* areas shall be located at the end of the *fire apparatus access road* or within 150 feet of the end of the *fire apparatus access road*.

**8.2.3 Turnaround Dimensions.** *Turnarounds* shall have dimensions equal to or greater than the examples in Figure 8.2(1) and 8.2(2). Where conditions do not allow an exact duplicate of one of these examples, alternate designs may be considered.

**8.3 Turnouts.** *Turnouts* required by other chapters of this standard shall be designed in accordance with Section 8.3.1 through 8.3.4.

**8.3.1 Turnout Maximum Grade.** *Turnouts* shall not have a grade greater than that allowed on the *fire apparatus access roads* they serve. Transitions between grades shall not exceed 6% and shall not interfere with the angle of approach, angle of departure or high centering of fire apparatus.

**8.3.2 Turnout Location.** *Turnouts* shall be installed in locations determined elsewhere in this standard in the appropriate chapter for the *fire apparatus access road* they serve.

**8.3.3 Turnout Dimensions.** *Turnouts* shall have dimensions for the *fire apparatus access roads* they serve equal to or greater than the examples in Figure 8.3(1).

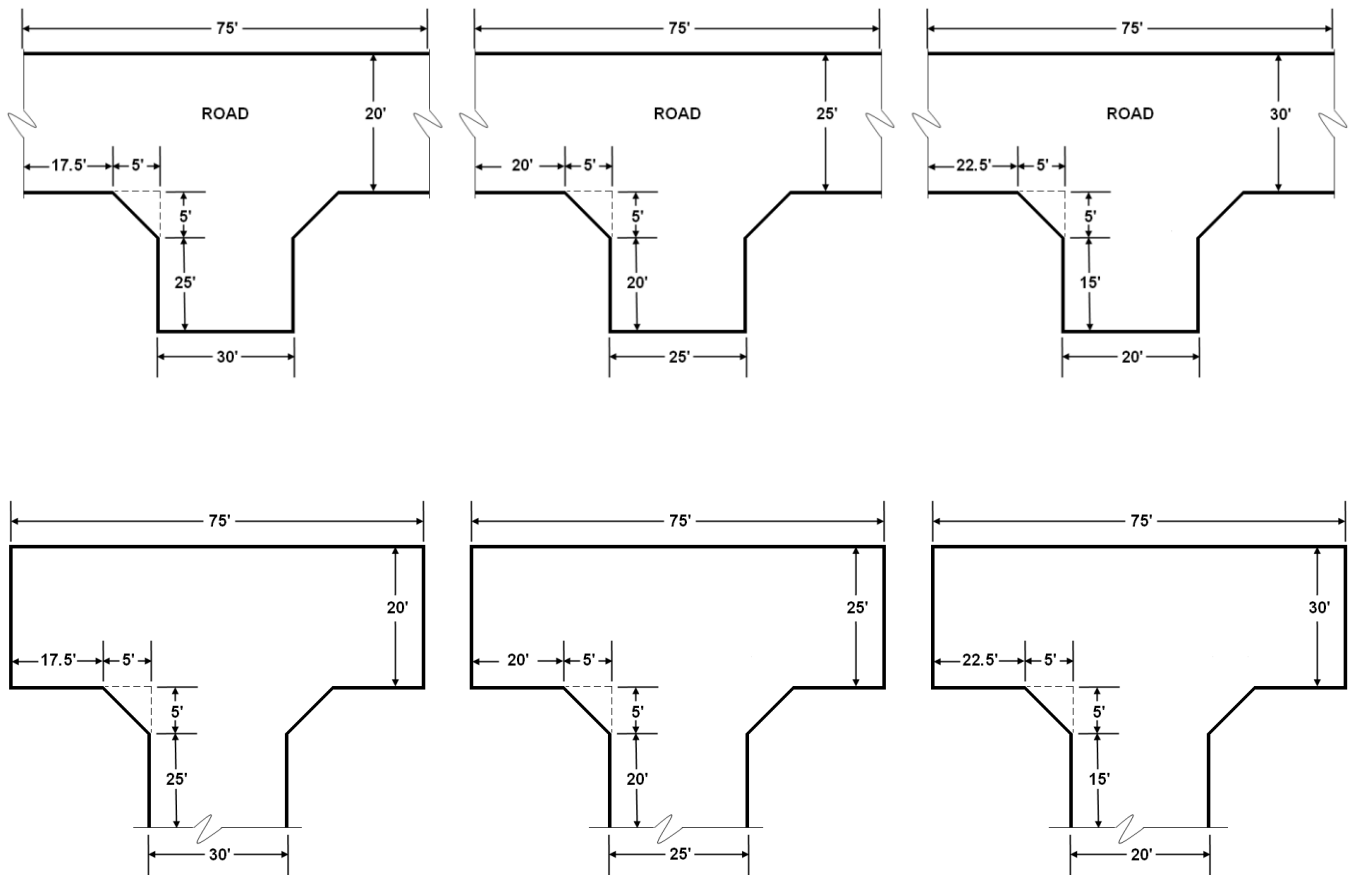
**8.3.4 Turnouts at Hydrants.** *Turnouts* located at fire hydrants shall not have a grade greater than 5% in any direction.

**8.4 90° Turns.** 90° degree turns shall be designed in accordance with sections 8.4.1 through 8.4.2.

**8.4.1 90° Turn Maximum Grade.** 90° shall not have a grade greater than 5% in any direction.

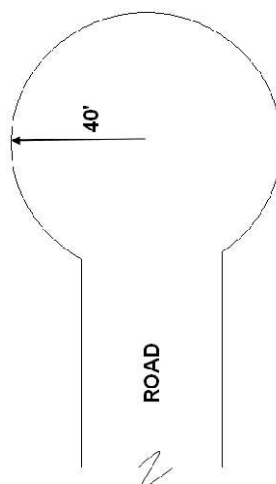
**8.4.2 90° Turn Dimensions.** 90° shall have dimensions equal to or greater than the examples in Figure 8.4. Where conditions do not allow an exact duplicate of one of these examples, alternate designs may be considered.

**Figure 8.2(1)\***



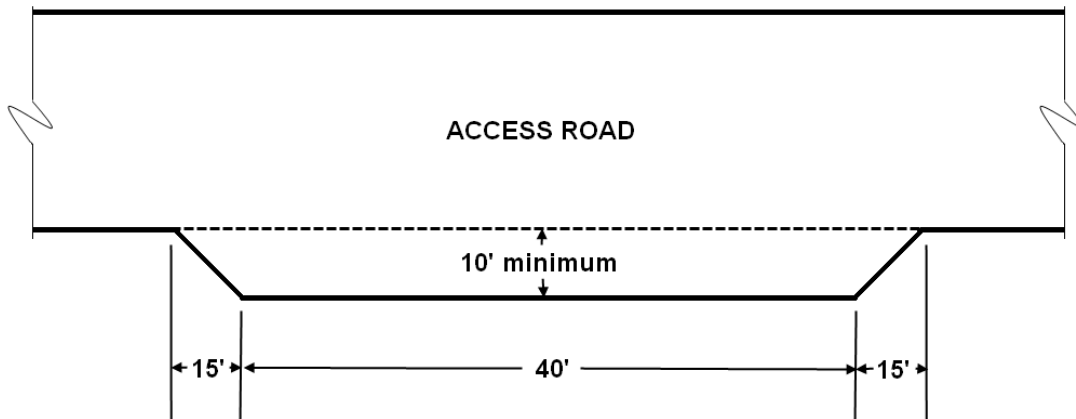
\*No Parking shall be permitted. Parking shall require an additional 8 feet to the traffic lane.

**Figure 8.2(2)\***



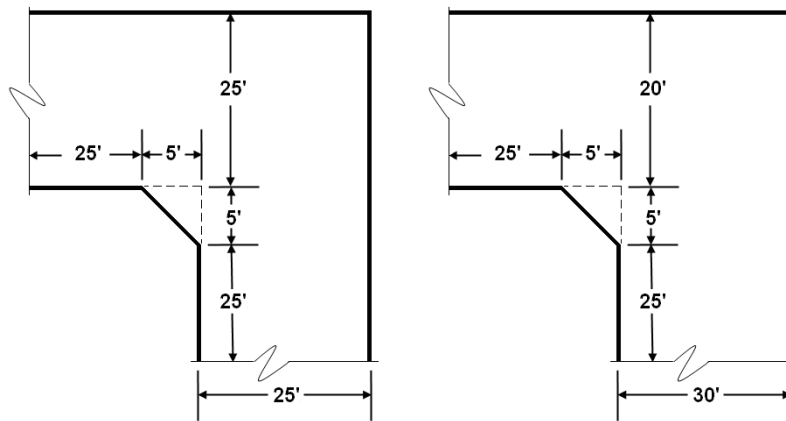
\*No Parking shall be permitted. Parking shall require a minimum 48 foot radius. A maximum 12 foot diameter island may be permitted at the center of cul-de-sac bulb when off-street parking is provided.

**Figure 8.3(1)\***



\*Existing roads that are being improved in accordance with Section 4.3.6 of this standard shall be improved to a minimum width of the road easement up to a width of 24 feet.

**Figure 8.4**





## CHAPTER 9 – GATES AND TRAFFIC CALMING DEVICES

**9.1 Gates General.** Gates shall be installed and maintained in an operative condition at all times in accordance with this chapter.

**9.1.1 Gate Permits Required.** Scaled access plans shall be submitted to the Fire District for review and approval prior to installation of any gates across *fire apparatus access roads*. In addition to obtaining Fire District approval, a zoning clearance and building permit may also be required. It shall be the responsibility of the owner or owners authorized agent to obtain all required permits and approvals prior to the installation of any gates across *fire apparatus access roads*.

**9.1.1.1 Gate Plans.** Gate plans shall include the following and be drawn on a minimum 24"x36" sheet and shall be drawn to scale of not less than 1 inch = 10 feet:

1. Identified clear width and height of gates.
2. Location of gates as they relate to required setbacks, and any fire protection equipment.
3. Location of Knox device.
4. Details of operation, inclusive of battery back-up or "fail-safe" operation as required.
5. Location of exiting spikes or similar devices.

**9.1.1.2 Gate Inspections.** Prior to placing any gate into service, the responsible party shall request an inspection from the *fire code official*.

**9.1.2 Knox Device.** All gates shall be equipped with a Knox Rapid Entry device installed in an approved location. Electric gates shall be equipped with a Knox electric switch. Manual gates may be locked with a padlock or Knox padlock. Gates locked with a padlock shall be provided with a Knox key box with padlock keys inside. Approved Knox devices can be ordered at [www.knoxbox.com](http://www.knoxbox.com). No other locks or latches shall be installed on gates.

**9.1.3 Multiple Gates.** There shall be no more than one (1) gate across *fire apparatus access roads* providing ingress and egress to an area.

**Exception:** Additional gates may be installed across *driveways* when they do not unduly impair ingress or egress as approved by the *fire code official*.

**9.1.4 Gate Interference.** Gates and other appurtenances shall be placed such that they do not interfere with the required turning radius and/or the use of fire protection equipment.

**9.2 Driveway Gates.** Gates across *driveways* shall comply with section 9.1 and sections 9.2.1 through 9.2.3.

**Exception:** Gates are not required comply with this section installed across a driveway that is not part of the required fire department access. All gates shall have a Knox device installed to provide foot access to firefighters.

**9.2.1 Driveway Gate Operation.** Gates across *driveways* shall be permitted to be electrically or manually operated and may be of the swing or sliding type.

**9.2.1.1 Fail-Safe.** Electrical gates must operate with battery back-up or in "fail-safe" when electrical service is interrupted. "Fail-safe" shall allow for a gate to be opened manually under power loss.

**9.2.2 Driveway Gate Easements.** All gate components shall be located within recorded easements, including location of any gate in the open position when serving more than one (1) parcel.

**9.2.3 Driveway Gate Width.** Gates across *driveways* shall have a clear width of not less than 15 feet.

**9.3 Road Gate Operation.** Gates across *roads* shall comply with section 9.1 and sections 9.3.1 through 9.3.7.

**9.3.1 Road Gates.** Gates shall be electrically operated and may be of the swing or sliding type.

**9.3.2 Road Gate Exit Loop.** An automatic exit loop shall be provided for all gates on the egress side of the gate. No gate shall require the use of a key, remote or other device to egress.

**9.3.3 Road Gate Battery Back-up.** Gates shall be equipped with a battery back-up and in the event of a power failure shall open and remain open until power is restored.

**9.3.4 Road Gate Easements.** All gate components shall be located within recorded easements, including location of any gate in the open position.

**9.3.5 Road Gate Width.** Gates across *roads* shall have a clear width of not less than 20 feet when serving two-way traffic and not less than 15 feet when serving one-way traffic. See Figure 9.3.5.

**9.3.6 Vehicle Stacking.** Gates across *roads* shall be situated in accordance with public road standards but not less than 40 feet for from an intersecting road to allow safe vehicle stacking.

**9.3.7 Vehicle Turnarounds.** Provisions for turning around vehicles must be provided when entry is denied.

**9.4 Gate Maintenance.** All gates and components shall be maintained in an operative condition at all times and shall be replaced or repaired when defective.

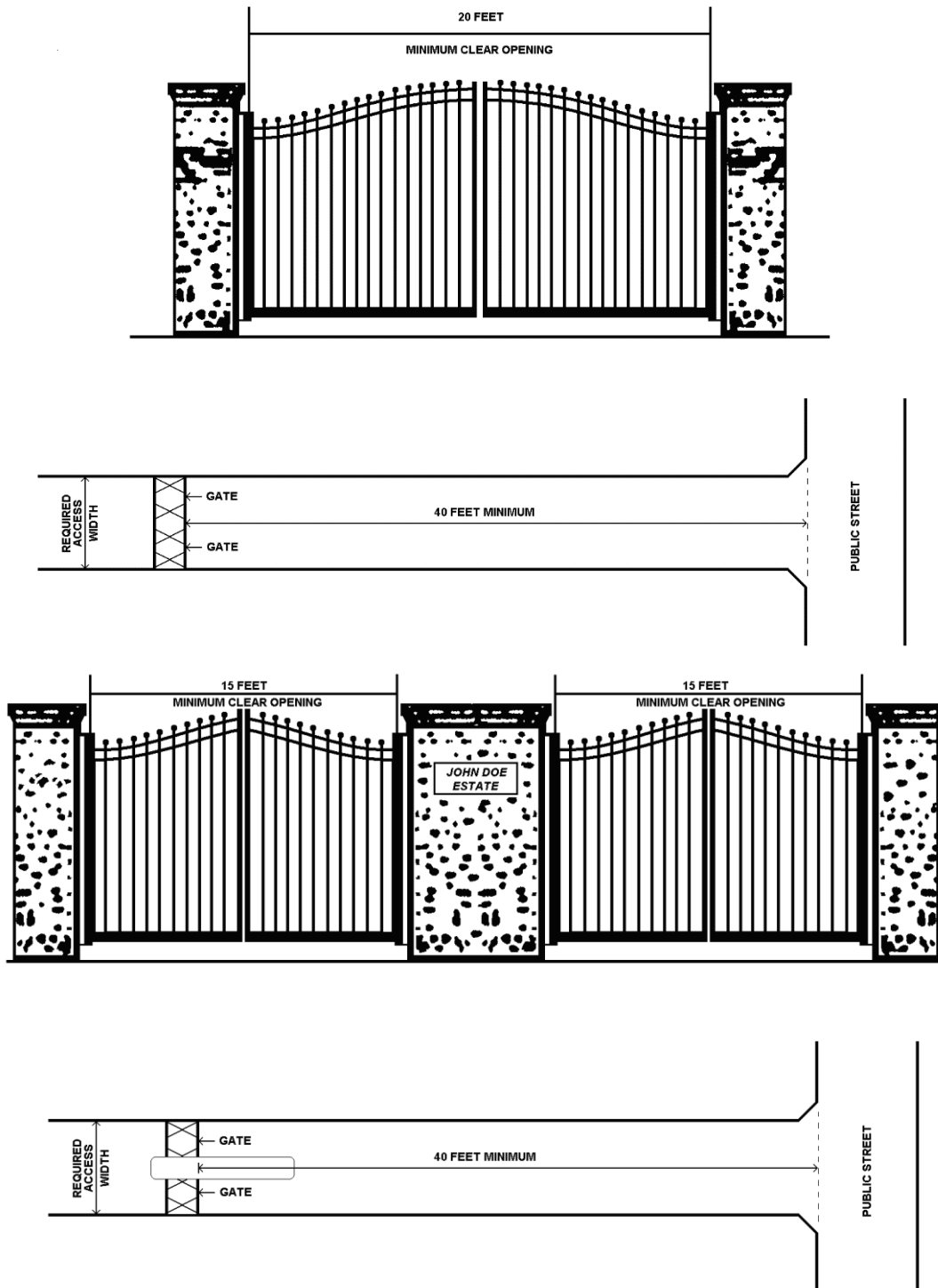
**9.4.1 Maintenance Responsibility.** Property owner(s) shall be responsible to maintain gates. Gates that are part of a tract development, residential planned development or similar situation shall be maintained by the development's Owner's Association.

**9.4.2 Battery Testing.** Any gate required to have a battery back-up system shall have a semi-annual test of that system performed and a record kept on file.

**9.4.3 Service Records.** Records shall be maintained on-site and are subject to review at the request of the Fire District.

**9.5 Traffic Calming Devices.** Traffic calming devices shall be installed and maintained in accordance with the road standards for the local jurisdiction in which the devices are to be installed. Where no road standards exist for the local jurisdiction, the devices shall be installed in accordance with the Ventura County Road Standards.

Figure 9.3.5



## CHAPTER 10 – ALTERNATIVE SURFACES

**10.1 Alternative surface Fire Apparatus Access Roads.** This chapter applies when a *fire apparatus access road* is not surfaced with traditional road building materials such as asphalt or concrete. This chapter includes surfaces such as but not limited to pavers, stone or grasscrete.

**10.2 Certified Report.** Alternative surface *fire apparatus access roads* shall be designed by an engineer register by the State of California. The engineer shall certify that all components of the *fire apparatus access road* meet the requirements for all-weather access and capable of supporting required loads. Certification of *fire apparatus access road* on 609 – All-Weather Access Certification Form shall be provided to the Fire District prior to final occupancy.

**10.3 Stabilization.** Stabilization of *fire apparatus access roads* shall be addressed in the design of the surface and may be accomplished by curbing.

**10.4 Compaction.** All subgrade soil is required to have minimum 95 percent compaction.

**10.5 Markings.** Where alternative surfaces are not clearly identifiable, such as grasscrete, a curb shall be provided and painted red or reflectors shall be imbedded into bordering curbing at intervals not exceeding 15 feet.

**10.6 Structural Section Driveways.** Alternate surfaced driveway shall have a structural section meeting the requirements of *all-weather* access based upon Cal-Trans standard R-value analysis and adequate drainage control.

**10.6.1 Acceptable Structural Section for Driveway.** When approved by a Civil Engineer and acceptable surface may be Double Chip Seal Surface over minimum 4" PMB compacted to 95% relative compaction: Apply bituminous prime coat to aggregate base at the rate of 0.35 gallons per square yard of SC70 or MC70 bituminous binder, followed by a medium chip seal coat consisting of 0.35 gallons per square yard of CRS emulsion and 25 pounds of 3/8" x #6 screening consisting of broken stone or crushed gravel per square yard in accordance with the current California Division of Highways Standard Specifications.

**10.7 Surface Requirements.** The surface shall support vehicles and provide reasonable traction (no sliding) during weather conditions as required for all weather access.

## CHAPTER 11 – ACCESS DURING CONSTRUCTION

**11.1 Fire Apparatus Access Roads During Construction.** *Fire apparatus access roads* during construction shall comply with this section.

**11.1.1 Utilities.** All utilities within the required width of *fire apparatus access roads* shall be installed prior to introducing combustible materials to a site or commencing vertical construction.

**11.2 Driveways During Construction.** Prior to and throughout vertical construction, *driveways*, inclusive of *turnarounds*, required for fire apparatus access shall have base material capable of supporting a 20-ton vehicle, during most-weather conditions, installed and compacted to 95% relative compaction at a minimum of 12 feet wide.

**11.3 Roads During Construction.** Prior to introducing combustible materials or starting vertical construction *fire apparatus access roads* shall be installed in accordance with 11.3.1 through 11.3.2.

**11.3.1 Width.** *Fire apparatus access roads* shall be a minimum un-obstructed width of 20 feet.

**11.3.2 Surface.** At minimum, the surface of *fire apparatus access roads* shall be as follows:

1. Minimum 6 inches of native soil compacted to 95 percent relative compaction.
2. Minimum 4 inches of aggregate base compacted to 100 percent relative compaction.

OR

3. First lift of AC pavement with required aggregate base in accordance with public road standards or registered engineers design requirements.

**11.4 Fire Protection Systems.** Fire protection systems shall remain clear and unobstructed. Temporary signage shall be provided to alert employees that no obstructions of fire protection equipment shall be permitted.

## CHAPTER 12 – SECONDARY ACCESS

**12.1 General Secondary Access.** *Secondary access* required in other chapters of this standard shall comply with the requirements of this chapter.

**12.1.1 Looped Access.** Separate access roads that come back to a single access location (choke point) are not acceptable and will be considered a dead-end access.

**12.1.2 No Limitations of Use.** Secondary access roads shall not be limited for emergency use only and shall permit the free passage for egress without the use of a key, remote or other special knowledge at all times.

**12.2 Construction of Secondary Access.** When *secondary access* is required, the width, grade, vertical and horizontal curves, and construction standards shall be the same as required for the *primary access* road.

**12.3 Separation of Primary and Secondary Access.** Primary and secondary access roads shall be separated to ensure that both routes will not be obstructed by a single emergency.

**12.3.1 Separation in Non-Hazardous Fire Areas.** The minimum separation of primary and secondary access roads in areas determined non-hazardous fire areas shall be 300 feet.

**12.3.2 Separation in Hazardous Fire Areas and State Responsibility Areas.** The minimum separation of primary and secondary access roads in areas determined to be hazardous fire areas or State Responsibility Areas shall be 1,000 feet.

**12.3.3 Separation Determination Point.** Separation shall be measured at the point in which each *road* terminates at a location where a vehicle operator can choose two independent directions in which to travel.



**VENTURA COUNTY FIRE PROTECTION DISTRICT**  
**2400 CONEJO SPECTRUM STREET THOUSAND OAKS, CA 91320-1445**  
**Tel: (805) 389-9710**

## REQUIREMENTS FOR CONSTRUCTION

**Case Number: FNC24-00857**

**Project Address:** 83 W HIGH ST MOORPARK, CA 93021

**Owner Name:** MOORPARK CITY OF

**APN:** 5110050175

**Tract #:**

**Lot #:**

**Planning #:**

**City Planning #:**

**BUILDING DATA:**

**Sq. Ft. Proposed:** 17500

**Existing:** 0

**Construction Type:** V-B

**Use of Building:** A3

**No. of Stories:**

### FIRE DISTRICT CONDITIONS

- 1 *All wet utilities and first lift of paving along all required Fire Department access roads / driveways shall be installed prior to vertical construction above any building foundation.*
- 2 *Certification of the all-weather access road/ driveway shall be provided prior to final inspection. The certification shall be recorded upon all parcels where the building under this permit is situated. See VCFD Form 618*
- 3 *Minimum Fire District access road / driveway width shall be installed and maintained per approved plan and VCFPD Access Standards.*
- 4 *Fire lane plans shall be submitted in accordance the VCFPD Standards to the Fire District for review and approval prior to posting and marking. Fire lanes shall be posted and marked in accordance with approved plans and VCFPD Standards prior to Final Fire Inspection.*
- 5 *Provide and maintain a minimum 10-foot brush clearance along each side of the required Fire District access roads / driveways / turnarounds serving structure(s) prior to any construction.*
- 6 *Provide and maintain a minimum 13-foot, 6-inch (13' 6") vertical clearance along all required Fire District access roads / driveways / turnarounds prior to any construction.*
- 7 *A minimum 20 foot clear width emergency access shall be maintained free of obstructions at all times within the development once construction starts.*
- 8 *Fire hydrants shall be operational and accessible at all times. No parking, storage or staging of equipment/supplies shall be located within 15 feet on either side of fire hydrants.*
- 9 *Project is located in a Hazardous Fire Area. Building construction shall comply with the local Building*

**Distribution:** ☐ Fire District ☐ Applicant ☐ Building & Safety ☐ Job Copy (Post on-site)

Issued By \_\_\_\_\_ Issued Date \_\_\_\_\_ Expiration Date \_\_\_\_\_  
FIRE PREVENTION DIVISION

**(Expires at the time of building permit expiration, but shall not exceed 12 months from date of approval if no permit is issued.)**

Renewed By \_\_\_\_\_ Renewal Date \_\_\_\_\_ Renewal Expiration \_\_\_\_\_  
FIRE PREVENTION DIVISION



**VENTURA COUNTY FIRE PROTECTION DISTRICT**  
**2400 CONEJO SPECTRUM STREET THOUSAND OAKS, CA 91320-1445**

**Tel: (805) 389-9710**

## **REQUIREMENTS FOR CONSTRUCTION**

**Case Number: FNC24-00857**

*Code of the jurisdiction where project is located. Contact the Building Department for requirements for construction within a hazardous fire area.*

- 10** *Provide and maintain 100-foot defensible space/brush clearance zone, but not beyond the property line from all existing and new structures prior to any construction.*
- 11** *Automatic fire sprinkler systems (underground, overhead) shall be installed in accordance with current adopted building code standard and NFPA # 13. Plans shall be submitted to Fire District for review and approval prior to installation.*
- 12** *An approved fire alarm system shall be installed. Submit engineered plans to the Fire District for review and approval prior to installation.*
- 13** *Post address numbers on structure with minimum height of 10 inches, contrast with background (no brass or gold), clearly visible from the street. Post temporary numbers during construction.*
- 14** *Final Fire Inspection Required.*

**Distribution:** ☐ Fire District ☐ Applicant ☐ Building & Safety ☐ Job Copy (Post on-site)

Issued By R.Luna Digitally signed by R.Luna  
Date: 2024.10.03 08:49:27 -07'00' Issued Date 10/3/2024 Expiration Date 10/3/2025  
FIRE PREVENTION DIVISION

**(Expires at the time of building permit expiration, but shall not exceed 12 months from date of approval if no permit is issued.)**

Renewed By \_\_\_\_\_ Renewal Date \_\_\_\_\_ Renewal Expiration \_\_\_\_\_  
FIRE PREVENTION DIVISION



SUBMITTAL LETTER

To: BALFOUR BEATTY CONSTRUCTION-SAN DI  
Re: GPRS FINDINGS REPORT  
799 MOORPARK AVENUE, MOORPARK, CA  
OCTOBER 30, 2024

We appreciate the opportunity to serve you on this project. Please refer to the job summary report that is sent separately from this document for additional notes related to our site visit.

There are now two ways to access your maps and models:

1. View the projects you've ordered (including this one) with our GIS platform SiteMap®. Click [HERE](#) to create your account and interact with your data.
2. Click the link below.

SiteMap® is designed to help you deliver your projects on time, on budget, and safely. Click [HERE](#) to learn more about SiteMap®. Please reach out to us at [support@sitemap.com](mailto:support@sitemap.com) with any questions as you logon to the system.

Document List:

COPIES	DATE	DESCRIPTION	LINK
1	10/30/2024	Visualize your Data with SiteMap	<a href="#">CLICK HERE</a>
1	10/30/2024	PDF Aerial Overlay - Open with PDF reader	<a href="#">PDF</a>
1	10/30/2024	PDF Aerial Overlay with Icons - Open with PDF reader	<a href="#">PDF</a>
1	10/30/2024	KMZ file - Open with Google Earth	<a href="#">KMZ</a>
1	10/30/2024	SHP files - For use in CAD or GIS software	<a href="#">SHP</a>

As an additional service, we also provide CAD drawings and can even use your existing drawings as background linework for our files. If you have already ordered CAD as a deliverable option, the CAD will be delivered as a separate submittal, typically in the next few days. If you would like CAD as a deliverable and have not yet requested it, please reach out to us to get a quote to have the service added to your job by replying to this email or giving me a call.

As a reminder, we do not provide surveying or engineering services at GPRS. The data provided is at mapping quality for general reference only. The GNSS/GPS locators that we utilize are certified for sub-meter accuracy and locations were attained by our project managers that are not surveying professionals. Some of the documents we provide with our deliverable have embedded location and elevation data that should be used at your own risk due to accuracy limitations listed above. If survey and design level accuracy is needed, you will need to hire a licensed surveyor in that state to pick up field markings to provide you with the desired data separate from GPRS. This letter is subject to our Terms and Conditions which are listed and incorporated by reference here: <https://gp-radar.com/terms-conditions>.

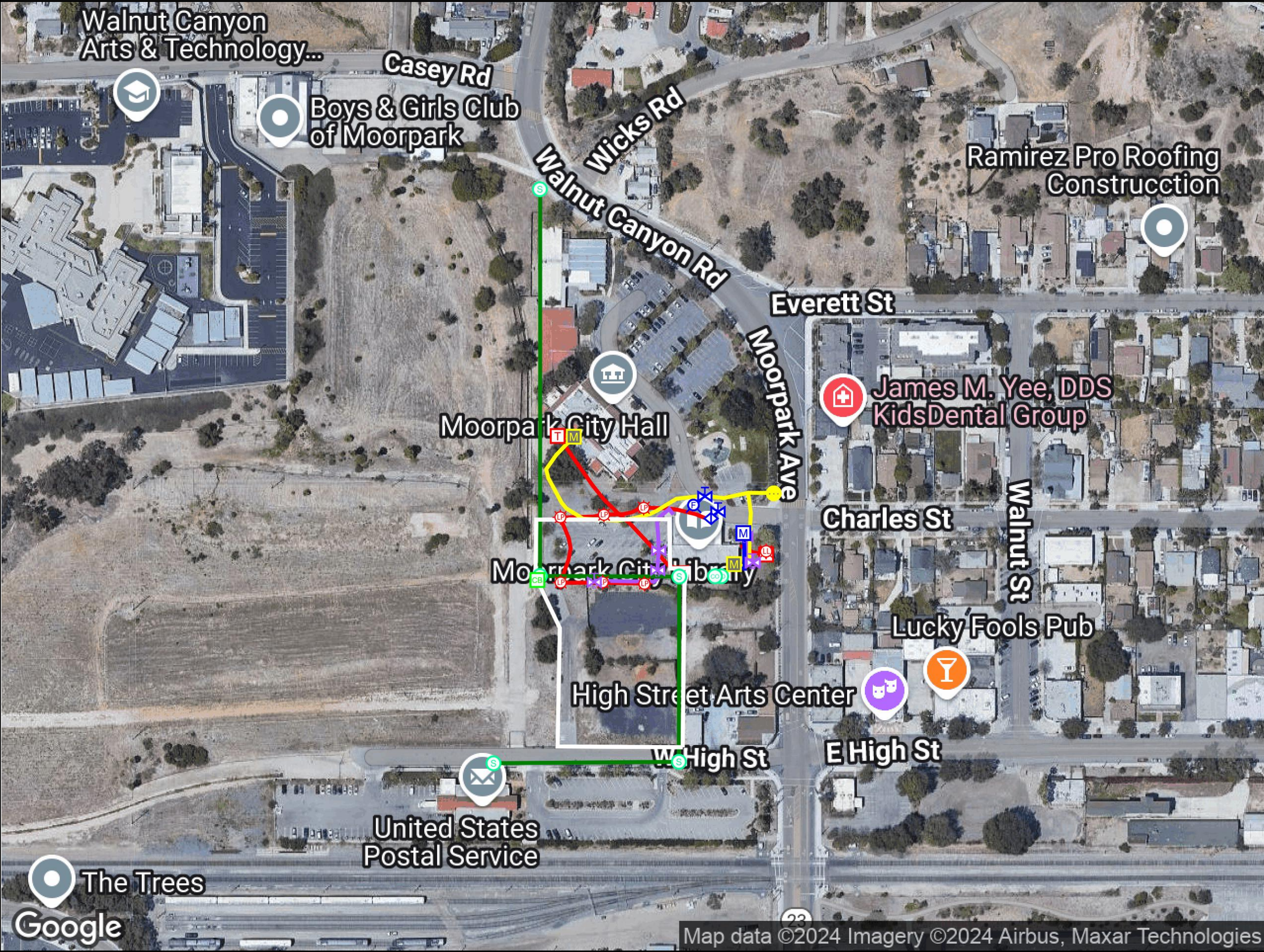
Please let me know if you have any questions, concerns, or additional requests. I look forward to working with you again soon.



Thank you!  
Bryan Easton  
CC: [docs@gprsinc.com](mailto:docs@gprsinc.com)  
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UTILITY LOCATING ■ VIDEO PIPE INSPECTION ■ LEAK DETECTION ■ MAPPING & MODELING ■ CONCRETE IMAGING ■ 3D LASER SCANNING

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PREPARED FOR:  
**BALFOUR BEATTY CONSTRUCTION - SAN DI**

LOCATION:  
**799 MOORPARK AVENUE  
799 MOORPARK AVENUE  
MOORPARK, CA**

PROJECT MANAGER:  
**BRYAN EASTON  
BRYAN.EASTON@GPRSINC.COM**

DATE	2024 OCT 30
DRAWING NO.	1 REV. 0





[illegible]

Completed Activities

Confirm

Critical Activities Pending

Pending

Phase I & II

Grant Timeline

Bidding Process Schedule		2024												2026																					
PROJECT TIMELINE		24-Dec	25-Jan	25-Feb	25-Mar	25-Apr	25-May	24-Jun	25-Jul	25-Aug	25-Sep	25-Oct	25-Nov	25-Dec	26-Jan	26-Feb	26-Mar	26-Apr	26-May	26-Jun	26-Jul	26-Aug	26-Sep	26-Oct	26-Nov	26-Dec	27-Jan	27-Feb	27-Mar	27-Apr	27-May	27-Jun	27-Jul	27-Aug	27-Sep
Activity	Comments																																		
Plan Approvals																																			
Pre-qualification Process Adv.																																			
Bid Package Finalized																																			
Council Approval - May 21, 2025																																			
Bid Period	Bid    Advertising																																		
Advertise Bid	5/27/25 & 6/2/25																																		
Bid Review Period	7/1/2025 - 7/10/25																																		
Council Approval of Bid	City Council Award Approval 7/16/2025																																		
NTP to Contractor																																			
Mobilization (SWPPP)																																			
Construction Phase																																			
Phase I	18 MO																																		
Phase II	6 MO																																		
Phase I - NOC																																			
Phase II - NOC																																			
Close-out																																			
Grant Funded Expend - 4.5M																																			
Grant Funded Expend - 4.5M																																			

**GEOTECHNICAL EXPLORATION  
PROPOSED CITY LIBRARY  
WEST HIGH STREET  
MOORPARK, CALIFORNIA**

Prepared For:

**LPA, Inc.**

5301 California Avenue, Suite 100  
Irvine, CA 92617

Project No. PWAS\_20221005

November 29, 2022  
(Revised December 5, 2022)

**CARL KIM GEOTECHNICAL, INC.**

945 Baileyana Road  
Hillsborough, CA 94010  
949-441-8143  
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November 29, 2022  
(Revised December 5, 2022)

Project No. PWAS\_20221005

LPA, Inc.  
5301 California Avenue, Suite 100  
Irvine, CA 92617  
**Attention:** Mr. Larry Chiu, Managing Director

**Subject: Geotechnical Exploration  
Proposed City Library  
West High Street  
Moorpark, California**

Per your request, Carl Kim Geotechnical, Inc. (Carl Kim Geo) has reviewed available geotechnical data and performed additional geotechnical exploration for the subject project. The purpose of this study was to characterize engineering properties of onsite soils, identify geologic and seismic hazards that may impact the site, and develop foundation and earthwork recommendations for the proposed project.

Based on plans prepared by LPA, Inc. (LPA), Carl Kim Geo understands that the City of Moorpark plans to construct a new 17,500-square-foot, single-story, wood framed library building southwest of the existing library located at 699 Moorpark Avenue in Moorpark, California. The existing library building and improvements will be demolished to accommodate the planned development, which will include associated parking, landscape areas, and other appurtenant features. The redevelopment area is approximately 2 acres. In addition to the current library, current site features include asphalt parking, driveways, and open lots.

The project site slopes gently toward the south with ground surface elevations ranging from approximately Elevation +528 to +513 feet mean sea level. An approximately 7-foot-tall slope ascends to the Moorpark City Hall building pad at the northern boundary of the project. Previous historic site uses appear to include agriculture, athletic and equestrian fields, and a trailer park.

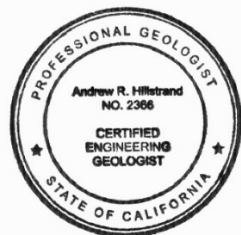
Carl Kim Geo reviewed subsurface exploration data in a report by Oakridge Geoscience, Inc. (dated June 2017), which included information from five cone penetration test soundings and two

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hollow stem auger borings. Carl Kim Geo incorporated pertinent existing data and investigated the site with three hand-excavated borings and site reconnaissance. Minor thicknesses of fill up to approximately 5 feet in depth underlain by alluvium extending to greater than 75 feet below ground surface was encountered during explorations. The historic high groundwater level for the site reported by the California Geological Survey is 15 feet below the ground surface (bgs) while explorations in 2017 encountered groundwater at a depth of 36 and 37.5 feet bgs.

Based on the results of our study, it is our opinion that the proposed development is feasible from a geotechnical standpoint provided that the recommendations presented herein are implemented in the design and construction of the project. No evidence of adverse geological or geotechnical hazards was noted at the site that will preclude the development of the project as currently planned.

We appreciate the opportunity to work with you on this project. If you have any questions, or if we can be of further service, please call us at your convenience.



Respectfully submitted,

Carl Kim Geotechnical, Inc.

Carl C. Kim  
Senior Principal Engineer

Andrew Hillstrand  
Consulting Engineering Geologist

ARH/CCK

Distribution: (4) Addressee

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## 1.0 INTRODUCTION

### 1.1 SITE LOCATION AND PROJECT DESCRIPTION

The project site is located at 33 West High Street in the city of Moorpark California (latitude +34.2857, longitude -118.8829). The site location is shown on Figure 1. The existing improvements and proposed development are shown on Plate 1. The site is bounded by Moorpark City Hall on the north, the existing Moorpark Library and retail shops on the west, High Street on the south, and a storm drain and open fields on the west perimeter. Vehicle access to the site is via paved driveways that connect with Charles Street and West High Street.

Based on review of plans prepared by LPA, Inc. (LPA, 2022) The City of Moorpark intends to construct a new 17,500-square-foot, single-story, wood-framed library building. The existing library building and improvements will be demolished to accommodate the planned development, which will include driveways, parking and landscape areas, and other appurtenant features. The planned development area appears to be approximately 2 acres. One retaining wall on the order of seven feet tall is planned along the northern edge of the project.

The project site slopes gently toward the south with ground surface elevations ranging from approximately Elevation (El.) +528 to +513 feet mean sea level (msl). An approximately 7-foot-tall slope ascends to the Moorpark City Hall building pad at the northern boundary of the project. Based on aerial photo review. previous site uses appear to include agriculture, athletic and equestrian fields, and a trailer park.

Current and proposed site conditions as well as subsurface exploration locations are shown on Plate 1, *Explorations*, and Plate 2, *Cross-Section A-A'*.

## 1.2 PURPOSE AND SCOPE

The purpose of this study was to characterize engineering properties of onsite soils, identify geologic and seismic hazards impacting the site, and develop geotechnical recommendations for foundations and earthwork. The tasks completed as part of this study are described below in more detail.

---

### *TASK 1 - DOCUMENT REVIEW AND PLANNING*

As part of our study, we reviewed geotechnical documents and maps pertinent to the subject site. The documents reviewed are referenced in Appendix A.

---

### *TASK 2 – SUBSURFACE EXPLORATION AND LABORATORY TESTING*

The site was previously explored by Oakridge Geoscience, Inc. (Oakridge). Carl Kim Geo has incorporated pertinent data from Oakridge (2017).

Three (3) hand-auger borings were advanced beyond target depths of five feet below ground surface (bgs) to obtain representative subsurface data for grading and foundation design. Prior explorations by others included five cone penetration test (CPT) soundings and two hollow stem auger borings. Exploration locations are shown on Plate 1. Explorations were advanced to a target depth of 5.5 to 75 feet bgs. Logs of borings are attached in Appendix B, Field Exploration.

Geotechnical laboratory testing was performed as part of the current and previous study by Oakridge. Results are attached in Appendix C, Laboratory Test Results. Geotechnical testing of the site earth materials includes the following properties and characteristics:

- Soil classification (ASTM D2488);
- Moisture and density (ASTM D 2216 and D 2937);
- Particle size distribution (ASTM D 422);
- Plasticity Index (ASTM D 4318);
- Expansion Index (ASTM D 4829);
- Direct Shear (ASTM D3080);
- Consolidation (ASTM D 2435);
- Compaction (ASTM D 1557);
- R-value (CTM 301); and
- Corrosivity (CTM 643, 417, 422).

---

*TASK 3 –GEOLOGIC/SEISMIC HAZARDS EVALUATION*

Using available geologic data, we have evaluated the general geologic conditions beneath the project including the locations of documented active and potentially active faults near the site. This study addresses the potential for primary earthquake hazards (ground shaking and surface rupture) and secondary earthquake hazards (liquefaction, seismic settlement, seiches, and earthquake-induced landsliding) impacting the site. Seismic design parameters are attached in Appendix D.

---

*TASK 4 - ENGINEERING ANALYSIS AND REPORT*

The results of subsurface explorations, laboratory testing, geologic-seismic hazards evaluation, and geotechnical design recommendations are summarized below.

## 2.0 GEOLOGIC CONDITIONS

### 2.1 GEOLOGIC SETTING

The property is located within the Transverse Ranges physiographic province of California. This geomorphic province is characterized by an east-west trending geologic grain, meaning that its primary faults, folds, mountains and valleys are all aligned in an east-west direction. The Transverse Ranges are a tectonically active region, with high rates of uplift, folding, and sedimentation. This deformation is driven by north-south compression associated with the convergence of the North American Plate and the Pacific Plate. This convergence has caused folding and faulting in the rock units and overlying sediments in the region as well as crustal shortening and rotation. The regional geologic conditions of the site and vicinity as mapped by Thomas W. Dibblee Jr. (Dibblee) (1992) are shown on Figure 2, *Geology*.

### 2.2 SITE GEOLOGY

The site is located along the north edge of Little Simi Valley near the mouth of Walnut Canyon. Walnut Canyon is a south-draining canyon that originates in hills north of the site which rise to approximately El. +900 feet msl. Local drainage is south and west toward Arroyo Simi via roadways, storm drains, and certain portions of man-made concrete-lined box culverts (Walnut Canyon Channel) (County of Ventura, 2022). Arroyo Simi drains westward toward Arroyo Las Posas and the Pacific Ocean.

Regional geologic mapping of the project site and vicinity indicates that near-surface native soils beneath the site consist of Quaternary-aged (Holocene and older) unconsolidated alluvial fan/flood plain deposits comprised of varying proportions of silt, sand, and gravel (Dibblee Jr., 1992). The surficial geologic units mapped in the vicinity of the project site are shown on Figure 3, *Geology*.

Based on subsurface explorations, earth materials at the site consist of modest amounts of fill over alluvium (Plate 1 and 2). The materials underlying the Site are described below.

*Artificial Fill (no map symbol):* Approximately 3 to 5 feet of material that appeared to be uncertified fill or processed earth was encountered in HA-1 and HA-3. Encountered materials consisted of well graded and poorly graded sand with varying amounts of gravel and trace man-made debris (glass and ceramic fragments). Fill depths are expected to be variable across the site based on historic land uses involving grading and agriculture.

*Quaternary Alluvium (Map Symbol - Qal):* Alluvium encountered in the borings primarily consisted of granular soils to 40 to 45 feet bgs (poorly graded and well graded sands with varying amounts of gravel and few thin silty sand and clayey sand interbeds). Below 40 to 45 feet the materials generally become more finely interbedded with a higher percentage of materials that classify as fine-grained soils. Sand materials were generally loose to medium dense.

The Saugus Formation was not encountered or recognized in the explorations, but is expected to be present at depth below the alluvium. Locally the Saugus Formation is primarily composed of weakly consolidated/indurated sandstone with common subconglomeratic sandstone, and siltstone interbeds. The Saugus Formation is widely exposed at outcrops in upland areas north and south of the site. Several west-southwest trending anticline and syncline fold axes are mapped by Dibblee (1992) (Figure 2).

### 2.3 GROUNDWATER

According to the California Geological Survey (2000), the historic high groundwater level at the site is anticipated to be about 15 feet bgs or about El. +498 feet msl. Groundwater was not encountered in Carl Kim Geo's hand excavations but was encountered at depths of 36 to 41 feet bgs in prior borings (Appendix B). Measured and design groundwater levels are shown on Plate 2.

Significant fluctuations of groundwater level and potential for localized zones of perched water should be anticipated to occur based on seasonal variations in precipitation and local surface runoff. Onsite and offsite irrigation and other factors can also impact local groundwater levels or likelihood of perched water occurrence in excavations.

## 2.4 INFILTRATION

As of the date of this report Carl Kim Geo understands that a storm water capture and infiltration system is being considered for the project. Because a stormwater infiltration system would increase the potential magnitude of ground deformation from liquefaction and other phenomena discussed in the following sections a storm water infiltration system is not recommended from a geotechnical perspective. In addition, because the published/estimated historic high groundwater below the site is 15 feet bgs (CGS, 2000) and the expected service life of the project, there is potential for an infiltration system to not maintain adequate vertical separation from groundwater over time.



### 3.0 GEOLOGIC HAZARDS

Geologic hazards include surface faulting, ground lurching, seismic shaking, landslides, liquefaction, seismically-induced settlement, lateral spreading, seismically-induced landslides, flooding, expansive soils, corrosive soils, and soil gas. The following sections discuss these hazards and their potential impacts at the site in more detail.

#### 3.1 FAULTING AND SEISMICITY

In general, the primary seismic hazards for sites in the region include strong ground shaking and surface fault rupture. Our discussion of faults potentially impacting the site is prefaced with a discussion of California legislation and state policies concerning the classification and land-use criteria associated with faults. By definition of the California Geological Survey (CGS), an active fault is a fault which has had surface displacement within Holocene time (about the last 11,000 years). Similarly, a fault whose recency of past movement is older than 11,700 years is a pre-Holocene fault, and does not meet State criteria as “active”. Age-undetermined faults are those whose age of most recent movement is not known and is unconstrained. These updated definitions were necessary to eliminate agency and practitioner confusion for fault investigation reports as mandated by the Alquist-Priolo Earthquake Faulting Zones Act of 1972 (AP Act) and recently revised Special Publication 42 (CGS, 2018). The intent of this act is to prevent citing of habitable structures across traces of “active” faults.

##### 3.1.1 *SURFACE RUPTURE HAZARD*

According to the State of California Earthquake Fault Zones map for the Moorpark Quadrangle (CGS, 2000b; Bryant and Hart, 2007), the site is not located within a currently established Alquist-Priolo Earthquake Fault Zone. Therefore, a surface fault rupture hazard evaluation is not mandated for this site and the potential for surface fault rupture at the site is expected to be low.

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, 2008b). The closest active faults to the site with the potential for surface fault rupture is the Simi-Santa Rosa Fault approximately 2.04 miles south of the project site. The Oakridge, San Cayetano, and Santa Susana Faults are reverse/thrust faults located

6.30 to 8.06 miles to the north of the site. The San Andreas fault, which is the largest active fault in California, is approximately 34 miles northeast of the site. Major regional faults with surface expression in proximity to the site are shown on Figure 4a, Regional Faults.

Figure 4b shows the locations of unnamed Quaternary and Late Quaternary faults mapped in the area (Jennings, 2010). One relatively short, unnamed north-northeast trending fault trace is mapped east of the project. At the given regional scale of Jennings (2010), the unnamed fault appears to project into Little Simi Valley 2000 or more feet east of the project. We have performed a review of the referenced aerial photos and performed a cursory review of historic USGS quadrangle maps and do not recognize photo lineaments or geomorphic features indicating that active or potentially active faults intersect the site. Given the preceding, the potential for ground surface fault rupture to occur at the site during the life of the project is very low.

---

### 3.1.2 HISTORICAL SEISMICITY

Although Southern California has been seismically active during the past 200 years, written accounts of only the strongest shocks survive the early part of this period. Early descriptions of earthquakes are rarely specific enough to allow an association with any particular fault zone. It is also not possible to precisely locate epicenters of earthquakes that have occurred prior to the twentieth century.

A search of historical earthquakes was performed using the USGS database (<https://earthquake.usgs.gov/earthquakes/search/>) for the time period between 1769 and the present. Within that time frame, 431 earthquakes of magnitude 4 or greater were found within a 100-kilometer radius of the site (Figure 5, *Historic Seismicity*).

---

### 3.1.3 SEISMICITY

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 (Figure 4a, 5). The intensity of ground shaking at a given location depends

primarily upon the earthquake magnitude, the distance from the source, and the site response characteristics.

Accordingly, design of the project should be performed 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). We understand that the project will be designed under the 2022 edition of the California Building Code (CBC). 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 code-based seismic parameters should be considered for design under the 2022 CBC:

### 2020 LABC Based Ground Motion Parameters

Categorization/Coefficient	Code-Based
Site Latitude	34.2857°
Site Longitude	-118.8829°
Site Class	D
Mapped Spectral Response Acceleration at Short Period (0.2 sec), $S_s$	1.890 g
Mapped Spectral Response Acceleration at Long Period (1 sec), $S_1$	0.697 g
Short Period (0.2 sec) Site Coefficient, $F_a$	1.0
Long Period (1 sec) Site Coefficient, $F_v$	null <sup>1</sup>
Adjusted Spectral Response Acceleration at Short Period (0.2 sec), $S_{MS}$	1.890 g
Adjusted Spectral Response Acceleration at Long Period (1 sec), $S_{M1}$	null <sup>1</sup>
Design Spectral Response Acceleration at Short Period (0.2 sec), $S_{DS}$	1.260 g
Design Spectral Response Acceleration at Long Period (1 sec), $S_{D1}$	null <sup>1</sup>
Site Amplification Factor, $F_{PGA}$	1.1
Site Modified Peak Ground Acceleration, $PGA_M$	0.906 g

<sup>1</sup>See Section 11.4.8 of ASCE 7-16. A site-specific ground motion hazard analysis in accordance with Section 21.2 of ASCE 7-16 is required for this site. Per Supplement 3 to ASCE 7-16, a site-specific ground motion hazard analysis is not required where the value of the parameters  $S_{M1}$  and  $S_{D1}$  in the table are increased by 50%.

The site is located within a seismically active region, as is all of Southern California. Based on the available subsurface information for the site, the site was designated as Site Class D. Details are presented in Appendix D.

## 3.2 SECONDARY SEISMIC HAZARDS

In general, secondary seismic hazards for sites in the region could include soil liquefaction, seismically-induced settlement, lateral spreading, landsliding, seiches and tsunamis. These potential secondary seismic hazards are discussed below.

---

### 3.2.1 LIQUEFACTION

Liquefaction and dynamic settlement of soils can be caused by strong ground motion due to earthquakes. Research and historical data indicate that loose, saturated granular soils are most susceptible to liquefaction. According to CGS (2000a, b), the site is in an area deemed susceptible to liquefaction (Figure 6, Seismic Hazards).

The results of our site-specific liquefaction analysis are included in Appendix E. Liquefaction potential is very high and severe liquefaction-induced damage to structures is anticipated.

---

### 3.2.2 SEISMICALLY-INDUCED SETTLEMENT

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

Up to one foot of seismically-induced settlement is anticipated (Appendix E).

---

### 3.2.3 LATERAL SPREADING OR FLOW FAILURE

The results of our analysis indicate up to 10 feet of lateral spreading due to liquefaction (Appendix E).

---

### 3.2.4 SEISMICALLY-INDUCED LANDSLIDES

According to the State of California Seismic Hazards Zones Map for the Moorpark Quadrangle (CGS, 2000b), the site is not located in an area potentially susceptible to earthquake induced landsliding (Figure 6, *Seismic Hazards*). No significantly tall or steep slopes are onsite or immediately adjacent to the site; therefore, earthquake induced landslide hazard is low.

---

### 3.2.5 SEICHES AND TSUNAMIS

Tsunamis are long wavelength seismic sea waves (long compared to the ocean depth) generated by sudden movements of the ocean bottom during submarine earthquakes, landslides, or volcanic activity. A seiche is an oscillation (wave) of a body of water in an enclosed or semi-enclosed basin or tank that varies in period, depending on the physical dimensions of the structure, from a few minutes to several hours, and in height from several inches to several feet. A seiche is caused chiefly by local changes in atmospheric pressure, aided by winds, tidal currents, and occasionally earthquakes.

The project site is not located near the ocean or a significantly sized body of water. Accordingly, the potential for damage from tsunami or seiche is deemed very low to negligible.

---

### 3.2.6 GROUND LURCHING

Ground lurching is defined as movement of low-density soil materials on a bluff, steep slope, or embankment due to earthquake shaking. Since there are no significant slopes at the site, it is our opinion that the potential for ground lurching as a result of nearby or distant seismic events is low.

---

## 3.3 FLOODING HAZARDS

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map, the project site is partially located within a flood hazard area identified as “Zone X”, which is defined as an area of minimal flood hazard (0.2% Annual Chance of Exceedance) while the remaining portion of the site is outside of a mapped flood hazard zone (FEMA, 2012, 2022) (Figure 7, *Flood Hazard Zones*).

Regionally, stormwater runoff is generally directed to the south and west.

Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures as a result of earthquakes. The site is marginally mapped within a potential inundation zone associated with Bard Reservoir (aka Wood Ranch, Dam # 1027-0) in the unlikely event catastrophic dam failure were to occur (Figure 8, *Dam Inundation*). However, the safety of dams and levees is regulated by the California Department of Water Resources (DWR), Division of

Safety of Dams (DSOD) and United States Army Corps of Engineers (ACOE) and this dam is under continuous monitoring for safety against failure. Therefore, the risk of seismically-induced flooding due to dam failure is considered low.

### 3.4 EXPANSIVE SOILS

Expansive soils contain significant amounts of clay particles that swell considerably when wetted and which shrink when dried. Foundations constructed on these soils are subject to uplifting forces caused by the swelling. Without proper mitigation measures, heaving and cracking of both building foundations and slabs-on-grade could result.

Laboratory testing of selected samples from current and prior investigation indicate that onsite soils have very low expansion potential. Expansion Index test results are attached in Appendix C.

### 3.5 CORROSIVE SOILS

Most of the Site is underlain by sandy soils. Accordingly, subsurface materials at the site are classified as corrosive to severely corrosive to metals, and deleterious to concrete and steel reinforcing in concrete. Corrosivity test results are attached in Appendix C.

A bulk soil sample of the onsite soils recovered from boring HA-1 performed as a part of our subsurface exploration were tested to assess corrosion potential. The chemical analysis test results for the onsite soil from our geotechnical exploration are included in Appendix C of this report.

The test results indicate a soluble sulfate concentration of 6 to 57 parts per million (ppm), chloride content of 2 to 19 ppm, pH value of 7.3 to 7.5, and minimum resistivity value of 1,820 to 16,319 ohm-cm.

The results of the resistivity tests indicate the underlying soil is mildly to severely corrosive to buried ferrous metals per ASTM STP 1013. Based on the measured water-soluble sulfate contents from the soil samples, concrete in contact with the soil is expected to have negligible (S0) exposure to sulfate attack per ACI 318 (ACI, 2014). The samples tested for water-soluble chloride content indicate a low potential for corrosion of steel in concrete due to the chloride content of the soil.

### 3.6 SUBSURFACE GASES

The project site is **not** located within a mapped methane zone a known landfill or underlain highly organic soils. In addition, based on review of State of California Geologic Energy Management Division (CalGEM, formerly DOGGR) records, the project site is not located within an oil field boundary (CalGEM, 2022).

The nearest active oil well (API 0411120670) is located approximately 12,900 feet west of the site in the Moorpark West field. Several dry wells and abandoned wells are located 4,400 feet or greater from the site (CalGEM, 2022). Based on these findings, the potential for methane hazard to impact the site is low.

### 3.7 SUBSIDENCE

Based on review of referenced reports the site is not within an area of known significant subsidence associated with groundwater or petroleum withdrawal, peat oxidation, or hydro-compaction. As shown on *Figure 9 – Subsidence*, data derived from global positioning system (GPS) measurements at station MPWD (located 3900 feet north of the project site) indicate subsidence has not occurred at that location between calendar year 1999 and 2022. Subsidence data was accessed from the California Department of Water (DWR) SGMA Data Viewer (DWR, 2022). The early part of the dataset (1999-2000) oscillates and does not appear to be representative of the overall trend reflected in the 2000 to 2022 data. There is no readily available explanation in the source data for the oscillations.

Because of the preceding, the potential for measurable or otherwise significant regional subsidence to occur at the site as result of groundwater or oil extraction is deemed very low.



#### 4.0 CONCLUSIONS

Based on the results of our study, it is our opinion that the proposed development is feasible from a geotechnical standpoint. In our opinion, the following geotechnical factors should be considered:

- Artificial fill and primarily granular alluvial soils were encountered in site explorations.
- Groundwater was encountered at depths of 36 and 37.5 feet bgs in 2017. The historic high groundwater level reported by the California Geological Survey is approximately 15 feet bgs. The design groundwater level should be assumed at El. +498 feet msl.
- Localized perched water is not anticipated but could occur in localized areas particularly after significant precipitation.
- Our review of the geologic literature (Appendix A) indicate there are no known active faults that intersect the site.
- The main seismic hazards that may affect the site is strong ground shaking and liquefaction.
- Liquefaction may induce up to a foot of settlement and 10 feet of lateral spreading.
- The expansion potential of near-surface onsite soils is expected to be very low.
- Laboratory testing indicated that onsite soils may be susceptible to hydro-collapse upon wetting.
- The onsite soils are deemed severely corrosive to buried ferrous metals and have negligible sulfate exposure to concrete.
- Ground improvement is recommended to mitigate liquefaction and hydro-collapse hazard at the site.
- The proposed building may be supported on spread footings and its floor slab supported on grade after implementation of ground improvement.
- Stormwater infiltration is not recommended given the potential for liquefaction at the site.

## 5.0 RECOMMENDATIONS

The proposed development for the subject site is feasible from a geotechnical standpoint, provided that the preliminary recommendations presented in this report are properly incorporated in design and construction.

Ground improvement is recommended to mitigate liquefaction and hydro-collapse hazard at the site. Viable options for ground improvement include vibro-replacement (stone columns), rammed aggregate piers (Geopiers), drilled displacement columns (DDCs), and various grouting alternatives. Based on our recent experience, stone columns and Geopiers will likely be the most cost-effective option for the site. Field testing will be required to validate design values.

The preliminary limits of the target improvement zone are down to 40 feet bgs and extending horizontally 20 feet beyond the proposed building footprint. Charts showing the preliminary target improvement representing a factor of safety of 1.2 against liquefaction based on CPT tip resistance are attached to the end of Appendix E.

The proposed library building may be supported on conventional spread footings or mat foundations after implementation of ground improvement. Since ground improvement is planned to support the proposed structures, site grading within the improved area can be limited to overexcavation of 2 feet below the planned finish grade to allow placement of a minimum of 2 feet of engineered fill to develop a suitable bearing subgrade for building slab support, pavements, and flatwork. There may be existing underground utilities that may be impacted by the planned development. Information on these utilities should be provided to Carl Kim Geo for evaluation.

The recommendations presented below are based upon the exhibited geotechnical engineering properties of the soils and their anticipated response both during and after construction. The recommendations are also based upon proper field observation and testing during construction. The project geotechnical engineer should be notified of suspected variances in field conditions to determine the effect upon the recommendations subsequently presented. These recommendations are considered minimal and may be superseded by more restrictive requirements of the civil and structural engineers, the City of Moorpark, and other governing agencies.

Carl Kim Geo should review the grading and foundation plans and project specifications as they become available to verify that the recommendations presented in this report have been incorporated into the plans for this project.

## 5.1 EARTHWORK AND GRADING

All site 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 professional. The *Earthwork and Grading Guide Specifications* included in Appendix F may be used for guidance in developing the project specifications. If conflict arises, the recommendations in Appendix F shall be superseded by the project specifications, recommendations contained in this report and/or the City of Moorpark requirements, whichever is more stringent.

To provide improved support for floor slabs, paving, sidewalks, and other concrete slabs-on-grade, the upper portion of existing fill soils or disturbed natural soils should be excavated and replaced as properly compacted fill. However, since ground improvement is planned to support the proposed structures, site grading within the improved area can be limited to overexcavation of 2 feet below the planned finish grade to allow placement of a minimum of 2 feet of engineered fill to develop a suitable bearing subgrade for building slab support, pavements, and flatwork. Any required additional fill should be properly compacted.

Good drainage of surface water, preferably away from the proposed structures, should be provided by providing adequate slopes to all graded and paved surfaces. Where good surface drainage is not possible, subdrains should be provided within planter areas to prevent accumulation of water within the upper soils. Proper drainage will be important to minimize infiltration of water into adjacent subgrade soils. Such drainage will also be important for proper plant growth.

Cut-off walls achieved by deepening curb sections or grade beams around planters or other comparable barriers are also recommended to minimize lateral flow of irrigation water beneath the adjacent subgrade soils. The cut-off walls should extend down to a depth of 18 inches bgs or 6 inches below the bottom of any adjacent aggregate base layers, whichever is deeper.

---

#### 5.1.1 SITE PREPARATION

All existing structures, pavements and hardscape should be completely demolished and removed from within the proposed improvement footprints. Any underground obstructions encountered should be removed. Efforts should be made to locate any existing utility lines. Those lines should be removed or rerouted where interfering with proposed construction. Trees to be removed should be grubbed out.

Pulverized demolition concrete free of rebar and other materials and demolished asphalt pavement can be pulverized to particles no-larger-than ( $\leq$ ) 3 inches and mixed with site soils for use in compacted fill. Blended pulverized concrete and asphalt should be mixed with at least 25% soils by weight. Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

---

#### 5.1.2 OVEREXCAVATION

Since ground improvement is planned to support the proposed library building, site grading can be limited to overexcavation of 2 feet below the planned finish grade to allow placement of a minimum of 2 feet of engineered fill to develop a suitable bearing subgrade for building slab support. The depth of overexcavation in non-building areas planned for new pavement construction can be also be limited to a depth of 2 feet below the planned subgrade elevation to allow placement of a minimum of 2 feet of engineered fill to develop a suitable bearing subgrade for pavement support. Preparation limited to 2 feet overexcavation below subgrade may result in the need for increased pavement maintenance and periodic repairs where existing fill is left in place below the recommended overexcavation depth of 2 feet. All resulting overexcavation bottom surfaces should be observed by Carl Kim Geo prior to placement of any backfill or new construction.

---

#### 5.1.3 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 clay soils should be brought to about 4 percent above optimum moisture content to a depth of 6 inches. The moisture

content of the subgrade should be checked and approved by Carl Kim Geo prior to placing the required fill.

After moistening as required, the exposed soils should scarified to a minimum depth of 6 inches and rolled with heavy compaction equipment. At least the upper 6 inches of the exposed soils should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM Test Method D1557.

When grading is interrupted by heavy rains, fill operations should not be resumed until the moisture content and the dry density of the placed fill are satisfactory.

---

#### 5.1.4 FILL MATERIALS

On-site soil that is free of construction debris, organics, cobbles, boulders, rubble, or rock larger than 4 inches in largest dimension is suitable to be used as fill for support of structures. Any imported fill soil should be approved by the geotechnical engineer prior to import or use onsite.

---

#### 5.1.5 FILL PLACEMENT AND COMPACTION

Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned to within 2 percent of optimum moisture content and compacted to a minimum of 95 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.

### 5.2 FOUNDATIONS

Conventional spread footings and mat foundations established in engineered fill over improved ground may be used to support the proposed building. Footings should be embedded a minimum 18 inches below the lowest adjacent grade. An allowable soil bearing pressure of 4,000 pounds per square foot (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 12,000 psf, which does not incorporate

a factor of safety. A resistance factor of 0.45 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  $\frac{1}{2}$  inch. Differential settlement can be taken as half the total settlement over a horizontal distance of 30 feet.

For static loading, 25 pounds per cubic inch (pci) may be assumed as the modulus of subgrade reaction ( $k$ ). For seismic loading, a  $k$  value of 100 pci may be assumed.

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 3,000 psf and a frictional coefficient of 0.35 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.

### 5.3 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 5.1. 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.

#### 5.4 CEMENT TYPE AND CORROSION PROTECTION

Based on the results of laboratory testing, concrete structures in contact with the onsite soil are expected to have negligible to moderate exposure to water-soluble sulfates in the soil. Common Type II cement may be used for concrete construction onsite and the concrete should be designed in accordance with 2020 LABC requirements. However, concrete exposed to recycled water should be designed using Type V cement.

Based on our laboratory testing, the onsite soil is considered mildly to severely corrosive to ferrous metals. Ferrous pipe should be avoided by using high-density polyethylene (HDPE) or other non-ferrous pipe when possible. Ferrous pipe, if used, should be protected by polyethylene bags, tap or coatings, di-electric fittings or other means to separate the pipe from onsite soils.

#### 5.5 LATERAL EARTH PRESSURES

Recommended lateral earth pressures are provided as equivalent fluid unit weights, in psf/ft. or pcf., for retaining walls in drained conditions using onsite sandy soils as backfill.

Condition	Equivalent Fluid Unit Weight (psf/ft)
	Level Backfill, Static Condition
Active	40
At-Rest	60
Passive	300
Coefficient of Friction	0.35

The above passive resistance values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

Cantilever walls that are designed for a deflection at the top of the wall of at least  $0.001H$ , where  $H$  is equal to the wall height, may be designed using the active earth pressure condition. Rigid walls that are not free to rotate, walls that are braced at the top, and walls that provide indirect support for foundations should be designed using the at-rest condition. A seismic increment of 25 pcf may be added to the active earth pressure above to evaluate seismic loading on walls.

The above lateral earth pressures are based on fully drained conditions. Infiltrating surface water may build-up behind proposed basement walls. Therefore, walls below grade should be designed to resist hydrostatic pressures (additional fluid pressure of 45 pounds per cubic foot) or be provided with positive drainage behind the wall.

Lateral load resistance will be provided by the sliding resistance at the base of the foundation and the passive pressure developed along the front of the foundation. A frictional resistance coefficient of 0.35 may be used at the concrete and soil interface.

In addition to the above lateral forces due to retained earth, the appropriate loads due to surcharges should be considered in the design of retaining structures.

## 5.6 PAVEMENT DESIGN

### 5.6.1 ASPHALT CONCRETE PAVING

The paving thicknesses presented in the table below are based on our review of available subsurface data. We assumed an average R-value of 50 based on laboratory test results indicating R-values of 70 and 77 for the near surface soils. The required paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of the on-site or comparable soils compacted to at least 95% of the maximum dry density obtainable by the ASTM Designation D1557 method of compaction as recommended, the minimum recommended paving thicknesses are presented in the following table.

Area	Traffic Index	Asphalt Concrete (inches)	Base Course (inches)
Car Parking	4	3	4
Light Truck	5	3	4
Heavy Truck	6	3	5
Main Drives	7	4	5



The asphalt paving sections were determined using the Caltrans design method. We can determine the recommended paving and base course thicknesses for other Traffic Indices if required. Careful inspection is recommended to verify that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed.

---

#### 5.6.2 PORTLAND CEMENT CONCRETE PAVING

We have assumed that the subgrade below paving will have an R-value of at least 50, which will need to be verified during grading. Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the following table. We have assumed that the Portland Cement Concrete will have a compressive strength of at least 4,000 pounds per square inch.

Area	Traffic Index	PCC (inches)	Base Course (inches)
Car Parking	4	5	4
Light Truck	5	5	4
Heavy Truck	6	6	4
Main Drives	7	6½	4

The paving 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.

---

#### 5.6.3 SPECIFICATIONS

The base course should conform to requirements of Section 26 of State of California Department of Transportation Standard Specifications (Caltrans), latest edition, or meet the specifications for untreated base as defined in Section 200-2 of the latest edition of the Standard Specifications for Public Works Construction (Green Book). The existing asphalt paving may be used for base course if it is crushed and processed to meet the requirements of crushed miscellaneous base per the Green Book. The base course should be compacted to at least 95 percent relative compaction. The asphalt concrete should conform to the specifications outlined in Section 203-6 of the Green

Book, and asphalt concrete construction methods should meet the requirements of Section 302-5 of the Green Book.

## 5.7 TEMPORARY EXCAVATIONS

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 4 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.

Temporary excavations should be treated in accordance with the State of California version of OSHA excavation regulations, Construction Safety Orders for Excavation General Requirements, Article 6, Section 1541, effective October 1, 1995. The sides of excavations should be shored or sloped in accordance with OSHA regulations. OSHA allows the sides of unbraced excavations, up to a maximum height of 20 feet, to be cut to a  $\frac{3}{4}$ H:1V (horizontal:vertical) slope for Type A soils, 1H:1V for Type B soils, and  $1\frac{1}{2}$ H:1V for Type C soils. Onsite sandy soils are to be considered Type C soils which are subject to collapse in shallow unbraced excavations (i.e. approximately 3-feet in vertical height).

During construction, the soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor shall be responsible for providing the “competent person” required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and the geotechnical engineer should be maintained to facilitate construction while providing safe excavations.

## 5.8 TRENCH BACKFILL

Utility trenches should be backfilled with compacted fill in accordance with Sections 306-1 and 306-6 of the Standard Specifications for Public Works Construction, (“Greenbook”), 2018 Edition. Utility trenches can be backfilled with onsite sandy material free of rubble, debris, organic and oversized

material up to ( $\leq$ ) 3-inches in largest dimension. Prior to backfilling trenches, pipes should be bedded in and covered with either:

- (1) **Sand:** A uniform, sand material that has a Sand Equivalent (SE) greater-than-or-equal-to ( $\geq$ ) 30, passing the No. 4 U.S. Standard Sieve (or as specified by the pipe manufacturer), water densified in place, or
- (2) **CLSM:** Controlled Low Strength Material (CLSM) conforming to Section 201-6 of the *Standard Specifications for Public Works Construction*, ("Greenbook"), 2018 Edition.

Pipe bedding should extend at least 4 inches below the pipeline invert and at least 12 inches over the top of the pipeline. Native and clean fill soils can be used as backfill over the pipe bedding zone, and should be placed in thin lifts, moisture conditioned above optimum, and mechanically compacted to at least 95 percent relative compaction, relative to the ASTM D 1557 laboratory maximum density.

## 5.9 DRAINAGE AND LANDSCAPING

Building walls below grade should be waterproofed or at least damp proofed, depending upon the degree of moisture protection desired. 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.

## 5.10 ADDITIONAL GEOTECHNICAL SERVICES

The geotechnical recommendations presented in this report are based on subsurface conditions as interpreted from limited subsurface explorations and limited laboratory testing. Our conclusions and recommendations presented in this report should be reviewed and verified by Carl Kim Geo during site construction and revised accordingly if exposed geotechnical conditions vary from our preliminary findings and interpretations. The recommendations presented in this report are only valid if Carl Kim Geo verifies the site conditions during construction. Geotechnical observation and testing should be provided during the following activities:

- Grading and excavation of the site;
- Overexcavation and compaction;

- Compaction of all fill materials;
- Excavation and installation of foundations;
- After excavation of all slabs and footings and prior to placement of steel or concrete to confirm the slabs and footings are founded in firm, compacted fill;
- Utility trench backfilling and compaction; and
- When any conditions are encountered that varies significantly from the conditions described in this report.

Carl Kim Geo should review the final grading and foundation plans and specifications, when available, to comment on the geotechnical aspects. Our recommendations should be revised, as necessary, based on future plans and incorporated into the final design plans and specifications.

## 7.0 LIMITATIONS

The geotechnical engineering analyses presented in this geotechnical exploration report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No other warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report.

Please also note that our evaluation was limited to assessment of the geologic and seismic aspects of the site, and did not include evaluation of structural issues, environmental concerns or the presence of hazardous materials. Our conclusions, recommendations and opinions are based on an analysis of the observed site conditions, engineering characteristics of the observed site soils and our review of the referenced geologic literature and reports. If geologic conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request.

## FIGURES



File: X:\CarlKim\California\MoorparkCA-F1\_Site Location.mxd Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet




0 150 300 600 Feet

1 inch = 300 feet

November 2022



#### Legend

 Site Boundary

Imagery Source: California F&W. 2020.

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CLIENT: LPA, Inc.

PROJECT: Moorpark City Library  
West High Street, Moorpark, California

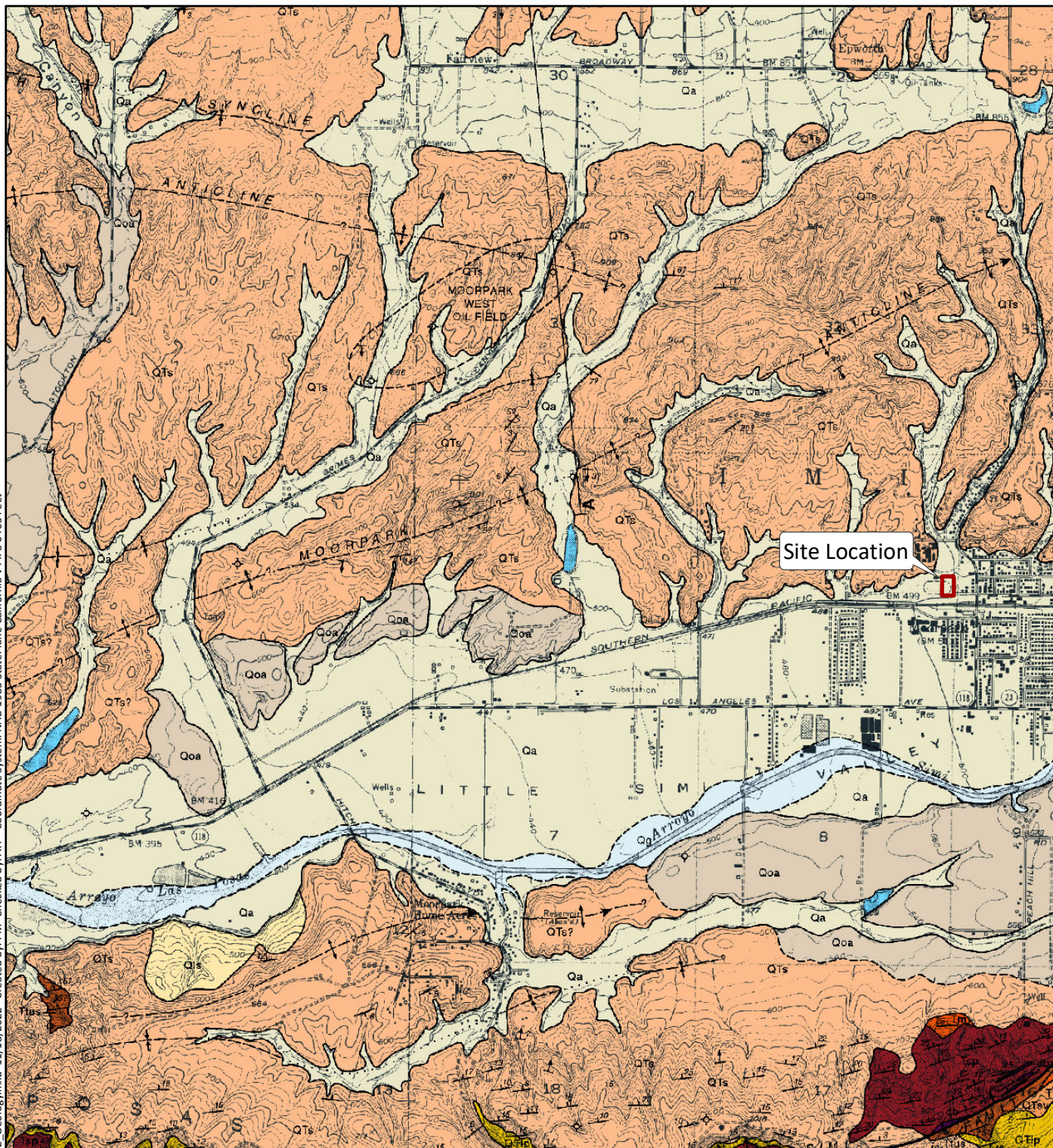
PROJECT NUMBER: PWAS\_20221005

**Site Location**

**FIGURE 1**



File: X:\CarlKim\California\Moorpark\CA\MCLP\_Moorpark\F2\_Geology.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



0 1,500 3,000 6,000  
Feet

1 inch = 3,000 feet

November 2022

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PROJECT NUMBER: PWAS\_20221005

#### Explanation

- QTs Saugus Formation, Quaternary to Tertiary age
- Qa Quaternary Alluvium

#### Base Map

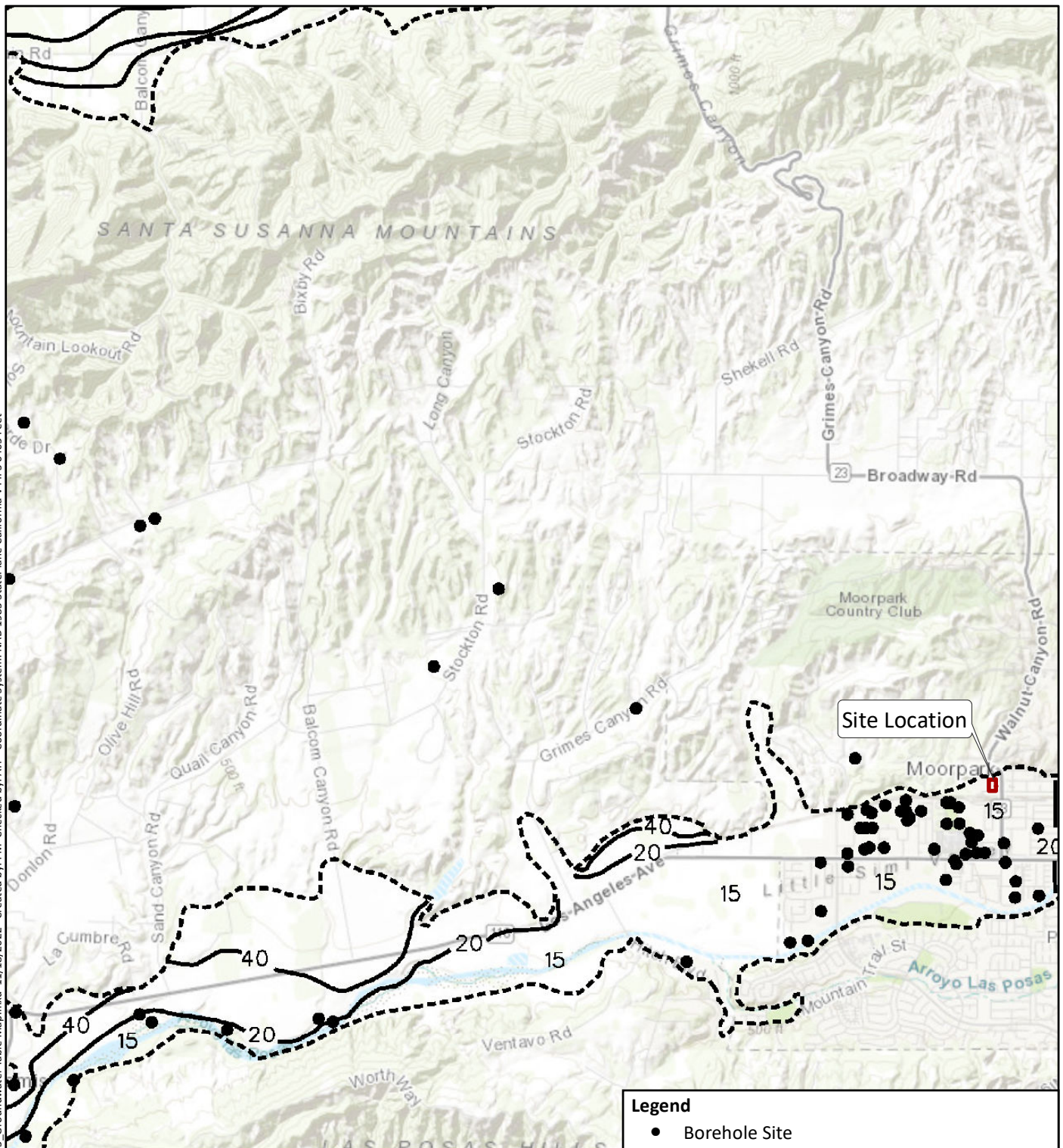
Geologic Map of the Moorpark Quadrangle,  
California, Thomas W. Dibble, Jr, 1992.

**Geology**

**FIGURE 2**



File: X:\CarlKim\California\Moorpark\CA\MCLP\_MoorparkCA-F3\_GroundwaterTable Map.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



0 2,500 5,000 10,000 Feet

1 inch = 5,000 feet

November 2022



#### Legend

- Borehole Site
- ~10~ Estimated depth to historic high groundwater level in feet
- Site Boundary

Base Map: Seismic Hazard Zone Report for the Tustin 7.5 Quadrangle, Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations

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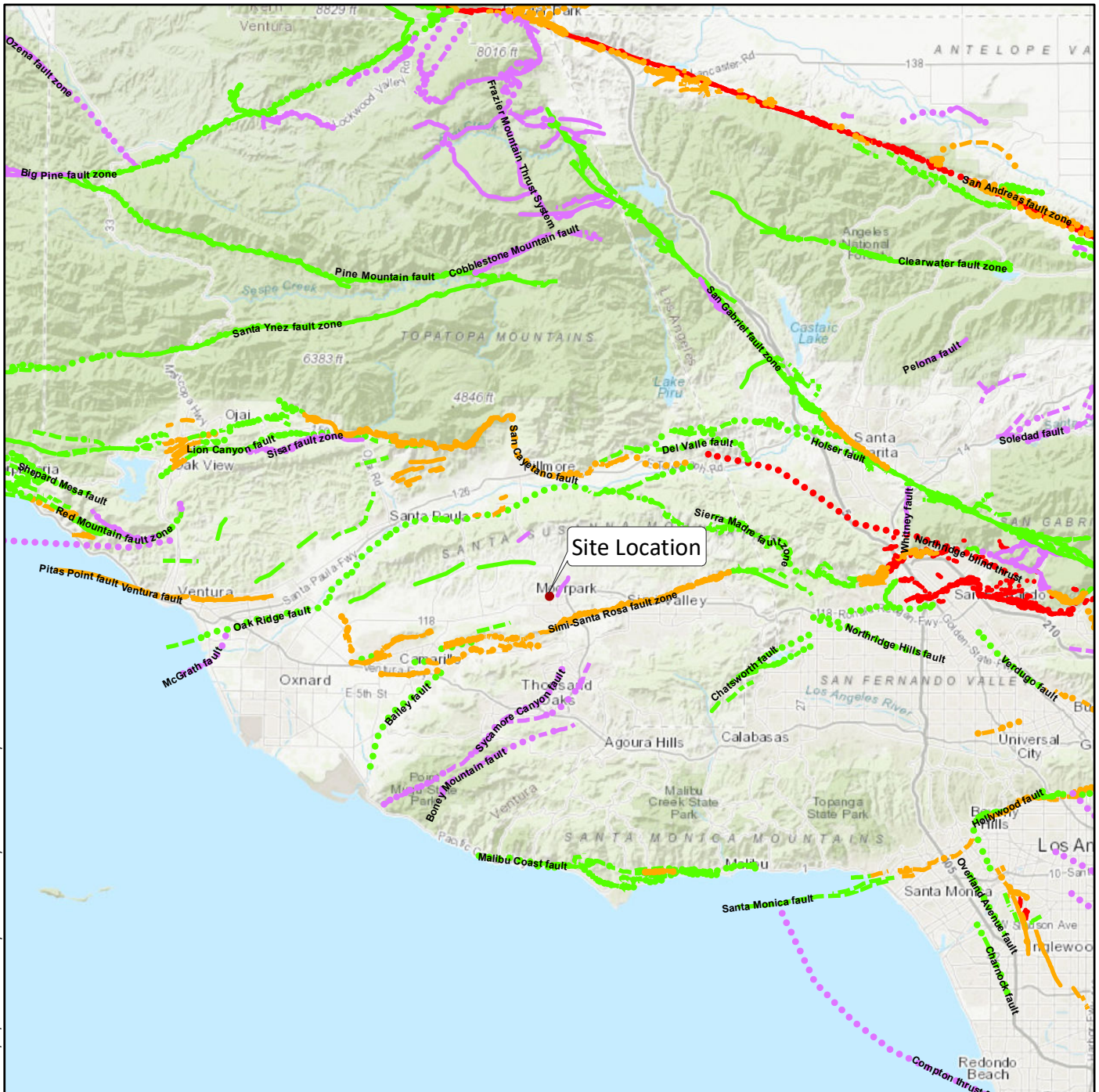
PROJECT NUMBER: PWAS\_20221005

### Historic High Groundwater Level

**FIGURE 3**



File: X:\CarlKim\California\MoorparkCA-F4a\_Regional Faults.mxd 11/18/2022. Created by: PM. Checked by: AH. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



0 25,000 50,000 100,000 Feet

1 inch = 50,000 feet

November 2022



### Legend

- Historic
- Holocene
- Late Quaternary
- Quaternary

Base Map: U.S. Geological Survey and California Geological Survey, Quaternary fault and fold database for the United States, accessed November 11, 2022, at: <https://www.usgs.gov/natural-hazards/earthquake-hazards/faults>.

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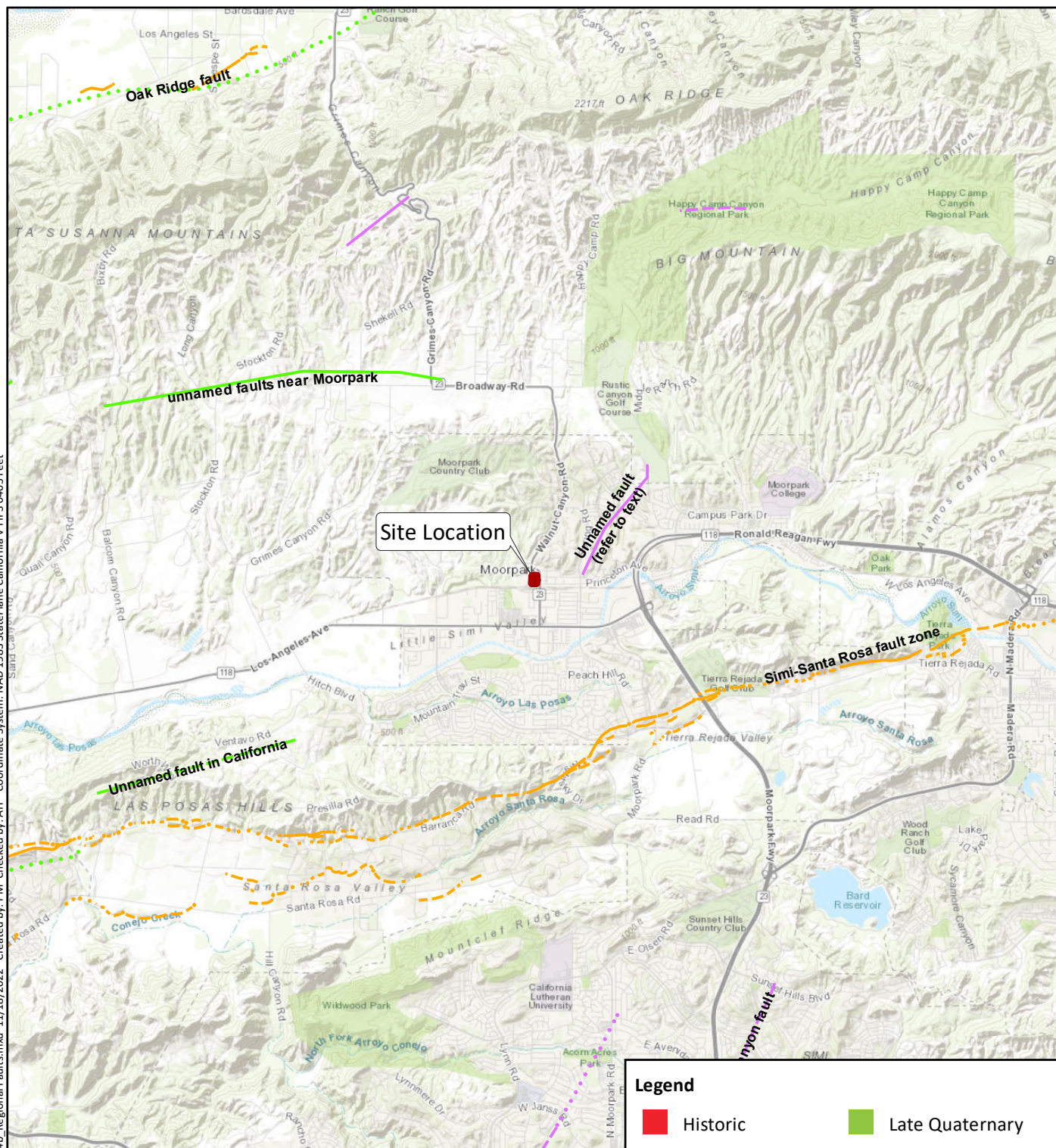
PROJECT NUMBER: PWAS\_20221005

### Regional Faults

**FIGURE 4a**



File: X:\CarlKim\California\Moorpark\CA\MCLP\_MoorparkCA-F4b\_Regional Faults.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



0 4,000 8,000 16,000 Feet

1 inch = 8,000 feet

November 2022



### Legend

- |          |                 |
|----------|-----------------|
| Historic | Late Quaternary |
| Holocene | Quaternary      |

Base Map: U.S. Geological Survey and California Geological Survey, Quaternary fault and fold database for the United States, accessed November 11, 2022, at: <https://www.usgs.gov/natural-hazards/earthquake-hazards/faults>.

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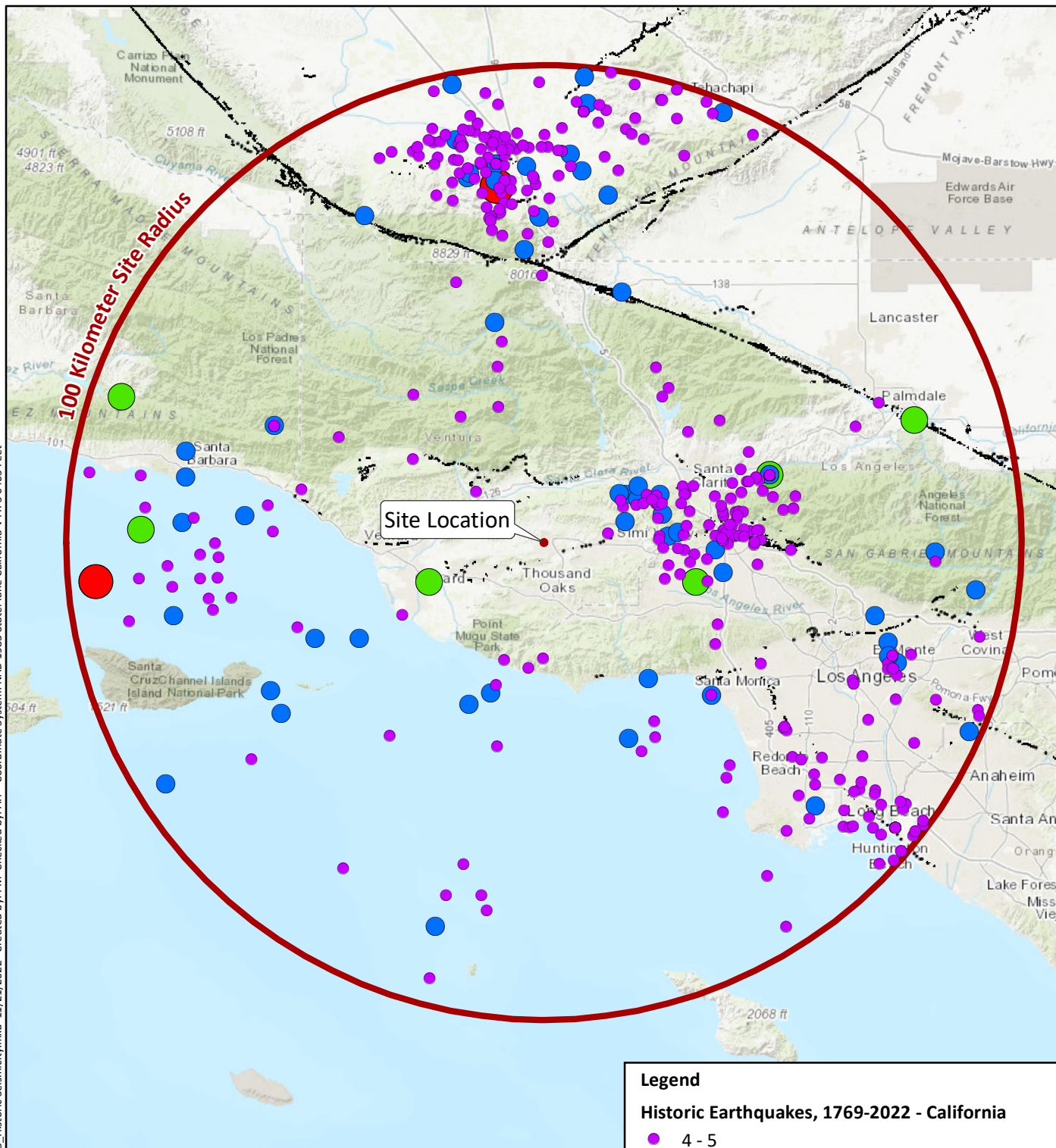
PROJECT NUMBER: PWAS\_20221005

### Regional Faults

**FIGURE 4b**



File: X:\CarlKim\California\Moorpark\CA-FS\_Historic Seismicity.mxd 11/21/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



0 50,000 100,000 200,000 Feet

1 inch = 100,000 feet

November 2022



### Legend

#### Historic Earthquakes, 1769-2022 - California

- 4 - 5
- 5 - 6
- 6 - 7
- 7+

Base Map: Earthquake Hazards Program. USGS.

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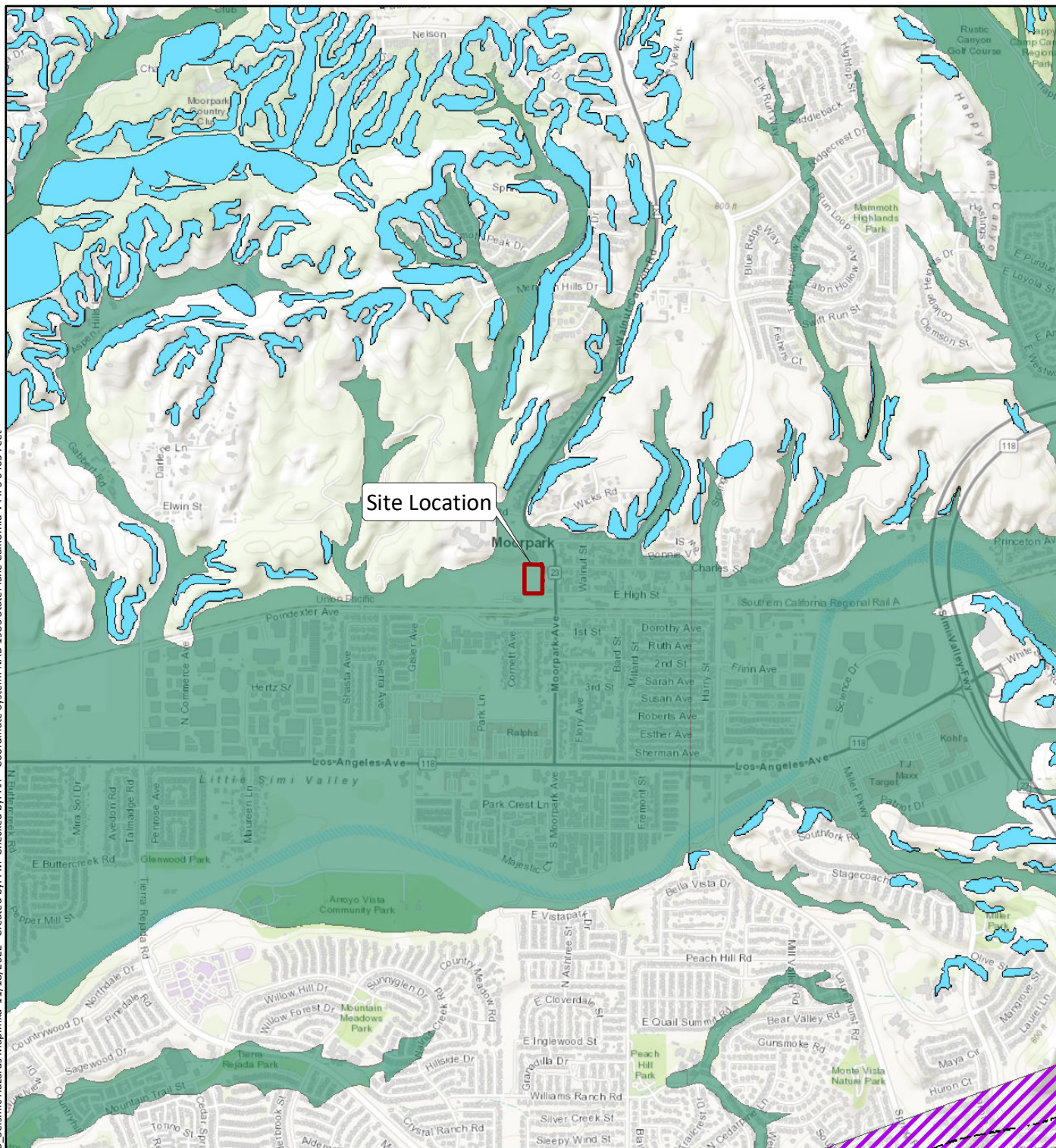
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PROJECT NUMBER: PWAS\_20221005

**Historic Seismicity**

**FIGURE 5**








0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

November 2022



#### Legend

-  Alquist-Priolo Earthquake Fault Zone
  -  Liquefaction Zones
  -  Landslide Zones
- Base Map: CGS Seismic Hazards  
Program: Liquefaction and  
Landslide Zones, California  
Department of Conservation

**CKGEO**

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CLIENT: LPA, Inc.

PROJECT: Moorpark City Library  
West High Street, Moorpark, California

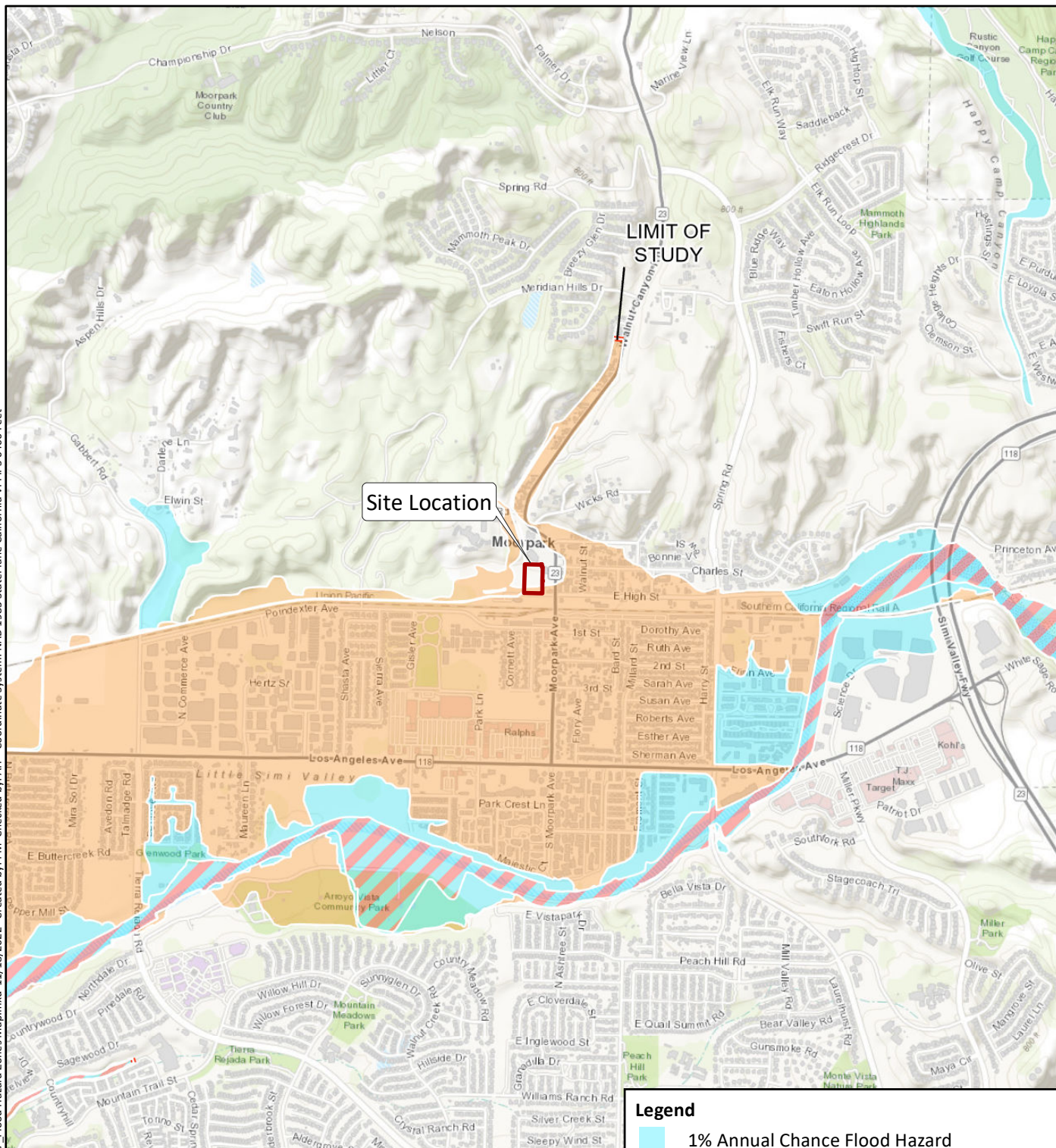
PROJECT NUMBER: PWAS\_20221005

#### Seismic Hazards

**FIGURE 6**



File: X:\CarlKim\California\Moorpark\CA\MCLP\_MoorparkCA-F7\_Flood Hazard Zones Map.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet



0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

November 2022

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West High Street, Moorpark, California

PROJECT NUMBER: PWAS\_20221005

#### Legend

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Regulatory Floodway
- Site Boundary

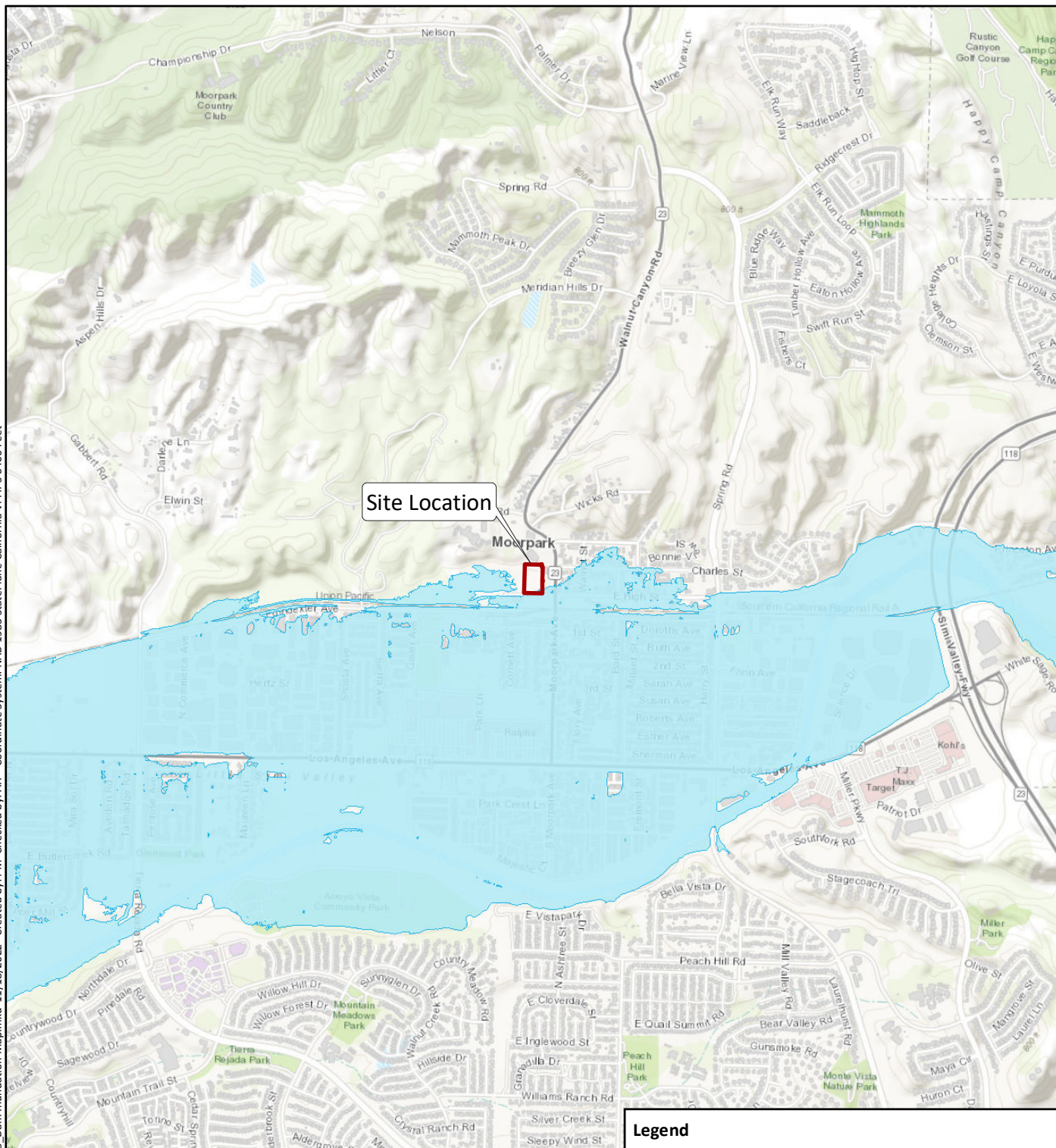
Flood Layer Source: FEMA's National Flood Hazard Layer

**Flood Hazard Zones**

**FIGURE 7**



File: X:\Carli\California\Moorpark\CA\MCLP\_MoorparkCA-F8\_Dam Inundation Map.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet



0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

**November 2022**

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West High Street, Moorpark, California

PROJECT NUMBER: PWAS\_20221005

#### Legend

 Site Boundary

 Dam Breach Inundation Scenario  
(Wood Ranch, No. 1027-0)

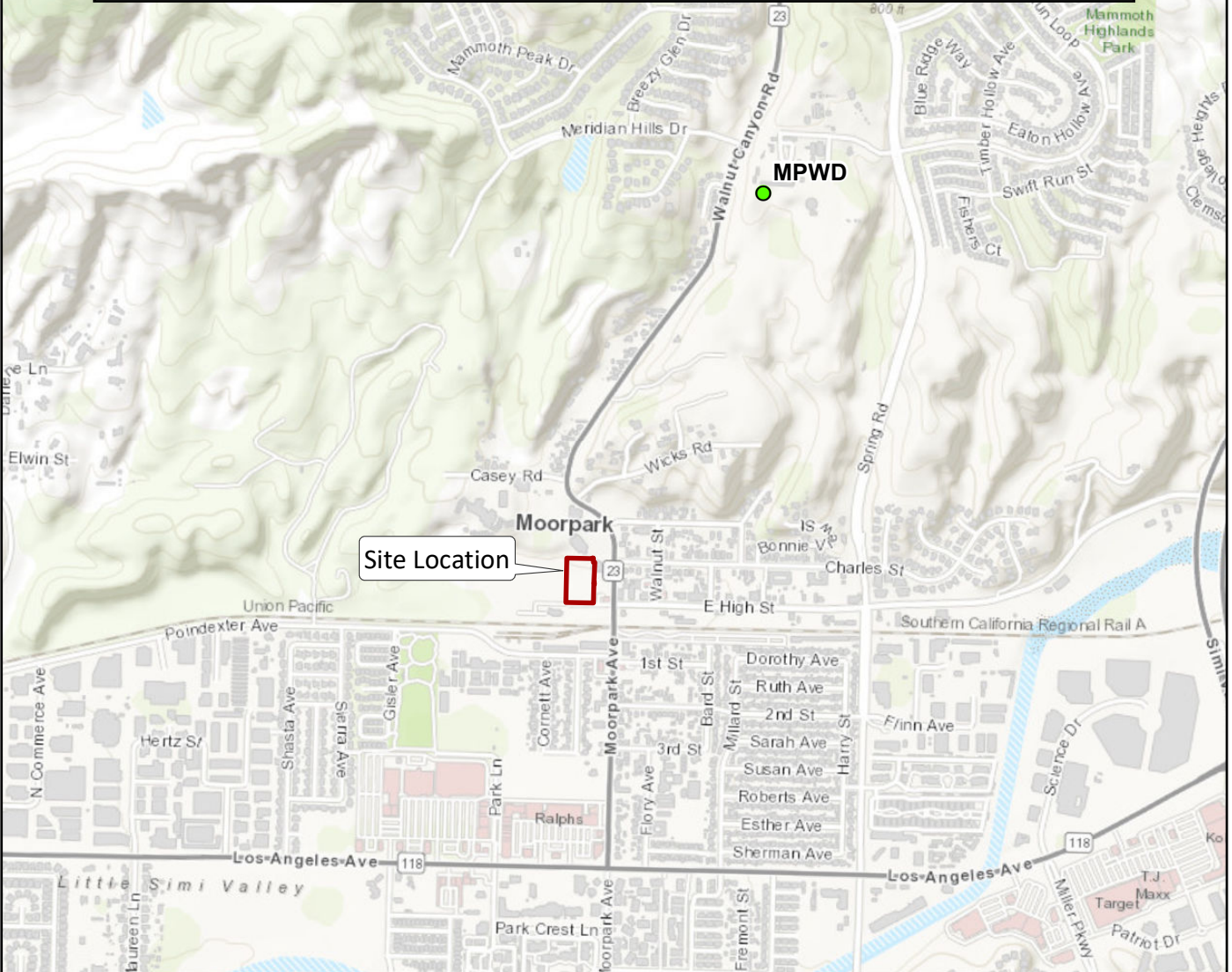
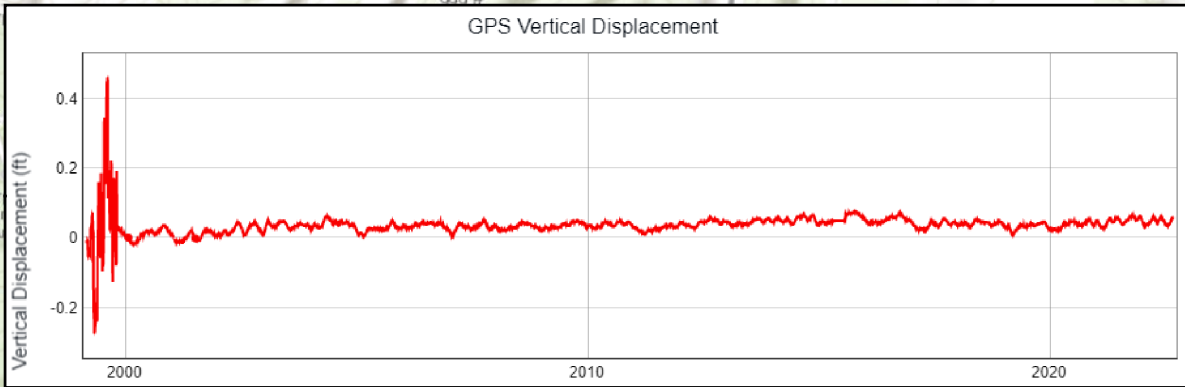
Dam Inundation Source: California Department of Water Resources, Division of Safety of Dams (DSOD). California Dam Breach Inundation Maps.

**Dam Inundation**

**FIGURE 8**



File: X:\Carl\Kim\California\Moorpark\CA\MCLP\_Moorpark\CA-F9\_Subside.mxd 11/18/2022 Created by: PM Checked by: AH Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet



0 750 1,500 3,000 Feet

1 inch = 1,500 feet

November 2022

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PROJECT: Moorpark City Library  
West High Street, Moorpark, California

PROJECT NUMBER: PWAS\_20221005



**Legend**

 Site Boundary

 Land Subsidence GPS Station

Subsidence Source: California Department of Water Resources.  
SGMA. <https://sgma.water.ca.gov/webgis>.

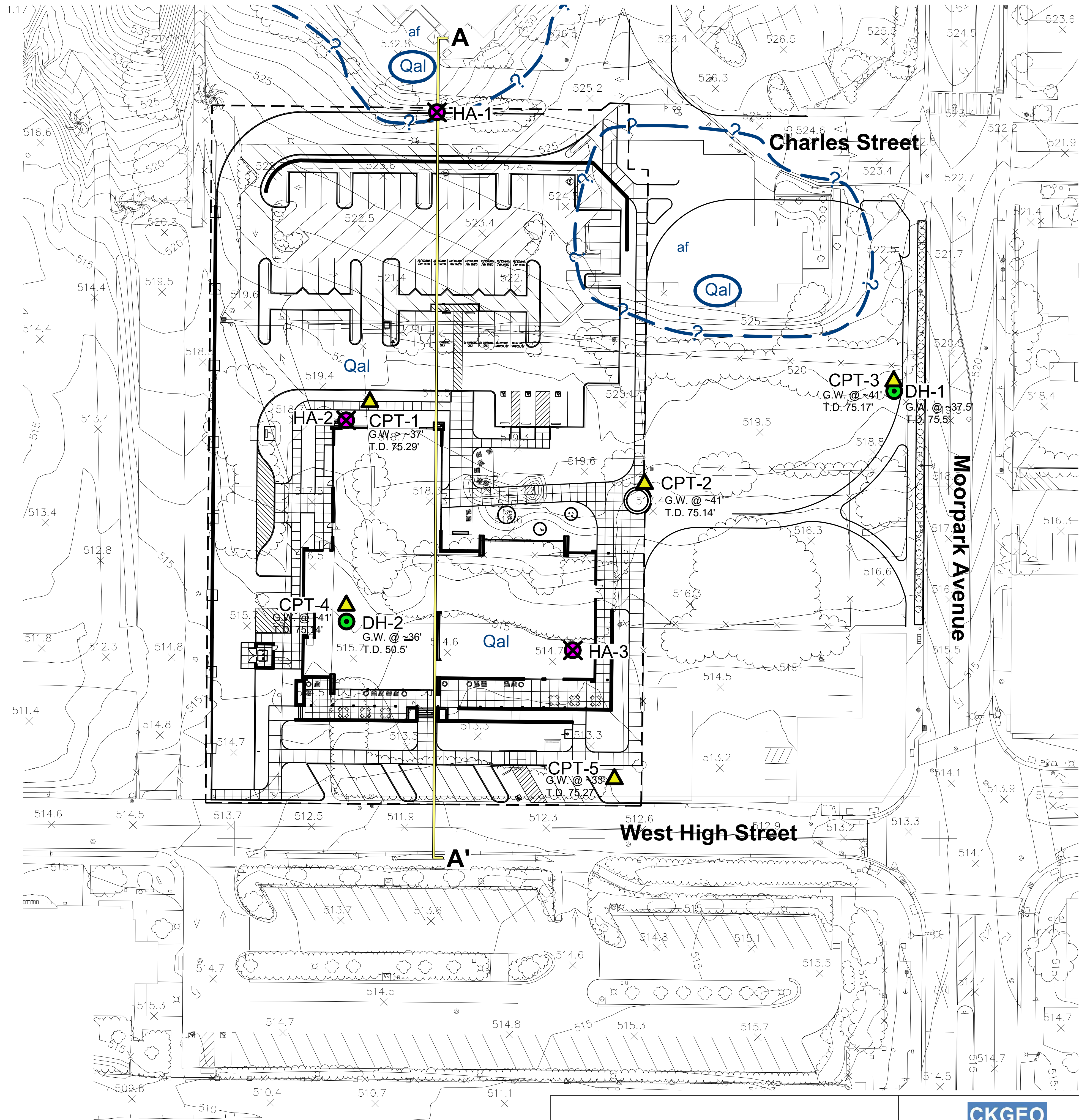
**Subsidence**

**FIGURE 9**



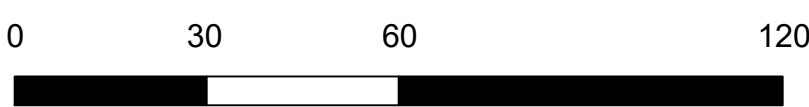
## PLATES





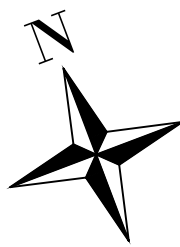
EXPLANATION	
	HAND AUGER BORING (CARL KIM GEOTECHNICAL)
	CONE PENETRATION TEST (CPT) (OAKRIDGE, 2017)
	HOLLOW-STEM AUGER BORING (OAKRIDGE, 2017)
	GROUNDWATER
	TOTAL DEPTH
	FILL**
	QUATERNARY ALLUVIUM (CIRCLED WHERE BURIED)
	GEOLOGIC CONTACT (DASHED WHERE APPROXIMATE, QUIERRIED WHERE UNCERTAIN)
	PROJECT LIMIT
	CROSS SECTION TRANSECT

\*\*NOTE: MAPPED LIMITS OF UNDIFFERENTIATED UNCERTIFIED/CERTIFIED FILL ARE APPROXIMATE. BORING DATA SUGGESTS THE SITE MAY HAVE VARIABLE AMOUNTS OF FILL ACROSS THE AREAS EXPLORED. REFER TO TEXT AND APPENDICES FOR MORE INFORMATION.



November 2022

Aerial Imagery Source: ©2022. Microsoft Corporation.



CKGEO

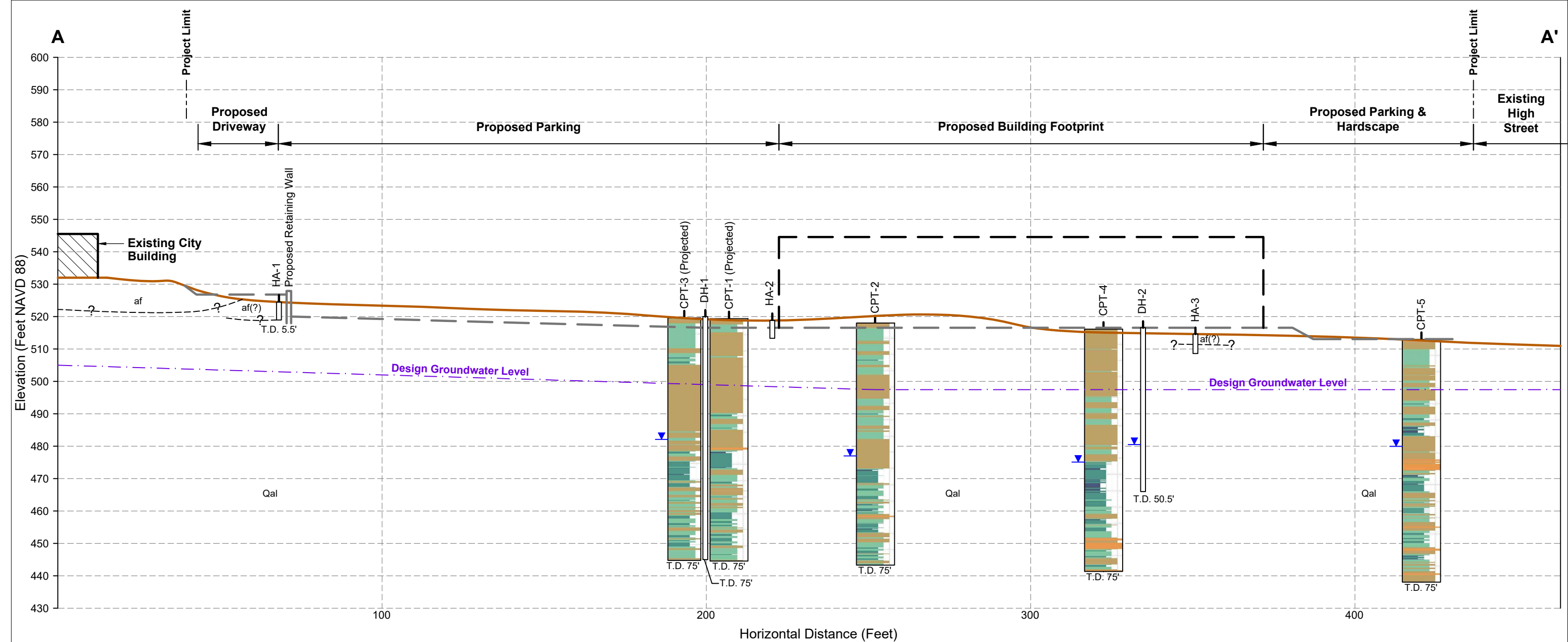
Carl Kim Geotechnical, Inc.  
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CLIENT:	LPA, Inc.
PROJECT:	Moorpark City Library West High Street, Moorpark, California
PROJECT NUMBER:	PWAS_20221005









Explorations

PLATE 1





EXPLANATION

-  BORING
-  PROPOSED GRADE
-  EXISTING GRADE
-  UNDOCUMENTED FILL
-  QUATERNARY ALLUVIUM
-  TOTAL DEPTH
-  GROUNDWATER (APRIL/MAY 2017)
-  NORTH AMERICAN VERTICAL DATUM OF 1988

NOTE: CPT-3 AND DH-1 PROJECTED APPROXIMATELY 260 FEET WEST ONTO SECTION WHILE OTHER DEPICTED EXPLORATIONS ARE PROJECTED LESS THAN 100 FEET TO SECTION.

<div><div>VERTICAL SCALE (IN FEET)</div><div>30</div><div>November 2022</div><div>30</div><div>HORIZONTAL SCALE (IN FEET)</div></div>	<div>CKGEO</div>	CLIENT: <div>LPA, Inc.</div>	CROSS SECTION A-A'
	<div>Carl Kim Geotechnical, Inc.</div> <div>945 Baileyana Road</div> <div>Hillsborough, CA 94010</div> <div>949-441-8143</div> <div>CARLKIMGEO@GMAIL.COM</div>	PROJECT: <div>Moorpark City Library</div> <div>West High Street, Moorpark, California</div>	
			PROJECT NUMBER: <div>PWAS_20221005</div>

## **APPENDIX A**

### REFERENCES

## APPENDIX A

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## AERIAL PHOTOS REVIEWED<sup>1</sup>

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[1945] Fairchild, Flight C-9800, Frame 5-397 and 8-710, Scale 1:14,400, flight begin date 1945-10-24.

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<sup>1</sup>University of California Santa Barbara (UCSB) digital collection, [http://mil.library.ucsb.edu/ap\\_indexes/FrameFinder/](http://mil.library.ucsb.edu/ap_indexes/FrameFinder/)



## **APPENDIX B**

### FIELD EXPLORATIONS

## **APPENDIX B**

### **FIELD EXPLORATION**

---

#### **General**

Subsurface explorations during the current geotechnical investigation consisted of hand-auger excavation and geologic mapping. Current explorations are designated HA-1 through HA-3.

Earth materials encountered were visually classified by Carl Kim Geotechnical, Inc. in accordance with the Unified Soil Classification System (USCS) (ASTM D 2488). Stratigraphic boundaries are indicated on the logs. Some soil/material types transition gradually.

The logs of the borings as well as logs by others are attached in this appendix.

#### **EXPLORATION LOGS**

HA-1 and HA-3 (Carl Kim Geotechnical)

DH-1 and DH-2 (prior exploration by Oakridge Geoscience, Inc., 2017)

CPT-1 through CPT-1 (prior exploration by Oakridge Geoscience, Inc., 2017)

<b>Project:</b> Moorpark City Library <b>Project Location:</b> ~33 West High Street, Moorpark, California <b>Project Number:</b> PWAS 20221005							<b>Boring HA-1</b>  <b>Sheet</b> 1 of 1		
<b>Date(s) Drilled</b> 11/2/2022				<b>Logged By</b> A. Hillstrand		<b>Checked By</b> A. Hillstrand			
<b>Drilling Method</b> Hand Auger and Post-Hole Digger				<b>Boring Diameter</b> 4"-8" (nominal)		<b>~Surface Elevation</b> +525			
<b>Drilling Contractor</b> NA				<b>Sampling Method</b> Grab/bulk		<b>Hammer Data</b> NA			
<b>Drill Rig Type</b> NA				<b>Comments</b> (LAT 34.286418 LONG -118.883023)					

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	PID (ppmv)	USCS Class.	% gravel	% sand	% fines	MATERIAL DESCRIPTION	Fine soils			Other Tests and Remarks
										DRY STRENGTH (none to v. high)	D LATANCY (none, slow, quick)	PLASTICITY (none, low, med., high)	
0					SW	5	90	5	0-0.2': WOODY MULCH 0.2 - 1.7' UNCERTIFIED FILL (af): Well graded sand, very loose, dark grayish brown (10YR 4/2), dry, sand is fine to coarse grained, subangular to angular, noncohesive, massive; trace asphalt and organic content				
1													
2					SW-SM	10	80	10	@1.7' fines content and density increase 1.7-3.0' FILL (af): Well graded sand with silt, loose to medium, similar to above				
3													
3					SP	25	70	5	FILL/HISTORIC ALLUVIUM (af or Qal): Poorly grades sand with gravel, loose, grayish brown (10YR 5/2), sand is mostly fine and coarse grained, subangular to angular, gravel is mostly fine with some scattered clasts to 1.5", subangular to subrounded, crude bedding and coarsening of gravels with depth  @ 3-3.5' ring sample; no recovery (NR)				
4													
5									@ 5-5.5' increased coarse gravel and trace glass fragments to 1.5" in greatest dimension				
									TOTAL DEPTH SAMPLED 5.5 FEET NO GROUNDWATER BORING BACKFILLED WITH SOIL AND TAMPED (NA = not applicable tr = trace)				

<div style="display: flex; justify-content: space-around; align-items: center;"> <div> <div style="width: 10px; height: 10px; background-color: black; margin-bottom: 2px;"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>Cal. Mod.</span> <span>No Recovery</span> <span>SPT</span> </div> </div> <div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-bottom: 2px;"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>No Recovery</span> <span>Sh</span> <span>No</span> </div> </div> <div> <div style="width: 10px; height: 10px; border: 1px solid black; margin-bottom: 2px;"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>Bulk</span> </div> </div> </div>	Sample	CKGEO
---	--------	-------

<b>Project:</b> Moorpark City Library <b>Project Location:</b> ~33 West High Street, Moorpark, California <b>Project Number:</b> PWAS 20221005										<b>Boring HA-2</b>  <b>Sheet</b> 1 of 1			
<b>Date(s) Drilled</b> 11/2/2022					<b>Logged By</b> A. Hillstrand			<b>Checked By</b> A. Hillstrand					
<b>Drilling Method</b> Hand Auger and Post-Hole Digger					<b>Boring Diameter</b> 4"-8" (nominal)			<b>~Surface Elevation</b> +519					
<b>Drilling Contractor</b> NA					<b>Sampling Method</b> Grab/bulk			<b>Hammer Data</b> NA					
<b>Drill Rig Type</b> NA					<b>Comments</b> (LAT 34.286047 LONG -118.883270)								
Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	PID (ppmv)	USCS Class.	% gravel	% sand	% fines	MATERIAL DESCRIPTION	Fine soils			Other Tests and Remarks
										DRY STRENGTH (none to v. high)	D LATANCY (none, slow, quick)	PLASTICITY (none, low, med., high)	
0					GP	60	30	10	0-0.3': WOODY MULCH				
					SP	tr	95	tr	0.3-0.5': FILL: Road Base/ Gravel				
									0.5-5.5' FILL/ ALLUVIUM (Qal/ af): Poorly graded sand, loose, grayish brown (10YR 5/2), dry, (dry to moist below 1.5'), fine to medium grained sand, trace to few angular to subrounded coarse gravel trace fines; massive				
1													
2													
3													
4													
5													
									TOTAL DEPTH SAMPLED 5.5 FEET NO GROUNDWATER BORING BACKFILLED WITH SOIL AND TAMPED (NA = not applicable tr = trace)				

Cal. Mod.

No Recovery

SPT

No Recovery

Sh

No

Bulk

Sample

CKGEO

<b>Project:</b> Moorpark City Library <b>Project Location:</b> ~33 West High Street, Moorpark, California <b>Project Number:</b> PWAS 20221005										<b>Boring HA-3</b>  <b>Sheet</b> 1 of 1			
<b>Date(s) Drilled</b> 11/2/2022					<b>Logged By</b> A. Hillstrand			<b>Checked By</b> A. Hillstrand					
<b>Drilling Method</b> Hand Auger and Post-Hole Digger					<b>Boring Diameter</b> 4"-8" (nominal)			<b>~Surface Elevation</b> +515					
<b>Drilling Contractor</b> NA					<b>Sampling Method</b> Grab/bulk			<b>Hammer Data</b> NA					
<b>Drill Rig Type</b> NA					<b>Comments</b> (LAT 34.285641 LONG -118.882943)								

Depth (ft)	Sample Type	Blows / 6 in. (N)	Sample ID	PID (ppmv)	USCS Class.	% gravel	% sand	% fines	MATERIAL DESCRIPTION	Fine soils			Other Tests and Remarks
										DRY STRENGTH (none to v. high)	D LATANCY (none, slow, quick)	PLASTICITY (none, low, med., high)	
0	X		B-1		SW	30	65	5	0-0.9': FILL (af) - imported material Well graded sand with gravel, dense to medium dense, sand is fine to coarse grained and angular, abundant angular fine gravel, high mafic mineral content, black (10YR 2/1), dry				
1				SP	5	95	tr	0.9-5.6': FILL (af) (?) and ALLUVIUM (Qal): Poorly graded sand, loose, grayish brown (10YR 5/2), slightly moist mostly fine to medium grained, angular to subangular sand, massive uniform					
2			B-2										
3													
4													
5													
TOTAL DEPTH SAMPLED 5.6 FEET NO GROUNDWATER BORING BACKFILLED WITH SOIL AND TAMPED (NA = not applicable tr = trace)													

Cal. Mod.

No Recovery

SPT

No Recovery

Sh

No

Bulk

CKGEO

LOG OF DRILL HOLE DH-1																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)		
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
					<b>ARTIFICIAL FILL (af)</b>											
			1		Silty Fine SAND (SM): pale brown, dry, with gravel											
					<b>ALLUVIUM (Qal)?</b>											
2					SAND (SP): very loose, moderate yellowish brown, damp											
			2	(5)						98	4					
4					Fine SAND with Clay (SP-SC): very loose, dark brown, damp											
			3	2												
6																
8					- loose, at 7'					105	8					
			4	(7)												
10					Silty Fine to Medium SAND (SM): very loose, moderate yellowish brown, damp, with scattered coarse grains, and with few fine rounded gravel to 1/2"-dia.						6		15			
			5	4												
12					Clayey SILT with Sand (ML): medium stiff, moderate to dark brown, damp					111	15					
			6	(10)	SAND with Clay (SP-SC): loose, moderate brown, damp, with scattered coarse sand											
14					SAND with Silt (SP-SM): loose, moderate yellowish brown, damp, with fine rounded gravel to 1/2"-dia.						5		7			
			7	7												
16																
18																
					- with medium dense, dark brown sand with clay, from 19' to 21.25'											
			8	(23)						108	2					
CONTRACTOR:					S/G Dr ng, Inc.					TOTAL DEPTH (ft):					75.5'	
METHOD:					8" d a. Ho ow stem auger					WATER DEPTH (ft):					37.5'	
BACKFILL:					Cutt ngs w th Port and					LOGGED BY:					L Prent ce	
DATE:					May1 2, 2017					CHECKED BY:					C Prent ce	
NO E he log and data presented herein are a simpli cation o actual subsur ace conditions encountered at the time o exploration at the speci c location explored Subsur ace conditions may di er at other locations and at this location with the passage o time																

LOG OF DRILL HOLE DH-1 (Continued)										
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map	DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)					
					MATERIAL DESCRIPTION					
22										
24		X	9	9	Silty Fine to Medium SAND (SM): loose, pale yellowish brown, damp, with few scattered coarse sand and 3/4" gravel fragments		5		23	
26										
28										
30			10	(37)	Fine to Medium SAND with Silt (SP-SM): medium dense, pale yellowish brown, damp	102	3			
32										
34		X	11	20	- with 1.5"-thick moderate yellowish brown clayey fine sand, at 34.5'		8		7	
36										
38										
		X	12	2	Clayey SAND (SC)/Sandy CLAY (CL): very loose, moderate brown, wet; shut down after sampling for 5 min.; measured water at 37.5'		21		50	

CONTRACTOR: S/G Dr ng, Inc.

METHOD: 8" d a. Ho ow stem auger

BACKFILL: Cutt ngs w th Port and

DATE: May1 2, 2017

NO E he log and data presented herein are a simpli cation o actual subsur ace conditions encountered at the time o exploration at the speci ic location explored Subsur ace conditions may di er at other locations and at this location with the passage o time

TOTAL DEPTH (ft): 75.5'

WATER DEPTH (ft): 37.5'

LOGGED BY: L Prent ce

CHECKED BY: C Prent ce



LOG OF DRILL HOLE DH-1 (Continued)										
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map		DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200
					SURFACE EL. (ft): (ref. MSL datum)					
					MATERIAL DESCRIPTION					
42					- loose, at 44' - flowing/caving sand below 44'; adding water to augers prior to sampling below 49'		112	19		p 0.5
44			13	(12)						
46										
48					Clayey SAND (SC): medium dense, moderate brown, wet - sand slough in sampler, blow counts may be affected		112	17		25
50			14	(36)						
52										
54					Fine to Medium SAND (SP): loose to medium dense, pale yellowish brown, wet, with moderate brown clayey fine sand in sampler shoe; sand slough in sampler		14		3	
56			15	21						
58			15b							
					Clayey SAND (SC): medium dense, moderate brown, wet		16		25	
			16	14						
CONTRACTOR: S/G Dr ng, Inc.					TOTAL DEPTH (ft): 75.5'					
METHOD: 8" d a. Ho ow stem auger					WATER DEPTH (ft): 37.5'					
BACKFILL: Cuttings w th Port and					LOGGED BY: L Prent ce					
DATE: May1 2, 2017					CHECKED BY: C Prent ce					

LOG OF DRILL HOLE DH-1 (Continued)										
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map	DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)					
62										
64										
66			17	7						
68					Fine Sandy CLAY (CL): medium stiff, moderate to dark brown, wet slightly micaceous, silty		24		63	
70			18	22						
72					Fine to Medium Clayey SAND (SC): medium dense, moderate brown, wet, with few coarse sand					
74			19	20						
76					Silty Fine SAND (SM): medium dense, moderate brown, wet		25		24	
78										

CONTRACTOR:	S/G Dr ng, Inc.	<small>NO E he log and data presented herein are a simpli ication o actual subsur ace conditions encountered at the time o exploration at the speci ic location explored. Subsur ace conditions may di er at other locations and at this location with the passage o time</small>	TOTAL DEPTH (ft):	75.5'
METHOD:	8" d a. Ho ow stem auger		WATER DEPTH (ft):	37.5'
BACKFILL:	Cutt ngs w th Port and		LOGGED BY:	L Prent ce
DATE:	May1 2, 2017		CHECKED BY:	C Prent ce

LOG OF DRILL HOLE DH-2										
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map	DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)					
					MATERIAL DESCRIPTION					
			1		<b>ARTIFICIAL FILL (af)</b> Silty Fine SAND (SM): with gravel, medium dense, grayish brown, dry to damp					
2			2	15	<b>ARTIFICIAL FILL (af)/ALLUVIUM (Qal)?</b> Clayey SAND (SC): medium dense, dark brown, dry to damp					
4			3	(15)	<b>ALLUVIUM (Qal)</b> Silty Fine SAND (SM): loose, moderate brown, dry to damp	97	4			
6										
8			4	6	- loose, damp, fine to medium grained, at 7'		4		22	
10			5	(14)	- fine to medium grained, darker, at 9' - with dark brown fine silty lenses, at 9.75'	101	4			
12			6	7	Fine to Medium SAND with Silt (SP-SM): loose, moderate brown, damp		3		12	
14			7	(15)	Silty Fine SAND (SM): loose, moderate brown, damp - with medium stiff, moderate brown silt with slight mottling and few fine root hairs and minor fine caliche, at 14 to 15' - fine to medium grained with few scattered coarse sand, at 15'	106	5		32	
16										
18										
			8	13	medium dense, pale yellowish brown, at 19'					
CONTRACTOR: S/G Dr ng, Inc.						TOTAL DEPTH (ft): 50.5'				
METHOD: 8" d a. Ho ow stem auger						WATER DEPTH (ft): 36'				
BACKFILL: Cutt ngs w th Port and						LOGGED BY: L Prent ce				
DATE: May1 2, 2017						CHECKED BY: C Prent ce				
NO E he log and data presented herein are a simpli ication o actual subsur ace conditions encountered at the time o exploration at the speci ic location explored Subsur ace conditions may di er at other locations and at this location with the passage o time										

LOG OF DRILL HOLE DH-2 (Continued)										
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map	DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)					
					MATERIAL DESCRIPTION					
22										
24			9	(15)	- loose, at 24'	90	6		29	
26					- with finely laminated sandy silt and silt in sampler shoe, at 25.5'					
28										
30			10	21	Fine to Medium SAND (SP): medium dense, pale yellowish brown, damp, with few coarse sand and few angular gravel fragments to about 1/2"-dia.					
32										
34			11	(24)	Clayey Fine to Medium SAND (SC): medium dense, dark brown, moist to wet	97	18		27	
36					Medium to Coarse SAND (SP): medium dense, moderate brown, moist to wet					
38										
			12	WOH	Sandy Silty CLAY (CL-ML): very soft, dark brown, wet		21		52	p 0.1

CONTRACTOR: S/G Dr ng, Inc.

METHOD: 8" d a. Ho ow stem auger

BACKFILL: Cutt ngs w th Port and

DATE: May1 2, 2017

NO E he log and data presented herein are a simpli ication o actual subsur ace conditions encountered at the time o exploration at the speci ic location explored Subsur ace conditions may di er at other locations and at this location with the passage o time

TOTAL DEPTH (ft): 50.5'

WATER DEPTH (ft): 36'

LOGGED BY: L Prent ce

CHECKED BY: C Prent ce

LOG OF DRILL HOLE DH-2 (Continued)											
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Locat on Map		DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)						
					MATERIAL DESCRIPTION						
42			13	(27)	- shut down after sampling for 5 min.; measured water at 36'		118	16		47	p 2.3 p 2.7
					- very stiff, at 41'						
					Medium to Coarse Clayey SAND (SC): medium dense, dark brown, wet						
44			NR	(10)	- no recovery after sampling at 44'						
46											
48											
50			14	(19)	- no recovery after sampling at 49'; recovered sample with SPT.			17		27	
52											
54											
56											
58											
CONTRACTOR:					S/G Dr ng, Inc.			TOTAL DEPTH (ft):		50.5'	
METHOD:					8" d a. Ho ow stem auger			WATER DEPTH (ft):		36'	
BACKFILL:					Cutt ngs w th Port and			LOGGED BY:		L Prent ce	
DATE:					May1 2, 2017			CHECKED BY:		C Prent ce	
NO E he log and data presented herein are a simpli ication o actual subsur ace conditions encountered at the time o exploration at the speci ic location explored Subsur ace conditions may di er at other locations and at this location with the passage o time											

NO E he log and data presented herein are a simpli ication o actual  
subsur ace conditions encountered at the time o exploration at the speci ic  
location explored Subsur ace conditions may di er at other locations and  
at this location with the passage o time

Summary of Sampling Details

Blowcount				
Symbol	Number	Push, or grab	Sampler Type	
	1	Bulk	Bulk Sample	
	2	23	Standard Penetration Test (SPT) Sampler (1-3/8" D/2" OD) driven	
	3	(23)	Modified California Liner Sampler driven ( 2-3/8" D/3" OD)	
	4	Push	Thin-walled sampler pushed ( 2-7/8" D/3" OD)	
				<u>Blowcount Information</u>
				<b>Blowcount Description</b>
				63 63 blows for 1' penetration after initial 6" seating
				89/11 89 blows for 11" penetration after initial 6" seating
				33/6 33 blows for 6" drive after initial 6" seating
				Ref >50 blows for initial 6" seating
				(23) Blowcounts for modified California sampler

Material Symbols and Classifications

	LEAN CLAY (CL)		Sandy S LT (ML)		CLAYSTONE		PAV NG AND BASE MATER ALS
	FAT CLAY (CH)		Silty SAND (SM)		S LTSTONE		CONCRETE
	Sandy CLAY (CL)		SAND with Silt (SP-SM) SAND with Clay (SP-SC)		SANDSTONE		
	S LT (ML) Sandy S LT (ML)		SAND (SP)		VOLCAN C		
	ELAST C S LT (MH)		Clayey SAND (SC)		DOLOM T C		
			GRAVEL (GP)		S L CEOUS		

Other Symbols

- Groundwater
- Strata break

SUMMARY OF TERMS AND SYMBOLS  
USED ON LOGS



# **SUMMARY OF CONE PENETRATION TEST DATA**

Project:

**Moorpark Library Project  
W. High Street & Moorpark Avenue  
Moorpark, CA  
April 27, 2017**

Prepared for:

**Mr. Craig Prentice  
Oakridge Geoscience, Inc.  
1098 Deseo Avenue  
Camarillo, CA 93010  
Office (805) 400-0867**

Prepared by:



**KEHOE TESTING & ENGINEERING**

5415 Industrial Drive  
Huntington Beach, CA 92649-1518  
Office (714) 901-7270 / Fax (714) 901-7289  
[www.kehoetesting.com](http://www.kehoetesting.com)



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- 1. INTRODUCTION**
- 2. SUMMARY OF FIELD WORK**
- 3. FIELD EQUIPMENT & PROCEDURES**
- 4. CONE PENETRATION TEST DATA & INTERPRETATION**

## **APPENDIX**

- CPT Plots
- CPT Classification/Soil Behavior Chart
- Interpretation Output (CPeT-IT)
- Pore Pressure Dissipation Graphs
- CPeT-IT Calculation Formulas

# SUMMARY OF CONE PENETRATION TEST DATA

## 1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the Moorpark Library Project located at W. High Street & Moorpark Avenue in Moorpark, California. The work was performed by Kehoe Testing & Engineering (KTE) on April 27, 2017. The scope of work was performed as directed by Oakridge Geoscience, Inc. personnel.

## 2. SUMMARY OF FIELD WORK

The fieldwork consisted of performing CPT soundings at five locations to determine the soil lithology. Groundwater measurements and hole collapse depths provided in **TABLE 2.1** are for information only. The readings indicate the apparent depth to which the hole is open and the apparent water level (if encountered) in the CPT probe hole at the time of measurement upon completion of the CPT. KTE does not warranty the accuracy of the measurements and the reported water levels may not represent the true or stabilized groundwater levels.

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	75	Hole open to 37 ft (dry)
CPT-2	75	Groundwater @ 41 ft
CPT-3	75	Groundwater @ 41 ft
CPT-4	75	Groundwater @ 41 ft
CPT-5	75	Groundwater @ 33 ft

**TABLE 2.1 - Summary of CPT Soundings**

## 3. FIELD EQUIPMENT & PROCEDURES

The CPT soundings were carried out by **KTE** using an integrated electronic cone system manufactured by Vertek. The CPT soundings were performed in accordance with ASTM standards (D5778). The cone penetrometers were pushed using a 30-ton CPT rig. The cone used during the program was a 15 cm<sup>2</sup> cone and recorded the following parameters at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed
- Pore Pressure Dissipation (at selected depths)

The above parameters were recorded and viewed in real time using a laptop computer. Data is stored at the KTE office for future analysis and reference. A complete set of baseline readings

was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

#### **4. CONE PENETRATION TEST DATA & INTERPRETATION**

The Cone Penetration Test data is presented in graphical form in the attached Appendix. These plots were generated using the CPeT-IT program. Penetration depths are referenced to ground surface. The soil classification on the CPT plots is derived from the attached CPT Classification Chart (Robertson) and presents major soil lithologic changes. The stratigraphic interpretation is based on relationships between cone resistance ( $q_c$ ), sleeve friction ( $f_s$ ), and penetration pore pressure ( $u$ ). The friction ratio ( $R_f$ ), which is sleeve friction divided by cone resistance, is a calculated parameter that is used along with cone resistance to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone resistance and generate excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little (or negative) excess pore water pressures.

Tables of basic CPT output from the interpretation program CPeT-IT are provided for CPT data averaged over one foot intervals in the Appendix. We recommend a geotechnical engineer review the assumed input parameters and the calculated output from the CPeT-IT program. A summary of the equations used for the tabulated parameters is provided in the Appendix.

It should be noted that it is not always possible to clearly identify a soil type based on  $q_c$ ,  $f_s$  and  $u$ . In these situations, experience, judgement and an assessment of the pore pressure data should be used to infer the soil behavior type.

If you have any questions regarding this information, please do not hesitate to call our office at (714) 901-7270.

Sincerely,

#### **KEHOE TESTING & ENGINEERING**



Richard W. Koester, Jr.  
General Manager

## **APPENDIX**



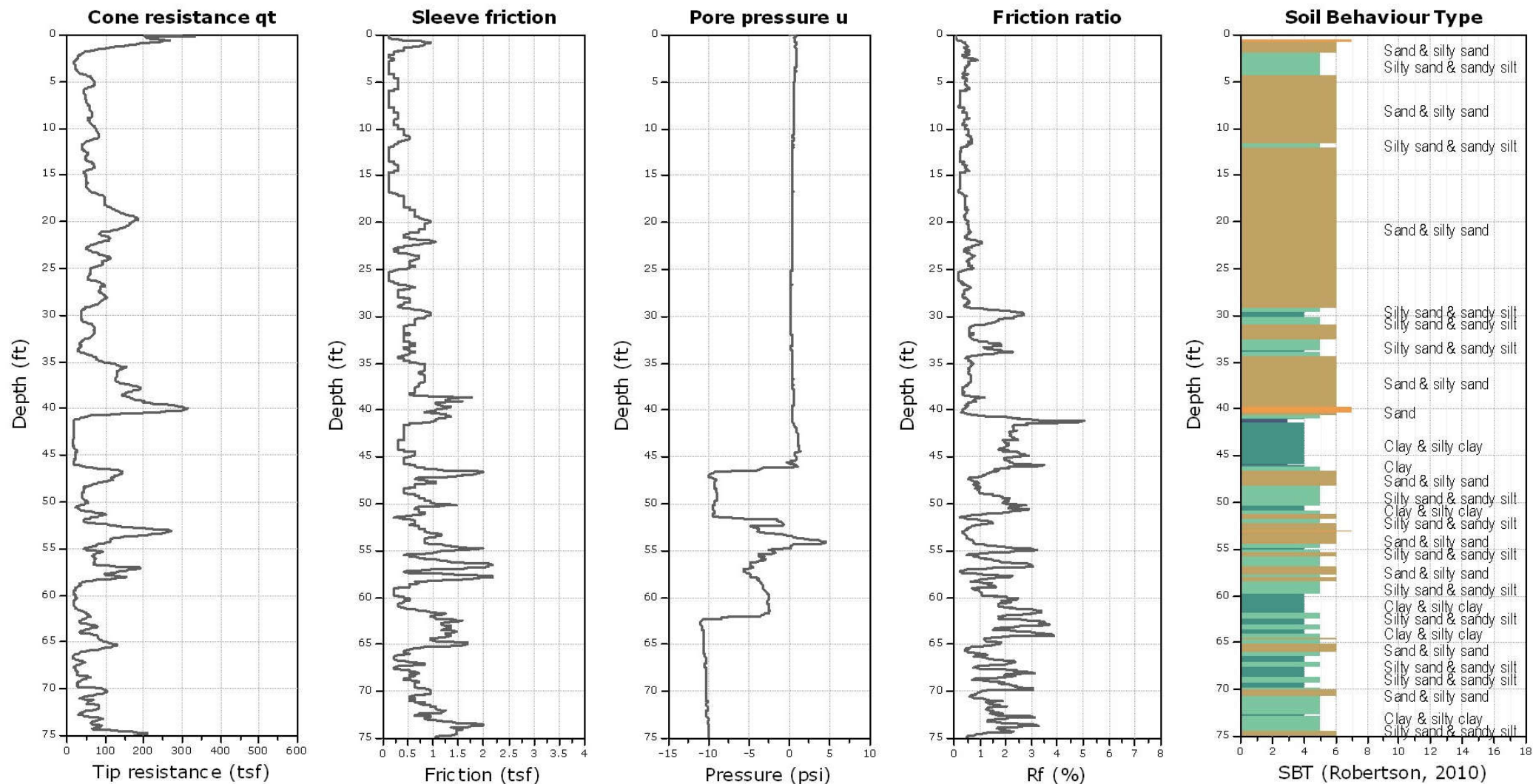
**Kehoe Testing and Engineering**  
714-901-7270  
rich@kehoetesting.com  
www.kehoetesting.com

**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-1**

Total depth: 75.29 ft, Date: 4/27/2017

Cone Type: Vertek





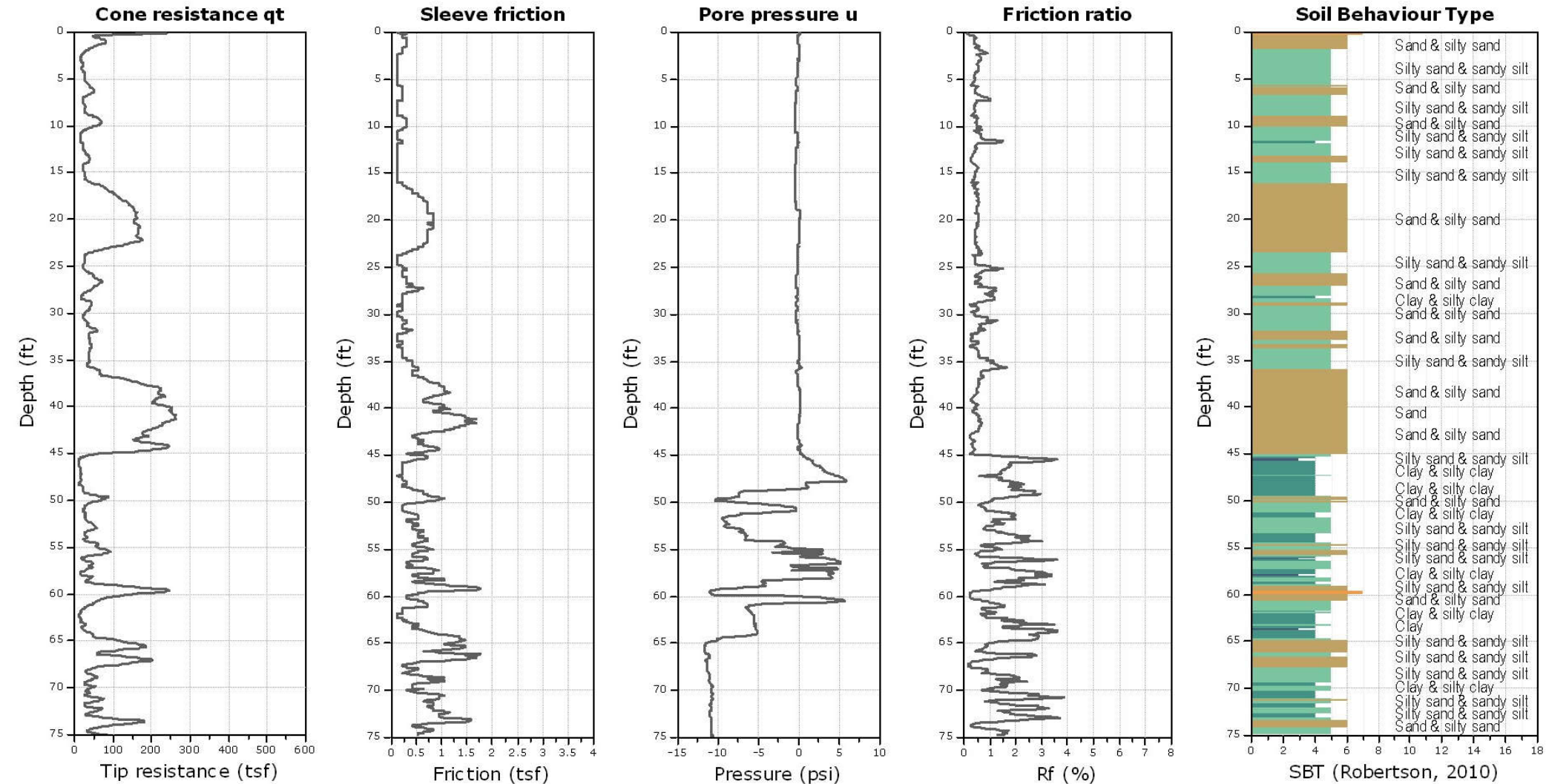
**Kehoe Testing and Engineering**  
714-901-7270  
rich@kehoetesting.com  
www.kehoetesting.com

**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-2**

Total depth: 75.14 ft, Date: 4/27/2017

Cone Type: Vertek







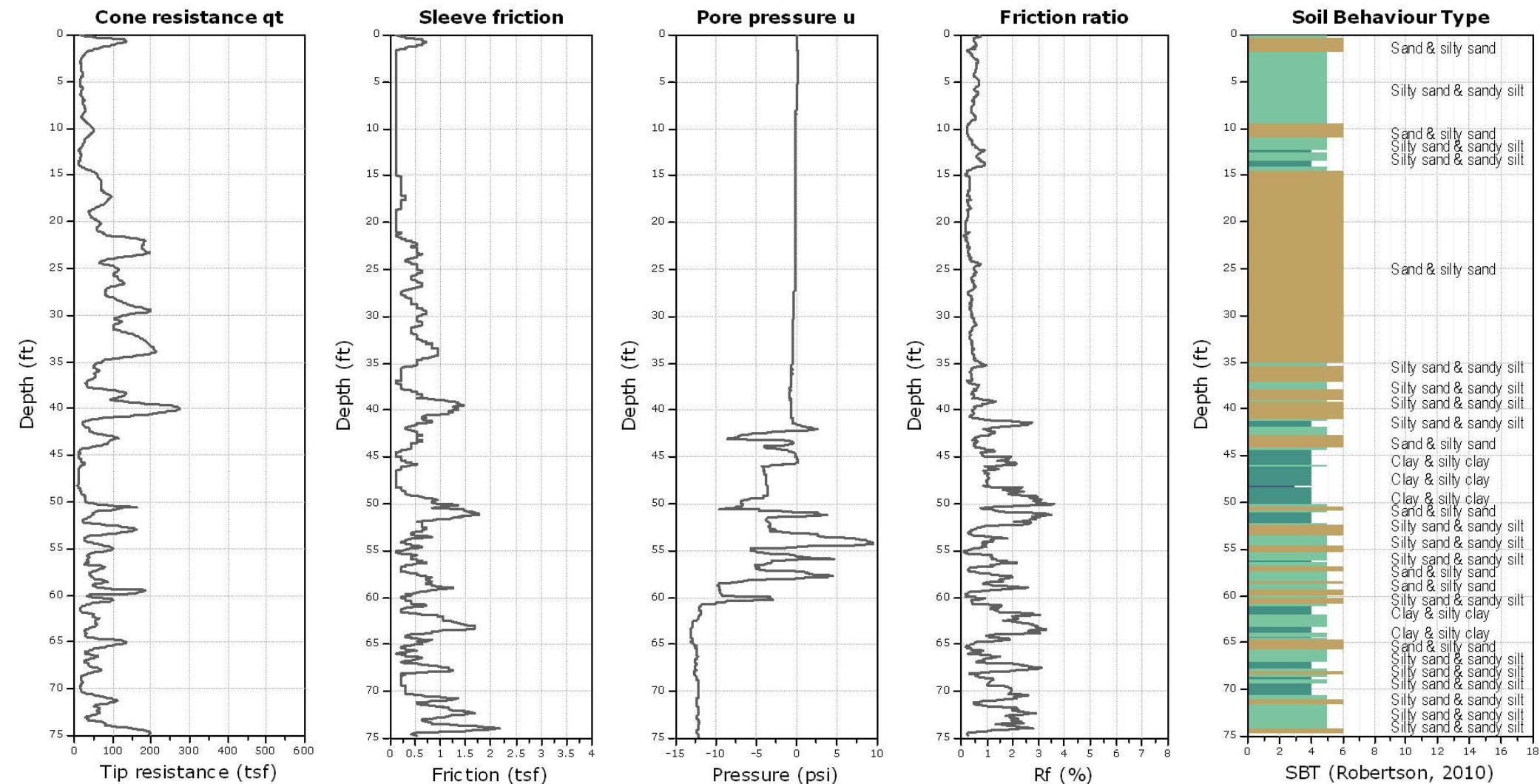
**Kehoe Testing and Engineering**  
714-901-7270  
rich@kehoetesting.com  
www.kehoetesting.com

**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-3**

Total depth: 75.07 ft, Date: 4/27/2017

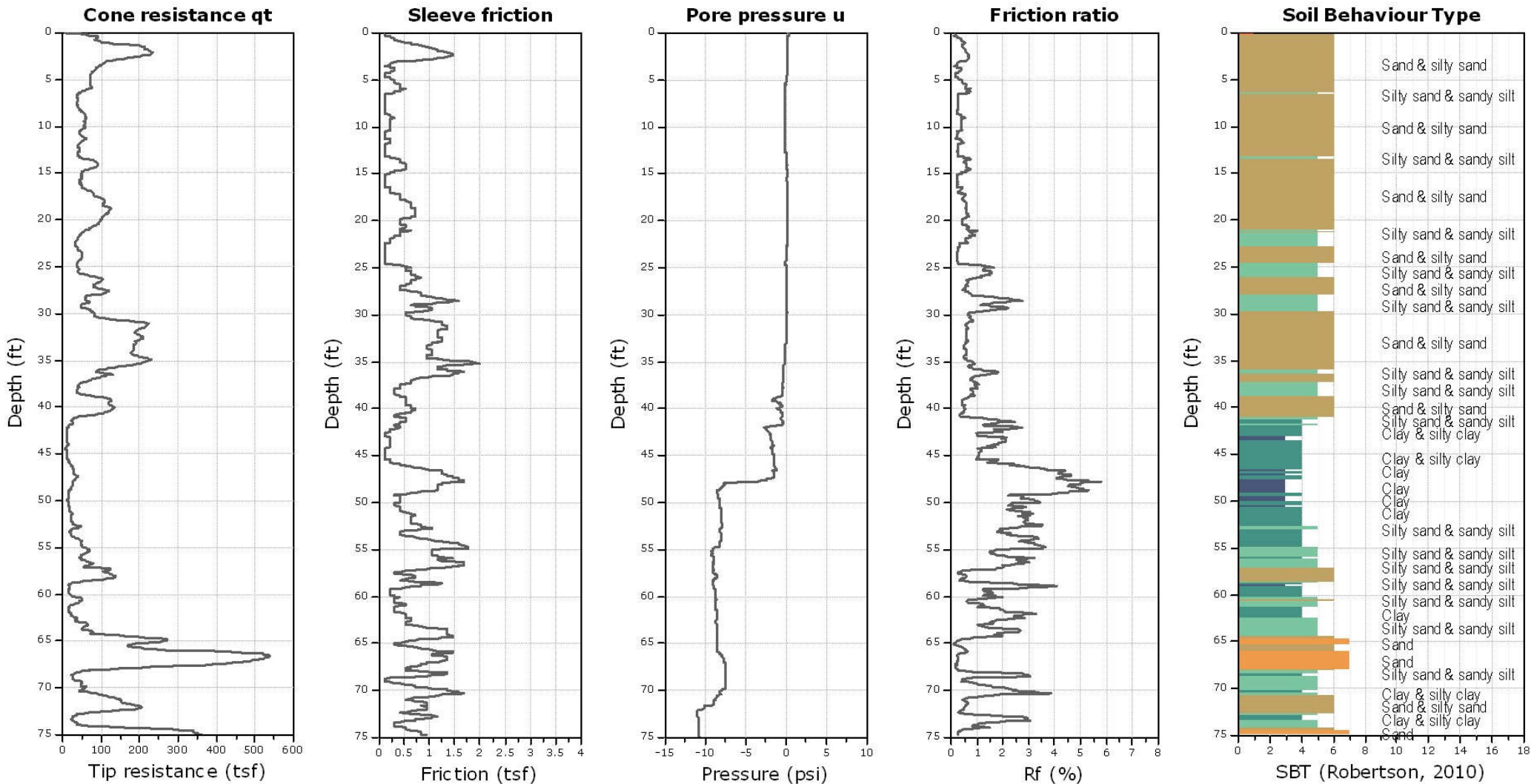
Cone Type: Vertek





**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-4**  
Total depth: 75.16 ft, Date: 4/27/2017  
Cone Type: Vertek





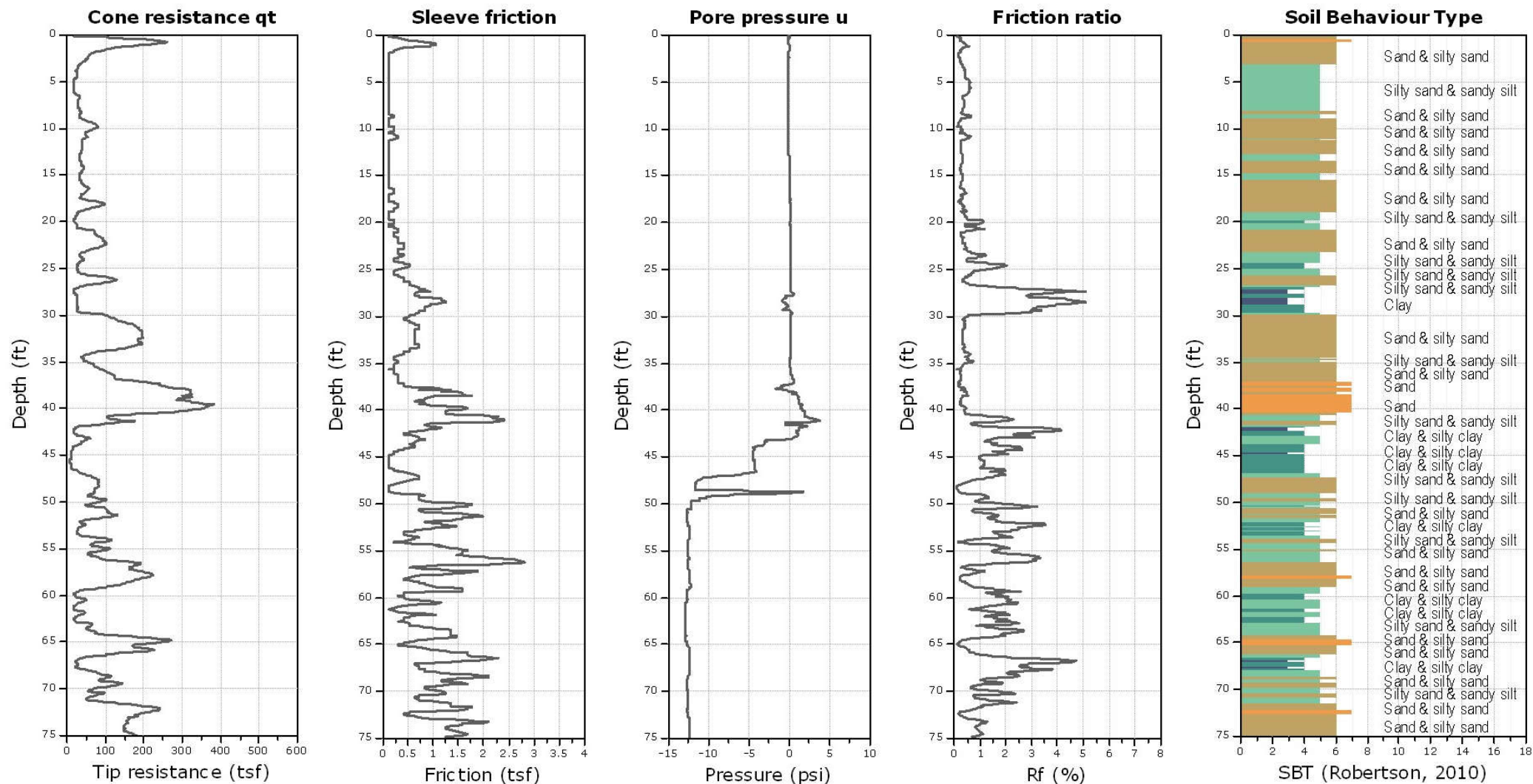
**Kehoe Testing and Engineering**  
714-901-7270  
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www.kehoetesting.com

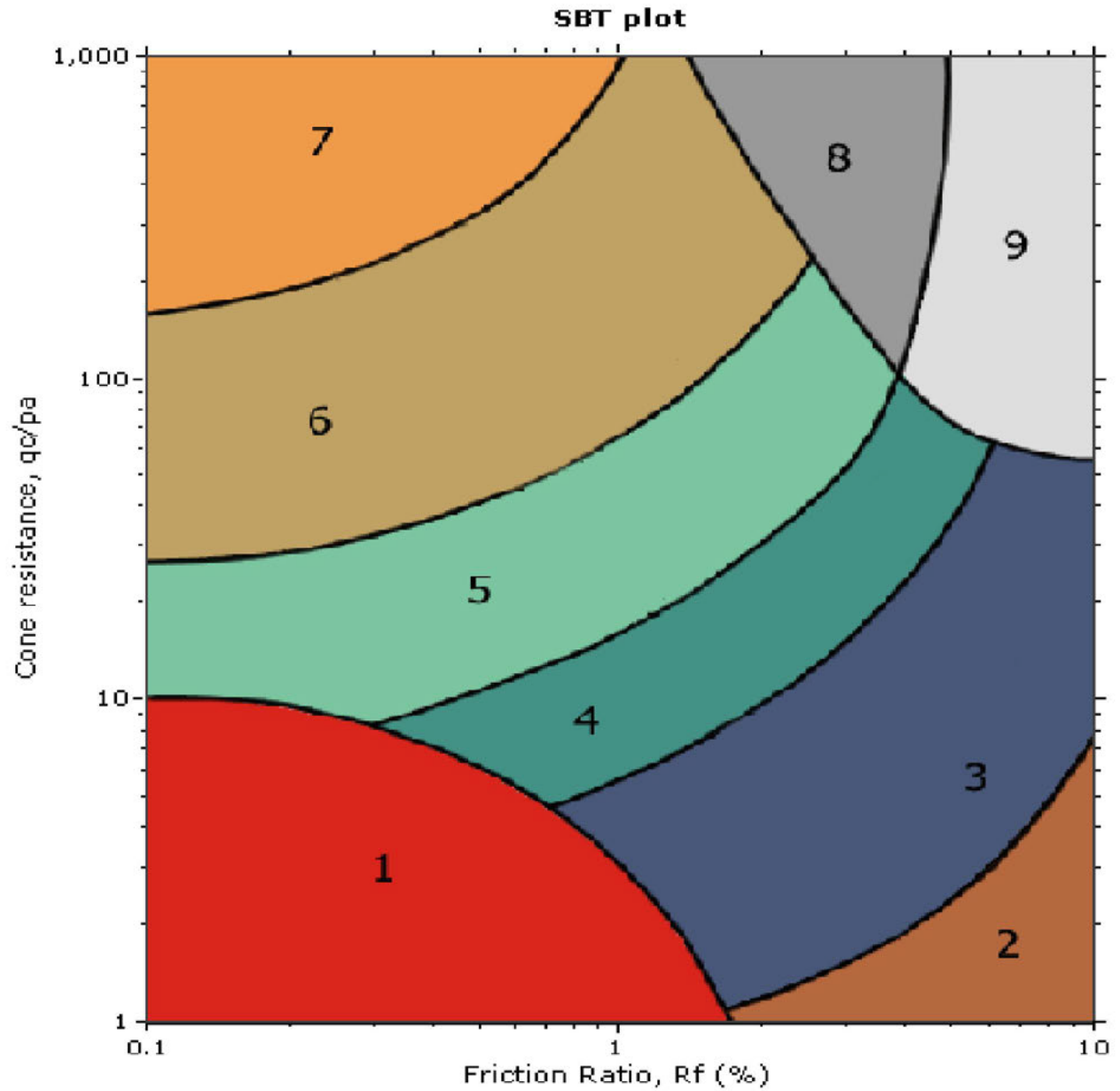
**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-5**

Total depth: 75.27 ft, Date: 4/27/2017

Cone Type: Vertek





**SBT legend**

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

Depth (ft)	CPT-1 In situ data				Basic output data																				
	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ā (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn	U2	l(B)	Mod. SBTn		
1	176.69	0.52	0.79	1.16	176.7	0.3	6	1.43	19	0.01	0	0.01	18587	0.3	0	7	0.24	3.07	1.03	512.62	5.95	235.96	7		
2	37.7	0.31	0.88	0.99	37.71	0.83	5	2.23	19	0.02	0	0.02	1982.4	0.83	0	6	0.46	6.28	1.6	223.72	3.35	91.31	7		
3	18.48	0.1	0.79	1.02	18.49	0.56	5	2.43	19	0.03	0	0.03	648.17	0.57	0	6	0.51	6.24	1.73	108.88	1.99	90.35	7		
4	28.72	0.21	0.69	1.1	28.73	0.73	5	2.31	19	0.04	0	0.04	755.07	0.73	0	6	0.5	5.33	1.7	144.45	1.3	88.17	7		
5	70.7	0.31	0.61	1.18	70.7	0.44	6	1.86	19	0.05	0	0.05	1487.5	0.44	0	6	0.39	3.39	1.41	226.38	0.92	138.74	7		
6	44.49	0.21	0.59	1.26	44.49	0.47	6	2.05	19	0.06	0	0.06	779.5	0.47	0	6	0.45	3.71	1.56	155.85	0.74	115.78	7		
7	51.48	0.1	0.59	1.31	51.49	0.2	6	1.86	19	0.07	0	0.07	773.14	0.2	0	6	0.39	2.95	1.42	143.22	0.64	154.64	7		
8	59.11	0.21	0.49	1.37	59.11	0.35	6	1.89	19	0.08	0	0.08	776.91	0.35	0	6	0.41	2.98	1.47	166.18	0.47	136.79	7		
9	55.97	0.31	0.49	1.47	55.98	0.56	6	2	19	0.09	0	0.09	653.77	0.56	0	6	0.45	3.14	1.58	165.65	0.41	107.86	7		
10	74.67	0.31	0.49	1.55	74.67	0.42	6	1.83	19	0.1	0	0.1	785.02	0.42	0	6	0.41	2.68	1.46	188.84	0.37	133.16	7		
11	81.98	0.42	0.49	1.61	81.98	0.51	6	1.83	19	0.1	0	0.1	783.46	0.51	0	6	0.42	2.64	1.49	204.23	0.34	122.99	7		
12	38.74	0.21	0.45	1.69	38.75	0.54	5	2.13	19	0.11	0	0.11	338.86	0.54	0	6	0.5	3.08	1.71	112.47	0.28	93.63	7		
13	47.93	0.1	0.39	1.76	47.94	0.22	6	1.9	19	0.12	0	0.12	387.19	0.22	0	6	0.43	2.53	1.52	114.22	0.23	130.83	7		
14	70.59	0.21	0.39	1.86	70.6	0.3	6	1.78	19	0.13	0	0.13	529.83	0.3	0	6	0.41	2.33	1.45	155.34	0.21	142.48	7		
15	46.99	0.1	0.39	1.92	47	0.22	6	1.91	19	0.14	0	0.14	328.8	0.22	0	6	0.44	2.43	1.55	107.78	0.2	125.27	7		
16	51.9	0.1	0.39	1.96	51.91	0.2	6	1.85	19	0.15	0	0.15	340.47	0.2	0	6	0.43	2.31	1.51	112.92	0.19	132.48	7		
17	78.63	0.21	0.39	2.02	78.64	0.27	6	1.72	19	0.16	0	0.16	485.89	0.27	0	6	0.4	2.12	1.43	157.36	0.18	149.59	7		
18	97.43	0.52	0.39	2.1	97.44	0.54	6	1.78	19	0.17	0	0.17	568.84	0.54	0	6	0.43	2.2	1.5	202.18	0.17	118.85	7		
19	137.64	0.73	0.39	2.14	137.64	0.53	6	1.65	19	0.18	0	0.18	761.57	0.53	0	6	0.4	2.02	1.41	262.84	0.16	130.06	7		
20	172.72	0.84	0.39	2.18	172.73	0.48	6	1.55	19	0.19	0	0.19	908.09	0.48	0	6	0.37	1.88	1.34	307.36	0.15	145.03	7		
21	104.84	0.73	0.39	2.2	104.85	0.7	6	1.82	19	0.2	0	0.2	524.55	0.7	0	6	0.46	2.14	1.56	211.6	0.14	101.74	7		
22	107.98	0.52	0.39	2.27	107.98	0.48	6	1.72	19	0.21	0	0.21	515.63	0.48	0	6	0.42	1.99	1.47	202.27	0.14	126.36	7		
23	55.14	0.42	0.29	2.38	55.14	0.76	6	2.07	19	0.22	0	0.22	251.38	0.76	0	6	0.54	2.33	1.77	120.93	0.1	80.83	7		
24	111.11	0.63	0.29	2.55	111.11	0.56	6	1.74	19	0.23	0	0.23	486.36	0.57	0	6	0.44	1.96	1.51	205.17	0.09	115.72	7		
25	63.07	0.42	0.29	2.59	63.08	0.66	6	1.99	19	0.24	0	0.24	264.59	0.66	0	6	0.52	2.16	1.72	128.29	0.09	89.06	7		
26	55.66	0.21	0.2	2.63	55.66	0.38	6	1.92	19	0.25	0	0.25	224.35	0.38	0	6	0.49	2.04	1.65	106.86	0.06	105.97	7		
27	86.57	0.31	0.2	2.71	86.57	0.36	6	1.74	19	0.26	0	0.26	336.5	0.36	0	6	0.44	1.86	1.51	151.59	0.05	129.25	7		
28	103.91	0.31	0.2	2.73	103.91	0.3	6	1.63	19	0.27	0	0.27	389.65	0.3	0	6	0.4	1.75	1.42	171.33	0.05	148.89	7		
29	65.06	0.63	0.2	2.75	65.06	0.96	5	2.07	19	0.28	0	0.28	235.16	0.97	0	6	0.56	2.11	1.82	129.28	0.05	71.41	7		
30	35.82	0.84	0.2	2.78	35.82	2.33	4	2.51	19	0.28	0	0.28	124.69	2.35	0	5	0.71	2.53	2.22	84.83	0.05	35.2	7		
31	63.7	0.52	0.2	2.81	63.7	0.82	6	2.04	19	0.29	0	0.29	215.3	0.82	0	6	0.55	2.01	1.79	120.72	0.05	77.16	7		
32	70.49	0.42	0.25	2.88	70.49	0.59	6	1.92	19	0.3	0	0.3	230.87	0.6	0	6	0.51	1.89	1.69	125.36	0.06	93.61	7		
33	33.83	0.42	0.29	2.92	33.84	1.23	5	2.36	19	0.31	0	0.31	106.94	1.25	0	5	0.66	2.23	2.09	70.61	0.07	51.03	7		
34	36.65	0.52	0.29	2.94	36.66	1.42	5	2.37	19	0.32	0	0.32	112.49	1.44	0	5	0.67	2.2	2.1	75.67	0.07	47.93	7		
35	92.63	0.52	0.33	2.92	92.63	0.56	6	1.81	19	0.33	0	0.33	277.59	0.57	0	6	0.48	1.74	1.61	152.19	0.07	103.91	7		
36	131.06	0.84	0.39	2.94	131.06	0.64	6	1.72	19	0.34	0	0.34	382.21	0.64	0	6	0.45	1.67	1.54	206.51	0.08	107.19	7		
37	127.19	0.84	0.39	2.98	127.2	0.66	6	1.73	19	0.35	0	0.35	360.86	0.66	0	6	0.46	1.67	1.56	199.64	0.08	104.05	7		
38	184.42	1.04	0.49	3.02	184.42	0.57	6	1.57	19	0.36	0	0.36	509.89	0.57	0	6	0.41	1.55	1.42	270.23	0.1	125.49	7		
39	180.45	1.46	0.49	3.62	180.46	0.81	6	1.68	19	0.37	0	0.37	486.07	0.81	0	6	0.45	1.6	1.53	272.92	0.1	97.04	7		
40	313.28	1.25	0.39	3.86	313.29	0.4	7	1.29	19	0.38	0	0.38	823.44	0.4	0	7	0.32	1.39	1.19	410.64	0.07	179.41	7		
41	37.59	1.04	0.39	3.76	37.6	2.78	4	2.54	19	0.39	0	0.39	95.53	2.81	0	5	0.75	2.11	2.31	74.29	0.07	30.27	5		
42	18.27	0.42	0.79	3.75	18.28	2.28	4	2.73	19	0.4	0	0.4	44.82	2.34	0	5	0.81	2.21	2.48	37.3	0.14	30.11	5		
43	17.75	0.42	1.08	3.84	17.77	2.35	4	2.75	19	0.41	0	0.41	42.49	2.41	0	4	0.82	2.18	2.5	35.81	0.19	29.33	5		
44	16.5	0.42	1.18	3.94	16.51	2.53	4	2.8	19	0.42	0	0.42	38.51	2.6	0.01	4	0.84	2.18	2.54	33.15	0.2	27.66	5		
45	22.03	0.63	0.81	4.01	22.04	2.84	4	2.73	19	0.43	0	0.42	51.15	2.9	0	4	0.82	2.12	2.49	43.27	0.13	27.26	5		
46	22.56	0.94	0.86	4.04	22.57	4.16	3	2.82	19	0.44	0.01	0.43	51.8	4.25	0	4	0.86	2.17	2.59	45.47	0.12	21.08	3		
47	139.83	1.57	-10.02	4.26	139.71	1.12	6	1.85	19	0.45	0.01	0.43	322.51	1.12	-0.01	6	0.52	1.6	1.71	210.19	-1.71	71.86	7		
48	80.2	0.84	-9.24	4.36	80.09	1.04	6	2.02	19	0.46	0.02	0.44	182.48	1.05	-0.01	6	0.57	1.66	1.85	125.23	-1.57	67.15	7		
49	41.77	0.52	-8.94	4.41	41.66	1.25	5	2.29	19	0.47	0.02	0.44	93.42	1.27	-0.02	5	0.67	1.8	2.1	69.91	-1.52	50.38	7		
50	54.72	0.84	-9.33	4.41	54.61	1.53	5	2.25	19	0.47	0.03	0.45	121.49	1.54	-0.01	5	0.66	1.77	2.07	90.41	-1.57	47.92	7		
51	49.5	0.63	-9.35	4.49	49.38	1.27	5	2.23	19	0.48	0.03	0.45	108.63	1.28	-0.01	5	0.65	1.75	2.05	80.69	-1.57	52.3	7		
52	43.02	0.63	-0.98	4.59	43.01	1.46	5	2.32	19	0.49	0.04	0.45	93.49	1.47	0	5	0.68	1.78	2.13	71.52	-0.24	46.48	7		
53	260.44	0.84	-4.03	4.73	260.39	0.32	7	1.3	19	0.5	0.04	0.46	565.78	0.32	0	7	0.33	1.32	1.2	323.39	-0.73	191.65	7		
54	111.32	1.04	4.3	4.79	111.37	0.94	6	1.88	19	0.51	0.05	0.46	238.95	0.94	0	6	0.53	1.55	1.74	162.53	0.56	77.33	7		
55	42.92	1.25	-2.06	4.84	42.89	2.92	4	2.51	19	0.52	0.05	0.47	90.43	2.96	0	5	0.76	1.86	2.33	74.29	-0.43	29.09	5		
56	72.99	1.15	-3.09	4.86	72.96	1.57	5	2.16	19	0.53	0.06	0.47	153.07	1.59	0	6	0.64	1.67	2	114.13	-0.59	49.45	7		
57	179.72	2.09	-5.62	4.92	179.65	1.16	6	1.79	19	0.54	0.06	0.48	374.91	1.17	0	6	0.51	1.5	1.67	253.69	-0.98	72.08	7		
58	150.69	1.46	-3.9	5.03	150.64	0.97	6	1.79																	

Depth (ft)	CPT-2 In situ data				Basic output data																			
	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ā (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn	U2	l(B)	Mod. SBTn	
1	80.51	0.21	-0.1	0.49	80.51	0.26	6	1.71	19	0.01	0	0.01	8468.4	0.26	0	7	0.3	4.1	1.16	311.86	-0.75	213.28	7	
2	29.45	0.21	0	0.59	29.45	0.71	5	2.29	19	0.02	0	0.02	1547.9	0.71	0	6	0.46	6.45	1.62	179.39	0	95.99	7	
3	16.81	0.1	-0.05	0.63	16.81	0.62	5	2.48	19	0.03	0	0.03	589.16	0.62	0	6	0.52	6.59	1.77	104.48	-0.14	84.8	7	
4	19.11	0.1	-0.2	0.67	19.11	0.55	5	2.41	19	0.04	0	0.04	501.92	0.55	0	6	0.52	5.58	1.75	100.57	-0.37	88.41	7	
5	25.79	0.1	-0.29	0.72	25.79	0.4	5	2.24	19	0.05	0	0.05	541.95	0.41	0	6	0.48	4.45	1.66	108.33	-0.45	103.85	7	
6	45.53	0.21	-0.2	0.79	45.53	0.46	6	2.04	19	0.06	0	0.06	797.65	0.46	0	6	0.45	3.67	1.55	157.74	-0.25	117.75	7	
7	22.66	0.21	-0.39	0.84	22.66	0.92	5	2.45	19	0.07	0	0.07	339.63	0.92	0	6	0.57	4.8	1.88	102.4	-0.43	68.25	7	
8	27.15	0.1	-0.49	0.9	27.15	0.38	5	2.21	19	0.08	0	0.08	356.23	0.39	0	6	0.5	3.74	1.69	95.68	-0.47	98.85	7	
9	45.53	0.21	-0.53	0.96	45.52	0.46	6	2.04	19	0.09	0	0.09	531.48	0.46	0	6	0.46	3.18	1.6	136.68	-0.45	110.43	7	
10	56.5	0.21	-0.59	1.02	56.49	0.37	6	1.91	19	0.1	0	0.1	593.61	0.37	0	6	0.43	2.81	1.52	149.81	-0.45	127.36	7	
11	15.77	0.1	-0.1	1.06	15.77	0.66	5	2.52	19	0.1	0	0.1	149.87	0.67	0	6	0.61	4.1	1.98	60.63	-0.07	63.96	7	
12	22.45	0.1	-0.2	1.1	22.45	0.47	5	2.32	19	0.11	0	0.11	195.9	0.47	0	6	0.55	3.44	1.84	72.54	-0.12	79.43	7	
13	30.08	0.1	-0.39	1.16	30.07	0.35	5	2.16	19	0.12	0	0.12	242.51	0.35	0	6	0.51	2.99	1.72	84.55	-0.23	95.04	7	
14	27.99	0.1	-0.49	1.2	27.98	0.37	5	2.2	19	0.13	0	0.13	209.39	0.38	0	6	0.53	2.98	1.76	78.47	-0.27	88.98	7	
15	24.02	0.1	-0.49	1.25	24.01	0.43	5	2.28	19	0.14	0	0.14	167.51	0.44	0	6	0.56	3.06	1.84	69.07	-0.25	78.9	7	
16	40.62	0.21	-0.59	1.29	40.61	0.51	5	2.1	19	0.15	0	0.15	266.19	0.52	0	6	0.51	2.71	1.73	103.77	-0.28	92.07	7	
17	93.25	0.42	-0.49	1.33	93.25	0.45	6	1.76	19	0.16	0	0.16	576.34	0.45	0	6	0.42	2.19	1.47	192.82	-0.22	129.58	7	
18	127.71	0.63	-0.47	1.38	127.71	0.49	6	1.66	19	0.17	0	0.17	745.89	0.49	0	6	0.4	2.06	1.41	248.44	-0.2	134.57	7	
19	154.03	0.73	0.1	1.43	154.03	0.47	6	1.58	19	0.18	0	0.18	852.39	0.48	0	6	0.38	1.95	1.36	283.2	0.04	143.33	7	
20	157.79	0.84	0	1.43	157.79	0.53	6	1.6	19	0.19	0	0.19	829.47	0.53	0	6	0.39	1.94	1.38	289.31	0	134	7	
21	167.81	0.84	0	1.49	167.81	0.5	6	1.57	19	0.2	0	0.2	840.15	0.5	0	6	0.38	1.88	1.36	297.05	0	140.81	7	
22	171.47	0.73	0	1.53	171.47	0.43	6	1.52	19	0.21	0	0.21	819.38	0.43	0	7	0.36	1.8	1.32	291.49	0	155.07	7	
23	92.73	0.42	-0.1	1.55	92.73	0.45	6	1.76	19	0.22	0	0.22	423.42	0.45	0	6	0.44	1.99	1.51	174.06	-0.03	123.87	7	
24	25.38	0.1	-0.1	1.61	25.37	0.41	5	2.25	19	0.23	0	0.23	110.3	0.42	0	6	0.59	2.46	1.9	58.38	-0.03	72.56	7	
25	20.05	0.1	-0.2	1.65	20.05	0.52	5	2.38	19	0.24	0	0.24	83.41	0.53	0	6	0.63	2.57	2.02	48.14	-0.06	60.96	6	
26	48.56	0.21	-0.29	1.69	48.56	0.43	6	2	19	0.25	0	0.25	195.57	0.43	0	6	0.52	2.12	1.71	96.67	-0.09	95.42	7	
27	61.4	0.31	-0.29	1.76	61.4	0.51	6	1.94	19	0.26	0	0.26	238.36	0.51	0	6	0.5	2.04	1.68	117.83	-0.08	98.05	7	
28	20.99	0.31	-0.23	1.96	20.99	1.49	4	2.58	19	0.27	0	0.27	77.9	1.51	0	5	0.72	2.69	2.24	52.65	-0.06	41.88	7	
29	43.96	0.21	-0.29	2.08	43.96	0.48	6	2.06	19	0.28	0	0.28	158.57	0.48	0	6	0.54	2.07	1.78	85.66	-0.08	86.21	7	
30	25.9	0.21	-0.31	2.08	25.89	0.81	5	2.37	19	0.28	0	0.28	89.86	0.82	0	6	0.65	2.34	2.06	56.59	-0.08	57.33	7	
31	34.36	0.31	-0.2	2.16	34.35	0.91	5	2.29	19	0.29	0	0.29	115.65	0.92	0	6	0.63	2.23	2	71.76	-0.05	60.12	7	
32	50.13	0.31	-0.1	2.34	50.12	0.63	6	2.06	19	0.3	0	0.3	163.87	0.63	0	6	0.55	2	1.81	94.03	-0.02	80.56	7	
33	39.79	0.1	0	2.41	39.79	0.26	6	2	19	0.31	0	0.31	125.92	0.26	0	6	0.53	1.9	1.74	71	0	91.23	7	
34	39.89	0.21	0	2.43	39.89	0.52	5	2.11	19	0.32	0	0.32	122.5	0.53	0	6	0.57	1.98	1.86	73.87	0	76.95	7	
35	37.49	0.31	-0.1	2.46	37.49	0.84	5	2.23	19	0.33	0	0.33	111.75	0.84	0	6	0.62	2.05	1.98	71.96	-0.02	62.72	7	
36	57.64	0.52	-0.29	2.55	57.64	0.91	5	2.1	19	0.34	0	0.34	167.54	0.91	0	6	0.58	1.92	1.87	104	-0.06	69.19	7	
37	126.25	0.73	-0.2	2.59	126.25	0.58	6	1.7	19	0.35	0	0.35	358.16	0.58	0	6	0.45	1.65	1.54	195.74	-0.04	112.03	7	
38	225.35	0.94	0	2.65	225.35	0.42	6	1.42	19	0.36	0	0.36	623.27	0.42	0	7	0.36	1.47	1.29	312.45	0	160.81	7	
39	217.31	0.94	0.1	2.74	217.31	0.43	6	1.44	19	0.37	0	0.37	585.55	0.43	0	7	0.37	1.47	1.31	301.29	0.02	155.24	7	
40	247.39	1.15	0.1	2.8	247.39	0.46	6	1.41	19	0.38	0	0.38	650.02	0.47	0	7	0.36	1.45	1.29	337.86	0.02	153.16	7	
41	261.07	1.36	0	2.8	261.07	0.52	6	1.43	19	0.39	0	0.39	669.26	0.52	0	7	0.37	1.44	1.31	355.64	0	143.27	7	
42	224.83	1.15	-0.1	2.86	224.83	0.51	6	1.47	19	0.4	0	0.39	569.48	0.51	0	6	0.38	1.46	1.35	309.3	-0.03	139.86	7	
43	183.69	0.63	-0.2	2.99	183.69	0.34	6	1.44	19	0.41	0.01	0.4	459.7	0.34	0	7	0.37	1.43	1.31	248.37	-0.06	166.79	7	
44	225.46	0.63	0.17	3.16	225.46	0.28	6	1.32	19	0.42	0.01	0.4	558.03	0.28	0	7	0.33	1.37	1.2	291.92	-0.01	199.58	7	
45	73.52	0.52	0.55	3.25	73.52	0.71	6	1.95	19	0.43	0.02	0.41	179.21	0.71	0	6	0.54	1.68	1.77	115.85	0.05	82.39	7	
46	11.38	0.31	1.87	3.27	11.41	2.75	3	2.95	19	0.44	0.02	0.41	26.59	2.86	0.01	4	0.89	2.31	2.68	23.97	0.27	24.53	5	
47	15.14	0.21	4.07	3.23	15.19	1.37	4	2.68	19	0.45	0.03	0.42	35.35	1.42	0.02	5	0.79	2.1	2.43	29.2	0.63	35.2	7	
48	14.62	0.31	0.79	3.3	14.63	2.14	4	2.8	19	0.46	0.03	0.42	33.61	2.21	0	4	0.84	2.16	2.55	29	0.05	29.08	5	
49	23.7	0.63	-7.47	3.25	23.61	2.65	4	2.68	19	0.47	0.04	0.43	54.31	2.71	-0.02	5	0.8	2.08	2.45	45.45	-1.35	28.73	5	
50	64.74	0.73	-6.87	3.2	64.66	1.13	5	2.11	19	0.47	0.04	0.43	148.97	1.14	-0.01	6	0.61	1.72	1.93	104.56	-1.25	60.59	7	
51	22.14	0.31	-1.63	3.23	22.12	1.42	4	2.55	19	0.48	0.05	0.44	49.68	1.45	-0.01	5	0.76	1.96	2.32	39.98	-0.38	39.08	7	
52	28.82	0.52	-9.2	3.23	28.71	1.82	4	2.52	19	0.49	0.05	0.44	64.12	1.85	-0.03	5	0.75	1.93	2.3	51.4	-1.63	37.19	7	
53	54.72	0.42	-7.07	3.25	54.63	0.76	5	2.07	19	0.5	0.06	0.44	121.74	0.77	-0.01	6	0.59	1.67	1.9	85.5	-1.28	70.23		

Depth (ft)	CPT-3 In situ data				Basic output data																				
	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ā (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn	U2	l(B)	Mod. SBTn		
1	103.59	0.42	0	0.47	103.59	0.4	6	1.69	19	0.01	0	0.01	10896	0.4	0	7	0.3	4.14	1.19	405.52	0	177.93	7		
2	27.88	0.1	0.1	0.49	27.88	0.37	5	2.2	19	0.02	0	0.02	1465.6	0.37	0	6	0.43	5.58	1.53	146.96	0.37	125.49	7		
3	16.81	0.1	0.1	0.57	16.81	0.59	5	2.48	19	0.03	0	0.03	589.22	0.6	0	6	0.52	6.52	1.76	103.4	0.25	86.17	7		
4	20.26	0.1	0.1	0.61	20.26	0.49	5	2.37	19	0.04	0	0.04	532.25	0.49	0	6	0.5	5.36	1.72	102.47	0.19	93.2	7		
5	14.62	0.1	0.1	0.65	14.62	0.68	5	2.56	19	0.05	0	0.05	306.81	0.69	0	6	0.57	5.92	1.88	81.54	0.15	72.68	7		
6	17.86	0.1	0	0.67	17.86	0.56	5	2.44	19	0.06	0	0.06	312.25	0.56	0	6	0.55	5	1.82	84.03	0	80.23	7		
7	23.5	0.1	0	0.69	23.5	0.43	5	2.29	19	0.07	0	0.07	352.26	0.43	0	6	0.51	4.15	1.73	91.99	0	93.35	7		
8	27.67	0.1	0	0.73	27.67	0.36	5	2.19	19	0.08	0	0.08	363.18	0.36	0	6	0.5	3.69	1.68	96.16	0	101.25	7		
9	20.36	0.1	-0.1	0.8	20.36	0.51	5	2.38	19	0.09	0	0.09	237.17	0.52	0	6	0.55	4	1.84	76.68	-0.08	79.17	7		
10	49.71	0.1	-0.1	0.8	49.71	0.21	6	1.88	19	0.1	0	0.1	522.22	0.21	0	6	0.42	2.72	1.47	127.72	-0.07	142.15	7		
11	32.27	0.1	-0.1	0.86	32.27	0.32	5	2.12	19	0.1	0	0.1	307.75	0.32	0	6	0.49	3.09	1.67	93.81	-0.07	103.34	7		
12	18.48	0.1	-0.1	0.92	18.48	0.57	5	2.43	19	0.11	0	0.11	161.11	0.57	0	6	0.59	3.7	1.93	64.3	-0.06	69.73	7		
13	17.96	0.1	-0.2	1	17.96	0.58	5	2.45	19	0.12	0	0.12	144.43	0.59	0	6	0.6	3.62	1.95	60.97	-0.11	67.15	7		
14	13.89	0.1	-0.2	1.04	13.89	0.75	4	2.59	19	0.13	0	0.13	103.41	0.76	0	5	0.65	3.85	2.08	50.01	-0.11	55.58	7		
15	59.11	0.1	-0.2	1.04	59.1	0.18	6	1.79	19	0.14	0	0.14	413.76	0.18	0	6	0.41	2.26	1.45	125.8	-0.1	147.16	7		
16	68.19	0.21	-0.2	1.09	68.19	0.31	6	1.8	19	0.15	0	0.15	447.59	0.31	0	6	0.42	2.27	1.49	145.78	-0.09	135.76	7		
17	84.79	0.21	-0.2	1.13	84.79	0.25	6	1.68	19	0.16	0	0.16	523.99	0.25	0	6	0.39	2.07	1.39	165.56	-0.09	158.37	7		
18	80.41	0.21	-0.2	1.14	80.41	0.26	6	1.71	19	0.17	0	0.17	469.25	0.26	0	6	0.4	2.07	1.42	157.05	-0.08	150.66	7		
19	38.01	0.1	-0.1	1.2	38.01	0.27	6	2.02	19	0.18	0	0.18	209.59	0.28	0	6	0.49	2.4	1.67	85.79	-0.04	102.25	7		
20	65.48	0.1	-0.1	1.22	65.47	0.16	6	1.73	19	0.19	0	0.19	343.6	0.16	0	6	0.41	2.01	1.44	124.03	-0.04	149.19	7		
21	65.58	0.1	-0.1	1.29	65.58	0.16	6	1.73	19	0.2	0	0.2	327.71	0.16	0	6	0.41	1.98	1.45	122.33	-0.04	147.79	7		
22	183.58	0.31	-0.1	1.33	183.58	0.17	6	1.31	19	0.21	0	0.21	877.33	0.17	0	7	0.29	1.59	1.12	276.19	-0.03	244.22	7		
23	182.12	0.52	-0.13	1.36	182.12	0.29	6	1.41	19	0.22	0	0.22	832.55	0.29	0	7	0.33	1.67	1.22	287.46	-0.04	195.04	7		
24	88.97	0.52	-0.2	1.43	88.97	0.59	6	1.83	19	0.23	0	0.23	389.23	0.59	0	6	0.47	2.04	1.58	171.25	-0.06	106.14	7		
25	109.54	0.52	-0.2	1.55	109.54	0.48	6	1.71	19	0.24	0	0.24	460.23	0.48	0	6	0.43	1.89	1.48	195.52	-0.06	125.78	7		
26	112.68	0.52	-0.2	1.69	112.67	0.46	6	1.69	19	0.25	0	0.25	455.16	0.46	0	6	0.42	1.85	1.47	196.82	-0.06	128.13	7		
27	94.09	0.52	-0.2	1.77	94.09	0.55	6	1.8	19	0.26	0	0.26	365.79	0.56	0	6	0.46	1.92	1.57	170.44	-0.05	109.46	7		
28	87.09	0.31	-0.29	1.82	87.09	0.36	6	1.74	19	0.27	0	0.27	326.42	0.36	0	6	0.44	1.83	1.51	150.3	-0.08	129.03	7		
29	150.27	0.52	-0.36	1.9	150.27	0.35	6	1.52	19	0.28	0	0.28	544.44	0.35	0	6	0.37	1.65	1.34	234.36	-0.09	161.2	7		
30	133.14	0.73	-0.39	1.96	133.14	0.55	6	1.67	19	0.28	0	0.28	466.16	0.55	0	6	0.43	1.75	1.48	220.18	-0.1	120.42	7		
31	106.52	0.52	-0.49	2.04	106.51	0.49	6	1.73	19	0.29	0	0.29	360.66	0.49	0	6	0.45	1.77	1.52	177.35	-0.12	119.19	7		
32	147.66	0.52	-0.49	2.15	147.65	0.35	6	1.53	19	0.3	0	0.3	484.68	0.35	0	6	0.38	1.61	1.36	224.35	-0.12	156.76	7		
33	191.42	0.73	-0.59	2.27	191.41	0.38	6	1.45	19	0.31	0	0.31	609.58	0.38	0	7	0.36	1.55	1.3	280.04	-0.14	163.75	7		
34	208.33	0.84	-0.59	2.35	208.33	0.4	6	1.44	19	0.32	0	0.32	643.98	0.4	0	7	0.36	1.53	1.29	300.29	-0.13	162.79	7		
35	70.49	0.42	-0.59	2.45	70.48	0.59	6	1.92	19	0.33	0	0.33	210.97	0.6	0	6	0.52	1.82	1.71	120.6	-0.13	92.09	7		
36	62.24	0.21	-0.69	2.49	62.23	0.34	6	1.86	19	0.34	0	0.34	180.96	0.34	0	6	0.49	1.74	1.64	101.97	-0.14	107.24	7		
37	36.65	0.21	-0.69	2.49	36.65	0.57	5	2.16	19	0.35	0	0.35	103.25	0.58	0	6	0.6	1.93	1.92	66.27	-0.14	70.53	7		
38	90.54	0.31	-0.78	2.45	90.53	0.35	6	1.71	19	0.36	0	0.36	249.78	0.35	0	6	0.45	1.62	1.53	138.38	-0.16	125.66	7		
39	92.63	0.84	-0.72	2.45	92.62	0.9	6	1.93	19	0.37	0	0.37	248.99	0.91	0	6	0.53	1.75	1.74	152.21	-0.14	78.04	7		
40	275.27	1.04	-0.69	2.53	275.26	0.38	7	1.32	19	0.38	0	0.38	723.37	0.38	0	7	0.33	1.4	1.21	364	-0.13	179.56	7		
41	81.24	0.52	-0.51	2.67	81.24	0.64	6	1.89	19	0.39	0	0.39	207.57	0.65	0	6	0.52	1.68	1.71	128.2	-0.09	90.45	7		
42	32.89	0.52	2.56	2.82	32.93	1.59	5	2.43	19	0.4	0	0.39	82.53	1.61	0.01	5	0.71	2.01	2.2	61.81	0.45	42.44	7		
43	107.56	0.52	-8.39	2.8	107.46	0.49	6	1.72	19	0.41	0.01	0.4	268.51	0.49	-0.01	6	0.46	1.57	1.56	159.04	-1.54	114.55	7		
44	58.69	0.31	-3.83	2.8	58.64	0.53	6	1.97	19	0.42	0.01	0.4	144.37	0.54	0	6	0.54	1.69	1.78	93.07	-0.72	85.84	7		
45	10.86	0.21	-0.03	2.8	10.86	1.92	4	2.88	19	0.43	0.02	0.41	25.58	2	0	4	0.86	2.28	2.61	22.44	-0.05	28.23	5		
46	25.48	0.31	-3.72	2.8	25.43	1.23	5	2.47	19	0.44	0.02	0.41	60.6	1.25	-0.01	5	0.72	1.97	2.23	46.53	-0.71	44.06	7		
47	10.03	0.1	-3.83	2.82	9.98	1.05	4	2.79	19	0.45	0.03	0.42	22.85	1.1	-0.03	5	0.83	2.16	2.52	19.48	-0.73	32.28	6		
48	9.92	0.21	-3.7	2.84	9.88	2.11	3	2.94	19	0.46	0.03	0.42	22.34	2.22	-0.03	4	0.89	2.26	2.67	20.15	-0.71	26.29	5		
49	17.02	0.52	-3.54	2.81	16.98	3.08	3	2.84	19	0.47	0.04	0.43	38.74	3.16	-0.02	4	0.86	2.18	2.59	34.02	-0.69	24.79	5		
50	29.24	1.04	-6.78	2.71	29.16	3.58	4	2.7	19	0.47	0.04	0.43	66.57	3.64	-0.02	4	0.81	2.08	2.48	56.29	-1.24	24.11	5		
51	56.39	1.25	2.16	2.81	56.42	2.22	5	2.34	19	0.48	0.05	0.44	128.45	2.24	0	5	0.69	1.85	2.16	97.75	0.24	37.28	7		
52	23.29	0.84	-3.41	2.9	23.25	3.59	4	2.77	19	0.49	0.05	0.44	51.7	3.67	-0.01	4	0.84	2.09	2.55	44.97	-0.68	23.38	5		
53	160.3	0.73	-2.59	2.88	160.26	0.46	6	1.56	19	0.5	0.06	0.44	359.31	0.46	0	6	0.42	1.44	1.44	216.76	-0.55	134.04	7		
54	23.91	0.63	9.03	2.9	24.02	2.61	4	2.67	19	0.51	0.06	0.45	52.34	2.66	0.02	5	0.81	2	2.46	44.35	1.3	28.88	5		
55	102.03	0.52	-5.7	2.92	101.96	0.51	6	1.75	19	0.52	0.07	0.45	223.5	0.51	0	6	0.48	1.51	1.61	144.32	-1.06	106.95	7		
56	38.43	0.42	-0.55	2.95	38.42	1.09	5	2.29	19	0.53	0.07	0.46	82.65	1.1	0	5	0.67	1.75	2.1	62.7	-0.25	52.26	7		
57	78.32	0.42	-4.39	3.05	78.27	0.53	6	1.86	19	0.54	0.08	0.46	167.86	0.54	-0.01	6	0.52	1.54	1.71	113	-0.85	94.09	7		
58	46.99	0.73	-2.18	3.08	46.97	1.56	5	2.31	19	0.55	0.08	0.47	99.26												



Depth (ft)	CPT-4 In situ data				Basic output data																			
	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ā (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn	U2	l(B)	Mod. SBTn	
1	103.91	0.63	0.2	1.1	103.91	0.6	6	1.78	19	0.01	0	0.01	10929	0.6	0	7	0.33	4.81	1.28	472.67	1.48	135.95	7	
2	229.53	1.15	0.2	1.65	229.53	0.5	6	1.46	19	0.02	0	0.02	12072	0.5	0	7	0.28	3.06	1.13	663.09	0.74	167.49	7	
3	119.88	0.84	0.2	1.71	119.88	0.7	6	1.77	19	0.03	0	0.03	4207.3	0.7	0	6	0.37	3.75	1.36	424.25	0.49	118.74	7	
4	82.6	0.21	0.1	1.78	82.6	0.25	6	1.7	19	0.04	0	0.04	2173.1	0.25	0	7	0.33	2.99	1.27	233.64	0.19	188.72	7	
5	72.47	0.21	0	1.84	72.47	0.29	6	1.77	19	0.05	0	0.05	1524.7	0.29	0	6	0.36	3.05	1.34	208.57	0	167.94	7	
6	69.03	0.31	-0.1	1.9	69.03	0.45	6	1.87	19	0.06	0	0.06	1209.8	0.45	0	6	0.4	3.25	1.44	212.12	-0.12	133.52	7	
7	38.43	0.1	-0.1	1.96	38.43	0.27	6	2.02	19	0.07	0	0.07	576.76	0.27	0	6	0.44	3.38	1.53	122.37	-0.11	128.13	7	
8	40.52	0.1	-0.1	2	40.52	0.26	6	1.99	19	0.08	0	0.08	532.2	0.26	0	6	0.44	3.16	1.52	120.93	-0.09	129.35	7	
9	59.73	0.21	-0.1	2.1	59.73	0.35	6	1.88	19	0.09	0	0.09	697.66	0.35	0	6	0.42	2.86	1.48	161.26	-0.08	135.42	7	
10	57.64	0.21	-0.1	2.14	57.64	0.36	6	1.9	19	0.1	0	0.1	605.76	0.36	0	6	0.43	2.79	1.51	151.61	-0.07	129.26	7	
11	49.39	0.1	-0.1	2.2	49.39	0.21	6	1.88	19	0.1	0	0.1	471.63	0.21	0	6	0.42	2.65	1.48	123.53	-0.07	138.85	7	
12	40.52	0.1	-0.1	2.26	40.52	0.26	6	1.99	19	0.11	0	0.11	354.37	0.26	0	6	0.45	2.75	1.58	105.1	-0.06	118.46	7	
13	39.58	0.21	0	2.35	39.58	0.53	5	2.12	19	0.12	0	0.12	319.5	0.53	0	6	0.51	2.97	1.71	110.58	0	93.81	7	
14	91.06	0.42	0	2.43	91.06	0.46	6	1.77	19	0.13	0	0.13	683.7	0.46	0	6	0.41	2.35	1.46	201.94	0	130.21	7	
15	49.6	0.31	0.1	2.47	49.6	0.63	6	2.07	19	0.14	0	0.14	347.1	0.63	0	6	0.5	2.75	1.7	128.5	0.05	91.49	7	
16	45.22	0.1	0.1	2.51	45.22	0.23	6	1.93	19	0.15	0	0.15	296.48	0.23	0	6	0.45	2.41	1.57	102.8	0.05	120.23	7	
17	74.77	0.31	0.1	2.57	74.77	0.42	6	1.83	19	0.16	0	0.16	461.94	0.42	0	6	0.44	2.27	1.52	160.1	0.04	123.96	7	
18	109.02	0.52	0.1	2.61	109.02	0.48	6	1.71	19	0.17	0	0.17	636.61	0.48	0	6	0.41	2.12	1.45	217.74	0.04	130.55	7	
19	120.82	0.63	0.1	2.67	120.82	0.52	6	1.69	19	0.18	0	0.18	668.41	0.52	0	6	0.41	2.06	1.44	235.35	0.04	127.63	7	
20	99.62	0.52	0.1	2.74	99.62	0.52	6	1.77	19	0.19	0	0.19	523.34	0.53	0	6	0.43	2.11	1.5	197.83	0.04	119.53	7	
21	64.22	0.42	0.1	2.8	64.22	0.65	6	1.98	19	0.2	0	0.2	320.91	0.65	0	6	0.5	2.31	1.68	139.63	0.04	92.88	7	
22	39.58	0.21	0.1	2.82	39.58	0.53	5	2.12	19	0.21	0	0.21	188.36	0.53	0	6	0.54	2.41	1.79	89.67	0.03	84.78	7	
23	39.37	0.1	0	2.84	39.37	0.27	6	2.01	19	0.22	0	0.22	179.19	0.27	0	6	0.5	2.22	1.69	81.99	0	100.13	7	
24	49.81	0.1	0	2.89	49.81	0.21	6	1.88	19	0.23	0	0.23	217.48	0.21	0	6	0.47	2.05	1.58	95.89	0	117.41	7	
25	38.22	0.42	0	2.96	38.22	1.09	5	2.29	19	0.24	0	0.24	159.93	1.1	0	6	0.61	2.5	1.97	89.76	0	59.13	7	
26	71.74	0.63	0	3.02	71.74	0.87	6	2.01	19	0.25	0	0.25	289.44	0.88	0	6	0.53	2.16	1.75	145.77	0	78.77	7	
27	79.57	0.63	0	3.06	79.57	0.79	6	1.95	19	0.26	0	0.26	309.21	0.79	0	6	0.51	2.06	1.7	154.5	0	85.66	7	
28	85.42	1.04	0	3.12	85.42	1.22	6	2.04	19	0.27	0	0.27	320.15	1.23	0	6	0.55	2.13	1.8	171.64	0	64.76	7	
29	52.21	1.15	0	3.15	52.21	2.2	5	2.37	19	0.28	0	0.28	188.53	2.21	0	5	0.66	2.43	2.1	119.32	0	38.73	7	
30	82.29	0.84	0	3.2	82.29	1.02	6	2	19	0.28	0	0.28	287.73	1.02	0	6	0.54	2.03	1.77	156.96	0	72.62	7	
31	213.45	1.15	0	3.26	213.45	0.54	6	1.5	19	0.29	0	0.29	723.77	0.54	0	6	0.38	1.62	1.35	326.72	0	136.84	7	
32	187.76	1.15	0	3.3	187.76	0.61	6	1.58	19	0.3	0	0.3	616.61	0.61	0	6	0.41	1.66	1.42	293.92	0	121.51	7	
33	189.74	1.15	-0.05	3.31	189.74	0.61	6	1.58	19	0.31	0	0.31	604.27	0.61	0	6	0.41	1.64	1.42	293.16	-0.01	122.35	7	
34	180.76	1.04	-0.2	3.37	180.76	0.58	6	1.58	19	0.32	0	0.32	558.64	0.58	0	6	0.41	1.62	1.42	276.52	-0.04	124.56	7	
35	229.22	1.15	-0.2	3.39	229.22	0.5	6	1.46	19	0.33	0	0.33	688.37	0.5	0	7	0.37	1.53	1.32	331.85	-0.04	144.52	7	
36	94.72	1.04	-0.29	3.45	94.71	1.1	6	1.97	19	0.34	0	0.34	275.93	1.11	0	6	0.54	1.85	1.78	164.72	-0.06	69.26	7	
37	79.26	0.73	-0.39	3.61	79.26	0.92	6	1.99	19	0.35	0	0.35	224.47	0.93	0	6	0.55	1.83	1.79	136.14	-0.08	74.51	7	
38	40.31	0.42	-0.49	3.69	40.3	1.04	5	2.26	19	0.36	0	0.36	110.65	1.05	0	6	0.64	1.98	2.02	74.8	-0.1	57.21	7	
39	117.38	0.52	-1.77	3.73	117.35	0.44	6	1.67	19	0.37	0	0.37	315.75	0.45	0	6	0.44	1.59	1.5	175.5	-0.34	125.06	7	
40	133.88	0.52	-1.08	3.79	133.86	0.39	6	1.59	19	0.38	0	0.38	351.27	0.39	0	6	0.42	1.53	1.44	193.04	-0.2	139.54	7	
41	48.25	0.31	-0.69	3.84	48.24	0.65	5	2.08	19	0.39	0	0.39	122.84	0.65	0	6	0.58	1.79	1.87	80.85	-0.13	73.9	7	
42	15.98	0.31	-2.64	3.82	15.95	1.96	4	2.75	19	0.4	0	0.39	39.45	2.02	-0.01	5	0.81	2.23	2.48	32.78	-0.5	31.44	5	
43	10.03	0.21	-1.96	3.82	10	2.09	3	2.93	19	0.41	0.01	0.4	24.06	2.18	-0.02	4	0.88	2.35	2.65	21.34	-0.38	26.91	5	
44	15.04	0.21	-1.78	3.84	15.02	1.39	4	2.69	19	0.42	0.01	0.4	36.2	1.43	-0.01	5	0.79	2.15	2.43	29.64	-0.35	35.26	7	
45	9.82	0.1	-1.57	3.84	9.8	1.07	4	2.8	19	0.43	0.02	0.41	22.97	1.11	-0.01	5	0.83	2.2	2.52	19.52	-0.33	32.17	0	
46	18.48	0.52	-1.47	3.75	18.47	2.83	4	2.79	19	0.44	0.02	0.41	43.71	2.9	-0.01	4	0.84	2.2	2.54	37.42	-0.32	26.58	5	
47	29.76	1.36	-1.57	3.76	29.74	4.56	3	2.76	19	0.45	0.03	0.42	70.24	4.63	0	4	0.83	2.17	2.53	60.21	-0.34	20.12	3	
48	25.27	1.46	-7.6	3.99	25.18	5.81	3	2.88	19	0.46	0.03	0.42	58.63	5.91	-0.02	3	0.88	2.25	2.65	52.5	-1.38	16.43	3	
49	14.62	0.94	-8.51	4.1	14.52	6.47	3	3.09	19	0.47	0.04	0.43	32.96	6.69	-0.05	3	0.95	2.38	2.84	31.58	-1.53	14.78	3	
50	13.05	0.42	-8.32	4.2	12.95	3.23	3	2.94	19	0.47	0.04	0.43	28.96	3.35	-0.05	4	0.9	2.24	2.69	26.36	-1.49	22.98	5	
51	17.02	0.42	-8.16	4.26	16.92	2.47	4	2.78	19	0.48	0.05	0.44	37.75	2.54	-0.04	4	0.84	2.11	2.54	32.72	-1.46	27.89	5	
52	22.35	0.73	-8.06	4.33	22.25	3.29	4	2.76	19	0.49	0.05	0.44	49.44	3.36	-0.03	4	0.84	2.08	2.54	42.83	-1.44	24.7	5	
53	29.76	0.84	-8.26	4.35	29.66	2.82	4	2.62	19	0.5	0.06	0.44	65.58	2.87	-0.02	5	0.79	1.98	2.41	54.64	-1.47	28.53	5	
54	36.86	1.04	-8.12	4.37	36.76	2.84	4	2.55	19	0.51	0.06	0.45	80.69	2.88	-0.02	5	0.77	1.93	2.35	66.14	-1.44	29.23	5	
55	55.66	1.46	-9.14	4.37	55																			

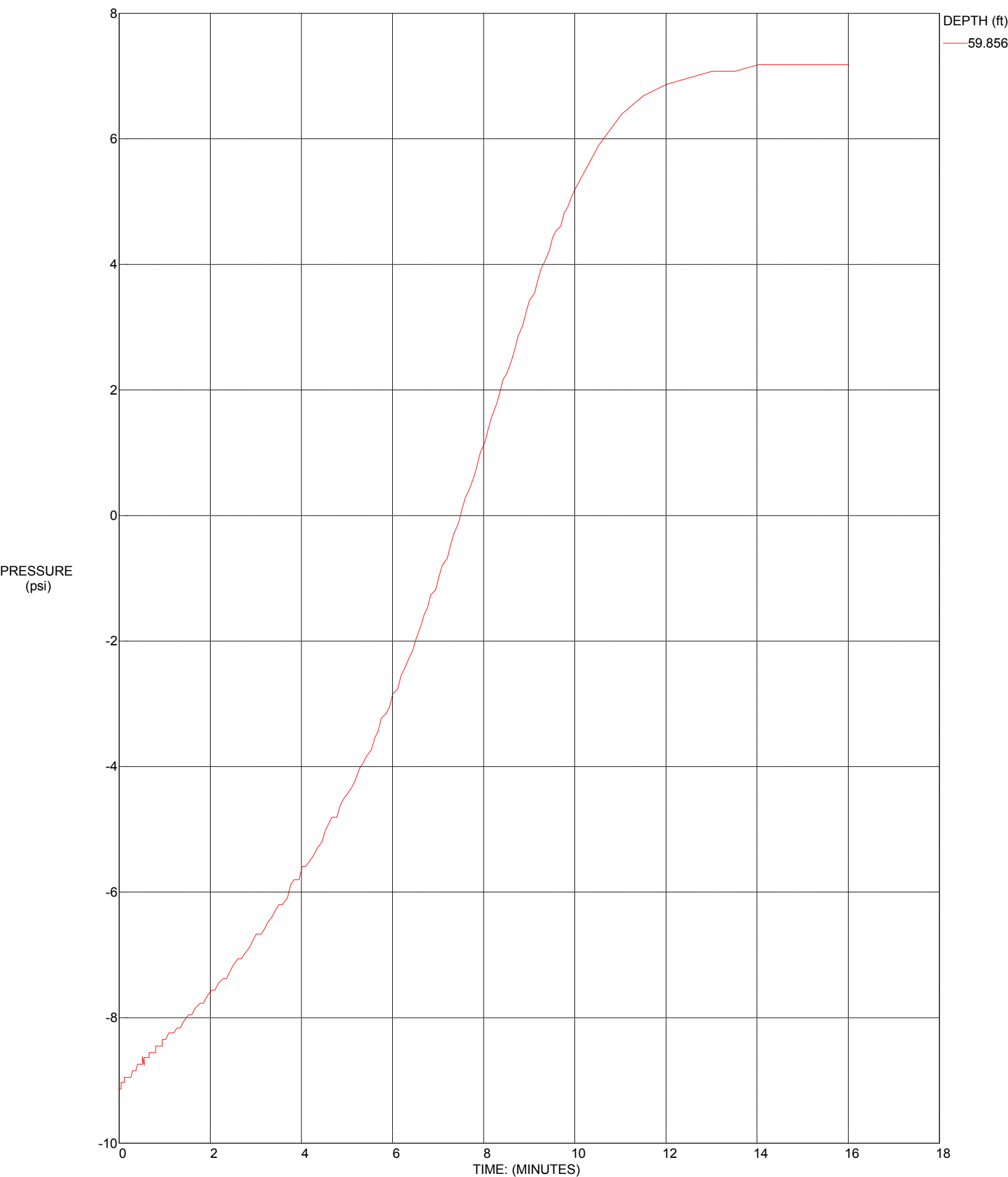


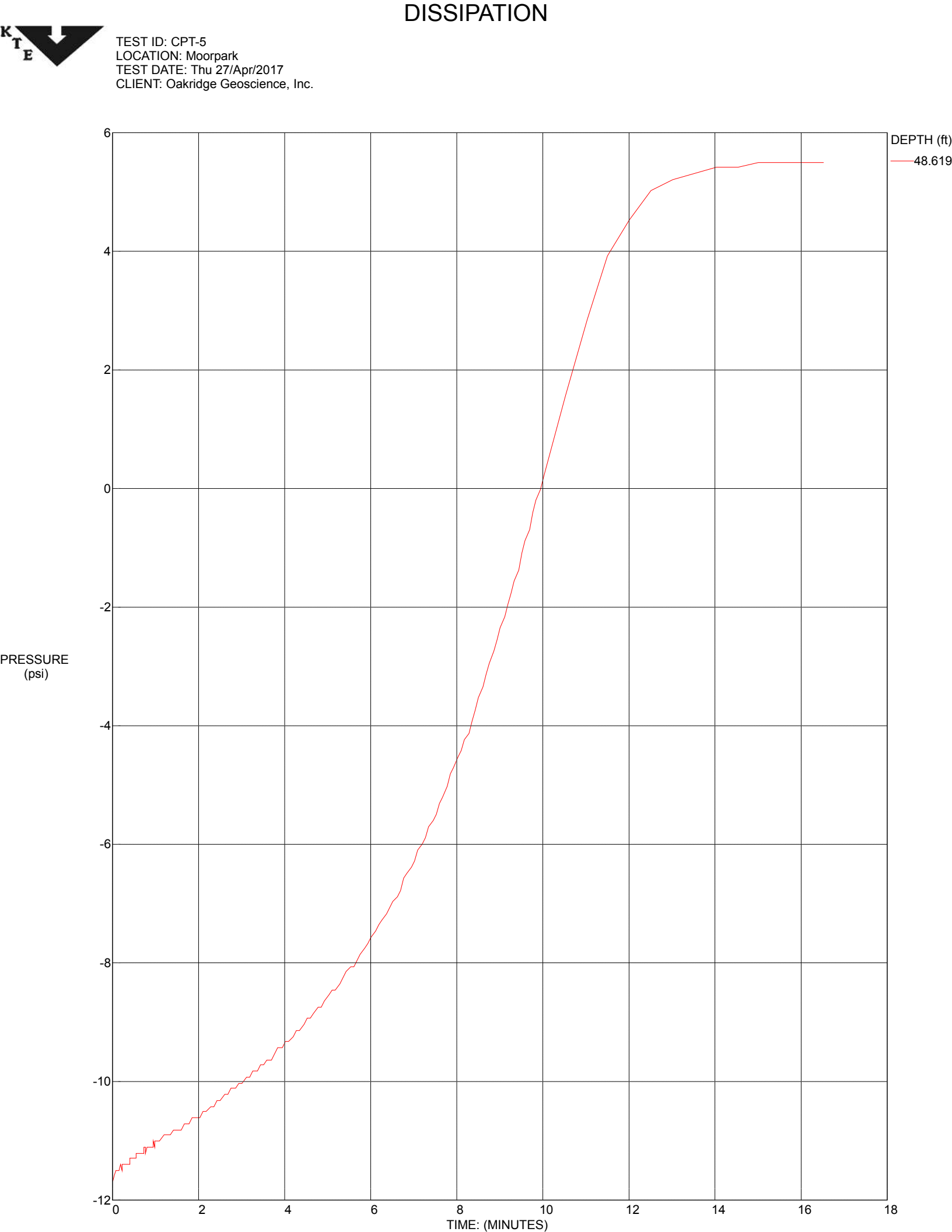
Depth (ft)	CPT-5 In situ data					Basic output data																		
	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ā (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn	U2	l(B)	Mod. SBTn	
1	215.64	0.52	-0.01	2.34	215.64	0.24	7	1.31	19	0.01	0	0.01	22683	0.24	0	7	0.21	2.66	0.95	541.69	-0.05	274.25	7	
2	63.49	0.21	-0.1	2.16	63.49	0.33	6	1.85	19	0.02	0	0.02	3338.4	0.33	0	7	0.35	4.13	1.3	247.83	-0.37	170.13	7	
3	37.59	0.1	-0.1	2.2	37.59	0.28	6	2.03	19	0.03	0	0.03	1318.6	0.28	0	6	0.41	4.34	1.44	154.21	-0.25	145.49	7	
4	24.23	0.1	-0.1	2.26	24.23	0.41	5	2.27	19	0.04	0	0.04	636.63	0.41	0	6	0.48	4.88	1.65	111.63	-0.19	104.72	7	
5	16.92	0.1	-0.1	2.33	16.92	0.59	5	2.47	19	0.05	0	0.05	355.13	0.59	0	6	0.55	5.51	1.82	87.83	-0.15	80.15	7	
6	18.27	0.1	-0.13	2.43	18.27	0.55	5	2.43	19	0.06	0	0.06	319.55	0.55	0	6	0.55	4.94	1.81	85.07	-0.17	81.47	7	
7	28.72	0.1	-0.2	2.55	28.72	0.35	5	2.17	19	0.07	0	0.07	430.72	0.35	0	6	0.48	3.8	1.64	103	-0.21	106.65	7	
8	33	0.1	-0.2	2.68	33	0.32	5	2.1	19	0.08	0	0.08	433.24	0.32	0	6	0.47	3.44	1.61	107.18	-0.19	112.67	7	
9	38.53	0.21	-0.2	2.8	38.53	0.54	5	2.13	19	0.09	0	0.09	449.69	0.54	0	6	0.49	3.42	1.67	124.35	-0.16	97.67	7	
10	75.29	0.1	-0.1	2.9	75.29	0.14	6	1.66	19	0.1	0	0.1	791.53	0.14	0	6	0.35	2.34	1.3	166.32	-0.07	189.39	7	
11	50.13	0.21	-0.1	2.93	50.12	0.42	6	1.98	19	0.1	0	0.1	478.63	0.42	0	6	0.45	2.87	1.58	135.44	-0.07	114.92	7	
12	39.06	0.1	-0.1	3	39.05	0.27	6	2.01	19	0.11	0	0.11	341.55	0.27	0	6	0.46	2.79	1.6	102.68	-0.06	115.52	7	
13	32.16	0.1	0	3.06	32.16	0.32	5	2.12	19	0.12	0	0.12	259.46	0.33	0	6	0.5	2.92	1.69	88.27	0	99.5	7	
14	39.58	0.1	0	3.12	39.58	0.26	6	2	19	0.13	0	0.13	296.59	0.26	0	6	0.47	2.64	1.61	98.39	0	112.85	7	
15	32.79	0.1	0	3.16	32.79	0.32	5	2.11	19	0.14	0	0.14	229.11	0.32	0	6	0.5	2.75	1.7	84.8	0	97.61	7	
16	41.88	0.1	0	3.23	41.88	0.25	6	1.97	19	0.15	0	0.15	274.48	0.25	0	6	0.47	2.47	1.6	97.58	0	113.94	7	
17	40.1	0.21	0	3.31	40.1	0.52	5	2.11	19	0.16	0	0.16	247.28	0.52	0	6	0.52	2.66	1.74	100.45	0	90.14	7	
18	95.76	0.1	0.1	3.33	95.76	0.11	6	1.54	19	0.17	0	0.17	559.05	0.11	0	7	0.34	1.86	1.27	168.04	0.04	201.5	7	
19	28.82	0.21	0.1	3.35	28.82	0.72	5	2.3	19	0.18	0	0.18	158.69	0.73	0	6	0.59	2.84	1.92	77	0.04	68.97	7	
20	18.69	0.21	0	3.43	18.69	1.12	4	2.56	19	0.19	0	0.19	97.38	1.13	0	5	0.68	3.19	2.14	55.84	0	49.49	7	
21	73.62	0.31	0.1	3.51	73.62	0.43	6	1.84	19	0.2	0	0.2	368.02	0.43	0	6	0.45	2.13	1.55	147.79	0.04	118.59	7	
22	95.24	0.31	0.1	3.55	95.24	0.33	6	1.69	19	0.21	0	0.21	454.66	0.33	0	6	0.41	1.94	1.43	174.09	0.03	144.51	7	
23	59.63	0.42	0.1	3.55	59.63	0.7	6	2.02	19	0.22	0	0.22	271.92	0.7	0	6	0.52	2.27	1.73	127.73	0.03	86.19	7	
24	41.46	0.42	0.1	3.61	41.46	1.01	5	2.24	19	0.23	0	0.23	180.84	1.01	0	6	0.59	2.49	1.92	97.05	0.03	63.6	7	
25	25.48	0.42	0.1	3.65	25.48	1.64	4	2.53	19	0.24	0	0.24	106.29	1.65	0	5	0.69	2.82	2.18	67.24	0.03	42.61	7	
26	111.63	0.31	0.1	3.73	111.63	0.28	6	1.59	19	0.25	0	0.25	450.95	0.28	0	6	0.39	1.76	1.38	184.98	0.03	159.79	7	
27	30.49	0.63	0.1	3.82	30.49	2.05	4	2.53	19	0.26	0	0.26	117.88	2.07	0	5	0.7	2.7	2.21	77.15	0.03	37.91	7	
28	26.21	0.84	-0.39	3.82	26.21	3.19	4	2.7	19	0.27	0	0.27	97.53	3.22	0	5	0.76	2.87	2.37	70.45	-0.11	27.1	5	
29	25.79	0.94	-0.29	3.86	25.79	3.64	4	2.74	19	0.28	0	0.28	92.61	3.68	0	4	0.78	2.87	2.42	69.21	-0.07	24.38	5	
30	100.98	0.63	0.1	3.88	100.98	0.62	6	1.8	19	0.28	0	0.28	353.32	0.62	0	6	0.47	1.85	1.59	176.18	0.02	103.65	7	
31	170.74	0.63	0.1	3.9	170.74	0.37	6	1.49	19	0.29	0	0.29	578.75	0.37	0	7	0.37	1.6	1.32	257.53	0.02	162.47	7	
32	195.7	0.63	0.1	3.94	195.7	0.32	6	1.4	19	0.3	0	0.3	642.72	0.32	0	7	0.34	1.53	1.25	282.73	0.02	182.2	7	
33	192.25	0.63	0.1	3.98	192.25	0.33	6	1.42	19	0.31	0	0.31	612.27	0.33	0	7	0.35	1.52	1.26	276.54	0.02	178.78	7	
34	72.26	0.42	0.1	4.08	72.26	0.58	6	1.91	19	0.32	0	0.32	226.17	0.58	0	6	0.51	1.84	1.69	125.3	0.01	94.78	7	
35	51.8	0.21	0	4.14	51.8	0.4	6	1.96	19	0.33	0.01	0.32	159.48	0.41	0	6	0.52	1.86	1.73	90.51	-0.03	94.17	7	
36	102.86	0.21	0.2	4.22	102.86	0.2	6	1.57	19	0.34	0.01	0.33	313.24	0.2	0	6	0.39	1.59	1.39	153.98	0	161.77	7	
37	166.04	0.63	0.53	4.28	166.05	0.38	6	1.5	19	0.35	0.02	0.33	499.25	0.38	0	6	0.38	1.55	1.35	243	0.05	156.28	7	
38	320.8	1.04	-0.07	4.11	320.8	0.33	7	1.23	19	0.36	0.02	0.34	952.36	0.33	0	7	0.29	1.4	1.12	423.16	-0.09	208.35	7	
39	287.38	1.04	1.28	3.96	287.4	0.36	7	1.3	19	0.37	0.03	0.34	841.56	0.36	0	7	0.32	1.43	1.18	387.56	0.18	188.41	7	
40	351.4	1.67	1.54	3.84	351.42	0.48	7	1.31	19	0.38	0.03	0.35	1015.5	0.48	0	7	0.32	1.43	1.2	475.34	0.22	163.83	7	
41	103.49	1.78	3.29	3.88	103.53	1.71	5	2.07	19	0.39	0.04	0.35	294.46	1.72	0	6	0.58	1.91	1.89	186.06	0.56	50.24	7	
42	28.3	0.73	1.18	4.1	28.31	2.58	4	2.61	19	0.4	0.04	0.35	78.67	2.62	0	5	0.76	2.3	2.35	60.66	0.11	30.88	5	
43	48.98	0.52	0.25	4.24	48.98	1.07	5	2.19	19	0.41	0.05	0.36	135.13	1.07	0	6	0.62	1.94	1.97	89.25	-0.09	59.81	7	
44	21.41	0.42	-4.47	4.32	21.35	1.96	4	2.64	19	0.42	0.05	0.36	57.51	2	-0.02	5	0.77	2.27	2.37	44.95	-1.03	34.41	7	
45	10.55	0.1	-4.42	4.32	10.49	1	4	2.76	19	0.43	0.06	0.37	27.3	1.04	-0.04	5	0.8	2.33	2.46	22.18	-1.02	34.6	6	
46	9.29	0.21	-4.22	4.33	9.24	2.26	3	2.98	19	0.44	0.06	0.37	23.59	2.37	-0.04	4	0.89	2.52	2.68	20.97	-0.99	25.86	5	
47	42.71	0.42	-7.6	4.39	42.62	0.98	5	2.22	19	0.45	0.07	0.38	111.61	0.99	-0.01	6	0.63	1.91	2	76.16	-1.63	59.24	7	
48	81.24	0.31	-11.79	4.33	81.1	0.39	6	1.78	19	0.46	0.07	0.38	210.88	0.39	-0.01	6	0.48	1.62	1.6	123.83	-2.41	113.32	7	
49	71.32	0.42	-5.88	4.46	71.25	0.59	6	1.92	19	0.47	0.08	0.39	182.9	0.59	-0.01	6	0.53	1.7	1.73	113.45	-1.3	90.15	7	
50	82.5	0.84	-12.28	4.57	82.35	1.01	6	2	19	0.47	0.08	0.39	209.06	1.02	-0.01	6	0.56	1.75	1.82	135.03	-2.47	69.8	7	
51	107.35	1.04	-12.68	4.61	107.2	0.97	6	1.9	19	0.48	0.09	0.4	269.33	0.98	-0.01	6	0.53	1.68	1.73	169.48	-2.53	76.1	7	
52	44.28	1.25	-12.58	4.67	44.12	2.84	4	2.49	19	0.49	0.09	0.4	108.85	2.87	-0.02	5	0.74	2.05	2.28	84.36	-2.49	30.21	5	
53	28.4	0.84	-12.48	4.75	28.25	2.96	4	2.65	19	0.5	0.1	0.41	68.45	3.01	-0.04	5	0.79	2.13	2.42	55.98	-2.46	27.66	5	
54	113.62	0.84	-12.58	4.81	113.46	0.74	6	1.8	19	0.51	0.1	0.41	275.49	0.74	-0.01	6	0.5	1.6	1.65	170.91	-2.46	92.11	7	
55	110.69	1.57	-12.58	4.87	110.54	1.42	6	2	19	0.52	0.11	0.41	265.36	1.42	-0.01	6	0.57	1.7	1.84	177.26	-2.44	58.09	7	
56	85.11	1.57	-12.58	4.92	84.95	1.84	5	2.16	19	0.53	0.11	0.42	201.39	1.86	-0.01	6	0.63	1.79	1.99	142.5	-2.43	45.6	7	
57	163.01	0.84	-12.52	5.04	162.86	0.51	6	1.58	19	0.54	0.12	0.42	383.01	0.51	-0.01	6	0.42	1.47	1.45	225.89	-2.41	126.64	7	
58	214.7	0.84	-12.48	5.14	214.55	0.39	6	1.42	19	0.55	0.12	0.43	499.57	0.39										



TEST ID: CPT-3  
LOCATION: Moorpark  
TEST DATE: Thu 27/Apr/2017  
CLIENT: Oakridge Geoscience, Inc.

# DISSIPATION





Presented below is a list of formulas used for the estimation of various soil properties. The formulas are presented in SI unit system and assume that all components are expressed in the same units.

**:: Unit Weight,  $g$  (kN/m<sup>3</sup>) ::**

$$g = g_w \cdot \left( 0.27 \cdot \log(R_f) + 0.36 \cdot \log\left(\frac{q_t}{p_a}\right) + 1.236 \right)$$

where  $g_w$  = water unit weight

**:: Permeability,  $k$  (m/s) ::**

$$I_c < 3.27 \text{ and } I_c > 1.00 \text{ then } k = 10^{0.952 - 3.04 \cdot I_c}$$

$$I_c \leq 4.00 \text{ and } I_c > 3.27 \text{ then } k = 10^{-4.52 - 1.37 I_c}$$

**::  $N_{SPT}$  (blows per 30 cm) ::**

$$N_{60} = \left( \frac{q_c}{p_a} \right) \cdot \frac{1}{10^{1.1268 - 0.2817 \cdot I_c}}$$

$$N_{I(60)} = Q_{tn} \cdot \frac{1}{10^{1.1268 - 0.2817 \cdot I_c}}$$

**:: Young's Modulus,  $E_s$  (MPa) ::**

$$(q_t - \sigma_v) \cdot 0.015 \cdot 10^{0.55 \cdot I_c + 1.68}$$

(applicable only to  $I_c < I_{c\_cutoff}$ )

**:: Relative Density,  $D_r$  (%) ::**

$$100 \cdot \sqrt{\frac{Q_{tn}}{k_{DR}}} \quad \text{(applicable only to SBT}_n\text{: 5, 6, 7 and 8 or } I_c < I_{c\_cutoff}\text{)}$$

**:: State Parameter,  $\psi$  ::**

$$\psi = 0.56 - 0.33 \cdot \log(Q_{tn,cs})$$

**:: Peak drained friction angle,  $\phi$  (°) ::**

$$\phi = 17.60 + 11 \cdot \log(Q_{tn})$$

(applicable only to SBT<sub>n</sub>: 5, 6, 7 and 8)

**:: 1-D constrained modulus,  $M$  (MPa) ::**

If  $I_c > 2.20$

$$\alpha = 14 \text{ for } Q_{tn} > 14$$

$$\alpha = Q_{tn} \text{ for } Q_{tn} \leq 14$$

$$M_{CPT} = \alpha \cdot (q_t - \sigma_v)$$

If  $I_c \leq 2.20$

$$M_{CPT} = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 I_c - 1.68}$$

**:: Small strain shear Modulus,  $G_0$  (MPa) ::**

$$G_0 = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 I_c + 1.68}$$

**:: Shear Wave Velocity,  $V_s$  (m/s) ::**

$$V_s = \left( \frac{G_0}{\rho} \right)^{0.50}$$

**:: Undrained peak shear strength,  $S_u$  (kPa) ::**

$$N_{kt} = 10.50 + 7 \cdot \log(F_r) \text{ or user defined}$$

$$S_u = \frac{(q_t - \sigma_v)}{N_{kt}}$$

(applicable only to SBT<sub>n</sub>: 1, 2, 3, 4 and 9 or  $I_c > I_{c\_cutoff}$ )

**:: Remolded undrained shear strength,  $S_u(rem)$  (kPa) ::**

$$S_{u(rem)} = f_s \quad \text{(applicable only to SBT}_n\text{: 1, 2, 3, 4 and 9 or } I_c > I_{c\_cutoff}\text{)}$$

**:: Overconsolidation Ratio, OCR ::**

$$k_{OCR} = \left[ \frac{Q_{tn}^{0.20}}{0.25 \cdot (10.50 + 7 \cdot \log(F_r))} \right]^{1.25} \text{ or user defined}$$

$$OCR = k_{OCR} \cdot Q_{tn}$$

(applicable only to SBT<sub>n</sub>: 1, 2, 3, 4 and 9 or  $I_c > I_{c\_cutoff}$ )

**:: In situ Stress Ratio,  $K_0$  ::**

$$K_0 = (1 - \sin \phi') \cdot OCR^{\sin \phi'}$$

(applicable only to SBT<sub>n</sub>: 1, 2, 3, 4 and 9 or  $I_c > I_{c\_cutoff}$ )

**:: Soil Sensitivity,  $S_t$  ::**

$$S_t = \frac{N_s}{F_r}$$

(applicable only to SBT<sub>n</sub>: 1, 2, 3, 4 and 9 or  $I_c > I_{c\_cutoff}$ )

**:: Effective Stress Friction Angle,  $\phi'$  (°) ::**

$$\phi' = 29.5^\circ \cdot B_q^{0.121} \cdot (0.256 + 0.336 \cdot B_q + \log Q_t)$$

(applicable for  $0.10 < B_q < 1.00$ )

**References**

- Robertson, P.K., Cabal K.L., Guide to Cone Penetration Testing for Geotechnical Engineering, Gregg Drilling & Testing, Inc., 5<sup>th</sup> Edition, November 2012
- Robertson, P.K., Interpretation of Cone Penetration Tests - a unified approach., Can. Geotech. J. 46(11): 1337–1355 (2009)

## **APPENDIX C**

### LABORATORY TESTS

## **APPENDIX C**

### LABORATORY TESTS



# SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory

781 East Washington Boulevard, Los Angeles, California 90021 ♦ Phone (213) 745-5333 ♦ Fax (213) 741-8621

November 17, 2022

SEL File No.: 48334-1  
SEL Report No.: G-22-3005

Carl Kim Geotechnical, Inc.  
945 Baileyana Road  
Hillsborough, CA 94010

Attention: Mr. Carl Kim

**RE: PWAS\_20221005**  
**Moorpark City Library**  
**699 Moorpark Avenue**  
**Moorpark, CA 93021**

**SUBJECT:** Soil Testing

**STANDARD:** ASTM D4829, R-Value, ASTM D1557 and Corrosion Series.

**SAMPLE LOCATION:** 699 Moorpark Ave, Moorpark, CA 93021

Date Received: 11/4/22

Date Tested: 11/7-16/22

## **REPORT OF TESTS**

In compliance with the request of your authorized representative, we have conducted the subject test as per project requirements for the above-referenced project.

The bulk soil sample was delivered to our laboratory by your representative. The test results are included in this report and tabulated as follow:

### **Expansion Index ASTM D4829:**

BH/Sample No.	Depth (ft)	Soil Type	Dry Density(pcf)	Moisture Content (%)		Potential Expansion	Expansion Index
				Initial	Final		
HA-3/B-2	0.9-5.6	Brown Poorly Graded SAND	114.0	8.8	12.7	Very Low	<b>0</b>

### **R-Value CT 301:**

BH/Sample No.	Depth (ft)	Soil Type	R-Value	
			By Exudation	By Expansion
HA-3/B-2	0.9-5.6	Brown Poorly Graded SAND	<b>77</b>	<b>0</b>

*Note: Report the R-value of soil whichever is less between by exudation or expansion.*



**ASTM D1557-21 Laboratory Compaction Characteristics of Soil:**

BH/Sample I.D.	Date Tested	Soil Description (Visual)	Uncorrected		Corrected	
			Max. Dry Density (pcf)	Optimum Moisture Content (%)	Max. Dry Density (pcf)	Optimum Moisture Content (%)
HA-3/B-2	11/8/22	Brown Poorly Graded SAND	123.6	8.4	NA	NA

**Corrosion Series:**

Min. Resistivity CTM 643 Ohm-cm	pH value EPA 9045C	Sulfate $\text{SO}_4^{2-}$ Content EPA 300,0M mg/ kg	Chloride $\text{Cl}^{-}$ Content EPA 300, 0M mg/kg
<b>1,820</b>	<b>7.3</b>	<b>56.7</b>	<b>18.8</b>

Should you have any questions regarding the contents of this report, please call.

Respectfully submitted,  
SMITH-EMERY LABORATORIES

  
ANGELITO CABANILLA  
Geotechnical Laboratory Manager



# SMITH-EMERY LABORATORIES

791/781 E. Washington Blvd., Los Angeles CA 90021

Tel.No.: (213) 745-5333; Fax No. (213) 741-8621

## Expansion Index

UBC 18-2/ASTM D4829-11

Client:	<u>Carl Kim Geotechnical Inc.</u>			Lab. Ref. No.:	<u>317</u>
Project:	<u>Moorpark City Library</u>			SEL File No.:	<u>48334-1</u>
Location:	<u></u>			Date Sampled:	<u>11/2/22</u>
Material Description:	<u>Brown, Poorly Graded Sand</u>			Date Received:	<u>11/4/22</u>
Boring No.:	<u>HA-3/B-2</u>	Sample No.	<u>1 (Bulk)</u>	Depth (ft.)	<u>0.9-5.6'</u>
Equipment: Used:	Ring I.D.:	<u>A</u>	Oven:	<u>SE SQ-1</u>	Chamber No.:
	Balance:	<u>SN3947</u>	5 #Rammer:	<u>SE SH-1</u>	
Area of specimen (in <sup>2</sup> )	<u>12.57</u>	Initial Ht. (in)	<u>1.0000</u>	Final Ht. (in)	<u>0.9958</u>
Ring Diameter (in)	<u>4.00</u>	Initial Vol. ft <sup>3</sup>	<u>0.00727</u>	Final Vol. ft <sup>3</sup>	<u>0.00724</u>
Undisturbed Sample	<input type="checkbox"/>	Assumed sp. gr. of soil =		<u>2.700</u>	
Remolded Sample	<input checked="" type="checkbox"/>	% Saturation: (%mcx sp.grx Dd)/(sp.grx 62.4-Dd)			
					Height Measurement
					<u>1.0000</u>
					<u>1.0000</u>
					<u>1.0000</u>
					<u>1.0000</u>

Initial Moisture content	
wt.wet soil + tare	<u>326.1</u>
wt. of dry soil + tare	<u>312.7</u>
wt. of tare	<u>160.0</u>
Moisture content %	<u>8.8</u>

Moisture and Density Data		Initial	Final
Wt. of wet soil + Ring		<u>776.3</u>	<u>790.9</u>
Wt. of dry soil+ Ring		<u>743.2</u>	<u>743.2</u>
Wt. of Moisture		<u>33.1</u>	<u>47.7</u>
Wt. of Ring		<u>366.7</u>	<u>366.7</u>
Wt of dry soil		<u>376.5</u>	<u>376.5</u>
Moisture Content %		<u>8.8</u>	<u>12.7</u>
Wet Density (pcf)		<u>124.1</u>	<u>129.0</u>
Dry Density (pcf)		<u>114.0</u>	<u>114.5</u>
% Saturation		<u>50</u>	<u>73</u>

### REMARKS

Sampled by Andrew H.

Date	Time	Time Lapsed	Load (kPa)/(psi)	Dial Reading	deflection (in.)
11/7/22	10:25		0	0.0000	0.0000
			6.9 kPa/ 1 psi	0.0000	0.0000
	10:35	10 min		0.0034	0.0034
		6sec	Saturated	0.0000	
11/7/22		15sec		0.0035	-0.0001
		30sec		0.0035	-0.0001
	10:36	1min		0.0036	-0.0002
	10:37	2min		0.0038	-0.0004
	10:39	4min		0.0039	-0.0005
	10:43	8min		0.0040	-0.0006
	10:50	15min		0.0041	-0.0007
	11:05	30min		0.0041	-0.0007
	11:35	1hr		0.0042	-0.0008
	12:35	2hr		0.0042	-0.0008
	13:35	3hr		0.0042	-0.0008
11/8/22	10:35	24hr		0.0042	-0.0008
				EI <sub>50</sub>	<u>-1</u>

Note: EI<sub>50</sub> prepare the test specimen in accordance with 8.1-8.4 to achieve degree of saturation 50 ±2%. The deformation of the specimen is recorded for 24H or until the rate of deformation becomes less than 0.0002 in/h.whichever occur first. A minimum recording time of 3 h is required Report EI zero (0) when result is negative (-).

**TABLE 18-1-B**

### Expansion Index

0 - 20  
21 - 50  
51 - 90  
91 - 130  
> 130

### Potential Expansion

#### Result

..... **VERY LOW**  
..... LOW  
..... MEDIUM  
..... HIGH  
..... VERY HIGH

Tested By: E.Saucedo

Checked By: A.Cabanilla



# SMITH-EMERY LABORATORIES

1195 N. Tustin, Anaheim, CA 92807 Tel. (714) 238-6133 Fax (714) 238-6144

## R-VALUE (CT 301/ ASTM D2844)

Lab Report # A22-293

Report Date: 11/14/22

Client: Smith Emery Los Angeles

Project: Moorpark City Library

Tested By: cl

Date 11/11/22

Project #: 48334-1

Checked By: CL

Date 11/12/22

Project/Site: On Site

Sample Location: 0.9-5.6' Depth

Sample #: HA-3/B-2

Sampled By: Client

Description: Brown Poorly Graded Sand

Date: 11/07/22

Test Specimen ID:	A	B	C	D
Prepared weight (g)	1100	1100	1100	
Compaction Foot Pressure (psi)	350	350	350	
Initial Moisture, %	5.0	5.0	5.0	
Soak Water (ml)	20	20	20	
Water Added for Saturation (g)	60	40	35	
Moisture at Compaction, %	12.7	10.7	10.3	
Exudation Load (Lb.)				
Exudation Pressure (psi)	225	246	565	
Height of Specimen, (in.)	2.47	2.51	2.51	
Wt. of Specimen & Mold (g)	3052	3119	3130	
Wt. of Mold (g)	2103	2073	2078	
Wt. of Specimen (g)	949	1046	1052	
Dry Density (pcf)	103.4	114.1	115.2	
Expansion Dial Reading, In.	0	0	0	
Expansion Pressure (psi)	0.000	0.000	0.000	
Stabilometer P <sub>H</sub> @ 2000lb (160psi)	39	25	20	
Turns Displacement, d	3.95	4.43	4.32	
R-Value By Stabilometer	66	75	80	
R-Value By Stab. (corrected)	66	75	80	
Thickness by Stabilometer, in	6.5	4.7	3.8	
Thickness by Exp. Pressure, in	0.0	0.0	0.0	
Equilibrium Thickness, in =	0 (from right chart below)			

<u>Initial Moisture:</u>	
Mass of Wet Soil + Can, g =	266.0
Mass of Can, g =	0.0
Oven-dry Soil + Can, g =	253.3
Moisture Content, % =	5.0

### Pavement/Traffic Data

Surface	
Base	
Subbase	

Gravel Equivalent Factor (Gf)

Gf = 1.00

Traffic Index, TI = 5.0

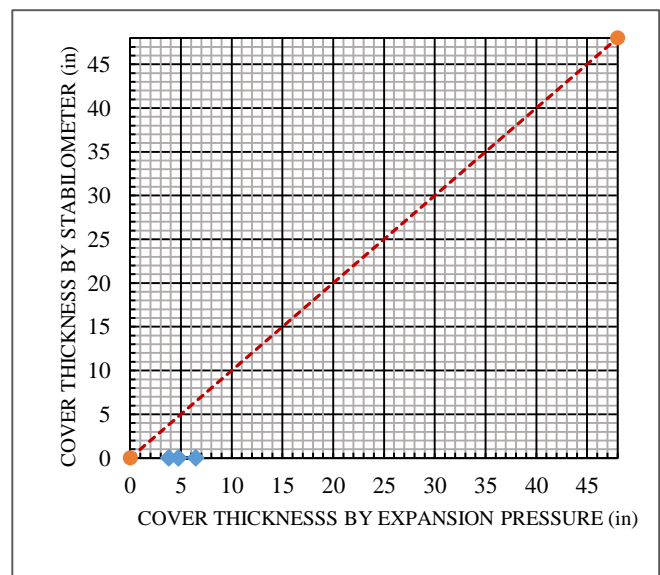
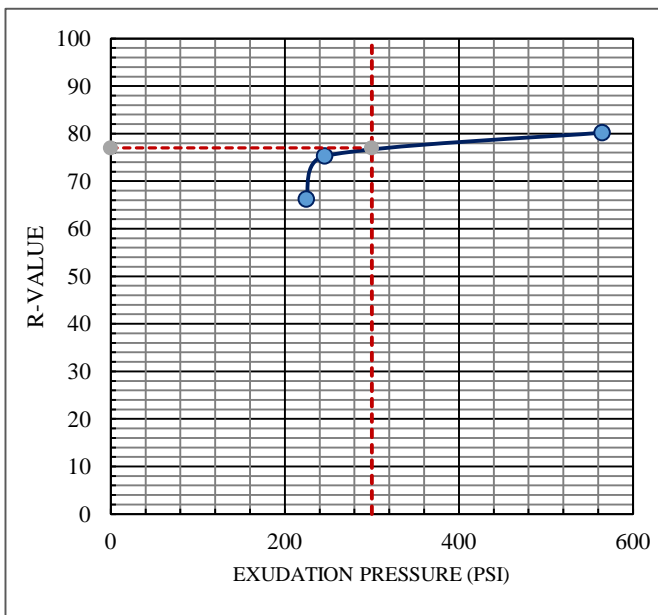
(assumed)

Unit Mass of Cover Mat. = 130

(pcf)

Spring Constant for deflection = 303

psi/in



### R-VALUE RESULT

#### Remarks

No expansion readings recorded after 16-24 hr expansion period.

BY EXPANSION PRESSURE:

BY EXCUDATION PRESSURE (from left chart): 77

R-VALUE, AT EQUILIBRIUM: 77



# Smith-Emery Laboratories

791/781 East Washington Blvd., Los Angeles, CA 90021; Tel (213) 745-5333; Fax (213) 749-8621

## LABORATORY COMPACTION CHARACTERISTICS ASTM D1557-21

Client: **Carl Kim Geotechnical Inc.**  
Project: **Moorpark City Library**  
Location: **699 Moorpark Ave, Moorpark, CA 93021**  
Soil Class: **Brown Poorly Graded SAND**  
Source: **Onsite**  
Remarks: **HA-3 / B-2** :if 5-25%ret,rock correction req'd

Lab. Ref No.: **317**  
SEL File No.: **48334-1**  
Date Sampled: **11/2/22**  
Date Received: **11/4/22**  
Date Tested: **11/8/22**  
Sampled by: **Andrew H.**

Equipment: Scale: B90416085/B846769478 **Drying:** Oven ☒ Burner: ☐ Microwave ☐ Method A ☒ (+)#4≤25%  
Rammer: **Mechanical** 10 lbs ☒ **Manual** 10 lbs ☐ PREPARATION: Method B ☐ (+) 3/8"≤25%  
Pie ☐ Round ☒ 5.5 lbs ☒ **Wet** ☐ **Dry Method C** ☐ (+) 3/4"≤30%

Calibrated Mold Vol. cc:  
4" dia. 6" dia  
943 2124

Rock Correction: OD Gs.: MC%: % Ret'd #4  
ZAV Assumed Gs.: 2.60 % Pass #4 0.0 Water density: 62.428 Calibrated Mold Vol. cc: 943  
Soil Gs ass: 2.60 Boring No.: HA-3/B-2 Sample No.: **1 (Bulk)** Depth (ft): **0.9-5.6'** Water Density: 62.23

Test no.	1	2	3	4	5
wt. of mold + wet soil (g)	3890.5	3970.8	4025.5	4023.5	4002.0
wt. of mold (g)	1996.5	1996.5	1996.5	1996.5	1996.5
wt. of wet soil (g)	1894.0	1974.3	2029.0	2027.0	2005.5
wet density of soil (g/cc)	2.008	2.094	2.152	2.150	2.127
wt. wet soil + tare (g)	849.8	677.1	768.5	785.7	796.2
wt.dry soil + tare (g)	821.9	643.7	717.6	722.2	720.7
Wt of tare (g)	182.3	131.1	135.2	135.2	131.4
moisture content %	4.4	6.5	8.7	10.8	12.8
Density of soil (pcf)	120.1	122.7	123.5	121.1	117.7
corrected moisture content %					3.6
Density of soil (pcf)corrected					0.0
Dry Density @ ZAV	115	123	129	134	
100 % Saturation @ ZAV	14.0	10.0	7.0	4.0	

sieve size	ret'd (g)	% ret'd
3/4"		
3/8"		
#4		
Total		

pass #4 % Moist content 0.0  
wet pass #4 (g) 0.0  
dry pass #4 (g) 0.0

### ASTM D127

wt OD (g) \_\_\_\_\_  
wt SSD \_\_\_\_\_  
wt in water (g) \_\_\_\_\_  
OD Gs \_\_\_\_\_  
moist % \_\_\_\_\_

Max Dry Density (pcf) : **123.6** OWC % **8.4** % Saturation: **70.7**

Max Dry Density (pcf) corrected : \_\_\_\_\_ OWC % Corr \_\_\_\_\_ % Saturation: \_\_\_\_\_

Moisture-Density Relationship

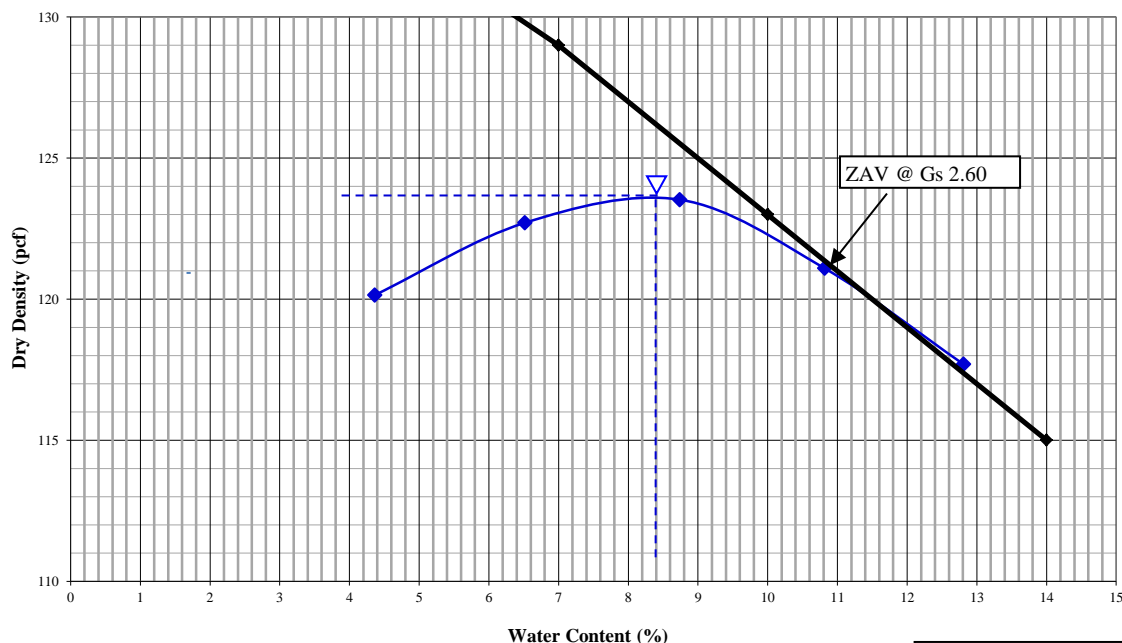


PLATE No.: 1

Tested by: A. Cabanilla

Checked by: A. Cabanilla



781 East Washington Blvd., Los Angeles, CA 90021  
(213) 745-5312 FAX (213) 745-6372

## Certificate of Analysis

Page 2 of 2

Smith Emery Laboratories  
791 East Washington Blvd.  
Los Angeles, CA 90021

Attn: Brando Resurreccion Phone: (213) 745-5333 FAX: (213) 746-0744

File #: 73419  
Report Date: 11/16/22  
Submitted: 11/04/22  
PLS Report No.: 2211062

Project: Corrosion Testing - Carl Kim Geo Technical Inc., Moorpark City Library

Sample ID: HA-3 B-2 Soil (2211062-01) Sampled: 11/02/22 00:00 Received: 11/04/22											
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method	Prepared	Analyzed	By	Batch	
Resistivity, Minimum	1820		1	ohm-cm	1.00	- CTM 643	11/11/22	11/11/22	jks	BK21116	
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method	Prepared	Analyzed	By	Batch	
Soluble Chloride	18.8	B	1	mg/kg	5.00	- EPA 300.0M	11/10/22	11/11/22	vc	BK21635	
Soluble Sulfate	56.7		1	mg/kg	5.00	- EPA 300.0M	11/10/22	11/11/22	vc	BK21635	
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method	Prepared	Analyzed	By	Batch	
pH	7.3		1	pH Units	0.1	- EPA 9045C	11/11/22	11/11/22	jks	BK21114	

## Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BK21635 - -										
Blank Prepared & Analyzed: 11/10/22										
Soluble Chloride	8.96	5.00	mg/kg							B
Soluble Sulfate	ND	5.00	mg/kg							
LCS Prepared & Analyzed: 11/10/22										
Soluble Chloride	57.7	5.00	mg/kg	50.00		115	70-130			B
Soluble Sulfate	53.5	5.00	mg/kg	50.00		107	70-130			
Duplicate Source: 2211062-01 Prepared: 11/10/22 Analyzed: 11/11/22										
Soluble Chloride	18.5	5.00	mg/kg		18.8			1.75	30	B
Soluble Sulfate	60.6	5.00	mg/kg		56.7			6.67	30	
Matrix Spike Source: 2211062-01 Prepared & Analyzed: 11/10/22										
Soluble Chloride	64.8	5.00	mg/kg	50.00	18.8	92.0	70-130			B
Soluble Sulfate	104	5.00	mg/kg	50.00	56.7	94.1	70-130			
Matrix Spike Dup Source: 2211062-01 Prepared: 11/10/22 Analyzed: 11/11/22										
Soluble Chloride	63.8	5.00	mg/kg	50.00	18.8	89.9	70-130	2.33	30	B
Soluble Sulfate	104	5.00	mg/kg	50.00	56.7	94.9	70-130	0.888	30	
Batch BK21114 - -										
Duplicate Source: 2211062-01 Prepared & Analyzed: 11/11/22										
pH	7.5	0.1	pH Units		7.3			3.12	5	

## Notes and Definitions

- B Analyte present in the blank (CLP B-flag).
- NA Not Applicable
- ND Analyte NOT DETECTED at or above the reported limit(s)
- NR Not Reported
- MDL Method Detection Limit
- PQL Practical Quantitation Limit

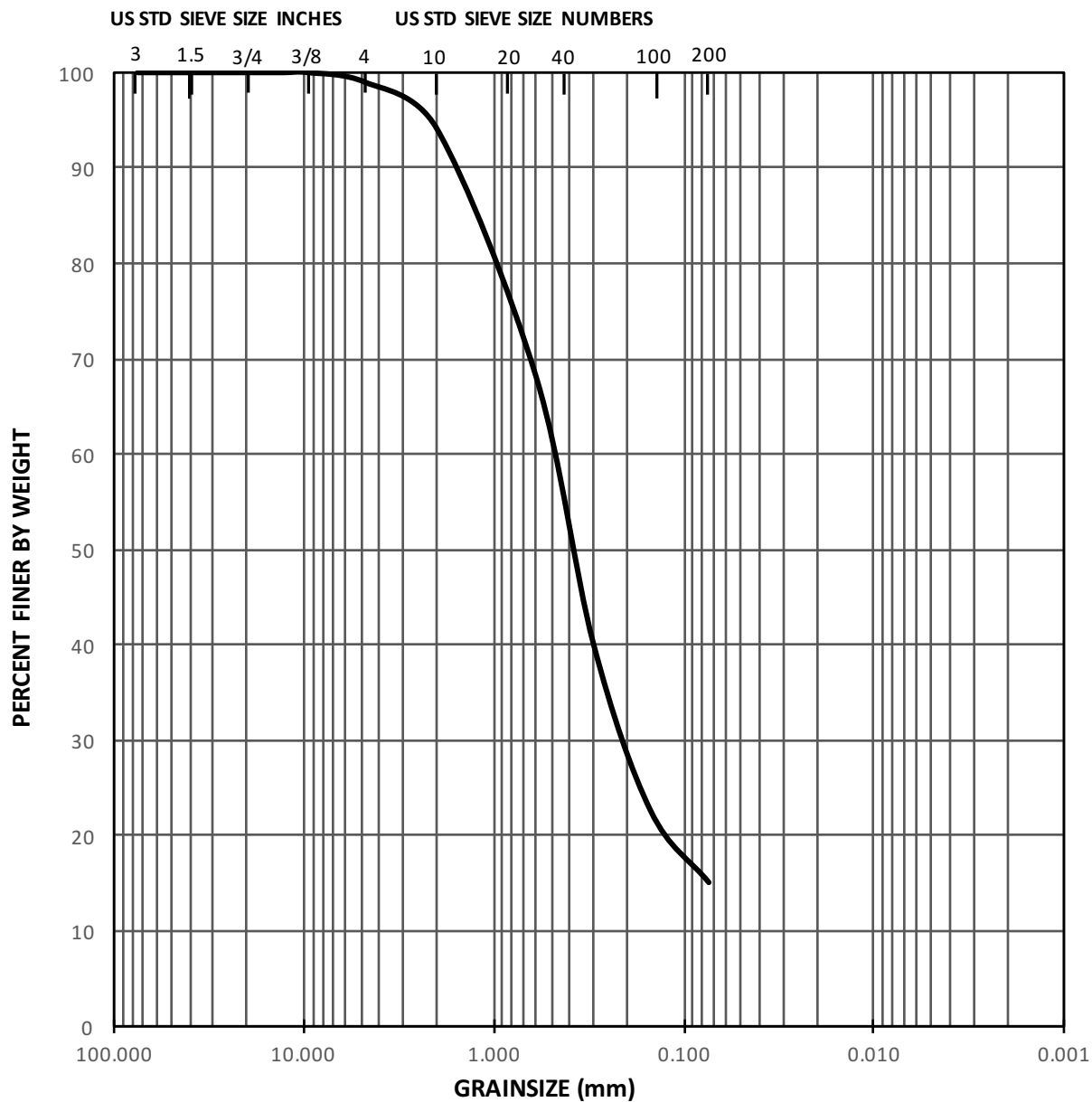
Environmental Laboratory Accreditation Program Certificate No. 1131, Mobile Lab No. 2534, LACSD No. 10138

*Rick Owen Parker*

Authorized Signature(s)

**OAKRIDGE (2017)**

LABORATORY TESTS



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-1

DEPTH10'

CLASSIFICATION

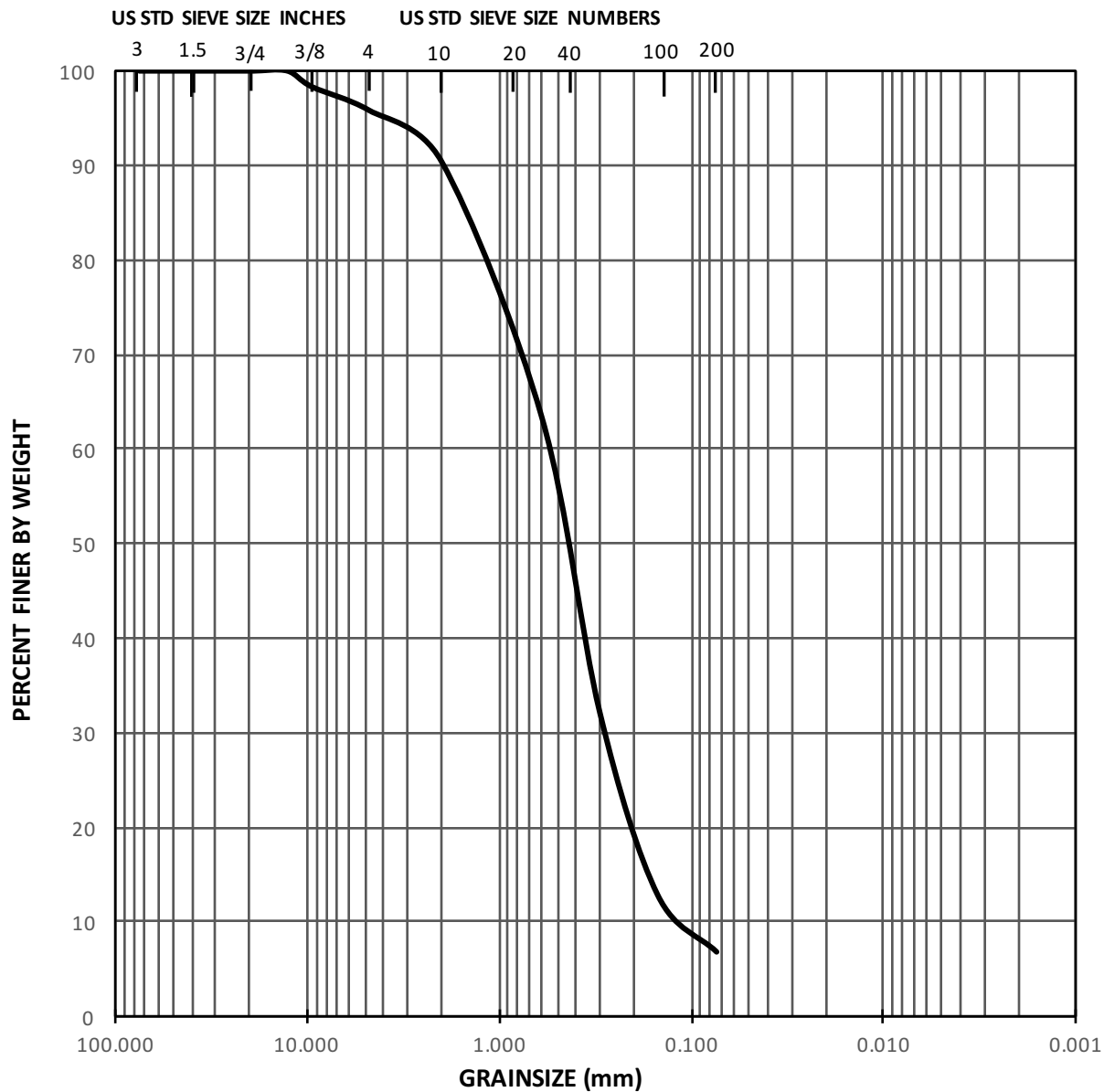
Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)

15

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California





GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-1

DEPTH15'

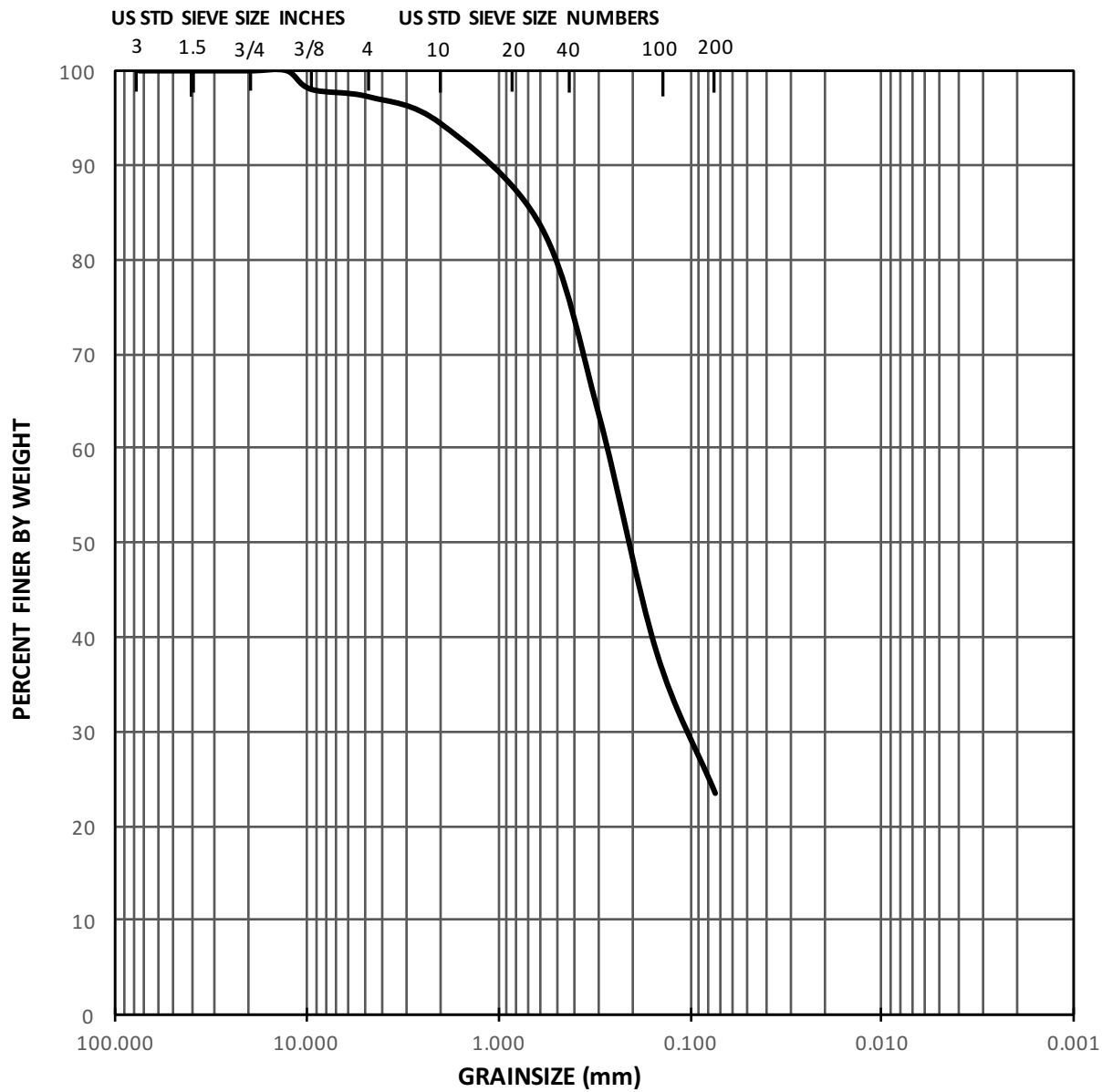
CLASSIFICATION

Fine to Medium SAND with Silt (SP-SM)

PASSING NO. 200 (%)

7

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-1

DEPTH25'

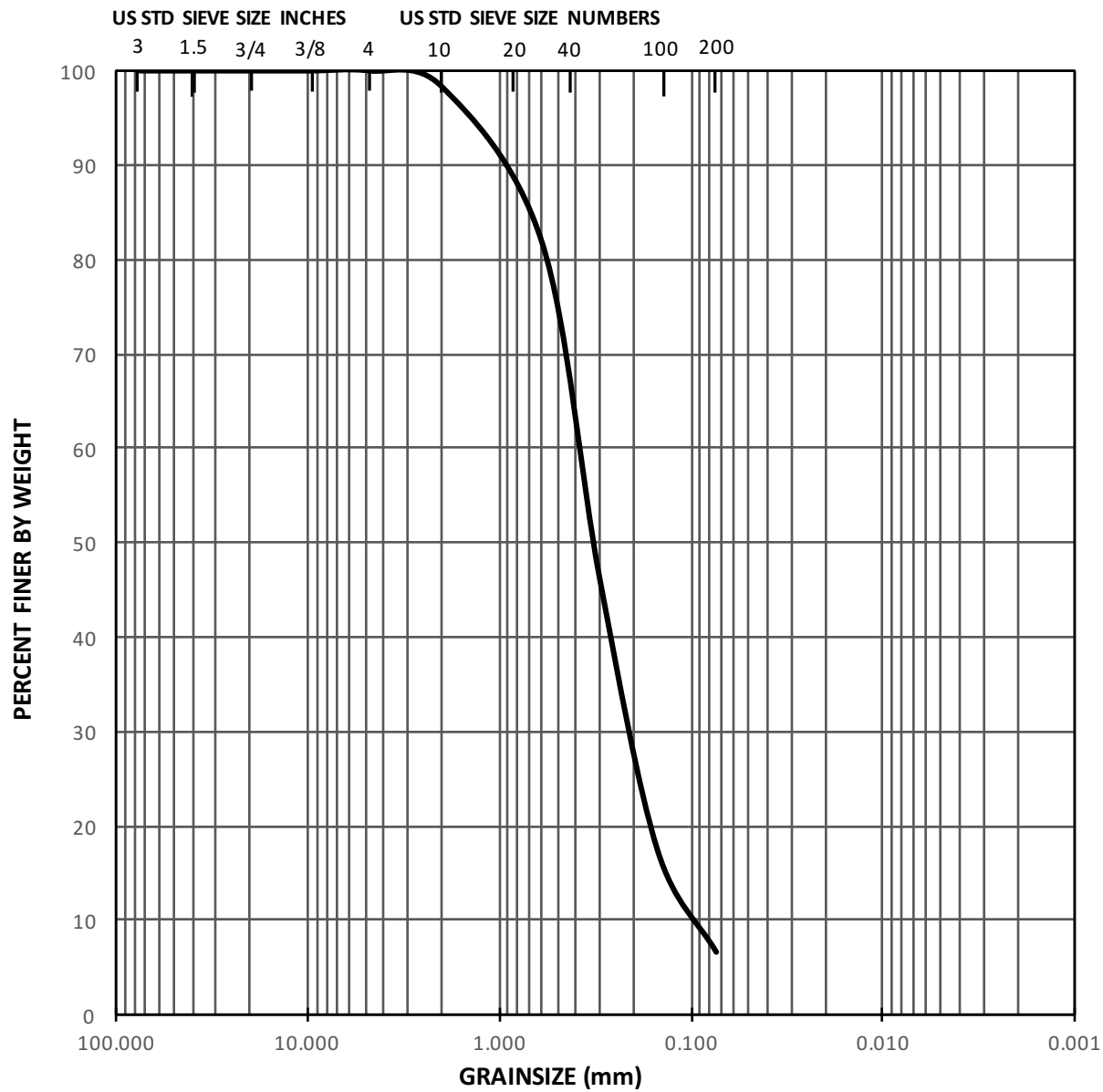
CLASSIFICATION

Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)

23

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-1

DEPTH35'

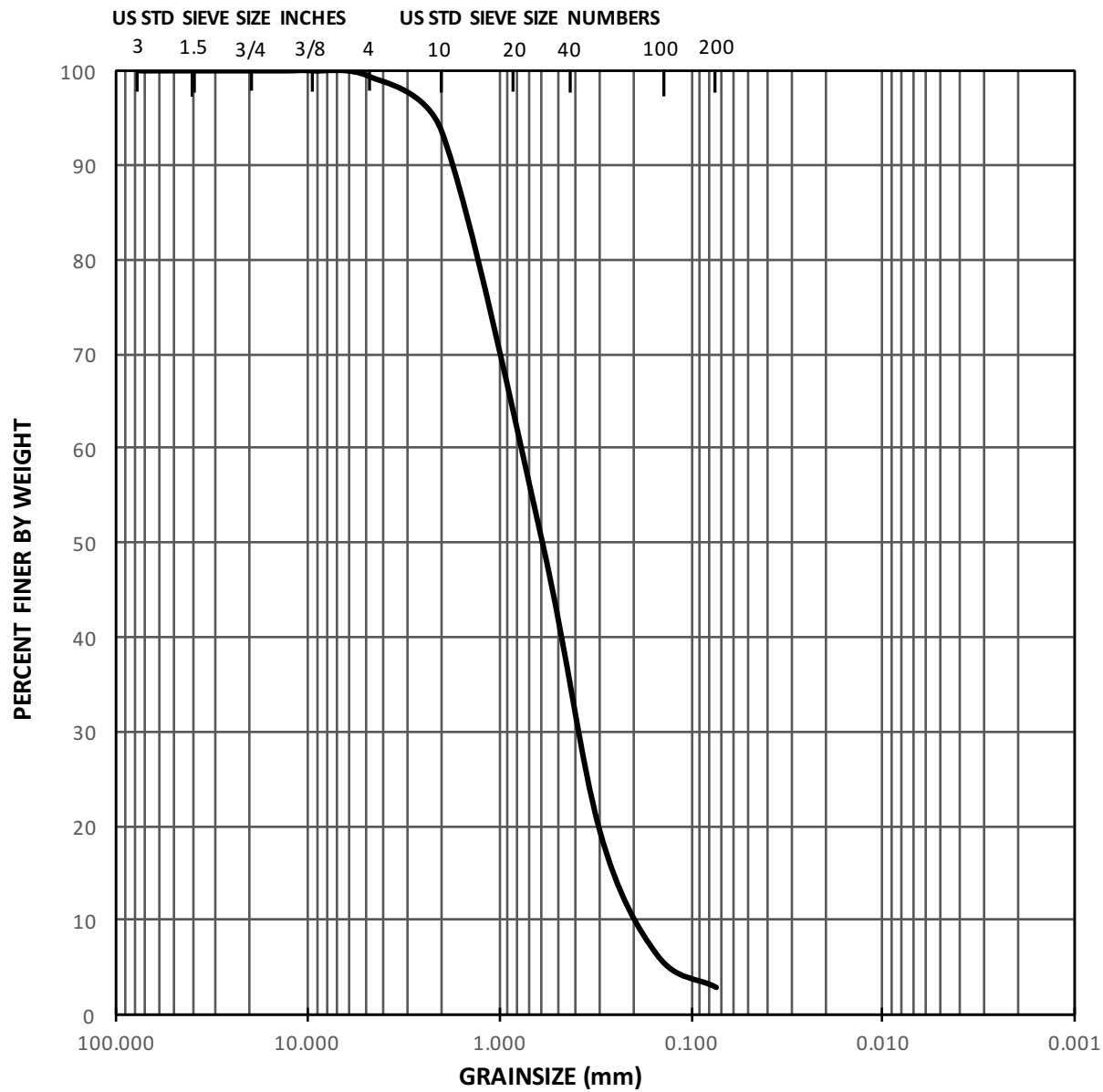
CLASSIFICATION

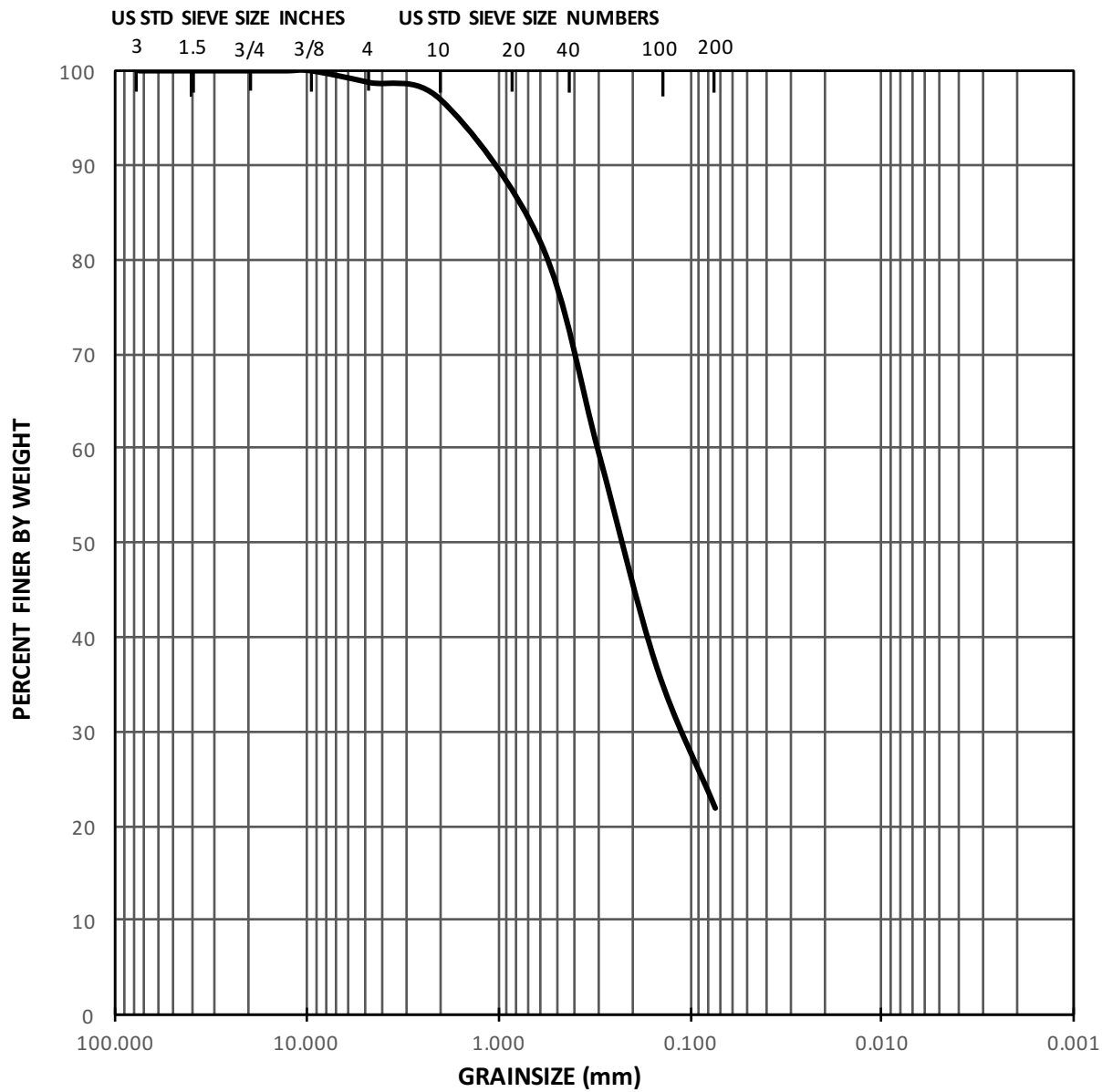
Fine to Medium SAND with Silt (SP-SM)

PASSING NO. 200 (%)

7

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California





GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-2

DEPTH8'

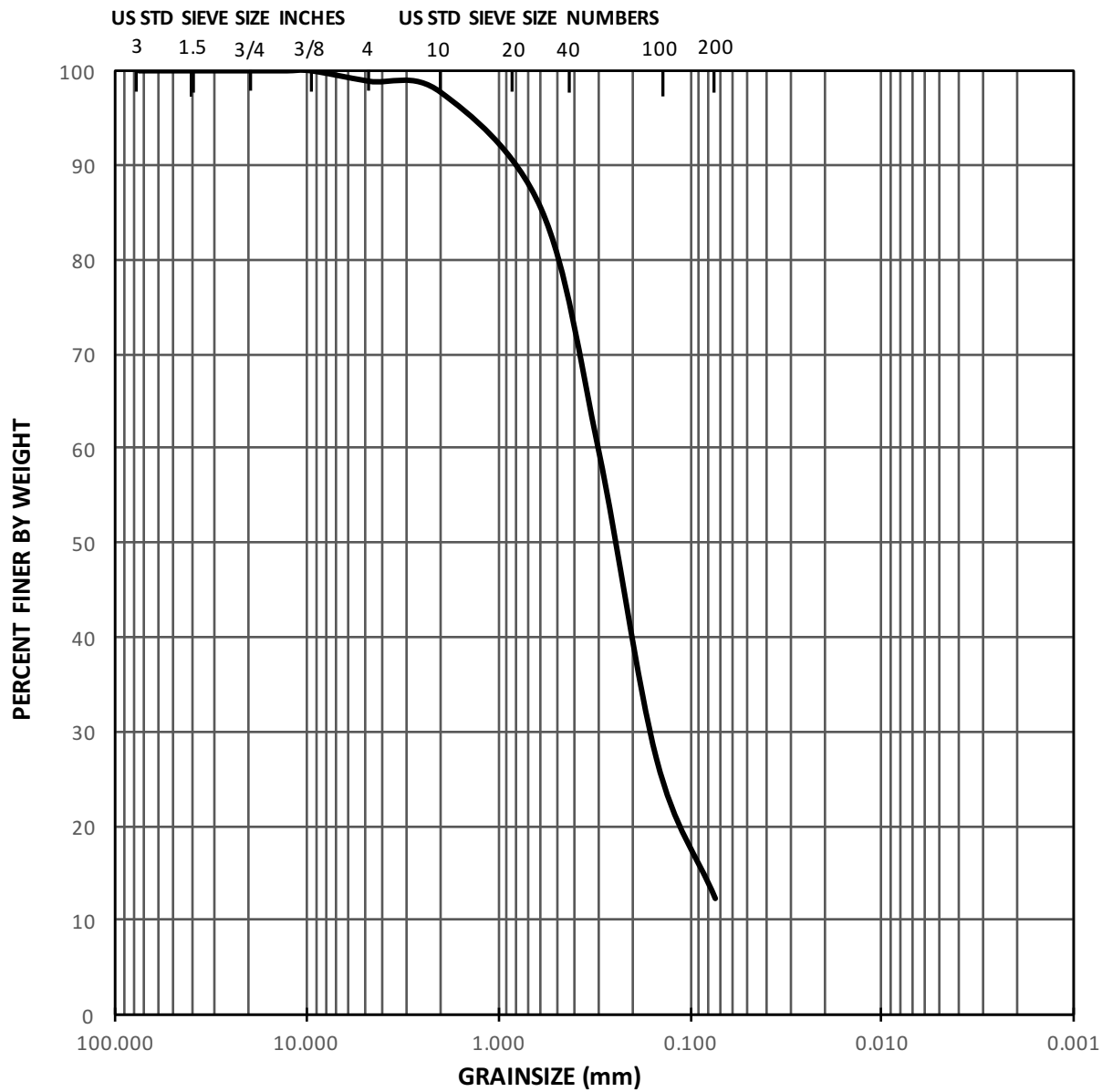
CLASSIFICATION

Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)

22

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION      DH-2

DEPTH      13'

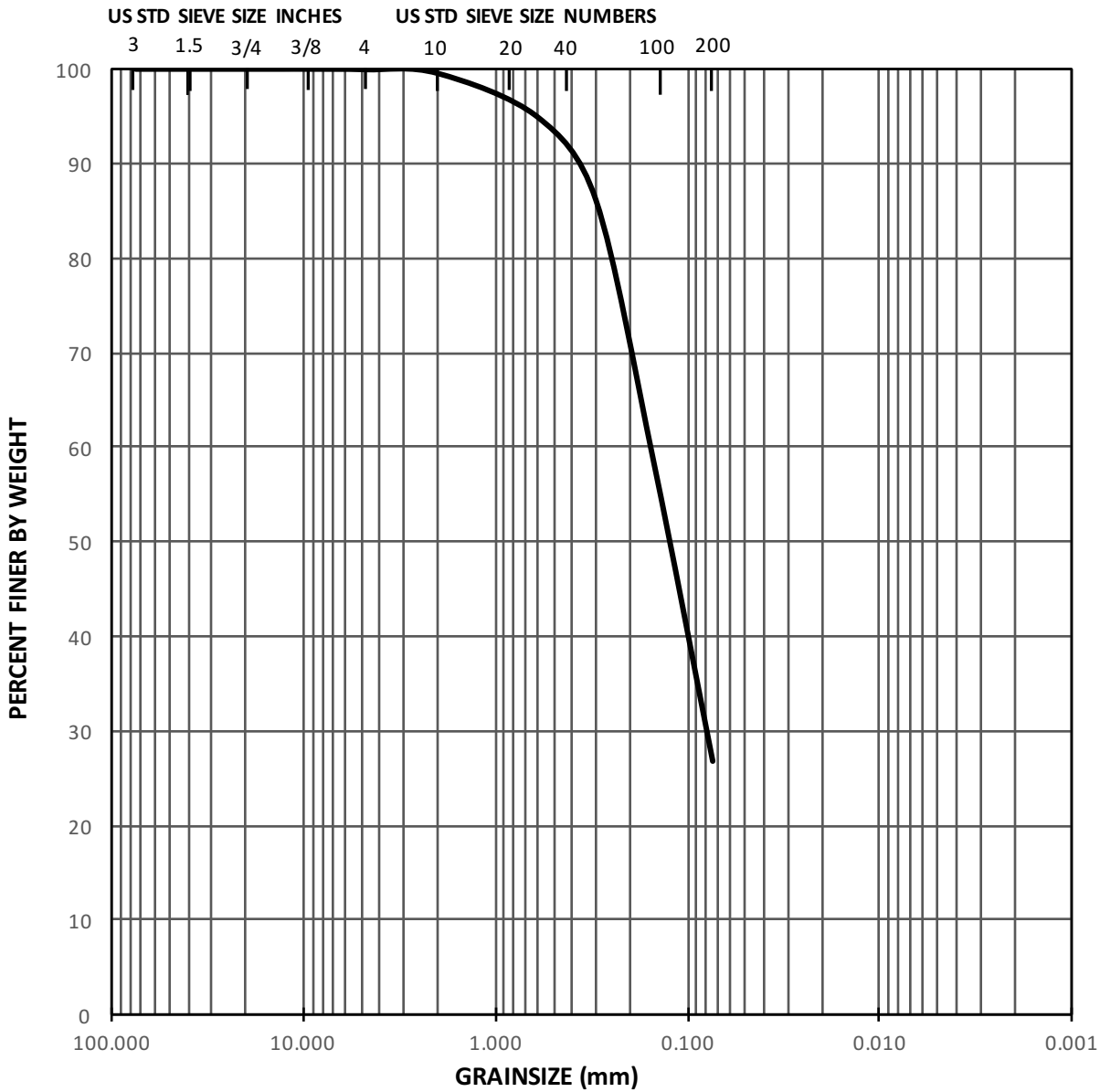
CLASSIFICATION

Fine to Medium SAND with Silt (SP-SM)

PASSING NO. 200 (%)

12

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-2

DEPTH15'

CLASSIFICATION

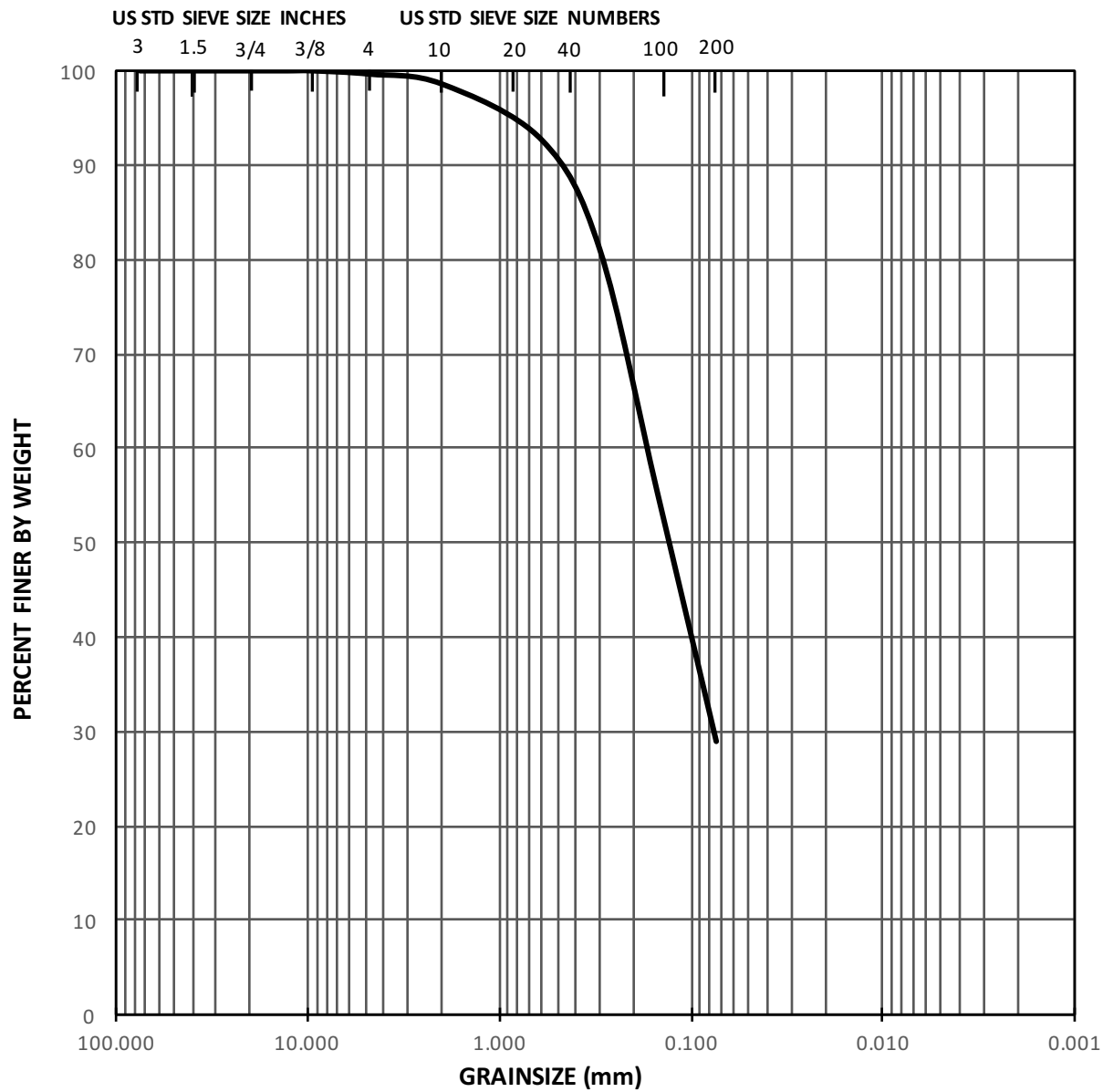
Silty Fine SAND (SM)

PASSING NO. 200 (%)

27

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California





GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-2

DEPTH25'

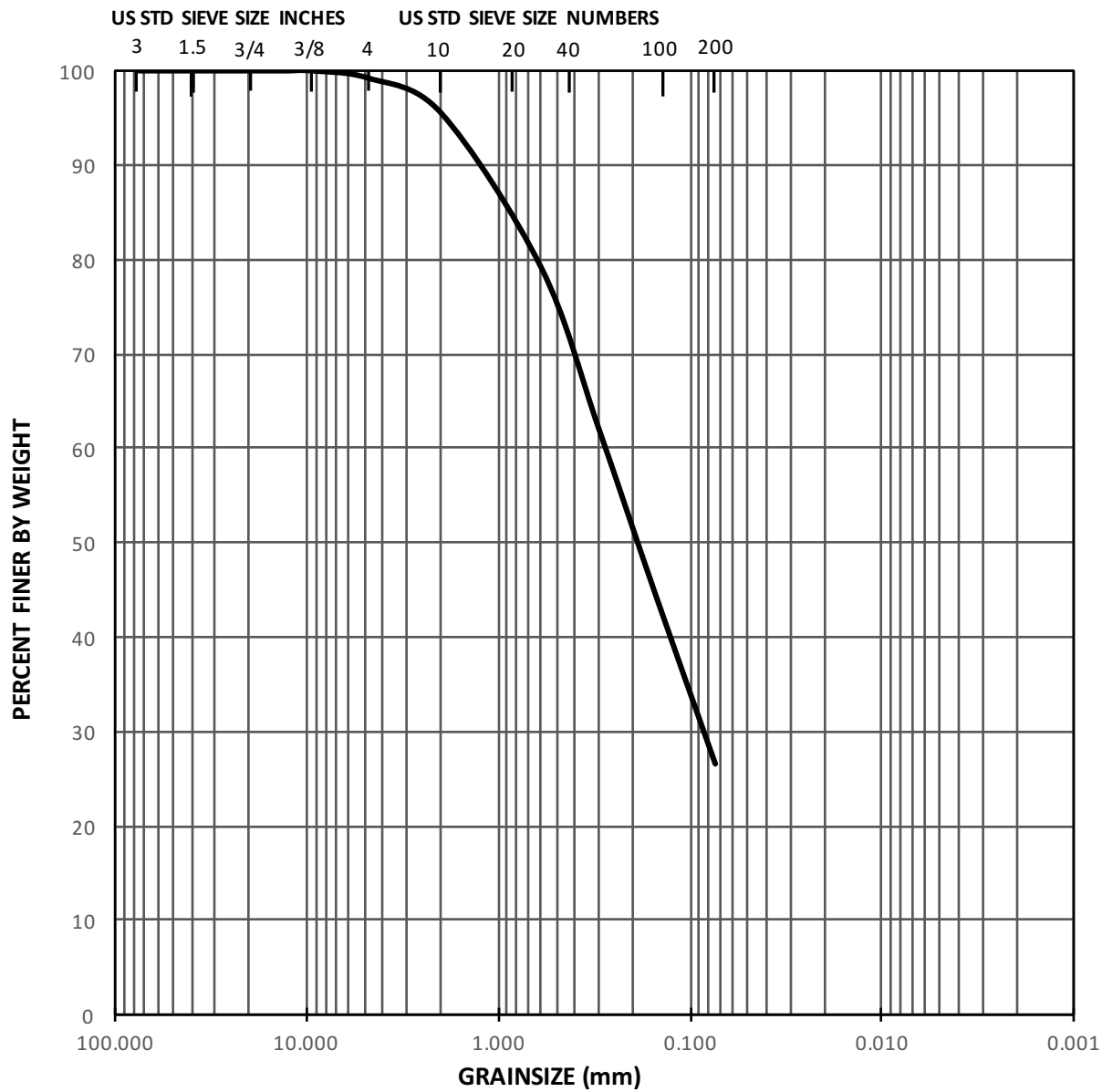
CLASSIFICATION

Silty Fine SAND (SM)

PASSING NO. 200 (%)

29

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATIONDH-2

DEPTH34'

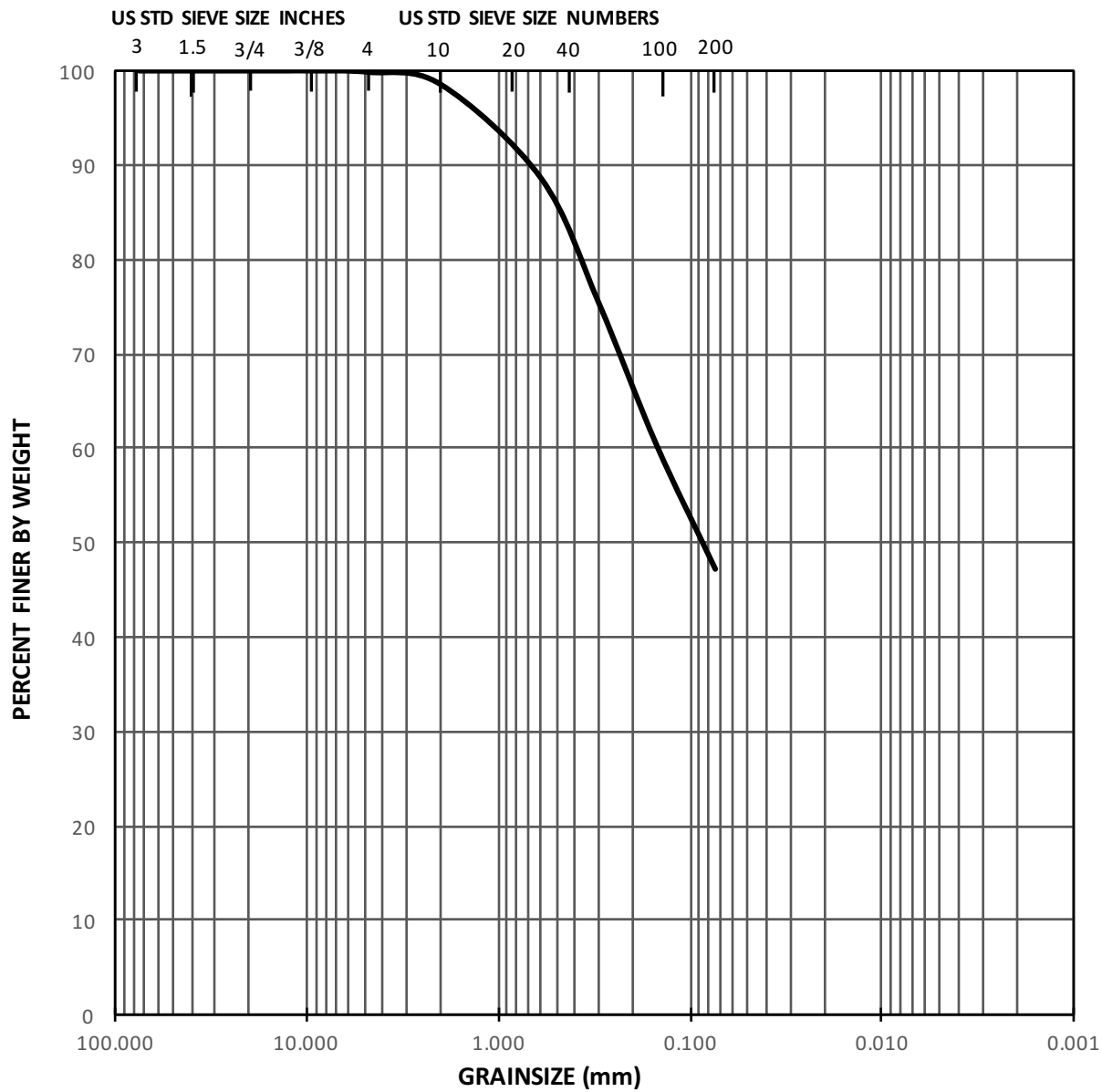
CLASSIFICATION

Clayey Fine to Medium SAND (SC)

PASSING NO. 200 (%)

27

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION    DH-2

DEPTH     42'

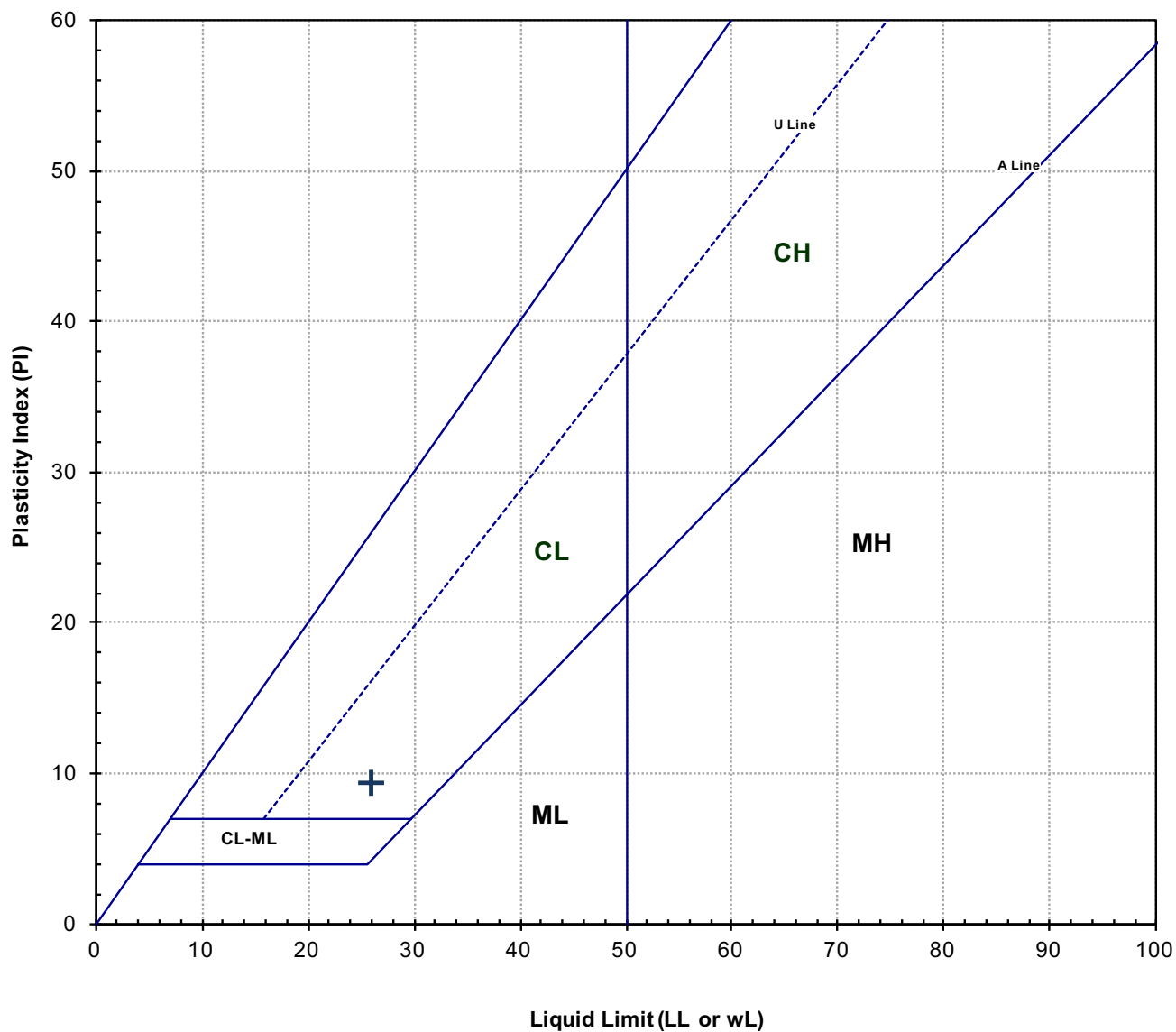
CLASSIFICATION

Sandy Silty CLAY (CL-ML)

PASSING NO. 200 (%)

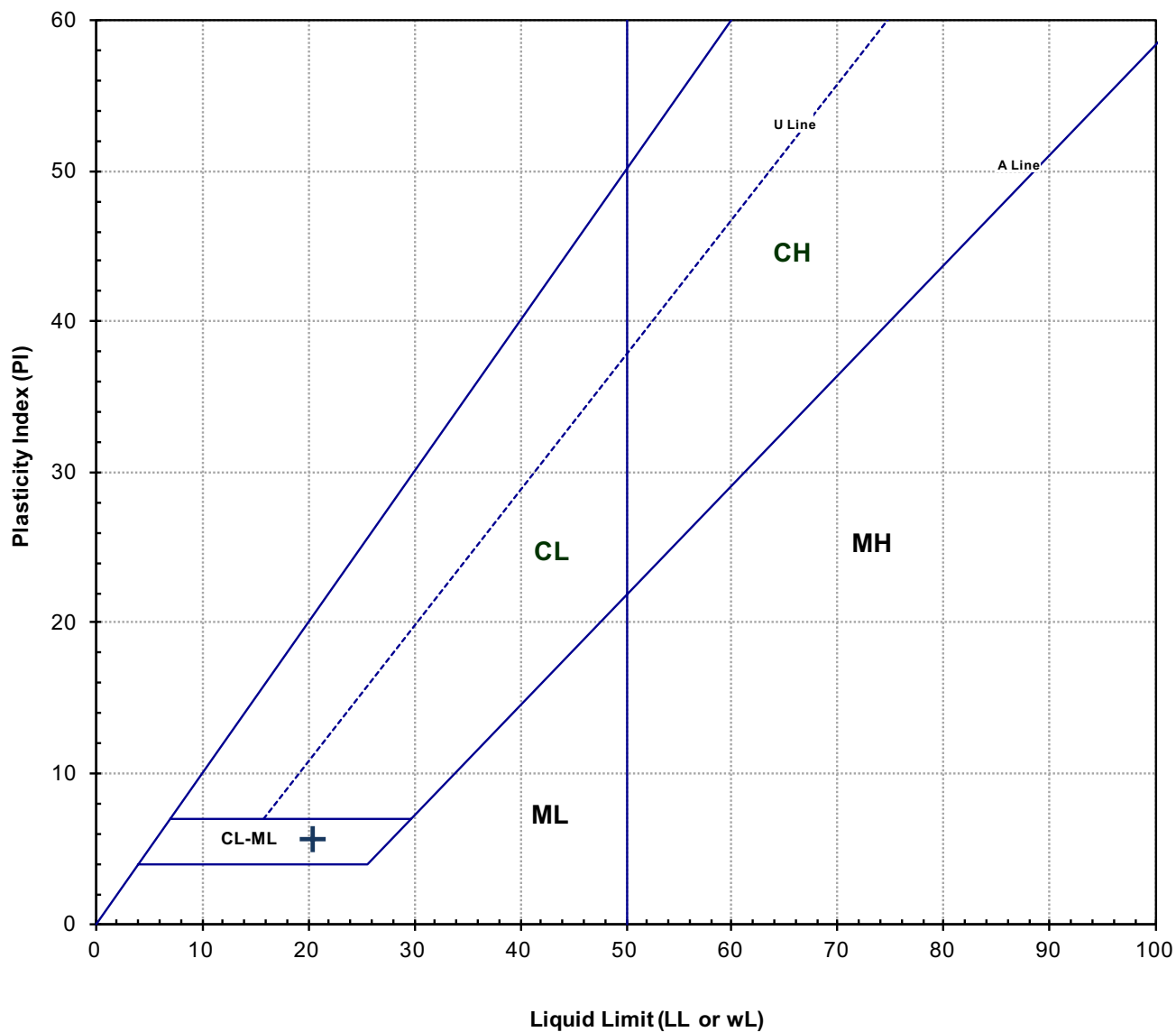
47

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



<u>LOCATION</u>	<u>DEPTH</u>	<u>CLASSIFICATION</u>	LIQUID	PLASTIC	PLASTICITY
			LIMIT	LIMIT	INDEX
DH-1	67'	Clayey SAND (SC)	(LL)	(PL)	(PI)
			26	17	9

MOORPARK LIBRARY  
Moorpark, California

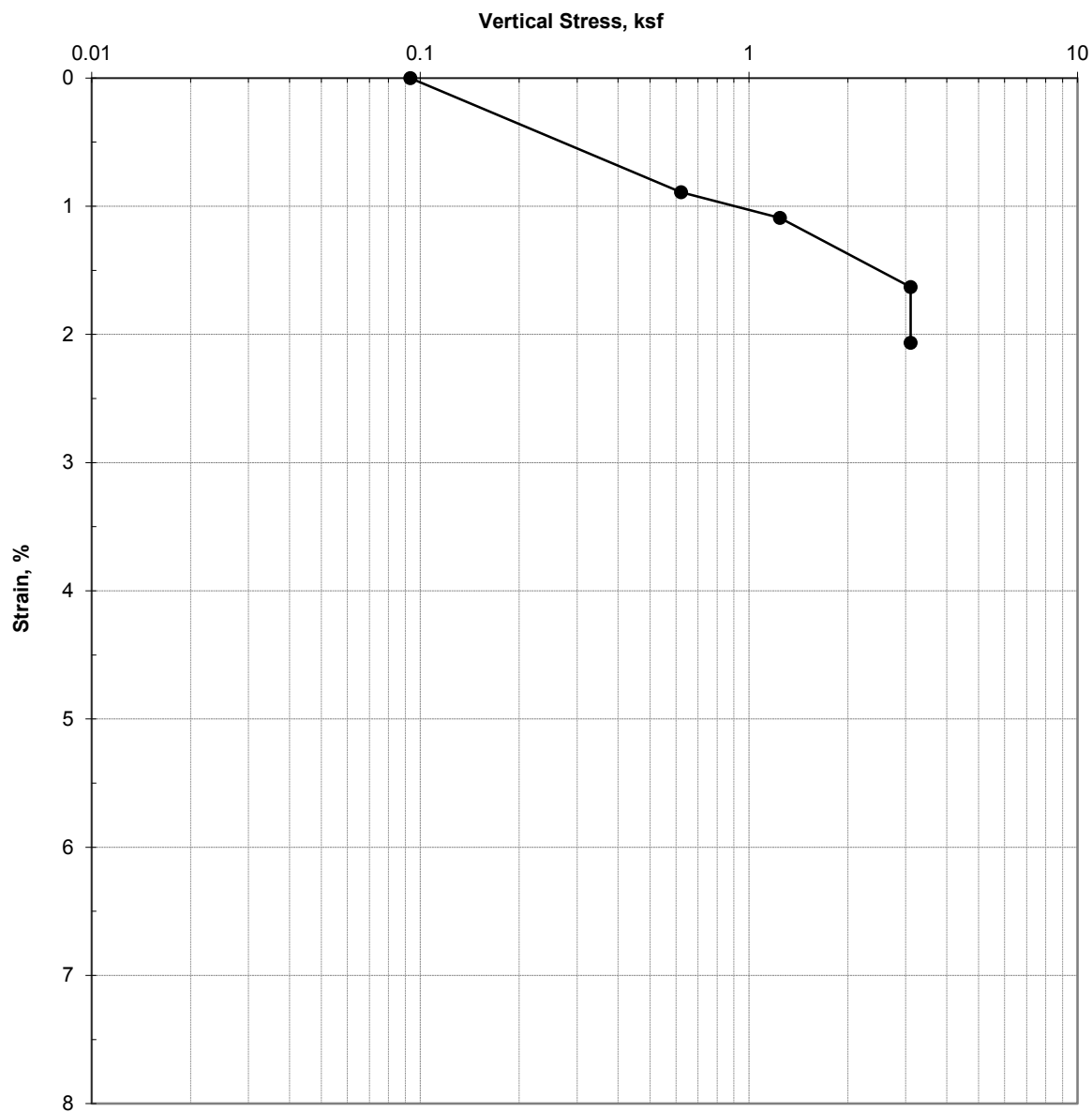


<u>LOCATION</u>	DH-2
<u>DEPTH</u>	40'

CLASSIFICATION  
Sandy Silty CLAY (CL-ML)

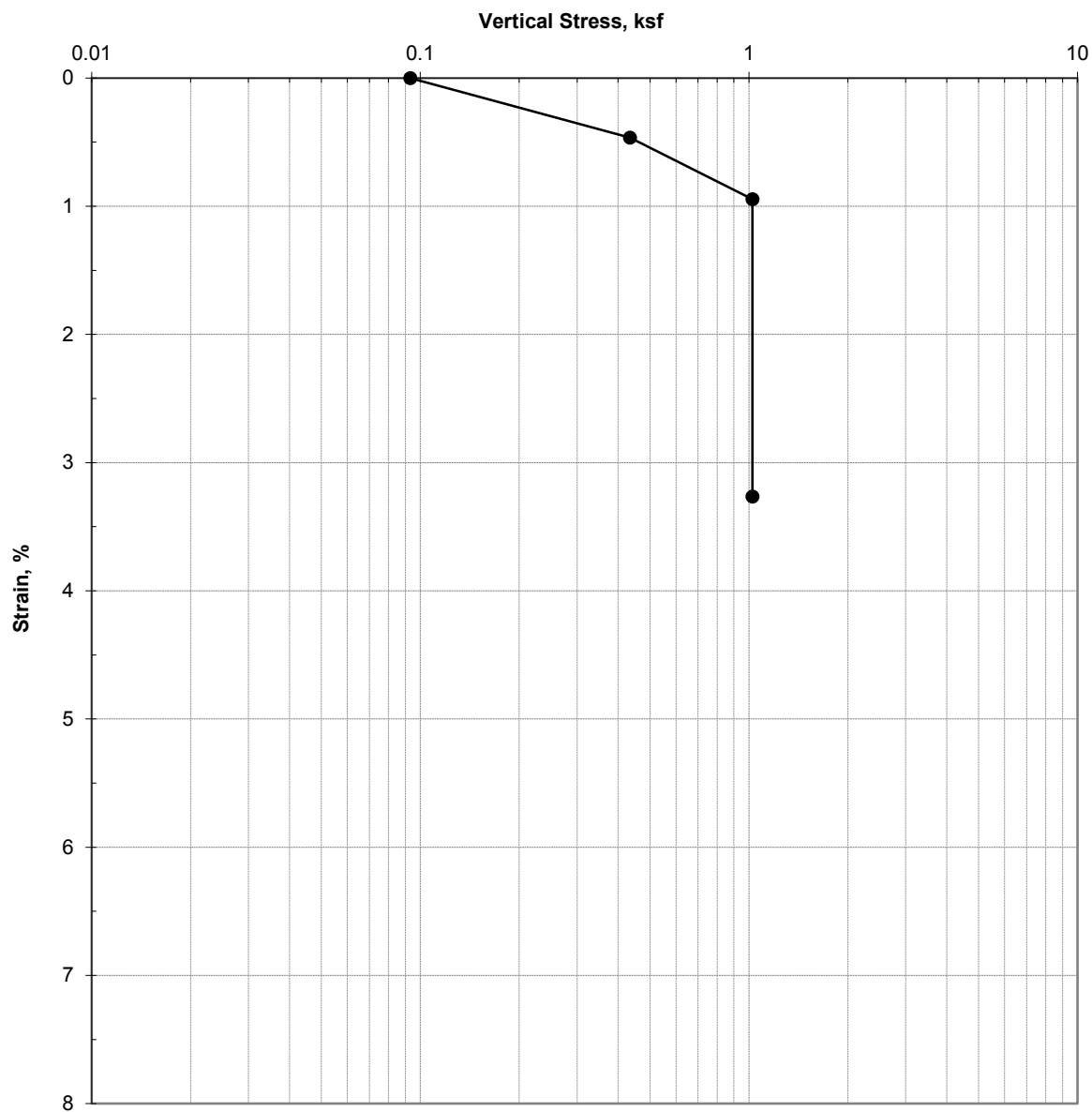
LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
21	15	6

MOORPARK LIBRARY  
Moorpark, California



SAMPLE ID	Boring, Sample #, Depth		DH-1 , #10 , 30.0 ft	SUMMARY	Preconsolidation Pressure, ksf		---
	USCS Classification:		Poorly-graded SAND (SP): yellow, dry		Inundation Increment, ksf		3.11
PROPERTIES					Liquid Limit		---
					Plastic Limit		---
					Plasticity Index		---
					Passing #200		---
					Estimated Gs		2.65
REMARKS				Test Method: ASTM D4546, Method B			
				030.003 - Moorpark Library			
				After adding water the specimen collapsed 0.43% at a stress of 3.11ksf.			

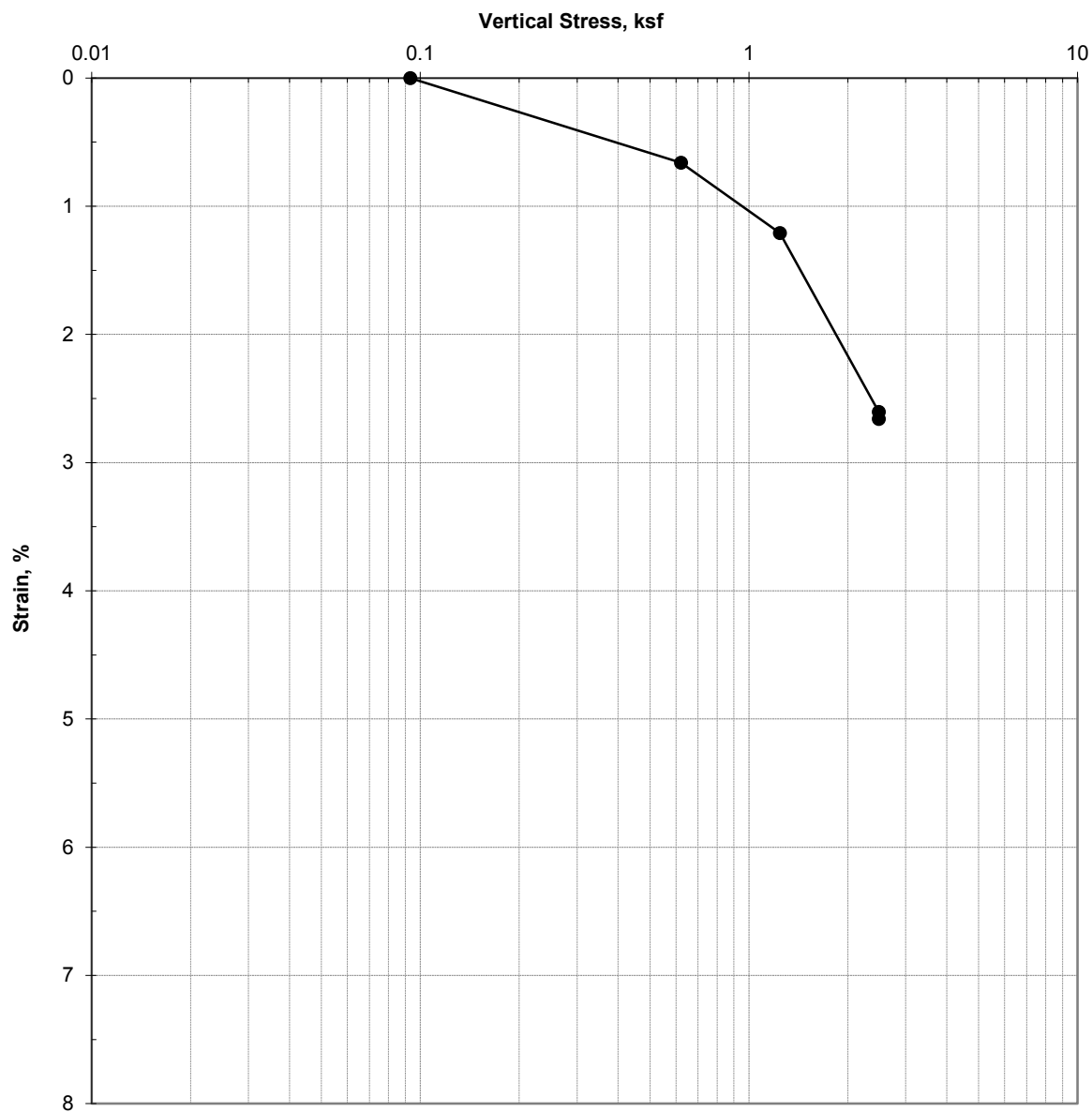
# ONE DIMENSIONAL COLLAPSE TEST



SAMPLE ID	Boring, Sample #, Depth	DH-2 , #5 , 10.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND with silt (SP-SM): light brown, dry, lightly cemented			Inundation Increment, ksf	1.03
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	3.5%	21.0%		Plastic Limit	---
	Dry Unit Weight, pcf	96.9	100.1		Plasticity Index	---
	Saturation, %	13%	85%		Passing #200	---
	Void Ratio	0.71	0.65		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B	
	Height, in	1.00	0.97		030.003 - Moorpark Library	
				After adding water the specimen collapsed 2.32% at a stress of 1.03ksf.		

# ONE DIMENSIONAL COLLAPSE TEST





SAMPLE ID	Boring, Sample #, Depth	DH-2 , #9 , 25.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND (SP): yellow brown, moist, fine			Inundation Increment, ksf	2.49
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	5.6%	24.6%		Plastic Limit	---
	Dry Unit Weight, pcf	89.9	92.4		Plasticity Index	---
	Saturation, %	18%	82%		Passing #200	---
	Void Ratio	0.84	0.79		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library After adding water the specimen collapsed 0.05% at a stress of 2.49ksf.	
	Height, in	1.00	0.97			

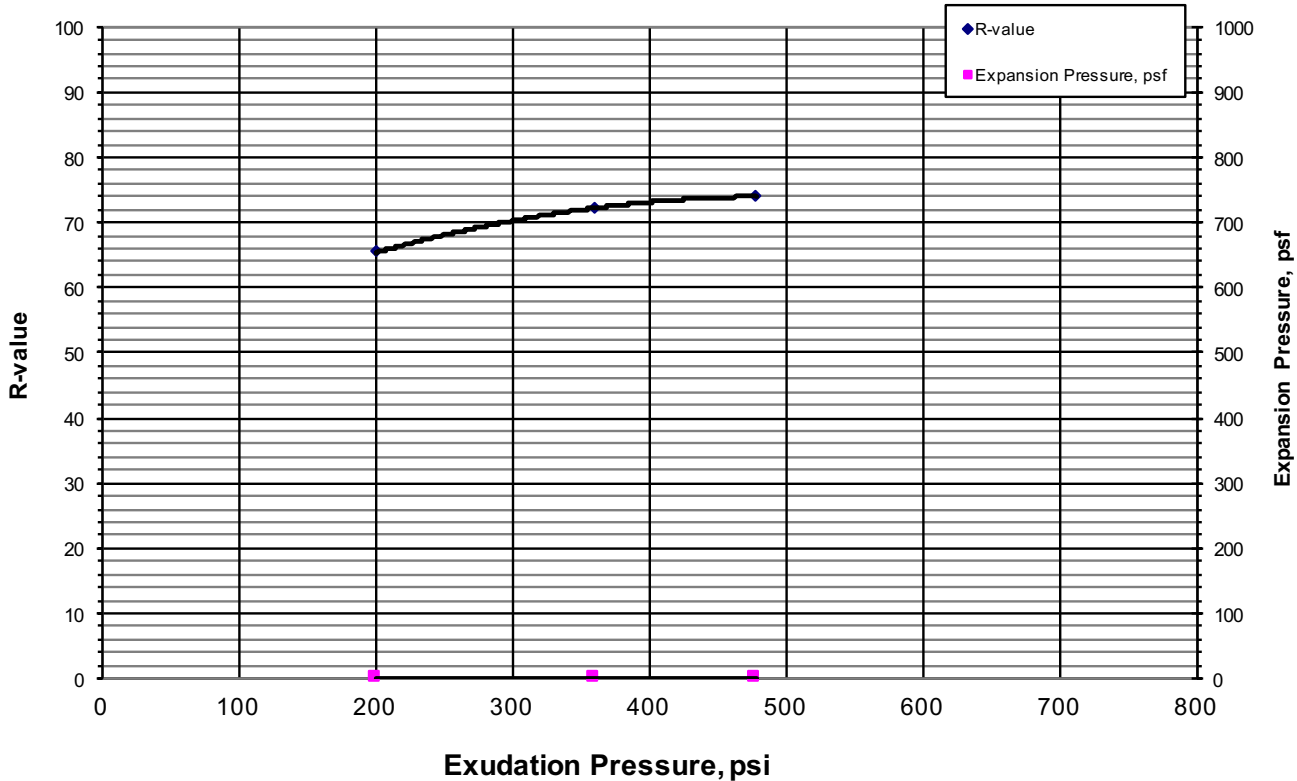
## ONE DIMENSIONAL COLLAPSE TEST



# R-value Test Report (Caltrans 301)

<b>Job No.:</b> 903-017	<b>Date:</b> 05/22/17	<b>Initial Moisture,</b> 6.6
<b>Client:</b> Oakridge Geoscience	<b>Tested</b> PJ	<b>R-value</b> 70
<b>Project:</b> Moorpark Library - 030.003	<b>Reduced</b> RU	<b>Expansion Pressure</b> 0 psf
<b>Sample</b> DH-1 @ 0-5'	<b>Checked</b> DC	
<b>Soil Type:</b> Brown SAND w/ Silt		

Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	200	360	478		
Prepared Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	60	50	45		
Weight of Soil & Mold, grams	3137	3143	3132		
Weight of Mold, grams	2083	2090	2089		
Height After Compaction, in.	2.50	2.50	2.42		
Moisture Content, %	11.9	11.0	10.6		
Dry Density, pcf	114.2	115.0	118.2		
Expansion Pressure, psf	0	0	0		
Stabilometer @ 1000					
Stabilometer @ 2000	34	26	22		
Turns Displacement	4.90	4.95	5.15		
R-value	65	72	74		





Checked: PJ  
Proj. No: 030.003

[illegible]

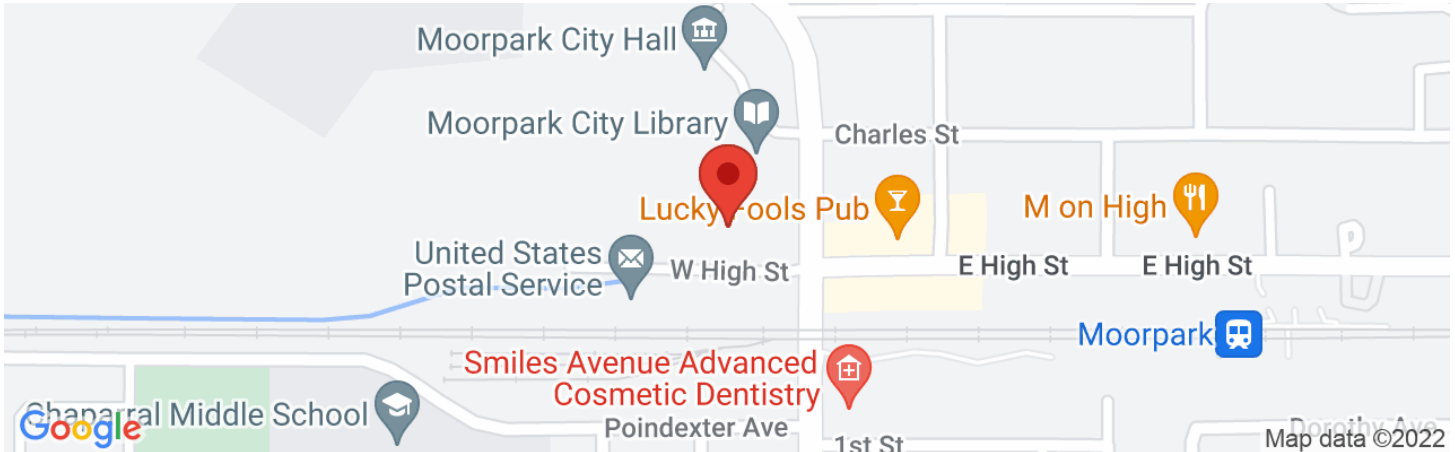
## **APPENDIX D**

### **SEISMIC DESIGN PARAMETERS**



# Moorpark Library

Latitude, Longitude: 34.2857, -118.8829



Date	10/6/2022, 11:42:51 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
$S_S$	1.89	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.697	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	1.89	Site-modified spectral acceleration value
$S_{M1}$	null -See Section 11.4.8	Site-modified spectral acceleration value
$S_{DS}$	1.26	Numeric seismic design value at 0.2 second SA
$S_{D1}$	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
$F_a$	1	Site amplification factor at 0.2 second
$F_v$	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.824	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.1	Site amplification factor at PGA
$PGA_M$	0.906	Site modified peak ground acceleration
$T_L$	8	Long-period transition period in seconds
$S_{sRT}$	1.89	Probabilistic risk-targeted ground motion. (0.2 second)
$S_{sUH}$	2.117	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$S_{sD}$	2.364	Factored deterministic acceleration value. (0.2 second)
$S_{1RT}$	0.697	Probabilistic risk-targeted ground motion. (1.0 second)
$S_{1UH}$	0.782	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S_{1D}$	0.764	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.966	Factored deterministic acceleration value. (Peak Ground Acceleration)
$PGA_{UH}$	0.824	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
$C_{RS}$	0.893	Mapped value of the risk coefficient at short periods

Type	Value	Description
C <sub>R1</sub>	0.892	Mapped value of the risk coefficient at a period of 1 s
C <sub>V</sub>	1.478	Vertical coefficient

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# Unified Hazard Tool



Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the [U.S. Seismic Design Maps web tools](#) (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

## ^ Input

### Edition

Dynamic: Conterminous U.S. 2014 (u...

### Spectral Period

Peak Ground Acceleration

### Latitude

Decimal degrees

34.2857

### Time Horizon

Return period in years

2475

### Longitude

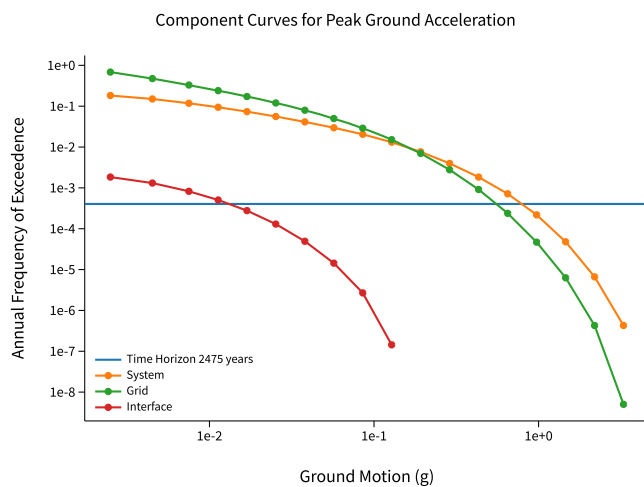
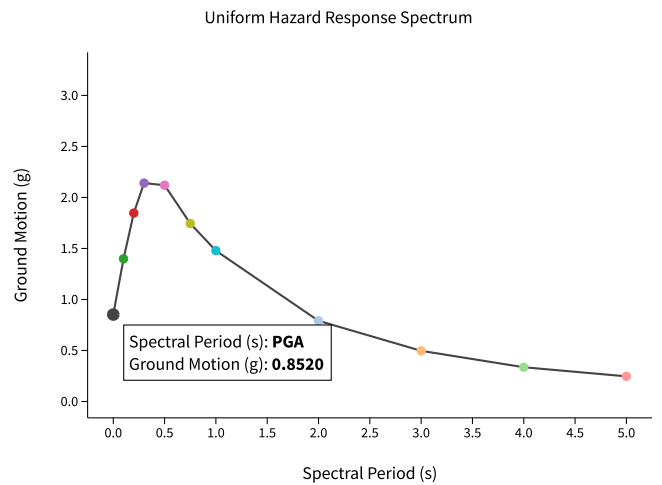
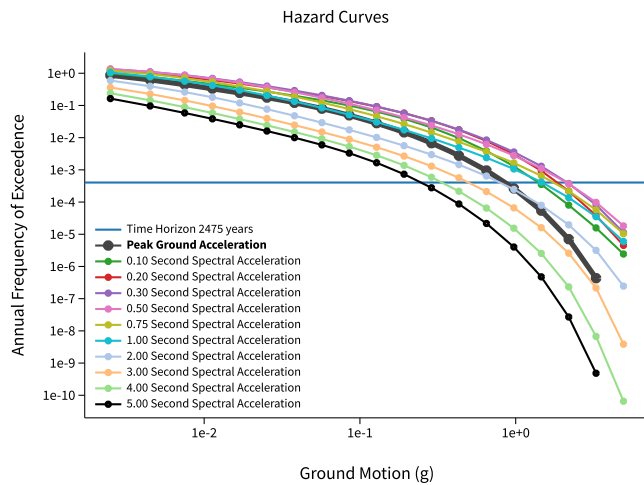
Decimal degrees, negative values for western longitudes

-118.8829

### Site Class

259 m/s (Site class D)

^ Hazard Curve

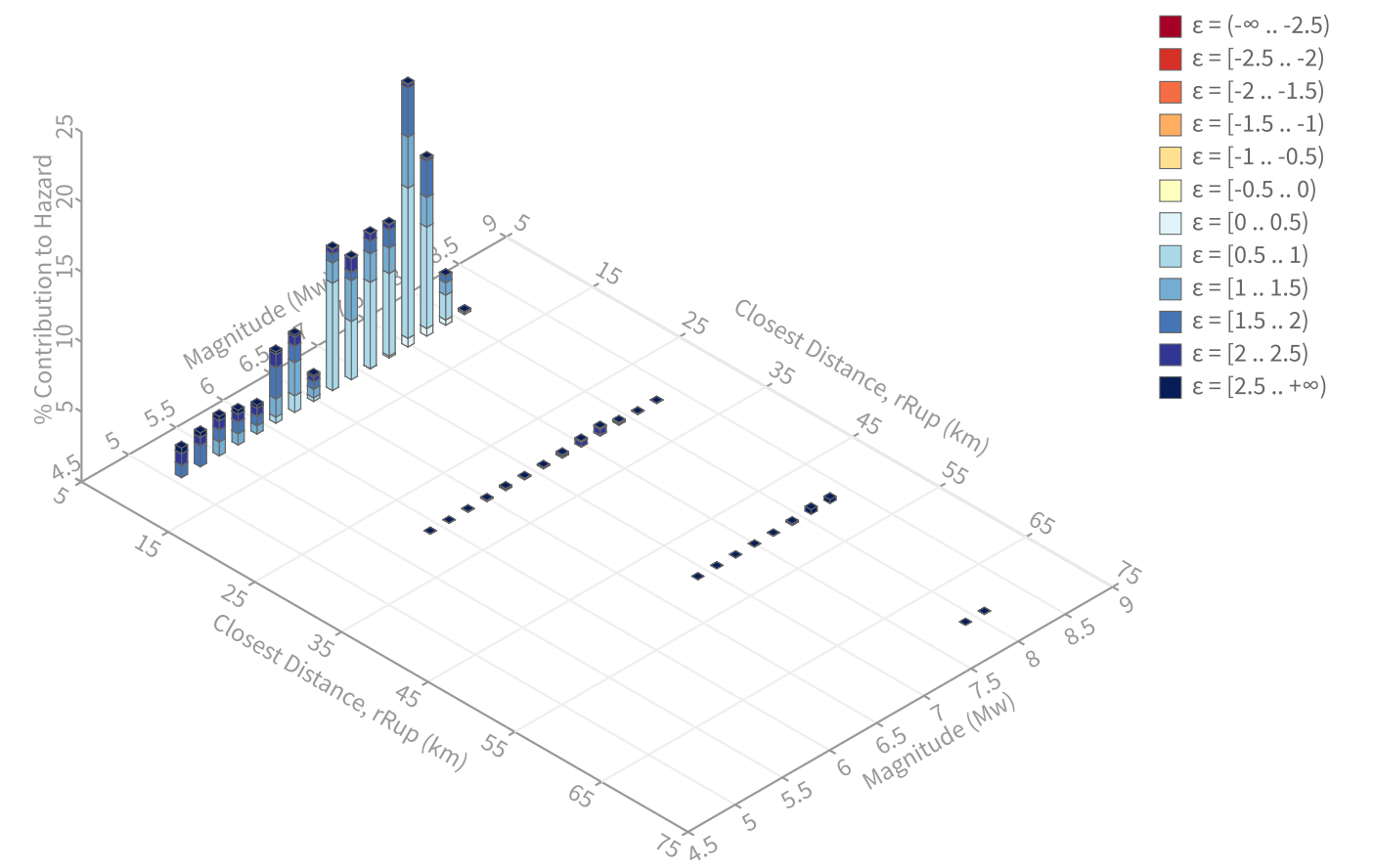


[View Raw Data](#)

^ Deaggregation

Component

Total



# Summary statistics for, Deaggregation: Total

## Deaggregation targets

**Return period:** 2475 yrs  
**Exceedance rate:** 0.0004040404 yr<sup>-1</sup>  
**PGA ground motion:** 0.85195989 g

## Recovered targets

**Return period:** 2917.5722 yrs  
**Exceedance rate:** 0.00034275072 yr<sup>-1</sup>

## Totals

**Binned:** 100 %  
**Residual:** 0 %  
**Trace:** 0.03 %

## Mean (over all sources)

**m:** 6.97  
**r:** 8.3 km  
**ε<sub>0</sub>:** 1.27 σ

## Mode (largest m-r bin)

**m:** 7.52  
**r:** 9.43 km  
**ε<sub>0</sub>:** 1.07 σ  
**Contribution:** 18.77 %

## Mode (largest m-r-ε<sub>0</sub> bin)

**m:** 7.52  
**r:** 8.83 km  
**ε<sub>0</sub>:** 0.83 σ  
**Contribution:** 10.73 %

## Discretization

**r:** min = 0.0, max = 1000.0, Δ = 20.0 km  
**m:** min = 4.4, max = 9.4, Δ = 0.2  
**ε:** min = -3.0, max = 3.0, Δ = 0.5 σ

## Epsilon keys

- ε0:** [-∞ .. -2.5)
- ε1:** [-2.5 .. -2.0)
- ε2:** [-2.0 .. -1.5)
- ε3:** [-1.5 .. -1.0)
- ε4:** [-1.0 .. -0.5)
- ε5:** [-0.5 .. 0.0)
- ε6:** [0.0 .. 0.5)
- ε7:** [0.5 .. 1.0)
- ε8:** [1.0 .. 1.5)
- ε9:** [1.5 .. 2.0)
- ε10:** [2.0 .. 2.5)
- ε11:** [2.5 .. +∞]

# Deaggregation Contributors

Source Set	Source	Type	r	m	$\epsilon_0$	lon	lat	az	%
UC33brAvg_FM32		System							41.29
	Oak Ridge (Onshore) [3]		9.66	7.50	1.04	118.908°W	34.367°N	345.43	16.14
	Simi-Santa Rosa [3]		3.40	7.00	0.92	118.871°W	34.264°N	155.78	14.62
	San Cayetano [1]		14.94	7.54	1.80	118.866°W	34.419°N	6.09	2.54
	Simi-Santa Rosa [2]		3.40	6.52	1.05	118.871°W	34.264°N	155.78	2.19
	Oak Ridge (Onshore) [2]		9.82	6.87	1.24	118.929°W	34.362°N	333.32	1.24
UC33brAvg_FM31		System							40.30
	Oak Ridge (Onshore) [3]		9.66	7.59	1.01	118.908°W	34.367°N	345.43	15.79
	Simi-Santa Rosa [3]		3.40	7.02	0.91	118.871°W	34.264°N	155.78	15.45
	San Cayetano [1]		14.94	7.61	1.76	118.866°W	34.419°N	6.09	2.02
	Simi-Santa Rosa [2]		3.40	6.58	1.03	118.871°W	34.264°N	155.78	1.71
	Oak Ridge (Onshore) [2]		9.82	6.96	1.20	118.929°W	34.362°N	333.32	1.45
UC33brAvg_FM31 (opt)		Grid							9.21
	PointSourceFinite: -118.883, 34.308		5.76	5.57	1.60	118.883°W	34.308°N	0.00	2.09
	PointSourceFinite: -118.883, 34.308		5.76	5.57	1.60	118.883°W	34.308°N	0.00	2.09
UC33brAvg_FM32 (opt)		Grid							9.19
	PointSourceFinite: -118.883, 34.308		5.76	5.57	1.60	118.883°W	34.308°N	0.00	2.10
	PointSourceFinite: -118.883, 34.308		5.76	5.57	1.60	118.883°W	34.308°N	0.00	2.10

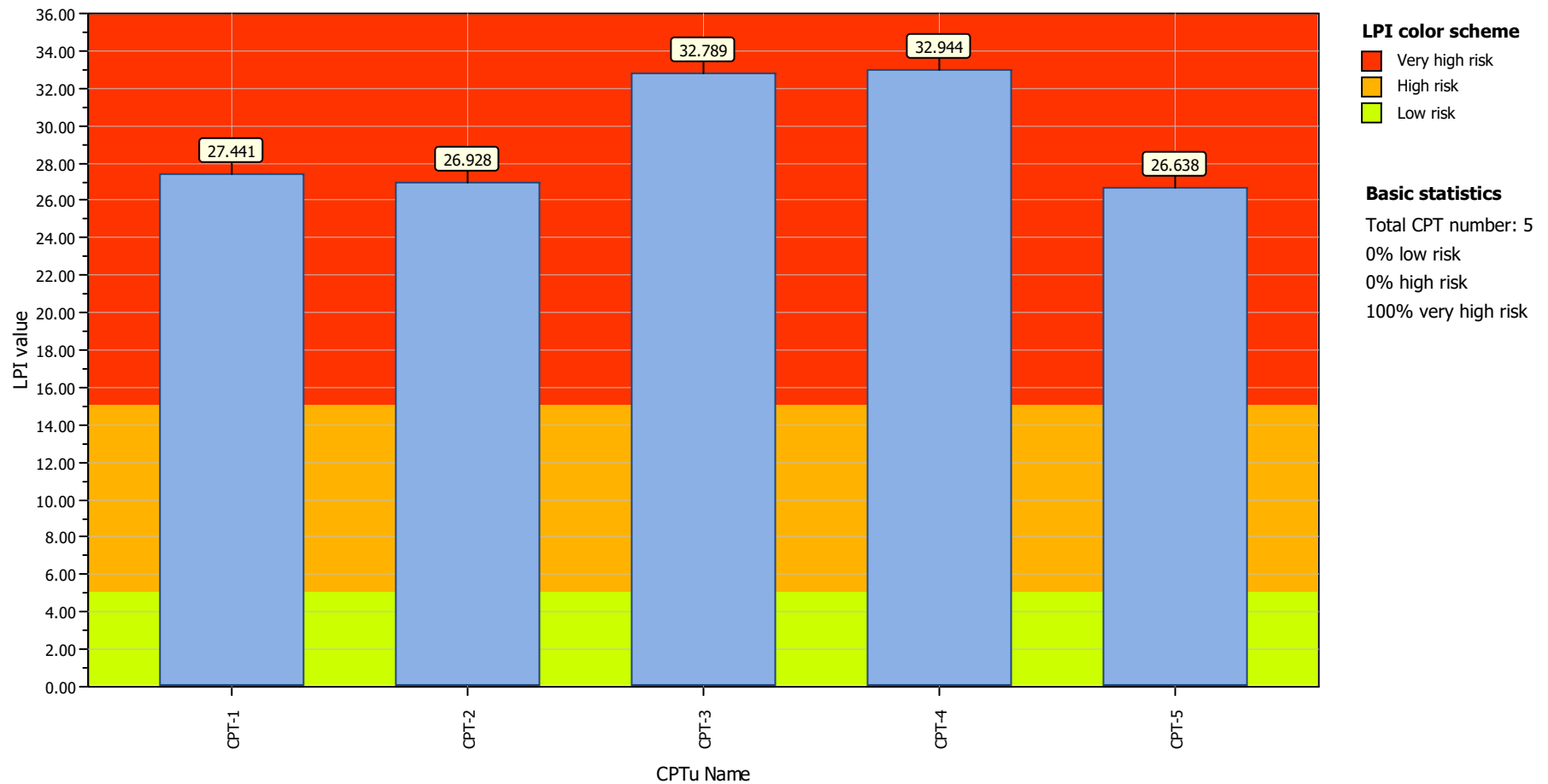
## **APPENDIX E**

### **LIQUEFACTION ANALYSIS**

**Project title : Moorpark Library**

**Location : NWC West High Street and Moorpark Ave**

## Overall Liquefaction Potential Index report

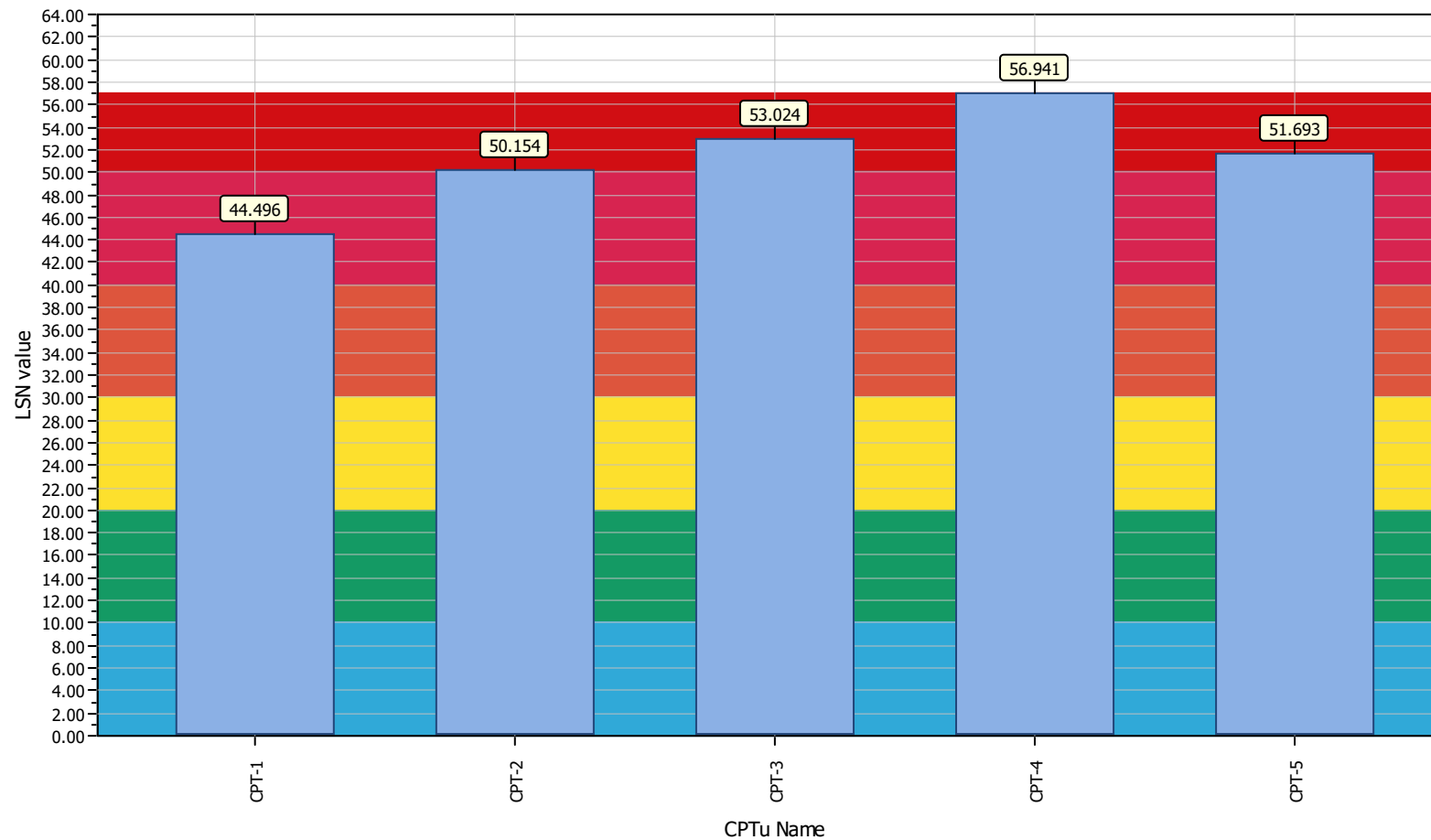




**Project title : Moorpark Library**

**Location : NWC West High Street and Moorpark Ave**

## Overall Liquefaction Severity Number report



### LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

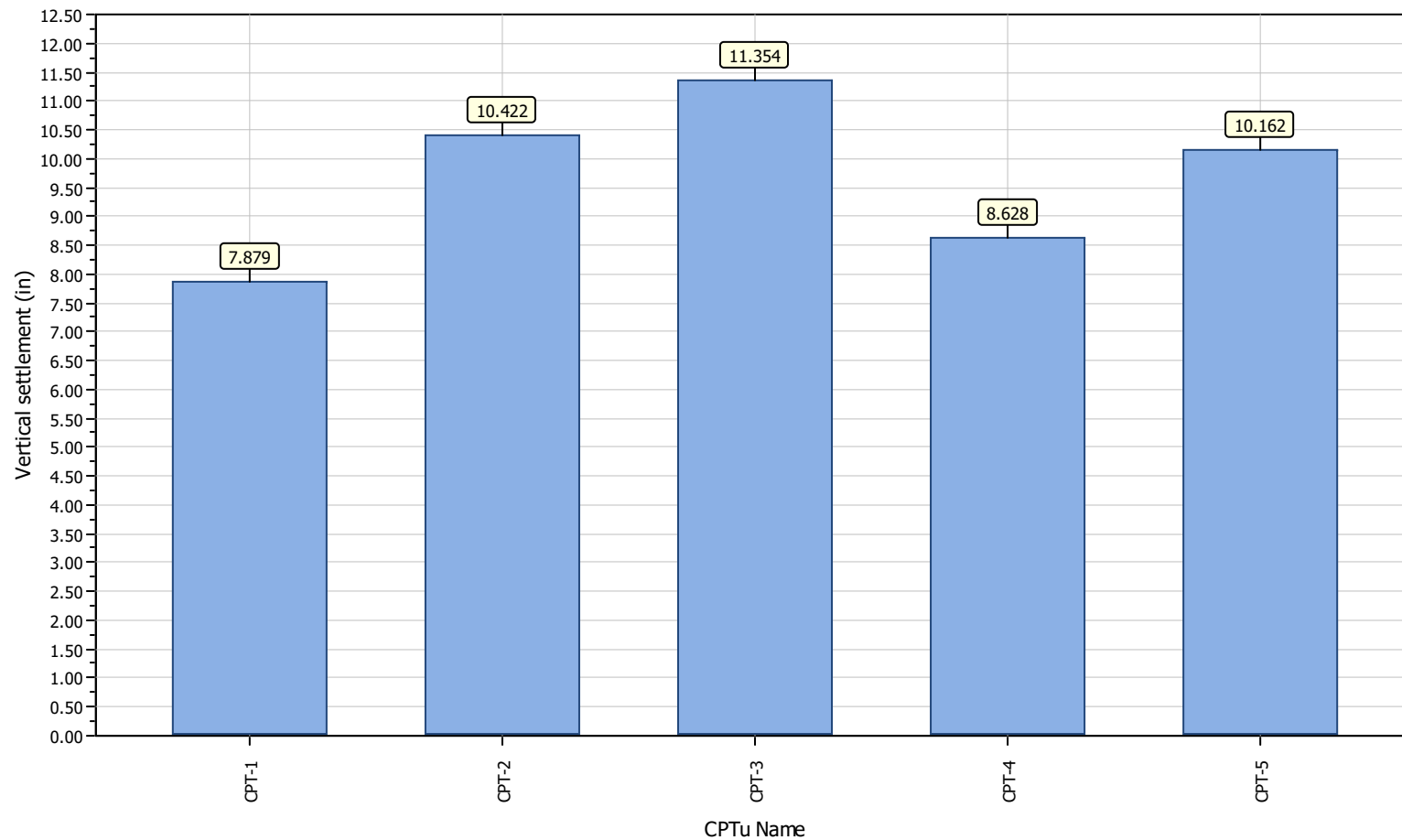
### Basic statistics

- Total CPT number: 5
- 0% little liquefaction
- 0% minor liquefaction
- 0% moderate liquefaction
- 0% moderate to major liquefaction
- 20% major liquefaction
- 80% severe liquefaction

**Project title : Moorpark Library**

**Location : NWC West High Street and Moorpark Ave**

## Overall vertical settlements report



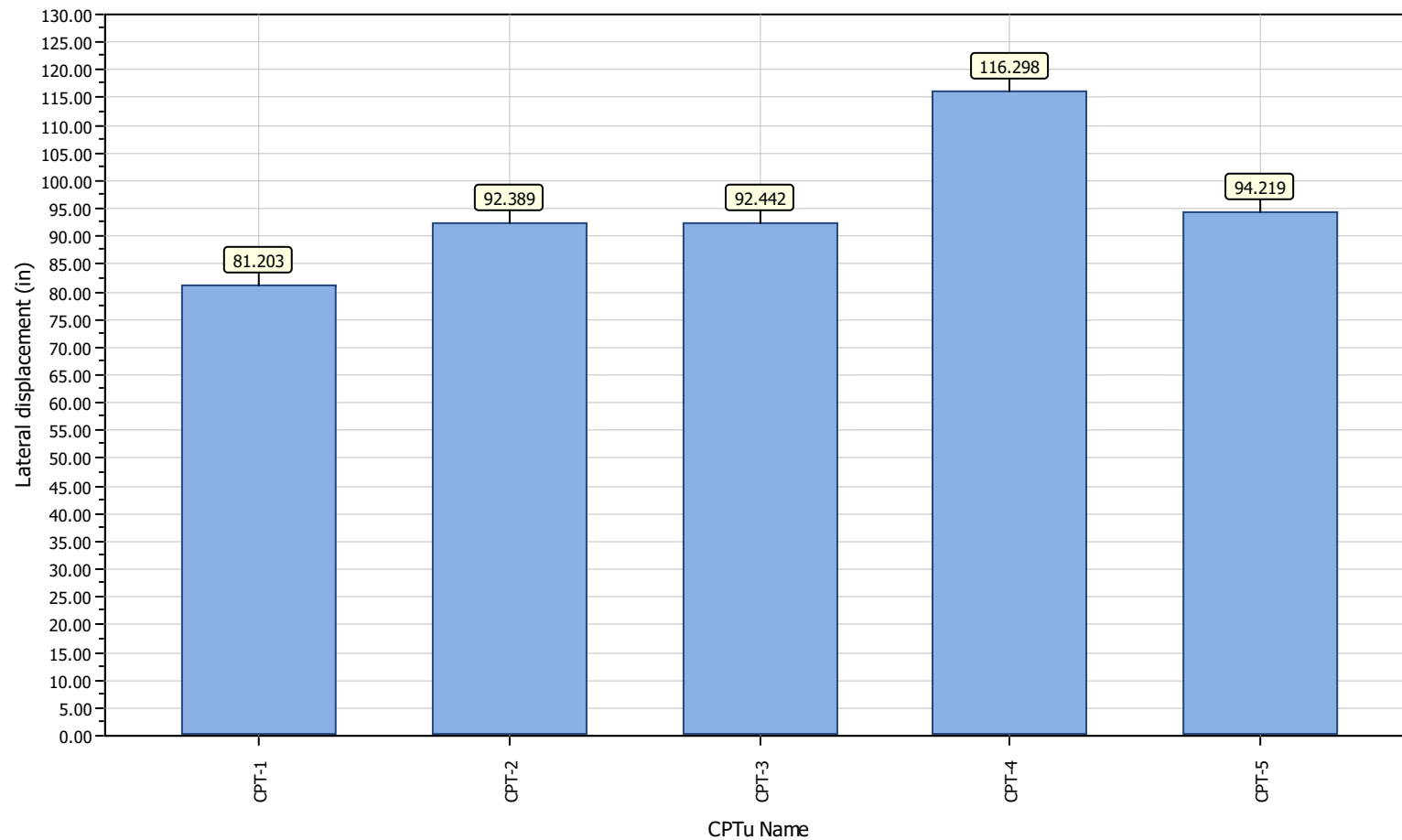


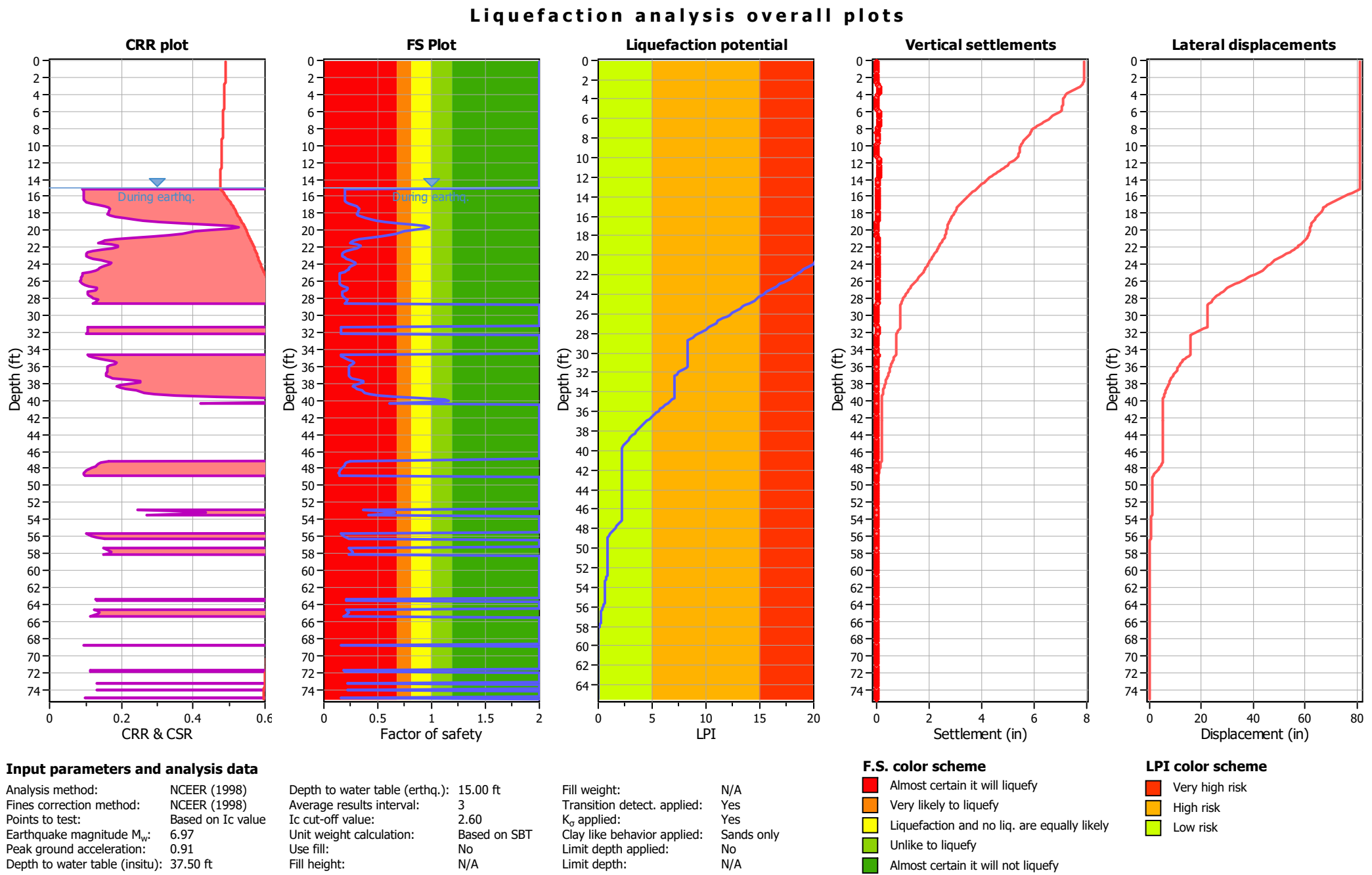
**Carl Kim Geotechnical, Inc.**  
945 Baileyana Road  
Hillsborough, CA 94010  
949-441-8143

**Project title : Moorpark Library**

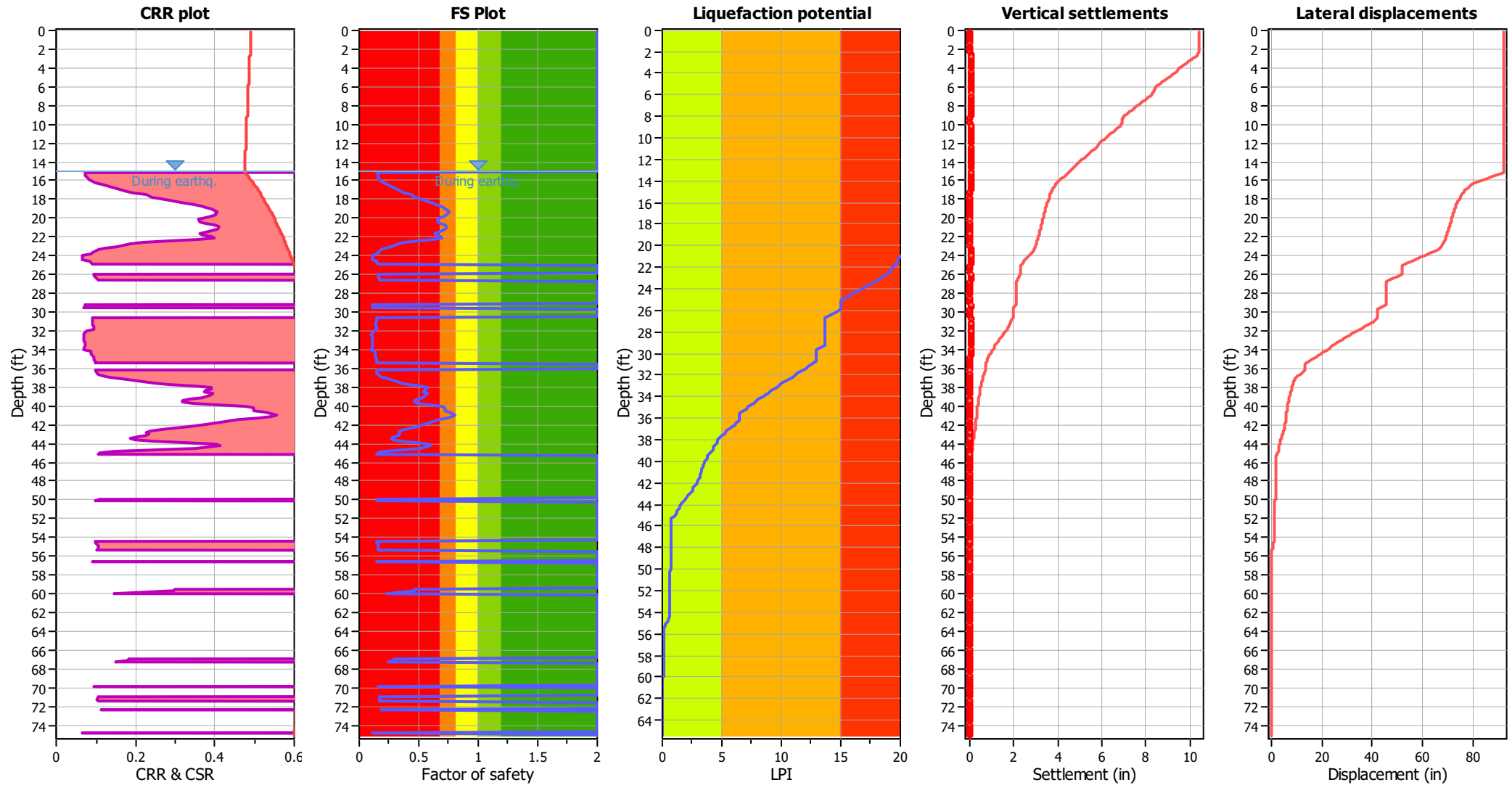
**Location : NWC West High Street and Moorpark Ave**

### Overall lateral displacements report





## Liquefaction analysis overall plots



### Input parameters and analysis data

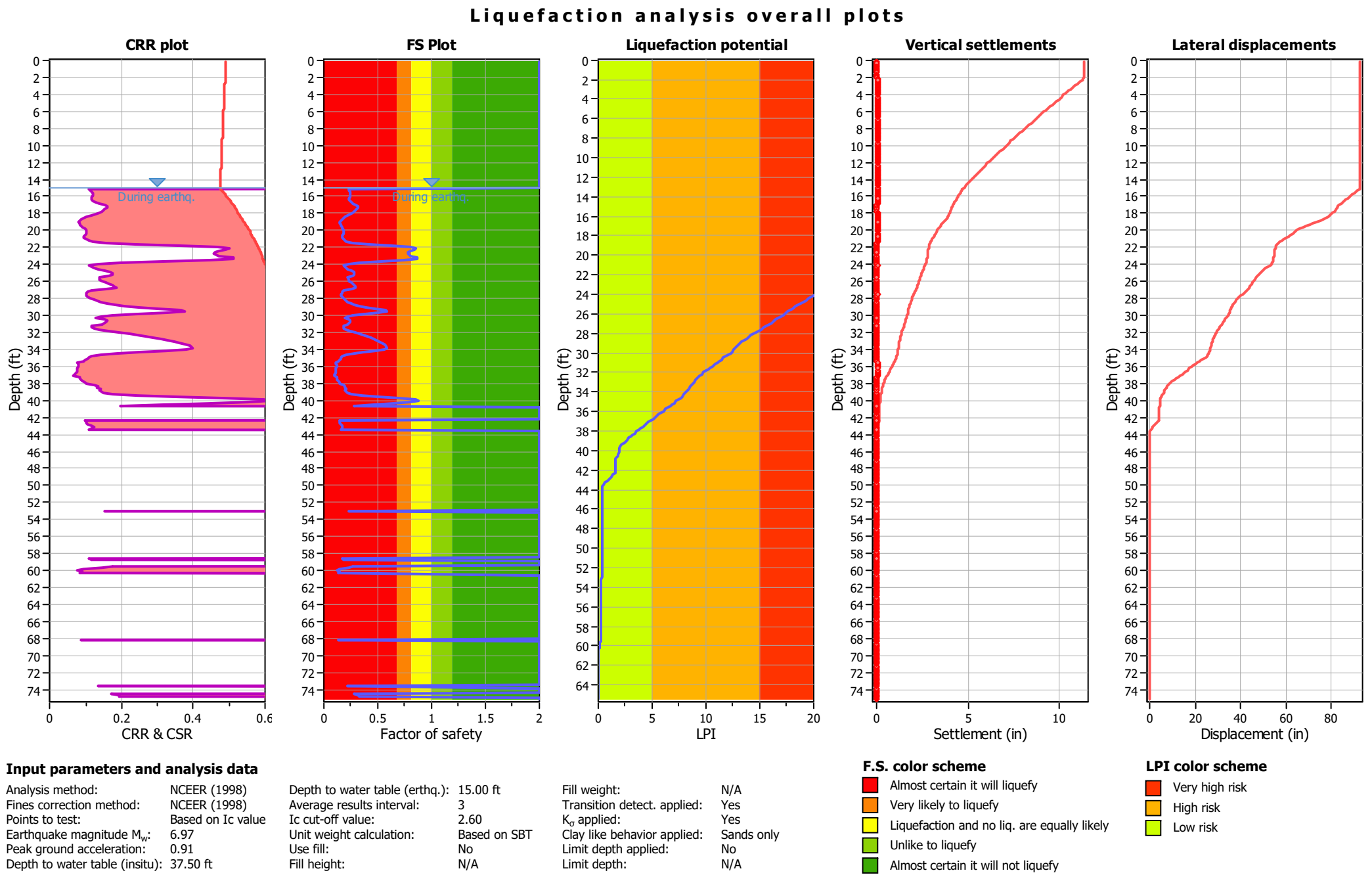
Analysis method:	NCEER (1998)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_G$ applied:	Yes
Earthquake magnitude $M_w$ :	6.97	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.91	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

### F.S. color scheme

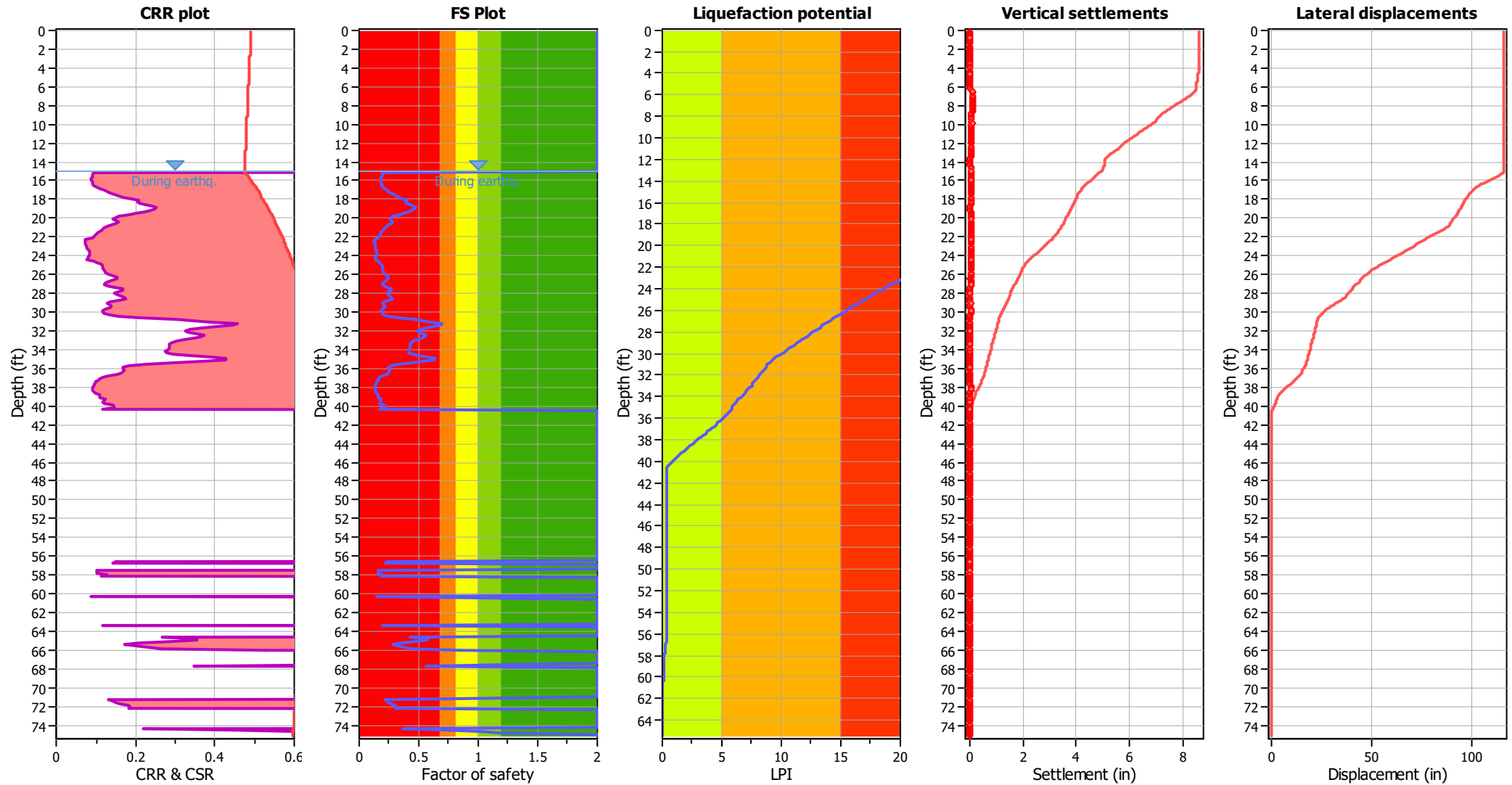
<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk



## Liquefaction analysis overall plots



### Input parameters and analysis data

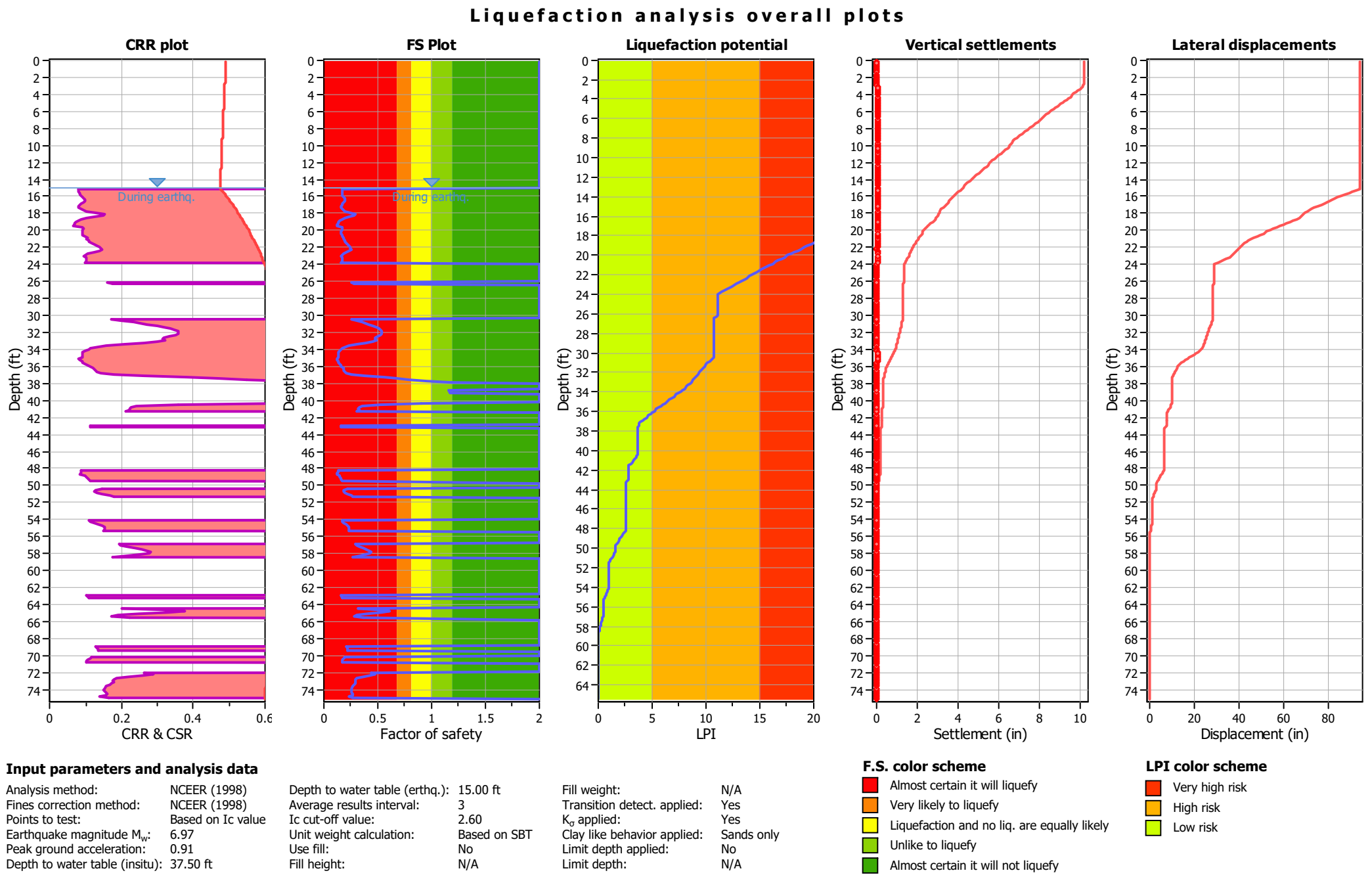
Analysis method:	NCEER (1998)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_{\sigma}$ applied:	Yes
Earthquake magnitude $M_w$ :	6.97	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.91	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

### F.S. color scheme

<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

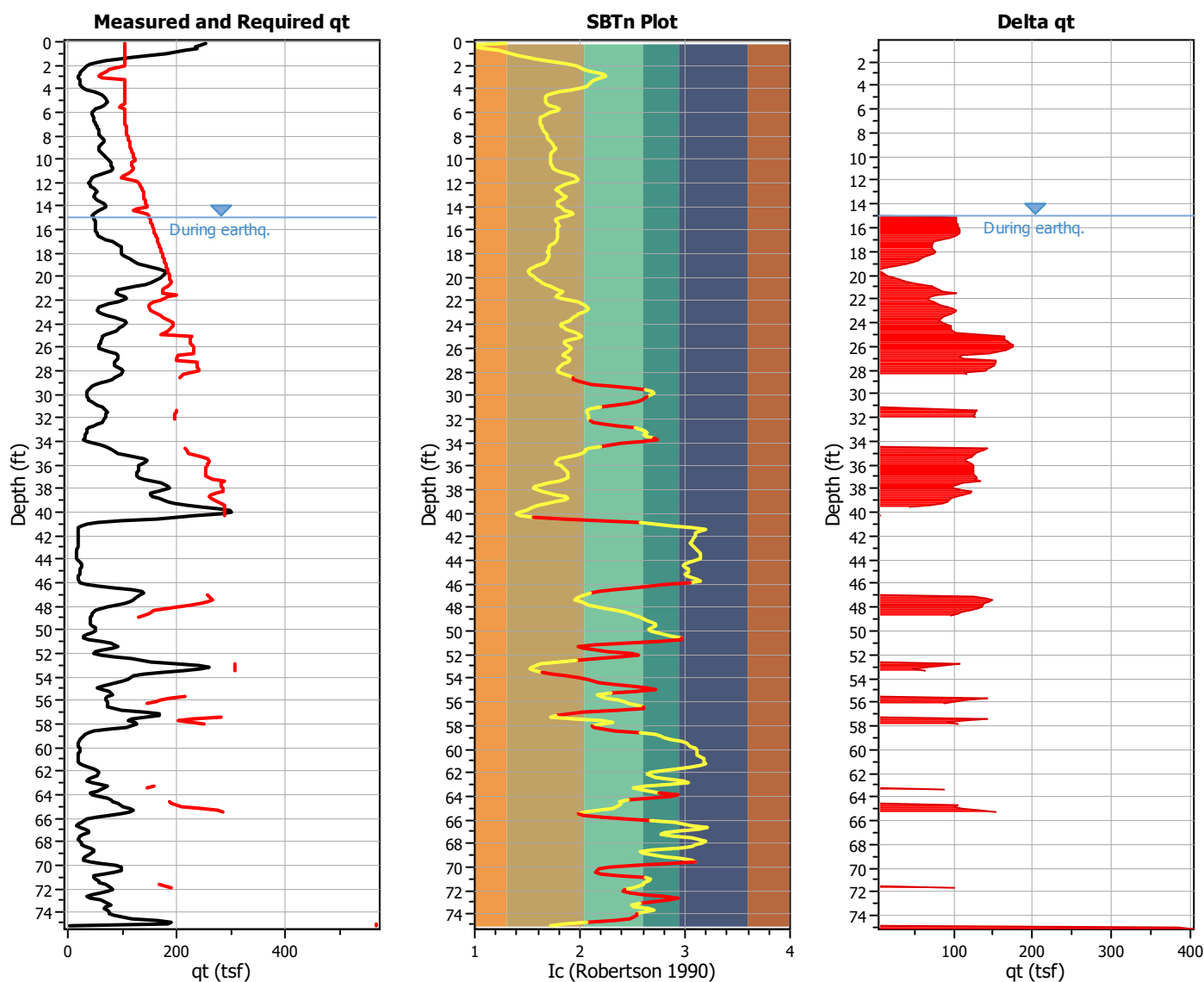
### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk





**GROUND IMPROVEMENT TARGETS  
BASED ON CPT TIP RESISTANCE**



**:: Tabular results ::**

Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)	Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)
1	0.16	0.00	0.00	0.00	254.38	0.00	2	0.33	0.00	0.00	0.00	243.24	0.00
3	0.49	0.00	0.00	0.00	235.48	0.00	4	0.66	0.00	0.00	0.00	239.04	0.00
5	0.82	0.00	0.00	0.00	217.58	0.00	6	0.98	0.00	0.00	0.00	181.84	0.00
7	1.15	0.00	0.00	0.00	150.24	0.00	8	1.31	0.00	0.00	0.00	121.74	0.00
9	1.48	0.00	0.00	0.00	95.61	0.00	10	1.64	0.00	0.00	0.00	71.28	0.00
11	1.80	0.00	0.00	0.00	52.75	0.00	12	1.97	0.00	0.00	0.00	40.35	0.00
13	2.13	0.00	0.00	0.00	33.58	0.00	14	2.30	0.00	0.00	0.00	29.55	0.00
15	2.46	0.00	0.00	0.00	26.88	0.00	16	2.62	0.00	0.00	0.00	23.78	0.00
17	2.79	0.00	0.00	0.00	20.85	0.00	18	2.95	0.00	0.00	0.00	18.98	0.00
19	3.12	0.00	0.00	0.00	19.48	0.00	20	3.28	0.00	0.00	0.00	21.04	0.00
21	3.44	0.00	0.00	0.00	22.64	0.00	22	3.61	0.00	0.00	0.00	23.58	0.00
23	3.77	0.00	0.00	0.00	24.78	0.00	24	3.94	0.00	0.00	0.00	28.61	0.00
25	4.10	0.00	0.00	0.00	36.01	0.00	26	4.27	0.00	0.00	0.00	46.11	0.00
27	4.43	0.00	0.00	0.00	55.81	0.00	28	4.59	0.00	0.00	0.00	62.81	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
29	4.76	0.00	0.00	0.00	67.01	0.00	30	4.92	0.00	0.00	0.00	69.64	0.00
31	5.09	0.00	0.00	0.00	71.61	0.00	32	5.25	0.00	0.00	0.00	71.08	0.00
33	5.41	0.00	0.00	0.00	67.21	0.00	34	5.58	0.00	0.00	0.00	59.61	0.00
35	5.74	0.00	0.00	0.00	51.91	0.00	36	5.91	0.00	0.00	0.00	46.68	0.00
37	6.07	0.00	0.00	0.00	44.88	0.00	38	6.23	0.00	0.00	0.00	45.44	0.00
39	6.40	0.00	0.00	0.00	46.41	0.00	40	6.56	0.00	0.00	0.00	47.21	0.00
41	6.73	0.00	0.00	0.00	48.14	0.00	42	6.89	0.00	0.00	0.00	49.61	0.00
43	7.05	0.00	0.00	0.00	51.18	0.00	44	7.22	0.00	0.00	0.00	52.48	0.00
45	7.38	0.00	0.00	0.00	53.84	0.00	46	7.55	0.00	0.00	0.00	55.64	0.00
47	7.71	0.00	0.00	0.00	57.11	0.00	48	7.87	0.00	0.00	0.00	58.47	0.00
49	8.04	0.00	0.00	0.00	60.67	0.00	50	8.20	0.00	0.00	0.00	63.57	0.00
51	8.37	0.00	0.00	0.00	65.71	0.00	52	8.53	0.00	0.00	0.00	66.04	0.00
53	8.69	0.00	0.00	0.00	64.34	0.00	54	8.86	0.00	0.00	0.00	60.87	0.00
55	9.02	0.00	0.00	0.00	57.91	0.00	56	9.19	0.00	0.00	0.00	57.37	0.00
57	9.35	0.00	0.00	0.00	59.97	0.00	58	9.51	0.00	0.00	0.00	63.64	0.00
59	9.68	0.00	0.00	0.00	67.57	0.00	60	9.84	0.00	0.00	0.00	71.21	0.00
61	10.01	0.00	0.00	0.00	74.44	0.00	62	10.17	0.00	0.00	0.00	76.77	0.00
63	10.33	0.00	0.00	0.00	78.71	0.00	64	10.50	0.00	0.00	0.00	80.81	0.00
65	10.66	0.00	0.00	0.00	82.84	0.00	66	10.83	0.00	0.00	0.00	83.44	0.00
67	10.99	0.00	0.00	0.00	79.91	0.00	68	11.15	0.00	0.00	0.00	71.51	0.00
69	11.32	0.00	0.00	0.00	60.07	0.00	70	11.48	0.00	0.00	0.00	49.87	0.00
71	11.65	0.00	0.00	0.00	43.07	0.00	72	11.81	0.00	0.00	0.00	40.01	0.00
73	11.98	0.00	0.00	0.00	39.04	0.00	74	12.14	0.00	0.00	0.00	39.94	0.00
75	12.30	0.00	0.00	0.00	42.71	0.00	76	12.47	0.00	0.00	0.00	47.91	0.00
77	12.63	0.00	0.00	0.00	52.01	0.00	78	12.80	0.00	0.00	0.00	52.61	0.00
79	12.96	0.00	0.00	0.00	50.01	0.00	80	13.12	0.00	0.00	0.00	48.27	0.00
81	13.29	0.00	0.00	0.00	49.61	0.00	82	13.45	0.00	0.00	0.00	54.37	0.00
83	13.62	0.00	0.00	0.00	60.57	0.00	84	13.78	0.00	0.00	0.00	66.11	0.00
85	13.94	0.00	0.00	0.00	69.77	0.00	86	14.11	0.00	0.00	0.00	69.41	0.00
87	14.27	0.00	0.00	0.00	64.31	0.00	88	14.44	0.00	0.00	0.00	55.81	0.00
89	14.60	0.00	0.00	0.00	48.84	0.00	90	14.76	0.00	0.00	0.00	46.04	0.00
91	14.93	0.00	0.00	0.00	46.71	0.00	92	15.09	174.24	174.24	151.88	48.41	103.47
93	15.26	174.64	174.64	153.09	50.07	103.02	94	15.42	175.03	175.03	154.13	50.91	103.23
95	15.58	175.41	175.41	155.17	51.17	104.00	96	15.75	175.79	175.79	156.42	51.77	104.65
97	15.91	176.16	176.16	157.67	52.07	105.60	98	16.08	176.53	176.53	158.85	52.27	106.58
99	16.24	176.89	176.89	160.01	53.07	106.93	100	16.40	177.25	177.25	161.21	54.61	106.60
101	16.57	177.61	177.61	162.46	57.44	105.02	102	16.73	177.95	177.95	163.70	62.51	101.19
103	16.90	178.29	178.29	165.04	71.44	93.60	104	17.06	178.63	178.63	166.45	82.77	83.68
105	17.22	178.96	178.96	167.85	92.24	75.61	106	17.39	179.28	179.28	169.17	97.34	71.83
107	17.55	179.60	179.60	170.44	98.67	71.76	108	17.72	179.91	179.91	171.66	98.81	72.86
109	17.88	180.22	180.22	172.84	98.37	74.47	110	18.04	180.52	180.52	173.99	98.14	75.86
111	18.21	180.82	180.82	175.18	101.21	73.97	112	18.37	181.12	181.12	176.37	107.54	68.83
113	18.54	181.40	181.40	177.57	115.87	61.70	114	18.70	181.69	181.69	178.79	123.34	55.45
115	18.86	181.96	181.96	179.99	130.91	49.09	116	19.03	182.24	182.24	181.12	141.54	39.58
117	19.19	182.51	182.51	182.25	154.17	28.08	118	19.36	182.77	182.77	183.38	167.47	15.90
119	19.52	183.03	183.03	184.50	177.37	7.13	120	19.69	183.28	183.28	185.63	180.94	4.69
121	19.85	183.53	183.53	186.75	178.61	8.14	122	20.01	183.78	183.78	187.87	171.67	16.19
123	20.18	184.02	184.02	188.97	165.27	23.70	124	20.34	184.26	184.26	190.07	159.44	30.64
125	20.51	184.49	184.49	191.17	152.91	38.26	126	20.67	184.73	181.31	188.88	141.87	47.01

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
127	20.83	184.95	175.59	184.04	125.41	58.63	128	21.00	185.18	168.85	178.19	106.64	71.55
129	21.16	185.40	163.90	174.08	92.77	81.30	130	21.33	185.63	165.04	176.05	90.31	85.74
131	21.49	185.85	185.85	198.76	96.74	102.02	132	21.65	186.06	171.02	183.67	104.74	78.93
133	21.82	186.27	165.47	178.99	108.64	70.36	134	21.98	186.47	156.27	170.59	102.97	67.62
135	22.15	186.67	145.56	160.47	92.47	67.99	136	22.31	186.87	137.10	152.48	77.64	74.84
137	22.47	187.07	133.83	149.83	65.67	84.16	138	22.64	187.27	132.60	149.28	56.70	92.58
139	22.80	187.47	133.56	151.04	52.84	98.20	140	22.97	187.66	139.33	157.87	55.80	102.07
141	23.13	187.85	145.83	165.46	64.77	100.69	142	23.29	188.04	150.20	170.79	74.20	96.59
143	23.46	188.22	154.28	175.83	86.70	89.13	144	23.62	188.39	158.85	181.33	96.20	85.12
145	23.79	188.56	164.93	188.31	106.37	81.94	146	23.95	188.73	168.33	192.52	107.17	85.35
147	24.11	188.90	167.83	192.85	102.20	90.64	148	24.28	189.07	165.32	191.16	95.40	95.76
149	24.44	189.23	162.09	188.72	92.10	96.62	150	24.61	189.46	157.64	185.00	88.30	96.70
151	24.77	189.68	150.19	178.06	79.60	98.46	152	24.93	189.91	144.22	172.51	69.57	102.94
153	25.10	190.13	190.13	227.31	63.80	163.51	154	25.26	190.35	190.35	226.54	62.44	164.10
155	25.43	190.56	190.56	226.14	61.50	164.64	156	25.59	190.77	190.77	227.18	59.67	167.51
157	25.75	190.98	190.98	229.03	57.70	171.33	158	25.92	191.19	191.19	230.94	56.20	174.74
159	26.08	191.40	191.40	232.29	57.94	174.35	160	26.25	191.60	191.60	232.71	65.37	167.34
161	26.41	191.80	191.80	232.64	77.04	155.60	162	26.57	192.00	192.00	233.45	88.10	145.34
163	26.74	192.19	166.52	203.94	93.60	110.33	164	26.90	192.38	161.88	200.04	92.07	107.97
165	27.07	192.57	161.44	200.39	88.54	111.85	166	27.23	192.76	192.76	239.11	85.14	153.97
167	27.40	192.94	192.94	238.70	84.77	153.93	168	27.56	193.13	193.13	238.75	86.70	152.05
169	27.72	193.31	193.31	239.19	91.37	147.82	170	27.89	193.48	193.48	240.12	98.24	141.88
171	28.05	193.66	193.66	242.06	101.67	140.39	172	28.22	193.83	168.90	213.43	99.70	113.73
173	28.38	194.00	163.40	208.68	93.34	115.34	174	28.54	194.17	159.84	205.78	86.94	118.84
175	28.71	0.00	0.00	0.00	81.17	0.00	176	28.87	0.00	0.00	0.00	72.94	0.00
177	29.04	0.00	0.00	0.00	61.87	0.00	178	29.20	0.00	0.00	0.00	51.74	0.00
179	29.36	0.00	0.00	0.00	43.67	0.00	180	29.53	0.00	0.00	0.00	39.20	0.00
181	29.69	0.00	0.00	0.00	36.07	0.00	182	29.86	0.00	0.00	0.00	35.54	0.00
183	30.02	0.00	0.00	0.00	35.64	0.00	184	30.18	0.00	0.00	0.00	35.90	0.00
185	30.35	0.00	0.00	0.00	36.64	0.00	186	30.51	0.00	0.00	0.00	38.84	0.00
187	30.68	0.00	0.00	0.00	45.30	0.00	188	30.84	0.00	0.00	0.00	53.87	0.00
189	31.00	0.00	0.00	0.00	62.00	0.00	190	31.17	0.00	0.00	0.00	67.94	0.00
191	31.33	196.63	142.03	199.19	70.54	128.65	192	31.50	196.76	141.96	199.83	71.77	128.06
193	31.66	196.88	139.12	197.25	71.14	126.11	194	31.82	197.00	137.87	196.49	70.80	125.69
195	31.99	197.12	138.65	198.14	70.30	127.83	196	32.15	197.24	136.54	196.35	67.77	128.58
197	32.32	0.00	0.00	0.00	62.37	0.00	198	32.48	0.00	0.00	0.00	54.60	0.00
199	32.64	0.00	0.00	0.00	46.24	0.00	200	32.81	0.00	0.00	0.00	39.40	0.00
201	32.97	0.00	0.00	0.00	35.47	0.00	202	33.14	0.00	0.00	0.00	34.57	0.00
203	33.30	0.00	0.00	0.00	34.84	0.00	204	33.46	0.00	0.00	0.00	33.27	0.00
205	33.63	0.00	0.00	0.00	30.54	0.00	206	33.79	0.00	0.00	0.00	29.80	0.00
207	33.96	0.00	0.00	0.00	36.04	0.00	208	34.12	0.00	0.00	0.00	46.47	0.00
209	34.28	0.00	0.00	0.00	58.90	0.00	210	34.45	0.00	0.00	0.00	68.80	0.00
211	34.61	198.71	144.47	216.48	75.04	141.44	212	34.78	198.79	146.34	219.41	81.64	137.77
213	34.94	198.87	149.49	223.82	91.37	132.45	214	35.10	198.95	158.92	235.19	107.81	127.38
215	35.27	199.02	169.08	246.61	124.94	121.67	216	35.43	199.09	178.96	256.82	141.14	115.68
217	35.60	199.16	183.11	261.30	146.57	114.73	218	35.76	199.22	182.54	261.55	143.77	117.78
219	35.93	199.29	178.47	258.65	135.57	123.08	220	36.09	199.35	175.38	256.54	131.07	125.47
221	36.25	199.41	173.37	255.38	129.97	125.41	222	36.42	199.47	171.28	254.12	129.21	124.91
223	36.58	199.52	169.62	253.24	128.31	124.93	224	36.75	199.57	168.83	253.20	127.51	125.69

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
225	36.91	199.63	169.96	255.09	127.74	127.35	226	37.07	199.67	174.14	259.89	131.54	128.35
227	37.24	199.72	181.05	266.94	140.07	126.87	228	37.40	199.77	199.77	288.87	155.47	133.39
229	37.57	199.81	199.81	284.01	172.57	111.44	230	37.73	199.85	199.85	284.40	185.54	98.86
231	37.89	199.89	199.89	284.78	186.41	98.37	232	38.06	199.93	199.93	285.15	176.67	108.48
233	38.22	199.97	199.97	285.77	163.94	121.83	234	38.39	200.00	184.93	273.43	152.77	120.66
235	38.55	200.03	173.20	263.27	151.37	111.89	236	38.71	200.06	169.29	259.84	155.97	103.87
237	38.88	200.09	174.32	265.11	169.14	95.97	238	39.04	200.11	185.60	275.52	183.37	92.15
239	39.21	200.13	194.50	283.42	198.21	85.21	240	39.37	200.15	200.15	288.20	218.57	69.63
241	39.53	200.17	200.17	288.58	245.27	43.31	242	39.70	200.19	200.19	288.95	275.67	13.28
243	39.86	0.00	0.00	0.00	298.14	0.00	244	40.03	0.00	0.00	0.00	302.71	0.00
245	40.19	200.23	200.23	290.05	283.81	6.24	246	40.35	200.24	200.24	290.41	236.64	53.77
247	40.52	0.00	0.00	0.00	165.34	0.00	248	40.68	0.00	0.00	0.00	99.81	0.00
249	40.85	0.00	0.00	0.00	55.01	0.00	250	41.01	0.00	0.00	0.00	35.44	0.00
251	41.17	0.00	0.00	0.00	25.31	0.00	252	41.34	0.00	0.00	0.00	19.24	0.00
253	41.50	0.00	0.00	0.00	18.58	0.00	254	41.67	0.00	0.00	0.00	18.34	0.00
255	41.83	0.00	0.00	0.00	18.34	0.00	256	41.99	0.00	0.00	0.00	18.18	0.00
257	42.16	0.00	0.00	0.00	18.51	0.00	258	42.32	0.00	0.00	0.00	18.85	0.00
259	42.49	0.00	0.00	0.00	19.25	0.00	260	42.65	0.00	0.00	0.00	19.05	0.00
261	42.81	0.00	0.00	0.00	18.58	0.00	262	42.98	0.00	0.00	0.00	17.88	0.00
263	43.14	0.00	0.00	0.00	17.02	0.00	264	43.31	0.00	0.00	0.00	16.15	0.00
265	43.47	0.00	0.00	0.00	15.42	0.00	266	43.64	0.00	0.00	0.00	15.08	0.00
267	43.80	0.00	0.00	0.00	15.35	0.00	268	43.96	0.00	0.00	0.00	16.32	0.00
269	44.13	0.00	0.00	0.00	18.48	0.00	270	44.29	0.00	0.00	0.00	21.72	0.00
271	44.46	0.00	0.00	0.00	24.01	0.00	272	44.62	0.00	0.00	0.00	24.25	0.00
273	44.78	0.00	0.00	0.00	22.98	0.00	274	44.95	0.00	0.00	0.00	22.04	0.00
275	45.11	0.00	0.00	0.00	21.61	0.00	276	45.28	0.00	0.00	0.00	20.81	0.00
277	45.44	0.00	0.00	0.00	19.70	0.00	278	45.60	0.00	0.00	0.00	18.60	0.00
279	45.77	0.00	0.00	0.00	18.64	0.00	280	45.93	0.00	0.00	0.00	22.91	0.00
281	46.10	0.00	0.00	0.00	34.26	0.00	282	46.26	0.00	0.00	0.00	57.80	0.00
283	46.42	0.00	0.00	0.00	86.99	0.00	284	46.59	0.00	0.00	0.00	117.86	0.00
285	46.75	0.00	0.00	0.00	135.37	0.00	286	46.92	0.00	0.00	0.00	140.32	0.00
287	47.08	199.52	153.04	258.53	133.69	124.84	288	47.24	199.47	158.68	265.28	125.20	140.08
289	47.41	199.42	160.71	267.82	119.93	147.89	290	47.57	199.37	151.15	257.28	113.67	143.61
291	47.74	199.32	139.71	243.49	104.87	138.62	292	47.90	199.27	125.99	225.55	90.13	135.41
293	48.06	199.22	110.57	203.97	74.60	129.37	294	48.23	199.17	95.28	181.35	60.90	120.45
295	48.39	199.12	81.27	159.69	50.73	108.96	296	48.56	199.07	74.97	149.78	45.37	104.41
297	48.72	199.01	68.93	140.08	42.94	97.15	298	48.88	198.96	63.20	130.74	42.30	88.43
299	49.05	0.00	0.00	0.00	41.47	0.00	300	49.21	0.00	0.00	0.00	40.34	0.00
301	49.38	0.00	0.00	0.00	40.01	0.00	302	49.54	0.00	0.00	0.00	41.20	0.00
303	49.70	0.00	0.00	0.00	44.77	0.00	304	49.87	0.00	0.00	0.00	49.77	0.00
305	50.03	0.00	0.00	0.00	51.27	0.00	306	50.20	0.00	0.00	0.00	45.96	0.00
307	50.36	0.00	0.00	0.00	35.40	0.00	308	50.52	0.00	0.00	0.00	28.10	0.00
309	50.69	0.00	0.00	0.00	28.30	0.00	310	50.85	0.00	0.00	0.00	38.10	0.00
311	51.02	0.00	0.00	0.00	59.10	0.00	312	51.18	0.00	0.00	0.00	81.00	0.00
313	51.35	0.00	0.00	0.00	91.61	0.00	314	51.51	0.00	0.00	0.00	82.38	0.00
315	51.67	0.00	0.00	0.00	65.02	0.00	316	51.84	0.00	0.00	0.00	51.05	0.00
317	52.00	0.00	0.00	0.00	47.58	0.00	318	52.17	0.00	0.00	0.00	61.35	0.00
319	52.33	0.00	0.00	0.00	84.57	0.00	320	52.49	0.00	0.00	0.00	116.02	0.00
321	52.66	0.00	0.00	0.00	152.11	0.00	322	52.82	197.46	197.46	308.00	200.38	107.63

**:: Field input data :: (continued)**

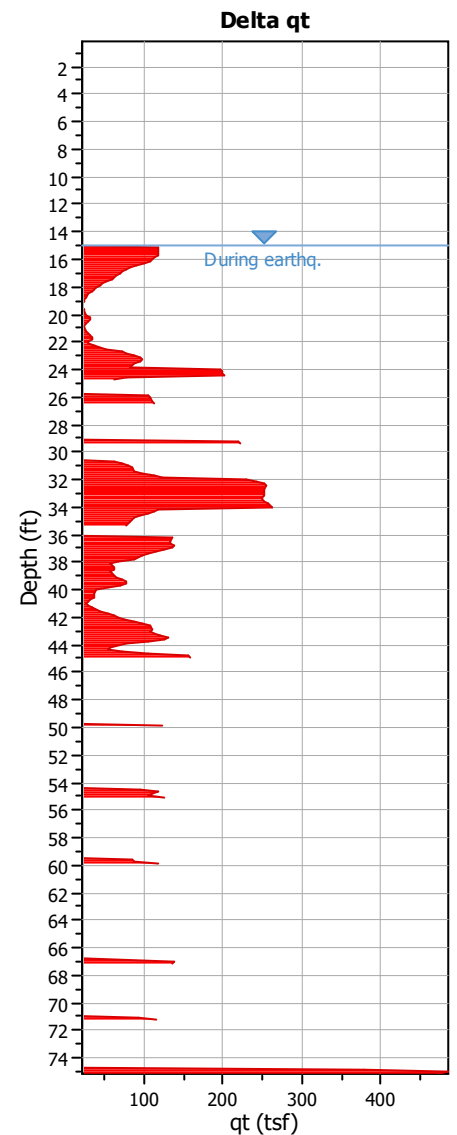
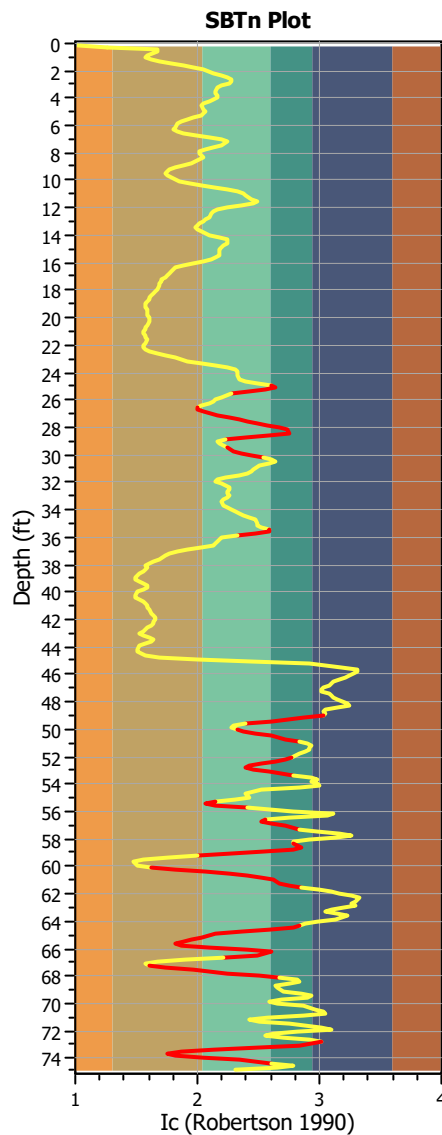
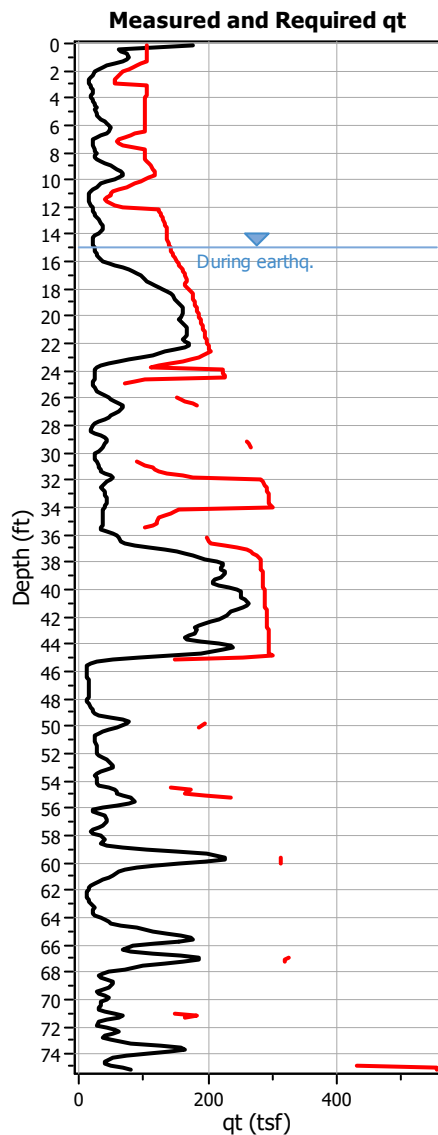
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
323	52.99	197.39	197.39	308.20	241.35	66.85	324	53.15	197.31	197.31	308.41	259.27	49.14
325	53.31	197.24	197.24	308.61	244.59	64.02	326	53.48	197.17	197.17	309.02	211.74	97.28
327	53.64	0.00	0.00	0.00	173.39	0.00	328	53.81	0.00	0.00	0.00	139.34	0.00
329	53.97	0.00	0.00	0.00	119.82	0.00	330	54.13	0.00	0.00	0.00	110.38	0.00
331	54.30	0.00	0.00	0.00	101.79	0.00	332	54.46	0.00	0.00	0.00	89.81	0.00
333	54.63	0.00	0.00	0.00	76.50	0.00	334	54.79	0.00	0.00	0.00	63.56	0.00
335	54.95	0.00	0.00	0.00	54.81	0.00	336	55.12	0.00	0.00	0.00	62.84	0.00
337	55.28	0.00	0.00	0.00	75.56	0.00	338	55.45	0.00	0.00	0.00	82.52	0.00
339	55.61	196.23	110.37	216.39	74.08	142.31	340	55.77	196.15	91.08	186.56	69.55	117.01
341	55.94	196.08	81.88	171.75	70.75	101.00	342	56.10	196.01	75.26	160.88	72.81	88.07
343	56.27	195.93	65.82	144.87	73.50	71.37	344	56.43	0.00	0.00	0.00	72.06	0.00
345	56.59	0.00	0.00	0.00	73.37	0.00	346	56.76	0.00	0.00	0.00	98.20	0.00
347	56.92	0.00	0.00	0.00	138.49	0.00	348	57.09	0.00	0.00	0.00	169.75	0.00
349	57.25	0.00	0.00	0.00	167.59	0.00	350	57.41	195.41	158.37	283.05	141.66	141.39
351	57.58	195.34	115.94	228.18	117.23	110.95	352	57.74	195.26	99.51	203.31	111.60	91.71
353	57.91	195.19	115.22	227.72	123.44	104.28	354	58.07	195.11	132.43	252.56	126.01	126.55
355	58.23	0.00	0.00	0.00	107.31	0.00	356	58.40	0.00	0.00	0.00	72.35	0.00
357	58.56	0.00	0.00	0.00	48.78	0.00	358	58.73	0.00	0.00	0.00	37.49	0.00
359	58.89	0.00	0.00	0.00	32.85	0.00	360	59.06	0.00	0.00	0.00	28.92	0.00
361	59.22	0.00	0.00	0.00	24.42	0.00	362	59.38	0.00	0.00	0.00	21.09	0.00
363	59.55	0.00	0.00	0.00	19.86	0.00	364	59.71	0.00	0.00	0.00	19.49	0.00
365	59.88	0.00	0.00	0.00	19.83	0.00	366	60.04	0.00	0.00	0.00	20.99	0.00
367	60.20	0.00	0.00	0.00	22.03	0.00	368	60.37	0.00	0.00	0.00	21.83	0.00
369	60.53	0.00	0.00	0.00	20.33	0.00	370	60.70	0.00	0.00	0.00	18.73	0.00
371	60.86	0.00	0.00	0.00	18.13	0.00	372	61.02	0.00	0.00	0.00	18.63	0.00
373	61.19	0.00	0.00	0.00	20.03	0.00	374	61.35	0.00	0.00	0.00	23.63	0.00
375	61.52	0.00	0.00	0.00	29.80	0.00	376	61.68	0.00	0.00	0.00	37.86	0.00
377	61.84	0.00	0.00	0.00	46.44	0.00	378	62.01	0.00	0.00	0.00	53.08	0.00
379	62.17	0.00	0.00	0.00	55.98	0.00	380	62.34	0.00	0.00	0.00	53.19	0.00
381	62.50	0.00	0.00	0.00	45.98	0.00	382	62.66	0.00	0.00	0.00	37.88	0.00
383	62.83	0.00	0.00	0.00	34.68	0.00	384	62.99	0.00	0.00	0.00	44.41	0.00
385	63.16	0.00	0.00	0.00	61.01	0.00	386	63.32	193.04	68.69	158.84	71.64	87.20
387	63.48	192.97	61.46	145.89	67.18	78.71	388	63.65	0.00	0.00	0.00	52.68	0.00
389	63.81	0.00	0.00	0.00	41.41	0.00	390	63.98	0.00	0.00	0.00	44.78	0.00
391	64.14	0.00	0.00	0.00	58.31	0.00	392	64.30	0.00	0.00	0.00	73.28	0.00
393	64.47	0.00	0.00	0.00	80.38	0.00	394	64.63	192.54	84.77	188.98	83.98	105.00
395	64.80	192.48	86.34	191.91	91.08	100.83	396	64.96	192.42	97.66	211.11	102.21	108.89
397	65.12	192.36	120.05	246.33	115.55	130.78	398	65.29	192.30	141.11	275.67	121.88	153.79
399	65.45	192.25	149.74	286.41	115.05	171.37	400	65.62	0.00	0.00	0.00	97.98	0.00
401	65.78	0.00	0.00	0.00	75.31	0.00	402	65.94	0.00	0.00	0.00	54.01	0.00
403	66.11	0.00	0.00	0.00	36.35	0.00	404	66.27	0.00	0.00	0.00	24.62	0.00
405	66.44	0.00	0.00	0.00	18.68	0.00	406	66.60	0.00	0.00	0.00	16.82	0.00
407	66.77	0.00	0.00	0.00	21.88	0.00	408	66.93	0.00	0.00	0.00	31.58	0.00
409	67.09	0.00	0.00	0.00	39.05	0.00	410	67.26	0.00	0.00	0.00	37.25	0.00
411	67.42	0.00	0.00	0.00	28.68	0.00	412	67.59	0.00	0.00	0.00	21.55	0.00
413	67.75	0.00	0.00	0.00	20.12	0.00	414	67.91	0.00	0.00	0.00	22.85	0.00
415	68.08	0.00	0.00	0.00	25.12	0.00	416	68.24	0.00	0.00	0.00	26.62	0.00
417	68.41	0.00	0.00	0.00	30.25	0.00	418	68.57	0.00	0.00	0.00	41.25	0.00
419	68.73	191.27	60.01	149.23	49.05	100.18	420	68.90	0.00	0.00	0.00	49.25	0.00

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
421	69.06	0.00	0.00	0.00	39.62	0.00	422	69.23	0.00	0.00	0.00	31.68	0.00
423	69.39	0.00	0.00	0.00	27.72	0.00	424	69.55	0.00	0.00	0.00	27.02	0.00
425	69.72	0.00	0.00	0.00	41.05	0.00	426	69.88	0.00	0.00	0.00	62.92	0.00
427	70.05	0.00	0.00	0.00	88.69	0.00	428	70.21	0.00	0.00	0.00	100.02	0.00
429	70.37	0.00	0.00	0.00	99.82	0.00	430	70.54	0.00	0.00	0.00	86.69	0.00
431	70.70	0.00	0.00	0.00	66.75	0.00	432	70.87	0.00	0.00	0.00	47.89	0.00
433	71.03	0.00	0.00	0.00	46.15	0.00	434	71.19	0.00	0.00	0.00	49.69	0.00
435	71.36	0.00	0.00	0.00	55.65	0.00	436	71.52	0.00	0.00	0.00	58.62	0.00
437	71.69	190.49	68.32	168.53	68.49	100.05	438	71.85	190.45	79.69	189.66	78.65	111.01
439	72.01	0.00	0.00	0.00	81.72	0.00	440	72.18	0.00	0.00	0.00	74.32	0.00
441	72.34	0.00	0.00	0.00	59.92	0.00	442	72.51	0.00	0.00	0.00	44.02	0.00
443	72.67	0.00	0.00	0.00	36.52	0.00	444	72.83	0.00	0.00	0.00	40.99	0.00
445	73.00	0.00	0.00	0.00	60.85	0.00	446	73.16	0.00	0.00	0.00	74.09	0.00
447	73.33	190.10	68.10	170.25	81.02	89.23	448	73.49	0.00	0.00	0.00	71.16	0.00
449	73.65	0.00	0.00	0.00	66.92	0.00	450	73.82	0.00	0.00	0.00	72.12	0.00
451	73.98	189.95	63.85	163.04	77.56	85.48	452	74.15	0.00	0.00	0.00	77.02	0.00
453	74.31	0.00	0.00	0.00	84.29	0.00	454	74.48	0.00	0.00	0.00	116.09	0.00
455	74.64	0.00	0.00	0.00	164.66	0.00	456	74.80	0.00	0.00	0.00	190.02	0.00
457	74.97	189.74	189.74	568.55	183.12	385.43	458	75.13	189.73	189.73	568.88	164.26	404.62

**Abbreviations**

Depth: Depth of CPT point from ground surface  
Q<sub>tn,cs</sub> demand: Demand for equivalent clean sand normalized cone resistance  
Q<sub>tn</sub> demand: Demand for cone resistance  
q<sub>t</sub> demand: Demand for cone resistance  
q<sub>t</sub>: Measured cone resistance  
Diff.: Difference between demanded and measured cone resistance



**:: Tabular results ::**

Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)	Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)
1	0.16	0.00	0.00	0.00	176.97	0.00	2	0.33	0.00	0.00	0.00	116.57	0.00
3	0.49	0.00	0.00	0.00	61.80	0.00	4	0.66	0.00	0.00	0.00	65.27	0.00
5	0.82	0.00	0.00	0.00	75.13	0.00	6	0.98	0.00	0.00	0.00	78.67	0.00
7	1.15	0.00	0.00	0.00	75.70	0.00	8	1.31	0.00	0.00	0.00	66.93	0.00
9	1.48	0.00	0.00	0.00	55.67	0.00	10	1.64	0.00	0.00	0.00	44.77	0.00
11	1.80	0.00	0.00	0.00	36.93	0.00	12	1.97	0.00	0.00	0.00	30.80	0.00
13	2.13	0.00	0.00	0.00	26.03	0.00	14	2.30	0.00	0.00	0.00	21.93	0.00
15	2.46	0.00	0.00	0.00	18.77	0.00	16	2.62	0.00	0.00	0.00	16.93	0.00
17	2.79	0.00	0.00	0.00	16.37	0.00	18	2.95	0.00	0.00	0.00	16.93	0.00
19	3.12	0.00	0.00	0.00	18.30	0.00	20	3.28	0.00	0.00	0.00	19.80	0.00
21	3.44	0.00	0.00	0.00	20.50	0.00	22	3.61	0.00	0.00	0.00	20.17	0.00
23	3.77	0.00	0.00	0.00	19.43	0.00	24	3.94	0.00	0.00	0.00	19.36	0.00
25	4.10	0.00	0.00	0.00	20.46	0.00	26	4.27	0.00	0.00	0.00	22.60	0.00
27	4.43	0.00	0.00	0.00	24.76	0.00	28	4.59	0.00	0.00	0.00	26.13	0.00



:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
29	4.76	0.00	0.00	0.00	26.33	0.00	30	4.92	0.00	0.00	0.00	26.10	0.00
31	5.09	0.00	0.00	0.00	26.40	0.00	32	5.25	0.00	0.00	0.00	28.10	0.00
33	5.41	0.00	0.00	0.00	31.30	0.00	34	5.58	0.00	0.00	0.00	35.33	0.00
35	5.74	0.00	0.00	0.00	39.43	0.00	36	5.91	0.00	0.00	0.00	43.26	0.00
37	6.07	0.00	0.00	0.00	46.56	0.00	38	6.23	0.00	0.00	0.00	48.46	0.00
39	6.40	0.00	0.00	0.00	47.46	0.00	40	6.56	0.00	0.00	0.00	42.80	0.00
41	6.73	0.00	0.00	0.00	35.53	0.00	42	6.89	0.00	0.00	0.00	27.99	0.00
43	7.05	0.00	0.00	0.00	22.89	0.00	44	7.22	0.00	0.00	0.00	21.09	0.00
45	7.38	0.00	0.00	0.00	21.56	0.00	46	7.55	0.00	0.00	0.00	22.99	0.00
47	7.71	0.00	0.00	0.00	24.63	0.00	48	7.87	0.00	0.00	0.00	26.06	0.00
49	8.04	0.00	0.00	0.00	26.39	0.00	50	8.20	0.00	0.00	0.00	25.99	0.00
51	8.37	0.00	0.00	0.00	25.66	0.00	52	8.53	0.00	0.00	0.00	27.86	0.00
53	8.69	0.00	0.00	0.00	32.83	0.00	54	8.86	0.00	0.00	0.00	39.76	0.00
55	9.02	0.00	0.00	0.00	49.16	0.00	56	9.19	0.00	0.00	0.00	57.83	0.00
57	9.35	0.00	0.00	0.00	65.06	0.00	58	9.51	0.00	0.00	0.00	67.76	0.00
59	9.68	0.00	0.00	0.00	67.26	0.00	60	9.84	0.00	0.00	0.00	63.02	0.00
61	10.01	0.00	0.00	0.00	54.99	0.00	62	10.17	0.00	0.00	0.00	44.39	0.00
63	10.33	0.00	0.00	0.00	34.32	0.00	64	10.50	0.00	0.00	0.00	26.29	0.00
65	10.66	0.00	0.00	0.00	20.66	0.00	66	10.83	0.00	0.00	0.00	17.36	0.00
67	10.99	0.00	0.00	0.00	15.93	0.00	68	11.15	0.00	0.00	0.00	15.63	0.00
69	11.32	0.00	0.00	0.00	15.00	0.00	70	11.48	0.00	0.00	0.00	14.60	0.00
71	11.65	0.00	0.00	0.00	15.73	0.00	72	11.81	0.00	0.00	0.00	18.43	0.00
73	11.98	0.00	0.00	0.00	21.26	0.00	74	12.14	0.00	0.00	0.00	22.70	0.00
75	12.30	0.00	0.00	0.00	22.96	0.00	76	12.47	0.00	0.00	0.00	23.36	0.00
77	12.63	0.00	0.00	0.00	24.76	0.00	78	12.80	0.00	0.00	0.00	26.99	0.00
79	12.96	0.00	0.00	0.00	29.79	0.00	80	13.12	0.00	0.00	0.00	32.96	0.00
81	13.29	0.00	0.00	0.00	35.89	0.00	82	13.45	0.00	0.00	0.00	37.79	0.00
83	13.62	0.00	0.00	0.00	37.66	0.00	84	13.78	0.00	0.00	0.00	34.96	0.00
85	13.94	0.00	0.00	0.00	30.19	0.00	86	14.11	0.00	0.00	0.00	24.99	0.00
87	14.27	0.00	0.00	0.00	21.56	0.00	88	14.44	0.00	0.00	0.00	20.56	0.00
89	14.60	0.00	0.00	0.00	21.26	0.00	90	14.76	0.00	0.00	0.00	22.63	0.00
91	14.93	0.00	0.00	0.00	23.53	0.00	92	15.09	174.25	174.25	142.16	24.13	118.03
93	15.26	174.66	174.66	143.58	25.06	118.52	94	15.42	175.07	175.07	145.06	26.63	118.44
95	15.58	175.46	175.46	146.81	28.59	118.22	96	15.75	175.86	175.86	148.82	31.93	116.89
97	15.91	176.24	176.24	151.07	37.29	113.78	98	16.08	176.62	176.62	153.56	45.72	107.84
99	16.24	177.00	177.00	155.99	56.49	99.50	100	16.40	177.37	177.37	158.10	67.26	90.84
101	16.57	177.73	177.73	159.84	76.46	83.38	102	16.73	178.08	178.08	161.29	83.09	78.20
103	16.90	178.43	178.43	162.75	89.36	73.39	104	17.06	178.77	178.77	164.23	95.19	69.03
105	17.22	179.11	179.11	165.69	100.93	64.76	106	17.39	179.44	179.44	167.03	105.96	61.07
107	17.55	179.77	173.77	162.72	111.36	51.36	108	17.72	180.09	174.85	164.68	116.89	47.79
109	17.88	180.40	176.63	167.35	123.36	43.99	110	18.04	180.71	179.27	170.88	130.36	40.51
111	18.21	181.01	181.69	174.18	136.49	37.69	112	18.37	181.31	181.31	174.71	141.43	33.28
113	18.54	181.60	181.60	175.88	145.63	30.25	114	18.70	181.89	181.89	177.05	149.80	27.25
115	18.86	182.17	182.17	178.21	152.76	25.44	116	19.03	182.45	182.45	179.36	155.47	23.89
117	19.19	182.72	182.72	180.51	157.83	22.67	118	19.36	182.99	182.99	181.65	159.77	21.88
119	19.52	183.26	183.26	182.79	160.10	22.69	120	19.69	183.52	183.52	183.93	160.63	23.29
121	19.85	183.77	183.77	185.06	159.80	25.26	122	20.01	184.02	184.02	186.18	158.07	28.11
123	20.18	184.27	184.27	187.29	155.50	31.79	124	20.34	184.51	184.51	188.40	156.67	31.74
125	20.51	184.75	184.75	189.51	160.27	29.24	126	20.67	184.99	184.99	190.61	164.73	25.87

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
127	20.83	185.22	185.22	191.70	167.07	24.63	128	21.00	185.45	185.45	192.79	167.93	24.85
129	21.16	185.67	185.67	193.87	167.70	26.17	130	21.33	185.89	185.89	194.94	166.43	28.51
131	21.49	186.11	186.11	196.01	164.10	31.91	132	21.65	186.32	186.32	197.08	161.97	35.11
133	21.82	186.53	186.53	198.13	164.03	34.10	134	21.98	186.74	186.74	199.19	169.17	30.02
135	22.15	186.94	186.94	200.24	171.27	28.97	136	22.31	187.14	187.14	201.28	163.93	37.34
137	22.47	187.34	187.34	202.31	149.13	53.17	138	22.64	187.53	187.53	203.68	131.90	71.78
139	22.80	187.72	176.30	193.12	114.73	78.39	140	22.97	187.92	167.01	184.76	96.43	88.33
141	23.13	188.11	155.51	173.96	77.73	96.23	142	23.29	188.30	140.58	159.25	60.53	98.72
143	23.46	188.49	122.53	140.74	45.97	94.77	144	23.62	188.68	105.44	122.79	35.30	87.49
145	23.79	188.87	94.36	111.15	28.73	82.41	146	23.95	189.06	189.06	222.65	26.07	196.58
147	24.11	189.25	189.25	223.91	25.33	198.57	148	24.28	189.44	189.44	225.29	25.23	200.06
149	24.44	189.63	189.63	226.93	25.07	201.87	150	24.61	189.81	82.97	100.94	24.30	76.64
151	24.77	189.98	69.18	85.59	22.66	62.93	152	24.93	190.15	57.17	72.03	21.50	50.54
153	25.10	0.00	0.00	0.00	21.86	0.00	154	25.26	0.00	0.00	0.00	24.73	0.00
155	25.43	0.00	0.00	0.00	29.13	0.00	156	25.59	0.00	0.00	0.00	34.86	0.00
157	25.75	0.00	0.00	0.00	40.83	0.00	158	25.92	191.21	123.61	151.86	45.96	105.90
159	26.08	191.42	127.38	156.77	49.83	106.95	160	26.25	191.63	132.85	163.57	54.30	109.28
161	26.41	191.83	142.86	175.31	61.66	113.65	162	26.57	192.03	148.51	182.18	66.90	115.28
163	26.74	0.00	0.00	0.00	68.10	0.00	164	26.90	0.00	0.00	0.00	62.66	0.00
165	27.07	0.00	0.00	0.00	56.66	0.00	166	27.23	0.00	0.00	0.00	50.90	0.00
167	27.40	0.00	0.00	0.00	45.56	0.00	168	27.56	0.00	0.00	0.00	39.13	0.00
169	27.72	0.00	0.00	0.00	31.70	0.00	170	27.89	0.00	0.00	0.00	25.10	0.00
171	28.05	0.00	0.00	0.00	20.66	0.00	172	28.22	0.00	0.00	0.00	18.73	0.00
173	28.38	0.00	0.00	0.00	19.30	0.00	174	28.54	0.00	0.00	0.00	24.40	0.00
175	28.71	0.00	0.00	0.00	32.83	0.00	176	28.87	0.00	0.00	0.00	40.13	0.00
177	29.04	0.00	0.00	0.00	43.00	0.00	178	29.20	194.91	194.91	260.63	42.06	218.57
179	29.36	195.07	195.07	263.15	40.56	222.59	180	29.53	195.23	195.23	265.75	38.20	227.56
181	29.69	0.00	0.00	0.00	34.40	0.00	182	29.86	0.00	0.00	0.00	29.93	0.00
183	30.02	0.00	0.00	0.00	26.20	0.00	184	30.18	0.00	0.00	0.00	24.03	0.00
185	30.35	0.00	0.00	0.00	23.29	0.00	186	30.51	0.00	0.00	0.00	23.80	0.00
187	30.68	196.27	59.20	89.25	26.33	62.92	188	30.84	196.41	69.34	103.18	30.00	73.18
189	31.00	196.54	76.67	113.33	32.26	81.07	190	31.17	196.68	78.98	116.87	32.73	84.14
191	31.33	196.81	82.86	122.48	34.17	88.31	192	31.50	196.94	93.76	137.20	39.87	97.34
193	31.66	197.07	112.45	161.56	48.60	112.96	194	31.82	197.19	124.23	176.78	52.67	124.12
195	31.99	197.31	197.31	279.86	49.97	229.90	196	32.15	197.44	197.44	283.67	42.07	241.60
197	32.32	197.56	197.56	288.08	36.57	251.51	198	32.48	197.68	197.68	289.83	35.37	254.47
199	32.64	197.79	197.79	290.12	37.13	252.99	200	32.81	197.91	197.91	291.27	38.97	252.30
201	32.97	198.02	198.02	292.76	39.90	252.86	202	33.14	198.13	198.13	293.11	40.70	252.41
203	33.30	198.23	198.23	292.49	42.07	250.43	204	33.46	198.34	198.34	292.75	42.93	249.82
205	33.63	198.44	198.44	294.84	42.50	252.34	206	33.79	198.54	198.54	297.72	41.27	256.46
207	33.96	198.64	198.64	301.33	39.63	261.69	208	34.12	198.73	100.91	155.50	38.37	117.14
209	34.28	198.83	95.74	149.15	37.23	111.92	210	34.45	198.92	89.98	141.89	36.57	105.33
211	34.61	199.01	81.99	131.44	35.87	95.57	212	34.78	199.09	75.57	122.96	35.87	87.09
213	34.94	199.18	73.94	121.16	36.90	84.26	214	35.10	199.26	73.29	120.73	37.53	83.19
215	35.27	199.33	68.01	113.64	35.87	77.77	216	35.43	199.41	60.49	103.16	33.63	69.53
217	35.60	0.00	0.00	0.00	35.07	0.00	218	35.76	0.00	0.00	0.00	42.27	0.00
219	35.93	0.00	0.00	0.00	52.10	0.00	220	36.09	0.00	0.00	0.00	59.86	0.00
221	36.25	199.76	127.44	198.33	63.30	135.03	222	36.42	199.82	128.07	199.81	65.73	134.08
223	36.58	199.88	131.68	205.07	71.43	133.64	224	36.75	199.94	148.46	226.27	87.96	138.31

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
225	36.91	199.99	165.21	245.68	109.40	136.28	226	37.07	200.04	177.32	258.38	132.90	125.48
227	37.24	200.09	183.67	264.86	150.16	114.69	228	37.40	200.14	188.38	269.71	163.37	106.34
229	37.57	200.18	193.59	274.81	177.43	97.38	230	37.73	200.22	200.79	281.58	194.83	86.74
231	37.89	200.26	200.26	281.03	212.40	68.63	232	38.06	200.30	200.30	281.44	222.90	58.54
233	38.22	200.34	200.34	281.84	222.90	58.94	234	38.39	200.37	200.37	282.24	220.07	62.17
235	38.55	200.40	200.40	282.63	219.27	63.36	236	38.71	200.43	200.43	283.01	224.77	58.25
237	38.88	200.46	200.46	283.39	224.13	59.26	238	39.04	200.49	200.49	283.76	219.17	64.59
239	39.21	200.51	200.51	284.13	210.53	73.59	240	39.37	200.54	200.54	284.50	206.20	78.30
241	39.53	200.56	200.56	284.87	206.33	78.53	242	39.70	200.58	200.58	285.24	214.87	70.37
243	39.86	200.59	200.59	285.61	230.50	55.11	244	40.03	200.61	200.61	285.98	245.27	40.71
245	40.19	200.62	200.62	286.34	249.63	36.71	246	40.35	200.63	200.63	286.70	250.00	36.70
247	40.52	200.64	200.64	287.07	249.87	37.20	248	40.68	200.65	200.65	287.43	255.70	31.73
249	40.85	200.65	200.65	287.80	259.27	28.53	250	41.01	200.65	200.65	288.17	262.40	25.77
251	41.17	200.65	200.65	288.53	260.03	28.50	252	41.34	200.65	200.65	288.89	254.73	34.16
253	41.50	200.65	200.65	289.25	244.80	44.45	254	41.67	200.64	200.84	290.27	234.77	55.50
255	41.83	200.64	200.31	290.15	228.10	62.05	256	41.99	200.63	200.22	290.43	222.40	68.04
257	42.16	200.62	200.42	290.96	215.00	75.96	258	42.32	200.61	200.80	291.63	204.30	87.34
259	42.49	200.60	200.60	291.27	193.33	97.94	260	42.65	200.59	200.59	291.57	184.46	107.11
261	42.81	200.58	200.58	291.87	180.46	111.40	262	42.98	200.57	200.57	292.16	183.10	109.06
263	43.14	200.55	200.55	292.44	180.13	112.31	264	43.31	200.54	200.54	292.73	171.30	121.43
265	43.47	200.52	200.52	293.27	162.50	130.77	266	43.64	200.50	200.50	293.30	167.87	125.43
267	43.80	200.48	200.48	293.58	189.03	104.55	268	43.96	200.46	200.46	293.87	215.53	78.34
269	44.13	200.43	200.43	294.17	235.63	58.53	270	44.29	200.41	200.41	294.46	238.80	55.66
271	44.46	200.38	200.38	294.75	222.87	71.88	272	44.62	200.35	200.35	295.02	189.87	105.15
273	44.78	200.32	200.32	300.21	143.50	156.70	274	44.95	200.29	153.80	252.48	92.77	159.71
275	45.11	200.26	78.60	148.38	52.28	96.10	276	45.28	0.00	0.00	0.00	28.28	0.00
277	45.44	0.00	0.00	0.00	18.02	0.00	278	45.60	0.00	0.00	0.00	13.49	0.00
279	45.77	0.00	0.00	0.00	12.06	0.00	280	45.93	0.00	0.00	0.00	11.73	0.00
281	46.10	0.00	0.00	0.00	11.87	0.00	282	46.26	0.00	0.00	0.00	12.17	0.00
283	46.42	0.00	0.00	0.00	12.97	0.00	284	46.59	0.00	0.00	0.00	13.94	0.00
285	46.75	0.00	0.00	0.00	14.45	0.00	286	46.92	0.00	0.00	0.00	15.32	0.00
287	47.08	0.00	0.00	0.00	15.76	0.00	288	47.24	0.00	0.00	0.00	15.77	0.00
289	47.41	0.00	0.00	0.00	15.11	0.00	290	47.57	0.00	0.00	0.00	15.41	0.00
291	47.74	0.00	0.00	0.00	16.03	0.00	292	47.90	0.00	0.00	0.00	15.51	0.00
293	48.06	0.00	0.00	0.00	13.55	0.00	294	48.23	0.00	0.00	0.00	13.11	0.00
295	48.39	0.00	0.00	0.00	15.78	0.00	296	48.56	0.00	0.00	0.00	19.59	0.00
297	48.72	0.00	0.00	0.00	22.22	0.00	298	48.88	0.00	0.00	0.00	23.15	0.00
299	49.05	0.00	0.00	0.00	24.50	0.00	300	49.21	0.00	0.00	0.00	31.86	0.00
301	49.38	0.00	0.00	0.00	48.48	0.00	302	49.54	0.00	0.00	0.00	67.94	0.00
303	49.70	0.00	0.00	0.00	77.26	0.00	304	49.87	199.04	105.55	195.79	73.37	122.42
305	50.03	198.98	97.96	184.68	60.13	124.54	306	50.20	0.00	0.00	0.00	47.80	0.00
307	50.36	0.00	0.00	0.00	36.43	0.00	308	50.52	0.00	0.00	0.00	29.72	0.00
309	50.69	0.00	0.00	0.00	25.63	0.00	310	50.85	0.00	0.00	0.00	23.75	0.00
311	51.02	0.00	0.00	0.00	23.32	0.00	312	51.18	0.00	0.00	0.00	24.29	0.00
313	51.35	0.00	0.00	0.00	26.36	0.00	314	51.51	0.00	0.00	0.00	27.34	0.00
315	51.67	0.00	0.00	0.00	27.53	0.00	316	51.84	0.00	0.00	0.00	27.60	0.00
317	52.00	0.00	0.00	0.00	29.23	0.00	318	52.17	0.00	0.00	0.00	32.37	0.00
319	52.33	0.00	0.00	0.00	38.07	0.00	320	52.49	0.00	0.00	0.00	44.37	0.00
321	52.66	0.00	0.00	0.00	50.35	0.00	322	52.82	0.00	0.00	0.00	53.42	0.00

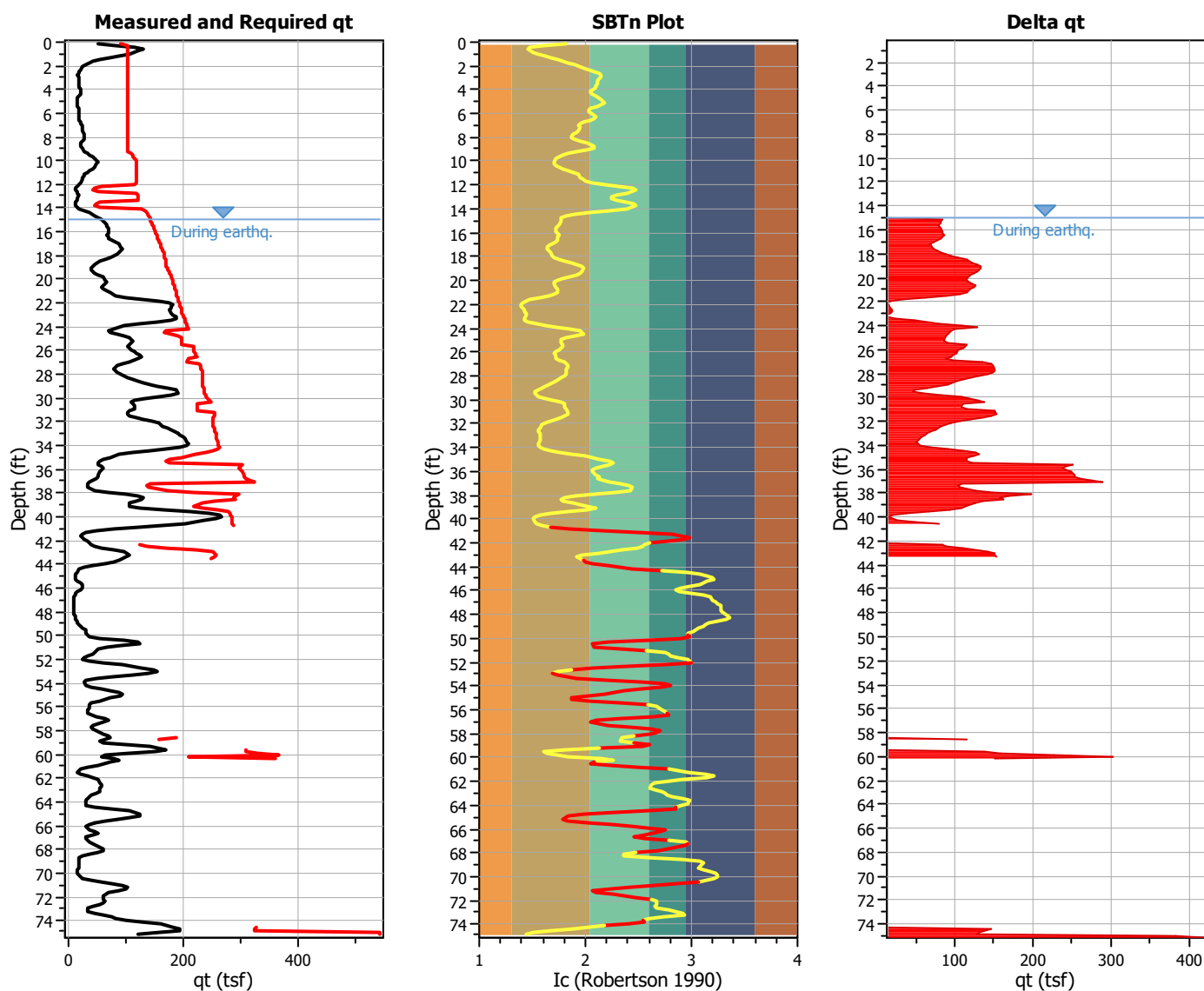
:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
323	52.99	0.00	0.00	0.00	51.36	0.00	324	53.15	0.00	0.00	0.00	43.97	0.00
325	53.31	0.00	0.00	0.00	34.03	0.00	326	53.48	0.00	0.00	0.00	27.54	0.00
327	53.64	0.00	0.00	0.00	26.17	0.00	328	53.81	0.00	0.00	0.00	28.71	0.00
329	53.97	0.00	0.00	0.00	27.62	0.00	330	54.13	0.00	0.00	0.00	26.41	0.00
331	54.30	0.00	0.00	0.00	31.53	0.00	332	54.46	197.26	67.14	141.17	45.14	96.03
333	54.63	197.19	86.97	174.01	56.30	117.70	334	54.79	197.12	83.32	168.38	58.38	109.99
335	54.95	197.05	80.54	164.09	59.71	104.38	336	55.12	196.98	99.43	194.33	68.97	125.36
337	55.28	196.91	126.73	234.67	80.84	153.83	338	55.45	0.00	0.00	0.00	85.97	0.00
339	55.61	0.00	0.00	0.00	76.88	0.00	340	55.77	0.00	0.00	0.00	57.26	0.00
341	55.94	0.00	0.00	0.00	35.77	0.00	342	56.10	0.00	0.00	0.00	22.19	0.00
343	56.27	0.00	0.00	0.00	21.77	0.00	344	56.43	0.00	0.00	0.00	30.73	0.00
345	56.59	196.35	63.21	137.01	39.95	97.06	346	56.76	0.00	0.00	0.00	42.63	0.00
347	56.92	0.00	0.00	0.00	42.36	0.00	348	57.09	0.00	0.00	0.00	40.41	0.00
349	57.25	0.00	0.00	0.00	37.15	0.00	350	57.41	0.00	0.00	0.00	29.68	0.00
351	57.58	0.00	0.00	0.00	21.59	0.00	352	57.74	0.00	0.00	0.00	17.72	0.00
353	57.91	0.00	0.00	0.00	22.12	0.00	354	58.07	0.00	0.00	0.00	32.50	0.00
355	58.23	0.00	0.00	0.00	39.12	0.00	356	58.40	0.00	0.00	0.00	37.32	0.00
357	58.56	0.00	0.00	0.00	34.20	0.00	358	58.73	0.00	0.00	0.00	42.44	0.00
359	58.89	0.00	0.00	0.00	67.06	0.00	360	59.06	0.00	0.00	0.00	105.97	0.00
361	59.22	0.00	0.00	0.00	152.60	0.00	362	59.38	0.00	0.00	0.00	198.35	0.00
363	59.55	195.08	195.08	311.20	225.74	85.46	364	59.71	195.01	195.01	311.37	224.35	87.02
365	59.88	194.94	194.94	311.53	194.27	117.26	366	60.04	194.88	194.88	311.69	153.74	157.94
367	60.20	0.00	0.00	0.00	116.68	0.00	368	60.37	0.00	0.00	0.00	89.57	0.00
369	60.53	0.00	0.00	0.00	71.95	0.00	370	60.70	0.00	0.00	0.00	61.20	0.00
371	60.86	0.00	0.00	0.00	53.98	0.00	372	61.02	0.00	0.00	0.00	45.85	0.00
373	61.19	0.00	0.00	0.00	37.94	0.00	374	61.35	0.00	0.00	0.00	30.07	0.00
375	61.52	0.00	0.00	0.00	23.34	0.00	376	61.68	0.00	0.00	0.00	19.21	0.00
377	61.84	0.00	0.00	0.00	16.08	0.00	378	62.01	0.00	0.00	0.00	14.52	0.00
379	62.17	0.00	0.00	0.00	12.85	0.00	380	62.34	0.00	0.00	0.00	12.52	0.00
381	62.50	0.00	0.00	0.00	13.45	0.00	382	62.66	0.00	0.00	0.00	15.09	0.00
383	62.83	0.00	0.00	0.00	15.89	0.00	384	62.99	0.00	0.00	0.00	19.46	0.00
385	63.16	0.00	0.00	0.00	22.26	0.00	386	63.32	0.00	0.00	0.00	23.42	0.00
387	63.48	0.00	0.00	0.00	20.96	0.00	388	63.65	0.00	0.00	0.00	20.26	0.00
389	63.81	0.00	0.00	0.00	24.79	0.00	390	63.98	0.00	0.00	0.00	32.59	0.00
391	64.14	0.00	0.00	0.00	40.67	0.00	392	64.30	0.00	0.00	0.00	45.85	0.00
393	64.47	0.00	0.00	0.00	50.27	0.00	394	64.63	0.00	0.00	0.00	65.65	0.00
395	64.80	0.00	0.00	0.00	88.48	0.00	396	64.96	0.00	0.00	0.00	115.34	0.00
397	65.12	0.00	0.00	0.00	135.90	0.00	398	65.29	0.00	0.00	0.00	156.50	0.00
399	65.45	0.00	0.00	0.00	172.80	0.00	400	65.62	0.00	0.00	0.00	174.66	0.00
401	65.78	0.00	0.00	0.00	153.83	0.00	402	65.94	0.00	0.00	0.00	118.40	0.00
403	66.11	0.00	0.00	0.00	84.44	0.00	404	66.27	0.00	0.00	0.00	67.37	0.00
405	66.44	0.00	0.00	0.00	79.31	0.00	406	66.60	0.00	0.00	0.00	113.70	0.00
407	66.77	0.00	0.00	0.00	158.74	0.00	408	66.93	192.36	192.36	323.71	184.84	138.87
409	67.09	192.31	192.31	318.75	184.07	134.68	410	67.26	192.26	192.26	318.91	161.67	157.24
411	67.42	0.00	0.00	0.00	131.70	0.00	412	67.59	0.00	0.00	0.00	99.47	0.00
413	67.75	0.00	0.00	0.00	70.70	0.00	414	67.91	0.00	0.00	0.00	47.60	0.00
415	68.08	0.00	0.00	0.00	36.44	0.00	416	68.24	0.00	0.00	0.00	31.27	0.00
417	68.41	0.00	0.00	0.00	34.67	0.00	418	68.57	0.00	0.00	0.00	43.17	0.00
419	68.73	0.00	0.00	0.00	52.31	0.00	420	68.90	0.00	0.00	0.00	52.91	0.00

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
421	69.06	0.00	0.00	0.00	46.61	0.00	422	69.23	0.00	0.00	0.00	35.61	0.00
423	69.39	0.00	0.00	0.00	29.08	0.00	424	69.55	0.00	0.00	0.00	29.91	0.00
425	69.72	0.00	0.00	0.00	39.94	0.00	426	69.88	191.51	59.09	145.14	45.28	99.86
427	70.05	0.00	0.00	0.00	42.08	0.00	428	70.21	0.00	0.00	0.00	33.94	0.00
429	70.37	0.00	0.00	0.00	32.81	0.00	430	70.54	0.00	0.00	0.00	31.81	0.00
431	70.70	0.00	0.00	0.00	31.61	0.00	432	70.87	0.00	0.00	0.00	39.21	0.00
433	71.03	191.21	59.54	147.33	55.31	92.02	434	71.19	191.17	79.04	183.33	66.74	116.59
435	71.36	191.13	68.10	163.76	60.81	102.95	436	71.52	0.00	0.00	0.00	44.48	0.00
437	71.69	0.00	0.00	0.00	31.54	0.00	438	71.85	0.00	0.00	0.00	28.24	0.00
439	72.01	0.00	0.00	0.00	42.71	0.00	440	72.18	0.00	0.00	0.00	56.48	0.00
441	72.34	190.89	62.15	153.85	62.94	90.91	442	72.51	0.00	0.00	0.00	52.24	0.00
443	72.67	0.00	0.00	0.00	39.34	0.00	444	72.83	0.00	0.00	0.00	35.78	0.00
445	73.00	0.00	0.00	0.00	48.54	0.00	446	73.16	0.00	0.00	0.00	79.68	0.00
447	73.33	0.00	0.00	0.00	125.41	0.00	448	73.49	0.00	0.00	0.00	158.84	0.00
449	73.65	0.00	0.00	0.00	163.64	0.00	450	73.82	0.00	0.00	0.00	138.34	0.00
451	73.98	0.00	0.00	0.00	104.34	0.00	452	74.15	0.00	0.00	0.00	75.08	0.00
453	74.31	0.00	0.00	0.00	53.51	0.00	454	74.48	0.00	0.00	0.00	40.24	0.00
455	74.64	0.00	0.00	0.00	39.88	0.00	456	74.80	190.35	190.35	429.52	50.18	379.34
457	74.97	190.34	190.34	553.01	67.84	485.17	458	75.13	190.32	190.32	553.34	81.11	472.23

**Abbreviations**

Depth: Depth of CPT point from ground surface  
Q<sub>tn,cs</sub> demand: Demand for equivalent clean sand normalized cone resistance  
Q<sub>tn</sub> demand: Demand for cone resistance  
q<sub>t</sub> demand: Demand for cone resistance  
q<sub>t</sub>: Measured cone resistance  
Diff.: Difference between demanded and measured cone resistance



**:: Tabular results ::**

Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)	Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)
1	0.16	0.00	0.00	0.00	50.13	0.00	2	0.33	0.00	0.00	0.00	82.23	0.00
3	0.49	0.00	0.00	0.00	114.97	0.00	4	0.66	0.00	0.00	0.00	129.87	0.00
5	0.82	0.00	0.00	0.00	121.33	0.00	6	0.98	0.00	0.00	0.00	106.83	0.00
7	1.15	0.00	0.00	0.00	88.10	0.00	8	1.31	0.00	0.00	0.00	71.43	0.00
9	1.48	0.00	0.00	0.00	55.87	0.00	10	1.64	0.00	0.00	0.00	43.87	0.00
11	1.80	0.00	0.00	0.00	35.10	0.00	12	1.97	0.00	0.00	0.00	29.37	0.00
13	2.13	0.00	0.00	0.00	25.30	0.00	14	2.30	0.00	0.00	0.00	22.20	0.00
15	2.46	0.00	0.00	0.00	19.50	0.00	16	2.62	0.00	0.00	0.00	17.50	0.00
17	2.79	0.00	0.00	0.00	16.53	0.00	18	2.95	0.00	0.00	0.00	16.70	0.00
19	3.12	0.00	0.00	0.00	17.37	0.00	20	3.28	0.00	0.00	0.00	17.93	0.00
21	3.44	0.00	0.00	0.00	18.27	0.00	22	3.61	0.00	0.00	0.00	18.50	0.00
23	3.77	0.00	0.00	0.00	19.00	0.00	24	3.94	0.00	0.00	0.00	19.90	0.00
25	4.10	0.00	0.00	0.00	20.97	0.00	26	4.27	0.00	0.00	0.00	21.17	0.00
27	4.43	0.00	0.00	0.00	19.90	0.00	28	4.59	0.00	0.00	0.00	17.70	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
29	4.76	0.00	0.00	0.00	15.80	0.00	30	4.92	0.00	0.00	0.00	14.87	0.00
31	5.09	0.00	0.00	0.00	14.67	0.00	32	5.25	0.00	0.00	0.00	15.20	0.00
33	5.41	0.00	0.00	0.00	16.50	0.00	34	5.58	0.00	0.00	0.00	18.43	0.00
35	5.74	0.00	0.00	0.00	19.43	0.00	36	5.91	0.00	0.00	0.00	18.90	0.00
37	6.07	0.00	0.00	0.00	17.53	0.00	38	6.23	0.00	0.00	0.00	16.70	0.00
39	6.40	0.00	0.00	0.00	17.37	0.00	40	6.56	0.00	0.00	0.00	18.87	0.00
41	6.73	0.00	0.00	0.00	20.80	0.00	42	6.89	0.00	0.00	0.00	22.30	0.00
43	7.05	0.00	0.00	0.00	22.90	0.00	44	7.22	0.00	0.00	0.00	23.00	0.00
45	7.38	0.00	0.00	0.00	23.27	0.00	46	7.55	0.00	0.00	0.00	24.43	0.00
47	7.71	0.00	0.00	0.00	25.97	0.00	48	7.87	0.00	0.00	0.00	27.17	0.00
49	8.04	0.00	0.00	0.00	27.40	0.00	50	8.20	0.00	0.00	0.00	26.17	0.00
51	8.37	0.00	0.00	0.00	23.90	0.00	52	8.53	0.00	0.00	0.00	21.37	0.00
53	8.69	0.00	0.00	0.00	20.03	0.00	54	8.86	0.00	0.00	0.00	20.27	0.00
55	9.02	0.00	0.00	0.00	23.20	0.00	56	9.19	0.00	0.00	0.00	27.40	0.00
57	9.35	0.00	0.00	0.00	32.30	0.00	58	9.51	0.00	0.00	0.00	36.83	0.00
59	9.68	0.00	0.00	0.00	41.50	0.00	60	9.84	0.00	0.00	0.00	46.00	0.00
61	10.01	0.00	0.00	0.00	49.47	0.00	62	10.17	0.00	0.00	0.00	50.90	0.00
63	10.33	0.00	0.00	0.00	49.80	0.00	64	10.50	0.00	0.00	0.00	46.40	0.00
65	10.66	0.00	0.00	0.00	41.97	0.00	66	10.83	0.00	0.00	0.00	37.27	0.00
67	10.99	0.00	0.00	0.00	32.60	0.00	68	11.15	0.00	0.00	0.00	28.73	0.00
69	11.32	0.00	0.00	0.00	26.17	0.00	70	11.48	0.00	0.00	0.00	24.57	0.00
71	11.65	0.00	0.00	0.00	22.93	0.00	72	11.81	0.00	0.00	0.00	20.93	0.00
73	11.98	0.00	0.00	0.00	18.53	0.00	74	12.14	0.00	0.00	0.00	15.67	0.00
75	12.30	0.00	0.00	0.00	13.60	0.00	76	12.47	0.00	0.00	0.00	13.30	0.00
77	12.63	0.00	0.00	0.00	14.80	0.00	78	12.80	0.00	0.00	0.00	16.60	0.00
79	12.96	0.00	0.00	0.00	17.06	0.00	80	13.12	0.00	0.00	0.00	16.40	0.00
81	13.29	0.00	0.00	0.00	14.70	0.00	82	13.45	0.00	0.00	0.00	13.03	0.00
83	13.62	0.00	0.00	0.00	11.86	0.00	84	13.78	0.00	0.00	0.00	11.83	0.00
85	13.94	0.00	0.00	0.00	13.83	0.00	86	14.11	0.00	0.00	0.00	18.96	0.00
87	14.27	0.00	0.00	0.00	26.66	0.00	88	14.44	0.00	0.00	0.00	36.23	0.00
89	14.60	0.00	0.00	0.00	45.26	0.00	90	14.76	0.00	0.00	0.00	52.53	0.00
91	14.93	0.00	0.00	0.00	57.16	0.00	92	15.09	174.27	174.27	144.03	59.93	84.10
93	15.26	174.70	174.70	145.49	62.53	82.96	94	15.42	175.13	175.13	147.15	65.43	81.72
95	15.58	175.56	175.56	148.73	68.10	80.63	96	15.75	175.97	175.97	150.04	69.43	80.61
97	15.91	176.38	176.38	151.14	69.20	81.94	98	16.08	176.78	176.78	152.23	68.50	83.73
99	16.24	177.18	177.18	153.39	68.00	85.39	100	16.40	177.57	177.57	154.70	68.70	86.00
101	16.57	177.95	177.95	156.10	70.90	85.21	102	16.73	178.33	178.33	157.63	75.03	82.60
103	16.90	178.70	178.70	159.25	80.90	78.35	104	17.06	179.07	179.07	160.89	87.66	73.22
105	17.22	179.42	179.42	162.30	92.43	69.87	106	17.39	179.78	179.78	163.49	92.93	70.55
107	17.55	180.12	180.12	164.57	90.53	74.03	108	17.72	180.46	180.46	165.54	86.93	78.61
109	17.88	180.80	180.80	166.53	83.60	82.94	110	18.04	181.13	181.13	167.43	78.53	88.90
111	18.21	181.46	181.46	168.23	71.73	96.50	112	18.37	181.78	181.78	168.94	63.33	105.61
113	18.54	182.10	182.10	169.64	54.40	115.24	114	18.70	182.42	182.42	170.41	46.63	123.78
115	18.86	182.73	182.73	171.34	41.33	130.01	116	19.03	183.04	183.04	172.47	39.36	133.10
117	19.19	183.35	183.35	173.73	40.07	133.66	118	19.36	183.65	183.65	175.09	42.80	132.29
119	19.52	183.94	183.94	176.50	47.00	129.50	120	19.69	184.24	184.24	178.01	52.77	125.24
121	19.85	184.52	184.52	179.45	59.30	120.15	122	20.01	184.81	184.81	180.79	64.67	116.13
123	20.18	185.09	185.09	181.96	66.57	115.40	124	20.34	185.37	185.37	183.04	64.77	118.27
125	20.51	185.65	185.65	184.04	61.03	123.00	126	20.67	185.92	185.92	185.04	58.57	126.48

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
127	20.83	186.19	186.19	186.09	60.17	125.93	128	21.00	186.45	186.45	187.18	65.87	121.31
129	21.16	186.71	186.71	188.26	73.07	115.19	130	21.33	186.96	186.96	189.28	82.67	106.62
131	21.49	187.20	187.20	190.30	100.86	89.44	132	21.65	187.44	187.44	191.35	128.73	62.62
133	21.82	187.67	187.67	192.41	158.16	34.24	134	21.98	187.89	187.89	193.47	175.43	18.04
135	22.15	188.11	188.11	194.54	180.93	13.61	136	22.31	188.33	188.33	195.60	180.06	15.54
137	22.47	188.54	188.54	196.66	178.40	18.26	138	22.64	188.75	188.75	197.72	177.30	20.42
139	22.80	188.95	188.95	198.77	177.63	21.13	140	22.97	189.15	189.15	199.81	180.90	18.91
141	23.13	189.35	189.35	200.86	187.20	13.66	142	23.29	189.54	189.54	201.90	188.33	13.56
143	23.46	189.73	189.73	202.93	178.76	24.16	144	23.62	189.92	189.92	203.95	153.93	50.02
145	23.79	190.10	190.10	204.96	124.00	80.96	146	23.95	190.29	190.29	206.97	97.83	109.14
147	24.11	190.47	190.47	209.42	80.26	129.15	148	24.28	190.65	153.36	170.72	71.00	99.72
149	24.44	190.83	149.90	167.95	72.93	95.02	150	24.61	191.00	159.94	179.11	84.60	94.51
151	24.77	191.17	169.95	190.02	97.86	92.16	152	24.93	191.33	175.93	196.78	107.56	89.21
153	25.10	191.49	176.25	197.93	110.60	87.34	154	25.26	191.65	175.86	198.39	111.03	87.36
155	25.43	191.80	174.85	198.23	107.10	91.13	156	25.59	191.96	191.96	218.32	103.40	114.92
157	25.75	192.11	192.11	218.76	104.76	113.99	158	25.92	192.26	192.26	219.29	108.73	110.56
159	26.08	192.40	192.40	220.00	114.56	105.43	160	26.25	192.54	192.54	221.12	118.73	102.39
161	26.41	192.68	192.68	222.07	124.06	98.01	162	26.57	192.81	192.81	223.15	126.50	96.65
163	26.74	192.94	179.95	209.80	120.50	89.30	164	26.90	193.07	174.41	205.22	106.90	98.32
165	27.07	193.20	193.20	228.98	92.73	136.25	166	27.23	193.34	193.34	230.00	83.90	146.11
167	27.40	193.47	193.47	230.53	80.63	149.90	168	27.56	193.60	193.60	231.47	79.50	151.98
169	27.72	193.73	193.73	232.72	80.66	152.06	170	27.89	193.85	193.85	233.68	84.40	149.29
171	28.05	193.97	193.97	234.17	92.10	142.08	172	28.22	194.08	194.08	234.08	101.86	132.22
173	28.38	194.26	194.26	233.80	112.66	121.14	174	28.54	194.44	194.44	233.47	122.23	111.24
175	28.71	194.61	194.61	233.48	131.73	101.76	176	28.87	194.78	194.78	234.11	142.16	91.95
177	29.04	194.95	194.95	235.06	155.89	79.17	178	29.20	195.11	195.11	236.02	171.76	64.26
179	29.36	195.27	195.27	236.98	187.09	49.89	180	29.53	195.43	195.43	237.94	190.33	47.61
181	29.69	195.59	195.59	238.89	179.29	59.59	182	29.86	195.74	195.74	239.83	156.36	83.47
183	30.02	195.89	195.89	242.76	133.53	109.24	184	30.18	196.04	196.04	246.53	116.46	130.07
185	30.35	196.19	196.19	249.01	109.69	139.32	186	30.51	196.33	176.35	224.81	112.63	112.19
187	30.68	196.47	176.43	225.70	116.16	109.54	188	30.84	196.61	175.02	225.15	114.79	110.36
189	31.00	196.75	172.78	223.76	107.46	116.30	190	31.17	196.89	196.89	255.23	102.63	152.60
191	31.33	197.02	197.02	255.05	101.96	153.09	192	31.50	197.15	197.15	254.51	106.79	147.71
193	31.66	197.28	197.28	253.22	117.26	135.96	194	31.82	197.40	197.40	251.79	131.43	120.36
195	31.99	197.53	197.53	251.49	145.13	106.37	196	32.15	197.65	197.65	252.37	156.49	95.87
197	32.32	197.76	197.76	253.24	164.93	88.31	198	32.48	197.88	197.88	254.11	172.56	81.55
199	32.64	197.99	197.99	254.98	179.49	75.49	200	32.81	198.10	198.10	255.86	185.76	70.10
201	32.97	198.21	198.21	256.73	190.96	65.77	202	33.14	198.31	198.31	257.60	195.76	61.84
203	33.30	198.41	198.41	258.47	200.19	58.27	204	33.46	198.51	198.51	259.33	204.02	55.31
205	33.63	198.61	198.61	260.19	207.46	52.74	206	33.79	198.70	198.70	261.05	209.56	51.50
207	33.96	198.79	198.79	261.91	206.49	55.42	208	34.12	198.88	198.88	262.76	193.26	69.50
209	34.28	198.97	195.77	260.95	170.49	90.46	210	34.45	199.06	185.35	252.29	141.52	110.77
211	34.61	199.14	171.42	239.98	112.19	127.79	212	34.78	199.23	152.88	221.04	88.62	132.41
213	34.94	199.31	131.40	196.27	72.06	124.22	214	35.10	199.39	115.70	177.06	61.99	115.07
215	35.27	199.47	109.72	169.89	54.82	115.06	216	35.43	199.55	113.25	175.15	51.69	123.46
217	35.60	199.62	199.62	303.78	52.66	251.12	218	35.76	199.70	199.70	299.99	57.26	242.73
219	35.93	199.77	199.77	298.70	59.49	239.21	220	36.09	199.84	199.84	299.97	57.96	242.01
221	36.25	199.91	199.91	303.50	54.39	249.11	222	36.42	199.98	199.98	305.99	52.56	253.43
223	36.58	200.04	200.04	306.92	52.29	254.63	224	36.75	200.11	200.11	310.60	48.79	261.81



:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
225	36.91	200.17	200.17	316.97	42.62	274.34	226	37.07	200.23	200.23	325.80	36.42	289.38
227	37.24	200.29	84.51	141.91	32.59	109.32	228	37.40	200.34	79.97	135.87	31.92	103.95
229	37.57	200.40	83.06	140.72	34.59	106.13	230	37.73	200.45	106.74	174.24	46.62	127.61
231	37.89	200.49	141.73	220.04	70.12	149.92	232	38.06	200.53	200.53	297.96	99.26	198.70
233	38.22	200.57	200.57	291.61	121.46	170.15	234	38.39	200.61	200.61	289.69	130.39	159.30
235	38.55	200.65	200.65	291.37	128.39	162.98	236	38.71	200.68	170.89	254.45	119.19	135.26
237	38.88	200.71	150.80	232.99	106.89	126.10	238	39.04	200.74	138.63	218.67	105.79	112.88
239	39.21	200.76	151.92	235.06	125.59	109.47	240	39.37	200.78	176.93	261.79	167.26	94.53
241	39.53	200.80	196.51	279.36	211.46	67.90	242	39.70	200.82	200.82	283.13	245.02	38.11
243	39.86	200.84	200.84	283.51	264.36	19.16	244	40.03	200.85	200.85	283.89	267.29	16.60
245	40.19	200.86	200.86	284.27	257.79	26.48	246	40.35	200.87	200.87	284.64	236.09	48.55
247	40.52	200.88	200.88	284.99	204.22	80.77	248	40.68	200.89	200.89	288.26	164.39	123.87
249	40.85	0.00	0.00	0.00	120.39	0.00	250	41.01	0.00	0.00	0.00	80.33	0.00
251	41.17	0.00	0.00	0.00	49.76	0.00	252	41.34	0.00	0.00	0.00	30.63	0.00
253	41.50	0.00	0.00	0.00	23.13	0.00	254	41.67	0.00	0.00	0.00	22.71	0.00
255	41.83	0.00	0.00	0.00	26.62	0.00	256	41.99	0.00	0.00	0.00	32.49	0.00
257	42.16	0.00	0.00	0.00	37.54	0.00	258	42.32	200.93	67.40	124.57	40.60	83.97
259	42.49	200.92	74.13	135.14	45.57	89.58	260	42.65	200.92	96.65	168.91	57.21	111.70
261	42.81	200.91	133.92	220.47	78.59	141.88	262	42.98	200.89	158.49	250.52	98.30	152.22
263	43.14	200.88	166.22	259.19	106.76	152.42	264	43.31	200.87	162.21	255.26	101.60	153.66
265	43.47	200.85	156.58	249.36	93.02	156.34	266	43.64	0.00	0.00	0.00	86.78	0.00
267	43.80	0.00	0.00	0.00	77.86	0.00	268	43.96	0.00	0.00	0.00	62.49	0.00
269	44.13	0.00	0.00	0.00	42.53	0.00	270	44.29	0.00	0.00	0.00	26.48	0.00
271	44.46	0.00	0.00	0.00	16.89	0.00	272	44.62	0.00	0.00	0.00	13.76	0.00
273	44.78	0.00	0.00	0.00	12.23	0.00	274	44.95	0.00	0.00	0.00	11.77	0.00
275	45.11	0.00	0.00	0.00	11.80	0.00	276	45.28	0.00	0.00	0.00	13.43	0.00
277	45.44	0.00	0.00	0.00	16.17	0.00	278	45.60	0.00	0.00	0.00	20.23	0.00
279	45.77	0.00	0.00	0.00	23.48	0.00	280	45.93	0.00	0.00	0.00	23.92	0.00
281	46.10	0.00	0.00	0.00	20.68	0.00	282	46.26	0.00	0.00	0.00	16.14	0.00
283	46.42	0.00	0.00	0.00	12.77	0.00	284	46.59	0.00	0.00	0.00	10.98	0.00
285	46.75	0.00	0.00	0.00	10.28	0.00	286	46.92	0.00	0.00	0.00	9.98	0.00
287	47.08	0.00	0.00	0.00	9.88	0.00	288	47.24	0.00	0.00	0.00	9.91	0.00
289	47.41	0.00	0.00	0.00	10.15	0.00	290	47.57	0.00	0.00	0.00	10.35	0.00
291	47.74	0.00	0.00	0.00	10.38	0.00	292	47.90	0.00	0.00	0.00	10.31	0.00
293	48.06	0.00	0.00	0.00	9.85	0.00	294	48.23	0.00	0.00	0.00	9.98	0.00
295	48.39	0.00	0.00	0.00	10.78	0.00	296	48.56	0.00	0.00	0.00	12.51	0.00
297	48.72	0.00	0.00	0.00	14.65	0.00	298	48.88	0.00	0.00	0.00	16.08	0.00
299	49.05	0.00	0.00	0.00	18.11	0.00	300	49.21	0.00	0.00	0.00	21.51	0.00
301	49.38	0.00	0.00	0.00	25.76	0.00	302	49.54	0.00	0.00	0.00	28.95	0.00
303	49.70	0.00	0.00	0.00	29.20	0.00	304	49.87	0.00	0.00	0.00	29.37	0.00
305	50.03	0.00	0.00	0.00	36.13	0.00	306	50.20	0.00	0.00	0.00	55.03	0.00
307	50.36	0.00	0.00	0.00	97.99	0.00	308	50.52	0.00	0.00	0.00	121.36	0.00
309	50.69	0.00	0.00	0.00	125.13	0.00	310	50.85	0.00	0.00	0.00	90.65	0.00
311	51.02	0.00	0.00	0.00	66.86	0.00	312	51.18	0.00	0.00	0.00	51.02	0.00
313	51.35	0.00	0.00	0.00	46.96	0.00	314	51.51	0.00	0.00	0.00	42.23	0.00
315	51.67	0.00	0.00	0.00	34.78	0.00	316	51.84	0.00	0.00	0.00	27.98	0.00
317	52.00	0.00	0.00	0.00	25.02	0.00	318	52.17	0.00	0.00	0.00	35.79	0.00
319	52.33	0.00	0.00	0.00	60.85	0.00	320	52.49	0.00	0.00	0.00	94.95	0.00
321	52.66	0.00	0.00	0.00	126.89	0.00	322	52.82	0.00	0.00	0.00	147.69	0.00

**:: Field input data :: (continued)**

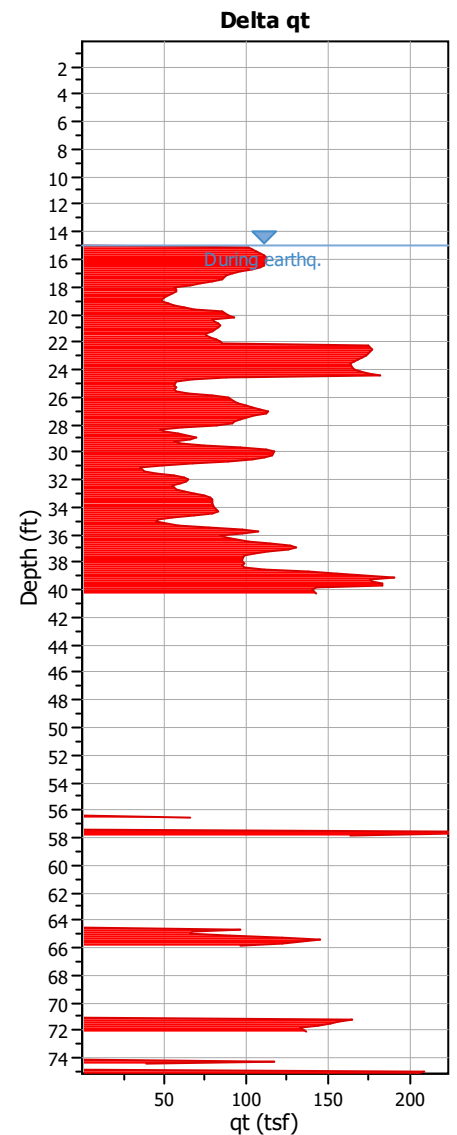
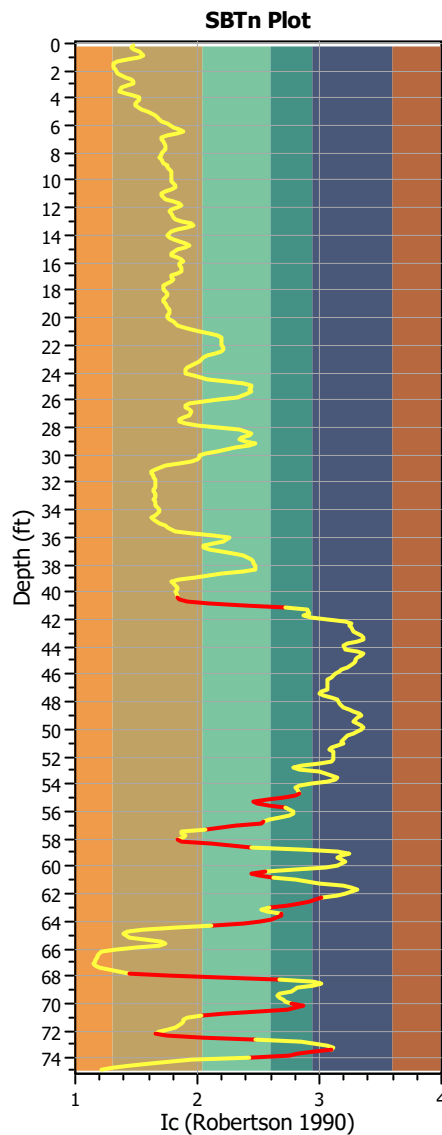
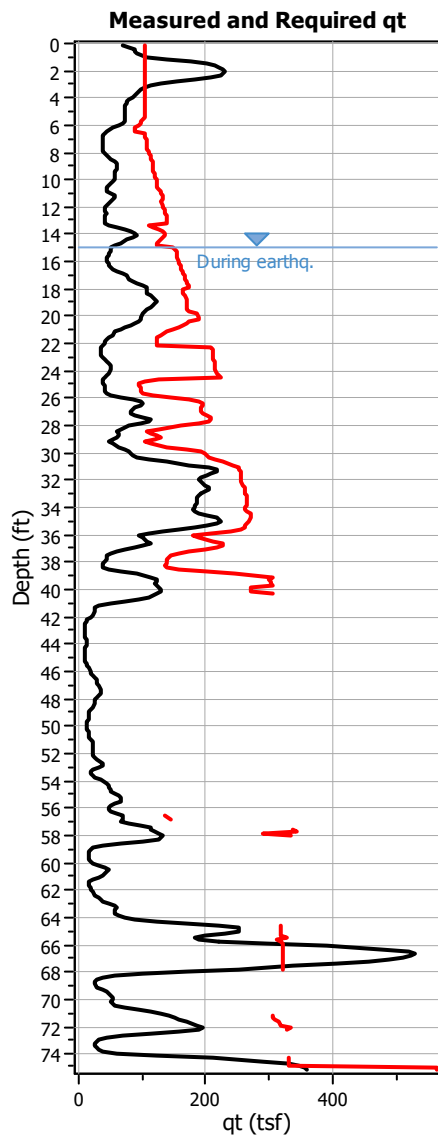
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
323	52.99	198.26	198.26	306.26	153.67	152.58	324	53.15	0.00	0.00	0.00	140.10	0.00
325	53.31	0.00	0.00	0.00	111.06	0.00	326	53.48	0.00	0.00	0.00	76.06	0.00
327	53.64	0.00	0.00	0.00	47.82	0.00	328	53.81	0.00	0.00	0.00	31.44	0.00
329	53.97	0.00	0.00	0.00	26.23	0.00	330	54.13	0.00	0.00	0.00	29.63	0.00
331	54.30	0.00	0.00	0.00	40.67	0.00	332	54.46	0.00	0.00	0.00	56.56	0.00
333	54.63	0.00	0.00	0.00	73.12	0.00	334	54.79	0.00	0.00	0.00	87.28	0.00
335	54.95	0.00	0.00	0.00	95.09	0.00	336	55.12	0.00	0.00	0.00	90.73	0.00
337	55.28	0.00	0.00	0.00	74.36	0.00	338	55.45	0.00	0.00	0.00	54.55	0.00
339	55.61	0.00	0.00	0.00	40.51	0.00	340	55.77	0.00	0.00	0.00	36.36	0.00
341	55.94	0.00	0.00	0.00	35.92	0.00	342	56.10	0.00	0.00	0.00	36.22	0.00
343	56.27	0.00	0.00	0.00	34.82	0.00	344	56.43	0.00	0.00	0.00	31.94	0.00
345	56.59	0.00	0.00	0.00	33.93	0.00	346	56.76	0.00	0.00	0.00	48.36	0.00
347	56.92	0.00	0.00	0.00	63.74	0.00	348	57.09	0.00	0.00	0.00	71.00	0.00
349	57.25	0.00	0.00	0.00	62.10	0.00	350	57.41	0.00	0.00	0.00	51.13	0.00
351	57.58	0.00	0.00	0.00	43.14	0.00	352	57.74	0.00	0.00	0.00	40.48	0.00
353	57.91	0.00	0.00	0.00	43.50	0.00	354	58.07	0.00	0.00	0.00	48.32	0.00
355	58.23	0.00	0.00	0.00	59.77	0.00	356	58.40	0.00	0.00	0.00	70.71	0.00
357	58.56	195.92	95.03	189.47	72.60	116.87	358	58.73	195.85	75.67	158.34	64.13	94.21
359	58.89	0.00	0.00	0.00	54.76	0.00	360	59.06	0.00	0.00	0.00	60.43	0.00
361	59.22	0.00	0.00	0.00	99.33	0.00	362	59.38	0.00	0.00	0.00	141.60	0.00
363	59.55	195.49	195.49	308.49	170.23	138.26	364	59.71	195.42	195.42	308.65	151.05	157.60
365	59.88	195.36	195.36	330.83	102.65	228.19	366	60.04	195.29	195.29	367.24	65.01	302.23
367	60.20	195.23	107.24	210.88	58.53	152.35	368	60.37	195.16	195.16	360.14	78.60	281.54
369	60.53	0.00	0.00	0.00	88.03	0.00	370	60.70	0.00	0.00	0.00	72.74	0.00
371	60.86	0.00	0.00	0.00	51.16	0.00	372	61.02	0.00	0.00	0.00	32.36	0.00
373	61.19	0.00	0.00	0.00	22.39	0.00	374	61.35	0.00	0.00	0.00	16.93	0.00
375	61.52	0.00	0.00	0.00	16.23	0.00	376	61.68	0.00	0.00	0.00	20.30	0.00
377	61.84	0.00	0.00	0.00	32.46	0.00	378	62.01	0.00	0.00	0.00	42.53	0.00
379	62.17	0.00	0.00	0.00	51.89	0.00	380	62.34	0.00	0.00	0.00	55.75	0.00
381	62.50	0.00	0.00	0.00	58.58	0.00	382	62.66	0.00	0.00	0.00	57.45	0.00
383	62.83	0.00	0.00	0.00	54.91	0.00	384	62.99	0.00	0.00	0.00	55.05	0.00
385	63.16	0.00	0.00	0.00	53.75	0.00	386	63.32	0.00	0.00	0.00	48.61	0.00
387	63.48	0.00	0.00	0.00	39.68	0.00	388	63.65	0.00	0.00	0.00	32.38	0.00
389	63.81	0.00	0.00	0.00	29.68	0.00	390	63.98	0.00	0.00	0.00	29.11	0.00
391	64.14	0.00	0.00	0.00	29.61	0.00	392	64.30	0.00	0.00	0.00	30.78	0.00
393	64.47	0.00	0.00	0.00	46.15	0.00	394	64.63	0.00	0.00	0.00	74.78	0.00
395	64.80	0.00	0.00	0.00	106.88	0.00	396	64.96	0.00	0.00	0.00	124.78	0.00
397	65.12	0.00	0.00	0.00	122.98	0.00	398	65.29	0.00	0.00	0.00	107.25	0.00
399	65.45	0.00	0.00	0.00	84.82	0.00	400	65.62	0.00	0.00	0.00	63.95	0.00
401	65.78	0.00	0.00	0.00	46.85	0.00	402	65.94	0.00	0.00	0.00	35.75	0.00
403	66.11	0.00	0.00	0.00	29.39	0.00	404	66.27	0.00	0.00	0.00	36.36	0.00
405	66.44	0.00	0.00	0.00	46.62	0.00	406	66.60	0.00	0.00	0.00	51.02	0.00
407	66.77	0.00	0.00	0.00	42.42	0.00	408	66.93	0.00	0.00	0.00	31.82	0.00
409	67.09	0.00	0.00	0.00	29.79	0.00	410	67.26	0.00	0.00	0.00	32.55	0.00
411	67.42	0.00	0.00	0.00	36.85	0.00	412	67.59	0.00	0.00	0.00	42.82	0.00
413	67.75	0.00	0.00	0.00	53.39	0.00	414	67.91	0.00	0.00	0.00	62.05	0.00
415	68.08	0.00	0.00	0.00	61.85	0.00	416	68.24	192.38	90.11	195.40	50.15	145.25
417	68.41	0.00	0.00	0.00	35.55	0.00	418	68.57	0.00	0.00	0.00	23.92	0.00
419	68.73	0.00	0.00	0.00	18.99	0.00	420	68.90	0.00	0.00	0.00	18.16	0.00

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
421	69.06	0.00	0.00	0.00	19.22	0.00	422	69.23	0.00	0.00	0.00	19.62	0.00
423	69.39	0.00	0.00	0.00	18.86	0.00	424	69.55	0.00	0.00	0.00	17.59	0.00
425	69.72	0.00	0.00	0.00	16.49	0.00	426	69.88	0.00	0.00	0.00	16.26	0.00
427	70.05	0.00	0.00	0.00	16.59	0.00	428	70.21	0.00	0.00	0.00	18.36	0.00
429	70.37	0.00	0.00	0.00	25.52	0.00	430	70.54	0.00	0.00	0.00	38.76	0.00
431	70.70	0.00	0.00	0.00	56.36	0.00	432	70.87	0.00	0.00	0.00	76.09	0.00
433	71.03	0.00	0.00	0.00	92.85	0.00	434	71.19	0.00	0.00	0.00	103.59	0.00
435	71.36	0.00	0.00	0.00	100.19	0.00	436	71.52	0.00	0.00	0.00	87.16	0.00
437	71.69	0.00	0.00	0.00	69.16	0.00	438	71.85	0.00	0.00	0.00	61.16	0.00
439	72.01	0.00	0.00	0.00	60.12	0.00	440	72.18	0.00	0.00	0.00	61.96	0.00
441	72.34	0.00	0.00	0.00	62.32	0.00	442	72.51	0.00	0.00	0.00	60.56	0.00
443	72.67	0.00	0.00	0.00	54.92	0.00	444	72.83	0.00	0.00	0.00	43.92	0.00
445	73.00	0.00	0.00	0.00	34.59	0.00	446	73.16	0.00	0.00	0.00	33.56	0.00
447	73.33	0.00	0.00	0.00	45.72	0.00	448	73.49	0.00	0.00	0.00	61.56	0.00
449	73.65	191.02	64.90	157.91	75.96	81.96	450	73.82	0.00	0.00	0.00	81.86	0.00
451	73.98	0.00	0.00	0.00	99.76	0.00	452	74.15	0.00	0.00	0.00	127.29	0.00
453	74.31	0.00	0.00	0.00	161.66	0.00	454	74.48	190.83	190.83	328.68	182.42	146.26
455	74.64	190.80	190.80	324.49	193.36	131.14	456	74.80	190.77	190.77	324.66	195.29	129.37
457	74.97	190.75	190.75	542.97	159.00	383.98	458	75.13	190.74	190.74	543.30	122.27	421.04

**Abbreviations**

Depth: Depth of CPT point from ground surface  
Q<sub>tn,cs</sub> demand: Demand for equivalent clean sand normalized cone resistance  
Q<sub>tn</sub> demand: Demand for cone resistance  
q<sub>t</sub> demand: Demand for cone resistance  
q<sub>t</sub>: Measured cone resistance  
Diff.: Difference between demanded and measured cone resistance



**:: Tabular results ::**

Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)	Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)
1	0.16	0.00	0.00	0.00	68.64	0.00	2	0.33	0.00	0.00	0.00	79.00	0.00
3	0.49	0.00	0.00	0.00	88.80	0.00	4	0.66	0.00	0.00	0.00	89.17	0.00
5	0.82	0.00	0.00	0.00	92.90	0.00	6	0.98	0.00	0.00	0.00	108.10	0.00
7	1.15	0.00	0.00	0.00	139.30	0.00	8	1.31	0.00	0.00	0.00	175.20	0.00
9	1.48	0.00	0.00	0.00	201.80	0.00	10	1.64	0.00	0.00	0.00	213.94	0.00
11	1.80	0.00	0.00	0.00	220.34	0.00	12	1.97	0.00	0.00	0.00	226.64	0.00
13	2.13	0.00	0.00	0.00	229.90	0.00	14	2.30	0.00	0.00	0.00	223.30	0.00
15	2.46	0.00	0.00	0.00	207.00	0.00	16	2.62	0.00	0.00	0.00	181.70	0.00
17	2.79	0.00	0.00	0.00	153.74	0.00	18	2.95	0.00	0.00	0.00	129.34	0.00
19	3.12	0.00	0.00	0.00	113.04	0.00	20	3.28	0.00	0.00	0.00	104.17	0.00
21	3.44	0.00	0.00	0.00	98.30	0.00	22	3.61	0.00	0.00	0.00	92.84	0.00
23	3.77	0.00	0.00	0.00	88.50	0.00	24	3.94	0.00	0.00	0.00	83.80	0.00
25	4.10	0.00	0.00	0.00	79.57	0.00	26	4.27	0.00	0.00	0.00	75.87	0.00
27	4.43	0.00	0.00	0.00	74.17	0.00	28	4.59	0.00	0.00	0.00	73.67	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
29	4.76	0.00	0.00	0.00	73.27	0.00	30	4.92	0.00	0.00	0.00	73.03	0.00
31	5.09	0.00	0.00	0.00	72.90	0.00	32	5.25	0.00	0.00	0.00	73.03	0.00
33	5.41	0.00	0.00	0.00	73.07	0.00	34	5.58	0.00	0.00	0.00	73.53	0.00
35	5.74	0.00	0.00	0.00	73.57	0.00	36	5.91	0.00	0.00	0.00	70.63	0.00
37	6.07	0.00	0.00	0.00	63.27	0.00	38	6.23	0.00	0.00	0.00	53.73	0.00
39	6.40	0.00	0.00	0.00	45.53	0.00	40	6.56	0.00	0.00	0.00	40.60	0.00
41	6.73	0.00	0.00	0.00	38.37	0.00	42	6.89	0.00	0.00	0.00	38.07	0.00
43	7.05	0.00	0.00	0.00	38.47	0.00	44	7.22	0.00	0.00	0.00	38.30	0.00
45	7.38	0.00	0.00	0.00	37.60	0.00	46	7.55	0.00	0.00	0.00	37.17	0.00
47	7.71	0.00	0.00	0.00	37.77	0.00	48	7.87	0.00	0.00	0.00	39.20	0.00
49	8.04	0.00	0.00	0.00	41.03	0.00	50	8.20	0.00	0.00	0.00	43.67	0.00
51	8.37	0.00	0.00	0.00	47.53	0.00	52	8.53	0.00	0.00	0.00	52.03	0.00
53	8.69	0.00	0.00	0.00	56.03	0.00	54	8.86	0.00	0.00	0.00	58.43	0.00
55	9.02	0.00	0.00	0.00	59.40	0.00	56	9.19	0.00	0.00	0.00	59.20	0.00
57	9.35	0.00	0.00	0.00	58.00	0.00	58	9.51	0.00	0.00	0.00	57.03	0.00
59	9.68	0.00	0.00	0.00	56.13	0.00	60	9.84	0.00	0.00	0.00	56.63	0.00
61	10.01	0.00	0.00	0.00	56.70	0.00	62	10.17	0.00	0.00	0.00	54.63	0.00
63	10.33	0.00	0.00	0.00	50.17	0.00	64	10.50	0.00	0.00	0.00	45.50	0.00
65	10.66	0.00	0.00	0.00	43.70	0.00	66	10.83	0.00	0.00	0.00	45.23	0.00
67	10.99	0.00	0.00	0.00	49.80	0.00	68	11.15	0.00	0.00	0.00	55.63	0.00
69	11.32	0.00	0.00	0.00	58.07	0.00	70	11.48	0.00	0.00	0.00	55.20	0.00
71	11.65	0.00	0.00	0.00	49.23	0.00	72	11.81	0.00	0.00	0.00	44.13	0.00
73	11.98	0.00	0.00	0.00	41.60	0.00	74	12.14	0.00	0.00	0.00	41.07	0.00
75	12.30	0.00	0.00	0.00	41.67	0.00	76	12.47	0.00	0.00	0.00	42.70	0.00
77	12.63	0.00	0.00	0.00	41.87	0.00	78	12.80	0.00	0.00	0.00	40.83	0.00
79	12.96	0.00	0.00	0.00	40.20	0.00	80	13.12	0.00	0.00	0.00	41.53	0.00
81	13.29	0.00	0.00	0.00	48.47	0.00	82	13.45	0.00	0.00	0.00	59.73	0.00
83	13.62	0.00	0.00	0.00	73.40	0.00	84	13.78	0.00	0.00	0.00	83.43	0.00
85	13.94	0.00	0.00	0.00	88.87	0.00	86	14.11	0.00	0.00	0.00	90.03	0.00
87	14.27	0.00	0.00	0.00	85.93	0.00	88	14.44	0.00	0.00	0.00	77.03	0.00
89	14.60	0.00	0.00	0.00	66.17	0.00	90	14.76	0.00	0.00	0.00	57.00	0.00
91	14.93	0.00	0.00	0.00	51.63	0.00	92	15.09	174.24	174.24	151.66	49.47	102.19
93	15.26	174.63	174.63	153.55	49.17	104.38	94	15.42	175.02	175.02	154.67	48.60	106.07
95	15.58	175.40	175.40	155.22	46.63	108.58	96	15.75	175.78	175.78	156.03	44.83	111.19
97	15.91	176.15	176.15	157.15	44.37	112.79	98	16.08	176.51	176.51	158.68	46.03	112.64
99	16.24	176.87	176.87	159.86	47.93	111.93	100	16.40	177.23	177.23	160.85	49.97	110.88
101	16.57	177.58	177.58	162.12	53.50	108.62	102	16.73	177.92	177.92	163.76	59.97	103.80
103	16.90	178.26	178.26	165.38	68.27	97.11	104	17.06	178.59	178.59	166.65	75.30	91.35
105	17.22	178.92	178.92	167.82	79.50	88.31	106	17.39	179.24	179.24	169.14	83.67	85.48
107	17.55	179.56	179.56	170.64	91.03	79.61	108	17.72	179.87	179.87	172.05	100.23	71.81
109	17.88	180.17	180.17	173.27	106.63	66.64	110	18.04	180.47	170.59	164.90	107.97	56.94
111	18.21	180.77	168.95	164.12	106.37	57.75	112	18.37	181.06	169.25	165.27	107.70	57.57
113	18.54	181.35	171.41	168.30	113.63	54.67	114	18.70	181.63	173.13	170.90	120.13	50.76
115	18.86	181.90	172.99	171.63	122.83	48.79	116	19.03	182.17	171.18	170.68	121.23	49.44
117	19.19	182.44	169.53	169.90	117.73	52.17	118	19.36	182.70	168.07	169.30	113.13	56.17
119	19.52	182.96	167.87	169.96	107.67	62.29	120	19.69	183.22	169.44	172.38	103.83	68.55
121	19.85	183.47	183.47	187.44	101.40	86.04	122	20.01	183.72	183.72	188.59	99.10	89.49
123	20.18	183.97	183.97	189.80	96.23	93.57	124	20.34	184.21	166.44	172.73	93.10	79.63
125	20.51	184.45	162.02	169.15	88.37	80.78	126	20.67	184.68	156.33	164.27	81.23	83.03

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
127	20.83	184.91	148.64	157.31	72.70	84.61	128	21.00	185.14	138.88	148.15	65.03	83.12
129	21.16	185.37	128.02	137.73	57.93	79.80	130	21.33	185.59	118.26	128.33	52.07	76.26
131	21.49	185.81	112.56	123.05	46.87	76.19	132	21.65	186.03	111.24	122.35	43.77	78.58
133	21.82	186.25	111.31	123.09	41.43	81.66	134	21.98	186.47	112.00	124.47	39.50	84.97
135	22.15	186.68	109.68	122.66	36.83	85.82	136	22.31	186.89	186.89	209.25	34.57	174.68
137	22.47	187.10	187.10	210.33	33.43	176.89	138	22.64	187.32	187.32	210.85	34.20	176.65
139	22.80	187.53	187.53	211.22	36.20	175.02	140	22.97	187.73	187.73	211.84	38.53	173.31
141	23.13	187.94	187.94	212.57	41.30	171.27	142	23.29	188.14	188.14	213.19	44.70	168.49
143	23.46	188.34	188.34	213.70	47.93	165.76	144	23.62	188.53	188.53	214.36	50.33	164.02
145	23.79	188.72	188.72	215.23	50.73	164.49	146	23.95	188.92	188.92	216.05	50.07	165.99
147	24.11	189.11	189.11	217.29	47.57	169.72	148	24.28	189.30	189.30	219.38	44.03	175.35
149	24.44	189.48	189.48	222.74	40.70	182.04	150	24.61	189.65	105.41	127.00	38.33	88.67
151	24.77	189.82	84.80	104.21	37.37	66.84	152	24.93	189.98	76.48	95.15	38.07	57.09
153	25.10	190.13	76.48	95.70	39.67	56.03	154	25.26	190.35	78.42	98.50	41.00	57.50
155	25.43	190.56	77.00	97.38	41.00	56.38	156	25.59	190.78	80.29	101.80	43.80	58.00
157	25.75	190.99	92.61	116.82	51.33	65.48	158	25.92	191.20	117.29	145.89	66.70	79.19
159	26.08	191.41	140.94	173.03	83.87	89.17	160	26.25	191.61	156.18	190.13	97.20	92.93
161	26.41	191.81	161.67	196.64	100.73	95.91	162	26.57	192.01	160.79	196.55	96.33	100.22
163	26.74	192.20	156.63	193.04	88.43	104.61	164	26.90	192.40	154.99	192.12	82.63	109.48
165	27.07	192.59	156.95	194.97	81.57	113.41	166	27.23	192.77	163.85	202.90	89.87	113.03
167	27.40	192.96	167.97	207.86	102.50	105.36	168	27.56	193.14	168.32	209.04	112.50	96.54
169	27.72	193.32	163.35	204.85	111.63	93.22	170	27.89	193.50	148.77	190.25	98.07	92.19
171	28.05	193.67	123.25	162.16	79.97	82.20	172	28.22	193.84	92.28	125.71	64.67	61.04
173	28.38	194.01	77.24	107.61	59.47	48.15	174	28.54	194.18	80.70	112.55	62.47	50.08
175	28.71	194.34	89.08	123.63	64.20	59.43	176	28.87	194.50	93.94	130.29	60.40	69.89
177	29.04	194.66	84.92	119.58	52.90	66.68	178	29.20	194.82	73.44	105.52	48.57	56.95
179	29.36	194.97	80.09	114.58	54.63	59.95	180	29.53	195.12	98.55	138.56	63.47	75.09
181	29.69	195.27	123.84	170.22	72.93	97.29	182	29.86	195.42	140.98	191.05	77.90	113.15
183	30.02	195.57	147.33	198.99	81.30	117.69	184	30.18	195.71	148.04	200.56	84.53	116.02
185	30.35	195.85	150.24	203.79	92.53	111.26	186	30.51	195.99	158.10	213.15	109.40	103.75
187	30.68	196.12	171.53	227.75	138.57	89.18	188	30.84	196.25	185.26	241.53	174.27	67.26
189	31.00	196.38	196.01	252.32	203.57	48.76	190	31.17	196.51	196.51	253.33	217.80	35.53
191	31.33	196.63	196.63	254.24	216.27	37.98	192	31.50	196.75	196.75	255.15	209.17	45.98
193	31.66	196.87	197.23	256.67	200.83	55.84	194	31.82	196.99	195.98	256.28	193.63	62.65
195	31.99	197.10	194.76	255.94	190.40	65.54	196	32.15	197.22	195.14	257.07	192.97	64.11
197	32.32	197.33	196.92	259.52	199.80	59.72	198	32.48	197.43	197.43	260.48	205.03	55.45
199	32.64	197.54	197.79	261.90	204.77	57.13	200	32.81	197.64	196.25	261.25	199.13	62.12
201	32.97	197.74	196.07	261.86	193.53	68.33	202	33.14	197.84	196.95	263.45	189.27	74.18
203	33.30	197.94	197.85	265.05	187.10	77.95	204	33.46	198.03	197.18	265.19	185.10	80.09
205	33.63	198.12	195.88	264.76	184.63	80.13	206	33.79	198.22	194.11	263.91	183.80	80.11
207	33.96	198.30	192.18	262.95	181.96	80.98	208	34.12	198.39	191.78	263.35	180.73	82.62
209	34.28	198.47	193.99	266.09	183.16	82.93	210	34.45	198.55	198.02	270.51	190.40	80.11
211	34.61	198.63	198.63	271.45	203.03	68.42	212	34.78	198.71	198.71	272.27	217.03	55.24
213	34.94	198.78	194.01	269.17	222.53	46.64	214	35.10	198.85	187.99	264.65	218.83	45.82
215	35.27	198.92	184.30	262.21	203.06	59.15	216	35.43	198.99	181.92	260.90	183.66	77.23
217	35.60	199.06	176.59	256.84	159.23	97.61	218	35.76	199.12	159.19	240.03	132.80	107.24
219	35.93	199.18	132.07	208.57	110.06	98.51	220	36.09	199.24	109.92	180.09	95.23	84.86
221	36.25	199.30	116.07	189.09	100.56	88.53	222	36.42	199.35	131.66	210.24	108.73	101.51
223	36.58	199.41	145.24	227.84	112.99	114.84	224	36.75	199.46	145.10	228.41	101.76	126.65

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
225	36.91	199.51	136.22	218.16	87.46	130.70	226	37.07	199.56	120.97	199.03	73.43	125.61
227	37.24	199.61	103.01	174.99	60.83	114.16	228	37.40	199.66	90.01	156.92	51.66	105.26
229	37.57	199.70	81.22	144.37	45.23	99.15	230	37.73	199.75	78.27	140.19	42.63	97.56
231	37.89	199.79	76.83	138.25	40.56	97.69	232	38.06	199.83	76.56	138.05	39.19	98.85
233	38.22	199.87	74.71	135.47	37.56	97.91	234	38.39	199.91	76.04	137.69	39.06	98.64
235	38.55	199.95	89.48	158.04	46.93	111.11	236	38.71	199.98	121.17	203.12	65.25	137.86
237	38.88	200.01	155.63	246.66	91.68	154.98	238	39.04	200.03	200.03	305.02	113.91	191.11
239	39.21	200.06	200.06	300.35	124.51	175.83	240	39.37	200.08	200.08	301.53	123.65	177.87
241	39.53	200.11	200.11	304.30	121.16	183.14	242	39.70	200.13	200.13	305.88	122.72	183.16
243	39.86	200.14	177.15	270.79	127.42	143.37	244	40.03	200.16	177.68	271.61	130.49	141.12
245	40.19	200.17	177.45	271.75	129.02	142.73	246	40.35	200.18	200.18	307.42	122.06	185.36
247	40.52	0.00	0.00	0.00	111.39	0.00	248	40.68	0.00	0.00	0.00	94.62	0.00
249	40.85	0.00	0.00	0.00	72.42	0.00	250	41.01	0.00	0.00	0.00	50.12	0.00
251	41.17	0.00	0.00	0.00	32.99	0.00	252	41.34	0.00	0.00	0.00	25.19	0.00
253	41.50	0.00	0.00	0.00	23.73	0.00	254	41.67	0.00	0.00	0.00	24.16	0.00
255	41.83	0.00	0.00	0.00	21.78	0.00	256	41.99	0.00	0.00	0.00	17.70	0.00
257	42.16	0.00	0.00	0.00	13.60	0.00	258	42.32	0.00	0.00	0.00	11.77	0.00
259	42.49	0.00	0.00	0.00	10.83	0.00	260	42.65	0.00	0.00	0.00	10.44	0.00
261	42.81	0.00	0.00	0.00	10.24	0.00	262	42.98	0.00	0.00	0.00	10.27	0.00
263	43.14	0.00	0.00	0.00	10.24	0.00	264	43.31	0.00	0.00	0.00	10.31	0.00
265	43.47	0.00	0.00	0.00	10.51	0.00	266	43.64	0.00	0.00	0.00	11.24	0.00
267	43.80	0.00	0.00	0.00	12.81	0.00	268	43.96	0.00	0.00	0.00	12.94	0.00
269	44.13	0.00	0.00	0.00	11.94	0.00	270	44.29	0.00	0.00	0.00	9.97	0.00
271	44.46	0.00	0.00	0.00	9.24	0.00	272	44.62	0.00	0.00	0.00	9.44	0.00
273	44.78	0.00	0.00	0.00	9.74	0.00	274	44.95	0.00	0.00	0.00	9.91	0.00
275	45.11	0.00	0.00	0.00	9.98	0.00	276	45.28	0.00	0.00	0.00	10.44	0.00
277	45.44	0.00	0.00	0.00	11.44	0.00	278	45.60	0.00	0.00	0.00	13.15	0.00
279	45.77	0.00	0.00	0.00	15.15	0.00	280	45.93	0.00	0.00	0.00	17.45	0.00
281	46.10	0.00	0.00	0.00	20.11	0.00	282	46.26	0.00	0.00	0.00	22.81	0.00
283	46.42	0.00	0.00	0.00	25.71	0.00	284	46.59	0.00	0.00	0.00	27.88	0.00
285	46.75	0.00	0.00	0.00	29.48	0.00	286	46.92	0.00	0.00	0.00	29.68	0.00
287	47.08	0.00	0.00	0.00	30.91	0.00	288	47.24	0.00	0.00	0.00	33.68	0.00
289	47.41	0.00	0.00	0.00	35.34	0.00	290	47.57	0.00	0.00	0.00	34.33	0.00
291	47.74	0.00	0.00	0.00	30.60	0.00	292	47.90	0.00	0.00	0.00	27.58	0.00
293	48.06	0.00	0.00	0.00	25.93	0.00	294	48.23	0.00	0.00	0.00	24.69	0.00
295	48.39	0.00	0.00	0.00	23.78	0.00	296	48.56	0.00	0.00	0.00	22.35	0.00
297	48.72	0.00	0.00	0.00	20.08	0.00	298	48.88	0.00	0.00	0.00	17.14	0.00
299	49.05	0.00	0.00	0.00	14.84	0.00	300	49.21	0.00	0.00	0.00	14.28	0.00
301	49.38	0.00	0.00	0.00	14.75	0.00	302	49.54	0.00	0.00	0.00	14.48	0.00
303	49.70	0.00	0.00	0.00	13.65	0.00	304	49.87	0.00	0.00	0.00	13.05	0.00
305	50.03	0.00	0.00	0.00	13.15	0.00	306	50.20	0.00	0.00	0.00	13.68	0.00
307	50.36	0.00	0.00	0.00	14.28	0.00	308	50.52	0.00	0.00	0.00	15.61	0.00
309	50.69	0.00	0.00	0.00	16.58	0.00	310	50.85	0.00	0.00	0.00	17.32	0.00
311	51.02	0.00	0.00	0.00	18.38	0.00	312	51.18	0.00	0.00	0.00	20.82	0.00
313	51.35	0.00	0.00	0.00	22.88	0.00	314	51.51	0.00	0.00	0.00	23.05	0.00
315	51.67	0.00	0.00	0.00	21.98	0.00	316	51.84	0.00	0.00	0.00	21.55	0.00
317	52.00	0.00	0.00	0.00	21.72	0.00	318	52.17	0.00	0.00	0.00	22.62	0.00
319	52.33	0.00	0.00	0.00	24.02	0.00	320	52.49	0.00	0.00	0.00	29.55	0.00
321	52.66	0.00	0.00	0.00	36.68	0.00	322	52.82	0.00	0.00	0.00	38.15	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
323	52.99	0.00	0.00	0.00	32.41	0.00	324	53.15	0.00	0.00	0.00	23.38	0.00
325	53.31	0.00	0.00	0.00	19.75	0.00	326	53.48	0.00	0.00	0.00	19.65	0.00
327	53.64	0.00	0.00	0.00	21.82	0.00	328	53.81	0.00	0.00	0.00	26.55	0.00
329	53.97	0.00	0.00	0.00	34.55	0.00	330	54.13	0.00	0.00	0.00	42.82	0.00
331	54.30	0.00	0.00	0.00	47.65	0.00	332	54.46	0.00	0.00	0.00	48.88	0.00
333	54.63	0.00	0.00	0.00	48.91	0.00	334	54.79	0.00	0.00	0.00	50.34	0.00
335	54.95	0.00	0.00	0.00	55.37	0.00	336	55.12	0.00	0.00	0.00	61.70	0.00
337	55.28	0.00	0.00	0.00	66.67	0.00	338	55.45	0.00	0.00	0.00	64.80	0.00
339	55.61	0.00	0.00	0.00	57.94	0.00	340	55.77	0.00	0.00	0.00	50.50	0.00
341	55.94	0.00	0.00	0.00	46.14	0.00	342	56.10	0.00	0.00	0.00	47.34	0.00
343	56.27	0.00	0.00	0.00	51.64	0.00	344	56.43	0.00	0.00	0.00	59.64	0.00
345	56.59	195.93	60.52	134.97	68.20	66.77	346	56.76	195.86	65.53	144.01	69.84	74.18
347	56.92	0.00	0.00	0.00	66.27	0.00	348	57.09	0.00	0.00	0.00	79.20	0.00
349	57.25	0.00	0.00	0.00	97.17	0.00	350	57.41	0.00	0.00	0.00	114.74	0.00
351	57.58	195.50	195.50	338.68	115.04	223.65	352	57.74	195.43	195.43	342.26	118.74	223.52
353	57.91	195.36	167.13	291.05	127.61	163.44	354	58.07	195.29	195.29	335.52	131.94	203.58
355	58.23	0.00	0.00	0.00	125.34	0.00	356	58.40	0.00	0.00	0.00	99.64	0.00
357	58.56	0.00	0.00	0.00	67.54	0.00	358	58.73	0.00	0.00	0.00	38.04	0.00
359	58.89	0.00	0.00	0.00	23.60	0.00	360	59.06	0.00	0.00	0.00	18.04	0.00
361	59.22	0.00	0.00	0.00	16.94	0.00	362	59.38	0.00	0.00	0.00	15.64	0.00
363	59.55	0.00	0.00	0.00	14.87	0.00	364	59.71	0.00	0.00	0.00	15.07	0.00
365	59.88	0.00	0.00	0.00	17.61	0.00	366	60.04	0.00	0.00	0.00	21.14	0.00
367	60.20	0.00	0.00	0.00	30.11	0.00	368	60.37	194.37	63.83	145.23	40.07	105.16
369	60.53	0.00	0.00	0.00	46.41	0.00	370	60.70	0.00	0.00	0.00	45.51	0.00
371	60.86	0.00	0.00	0.00	39.01	0.00	372	61.02	0.00	0.00	0.00	30.61	0.00
373	61.19	0.00	0.00	0.00	22.27	0.00	374	61.35	0.00	0.00	0.00	16.91	0.00
375	61.52	0.00	0.00	0.00	15.58	0.00	376	61.68	0.00	0.00	0.00	15.78	0.00
377	61.84	0.00	0.00	0.00	17.64	0.00	378	62.01	0.00	0.00	0.00	19.64	0.00
379	62.17	0.00	0.00	0.00	21.81	0.00	380	62.34	0.00	0.00	0.00	26.58	0.00
381	62.50	0.00	0.00	0.00	31.18	0.00	382	62.66	0.00	0.00	0.00	34.01	0.00
383	62.83	0.00	0.00	0.00	37.81	0.00	384	62.99	0.00	0.00	0.00	48.31	0.00
385	63.16	0.00	0.00	0.00	58.08	0.00	386	63.32	193.26	60.74	142.89	60.41	82.48
387	63.48	0.00	0.00	0.00	55.31	0.00	388	63.65	0.00	0.00	0.00	56.71	0.00
389	63.81	0.00	0.00	0.00	63.98	0.00	390	63.98	0.00	0.00	0.00	73.34	0.00
391	64.14	0.00	0.00	0.00	89.51	0.00	392	64.30	0.00	0.00	0.00	122.68	0.00
393	64.47	0.00	0.00	0.00	171.48	0.00	394	64.63	192.76	192.76	318.75	221.44	97.31
395	64.80	192.70	192.70	318.92	251.58	67.35	396	64.96	192.64	192.64	319.09	252.64	66.45
397	65.12	192.58	192.58	319.26	228.98	90.28	398	65.29	192.53	192.53	319.43	197.44	121.99
399	65.45	192.47	192.47	327.77	181.68	146.09	400	65.62	192.41	181.11	312.62	189.94	122.67
401	65.78	192.35	187.67	317.47	220.45	97.02	402	65.94	192.29	192.29	320.20	297.28	22.92
403	66.11	0.00	0.00	0.00	390.72	0.00	404	66.27	0.00	0.00	0.00	478.58	0.00
405	66.44	0.00	0.00	0.00	521.12	0.00	406	66.60	0.00	0.00	0.00	530.69	0.00
407	66.77	0.00	0.00	0.00	524.89	0.00	408	66.93	0.00	0.00	0.00	509.75	0.00
409	67.09	0.00	0.00	0.00	489.56	0.00	410	67.26	0.00	0.00	0.00	457.62	0.00
411	67.42	0.00	0.00	0.00	405.96	0.00	412	67.59	0.00	0.00	0.00	336.12	0.00
413	67.75	191.68	191.68	322.39	253.46	68.93	414	67.91	0.00	0.00	0.00	169.59	0.00
415	68.08	0.00	0.00	0.00	100.99	0.00	416	68.24	0.00	0.00	0.00	57.39	0.00
417	68.41	0.00	0.00	0.00	37.26	0.00	418	68.57	0.00	0.00	0.00	28.69	0.00
419	68.73	0.00	0.00	0.00	25.86	0.00	420	68.90	0.00	0.00	0.00	25.79	0.00

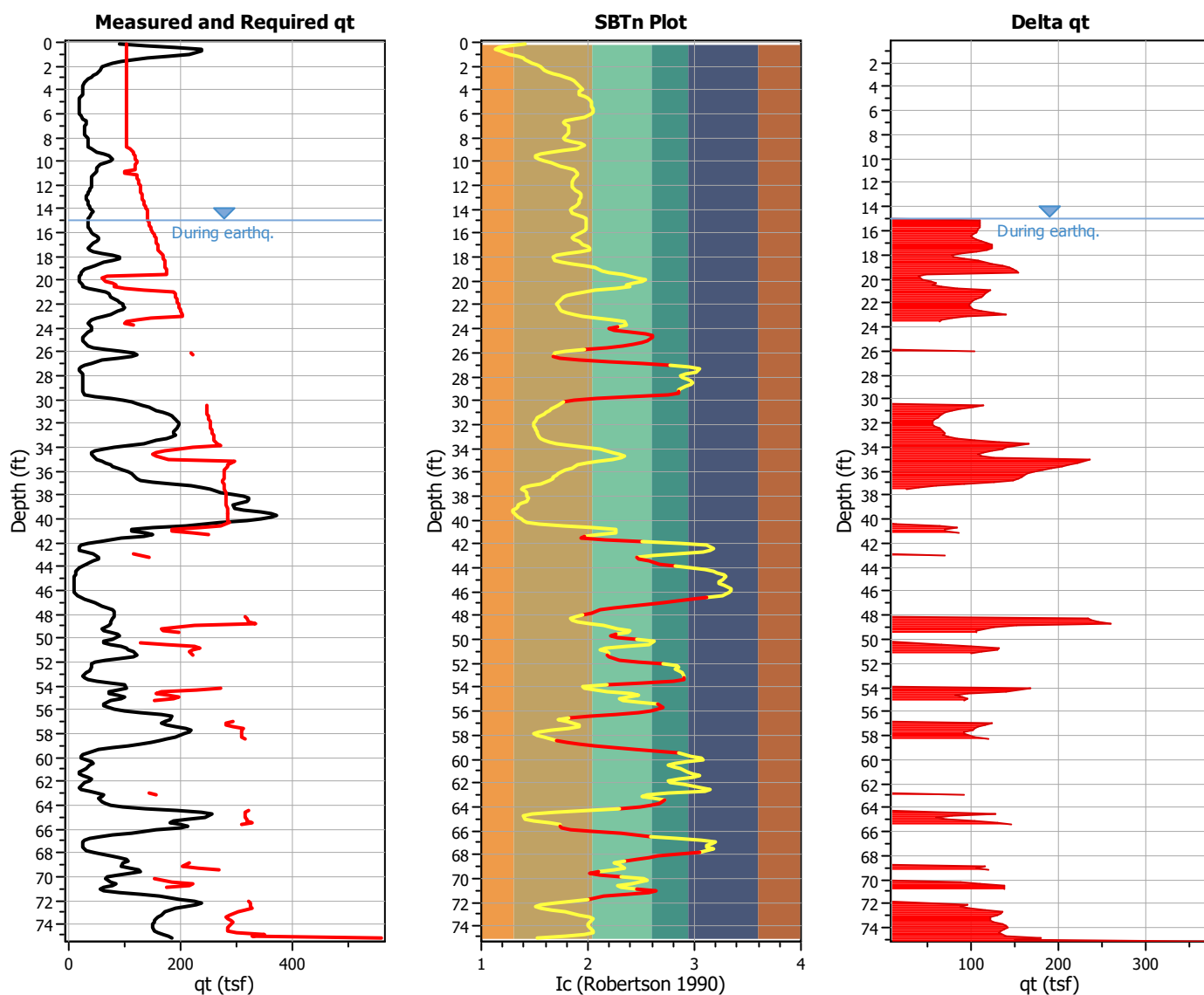


**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
421	69.06	0.00	0.00	0.00	29.36	0.00	422	69.23	0.00	0.00	0.00	37.66	0.00
423	69.39	0.00	0.00	0.00	44.26	0.00	424	69.55	0.00	0.00	0.00	47.66	0.00
425	69.72	0.00	0.00	0.00	51.49	0.00	426	69.88	0.00	0.00	0.00	54.39	0.00
427	70.05	0.00	0.00	0.00	54.68	0.00	428	70.21	0.00	0.00	0.00	49.38	0.00
429	70.37	0.00	0.00	0.00	56.21	0.00	430	70.54	0.00	0.00	0.00	72.95	0.00
431	70.70	0.00	0.00	0.00	95.41	0.00	432	70.87	0.00	0.00	0.00	112.67	0.00
433	71.03	0.00	0.00	0.00	128.71	0.00	434	71.19	190.72	161.49	305.96	141.47	164.49
435	71.36	190.68	162.56	307.18	150.60	156.58	436	71.52	190.64	164.59	309.20	157.33	151.87
437	71.69	190.60	170.23	313.92	169.03	144.90	438	71.85	190.56	177.74	319.36	185.62	133.75
439	72.01	190.51	190.51	333.55	195.98	137.57	440	72.18	190.47	190.47	328.98	189.81	139.17
441	72.34	0.00	0.00	0.00	158.17	0.00	442	72.51	0.00	0.00	0.00	113.11	0.00
443	72.67	0.00	0.00	0.00	70.11	0.00	444	72.83	0.00	0.00	0.00	43.78	0.00
445	73.00	0.00	0.00	0.00	31.41	0.00	446	73.16	0.00	0.00	0.00	26.08	0.00
447	73.33	0.00	0.00	0.00	23.88	0.00	448	73.49	0.00	0.00	0.00	27.21	0.00
449	73.65	0.00	0.00	0.00	32.14	0.00	450	73.82	0.00	0.00	0.00	36.84	0.00
451	73.98	0.00	0.00	0.00	59.64	0.00	452	74.15	0.00	0.00	0.00	122.61	0.00
453	74.31	190.02	190.02	329.72	211.68	118.04	454	74.48	189.98	189.98	329.93	290.41	39.52
455	74.64	189.95	189.95	330.13	329.84	0.28	456	74.80	0.00	0.00	0.00	346.88	0.00
457	74.97	189.90	189.90	564.30	354.98	209.32	458	75.13	189.88	189.88	564.63	361.05	203.58

**Abbreviations**

Depth: Depth of CPT point from ground surface  
Q<sub>tn,cs</sub> demand: Demand for equivalent clean sand normalized cone resistance  
Q<sub>tn</sub> demand: Demand for cone resistance  
q<sub>t</sub> demand: Demand for cone resistance  
q<sub>t</sub>: Measured cone resistance  
Diff.: Difference between demanded and measured cone resistance



**:: Tabular results ::**

Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)	Point No	Depth (ft)	$Q_{tn,cs}$ demand	$Q_{tn}$ demand	$q_t$ demand (tsf)	$q_t$ (tsf)	Diff. (tsf)
1	0.16	0.00	0.00	0.00	90.40	0.00	2	0.33	0.00	0.00	0.00	136.40	0.00
3	0.49	0.00	0.00	0.00	190.30	0.00	4	0.66	0.00	0.00	0.00	235.50	0.00
5	0.82	0.00	0.00	0.00	238.37	0.00	6	0.98	0.00	0.00	0.00	216.00	0.00
7	1.15	0.00	0.00	0.00	176.27	0.00	8	1.31	0.00	0.00	0.00	139.73	0.00
9	1.48	0.00	0.00	0.00	113.93	0.00	10	1.64	0.00	0.00	0.00	93.77	0.00
11	1.80	0.00	0.00	0.00	78.37	0.00	12	1.97	0.00	0.00	0.00	67.40	0.00
13	2.13	0.00	0.00	0.00	59.83	0.00	14	2.30	0.00	0.00	0.00	55.90	0.00
15	2.46	0.00	0.00	0.00	52.90	0.00	16	2.62	0.00	0.00	0.00	49.00	0.00
17	2.79	0.00	0.00	0.00	44.27	0.00	18	2.95	0.00	0.00	0.00	39.27	0.00
19	3.12	0.00	0.00	0.00	34.97	0.00	20	3.28	0.00	0.00	0.00	31.60	0.00
21	3.44	0.00	0.00	0.00	28.87	0.00	22	3.61	0.00	0.00	0.00	26.47	0.00
23	3.77	0.00	0.00	0.00	24.67	0.00	24	3.94	0.00	0.00	0.00	24.20	0.00
25	4.10	0.00	0.00	0.00	24.73	0.00	26	4.27	0.00	0.00	0.00	25.07	0.00
27	4.43	0.00	0.00	0.00	24.30	0.00	28	4.59	0.00	0.00	0.00	22.27	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
29	4.76	0.00	0.00	0.00	19.77	0.00	30	4.92	0.00	0.00	0.00	17.90	0.00
31	5.09	0.00	0.00	0.00	17.37	0.00	32	5.25	0.00	0.00	0.00	17.50	0.00
33	5.41	0.00	0.00	0.00	17.46	0.00	34	5.58	0.00	0.00	0.00	17.20	0.00
35	5.74	0.00	0.00	0.00	17.40	0.00	36	5.91	0.00	0.00	0.00	17.83	0.00
37	6.07	0.00	0.00	0.00	18.83	0.00	38	6.23	0.00	0.00	0.00	21.26	0.00
39	6.40	0.00	0.00	0.00	25.76	0.00	40	6.56	0.00	0.00	0.00	30.00	0.00
41	6.73	0.00	0.00	0.00	31.56	0.00	42	6.89	0.00	0.00	0.00	30.40	0.00
43	7.05	0.00	0.00	0.00	28.86	0.00	44	7.22	0.00	0.00	0.00	28.13	0.00
45	7.38	0.00	0.00	0.00	28.00	0.00	46	7.55	0.00	0.00	0.00	28.16	0.00
47	7.71	0.00	0.00	0.00	29.16	0.00	48	7.87	0.00	0.00	0.00	31.06	0.00
49	8.04	0.00	0.00	0.00	33.33	0.00	50	8.20	0.00	0.00	0.00	34.96	0.00
51	8.37	0.00	0.00	0.00	34.66	0.00	52	8.53	0.00	0.00	0.00	33.56	0.00
53	8.69	0.00	0.00	0.00	33.20	0.00	54	8.86	0.00	0.00	0.00	35.46	0.00
55	9.02	0.00	0.00	0.00	41.56	0.00	56	9.19	0.00	0.00	0.00	51.00	0.00
57	9.35	0.00	0.00	0.00	61.70	0.00	58	9.51	0.00	0.00	0.00	70.70	0.00
59	9.68	0.00	0.00	0.00	76.00	0.00	60	9.84	0.00	0.00	0.00	77.17	0.00
61	10.01	0.00	0.00	0.00	73.43	0.00	62	10.17	0.00	0.00	0.00	65.10	0.00
63	10.33	0.00	0.00	0.00	56.10	0.00	64	10.50	0.00	0.00	0.00	50.03	0.00
65	10.66	0.00	0.00	0.00	48.67	0.00	66	10.83	0.00	0.00	0.00	49.50	0.00
67	10.99	0.00	0.00	0.00	47.40	0.00	68	11.15	0.00	0.00	0.00	44.13	0.00
69	11.32	0.00	0.00	0.00	40.67	0.00	70	11.48	0.00	0.00	0.00	40.10	0.00
71	11.65	0.00	0.00	0.00	39.97	0.00	72	11.81	0.00	0.00	0.00	39.60	0.00
73	11.98	0.00	0.00	0.00	39.23	0.00	74	12.14	0.00	0.00	0.00	39.00	0.00
75	12.30	0.00	0.00	0.00	38.43	0.00	76	12.47	0.00	0.00	0.00	37.27	0.00
77	12.63	0.00	0.00	0.00	35.27	0.00	78	12.80	0.00	0.00	0.00	33.50	0.00
79	12.96	0.00	0.00	0.00	32.50	0.00	80	13.12	0.00	0.00	0.00	32.60	0.00
81	13.29	0.00	0.00	0.00	33.33	0.00	82	13.45	0.00	0.00	0.00	34.10	0.00
83	13.62	0.00	0.00	0.00	34.93	0.00	84	13.78	0.00	0.00	0.00	36.27	0.00
85	13.94	0.00	0.00	0.00	38.70	0.00	86	14.11	0.00	0.00	0.00	41.43	0.00
87	14.27	0.00	0.00	0.00	42.57	0.00	88	14.44	0.00	0.00	0.00	41.27	0.00
89	14.60	0.00	0.00	0.00	38.30	0.00	90	14.76	0.00	0.00	0.00	35.50	0.00
91	14.93	0.00	0.00	0.00	33.63	0.00	92	15.09	174.26	174.26	142.16	32.83	109.32
93	15.26	174.69	174.69	143.51	32.80	110.71	94	15.42	175.10	175.10	144.80	33.57	111.24
95	15.58	175.52	175.52	146.22	35.07	111.15	96	15.75	175.92	175.92	147.87	37.27	110.60
97	15.91	176.33	176.33	149.60	40.33	109.27	98	16.08	176.72	176.72	151.40	44.63	106.77
99	16.24	177.11	177.11	153.21	50.00	103.21	100	16.40	177.49	177.49	154.67	53.53	101.14
101	16.57	177.87	177.87	155.81	53.63	102.18	102	16.73	178.24	178.24	156.57	49.90	106.67
103	16.90	178.60	178.60	157.29	44.37	112.92	104	17.06	178.96	178.96	158.09	39.03	119.06
105	17.22	179.32	179.32	159.11	35.57	123.55	106	17.39	179.67	179.67	160.52	36.03	124.48
107	17.55	180.02	180.02	162.61	43.37	119.24	108	17.72	180.36	180.36	165.22	59.73	105.49
109	17.88	180.69	180.69	167.47	79.20	88.27	110	18.04	181.02	181.02	168.99	91.07	77.92
111	18.21	181.34	181.34	169.96	90.13	79.83	112	18.37	181.65	181.65	170.58	78.60	91.98
113	18.54	181.96	181.96	171.09	63.23	107.85	114	18.70	182.27	182.27	171.54	47.80	123.73
115	18.86	182.58	182.58	172.17	36.03	136.13	116	19.03	182.89	182.89	173.16	29.10	144.05
117	19.19	183.20	183.20	174.27	25.43	148.84	118	19.36	183.50	183.50	175.21	23.30	151.91
119	19.52	183.80	183.80	175.94	21.47	154.47	120	19.69	184.09	70.63	68.47	19.90	48.57
121	19.85	184.37	61.35	59.94	18.93	41.00	122	20.01	184.65	66.09	65.00	20.17	44.83
123	20.18	184.93	77.37	76.52	22.00	54.52	124	20.34	185.20	85.48	85.03	24.07	60.97
125	20.51	185.46	81.93	82.07	25.03	57.03	126	20.67	185.72	100.65	101.29	34.30	66.99

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
127	20.83	185.98	133.90	135.23	50.53	84.70	128	21.00	186.23	186.23	188.59	65.90	122.69
129	21.16	186.47	186.47	189.65	73.23	116.42	130	21.33	186.72	186.72	190.74	75.47	115.27
131	21.49	186.96	186.96	191.84	80.47	111.37	132	21.65	187.19	187.19	192.90	86.70	106.20
133	21.82	187.42	187.42	193.93	91.53	102.40	134	21.98	187.64	187.64	194.97	95.47	99.50
135	22.15	187.87	187.87	196.08	98.10	97.98	136	22.31	188.08	188.08	197.24	99.47	97.78
137	22.47	188.29	188.29	198.54	95.87	102.67	138	22.64	188.50	188.50	199.94	87.63	112.31
139	22.80	188.71	188.71	201.55	75.47	126.08	140	22.97	188.92	188.92	203.46	62.77	140.69
141	23.13	189.12	133.68	145.79	51.40	94.39	142	23.29	189.32	108.82	120.37	42.07	78.30
143	23.46	189.52	91.42	102.44	36.53	65.90	144	23.62	189.72	89.07	100.49	35.13	65.35
145	23.79	189.91	102.14	115.19	37.33	77.86	146	23.95	0.00	0.00	0.00	39.97	0.00
147	24.11	0.00	0.00	0.00	39.23	0.00	148	24.28	0.00	0.00	0.00	34.93	0.00
149	24.44	0.00	0.00	0.00	29.77	0.00	150	24.61	0.00	0.00	0.00	27.37	0.00
151	24.77	0.00	0.00	0.00	26.50	0.00	152	24.93	0.00	0.00	0.00	26.47	0.00
153	25.10	0.00	0.00	0.00	26.47	0.00	154	25.26	0.00	0.00	0.00	28.13	0.00
155	25.43	0.00	0.00	0.00	33.00	0.00	156	25.59	0.00	0.00	0.00	44.30	0.00
157	25.75	0.00	0.00	0.00	66.97	0.00	158	25.92	0.00	0.00	0.00	94.07	0.00
159	26.08	192.29	192.29	219.75	116.27	103.48	160	26.25	192.43	192.43	220.39	122.30	98.09
161	26.41	0.00	0.00	0.00	111.77	0.00	162	26.57	0.00	0.00	0.00	87.53	0.00
163	26.74	0.00	0.00	0.00	60.53	0.00	164	26.90	0.00	0.00	0.00	39.80	0.00
165	27.07	0.00	0.00	0.00	27.90	0.00	166	27.23	0.00	0.00	0.00	21.63	0.00
167	27.40	0.00	0.00	0.00	18.17	0.00	168	27.56	0.00	0.00	0.00	18.61	0.00
169	27.72	0.00	0.00	0.00	21.30	0.00	170	27.89	0.00	0.00	0.00	24.33	0.00
171	28.05	0.00	0.00	0.00	25.96	0.00	172	28.22	0.00	0.00	0.00	26.02	0.00
173	28.38	0.00	0.00	0.00	25.22	0.00	174	28.54	0.00	0.00	0.00	24.42	0.00
175	28.71	0.00	0.00	0.00	24.29	0.00	176	28.87	0.00	0.00	0.00	24.96	0.00
177	29.04	0.00	0.00	0.00	26.19	0.00	178	29.20	0.00	0.00	0.00	26.13	0.00
179	29.36	0.00	0.00	0.00	25.56	0.00	180	29.53	0.00	0.00	0.00	29.37	0.00
181	29.69	0.00	0.00	0.00	47.77	0.00	182	29.86	0.00	0.00	0.00	73.80	0.00
183	30.02	0.00	0.00	0.00	98.20	0.00	184	30.18	0.00	0.00	0.00	112.33	0.00
185	30.35	0.00	0.00	0.00	121.77	0.00	186	30.51	196.30	196.30	245.83	132.13	113.69
187	30.68	196.44	196.44	245.70	143.93	101.76	188	30.84	196.58	196.58	245.82	157.27	88.56
189	31.00	196.72	196.72	246.74	169.00	77.74	190	31.17	196.85	196.85	247.65	177.83	69.82
191	31.33	196.98	196.98	248.56	183.23	65.32	192	31.50	197.11	197.11	249.46	187.87	61.59
193	31.66	197.23	197.23	250.35	191.50	58.85	194	31.82	197.36	197.36	251.24	194.33	56.91
195	31.99	197.48	197.48	252.13	195.37	56.76	196	32.15	197.60	197.60	253.01	196.07	56.94
197	32.32	197.71	197.71	253.89	194.90	58.99	198	32.48	197.83	197.83	254.76	190.97	63.79
199	32.64	197.94	197.94	255.63	187.57	68.06	200	32.81	198.05	198.05	256.49	187.07	69.43
201	32.97	198.15	198.15	257.36	189.70	67.66	202	33.14	198.26	198.26	258.22	184.53	73.68
203	33.30	198.36	198.36	259.07	174.33	84.74	204	33.46	198.46	198.46	260.03	154.70	105.33
205	33.63	198.56	198.56	264.54	133.23	131.30	206	33.79	198.66	198.66	272.47	105.93	166.53
207	33.96	198.75	156.88	222.15	81.37	140.79	208	34.12	198.85	134.04	196.34	61.00	135.34
209	34.28	198.94	114.02	171.92	47.50	124.42	210	34.45	199.03	101.82	156.58	41.30	115.28
211	34.61	199.12	95.77	149.09	40.20	108.89	212	34.78	199.21	101.07	156.75	44.00	112.75
213	34.94	199.29	115.50	176.33	49.67	126.66	214	35.10	199.38	199.38	295.57	58.60	236.97
215	35.27	199.46	199.46	289.12	66.37	222.75	216	35.43	199.54	199.54	285.26	73.67	211.59
217	35.60	199.61	199.61	282.64	78.90	203.74	218	35.76	199.69	199.69	280.24	87.54	192.70
219	35.93	199.76	199.76	278.86	95.94	182.93	220	36.09	199.83	199.83	277.83	104.97	172.86
221	36.25	199.90	199.90	276.62	112.90	163.72	222	36.42	199.96	199.96	276.16	118.57	157.59
223	36.58	200.02	200.02	276.24	121.97	154.26	224	36.75	200.08	200.08	275.38	127.87	147.51

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
225	36.91	200.14	200.14	275.89	150.44	125.44	226	37.07	200.20	200.20	276.62	183.94	92.69
227	37.24	200.25	200.25	277.36	217.76	59.60	228	37.40	200.30	200.30	278.11	237.76	40.35
229	37.57	200.34	200.34	278.72	252.92	25.80	230	37.73	200.38	200.38	279.14	270.55	8.58
231	37.89	0.00	0.00	0.00	294.19	0.00	232	38.06	0.00	0.00	0.00	311.67	0.00
233	38.22	0.00	0.00	0.00	322.07	0.00	234	38.39	0.00	0.00	0.00	320.58	0.00
235	38.55	0.00	0.00	0.00	316.78	0.00	236	38.71	0.00	0.00	0.00	304.15	0.00
237	38.88	0.00	0.00	0.00	294.65	0.00	238	39.04	0.00	0.00	0.00	296.12	0.00
239	39.21	0.00	0.00	0.00	312.49	0.00	240	39.37	0.00	0.00	0.00	341.99	0.00
241	39.53	0.00	0.00	0.00	361.52	0.00	242	39.70	0.00	0.00	0.00	369.72	0.00
243	39.86	0.00	0.00	0.00	360.39	0.00	244	40.03	0.00	0.00	0.00	343.66	0.00
245	40.19	0.00	0.00	0.00	317.13	0.00	246	40.35	200.78	200.78	285.45	271.49	13.96
247	40.52	200.78	184.45	272.21	207.73	64.48	248	40.68	200.79	146.60	233.26	148.73	84.53
249	40.85	200.79	108.18	183.31	112.94	70.37	250	41.01	200.79	108.14	183.59	112.78	70.81
251	41.17	200.79	137.08	222.66	136.80	85.87	252	41.34	200.79	158.31	248.45	148.34	100.11
253	41.50	0.00	0.00	0.00	135.00	0.00	254	41.67	0.00	0.00	0.00	93.35	0.00
255	41.83	0.00	0.00	0.00	56.89	0.00	256	41.99	0.00	0.00	0.00	33.28	0.00
257	42.16	0.00	0.00	0.00	21.75	0.00	258	42.32	0.00	0.00	0.00	17.85	0.00
259	42.49	0.00	0.00	0.00	17.71	0.00	260	42.65	0.00	0.00	0.00	19.98	0.00
261	42.81	0.00	0.00	0.00	29.88	0.00	262	42.98	200.74	60.37	115.37	44.23	71.13
263	43.14	200.73	77.40	142.17	53.88	88.28	264	43.31	0.00	0.00	0.00	52.30	0.00
265	43.47	0.00	0.00	0.00	43.49	0.00	266	43.64	0.00	0.00	0.00	36.82	0.00
267	43.80	0.00	0.00	0.00	30.45	0.00	268	43.96	0.00	0.00	0.00	23.84	0.00
269	44.13	0.00	0.00	0.00	18.17	0.00	270	44.29	0.00	0.00	0.00	14.87	0.00
271	44.46	0.00	0.00	0.00	13.07	0.00	272	44.62	0.00	0.00	0.00	11.07	0.00
273	44.78	0.00	0.00	0.00	10.24	0.00	274	44.95	0.00	0.00	0.00	10.27	0.00
275	45.11	0.00	0.00	0.00	10.30	0.00	276	45.28	0.00	0.00	0.00	9.84	0.00
277	45.44	0.00	0.00	0.00	9.24	0.00	278	45.60	0.00	0.00	0.00	8.94	0.00
279	45.77	0.00	0.00	0.00	8.97	0.00	280	45.93	0.00	0.00	0.00	9.27	0.00
281	46.10	0.00	0.00	0.00	9.84	0.00	282	46.26	0.00	0.00	0.00	11.37	0.00
283	46.42	0.00	0.00	0.00	15.37	0.00	284	46.59	0.00	0.00	0.00	21.03	0.00
285	46.75	0.00	0.00	0.00	28.12	0.00	286	46.92	0.00	0.00	0.00	36.70	0.00
287	47.08	0.00	0.00	0.00	47.14	0.00	288	47.24	0.00	0.00	0.00	59.08	0.00
289	47.41	0.00	0.00	0.00	69.27	0.00	290	47.57	0.00	0.00	0.00	76.80	0.00
291	47.74	0.00	0.00	0.00	80.43	0.00	292	47.90	0.00	0.00	0.00	81.46	0.00
293	48.06	0.00	0.00	0.00	81.80	0.00	294	48.23	199.83	199.83	315.65	81.23	234.42
295	48.39	199.78	199.78	316.97	78.95	238.02	296	48.56	199.74	199.74	321.93	75.85	246.08
297	48.72	199.69	199.69	332.87	73.59	259.28	298	48.88	199.63	129.06	225.15	72.03	153.12
299	49.05	199.58	105.46	192.22	66.67	125.55	300	49.21	199.52	87.74	165.84	60.44	105.41
301	49.38	199.46	89.26	168.44	62.01	106.42	302	49.54	199.41	108.37	197.30	75.34	121.96
303	49.70	0.00	0.00	0.00	88.66	0.00	304	49.87	0.00	0.00	0.00	90.09	0.00
305	50.03	0.00	0.00	0.00	76.99	0.00	306	50.20	0.00	0.00	0.00	62.02	0.00
307	50.36	199.09	63.64	129.08	62.59	66.49	308	50.52	199.03	92.83	175.84	76.22	99.62
309	50.69	198.96	127.06	225.85	94.32	131.54	310	50.85	198.90	133.12	234.32	103.18	131.13
311	51.02	198.83	122.48	220.17	107.08	113.09	312	51.18	198.76	119.13	215.80	114.92	100.89
313	51.35	198.69	122.38	220.69	120.68	100.00	314	51.51	0.00	0.00	0.00	114.22	0.00
315	51.67	0.00	0.00	0.00	91.78	0.00	316	51.84	0.00	0.00	0.00	65.02	0.00
317	52.00	0.00	0.00	0.00	46.15	0.00	318	52.17	0.00	0.00	0.00	40.29	0.00
319	52.33	0.00	0.00	0.00	41.25	0.00	320	52.49	0.00	0.00	0.00	42.02	0.00
321	52.66	0.00	0.00	0.00	37.29	0.00	322	52.82	0.00	0.00	0.00	31.12	0.00

:: Field input data :: (continued)													
Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
323	52.99	0.00	0.00	0.00	27.35	0.00	324	53.15	0.00	0.00	0.00	26.19	0.00
325	53.31	0.00	0.00	0.00	27.29	0.00	326	53.48	0.00	0.00	0.00	32.75	0.00
327	53.64	0.00	0.00	0.00	49.65	0.00	328	53.81	0.00	0.00	0.00	75.89	0.00
329	53.97	0.00	0.00	0.00	98.95	0.00	330	54.13	197.53	157.31	270.02	101.75	168.27
331	54.30	197.46	122.69	226.27	86.72	139.55	332	54.46	197.39	83.14	166.71	70.99	95.73
333	54.63	197.31	75.62	154.72	72.19	82.53	334	54.79	197.24	89.28	177.05	86.92	90.13
335	54.95	197.16	101.82	196.84	99.72	97.12	336	55.12	197.09	95.64	187.60	94.52	93.08
337	55.28	197.01	74.02	153.08	76.22	76.86	338	55.45	0.00	0.00	0.00	61.05	0.00
339	55.61	0.00	0.00	0.00	61.15	0.00	340	55.77	0.00	0.00	0.00	70.52	0.00
341	55.94	0.00	0.00	0.00	80.82	0.00	342	56.10	0.00	0.00	0.00	98.69	0.00
343	56.27	0.00	0.00	0.00	129.02	0.00	344	56.43	0.00	0.00	0.00	164.12	0.00
345	56.59	0.00	0.00	0.00	182.65	0.00	346	56.76	0.00	0.00	0.00	180.55	0.00
347	56.92	196.25	176.97	293.97	170.29	123.68	348	57.09	196.17	162.15	280.76	164.59	116.17
349	57.25	196.10	162.02	280.93	173.09	107.84	350	57.41	196.02	175.11	293.29	189.35	103.94
351	57.58	195.94	195.94	310.37	208.42	101.95	352	57.74	195.87	195.87	309.22	217.79	91.44
353	57.91	195.80	195.80	309.40	216.29	93.11	354	58.07	195.73	195.73	309.57	205.02	104.55
355	58.23	195.66	195.66	309.74	189.59	120.15	356	58.40	195.59	195.59	316.43	174.46	141.98
357	58.56	0.00	0.00	0.00	160.82	0.00	358	58.73	0.00	0.00	0.00	145.89	0.00
359	58.89	0.00	0.00	0.00	127.56	0.00	360	59.06	0.00	0.00	0.00	105.69	0.00
361	59.22	0.00	0.00	0.00	77.92	0.00	362	59.38	0.00	0.00	0.00	52.95	0.00
363	59.55	0.00	0.00	0.00	33.62	0.00	364	59.71	0.00	0.00	0.00	24.55	0.00
365	59.88	0.00	0.00	0.00	20.92	0.00	366	60.04	0.00	0.00	0.00	21.45	0.00
367	60.20	0.00	0.00	0.00	29.65	0.00	368	60.37	0.00	0.00	0.00	38.98	0.00
369	60.53	0.00	0.00	0.00	43.88	0.00	370	60.70	0.00	0.00	0.00	38.91	0.00
371	60.86	0.00	0.00	0.00	30.38	0.00	372	61.02	0.00	0.00	0.00	23.51	0.00
373	61.19	0.00	0.00	0.00	19.78	0.00	374	61.35	0.00	0.00	0.00	18.68	0.00
375	61.52	0.00	0.00	0.00	23.78	0.00	376	61.68	0.00	0.00	0.00	33.95	0.00
377	61.84	0.00	0.00	0.00	40.48	0.00	378	62.01	0.00	0.00	0.00	37.85	0.00
379	62.17	0.00	0.00	0.00	28.55	0.00	380	62.34	0.00	0.00	0.00	22.05	0.00
381	62.50	0.00	0.00	0.00	20.05	0.00	382	62.66	0.00	0.00	0.00	22.01	0.00
383	62.83	0.00	0.00	0.00	35.95	0.00	384	62.99	193.76	62.27	142.86	50.95	91.91
385	63.16	193.69	69.17	155.37	61.18	94.19	386	63.32	0.00	0.00	0.00	57.95	0.00
387	63.48	0.00	0.00	0.00	53.21	0.00	388	63.65	0.00	0.00	0.00	57.88	0.00
389	63.81	0.00	0.00	0.00	65.38	0.00	390	63.98	0.00	0.00	0.00	75.48	0.00
391	64.14	0.00	0.00	0.00	97.71	0.00	392	64.30	0.00	0.00	0.00	137.51	0.00
393	64.47	193.19	193.19	321.79	193.15	128.64	394	64.63	193.13	193.13	316.18	237.02	79.17
395	64.80	193.07	193.07	316.36	256.45	59.91	396	64.96	193.01	193.01	316.53	243.38	73.14
397	65.12	192.96	192.96	316.70	213.32	103.38	398	65.29	192.90	192.90	317.08	186.45	130.62
399	65.45	192.84	192.84	328.13	181.69	146.45	400	65.62	192.78	181.46	309.88	198.32	111.56
401	65.78	0.00	0.00	0.00	211.79	0.00	402	65.94	0.00	0.00	0.00	198.09	0.00
403	66.11	0.00	0.00	0.00	156.35	0.00	404	66.27	0.00	0.00	0.00	112.99	0.00
405	66.44	0.00	0.00	0.00	79.32	0.00	406	66.60	0.00	0.00	0.00	55.85	0.00
407	66.77	0.00	0.00	0.00	36.89	0.00	408	66.93	0.00	0.00	0.00	26.52	0.00
409	67.09	0.00	0.00	0.00	24.45	0.00	410	67.26	0.00	0.00	0.00	25.45	0.00
411	67.42	0.00	0.00	0.00	25.89	0.00	412	67.59	0.00	0.00	0.00	24.55	0.00
413	67.75	0.00	0.00	0.00	29.95	0.00	414	67.91	0.00	0.00	0.00	43.72	0.00
415	68.08	0.00	0.00	0.00	60.62	0.00	416	68.24	0.00	0.00	0.00	74.62	0.00
417	68.41	0.00	0.00	0.00	89.82	0.00	418	68.57	0.00	0.00	0.00	101.92	0.00
419	68.73	0.00	0.00	0.00	105.88	0.00	420	68.90	191.70	98.31	213.64	96.85	116.79

**:: Field input data :: (continued)**

Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)	Point No	Depth (ft)	Q <sub>tn,cs</sub> demand	Q <sub>tn</sub> demand	q <sub>t</sub> demand (tsf)	q <sub>t</sub> (tsf)	Diff. (tsf)
421	69.06	191.65	90.73	201.29	94.38	106.91	422	69.23	191.60	107.72	229.30	108.65	120.65
423	69.39	191.55	133.24	267.14	126.12	141.03	424	69.55	0.00	0.00	0.00	128.95	0.00
425	69.72	0.00	0.00	0.00	110.55	0.00	426	69.88	0.00	0.00	0.00	87.52	0.00
427	70.05	0.00	0.00	0.00	68.05	0.00	428	70.21	191.32	62.88	153.37	65.59	87.78
429	70.37	191.27	80.38	185.42	74.75	110.67	430	70.54	191.23	101.17	220.96	82.79	138.18
431	70.70	191.18	97.57	215.31	77.19	138.13	432	70.87	191.14	73.63	174.02	63.19	110.84
433	71.03	0.00	0.00	0.00	54.79	0.00	434	71.19	0.00	0.00	0.00	63.85	0.00
435	71.36	0.00	0.00	0.00	90.42	0.00	436	71.52	0.00	0.00	0.00	127.92	0.00
437	71.69	0.00	0.00	0.00	163.72	0.00	438	71.85	0.00	0.00	0.00	200.25	0.00
439	72.01	190.83	185.01	321.82	225.72	96.10	440	72.18	190.79	190.79	325.14	236.95	88.18
441	72.34	190.75	190.75	325.33	226.19	99.14	442	72.51	190.72	190.72	325.52	208.75	116.77
443	72.67	190.68	190.68	327.56	191.55	136.00	444	72.83	190.64	173.56	315.38	180.39	134.99
445	73.00	190.60	157.90	302.64	171.42	131.22	446	73.16	190.55	144.44	288.12	164.85	123.26
447	73.33	190.51	137.82	280.10	157.82	122.28	448	73.49	190.47	140.52	283.88	156.72	127.16
449	73.65	190.43	145.19	289.94	154.22	135.72	450	73.82	190.40	147.22	292.64	152.52	140.12
451	73.98	190.36	145.69	291.14	149.72	141.41	452	74.15	190.32	142.82	287.96	149.12	138.83
453	74.31	190.28	138.81	283.20	149.09	134.11	454	74.48	190.24	138.52	283.12	151.85	131.26
455	74.64	190.21	151.15	298.57	159.15	139.42	456	74.80	190.17	190.17	347.96	168.25	179.71
457	74.97	190.14	190.14	328.71	178.52	150.19	458	75.13	190.13	190.13	558.24	184.62	373.62

**Abbreviations**

Depth: Depth of CPT point from ground surface  
Q<sub>tn,cs</sub> demand: Demand for equivalent clean sand normalized cone resistance  
Q<sub>tn</sub> demand: Demand for cone resistance  
q<sub>t</sub> demand: Demand for cone resistance  
q<sub>t</sub>: Measured cone resistance  
Diff.: Difference between demanded and measured cone resistance

## **APPENDIX F**

### **EARTHWORK AND GRADING GUIDE SPECIFICATIONS**



## **APPENDIX F**

### **CARL KIM GEOTECHNICAL, INC. EARTHWORK AND GRADING GUIDE SPECIFICATIONS**

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## **F-1.0 GENERAL**

### **F-1.1 Intent**

These Earthwork and Grading Guide Specifications are for grading and earthwork shown on the current, approved grading plan(s) and/or indicated in the Carl Kim Geotechnical, Inc. (Carl Kim Geo) geotechnical report(s). These Guide Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the project-specific recommendations in the geotechnical report shall supersede these Guide Specifications. Carl Kim Geo shall provide geotechnical observation and testing during earthwork and grading. Based on these observations and tests, Carl Kim Geo may provide new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

### **F-1.2 Role of Carl Kim Geotechnical, Inc.**

Prior to commencement of earthwork and grading, Carl Kim Geo shall meet with the earthwork contractor to review the earthwork contractor's work plan, to schedule sufficient personnel to perform the appropriate level of observation, mapping and compaction testing. During earthwork and grading, Carl Kim Geo shall observe, map, and document subsurface exposures to verify geotechnical design assumptions. If observed conditions are found to be significantly different than the interpreted assumptions during the design phase, Carl Kim Geo shall inform the owner, recommend appropriate changes in design to accommodate these observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include (1) natural ground after clearing to receiving fill but before fill is placed, (2) bottoms of all "remedial removal" areas, (3) all key bottoms, and (4) benches made on sloping ground to receive fill.

Carl Kim Geo shall observe moisture-conditioning and processing of the subgrade and fill materials, and perform relative compaction testing of fill to determine the attained relative compaction. Carl Kim Geo shall provide *Daily Field Reports* to the owner and the Contractor on a routine and frequent basis.

### **F-1.3 The Earthwork Contractor**

The earthwork contractor (Contractor) shall be qualified, experienced and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The

Contractor shall review and accept the plans, geotechnical report(s), and these Guide Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing grading and backfilling in accordance with the current, approved plans and specifications.

The Contractor shall inform the owner and Carl Kim Geo of changes in work schedules at least one working day in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that Carl Kim Geo is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish earthwork and grading in accordance with the applicable grading codes and agency ordinances, these Guide Specifications, and recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of Carl Kim Geo, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, adverse weather, etc., are resulting in a quality of work less than required in these specifications, Carl Kim Geo shall reject the work and may recommend to the owner that earthwork and grading be stopped until unsatisfactory condition(s) are rectified.

## **F-2.0 PREPARATION OF AREAS TO BE FILLED**

### **F-2.1 Clearing and Grubbing**

Vegetation, such as brush, grass, roots and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies and Carl Kim Geo. Care should be taken not to encroach upon or otherwise damage native and/or historic trees designated by the Owner or appropriate agencies to remain. Pavements, flatwork or other construction should not extend under the “drip line” of designated trees to remain.

Carl Kim Geo shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 3 percent of organic materials (by dry weight: ASTM D 2974). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area. As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

### **F-2.2 Processing**

Existing ground that has been declared satisfactory for support of fill, by Carl Kim Geo, shall be scarified to a minimum depth of 6 inches (15 cm). Existing ground that is not satisfactory shall be over-excavated as specified in the following Section F-2.3. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

### **F-2.3 Overexcavation**

In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by Carl Kim Geo during grading. All undocumented fill soils under proposed structure footprints should be excavated

**F-2.4 Benching**

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), (>20 percent grade) the ground shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet (4.5 m) wide and at least 2 feet (0.6 m) deep, into competent material as evaluated by Carl Kim Geo. Other benches shall be excavated a minimum height of 4 feet (1.2 m) into competent material or as otherwise recommended by Carl Kim Geo. Fill placed on ground sloping flatter than 5:1 (horizontal to vertical units), (<20 percent grade) shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

**F-2.5 Evaluation/Acceptance of Fill Areas**

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by Carl Kim Geo as suitable to receive fill. The Contractor shall obtain a written acceptance (*Daily Field Report*) from Carl Kim Geo prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys and benches.

## **F-3.0 FILL MATERIAL**

### **F-3.1 Fill Quality**

Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by Carl Kim Geo prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to Carl Kim Geo or mixed with other soils to achieve satisfactory fill material.

### **F-3.2 Oversize**

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 6 inches (15 cm), shall not be buried or placed in fill unless location, materials and placement methods are specifically accepted by Carl Kim Geo. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet (3 m) measured vertically from finish grade, or within 2 feet (0.61 m) of future utilities or underground construction.

### **F-3.3 Import**

If importing of fill material is required for grading, proposed import material shall meet the requirements of Section F-3.1, and be free of hazardous materials ("contaminants") and rock larger than 3-inches (8 cm) in largest dimension. All import soils shall have an Expansion Index (EI) of 20 or less and a sulfate content no greater than ( $\leq$ ) 500 parts-per-million (ppm). A representative sample of a potential import source shall be given to Carl Kim Geo at least four full working days before importing begins, so that suitability of this import material can be determined and appropriate tests performed.

## **F-4.0 FILL PLACEMENT AND COMPACTION**

### **F-4.1 Fill Layers**

Approved fill material shall be placed in areas prepared to receive fill, as described in Section 0, above, in near-horizontal layers not exceeding 8 inches (20 cm) in loose thickness. Carl Kim Geo may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers, and only if the building officials with the appropriate jurisdiction approve. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

### **F-4.2 Fill Moisture Conditioning**

Fill soils shall be watered, dried back, blended and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM) Test Method D 1557.

### **F-4.3 Compaction of Fill**

After each layer has been moisture-conditioned, mixed, and evenly spread, each layer shall be uniformly compacted to not-less-than ( $\geq$ ) 95 percent of the maximum dry density as determined by ASTM Test Method D 1557. Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

### **F-4.4 Compaction of Fill Slopes**

In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by back rolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet (1 to 1.2 m) in fill elevation, or by other methods producing satisfactory results acceptable to Carl Kim Geo. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of the ASTM D 1557 laboratory maximum density.

### **F-4.5 Compaction Testing**

Field-tests for moisture content and relative compaction of the fill soils shall be performed by Carl Kim Geo. Location and frequency of tests shall be at our field representative(s) discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged

to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

**F-4.6 Compaction Test Locations**

Carl Kim Geo shall document the approximate elevation and horizontal coordinates of each density test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that Carl Kim Geo can determine the test locations with sufficient accuracy. Adequate grade stakes shall be provided.



### **F-5.0 EXCAVATION**

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by Carl Kim Geo during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by Carl Kim Geo based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, then observed and reviewed by Carl Kim Geo prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by Carl Kim Geo.

## **F - 6.0 TRENCH BACKFILLS**

### **F-6.1 Safety**

The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations. Work should be performed in accordance with Article 6 of the *California Construction Safety Orders*, 2003 Edition or more current (see also: <http://www.dir.ca.gov/title8/sb4a6.html> ).

### **F-6.2 Bedding and Backfill**

All utility trench bedding and backfill shall be performed in accordance with applicable provisions of the current edition of the *Standard Specifications for Public Works Construction* (Green Book). Bedding material shall have a Sand Equivalent greater than 30 (SE>30). Bedding shall be placed to 1-foot (0.3 m) over the top of the conduit, and densified by jetting in areas of granular soils, if allowed by the permitting agency. Otherwise, the pipe-bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, and conforming to Section 201-6 of the current edition of the *Standard Specifications for Public Works Construction* (Green Book). Backfill over the bedding zone shall be placed and densified mechanically to a minimum of 95 percent of relative compaction (ASTM D 1557) from 1 foot (0.3 m) above the top of the conduit to the surface. Backfill above the pipe zone shall **not** be jetted. Jetting of the bedding around the conduits shall be observed by Carl Kim Geo and backfill above the pipe zone (bedding) shall be observed and tested by Carl Kim Geo.

### **F-6.3 Lift Thickness**

Lift thickness of trench backfill shall not exceed those allowed in the *Standard Specifications of Public Works Construction* unless the Contractor can demonstrate to Carl Kim Geo that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method, and only if the building officials with the appropriate jurisdiction approve.

October 4, 2024

Project No. PWAS\_20221005

LPA, Inc.  
5301 California Avenue, Suite 100  
Irvine, CA 92617

**Attention:** Mr. Larry Chiu, Managing Director

**Subject:** **Addendum to Geotechnical Exploration Report**  
**Response to Review Comments**  
**Proposed City Library**  
**83 West High Street**  
**Moorpark, California 93021**

**References:** Appendix A

Carl Kim Geotechnical, Inc. (Carl Kim Geo) has prepared this response letter to the City of Moorpark's review comments (GeoDynamics, Inc., 2024) on our geotechnical exploration report (Carl Kim Geo, 2022) for the subject project. The subject review comments from GeoDynamics on behalf of the City of Moorpark and our corresponding responses are provided in the following sections while a copy of the review comments is provided in Appendix B.

*COMMENT NO. 1:*

*The submitted report is over one year old. The consultant needs to provide an update report to address any changes in geotechnical conditions at the site, proposed development, or applicable codes and guidelines. An updated geotechnical map using the latest development plan as a base map should be provided with the update letter/report.*

*RESPONSE:*

Carl Kim Geo (2022) remains valid for the proposed project under the 2022 California Building Code (CBC) except as updated herein. The 2022 CBC seismic parameters are presented in the table below. Updated Plates 1 and 2 showing the geotechnical map and cross sections are included herein. No substantial changes were noted.

**CARL KIM GEOTECHNICAL, INC.**

945 Baileyana Road  
Hillsborough, CA 94010  
949-441-8143  
carlkimgeo@gmail.com

**2022 CBC Based Ground Motion Parameters**

<b>Categorization/Coefficient</b>	<b>Map-Based</b>
Site Latitude	34.2857°
Site Longitude	-118.8829°
Site Class	D
Mapped Spectral Response Acceleration at Short Period (0.2 sec), $S_s$	1.890 g
Mapped Spectral Response Acceleration at Long Period (1 sec), $S_1$	0.697 g
Short Period (0.2 sec) Site Coefficient, $F_a$	1.0
Long Period (1 sec) Site Coefficient, $F_v$	1.7 <sup>1</sup>
Adjusted Spectral Response Acceleration at Short Period (0.2 sec), $S_{MS}$	1.890 g
Adjusted Spectral Response Acceleration at Long Period (1 sec), $S_{M1}$	1.185 <sup>1</sup>
Design Spectral Response Acceleration at Short Period (0.2 sec), $S_{DS}$	1.260 g
Design Spectral Response Acceleration at Long Period (1 sec), $S_{D1}$	0.790 <sup>1</sup>
Site Amplification Factor, $F_{PGA}$	1.1
Site Modified Peak Ground Acceleration, $PGA_M$	0.906 g

<sup>1</sup>See Section 11.4.8 of ASCE 7-16. A site-specific ground motion hazard analysis in accordance with Section 21.2 of ASCE 7-16 is required for this site. Per Supplement 3 to ASCE 7-16, a site-specific ground motion hazard analysis is not required where the value of the parameters  $S_{M1}$  and  $S_{D1}$  in the table are increased by 50%.

**COMMENT 2:**

*The consultant should provide threshold targets for post-ground improvement to verify achievement of the required level of mitigation, including targets for maximum total and differential settlement (due to seismic, static and hydrocollapse), lateral spreading and surface manifestation.*

**RESPONSE:**

Preliminary improvement targets based on CPT soundings are provided at the end of Appendix E in Carl Kim Geo (2022). The preliminary performance criteria for ground improvement to allow the use of spread footings is less than 1 inch of post-construction liquefaction-induced settlement, less than 6 inches of post-construction liquefaction-induced lateral displacement, and little to no expression of liquefaction at the ground surface. We will develop the final performance criteria in

collaboration with the owner, design-build ground improvement contractor, and the structural engineer.

**COMMENT 3:**

*The consultant needs to provide a quality control/quality assurance (QA/QC) program to verify that the selected ground modification method will achieve the specified threshold targets.*

**RESPONSE:**

The quality control (QC) is provided by the design-build ground improvement contractor and will include the following:

1. Monitor and document the installation of ground improvement elements to verify that the production installation methods are in accordance with the approved design submittal.
2. Report any installation or material discrepancies to the geotechnical engineer and construction manager.

Carl Kim Geo will provide quality assurance (QA) services and perform the post-improvement verification program. Our QA documentation will include:

1. Provide full-time observation and documentation of ground improvement installation.
2. Verify the QC measures are being implemented.
3. Monitor and document progress of ground improvement treatment areas on contract drawings.
4. Following ground improvement, complete at least 4 cone penetration test (CPT) soundings within the treatment area.
  - a. Locate CPTs at the center of the grid of 4 or 3 columns.
  - b. Terminate each CPT at depths no less than depth of improvement.
  - c. Complete the CPTs no earlier than 5 calendar days following ground improvement installation.

**COMMENT NO. 4:**

*The consultant indicates on page 15 that “The onsite soils are deemed severely corrosive to buried ferrous metals and have negligible exposure to concrete.” On page 21, the consultant states that “Based on our laboratory testing, the onsite soil is considered mildly corrosive to ferrous metals.” The consultant should resolve this apparent discrepancy.*

**RESPONSE:**

The onsite soils are severely corrosive to ferrous metals based on results of laboratory testing.

**COMMENT NO. 5:**

*The consultant discussed and evaluated the potential for post-liquefaction settlement. Other hazards associated with the liquefaction phenomenon such as lateral spreading and surface manifestation should also be evaluated using appropriate methods of analyses in conformance with the State of California Special Publication 1127A (SP-117A). Mitigation measures should be recommended, as necessary.*

**RESPONSE:**

The requested information is provided in Appendix E of Carl Kim Geo (2022). Lateral spreading is also discussed in Section 3.2.3. As shown on the Liquefaction Severity Number chart in Appendix E, surface manifestation of liquefaction is anticipated to induce severe damage. The ground improvement program will be designed to mitigate liquefaction hazards, including surface manifestation and lateral spreading to acceptable thresholds. The preliminary performance criteria for ground improvement is less than 1 inch of post-construction liquefaction-induced settlement, less than 6 inches of post-construction liquefaction-induced lateral displacement, and little to no expression of liquefaction at the ground surface.

Please bind this addendum to the front of Carl Kim Geo (2022). We appreciate the opportunity to work with you on this project. If you have any questions, or if we can be of further service, please call us at your convenience.

Respectfully submitted,

CARL KIM GEOTECHNICAL, INC.



Carl C. Kim

Senior Principal Engineer



Andrew R. Hillstrand

Senior Geologist

#### Attachments

Appendix A – References

Appendix B – Review Sheet

Plate 1 – Explorations

Plate 2 – Cross-Section A-A'

**APPENDIX A**  
REFERENCES



## APPENDIX A

### REFERENCES

Carl Kim Geotechnical, Inc., 2022, Geotechnical Exploration, Proposed City Library, West High Street, Moorpark, California, Project No. PWAS\_20221005, dated November 29 (revised December 5).

GeoDynamics, Inc., 2024, Geotechnical Review of Proposed City Library, 83 West High Street, Moorpark California, GDI # 24.00102.0121, dated August 29.

## **APPENDIX B**

### REVIEW COMMENTS

Date: August 29, 2024  
GDI #: 24.00102.0121

Mr. Daniel Kim, P.E.  
**CITY OF MOORPARK**  
799 Moorpark Avenue  
Moorpark, California 93021

**Subject:** Geotechnical Review of Proposed City Library, 83 West High Street, Moorpark, California.

**City Project #:**

**Reports:** Carl Kim Geotechnical, Inc. (2024), "Geotechnical Exploration, Proposed City Library, West High Street, Moorpark, California," Project No. 21889-20, dated April 8, 2022.

**Plan:** LPA. (2024) "Civil Plans, Sheets C1-C17, Moorpark City Library, 83 W. High St., Moorpark, CA 93021," Grading Permit Submittal: August 2, 2024.

**Previous Reviews:** None

#### **REMARKS:**

Carl Kim Geotechnical, Inc. (CKG, consultant) provided the above-referenced geotechnical report for the proposed Moorpark City Library at the site located at 83 W. High Street in the City of Moorpark, California. The proposed development includes the construction of an approximately 17,500 ft<sup>2</sup> single-story, wood-frame library building southwest of the existing City of Moorpark Library. The existing library and improvements at the site will be demolished. Other ancillary improvements associated with the proposed development include parking and access areas, walkways, and landscaping. The subject site is mildly sloping to the south and constitutes approximately two acres.

Geodynamics, Inc. (GDI) reviewed the referenced report from a geotechnical perspective for compliance with applicable codes, guidelines, and standards of practice. GDI performed the review on behalf of the City of Moorpark. Based on our review, the consultant should respond to the following comments prior to approval.

**Note to the City:** *The site is located within a Liquefaction Hazard Zone as defined by the Seismic Hazards Mapping Act (California PRC Div. 2, Chap 7.8, sec, 2690-2699.6). Upon acceptance by the City of this report(s), the City must forward the report(s) to the State Geologist within 30 days of approval.*

#### **GEOTECHNICAL REVIEW COMMENTS**

1. The submitted report is over one year old. The consultant needs to provide an update report to address any changes in geotechnical conditions at the site, proposed development, or applicable codes and guidelines. An updated geotechnical map using the latest development plan as a base map should be provided with the update letter/report.
2. The consultant should provide threshold targets for the post-ground improvement to verify achievement of the required level of mitigation, including targets for maximum total and differential settlements (due to seismic, static and hydrocollapse), lateral spreading and surface manifestation.
3. The consultant needs to provide a quality control/quality assurance (QA/QC) program to verify that the selected ground modification method will achieve the specified threshold targets.

4. The consultant indicates on page 15 that "*The onsite soils are deemed severely corrosive to buried ferrous metals and have negligible sulfate exposure to concrete.*" On page 21, the consultant states that "*Based on our laboratory testing, the onsite soil is considered mildly corrosive to ferrous metals.*" The consultant should resolve this apparent discrepancy.
5. The consultant discussed and evaluated the potential for post-liquefaction settlement. Other hazards associated with the liquefaction phenomenon such as lateral spreading and surface manifestation should also be evaluated using appropriate methods of analyses in conformance with the State of California Special Publication 117A (SP-117A). Mitigation measures should be recommended, as necessary.

#### **PLAN CHECK COMMENTS**

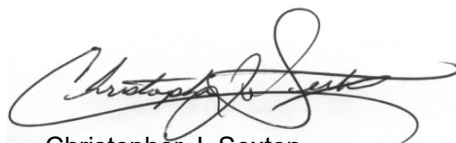
1. The recommended limits of overexcavation (vertical and horizontal) should be depicted on the grading plans.
2. The structural engineer for the project should provide a letter indicating that the estimated total (accumulative static and seismic) and differential settlements (no less than half the accumulative total settlement) are considered and incorporated in the design of the foundations in a manner that meet the intent of the applicable codes.
3. The following notes must be added to the grading plan:
  - The consultant should determine the expansion potential of the finish grade materials at the completion of grading. Foundation design recommendations should be revised if the expansion potential of finish grade materials substantially differs from the assumed expansion range.
  - The consultant should determine the R-value of the finish grade materials within parking and access road areas. Pavement design should be verified at the end of grading.
  - The consultant should evaluate the corrosion potential of finish grade materials at the end of grading and provide additional geotechnical recommendations as necessary.
  - An as-built report prepared by the consultant must be submitted to the City for review. The report must include the results of all compaction tests as well as a map depicting the limits of overexcavation, observed geologic conditions, location of all density tests, location and elevation of all removal bottoms, and location and elevations of all retaining wall backdrains and outlets.
4. Print the name, address, and phone number of the Project Geotechnical Consultant and list all applicable geotechnical reports on the building/grading plans. The foundation plans and foundation details shall clearly depict the embedment material and minimum depth of embedment for the foundations.
5. The following note must appear on all foundation plans: "All foundation excavations must be observed and approved by the Geotechnical Consultant prior to placement of reinforcing steel."
6. The final grading, drainage, and foundation plans should be reviewed, signed and wet stamped by the project geotechnical consultant.

This review has been conducted as part of the City of Moorpark permit process. If you have any questions regarding this letter, please contact GDI at (805) 496-1222.

Respectfully Submitted,  
**GeoDynamics, Inc.**



Ali Abdel-Haq  
Geotechnical Engineering Reviewer  
GE 2308 (exp. 12/31/25)

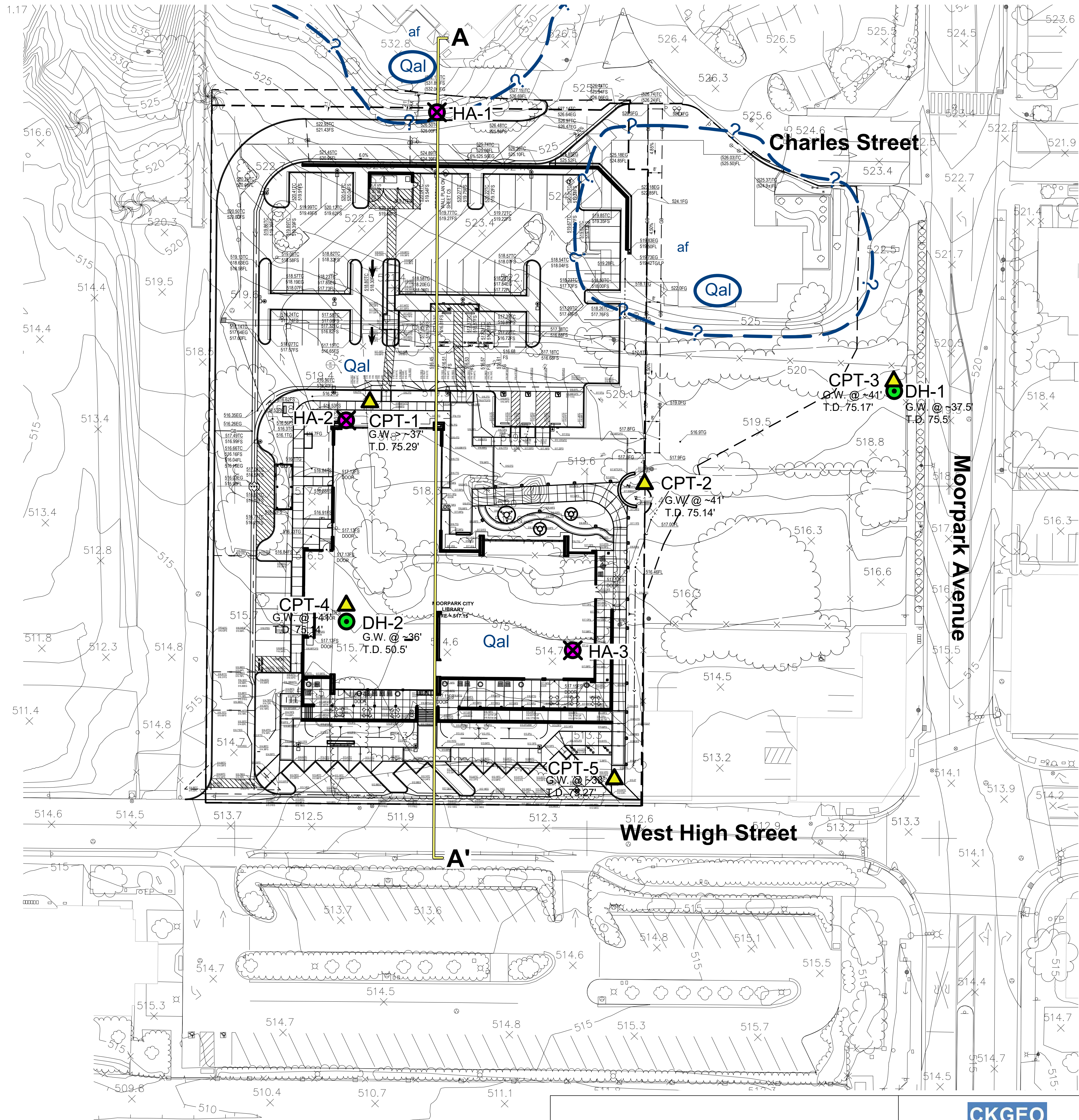


Christopher J. Sexton  
Engineering Geologic Reviewer  
CEG 1441 (exp. 11/30/24)

## PLATES



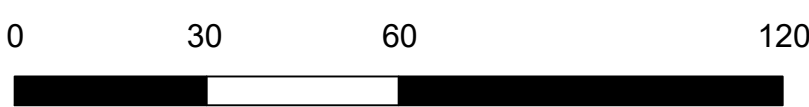
X:\Cart\GIS\CarlKim\MapArea - CAMEL P - Moorpark City Library - Explorations\202211\Map - Explorations October 3, 2024



EXPLANATION

- HAND AUGER BORING (CARL KIM GEOTECHNICAL)
- CONE PENETRATION TEST (CPT) (OAKRIDGE, 2017)
- HOLLOW-STEM AUGER BORING (OAKRIDGE, 2017)
- G.W. TOTAL DEPTH
- FILL\*\*
- QUATERNARY ALLUVIUM (CIRCLED WHERE BURIED)
- GEOLOGIC CONTACT (DASHED WHERE APPROXIMATE, QUIERRIED WHERE UNCERTAIN)
- PROJECT LIMIT
- CROSS SECTION TRANSECT

\*\*NOTE: MAPPED LIMITS OF UNDIFFERENTIATED UNCERTIFIED/CERTIFIED FILL ARE APPROXIMATE. BORING DATA SUGGESTS THE SITE MAY HAVE VARIABLE AMOUNTS OF FILL ACROSS THE AREAS EXPLORED. REFER TO TEXT AND APPENDICES FOR MORE INFORMATION.



OCTOBER 2024

Aerial Imagery Source: ©2022. Microsoft Corporation.



CKGEO

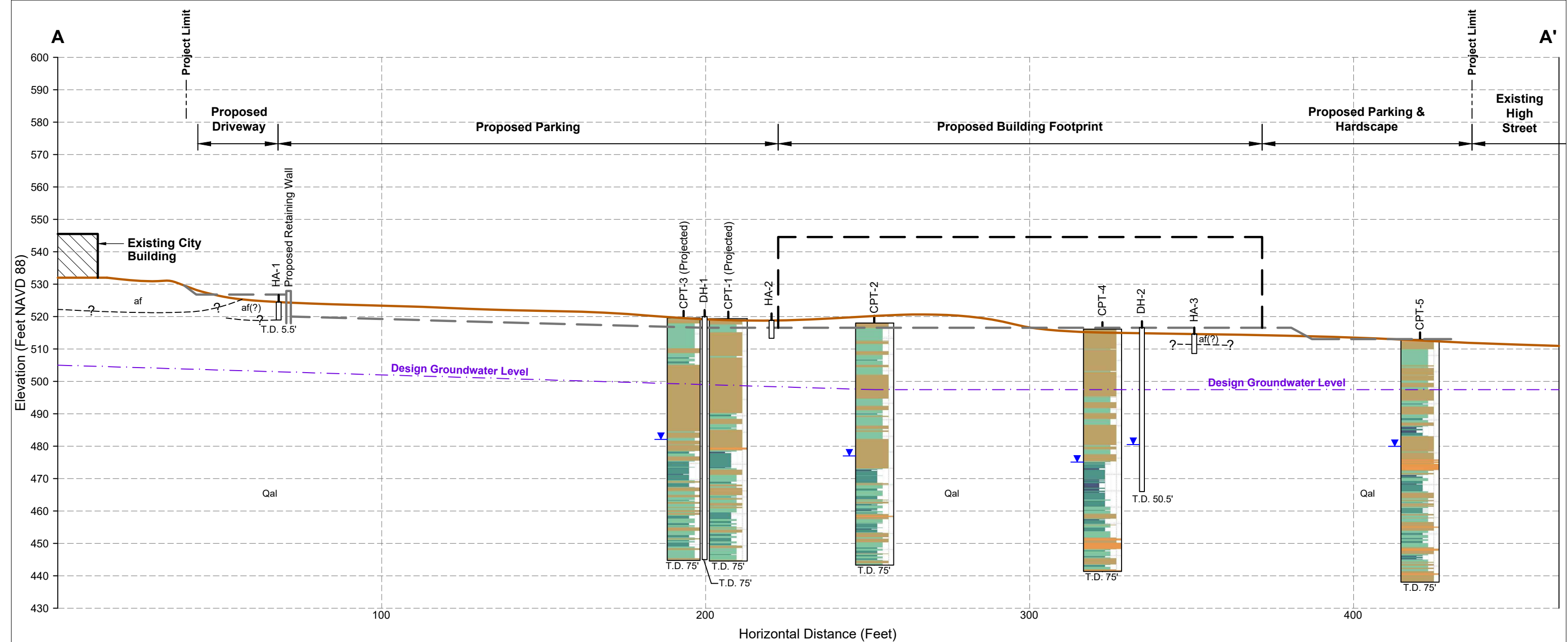
Carl Kim Geotechnical, Inc.  
945 Baileyana Road  
Hillsborough, CA 94010  
949-441-8143  
CARLKIMGEO@GMAIL.COM

CLIENT:	LPA, Inc.
PROJECT:	Moorpark City Library West High Street, Moorpark, California
PROJECT NUMBER:	PWAS_20221005









Explorations

PLATE 1





EXPLANATION

-  BORING
-  PROPOSED GRADE
-  EXISTING GRADE
-  UNDOCUMENTED FILL
-  QUATERNARY ALLUVIUM
-  TOTAL DEPTH
-  GROUNDWATER (APRIL/MAY 2017)
-  NORTH AMERICAN VERTICAL DATUM OF 1988

NOTE: CPT-3 AND DH-1 PROJECTED APPROXIMATELY 260 FEET WEST ONTO SECTION WHILE OTHER DEPICTED EXPLORATIONS ARE PROJECTED LESS THAN 100 FEET TO SECTION.

<div><div>VERTICAL SCALE (IN FEET)</div><div>30</div><div>October 2024</div><div>30</div><div>HORIZONTAL SCALE (IN FEET)</div></div>	<div>CKGEO</div>	CLIENT:  LPA, Inc.	CROSS SECTION A-A'
	<div>Carl Kim Geotechnical, Inc. 945 Baileyana Road Hillsborough, CA 94010 949-441-8143 CARLKIMGEO@GMAIL.COM</div>	PROJECT:  Moorpark City Library West High Street, Moorpark, California	
			PROJECT NUMBER:  PWAS_20221005

October 17, 2024

Re: Moorpark Library- Plan Check Responses  
LPA Project No. 30647

Dear Reviewer:

Please see the response to plan check comment #2 from GDI #: 24.00102.0121 stated below:

The structural engineer for the project should provide a letter indicating that the estimated total (accumulative static and seismic) and differential settlements (no less than half the accumulative total settlement) are considered and incorporated in the design of the foundations in a manner that meet the intent of the applicable codes.

The requirements for estimated total and differential settlements are listed on sheet S0.01, note D.8. Per this note ground improvement is required to limit post-construction total settlement (static and seismic) to less than 1 ½". Post-construction differential settlement (static and seismic) would then be ¾" over 40 feet.

The total and differential settlement are considered and incorporated in the foundation design in a manner that meets the intent of the 2022 CBC and reference codes. The foundation is not required to accommodate the seismic differential settlement because it does not exceed one fourth of the threshold in table 12.3-3 (0.9" in 40ft) per the exception in ASCE7-16 section 12.13.9.

Sincerely,

LPA, Inc.



Daniel Wang, S.E.  
Director of Structural Engineering



## OAKRIDGE GEOSCIENCE, INC.

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# **PRELIMINARY GEOTECHNICAL REPORT PROPOSED MOORPARK LIBRARY MOORPARK, CALIFORNIA**

Prepared for:  
City of Moorpark

June 17, 2017  
Job No. 030.003



PO Box 2540, Camarillo, California 93011

[www.Oakridgegeo.com](http://www.Oakridgegeo.com)

805-368-7765

June 17, 2017

Project No. 030.003

City of Moorpark  
799 Moorpark Avenue  
Moorpark, California 93021

Attention: Mr. Chris Ball

Subject: Preliminary Geotechnical Report, Proposed Moorpark Library, Moorpark, California

Dear Mr. Ball:

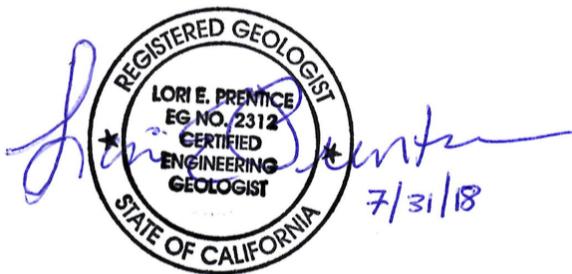
Oakridge Geoscience, Inc. (OGI) is pleased to provide this preliminary geotechnical report for the proposed library project in Moorpark, California. The purpose of the preliminary geotechnical study was to evaluate if seismic related geohazards including liquefaction, dry seismic settlement and lateral spreading, and hydroconsolidation (collapse) potential are present at the site and the need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking.

This report summarizes the geotechnical data review, field exploration, geotechnical laboratory testing, our evaluations, and our opinions of the site conditions based on the work performed. A supplemental geotechnical design report will be required as part of project design once the building type and location are selected.

### Closure

Thank you for the opportunity to provide geotechnical services to the City of Moorpark for this project. Please contact us if you have any questions on the information presented herein or if we can be of further assistance on this project.

SINCERELY,  
OAKRIDGE GEOSCIENCE, INC.



Lori E. Prentice, CEG  
President



Rory "Tony" Robinson, GE  
Principal Geotechnical Engineer

Copies Submitted: (1 electronic copy (pdf) via email)

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APPENDIX B	LABORATORY TESTING
APPENDIX C	LIQUEFACTION EVALUATION

## **1.0 INTRODUCTION**

### **1.1 PROPOSED PROJECT AND PURPOSE**

The City of Moorpark (City) is planning to build a new library building northwest of High Street and Moorpark Avenue near the location shown on Plate 1. As described in the staff report dated November 30, 2016, the library facility has not been designed but is anticipated to consist of an 18,000-square-foot, one-story building of standard wood frame construction.

A recent geotechnical study for the nearby Area Housing Authority (AHA) site development south of Everett Street (Plate 1) recommended ground improvement to reduce potential foundation settlement associated with liquefaction and dry seismic settlement from earthquake-induced ground shaking due to subsurface conditions at that site (Geotechnologies, Inc., 2016). The City retained Oakridge Geoscience, Inc. (OGI) to perform a preliminary geotechnical evaluation of the proposed library site to evaluate whether the conditions onsite will require subsurface ground improvement similar to the AHA site, prior to hiring an architect or engineer to design the proposed structure.

### **1.2 WORK PERFORMED AND AUTHORIZATION**

The work performed for this study consisted of data review, project coordination, field exploration, laboratory testing, and geotechnical evaluation and reporting. The work was performed in general accordance with our revised proposal dated April 3, 2017 and was authorized by receipt of a Professional Services Agreement from the City, dated April 13, 2017.

#### **1.2.1 Data Review and Project Coordination**

We reviewed readily available published data and existing geotechnical reports provided by the City for the nearby AHA site to the east (Geotechnologies, Inc., 2016) and the Moorpark Apartments site (Gorian and Associates, 2013a) to the west. The approximate locations of the AHA and Moorpark Apartments sites are shown on Plate 1. Prior to field exploration, we performed a site reconnaissance to locate and mark the exploration locations for coordination with Underground Service Alert.

#### **1.2.2 Field Exploration**

Subsurface geologic conditions at the proposed library site were explored using a combination of cone penetrometer tests (CPTs) and drill holes near the locations shown on Plate 2. The CPT and drill hole logs are included in Appendix A.

**CPTs.** Five CPTs were advanced to depths of about 75 feet each on April 27 by Kehoe Testing & Engineering. The CPT is mounted on a 30-ton 3-axle truck and consists of an about 1.4-inch-diameter rod fitted with a cone at the base. The cone is sequentially connected to 1-meter-long rods and pushed into the subsurface at a constant rate by hydraulic rams using the weight of the truck as resistance. Additional rods are added to the rod length as the depth increases. The cone is equipped with electronic load cells which measure point (tip) resistance to the penetration and frictional resistance between the soils and the cylinder side (sleeve) of the cone. The subsurface stratigraphy and engineering parameters of the penetrated materials are inferred based on correlations of the recorded tip and sleeve properties. The CPT collects

nearly continuous data (2-centimeter intervals) and allows for efficient evaluation of seismic-related hazards, engineering properties, and stratigraphy.

Additionally, the CPT was equipped with a piezo-cone which measures excess pore pressure as a result of the penetration to further aid in evaluation of the depth to groundwater at the site. Pore-pressure dissipation tests were performed in CPT-3 and CPT-5.

Following the completion of each CPT, the rods were withdrawn, and the small-diameter holes were backfilled to the ground surface with fine bentonite chips.

**Drill Holes.** Two hollow-stem-auger drill holes, DH-1 and DH-2, were advanced near CPT-3 and CPT-4 by S/G Drilling on May 1, 2017 using a CME-85 drill rig equipped with 8-inch-diameter augers and a 140-pound automatic trip hammer. The drill holes were advanced to depths of 50 and 75 feet to help in evaluation of the subsurface conditions, to “ground truth” the CPT data, and to collect samples for laboratory testing and evaluation of liquefaction consistent with the guidelines published by the California Division of Mines and Geology (CDMG, now California Geologic Survey [CGS]), Special Publication 117A (CGS, 2008).

The drill holes were sampled at about 2.5-foot intervals to about 15 feet and at about 5-foot intervals to total depth using a combination of driven modified California and standard penetration test (SPT) samplers. In addition, bulk samples were collected from the near surface materials recovered from the auger flights. Our field geologist logged the recovered samples in general accordance with ASTM D2488 for visual soil classification. Groundwater depths encountered during drilling were measured and recorded on the drilling logs.

Following completion of drilling and sampling at each location, the drill holes were backfilled to the surface with the drill cuttings mixed with cement to create soil-cement and tamped.

### **1.2.3 Laboratory Testing**

Geotechnical laboratory testing was performed on selected earth materials sampled in the drill holes to characterize the materials and estimate relevant preliminary engineering design parameters. The testing consisted of moisture/density relationships, grainsize, Atterberg limits (plasticity), hydroconsolidation (collapse) potential, R-value, and soil chemistry for corrosion (pH, resistivity, sulfates, and chlorides).

The laboratory test results are presented on the drill hole logs (Appendix A) and in Appendix B.

### **1.2.4 Geotechnical Evaluation and Reporting**

We evaluated the field and laboratory geotechnical data, developed preliminary geotechnical engineering recommendations for the project, and prepared this report to summarize our findings, opinions and recommendations. Our report includes the following:

- Summary of soil and groundwater conditions encountered;
- Logs of CPT and drill hole explorations;
- Geologic cross sections depicting interpreted subsurface conditions;
- Laboratory test data;
- Evaluation of seismic-related hazards including fault rupture, liquefaction, dry seismic settlement and lateral spreading;
- Potential need for ground improvement;
- Preliminary design parameters for soil bearing and estimated settlement, and lateral earth pressures;
- Suitability of onsite soil for use as fill and select fill material;
- Anticipated excavation conditions; and
- Preliminary grading recommendations.

## **2.0 FINDINGS**

### **2.1 BACKGROUND**

Geotechnical studies for two nearby sites: 1) AHA site (Geotechnologies, Inc., 2016) and 2) Moorpark Apartments (Gorian and Associates, 2013a) have documented the potential for seismic-related geohazards (liquefaction, dry seismic settlement, lateral spreading) and hydroconsolidation (collapse) potential in the downtown Moorpark area. The approximate locations of the two sites relative to the proposed Moorpark Library site are shown on Plate 1.

**AHA Site.** At the AHA site, Geotechnologies, Inc. reported zones of medium dense granular soils ranging from less than one-foot to about 18-feet thick between depths of 15 to 75 feet. Their report indicated those soils could liquefy in response to the design earthquake event with settlements ranging from about two- to six-inches. On that basis, Geotechnologies recommended ground improvement to a depth of 30 feet to reduce total settlement to less than two inches and differential settlement to less than one inch. Their report indicated the structure could be supported on shallow spread footings following the recommended ground improvement. Alternatively, if the ground improvement could not reduce the total settlement to less than two inches the structure could be supported on a mat foundation. The report indicated the “most feasible ground improvement techniques could consist of a mixture of soil mixing, stone columns, aggregate piers or earthquake drains.” The final ground improvement design was to be performed by a specialized ground improvement contractor.

As a follow-up to our initial review of the AHA geotechnical report, we spoke briefly with the City’s Geotechnical review consultant, RJR Engineering. Mr. Rob Anderson with RJR

Engineering indicated seismic-related settlement issues have been reported at other locations within the City the Moorpark in addition to the AHA site. Sites closer to the Arroyo Simi drainage channel along the southern portion of the City seem to have a higher amount of estimated seismic settlement. The estimated seismic settlement in other areas in the City is variable.

**Moorpark Apartments Site.** Gorian and Associates (Gorian, 2006; 2013a; 2013b) prepared a geotechnical study for the Moorpark Apartments site directly west and northwest of the proposed Library Site (Plate 1). Gorian's evaluation of the subsurface conditions indicated the potential for up to nine inches of seismic-related settlement (liquefaction and dry seismic settlement) based on a groundwater level of 15 to 25 feet below the ground surface and an earthquake ground acceleration of 0.68g. Exploration by Gorian was limited to a depth of 50 feet, therefore, subsurface data are not available to evaluate if liquefaction could also occur at deeper depths for that site. We note Gorian (2006) indicates up to 15 inches of dry seismic settlement were estimated from CPT-3A, but the calculated value was not considered accurate and the soils in the upper portion of the CPT would be mitigated as part of site grading. Gorian recommended ground improvement consisting of overexcavation and recompaction of soils to a depth of 13 to 22 feet below the existing grade to mitigate soils susceptible to seismic-related settlement; the proposed mitigation reduced the estimated vertical seismic settlement to about one-and-one-half to four inches. Gorian also recommended the proposed structures be supported on a "strong mat" type foundation to reduce the potential for differential settlement.

## **2.2 GEOLOGIC SETTING**

The project site is located within the Transverse Ranges geologic/geomorphic province of California. That province is characterized by generally east-west-trending mountain ranges composed of sedimentary and volcanic rocks ranging in age from Cretaceous to Recent. Major east-trending folds, reverse faults, and left-lateral strike-slip faults reflect regional north-south compression and are characteristic of the Transverse Ranges. Several authors including Dibblee (1992), and Weber (1973) have mapped the Moorpark area.

The project site is located south of the confluence of two southerly draining tributaries (Walnut Canyon and an unnamed canyon) to the Arroyo Simi. As mapped by Dibblee (1992), the earth materials in the vicinity of the proposed library site consists of alluvial sediments of silt, sand, and gravel deposits.

## **2.3 REGIONAL GEOLOGIC HAZARDS**

Mapping by the CDMG, (now CGS, 2000) indicates the proposed library site is located in a potential liquefaction area based on a regional evaluation of geologic and geotechnical conditions. Proposed habitable developments within this zone are required to have a site-specific liquefaction evaluation performed in accordance with CGS Special Publication 117A (CGS, 2008).

## **2.4 SITE CONDITIONS**

The project site is roughly an "L"-shaped vacant lot located west of the intersection of Moorpark Avenue and West High Street, south of the existing City library and parking lot as indicated on Plate 2. Review of images on Google Earth and the USGS topographic map



indicate the project site was formerly developed with small structures that were demolished after about 2003. Asphalt concrete pavement is located in the northwest portion of the "L"-shaped property; the remainder of the site is earthen. The site topography slopes gently to the south. Based on ground surface elevations from the USGS Moorpark Quadrangle, the ground surface at the project site slopes southward from about elevation (El.) +520 feet at the northern portion of the site to about El. +514 feet at the southern portion of the site (6 feet of elevation difference) over a distance of about 270 feet (approximately a 2.2 percent slope).

## **2.5 EARTH MATERIALS**

Descriptions of soil conditions presented herein are based on visual classification of samples obtained from our field exploration combined with the results of laboratory testing.

As depicted on the attached Geologic Cross Sections A-A' and B-B' (Plates 3a and 3b), the earth materials encountered by the CPTs and drill holes for this study consist primarily of interbedded granular alluvial deposits of sand and silty sand to depths of about 40 feet and interbedded silty to clayey sand, sandy clay, and silt from about 40 to 75 feet (maximum depth explored). As shown on the CPT logs in Appendix A, the silt, clay, and sand layers below a depth of 40 feet are typically thinly bedded ranging from several inches to two feet in thickness, with occasional clay or silty sand layers to about five feet thick.

### **2.5.1 Engineering Properties**

A summary of the general engineering parameters for the earth materials encountered in the explorations advanced for this study consists of:

- Field SPT N-values ranged from about 2 to 15 blows per foot (bpf) from the ground surface to a depth of about 25 feet, and 12 to 22 bpf from about 25 to 75 feet below the ground surface (Appendix A). The SPT N-values indicate the granular soils classify as very loose to loose in the upper 25 feet and loose to medium dense from 25 to 75 feet. The fine-grained silt and clay soil layers generally classify as medium stiff, with the exception of a very soft layer at a depth of 50 feet in DH-1.
- Moisture contents generally ranged from about 2 to 8 percent in the granular alluvial deposits above the groundwater level (above 37 feet) and from about 14 to 25 percent below the encountered groundwater level.
- Dry densities of the granular soil in the upper 40 feet of the site ranged from 95 to 111 pounds per cubic foot (pcf), and the densities of interbedded soils from 40 to 75 feet ranged from 112 to 118 pcf.
- The results of grainsize analyses indicate fines contents (percent passing No. 200 sieve) ranging from about 3 to 47 percent for the tested granular soil samples and from about 50 to 63 percent for cohesive materials.
- Atterberg Limit tests indicate the tested fine-grained sandy clay layers have liquid limits of 21 to 26 and plasticity indexes of 6 to 9. Those soils classify as low plasticity sandy clay and sandy to silty clay (Appendix B).
- The hydroconsolidation (collapse) potential for three silty sand soil samples from depths of 10, 25, and 30 feet was tested in accordance with ASTM D4546, Method

B. The test results are presented in Appendix B. The samples were selected for testing based on unit weight, degree of saturation, void ratio, and fines content (percent passing No. 200 sieve). The test results indicate hydroconsolidation potentials of 2.3 percent at 10 feet, 0.05 percent at 25 feet, and 0.4 percent at 30 feet. (Appendix B).

- The near surface soil materials consist of silty sand with an R-value of 70 and an anticipated low expansion index (EI of less than 20).
- The results of the soil chemistry tests are summarized below.

## **2.6 SOIL CHEMISTRY AND CORROSION**

### **2.6.1 Test Results**

A selected soil sample obtained from our exploration was provided to Cooper Testing Laboratories for resistivity, pH, chloride, and sulfate testing. The test results are summarized below and the laboratory test report is included in Appendix B.

**Table 1. Summary of Chemical Test Results**

<b>Drill Hole</b>	<b>USCS Classification</b>	<b>Depth (feet)</b>	<b>Sulfate (mg/kg/%)</b>	<b>Chloride (mg/kg)</b>	<b>Resistivity (ohm-cm)</b>	<b>pH</b>
DH-1	Sand with Silt	0 - 5	6/0.0006	2	16,319	7.5

### **2.6.2 Corrosion and Cement Considerations**

As summarized in the table above, the measured pH of the tested sample (ASTM G51) is 7.5, the measured electrical resistivity (ASTM G57) is 16,319 ohm-centimeters, the chloride content (ASTM D4327) of the measured samples is 2 mg/kg, and the sulfate content (ASTM D4327) of the measured sample is 6mg/kg (0.0006 percent).

Caltrans (2012) classifies soils as non-corrosive if the earth materials have less than 500 ppm chlorides, less than 0.20 percent sulfates (i.e., 2,000 mg/kg or ppm), a pH of 5.5 or more, or an electrical resistivity of 1,000 ohm-centimeters or more. The data suggest the tested soil materials are not corrosive to underground steel. If applicable, the test results should be evaluated by a corrosion engineer to determine how underground utilities should be protected from corrosion.

The cement type should be selected with consideration of the sulfate content of the tested soils. Available sulfate content data suggest that, per Table 4-3-1 of ACI 318, Type II cement can be used for concrete that will be in contact with onsite granular soils.

## **2.7 GROUNDWATER CONDITIONS**

Groundwater was encountered at depths of about 36 to 37.5 feet in the drill holes advanced onsite (Appendix A). Interpretation of the CPT dissipation test data indicates similar groundwater depths of about 37 feet below ground surface at the time of our exploration on April 27, 2017 (Appendix A). Historically high groundwater levels reported by the CGS (2000)

indicate the groundwater levels at the project site have been within about 15 feet of the ground surface. Variations in groundwater levels and soil moisture conditions can occur as a result of rainfall, irrigation, runoff, and other factors.

## **2.8 DATA INTERPRETATION AND ANALYSES**

Data interpretation for this study utilized the CPTs and the SPT N-values from the drill holes advanced onsite (Appendix A). Analyses of the CPT and SPT data from this study were performed using the computer program GeoLogisMiki. Selected computer printouts from the GeoLogisMiki analyses are presented in Appendix C. A complete pdf file of the analyses can be provided upon request.

The field SPT N-values presented on the drill hole logs in Appendix A were normalized to 1 ton/square foot and corrected for rig efficiency, hammer type, sampler type (no liner), and rod length as described in the Recommended Procedures for Implementation of CGS Special Publication 117A (CGS, 2008). Recent modifications to the CGS procedures by Boulanger and Idriss (2014) are incorporated into the software evaluation. We also utilized blow counts measured for the modified California sampler (MCS) in the analyses by dividing the MCS blowcount by 1.6 to provide an equivalent SPT N-value. The SPT N-value correction factors are summarized in Table 2.

**Table 2. SPT N-Value Correction Factors**

<b>Correction Factor</b>	<b>Value</b>	<b>Comment</b>
Hammer Efficiency ( $C_E$ )	1.3	Auto trip hammer 80% efficiency
Rod Length ( $C_R$ )	$L < 15' = 0.75$ $L < 20' = 0.85$ $L < 35' = 0.95$ $L > 35' = 1.0$	L = Rod Length (feet)
Sampling Method ( $C_S$ )	1.2	
Modified California Sampler (MCS) blowcounts	$MCS/1.6 = \text{SPT N-value}$	Equivalent SPT N-Value

## **2.9 POTENTIAL VARIATION OF SUBSURFACE MATERIALS**

There is a potential for variation in the consistency, density, and strength/hardness of the materials from what was encountered in our explorations. The potential exists to encounter perched water, zones of poorly consolidated soils, or other conditions not indicated on the exploration logs. If significant variation in the geologic conditions is observed during construction, we recommend the geotechnical engineer, in conjunction with the project designer, evaluate the impact of those variations on the project design.

**2.10 SEISMIC CONSIDERATIONS AND GEOHAZARDS****2.10.1 Faults**

The project site is located in a seismically active portion of southern California and the project most likely will be subjected to strong earthquake ground motion during its lifetime. As summarized in the following table, numerous active or potentially active faults are known or postulated to exist within about 15 miles of the proposed new library site.

**Table 3. Nearby Faults**

<b>Fault</b>	<b>Approximate Distance (miles)<sup>1</sup></b>	<b>Maximum Moment Magnitude (Mmax)</b>
Simi-Santa Rosa	2.1	6.8
Oak Ridge	6.0	7.1
San Cayetano	8.1	7.1
Northridge	12.1	6.8

<sup>1</sup> Earthquake distances and magnitudes obtained from the USGS website (2017)

**2.10.2 Ground Rupture Potential**

The site is not located within a State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zone) and no known active or potentially active faults cross or trend toward the site. The potential for fault rupture to affect the site is considered low.

**2.10.3 Seismic Considerations for 2016 CBC**

We estimated the probabilistic seismic ground acceleration at the proposed library site using the USGS web application (USGS; 2017). On the basis of the web-based analyses, the peak horizontal ground acceleration (pga) at the proposed site is estimated to be 1.035g for an earthquake with a 2,475-year return period (2 percent probability of exceedance in 50 years) assuming Site Class D soil conditions. The following table summarizes the probabilistically estimated strong ground motion parameters for the project site.

**Table 4. Summary of USGS Probabilistic Seismic Hazard Deaggregation Results**

<b>Return Period (years)</b>	<b>Mean Magnitude (Mw)</b>	<b>Mean Source Distance (miles)</b>	<b>Peak Horizontal Ground Acceleration</b>
2,475	6.9	5.0	1.035g

**2.10.4 2016 CBC Seismic Design Parameters**

In accordance with Chapter 16, Section 1613 of the 2016 CBC, the following parameters have been obtained from the USGS Seismic Design Maps web application (USGS, 2017) and shall be incorporated into the seismic design at the project site. The subsurface conditions at

the site are considered to satisfy the parameters for Site Class D<sup>1</sup>. The associated seismic design parameters for Site Class D for use in generating the risk-targeted maximum considered earthquake and design level spectra are summarized in the following table.

**Table 5. 2016 CBC Seismic Design Parameters**

<b>2013 California Building Code Section 1613</b>	<b>Seismic Parameter</b>	<b>Site Class D Values</b>
---	Latitude	34.2857
---	Longitude	-118.8829
Figure 1613.3.1(1)	Mapped Acceleration Response Parameter ( $S_s$ )	2.755g
Figure 1613.3.1(2)	Mapped Acceleration Response Parameter ( $S_1$ )	0.968g
Section 1613.3.2	Site Class	D
Section 1613.3.3 and Table 1613.3.3(1)	Site Coefficient ( $F_a$ )	1.0
Section 1613.3.3 and Table 1613.3.3(2)	Site Coefficient ( $F_v$ )	1.5
Section 1613.3.3	$PGA_M$ Equation 11.8-1 $PGA_M = F_{PGA} PGA$	1.035g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{MS}$ )	2.755g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{M1}$ )	1.452g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{DS}$ )	1.837g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{D1}$ )	0.968g

### 2.10.5 Liquefaction and Dry Seismic Settlement Potential

Liquefaction is described as the sudden loss of soil strength because of a rapid increase in soil pore water pressures due to cyclic loading during a seismic event. In order for liquefaction to occur, three general geotechnical characteristics must be present<sup>2</sup>: 1) groundwater must be present within the potentially liquefiable zone; 2) the potentially liquefiable soil must meet certain grainsize and classification characteristics; and 3) the potentially liquefiable granular soil must be of low to moderate relative density. If those criteria

<sup>1</sup> A Site Class D soil is defined in California Building Code (CBC) as the soil having the following average parameters for the upper 100 feet of the site: 1) shear wave velocity of 600 to 1,200 ft/sec, 2) standard penetration test SPT N-value of between 15 to 50, and 3) undrained shear strength of fine-grained soil between 1,000 to 2,000 psf. SPT N-values in the upper 50 feet of the Moorpark Library site ranged from 2 to 15 for granular soils to a depth of about 25 feet and 12 to 22 from about 25 to 75 feet (Appendix A). The average SPT N-values and soil shear strength in the upper 100 feet of the site would be consistent with Site Class D soil.

<sup>2</sup> Based on studies by Seed and Idriss (1971) and Youd and Idriss (2000), liquefaction occurs primarily in clean granular soils that classify as sand (SP) and sand with silt (SP-SM). Dense granular soils with fines contents greater than 35% (silty sand - SM and clayey sand - SC) are less likely to liquefy. Liquefaction susceptibility criteria developed by Boulanger and Idriss (2006) indicates that fine-grained soils with a PI of 6 or less can be susceptible to liquefaction. Studies by Bray and Sancio (2006) indicates that silty soils with a PI of 12 or less could potentially liquefy.

are met and strong ground motion occurs, then those soils may liquefy, depending upon the intensity and cyclic nature of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon is not restricted to depths of less than 50 feet.

As described in the Earth Materials section above, the soil profile consists primarily of interbedded granular alluvial deposits of sand and silty sand to depths of about 40 feet and interbedded silty to clayey sand, sandy clay, and silt from about 40 to 75 feet (Plates 3a and 3b). Groundwater was encountered at a depth of about 37 feet during field exploration for this study. Historic high groundwater levels summarized by the CGS (2000) are about 15 feet below the ground surface. SPT N-values from the upper 25 feet of the drill holes range from 2 to 15 bpf, indicating the granular soils are very loose to medium dense in that zone. The SPT N-values from 25 to 75 feet range from 12 to 22 bpf, indicating the granular soils are medium dense and the fine-grained silt and clay soils are medium stiff within that zone.

Research by Boulanger and Idriss<sup>2</sup> (2006) has indicated fine-grained silt and clay soils with Plasticity Index (PI) values of 6 or less can be susceptible to liquefaction and research by Bray and Sancio (2006) indicates low plasticity silt with a PI of up to 12 can liquefy during strong earthquake ground shaking. Clay soils with PI of greater than 18 generally exhibit a clay-like behavior and are considered non-liquefiable based on the criteria developed by Bray and Sancio (2006). The fine-grained sandy clay and sandy to silty clay soil layers tested for this study (Appendix B) have fines contents (percent passing the number 200 sieve) of 50 to 63 percent and PI's of 6 to 9, suggesting those layers have low plasticity and may be susceptible to liquefaction in response to strong earthquake ground shaking.

Analyses of the CPT and SPT data were performed using the program GeoLogisMiki. The input values are summarized below and selected graphics from the analyses are presented in Appendix C:

- The seismic ground motion is 1.03g for a 2 percent probability of exceedance in 50 years for the project site.
- Historic high groundwater level of 15 feet below the ground surface.
- CPT evaluation using the procedure recommended by Robertson (2009).
- SPT data evaluation using the procedure recommended by Boulanger and Idriss (2014).

Overall, the liquefaction analyses indicate the very loose to loose granular soils at the site are susceptible to liquefaction below the groundwater and dry seismic settlement above the groundwater. The estimated vertical liquefaction and dry seismic settlements are summarized in Table 6.

Seismically induced settlement or collapse can occur in soils that are loose, soft, or that are moderately dense, but weakly cemented. The onsite very loose to loose granular and silty soils above the groundwater are susceptible to seismically induced settlement. The estimated seismically induced settlement in the upper 15 feet of site is summarized in Table 6. We note the groundwater is assumed to be at 15 feet; therefore, soils below that depth are subject to liquefaction potential in the analyses even though the groundwater depth encountered by our explorations was about 37 feet below the ground surface.

**Table 6. Summary of Estimated Vertical Seismic Settlement**

<b>Exploration Location</b>	<b>Estimated Liquefaction Settlement (inches)</b>	<b>Estimated Dry Seismic Settlement (inches)</b>	<b>Total Estimated Seismic Settlement (inches)</b>	<b>Estimated Lateral Displacement (inches)</b>
CPT-1	7.5	6.9	14.4	200 inches
CPT-2	8.0	8.3	16.3	200+ inches
CPT-3	9.9	8.2	18.1	200+ inches
CPT-4	10.9	5.8	16.7	300+ inches
CPT-5	10.4	8.0	18.4	300+ inches
DH-1	13.8	34.0	37.8	108 inches
DH-2	9.4	2.4	11.8	72 inches
<b>Range (inches)</b>	<b>7.5 -13.8</b>	<b>2.4 - 34</b>	<b>11.8 – 37.8</b>	<b>-</b>
<b>Average Value (inches)</b>	<b>10</b>	<b>9.4</b>	<b>19</b>	<b>-</b>

**2.10.6 Data Summary**

Review of the data plots in Appendix C indicates:

- The liquefaction and dry seismic settlements estimated from the five CPTs advanced for this study are fairly consistent, ranging from 7 to 11 inches and 6 to 8 inches, respectively.
- The estimated liquefaction and dry seismic settlement estimated from the SPT data ranges 9.4 to 13.8 inches and 2.4 to 34 inches, respectively. The estimated liquefaction settlements from the SPT data are fairly consistent with CPT data with a slightly higher value for estimated settlement in DH-1 which extended to 75 feet (25 feet deeper than DH-2).
- The procedures for estimating dry seismic settlement from blowcount data are sensitive to low N-values such as was encountered in the near surface soil in DH-1. In DH-1, a three-foot-thick zone from 3.5 to 6.5 feet with an SPT N-value of 2 accounts for half (17 inches) of the estimated dry seismic settlement in that drill hole.
- The analyses presented in Appendix C indicate the loose granular soils and soft low plasticity silt/clay layers have a seismic factor of safety of less than 1 and an associated liquefaction potential to a depth of 75 feet (maximum depth explored).
- A majority of the estimated settlement from the CPT data occurs between the ground surface and a depth of about 40 to 50 feet.
- Estimated liquefaction settlement below a depth of about 40 feet is about 2 to 4 inches based on the CPT data (Appendix C).
- The total estimated liquefaction settlement in DH-1 (75 feet deep) is 13.8 inches; 4 inches of the settlement is estimated below about 50 feet. The analyses for DH-1

conservatively assumes all zones below a depth of 15 feet could liquefy except for a medium stiff clay from 66 to 69 feet.

### **2.10.7 Lateral Movement**

The occurrence of lateral spreading is generally associated with sites where liquefaction is possible and: 1) the ground surface is sloping, or 2) there is a free-face condition such as a road cut or riverbank. Existing analytical methods of assessing potential deformations caused by lateral spreading are based on a small number of case histories and generally involve layers of liquefiable soils of greater than about three feet (one meter). The procedures are generally considered reasonable in assessing risks where significant lateral deformations are possible (deformations of three feet or greater). The ability to reasonably predict small lateral spreading deformations is, however, considered significantly limited.

As depicted on the regional geologic/topographic map for the Moorpark Quadrangle (Dibblee, 1992), the ground surface in the vicinity of the project site slopes southward at a gradient of about 2.2 percent or less (six feet over 270 feet). From High Street southward, the regional slope gradient is one percent or less to the west. As described above, based on the CPT and drill holes advanced for this study, there is a potential for liquefaction, primarily in the upper 40 to 50 feet of the site. The lateral displacements estimated from the CPT and SPT data are summarized in Table 6 and range from 72 inches to greater than 300 inches.

CGS Special Publication 117A (CGS, 2008) defines large-scale ground displacements as areas that exceed one to three feet horizontally and four to six inches vertically. The estimated lateral displacements summarized in Table 6 range from six to 25 feet, and estimated vertical settlements (combined liquefaction and dry seismic settlement) in Table 6 average 19 inches. Based on both of those criteria, ground improvement of the subsurface soils will be required prior to construction to reduce the estimated lateral displacement to acceptable levels.

## **2.11 HYDROCONSOLIDATION (COLLAPSE) POTENTIAL**

Research by several authors including and Houston et al. (1997; 2001) and Purdue University (Howayek, 2012) indicates hydroconsolidation (collapse) typically occurs in silty and granular soil materials with densities below 105 pcf, degree of saturation of less than 25 percent, and high void ratios. In the Ventura County area, our experience indicates hydroconsolidation is commonly associated with silty soils deposited in debris-flow type environments. The depositional environment with high collapse potential previously observed in Ventura, Camarillo, and Simi Valley consists of Holocene- to Late Pleistocene-age alluvial fan deposits above the groundwater. As noted above in the Site Conditions section of this report, the proposed site is located at the mouth of tributary drainage to Arroyo Simi and is underlain by younger to older alluvial deposits; those deposits are equivalent to the Holocene- to Late Pleistocene-age fan deposits.

Based on an evaluation of the laboratory index properties (soil density, moisture content, void ratio, and fines content), three samples were selected for collapse testing per ASTM D4546, Method B. The results of those tests are presented in Appendix B and are summarized in Table 7 below. Based on published criteria (ASTM D5333), a collapse index of two percent or less is classified as slight, two to six percent is moderate, six to ten percent is moderately



severe, and above 10 percent is severe. Based on the tested samples, the amount of hydroconsolidation ranges from 0.05 to 2.3 percent. The values of less than two percent are considered slight by ASTM D5333 classification and within background levels for soils in Ventura County based on our previous experience. The sample from DH-2 at 10 feet with 2.3 percent hydroconsolidation (collapse index) indicates a moderate degree of potential collapse settlement.

The typical procedure to mitigate shallow collapse potential is to overexcavate and recompact the soil. If ground improvement is performed at the site, the near-surface soils would be densified and, in our opinion, likely reduce the hydroconsolidation potential to an acceptable level (i.e., less than two percent).

**Table 7. Summary of Hydroconsolidation (Collapse) Potential of Onsite Soils**

<b>Location and Depth</b>	<b>Soil Type</b>	<b>Dry Density (pcf)</b>	<b>Moisture Content (%)</b>	<b>Degree of Saturation</b>	<b>Void Ratio (%)</b>	<b>Fines Content (%)</b>	<b>Measured Hydroconsolidation (%)</b>
DH-2 10 feet	Silty Sand (SM)	96.9	3.5	13	0.71	22	2.3
DH-2 25 feet	Silty Sand (SM)	89.9	5.6	18	0.84	29	0.05
DH-1 30 feet	Sand w/Silt (SP-SM)	102	2.5	11	0.62	7	0.43

## **2.12 EXPANSIVE SOILS**

As described on the drill holes and laboratory data, the onsite surficial soils consist of sand and silty to clayey sand. The onsite granular soils are anticipated to have a low expansion potential.

### **3.0 OPINIONS AND RECOMMENDATIONS**

#### **3.1 SUMMARY OF SUBSURFACE SITE CONDITIONS**

The geotechnical conditions for the proposed library site were evaluated based on the explorations advanced for this study supplemented by data from previous geotechnical reports from the project vicinity. Based on the work performed, the site conditions consist of:

- Generally granular sand and silty sand soil in the upper 40 feet underlain by thinly interbedded silt, clay, and clayey sand from 40 to 75 feet (maximum depth explored).
- SPT N-values from the upper 25 feet of the drill holes range from 2 to 15 bpf, indicating the granular soils are very loose to medium dense in that zone. The SPT N-values from 25 to 75 feet range from 12 to 22 bpf, indicating the granular soils are medium dense and the fine-grained silt and clay soils are medium stiff within that zone.
- Groundwater was encountered at a depth of about 37 feet during exploration. Historic high groundwater levels in the Moorpark area are about 15 feet below the ground surface.
- The site is not located within a fault rupture hazard zone as defined by the State of California, California Geological Survey.
- The site is located in a seismically active area of Ventura County and has an estimated peak ground acceleration  $PGA_M$  of 1.03g.
- The plasticity index of fine grained soils ranges from 6 to 9. Research by Bray and Sancio (2006) indicates the fine grained soils could potentially liquefy during a seismic event.
- CPT and SPT data were evaluated (Appendix C) to estimate liquefaction and dry seismic settlement using the program GeoLogisMiki and the procedures developed by Robertson (2009) and Boulanger and Idriss (2014). The combined estimated liquefaction and dry seismic settlement ranges from about 12 to 34 inches with an average of about 19 inches in the upper 75 feet at the site.
- A majority of the estimated seismically induced settlement occurs in the granular soil layers in the upper 50 feet of the site; less than two to four inches of settlement is estimated to occur below 50 feet. Based on the liquefaction analyses, the fine-grained silt and clay soil layers do not contribute to liquefaction settlement.
- Estimated lateral spreading ranges from six feet to greater than 20 feet using the procedure developed by Robertson (2009) for CPT data and Boulanger and Idriss (2014) for SPT data.
- Estimated hydroconsolidation (collapse) potential ranges from 0.05 to 2.3 percent based on the laboratory testing on three samples of onsite soil.
- Nearby sites have estimated liquefaction/dry seismic settlement 2.5 inches (AHA Site; Geotechnologies, 2016) and 2 to 9 inches (Moorpark Apartments; Gorian, 2013). Liquefaction potential was identified to depths of about 60 feet with individual zones ranging from several feet to 18 feet thick.

- CGS Special Publication 117A (CGS, 2008) and the California Building Code (CBC) typically require projects to have seismic settlement of no more than two inches total and one inch of differential settlement. Sites with estimated settlements of more than two inches are normally required to mitigate settlement to about two inches with ground improvement. Potential ground improvement options are discussed in the following sections.

### **3.2 GROUND IMPROVEMENT OPTIONS**

As discussed above, ground improvement of the soils at the proposed library site will be required to mitigate the amount of estimated settlement to near two inches of total settlement and one inch of differential settlement. To reduce the estimated settlement to near two inches will require improving the site to a depth of approximately 50 feet. We note a 50-foot thick treatment depth would reduce the estimated settlement to less than two inches for most of the exploration locations performed for this study with the exception of DH-1. The data and analyses for DH-1 indicates up to four inches of settlement could occur from depths of 50 to 75 feet. However, in our opinion, if the upper 50 feet of soil were densified/improved, the site would have a 50-foot-thick cap of non-liquefiable improved soil to dampen any settlement below 50 feet. If the treatment depth was limited to 50 feet, a mat-type foundation may be required to reduce differential settlement to an acceptable level for the structure. The alternative would be to select a ground improvement option that could treat soil to a depth of greater than 50 feet as discussed below.

The two primary ground improvement methods to mitigate seismically induced settlements to a depth of about 50 feet with groundwater at a depth of 37 feet are: 1) vibro replacement (VR, also referred to as "stone columns"), and 2) deep soil mixing (DSM). The VR procedure consists of advancing a 30-inch diameter steel mandrel to the selected depth (approximately 50 feet) using a combination of the weight of mandrel and vibration. Once the mandrel reaches the selected depth,  $\frac{3}{4}$ -inch crushed rock is used to backfill the hole. The gravel is vibrated and "rammed" into the soft soil. The stone columns are placed on a grid pattern with a spacing typically in the range of six to nine feet on center. The soil displaced by the mandrel is "pushed" laterally into the adjacent soil, densifying the soil mass at the site to the point where it will resist liquefying and settlement in response to earthquake ground shaking. CPTs are advanced between columns after the VR is performed to evaluate the increase in soil strength/resistance to liquefaction. VR is an effective method of densifying granular soils to a depth of about 50 feet, but the process does not significantly improve the density of fine-grained silt and clay soils or highly interbedded fine-grained and granular soils. In our opinion, VR will be most effective in the upper 40 feet at the proposed library site.

DSM uses a large diameter auger mounted to a large drill rig or crane to advance the auger to the target depth (approximately 50 feet for the library project). Cement is mixed into the soil at a regulated rate of around 10 percent and mixed by the auger using several up and down passes of the auger. The amount of cement added to the soil is determined by laboratory testing to optimize the soil strength versus amount of cement utilized. Once the cement and soil are uniformly mixed, the auger is withdrawn and moved to the next location. The DSM columns can be placed in a variety of patterns (grid, tangent, overlapping) depending on the project requirements. For the proposed library project, one option is to place the DSM columns on a

grid pattern with a center to center spacing of two to three diameters with a grade beam type foundation system supported on the columns. The column configuration will depend on the column diameter selected (typically three to six feet), cement percentage, soil type, and amount of soil improvement required. Once the columns are completed, a grade-beam type foundation can be installed on top of the DSM columns to support the structure. Other column configurations such as tangent columns, overlapping columns, etc. can be utilized depending on project requirements. The advantages of the DSM method are that it can be installed to depths of greater than 50 feet and it can improve the strength of fine-grained soils.

The final design of the ground improvement system is typically performed by the specialty ground improvement contractor working with the project civil, structural, and geotechnical engineers. Other options could be considered pending an evaluation by a specialty ground improvement contractor. Both methods are established procedures and are considered feasible for the Moorpark Library site pending detailed site analyses of the proposed method and cost proposal from a qualified ground-improvement contractor. The pros and cons of the two primary methods are summarized in the following table.

**Table 8. Summary of Ground Improvement Methods**

<b>Ground Improvement Method</b>	<b>Pros</b>	<b>Cons</b>	<b>General Cost Range</b>
Vibro Replacement (VR) / Stone Columns	<ul style="list-style-type: none"> <li>Established procedure, excepted by agencies</li> <li>Densifies granular soil between individual columns</li> <li>Provides conduit to dissipate buildup of water pressure during a seismic event</li> <li>multiple contractors perform procedure – multiple bids</li> <li>No spoil generated during installation</li> </ul>	<ul style="list-style-type: none"> <li>Treatment depth limited to 50 feet</li> <li>Vibration could impact adjacent structures. Vibration monitoring recommended.</li> <li>Limited density improvement to fine-grained silt and clay soils from 40 to 50 feet below the ground surface.</li> <li>Treatment area usually extends out beyond building foundations</li> <li>Ground disturbance at surface requires upper several feet of site to be recompacted</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$60,000</li> <li>\$30/ft of column</li> <li>Column center to center spacing typically 6 to 9 feet</li> </ul>
Deep Soil Mixing (DSM)	<ul style="list-style-type: none"> <li>Established procedure excepted by agencies</li> <li>DSM columns can be extended to depths of 75 feet if required.</li> <li>Treatment area can be limited to building foundation footprint depending on site conditions</li> </ul>	<ul style="list-style-type: none"> <li>More expensive mobilization and per foot of column cost than vibro replacement</li> <li>Does not densify soil between columns</li> <li>Soil between columns can settle requiring a grade-beam type foundation to span across columns</li> <li>About 20 percent spoil generated during installation that needs to be disposed of.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$100,000 to \$150,000</li> <li>\$50/ft of column</li> <li>Replacement ratio 10%</li> </ul>

### **3.2.1 Ground Improvement Limits**

Typically, ground improvement is performed beneath the building footprint for “habitable structures” plus a minimal distance outside the building footprint (generally one column spacing) to provide lateral support for the structure. Habitable structures are defined by the CGS as structures with 2,000 man-hours occupancy per year. The remainder of the site beneath auxiliary structures is generally not improved unless the structures are considered an essential facility (such as an emergency back-up generator). The area outside of the building footprints beneath auxiliary structures and paved areas would be overexcavated per the recommendations in this report.

### **3.2.2 Surface Treatment**

Installation of VR columns typically causes the upper several feet of the ground surface to heave. Once the VR columns have been installed, the upper two feet of soil in the building foundation area should be over-excavated and recompacted to 90 percent relative compaction. The compacted material could consist of onsite granular soil or crushed rock.

For DSM projects, the loose disturbed soil in the upper portion of the site is removed to expose the upper part of the DSM columns. The surface treatment beneath the grade beam foundation treatment will be specified by the project civil and structural engineers based on the column and foundation configuration.

## **3.3 PRELIMINARY GRADING CONSIDERATIONS**

### **3.3.1 General Site Clearing and Grubbing**

Soil containing debris, organics, trees and root systems, and other unsuitable materials should be excavated and removed from improvement areas prior to commencing grading operations. Areas should be cleared of old foundations, slabs, pavement, abandoned utilities, and soils disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material should be replaced with compacted fill.

### **3.3.2 Subgrade Preparation**

For areas within the building foundation improved with VR, the ground surface should be overexcavated to a depth of two feet below the existing ground surface and replaced with compacted fill consisting of onsite granular soils or a blanket of crushed rock.

For improved areas outside of the building foundation ground improvement area, the ground surface should be overexcavated to a depth of two feet below the existing ground surface or two feet below footing depth, whichever is deeper. The resulting surface should be scarified to a depth of eight inches and compacted to 90 percent relative compaction (RC) and the fill placed above that level. Areas underlain by asphalt concrete pavement should be scarified to a depth of 12 inches and compacted to 95 percent RC.

### **3.3.3 Fill Material Selection**

Recommended fill material selection requirements for subgrade fill, aggregate base, and use of onsite materials are presented below. Areas or zones where the various fill materials may be used are described below.

**Use of Onsite Materials.** As described above, the near-surface onsite materials consist of granular silty sand soils with some gravel and cobble-size rock fragments. The material generated from the site overexcavation can be utilized as compacted fill as long as those materials satisfy criteria for general fill.

**General Fill.** General fill should consist of granular soil materials (SP, SW, SP-SM, and SM) free of organics, oversize rock (greater than six inches in diameter), trash, debris, and other deleterious or unsuitable materials, and should have an expansion index less than 20. The fill materials should have less than 15 percent larger than three inches in diameter.

**Aggregate and Miscellaneous Base.** Base materials should consist of material conforming to Caltrans Standard Specifications for Class 2 Aggregate Base, Section 26-1.02 (Caltrans, 2015) or Section 200-2.5 of the Greenbook (2015) for Processed Miscellaneous Base.

**Imported Fill.** Although importing fill is not anticipated, if material is imported, the imported subgrade fill materials should comply with recommendations for general fill or as appropriate for its intended use. Imported fill should be reviewed by the geotechnical engineer prior to being transported to the site.

### **3.3.4 Dewatering**

On the basis of our subsurface exploration and previous studies nearby, we do not anticipate groundwater will be encountered during site grading activities. Although we do not anticipate the need for dewatering, groundwater levels may vary seasonally and it is possible some seepage may be encountered in the excavations following rain events.

### **3.3.5 Fill Placement**

Fill should be placed, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. In general, we recommend the moisture content of the fill should be 0 to 2 percent above the optimum. We note the tested on-site soils have low moisture contents in the range of 2 to 8 percent. On the basis of the test results, water will need to be added during grading to bring the moisture content up near the optimum moisture content of about 10 to 11 percent. Each layer should be spread evenly and should be thoroughly blade-mixed during the spreading to provide relative uniformity of material within each layer. Soft or yielding materials should be removed and be replaced with properly compacted fill material prior to placing the next layer.

Rock, cobbles, and other oversized material greater than six inches in dimension in any direction should be removed from the fill material being placed. The contractor should be prepared to screen all native materials prior to placement as compacted fill. Rocks should not be nested and voids should be filled with compacted material. Organics, foreign matter, and other deleterious materials also should be removed from any material used in constructed fills.

Fill and backfill materials should be placed in layers that can be compacted with the equipment being used. Fill should be spread in lifts no thicker than approximately eight inches prior to being compacted. Fill and backfill materials may need to be placed in thinner lifts to achieve the recommended compaction depending on the equipment being used.

### **3.3.6 Compaction**

Fill placement and grading operations should be performed according to the City of Moorpark, Greenbook Specification 300-4, and the grading recommendations of this report. Relative compaction should be assessed based on the latest approved edition of ASTM D1557. The building and general site improvement over-excavation and upper 1-foot of paved areas (subgrade plus base materials) should be compacted to 95 percent relative compaction. We recommend general fill be compacted to a minimum of 90 percent relative compaction. Recommended specified relative compaction should extend to a minimum of three feet horizontally beyond the limits of the improvements.

## **3.4 SHALLOW FOUNDATION DESIGN**

The following sections describes preliminary shallow foundation design parameters for the site assuming the seismic geohazards have been mitigated through ground improvement. Depending on the level of improvement and building design criteria, it may be necessary to support the proposed structure on a mat type foundation. The decision on the preferred foundation type should be coordinated with the project civil and structural engineers based on building settlement tolerances. The following sections provides preliminary shallow foundation parameters consisting of isolated and continuous footings designed in accordance with current CBC and Greenbook requirements assuming that those values are suitable for the proposed structure.

### **3.4.1 Allowable Bearing Pressure**

Continuous and isolated spread footings will be supported on recompacted onsite materials underlain by alluvium. For these conditions, we recommend shallow footings be designed using a maximum allowable bearing pressure of 1,500 pounds per square foot (psf). The allowable value incorporates a factor of safety of at least 3. The toe-pressure below retaining walls or eccentrically loaded footings can exceed the recommended bearing pressure, provided the resultant pressure is within the middle-third of the footing. In accordance with 2016 CBC Section 1806.1, the bearing values indicated above are for static loads (including the total of dead and frequently applied live loads), and may be increased for short duration loading (including the effects of wind or seismic forces) as allowed in 2016 CBC Section 1605.3.2.

### **3.4.2 Minimum Embedment Depth and Width**

In general, footings should be embedded to at least two feet below the adjacent grade and have a minimum width of 18 inches. Isolated pad footings should be at least three feet in least-dimension.

### **3.4.3 Sliding and Passive Resistance**

Ultimate sliding resistance (friction) generated at the interface of concrete foundations and compacted soils can be computed by multiplying the total dead weight structural load by a coefficient of 0.40. The ultimate net passive resistance developed from lateral bearing of foundations against compacted backfill or undisturbed native soil can be estimated using an equivalent fluid weight of 300 pcf. The passive resistance for the upper one-foot of soil should be neglected unless the soils are confined at the ground surface by slab-on-grade or pavement.

Sliding resistance and passive pressure may be used together without reduction, when used with the recommended minimum factors of safety. For static conditions, minimum factors of safety of 1.5 and 2.0 are recommended for foundation overturning and sliding, respectively. The factor of safety for sliding can be reduced to 1.5, if passive resistance is neglected. The factor of safety for transient (seismic, wind) conditions should be at least 1.1.

### **3.4.4 Settlements**

**Static Settlements.** Static settlements will generally occur in response to foundation loads on the foundation support material. The structure should be designed to accommodate static differential settlements of at least one-half-inch over a distance of 30 feet (i.e., a distortion ratio of approximately 1/720) for similarly sized and loaded footings.

**Seismic Settlements.** Seismically induced settlements are discussed previously in this report. We anticipate the alluvial soils underlying the proposed excavation could experience seismic settlement of 19 inches without ground improvement and up to four inches with ground improvement to 50 feet with associated differential settlements of two-inches across the site.

### **3.5 SLAB-ON-GRADE**

At-grade floor slab thickness should be designed by the structural engineer, but should not be less than six inches thick. Control joints should be specified by the project structural engineer. The structural engineer should determine reinforcement requirements, but, at a minimum, reinforcement of on-grade floor slabs should consist of No. 4 bars at 18 inches each way, placed above slab mid-height with preferably about 1½- to 2-inches of clear cover. Means should be provided to maintain reinforcement location during construction and concrete placement.

Proper concrete placement in accordance with applicable specifications and curing of concrete slabs inhibits moisture migration. The concrete slab water cement ratio should be maintained during concrete mixing and placement. The project architect and design engineer should select the desired concrete properties based on the concrete slab-on-grade performance requirements.

The slab-on-grade should incorporate a moisture seal beneath the slab in areas where the concrete slab will be covered with flooring. The moisture seal should be bedded in sand per ACI criteria.

### **3.6 CONSTRUCTION CONSIDERATIONS**

#### **3.6.1 Existing Utilities**

We recommend any existing utilities be removed from the grading areas and relocated as necessary. The removal should consist of the excavation of the existing trench backfill and subsequent placement of new compacted fill. Excavation work required for the abandonment of utilities is anticipated to be relatively nominal but should be considered in the construction documents.

Trenches should be excavated no closer than a 1 horizontal to 1 vertical (1h:1v) projection up from the bottom of the excavation in areas where an existing utility/pipeline parallel's or subparallels the trench excavation. The minimum clear distance between an



existing utility and the trench should be evaluated by the contractor. We recommend existing utility/pipelines be supported/protected or the trench be shored to prevent loss of lateral support for existing utility/pipelines when: 1) the trench is closer than a 1h:1v projection to the existing utility, 2) the stability of the existing utility is in question, or 3) there is a potential for sloughing of the trench sidewalls adjacent to the existing utility.

### **3.6.2 Excavation Conditions**

Subsurface materials encountered in our exploratory holes consisted of very loose to loose silty sand to sand (granular) sediments to the anticipated excavation depths. We expect excavations in those soils can be made using conventional heavy-duty equipment in good working order.

### **3.6.3 Temporary Slopes and Excavations**

The contractor should be responsible for the design of temporary slopes. Subsurface materials encountered in our exploratory holes consisted of very loose to loose granular sediments to the anticipated excavation depths. Temporary slopes should be braced or sloped according to the requirements of OSHA.

As input to design, excavations without shoring that are shallower than 10 feet likely will be classified as Type C and should be sloped no steeper than 1.5h:1v as deemed appropriate based upon classification Type determined in the field per OSHA guidelines. OSHA requires excavations greater than 20 feet deep be designed by a qualified professional. We recommend all temporary excavations be monitored for signs of instability and appropriate actions (such as flattening the slope, providing shoring, and controlling groundwater, if encountered) should be undertaken if evidence of potential instability is observed.

## **3.7 PRELIMINARY PAVEMENT DESIGN**

### **3.7.1 Subgrade Preparation**

The finished subgrade surface exposed after overexcavation should be scarified to a depth of 12 inches, moisture-conditioned to within 0 to 2 percent of optimum moisture, and compacted to a relative compaction of at least 90 percent (i.e., 90 percent of the maximum dry density determined from ASTM D1557).

### **3.7.2 Fill Material Selection**

Recommended fill material selection requirements for subgrade fill, aggregate base, and use of onsite materials are presented below. Areas or zones where the various fill materials may be used are described below.

**Subgrade Fill.** General fill should be free of organics, oversize rock (greater than 3 inches in diameter), trash, debris, and other deleterious or unsuitable materials, and should have an expansion index less than 20.

**Aggregate and Miscellaneous Base.** Aggregate or miscellaneous base material should be placed below the asphalt pavement. Base materials should consist of imported material conforming to Caltrans Standard Specifications for Class 2 Aggregate Base, Section

26-1.02 (Caltrans, 2015) or Section 200-2.5 of the Greenbook (2015) for Processed Miscellaneous Base.

**Use of Onsite Materials.** Materials generated during excavation and grading in pavement areas are generally anticipated to consist primarily of granular soil materials. Material derived from the overexcavation can be used as subgrade as long as those materials satisfy criteria presented above for subgrade fill.

**Imported Fill.** Imported subgrade fill materials should comply with recommendations for subgrade fill or as appropriate for its intended use. Imported fill should be reviewed by the geotechnical engineer prior to being transported to the site.

### 3.7.3 Pavement Section

A flexible pavement design section was estimated using the County of Ventura pavement design procedures for assumed Traffic Index (TI) of 5, an R-value of 70 for the tested onsite sandy subgrade materials, and our experience. The recommended asphalt pavement sections based on the assumed TIs and the R-value test data are presented in the following table. Asphalt pavement materials should be compacted to at least 95 percent relative compaction.

**Table 9. Asphalt Pavement Section**

R-Value	Traffic Index	Thickness of Asphalt Concrete (in)	Thickness of Aggregate Base (in)
70	5	3	4

## 3.8 SITE DRAINAGE

Site grading should be provided such that positive drainage away from improvements is provided. Water should not be allowed to pond near the improvements; we recommend the construction of finish slopes of 1 to 2 percent away from improvements.

## 3.9 STORMWATER INFILTRATION

Recent regulatory agency requirements mandate stormwater generated on a new project site be infiltrated into the onsite soils. While this concept may have merit from an environmental standpoint, it increases the potential to cause foundation damage to onsite improvements due to higher groundwater levels, reduced soil strength, hydroconsolidation of onsite soils, and moisture infiltration into buried structures. If onsite stormwater disposal is implemented at the site, the design needs to consider the locations of existing and proposed structures and impacts to offsite improvements.

The liquefaction analyses performed for this study indicates up to about 12 inches of liquefaction related settlement could occur in response to the design seismic event. Infiltration of stormwater could increase groundwater levels beneath the site and reduce the shear strength of the soils which would increase the potential for liquefaction related settlement. In addition, the study indicated the potential for hydroconsolidation (collapse) of the onsite soil as high as 2.3 percent at a depth of 10 feet in areas not mitigated by ground improvement. A collapse of 2

percent over a depth of 35 feet (depth above current groundwater level) is equivalent to a collapse settlement of about 8 inches. Previous experience with collapse related settlements indicates concentrated water infiltration can cause hydroconsolidation of soils with collapse potential. Those concentrated settlements are typically associated with leaking water or sewer pipelines, but in our opinion, concentrated stormwater infiltration in a discrete basin has the potential to cause hydroconsolidation of the soils. The settlement contours from soil hydroconsolidation related settlement measured in previous forensic studies in the Ventura area documented a radial settlement pattern extending up to about 100 feet from the water infiltration source.

If storm water is infiltrated at the proposed library site, we suggest the project civil engineer consider the above factors in the design process. If concentrated stormwater infiltration is proposed in a discrete basin, that basin should be located away from project structural elements and offsite improvements (including buried utilities) that could be impacted by settlement. A setback distance of at least 100 feet from a discrete infiltration location is likely a reasonable starting point for infiltration design. Another alternative would be a diffuse infiltration system that does not concentrate infiltration in a specific location.

## **4.0 LIMITATIONS**

### **4.1 REPORT USE**

This preliminary report has been prepared for the exclusive use of the City of Moorpark for evaluation of the liquefaction potential and need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking at the library site. This preliminary report is intended to provide a summary of the site conditions, geohazard assessment, proposed ground improvement mitigations, and preliminary foundation recommendations. A supplemental geotechnical design report will be required as part of project design once the building type and location have selected, ground improvement option identified and foundation support conditions determined. The findings, conclusions, and recommendations presented herein were prepared in accordance with generally accepted geotechnical engineering practices of the project region. No other warranty, express or implied, is made.

Although information contained in this report may be of some use for other purposes, it may not contain sufficient information for other parties or uses. If any changes are made to the project as described in this report, the conclusions and recommendations in this report shall not be considered valid unless the changes are reviewed and the conclusions and recommendations of this report are modified or validated in writing by OGI.

### **4.2 HAZARDOUS MATERIALS**

This report does not provide information regarding the presence of hazardous/toxic materials in the soil, surface water, groundwater, or atmosphere.

#### **4.3 LOCAL PRACTICE**

In performing our professional services, we have used generally accepted geologic and geotechnical engineering principles and have applied the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers currently practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report.

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## REFERENCES

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## **PLATES**



Source: Google Earth, 2017

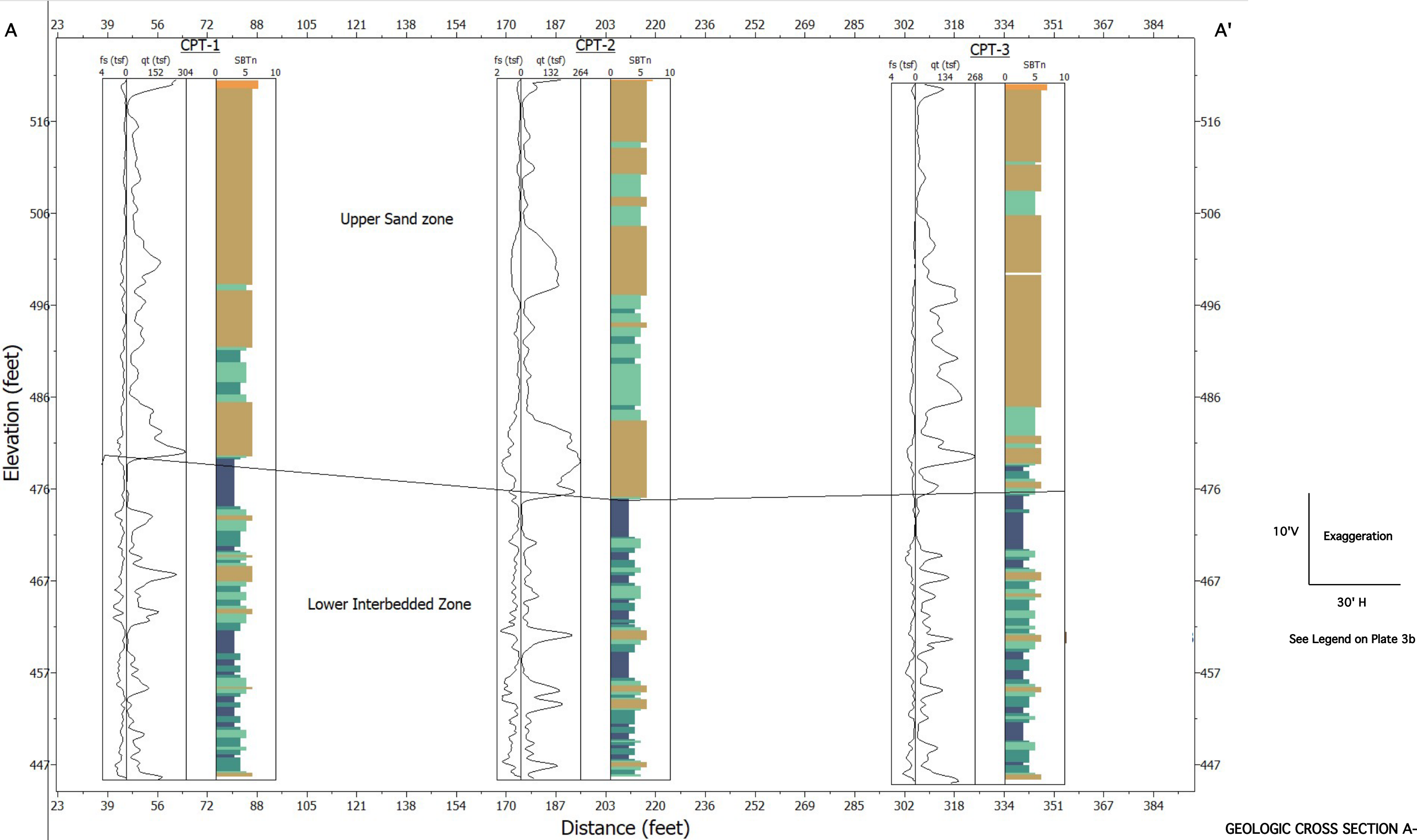
**VICINITY MAP**  
**Proposed New Library Site**  
**Moorpark, California**





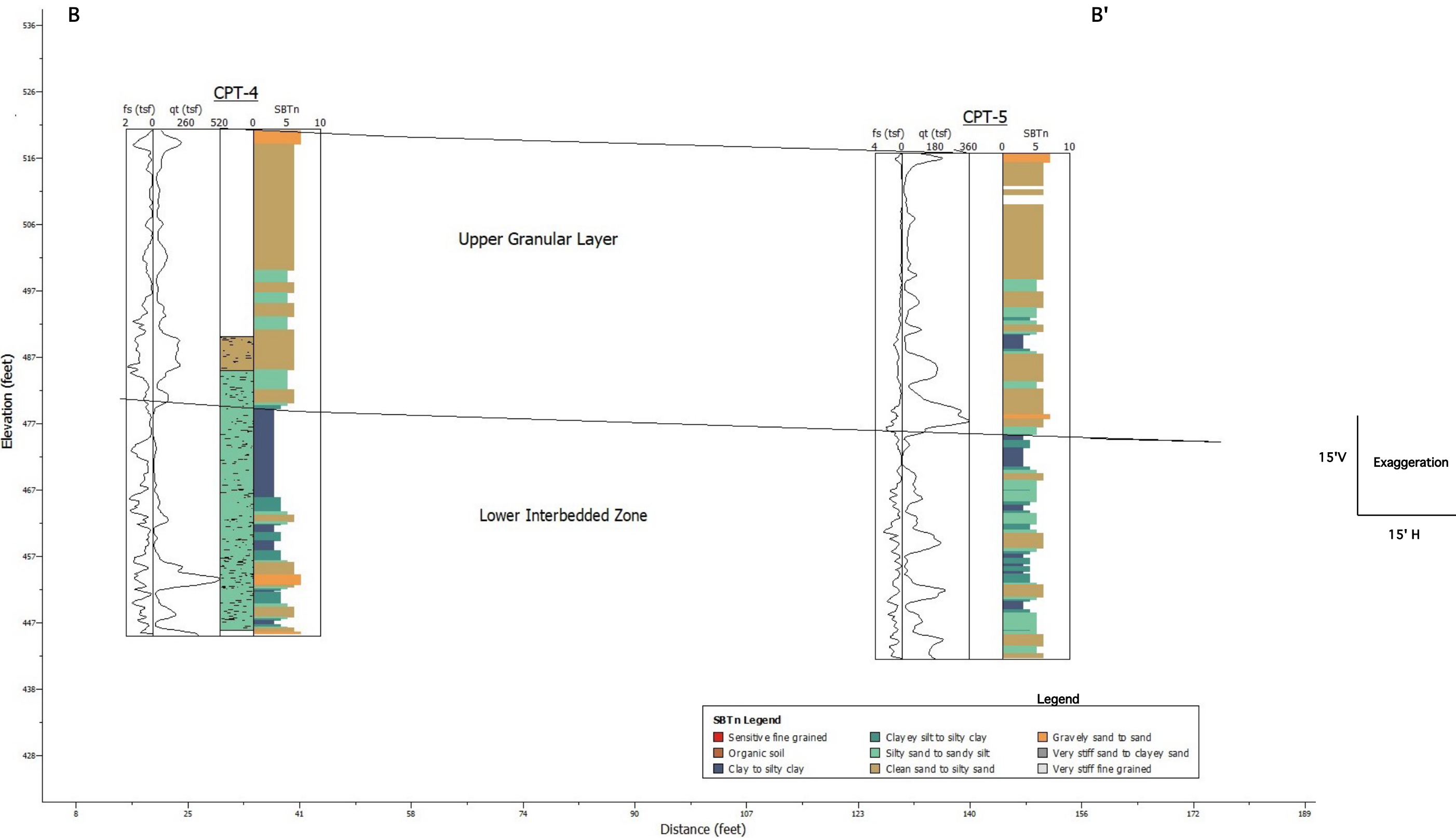
**EXPLORATION LOCATIONS**  
**Proposed New Library Site**  
**Moorpark, California**





NOTE: Elevations are approximate and are based on USGS 7.5 minute topographic map of Moorpark quadrangle.

GEOLOGIC CROSS SECTION A-A'  
Proposed New Library Site  
Moorpark, California



NOTE: Elevations are approximate and are based on USGS 7.5 minute topographic map of Moorpark quadrangle.

GEOLOGIC CROSS SECTION B-B'  
Proposed New Library Site  
Moorpark, California

## **APPENDIX A**

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)		
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
					<b>ARTIFICIAL FILL (af)</b>											
			1		Silty Fine SAND (SM): pale brown, dry, with gravel											
					<b>ALLUVIUM (Qal)?</b>											
2					SAND (SP): very loose, moderate yellowish brown, damp											
			2	(5)						98	4					
4					Fine SAND with Clay (SP-SC): very loose, dark brown, damp											
			3	2												
6					- loose, at 7'											
8			4	(7)						105	8					
10					Silty Fine to Medium SAND (SM): very loose, moderate yellowish brown, damp, with scattered coarse grains, and with few fine rounded gravel to 1/2"-dia.											
			5	4							6		15			
12					Clayey SILT with Sand (ML): medium stiff, moderate to dark brown, damp											
			6	(10)	SAND with Clay (SP-SC): loose, moderate brown, damp, with scattered coarse sand					111	15					
14					SAND with Silt (SP-SM): loose, moderate yellowish brown, damp, with fine rounded gravel to 1/2"-dia.											
			7	7							5		7			
16																
18																
					- with medium dense, dark brown sand with clay, from 19' to 21.25'											
			8	(23)						108	2					
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):					75.5'	
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):					37.5'	
BACKFILL:					Cuttings with Portland					LOGGED BY:					L Prentice	
DATE:					May1-2, 2017					CHECKED BY:					C Prentice	
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

MOORPARK LIBRARY  
Moorpark, California

PLATE A-1a

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)															
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)	
					SURFACE EL. (ft): (ref. MSL datum)										
					MATERIAL DESCRIPTION										
22															
24			9	9	Silty Fine to Medium SAND (SM): loose, pale yellowish brown, damp, with few scattered coarse sand and 3/4" gravel fragments						5		23		
26															
28															
30			10	(37)	Fine to Medium SAND with Silt (SP-SM): medium dense, pale yellowish brown, damp					102	3				
32															
34			11	20	- with 1.5"-thick moderate yellowish brown clayey fine sand, at 34.5'						8		7		
36															
38			12	2	Clayey SAND (SC)/Sandy CLAY (CL): very loose, moderate brown, wet; shut down after sampling for 5 min.; measured water at 37.5'						21		50		
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):		75.5'			
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):		37.5'			
BACKFILL:					Cuttings with Portland					LOGGED BY:		L Prentice			
DATE:					May1-2, 2017					CHECKED BY:		C Prentice			
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.															

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

**MOORPARK LIBRARY**  
Moorpark, California

PLATE A-1b

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map							DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
42					<p>- loose, at 44'</p> <p>- flowing/caving sand below 44'; adding water to augers prior to sampling below 49'</p>							112	19			p 0.5
44			13	(12)												
46																
48					<p>Clayey SAND (SC): medium dense, moderate brown, wet</p> <p>- sand slough in sampler, blow counts may be affected</p>							112	17		25	
50			14	(36)												
52																
54			15	21	<p>Fine to Medium SAND (SP): loose to medium dense, pale yellowish brown, wet, with moderate brown clayey fine sand in sampler shoe; sand slough in sampler</p>							14		3		
56			15b													
58																
			16	14	Clayey SAND (SC): medium dense, moderate brown, wet							16		25		
CONTRACTOR:					S/G Drilling, Inc.			TOTAL DEPTH (ft):			75.5'					
METHOD:					8"-dia. Hollow-stem-auger			WATER DEPTH (ft):			37.5'					
BACKFILL:					Cuttings with Portland			LOGGED BY:			L Prentice					
DATE:					May1-2, 2017			CHECKED BY:			C Prentice					
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

MOORPARK LIBRARY  
Moorpark, California

PLATE A-1c

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)												
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map			DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)							
					MATERIAL DESCRIPTION							
62												
64												
66			17	7	Fine Sandy CLAY (CL): medium stiff, moderate to dark brown, wet slightly micaceous, silty				24		63	
68												
70			18	22	Fine to Medium Clayey SAND (SC): medium dense, moderate brown, wet, with few coarse sand							
72												
74			19	20	Silty Fine SAND (SM): medium dense, moderate brown, wet				25		24	
76												
78												
CONTRACTOR:					S/G Drilling, Inc.			TOTAL DEPTH (ft):		75.5'		
METHOD:					8"-dia. Hollow-stem-auger			WATER DEPTH (ft):		37.5'		
BACKFILL:					Cuttings with Portland			LOGGED BY:		L Prentice		
DATE:					May1-2, 2017			CHECKED BY:		C Prentice		
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.												

MOORPARK LIBRARY  
Moorpark, California

PLATE A-1c

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-2															
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)	
					SURFACE EL. (ft): (ref. MSL datum)										
					MATERIAL DESCRIPTION										
					<b>ARTIFICIAL FILL (af)</b> Silty Fine SAND (SM): with gravel, medium dense, grayish brown, dry to damp										
2			1												
			2	15	<b>ARTIFICIAL FILL (af)/ALLUVIUM (Qal)?</b> Clayey SAND (SC): medium dense, dark brown, dry to damp										
4			3	(15)	<b>ALLUVIUM (Qal)</b> Silty Fine SAND (SM): loose, moderate brown, dry to damp					97	4				
6															
8			4	6	- loose, damp, fine to medium grained, at 7'						4		22		
10			5	(14)	- fine to medium grained, darker, at 9' - with dark brown fine silty lenses, at 9.75'					101	4				
12			6	7	Fine to Medium SAND with Silt (SP-SM): loose, moderate brown, damp						3		12		
14			7	(15)	Silty Fine SAND (SM): loose, moderate brown, damp - with medium stiff, moderate brown silt with slight mottling and few fine root hairs and minor fine caliche, at 14 to 15' - fine to medium grained with few scattered coarse sand, at 15'					106	5		32		
16															
18															
			8	13	medium dense, pale yellowish brown, at 19'										
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft): 50.5'					
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft): 36'					
BACKFILL:					Cuttings with Portland					LOGGED BY: L Prentice					
DATE:					May1-2, 2017					CHECKED BY: C Prentice					
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.															

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

**MOORPARK LIBRARY**  
Moorpark, California

PLATE A-2a



LOG OF DRILL HOLE DH-2 (Continued)																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)		
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
22					- loose, at 24'  - with finely laminated sandy silt and silt in sampler shoe, at 25.5'					90	6		29			
24			9	(15)												
26																
28					Fine to Medium SAND (SP): medium dense, pale yellowish brown, damp, with few coarse sand and few angular gravel fragments to about 1/2"-dia.											
30			10	21												
32																
34			11	(24)	Clayey Fine to Medium SAND (SC): medium dense, dark brown, moist to wet					97	18		27			
36					Medium to Coarse SAND (SP): medium dense, moderate brown, moist to wet											
38					Sandy Silty CLAY (CL-ML): very soft, dark brown, wet								52	p 0.1		
			12	WOH												
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):					50.5'	
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):					36'	
BACKFILL:					Cuttings with Portland					LOGGED BY:					L Prentice	
DATE:					May1-2, 2017					CHECKED BY:					C Prentice	
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-2 (Continued)											
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map		DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)						
					MATERIAL DESCRIPTION						
42			13	(27)	- shut down after sampling for 5 min.; measured water at 36'		118	16		47	p 2.3 p 2.7
					- very stiff, at 41'						
					Medium to Coarse Clayey SAND (SC): medium dense, dark brown, wet						
44			NR	(10)	- no recovery after sampling at 44'						
46											
48											
50			14	(19)	- no recovery after sampling at 49'; recovered sample with SPT.			17		27	
52											
54											
56											
58											
CONTRACTOR:					S/G Drilling, Inc.		TOTAL DEPTH (ft):		50.5'		
METHOD:					8"-dia. Hollow-stem-auger		WATER DEPTH (ft):		36'		
BACKFILL:					Cuttings with Portland		LOGGED BY:		L Prentice		
DATE:					May1-2, 2017		CHECKED BY:		C Prentice		
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.											

MOORPARK LIBRARY  
Moorpark, California

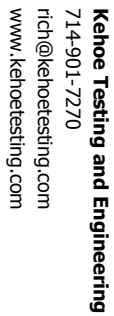
PLATE A-2c

Summary of Sampling Details					
Symbol	Number	Blowcount Push, or grab	Sampler Type	Blowcount Information	
	1	Bulk	Bulk Sample		
	2	23	Standard Penetration Test (SPT) Sampler (1-3/8" ID/2" OD) driven	63	63 blows for 1' penetration after initial 6" seating
				89/11	89 blows for 11" penetration after initial 6" seating
				33/6	33 blows for 6" drive after initial 6" seating
	3	(23)	Modified California Liner Sampler driven ( 2-3/8" ID/3" OD)	Ref	>50 blows for initial 6" seating
				(23)	Blowcounts for modified California sampler
	4	Push	Thin-walled sampler pushed ( 2-7/8" ID/3" OD)		

Material Symbols and Classifications					
	LEAN CLAY (CL)		Sandy SILT (ML)		CLAYSTONE
	FAT CLAY (CH)		Silty SAND (SM)		SILTSTONE
	Sandy CLAY (CL)		SAND with Silt (SP-SM)		SANDSTONE
			SAND with Clay (SP-SC)		
	SILT (ML)		SAND (SP)		VOLCANIC
	Sandy SILT (ML)				
	ELASTIC SILT (MH)		Clayey SAND (SC)		DOLOMITIC
			GRAVEL (GP)		SILICEOUS

Other Symbols	
	Groundwater
	Strata break

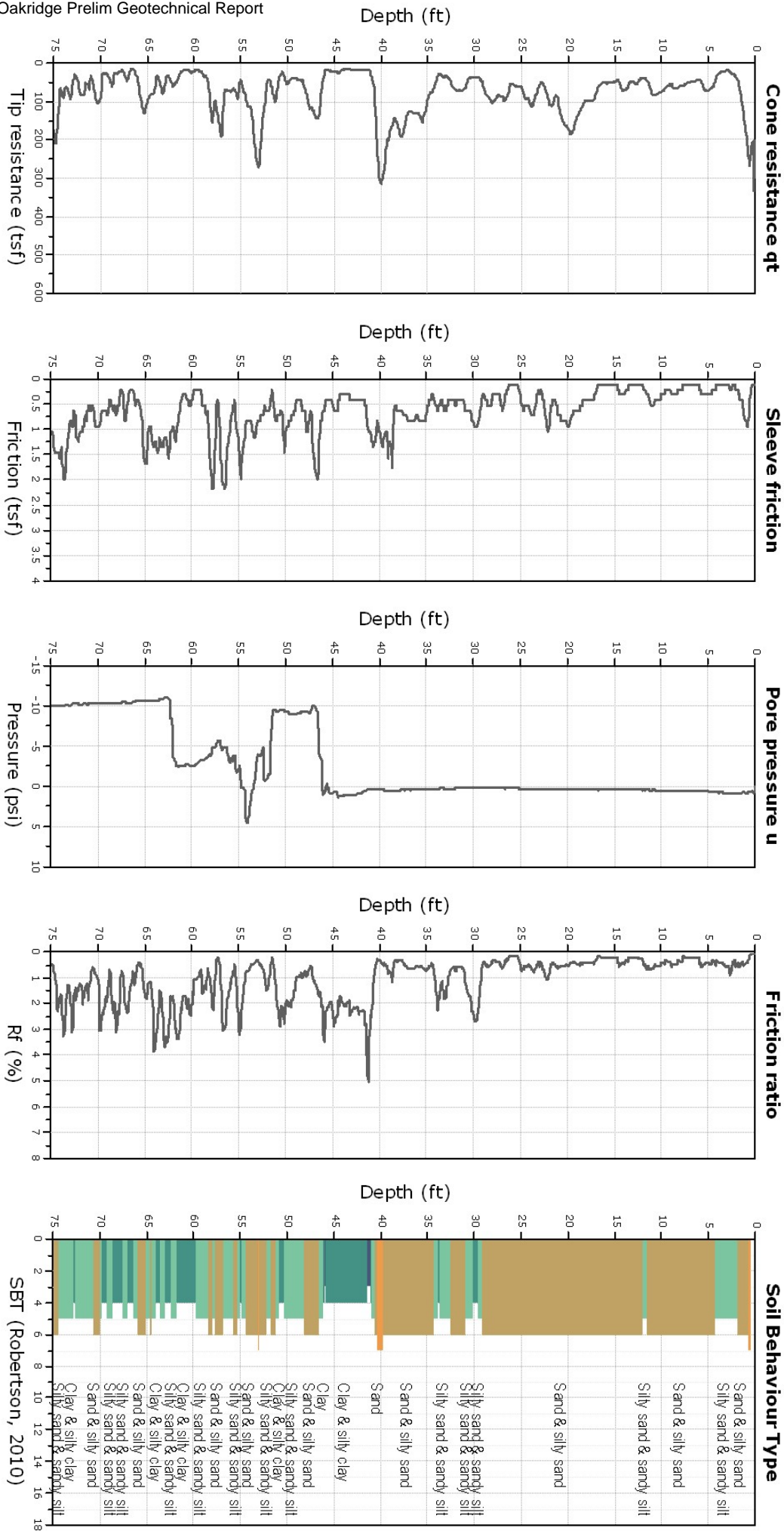
SUMMARY OF TERMS AND SYMBOLS  
USED ON LOGS

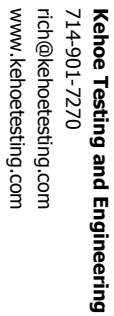


**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.29 ft, Date: 4/27/2017

Cone Type: Vertek

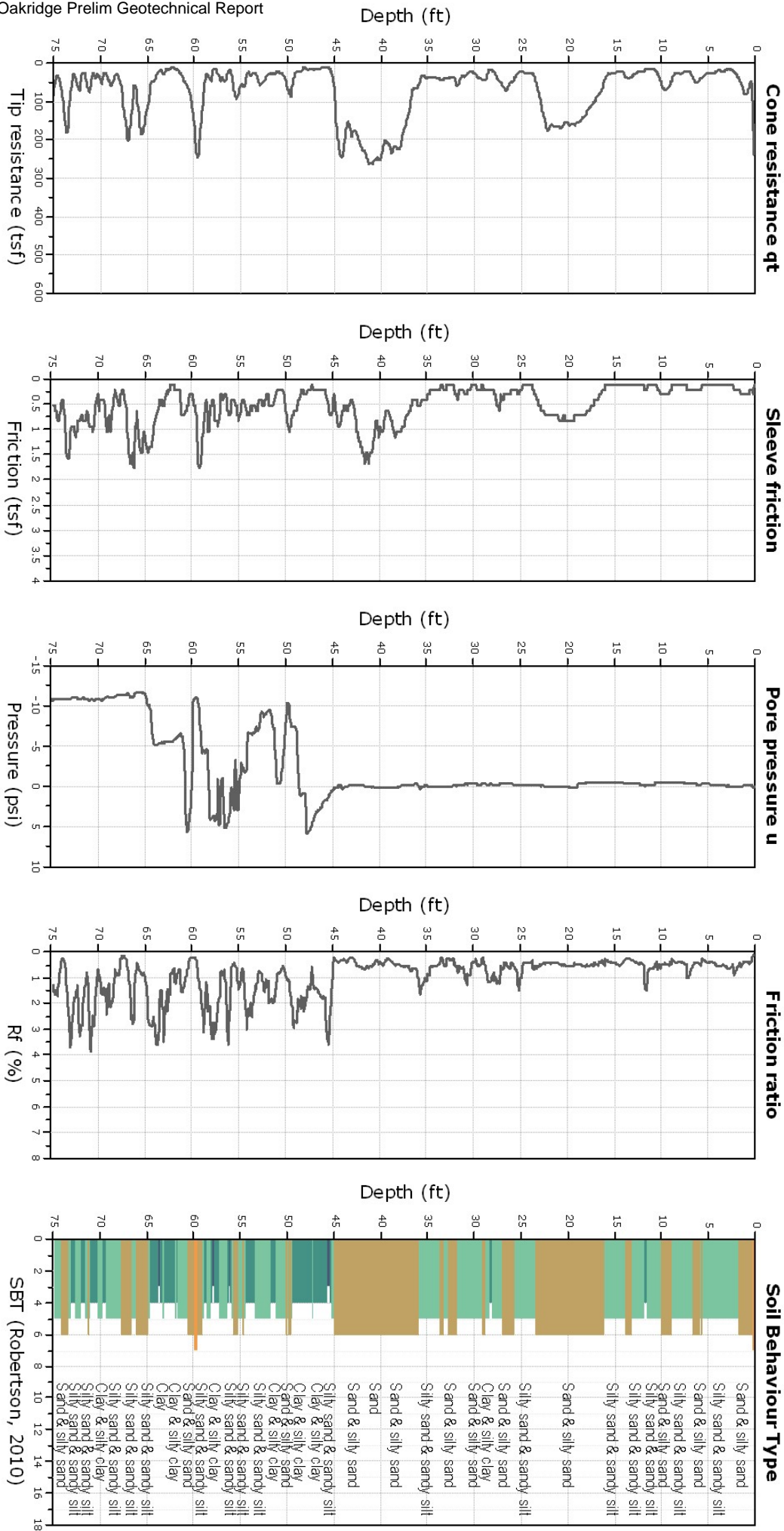




**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.14 ft, Date: 4/27/2017

Cone Type: Vertek

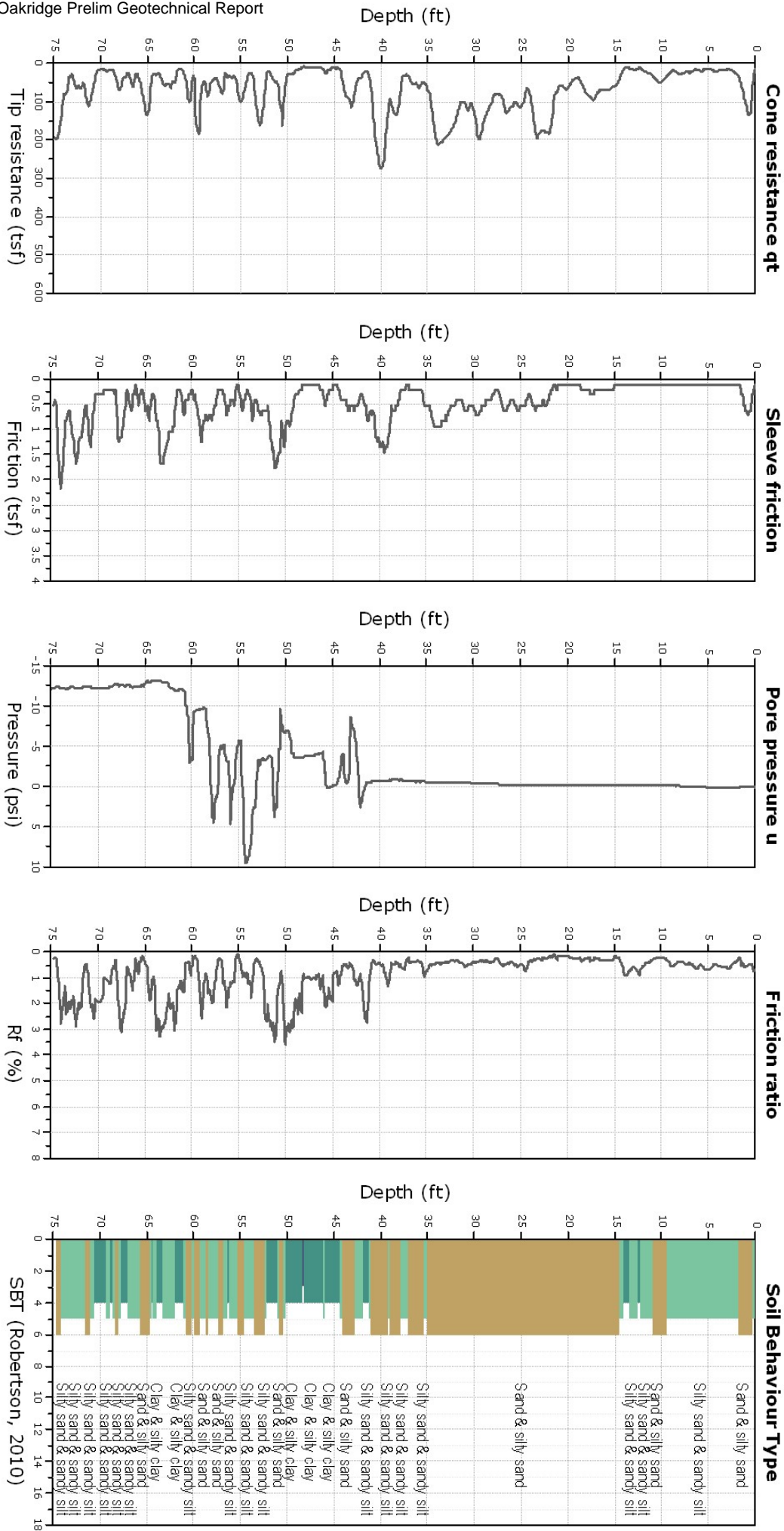




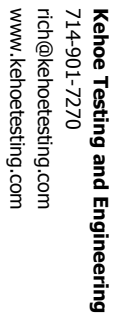
**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.07 ft, Date: 4/27/2017

Cone Type: Vertek



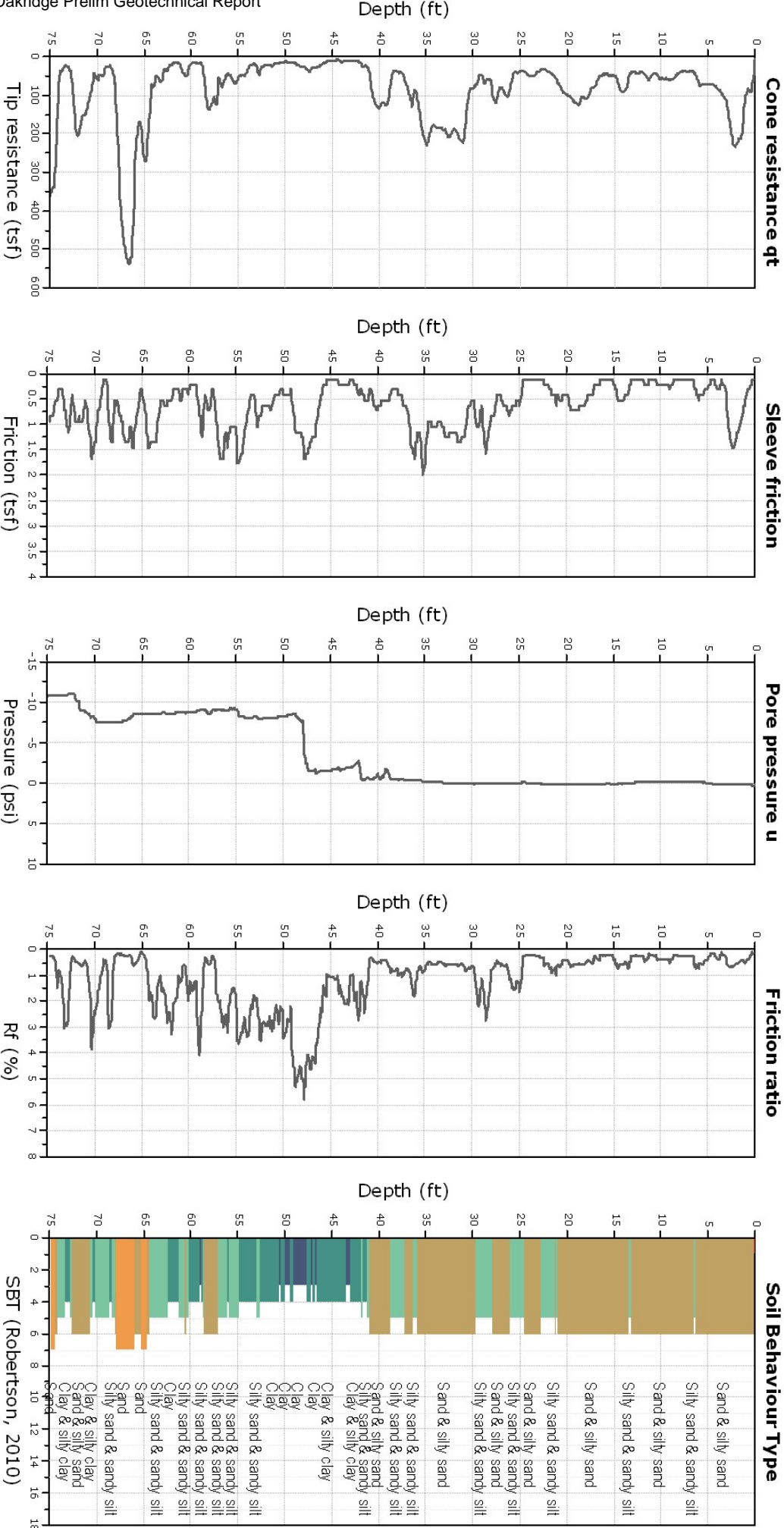




**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.16 ft, Date: 4/27/2017

Cone Type: Vertek

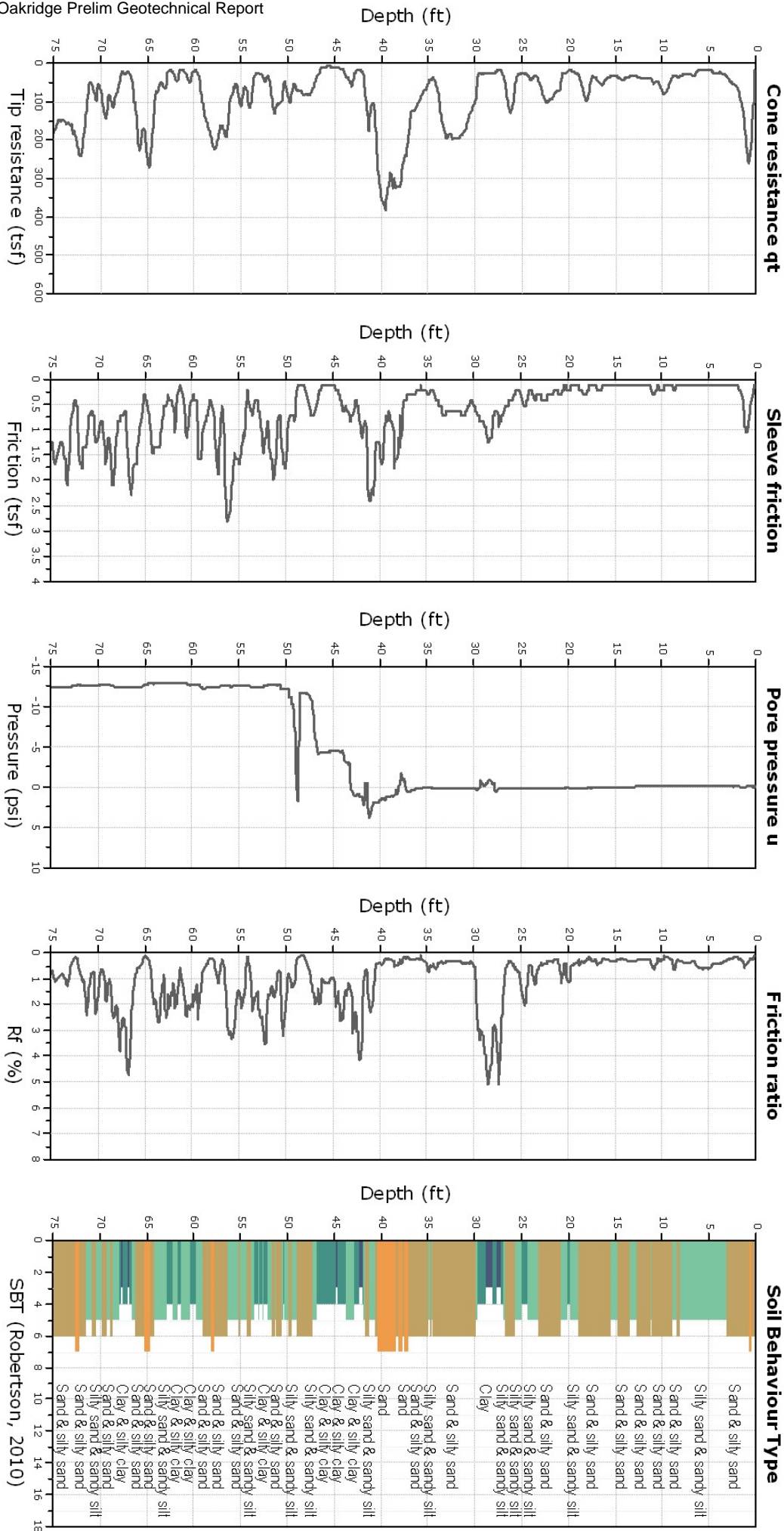




**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

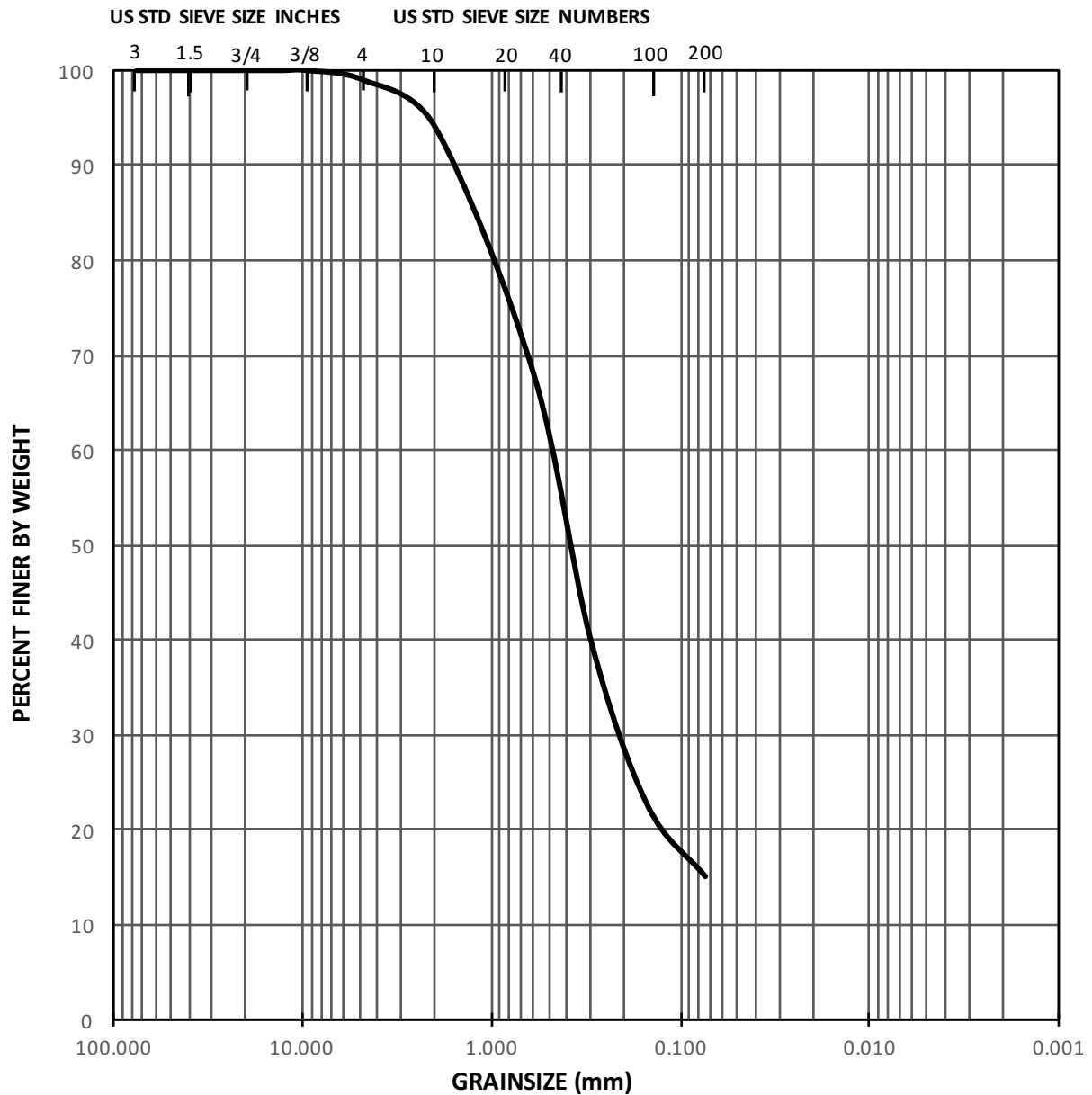
Total depth: 75.27 ft, Date: 4/27/2017

Cone Type: Vertek





## **APPENDIX B**



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

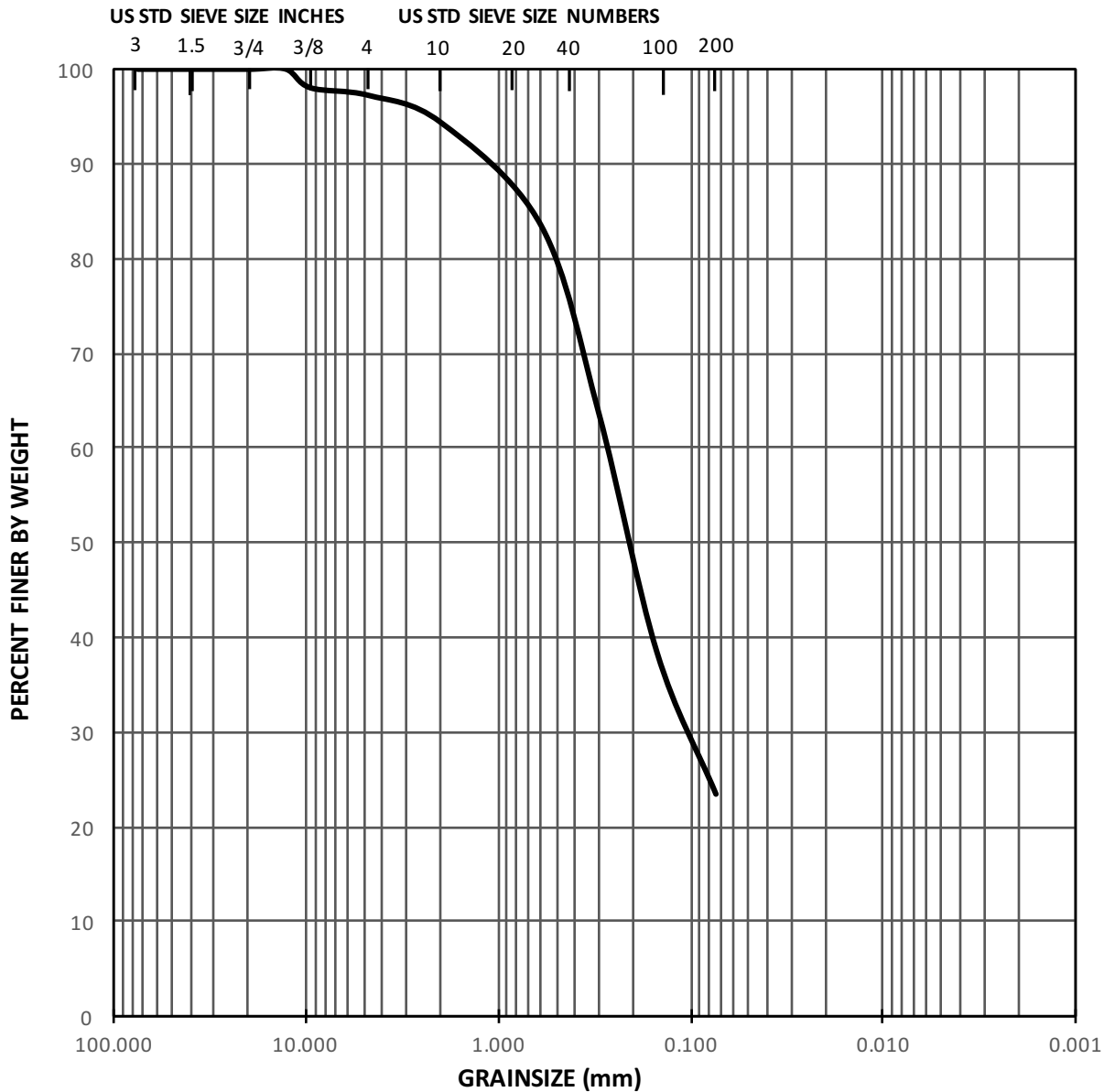
LOCATION      DH-1  
DEPTH        10'

CLASSIFICATION  
 Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)  
 15

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**





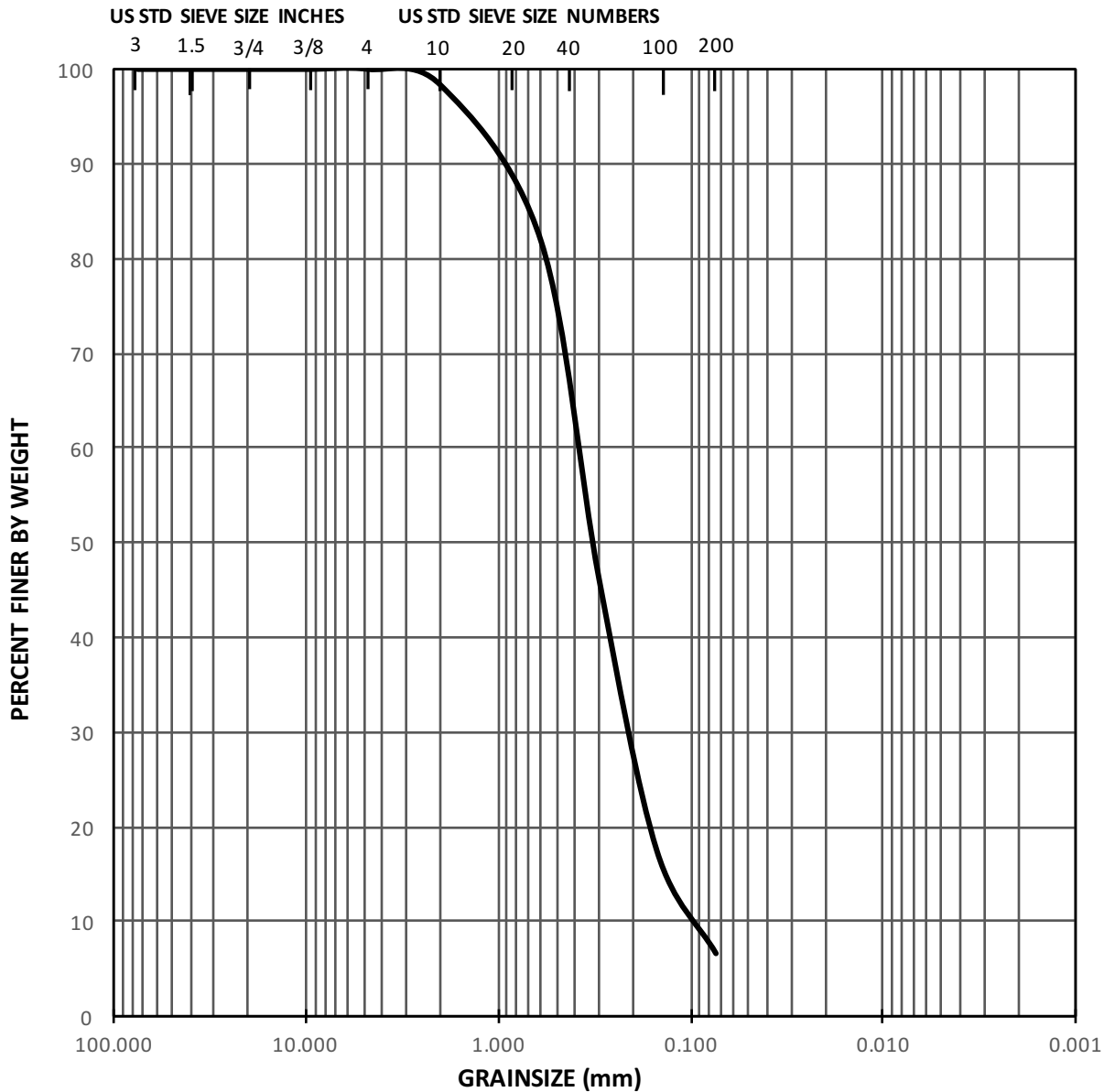
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-1  
 DEPTH 25'

CLASSIFICATION  
 Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)  
 23

GRAINSIZE DISTRIBUTION  
 Moorpark Library  
 Moorpark, California



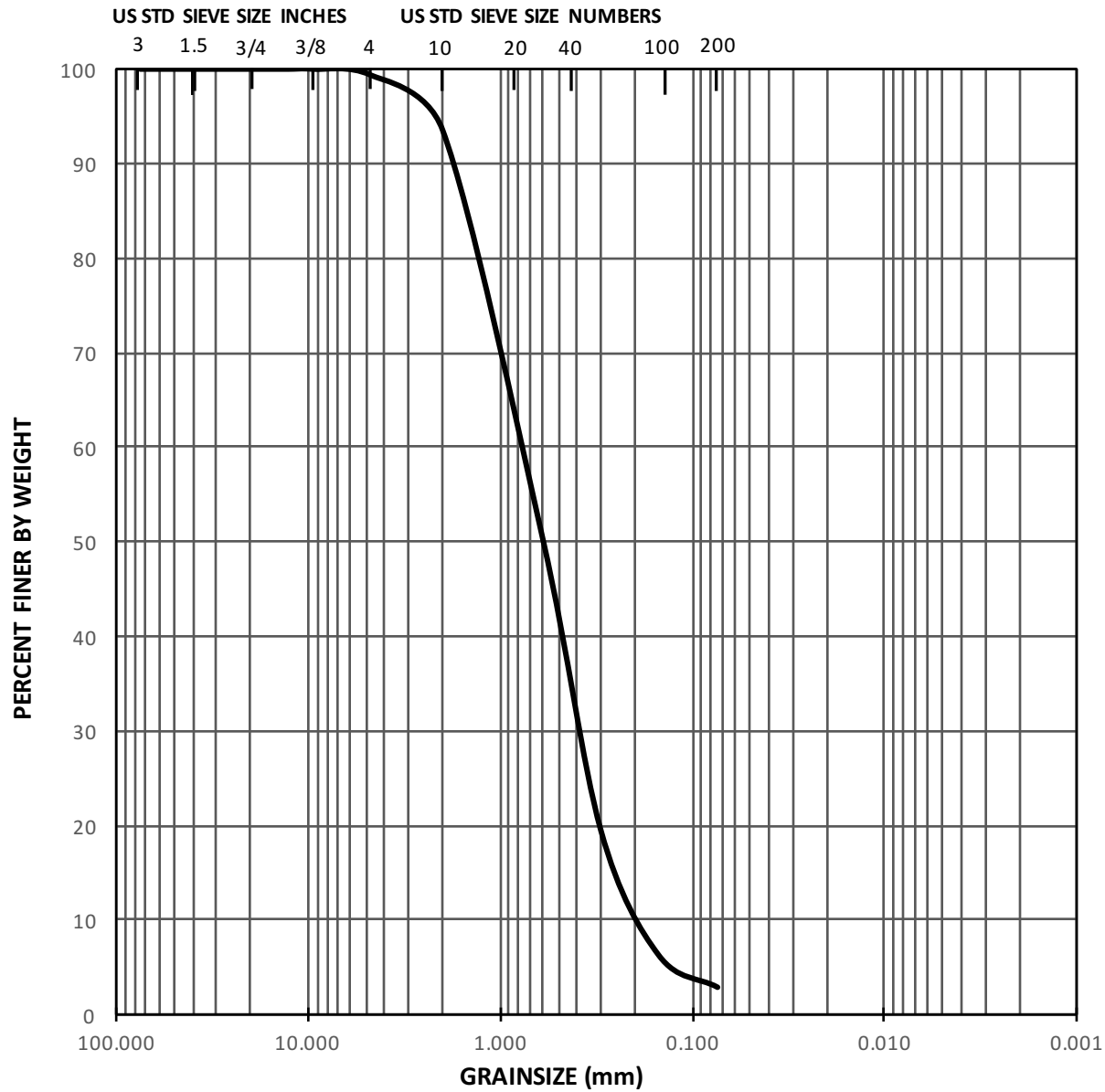
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

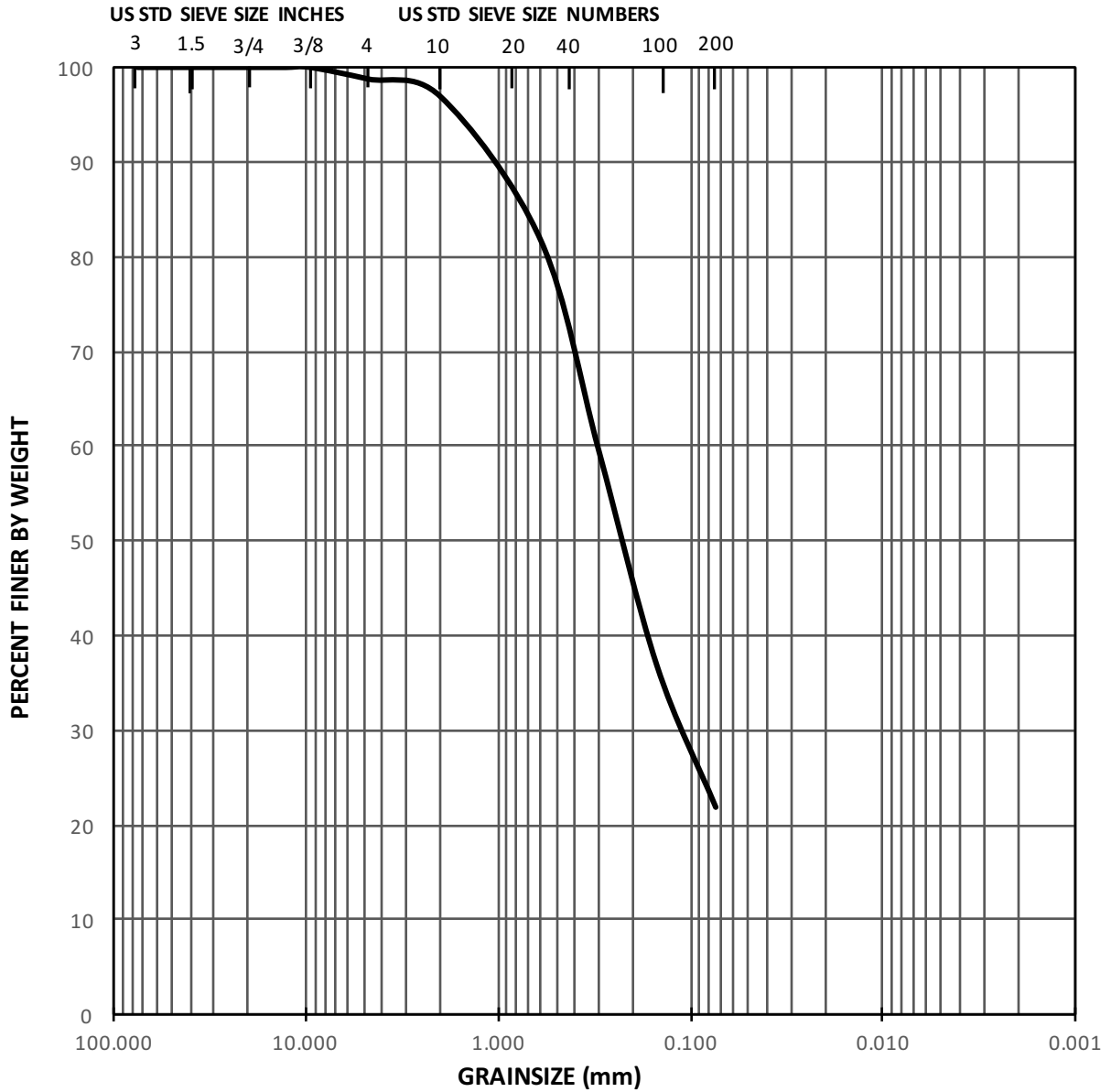
LOCATION DH-1  
 DEPTH 35'

CLASSIFICATION  
 Fine to Medium SAND with Silt (SP-SM)

PASSING NO. 200 (%)  
 7

GRAINSIZE DISTRIBUTION  
 Moorpark Library  
 Moorpark, California





GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION    DH-2  
DEPTH     8'

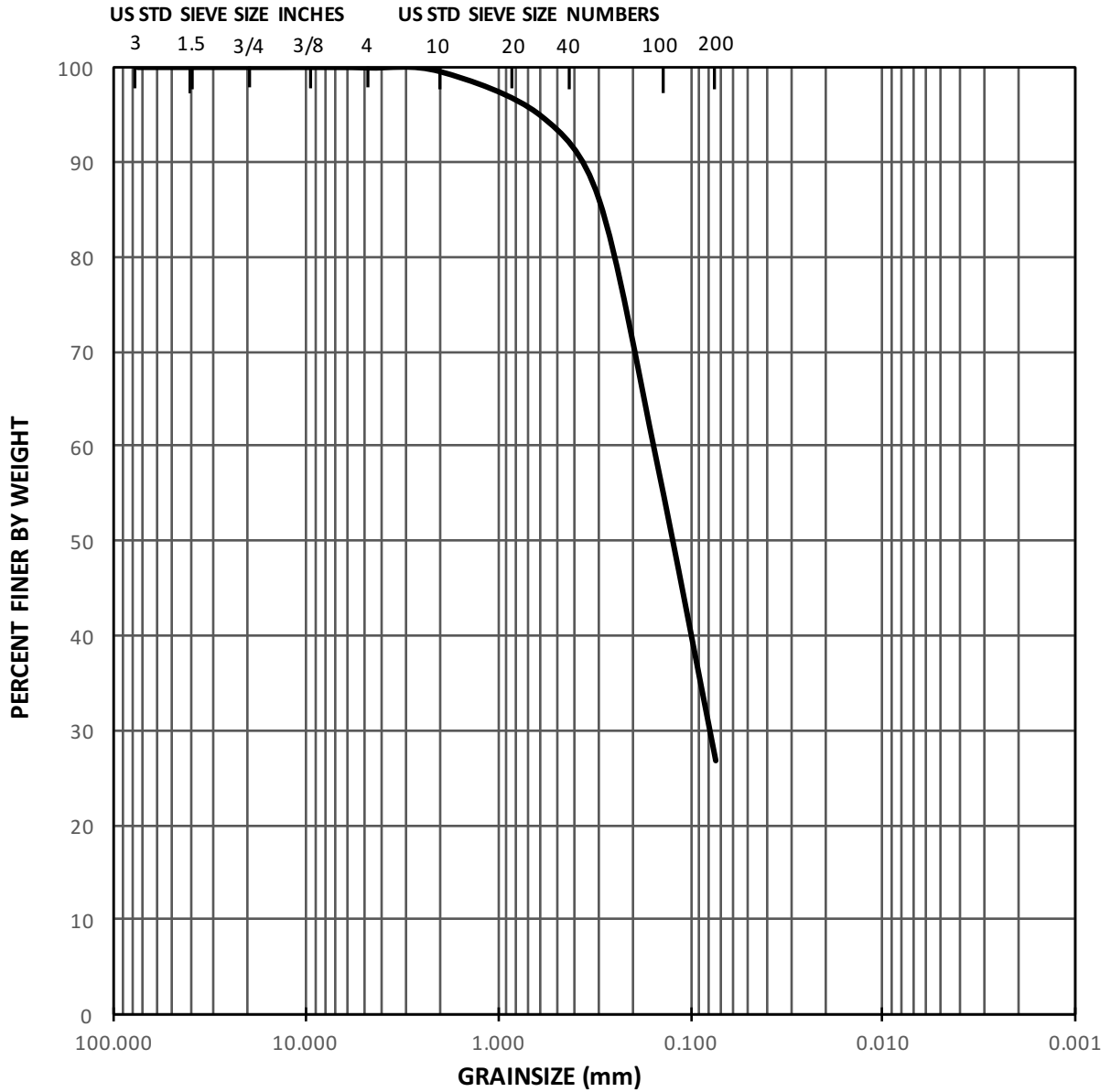
CLASSIFICATION  
Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)  
22

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**







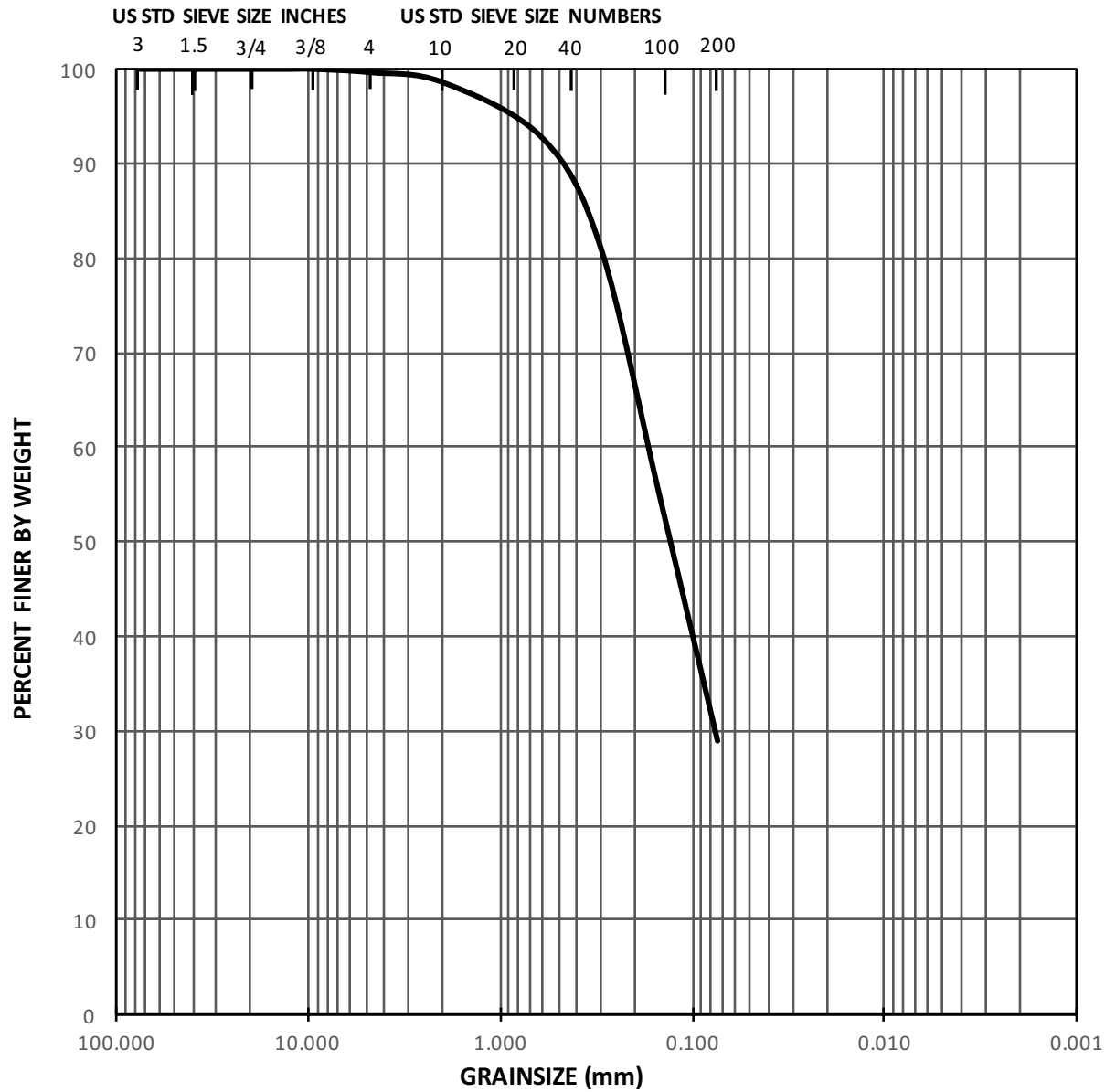
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION    DH-2  
DEPTH    15'

CLASSIFICATION  
Silty Fine SAND (SM)

PASSING NO. 200 (%)  
27

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**



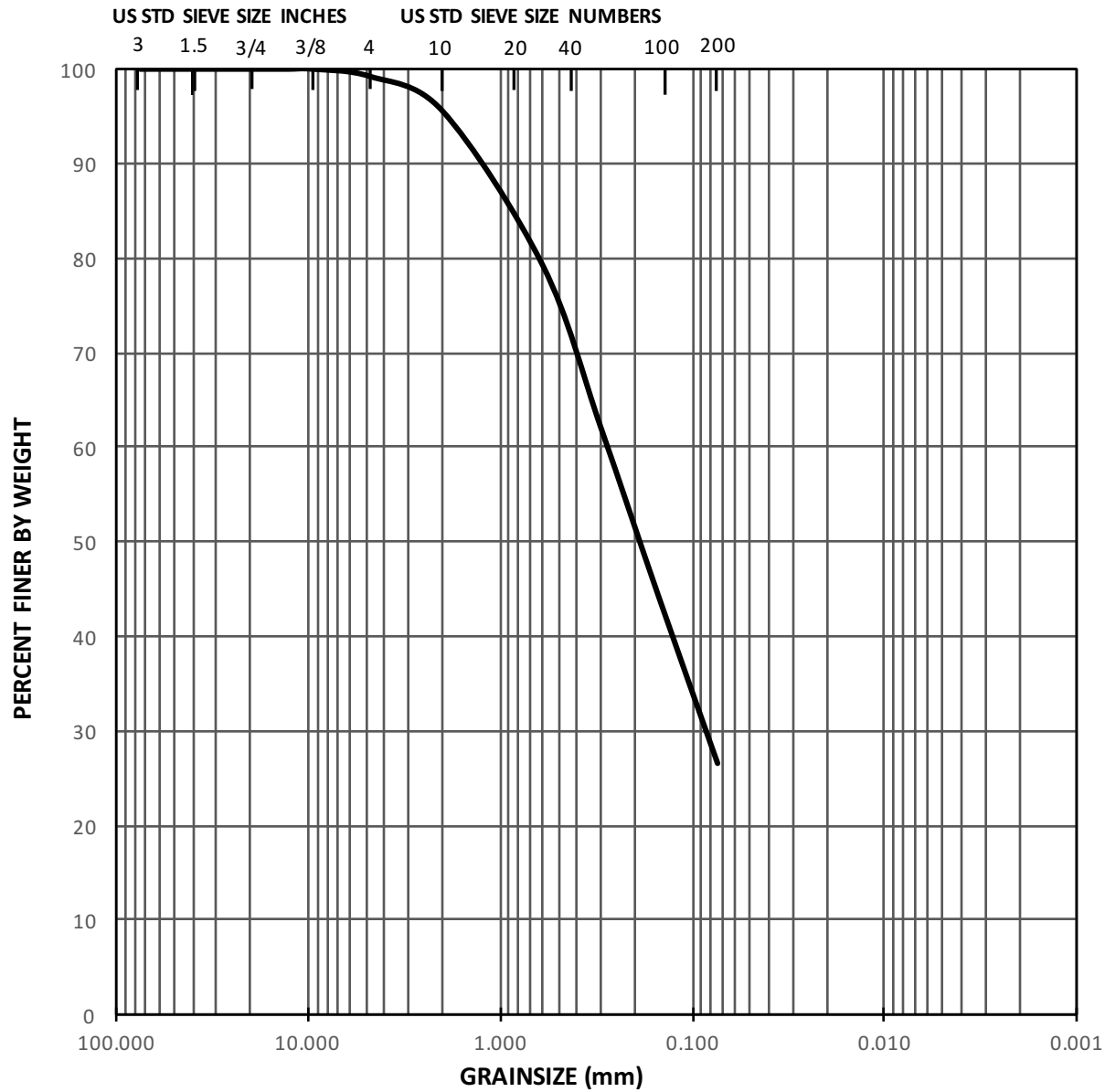
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
DEPTH 25'

CLASSIFICATION  
Silty Fine SAND (SM)

PASSING NO. 200 (%)  
29

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



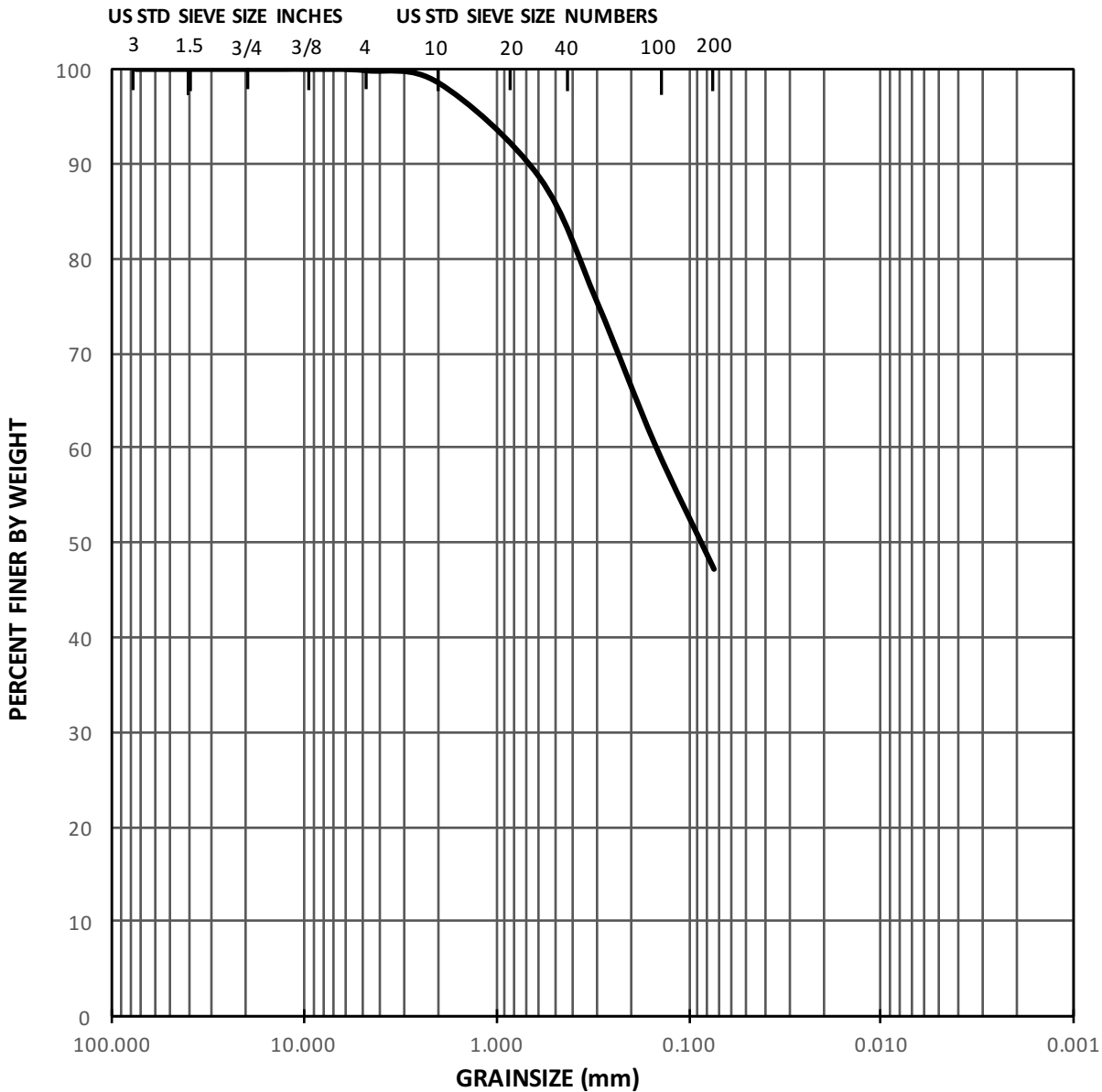
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
DEPTH 34'

CLASSIFICATION  
Clayey Fine to Medium SAND (SC)

PASSING NO. 200 (%)  
27

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
 DEPTH 42'

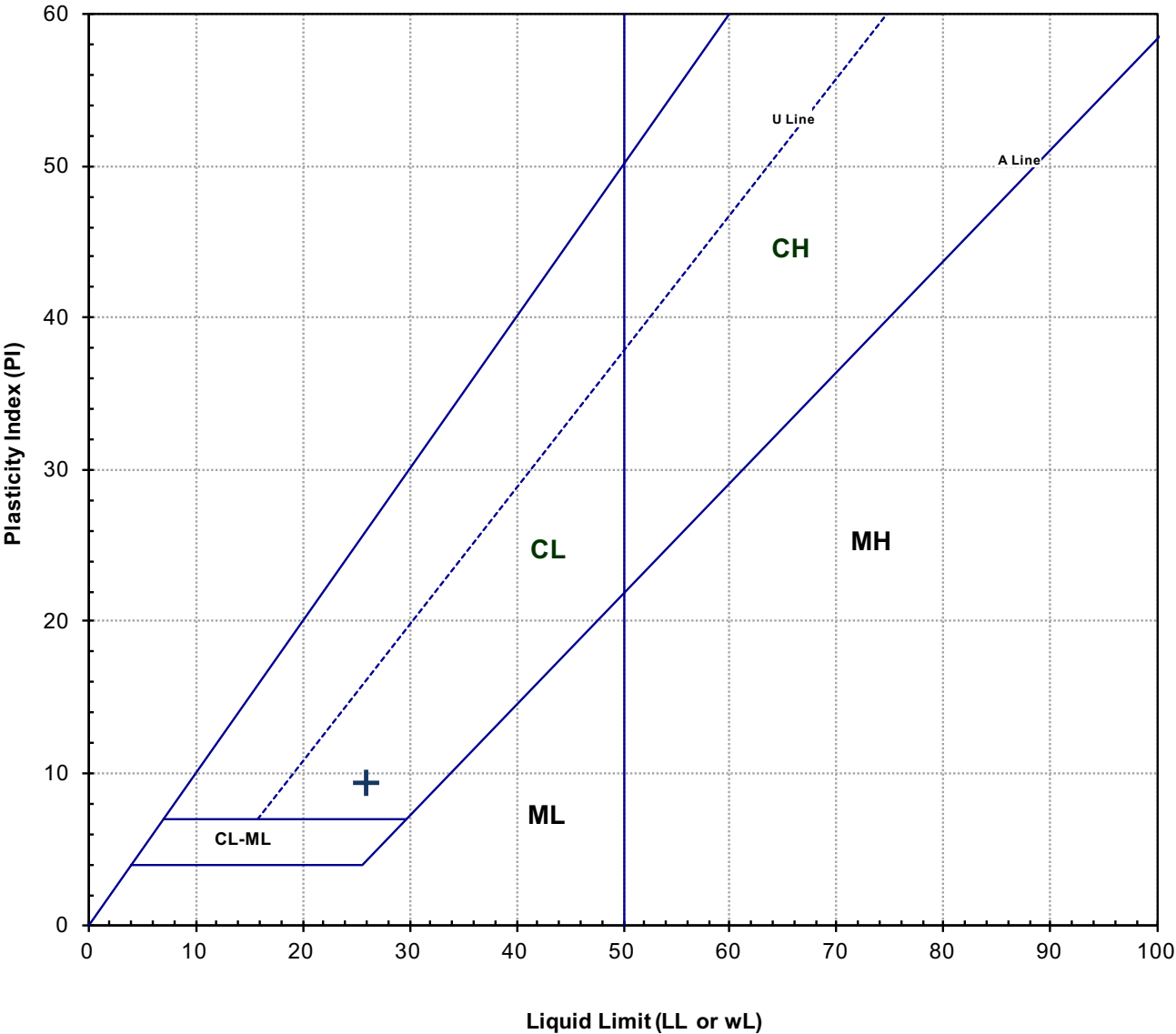
CLASSIFICATION  
 Sandy Silty CLAY (CL-ML)

PASSING NO. 200 (%)  
 47

GRAINSIZE DISTRIBUTION  
 Moorpark Library  
 Moorpark, California

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.



<u>LOCATION</u>	DH-1
<u>DEPTH</u>	67'

CLASSIFICATION

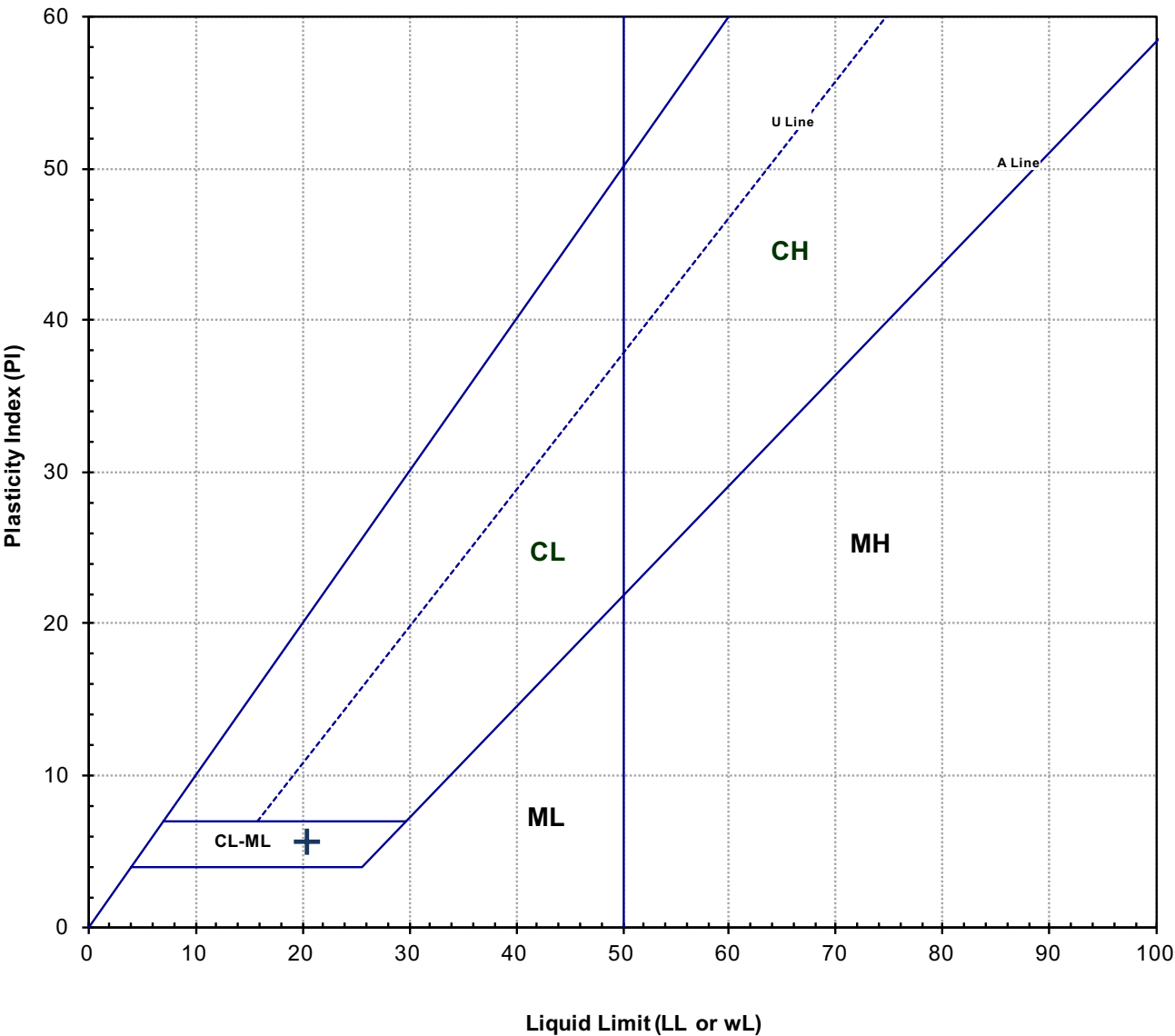
Clayey SAND (SC)

LIQUID	PLASTIC	PLASTICITY
LIMIT	LIMIT	INDEX
<u>(LL)</u>	<u>(PL)</u>	<u>(PI)</u>
26	17	9

MOORPARK LIBRARY  
Moorpark, California

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

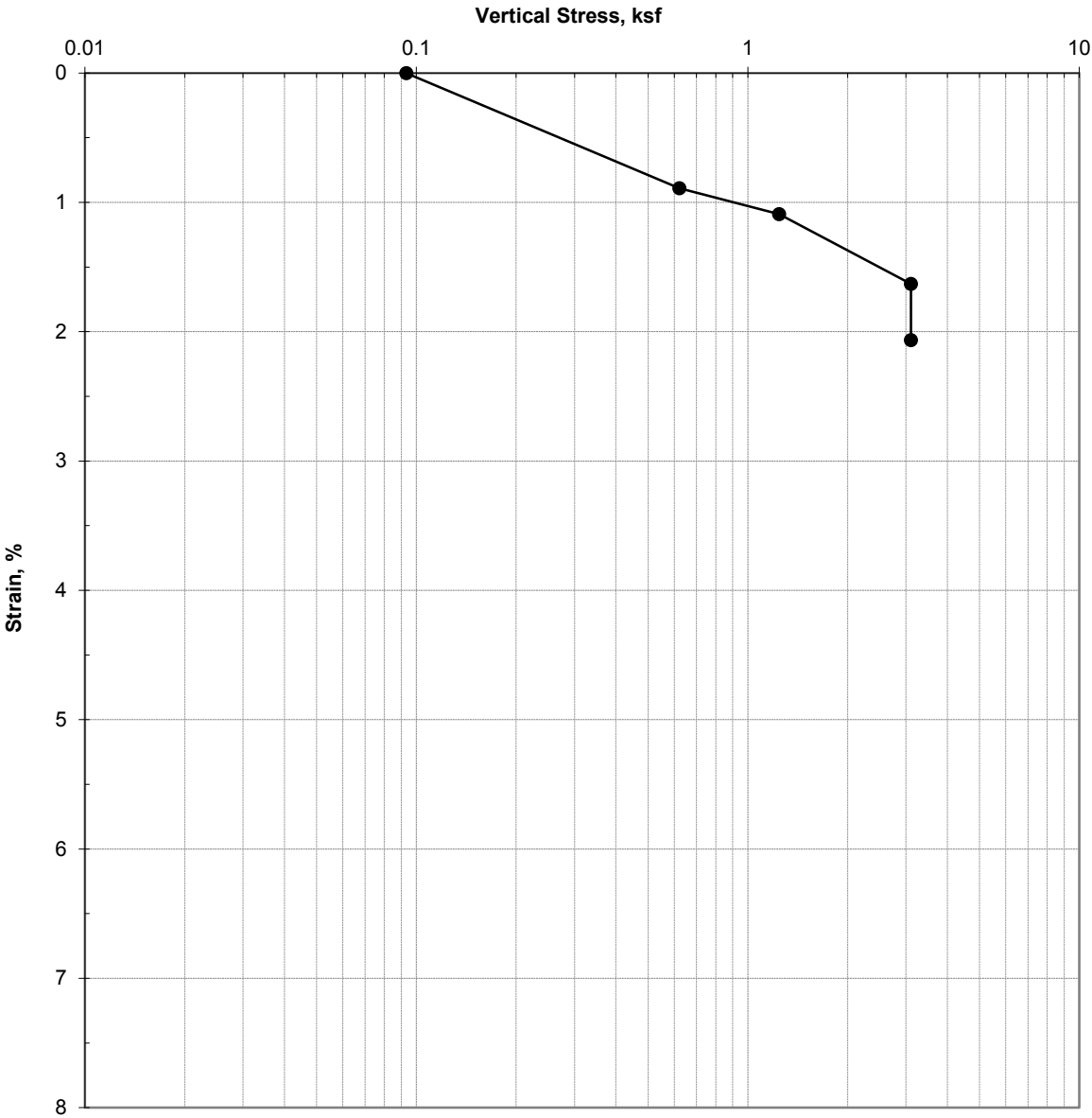


<u>LOCATION</u>	DH-2
<u>DEPTH</u>	40'

CLASSIFICATION  
Sandy Silty CLAY (CL-ML)

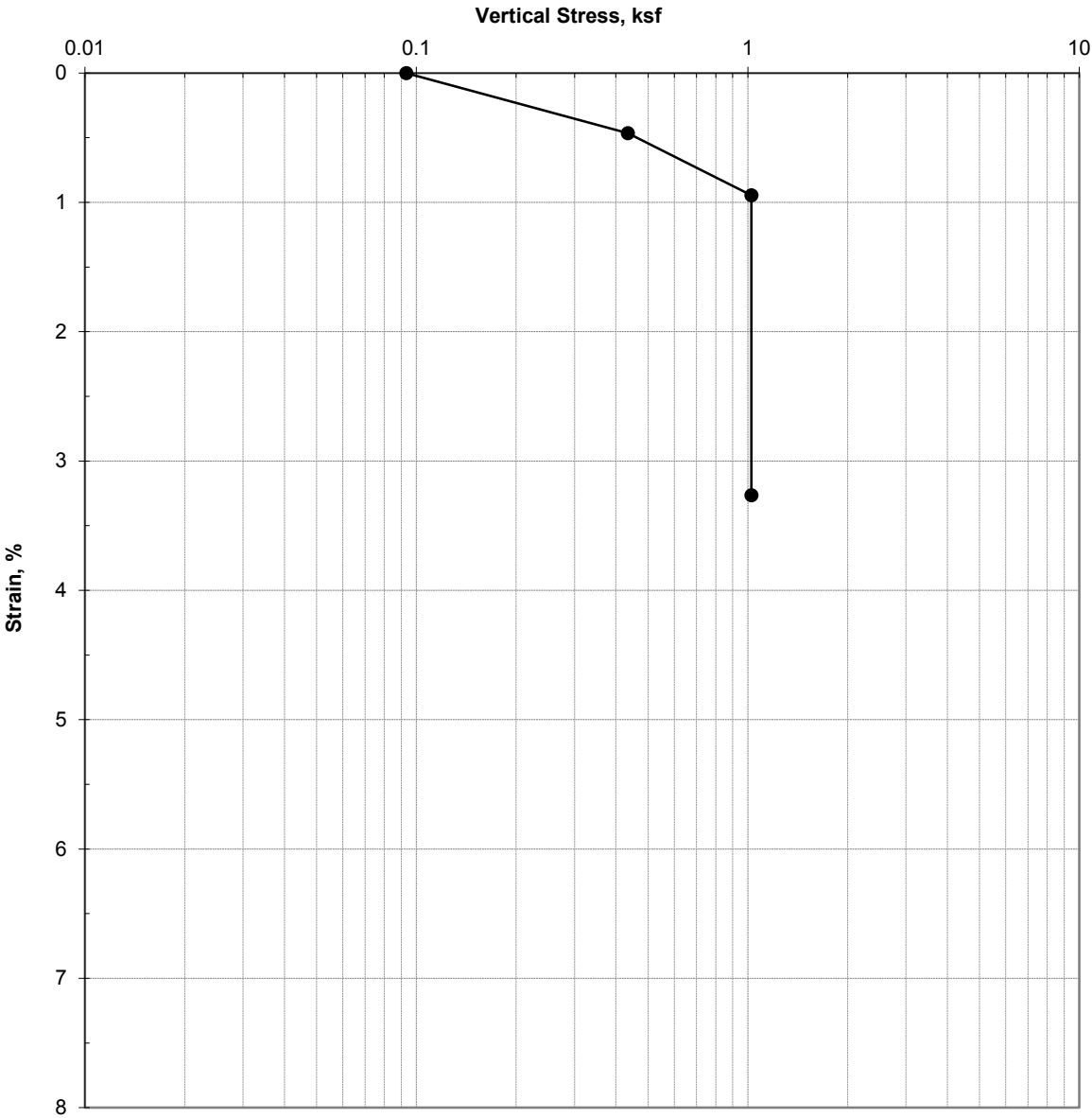
LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
21	15	6

MOORPARK LIBRARY  
Moorpark, California



SAMPLE ID	Boring, Sample #, Depth	DH-1 , #10 , 30.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND (SP): yellow, dry			Inundation Increment, ksf	3.11
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	2.5%	18.6%		Plastic Limit	---
	Dry Unit Weight, pcf	102.0	104.1		Plasticity Index	---
	Saturation, %	11%	84%		Passing #200	---
	Void Ratio	0.62	0.59		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library  After adding water the specimen collapsed 0.43% at a stress of 3.11ksf.	
	Height, in	1.00	0.98			

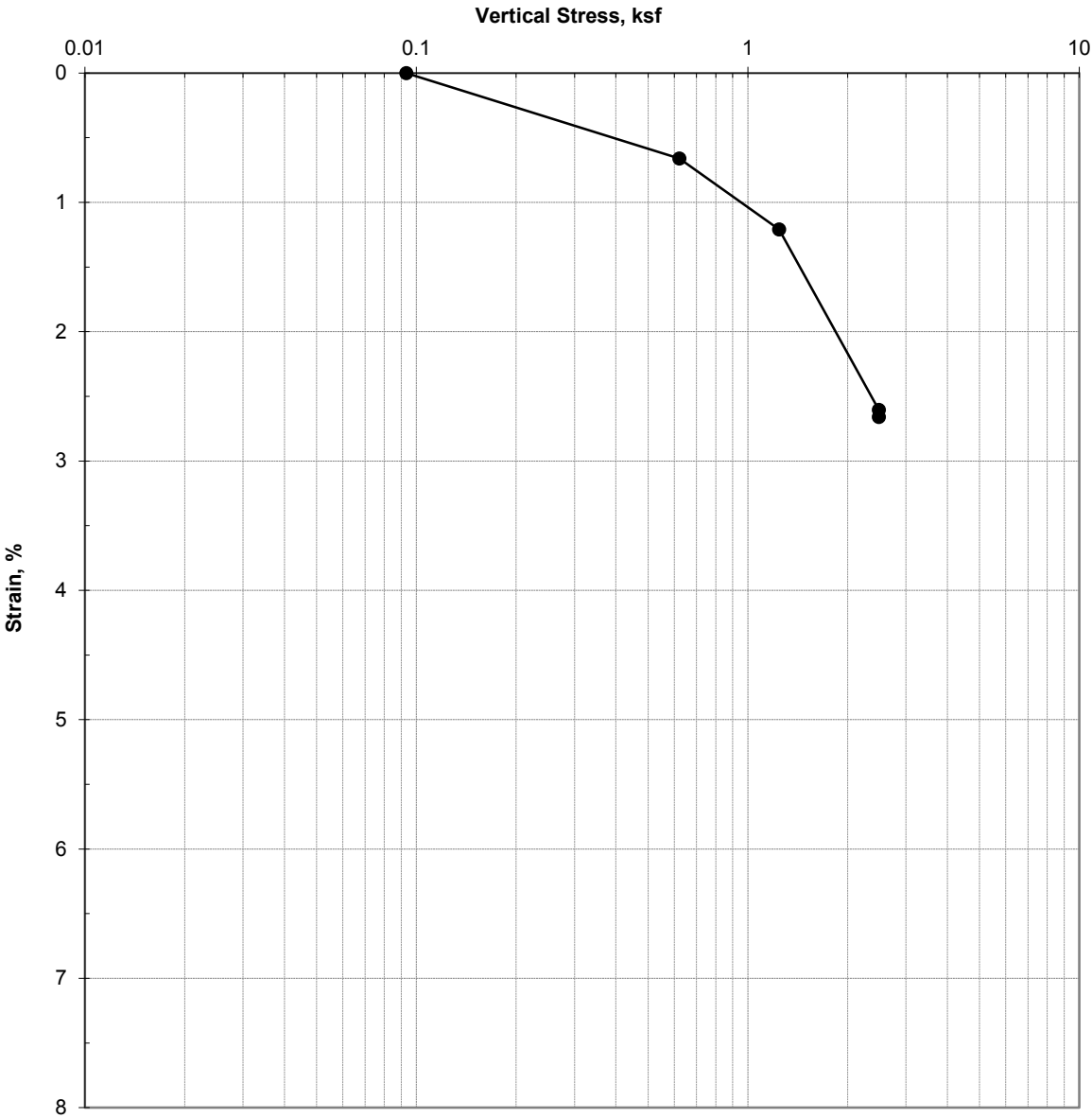
ONE DIMENSIONAL COLLAPSE TEST



SAMPLE ID	Boring, Sample #, Depth	DH-2 , #5 , 10.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND with silt (SP-SM): light brown, dry, lightly cemented			Inundation Increment, ksf	1.03
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	3.5%	21.0%		Plastic Limit	---
	Dry Unit Weight, pcf	96.9	100.1		Plasticity Index	---
	Saturation, %	13%	85%		Passing #200	---
	Void Ratio	0.71	0.65		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library After adding water the specimen collapsed 2.32% at a stress of 1.03ksf.	
	Height, in	1.00	0.97			

ONE DIMENSIONAL COLLAPSE TEST





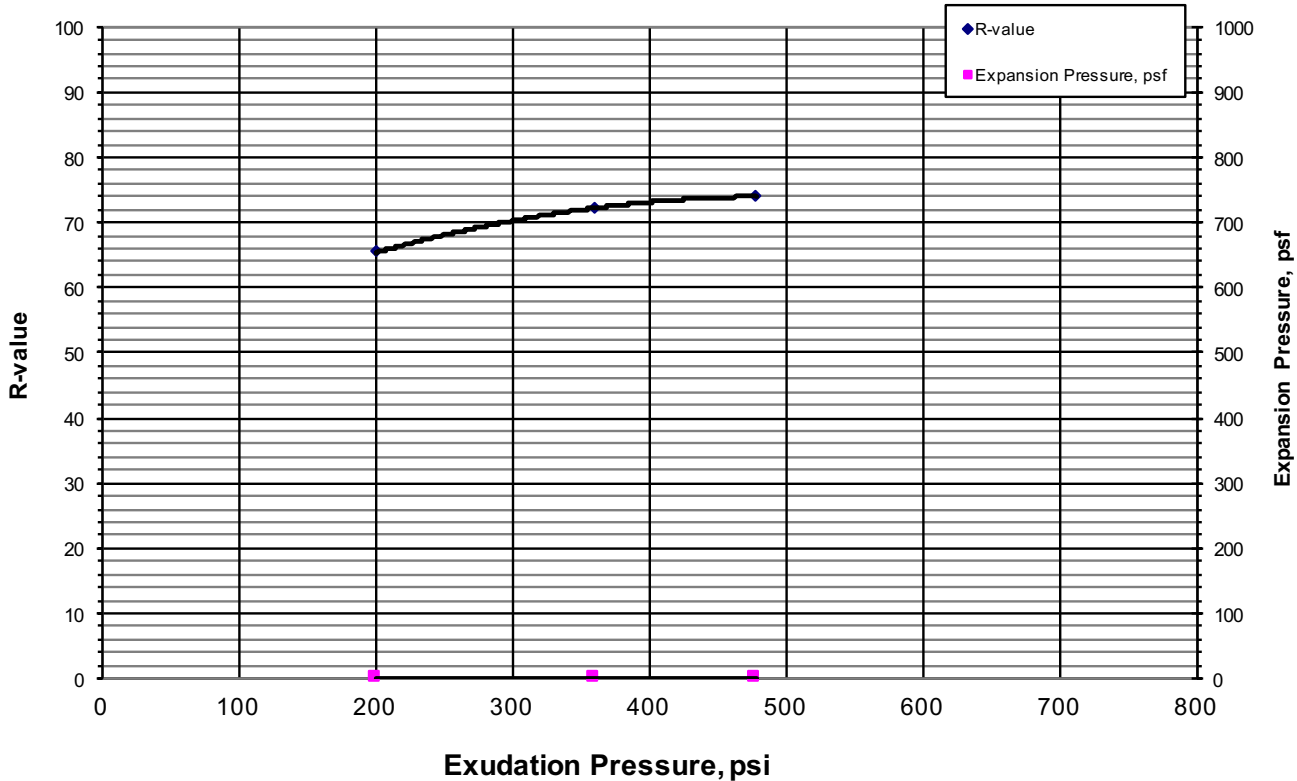
SAMPLE ID	Boring, Sample #, Depth	DH-2, #9, 25.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND (SP): yellow brown, moist, fine			Inundation Increment, ksf	2.49
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	5.6%	24.6%		Plastic Limit	---
	Dry Unit Weight, pcf	89.9	92.4		Plasticity Index	---
	Saturation, %	18%	82%		Passing #200	---
	Void Ratio	0.84	0.79		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library After adding water the specimen collapsed 0.05% at a stress of 2.49ksf.	
	Height, in	1.00	0.97			

ONE DIMENSIONAL COLLAPSE TEST



# R-value Test Report (Caltrans 301)

Job No.:	903-017	Date:	05/22/17	Initial Moisture,	6.6
Client:	Oakridge Geoscience	Tested	PJ	R-value	70
Project:	Moorpark Library - 030.003	Reduced	RU	Expansion Pressure	0 psf
Sample	DH-1 @ 0-5'	Checked	DC	Remarks:	
Soil Type:	Brown SAND w/ Silt				
Specimen Number	A	B	C	D	
Exudation Pressure, psi	200	360	478		
Prepared Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	60	50	45		
Weight of Soil & Mold, grams	3137	3143	3132		
Weight of Mold, grams	2083	2090	2089		
Height After Compaction, in.	2.50	2.50	2.42		
Moisture Content, %	11.9	11.0	10.6		
Dry Density, pcf	114.2	115.0	118.2		
Expansion Pressure, psf	0	0	0		
Stabilometer @ 1000					
Stabilometer @ 2000	34	26	22		
Turns Displacement	4.90	4.95	5.15		
R-value	65	72	74		



CTL # 903-017  
Client: Oakridge Geoscience

Date: \_\_\_\_\_ Tested By: PJ  
Project: Moorpark Library

Checked: PJ  
Proj. No: 030.003

[illegible]

## **APPENDIX C**



## LIQUEFACTION ANALYSIS REPORT

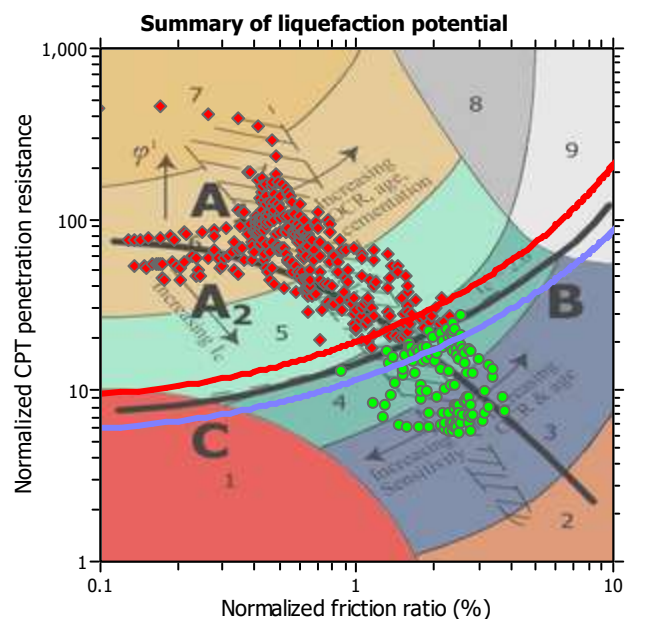
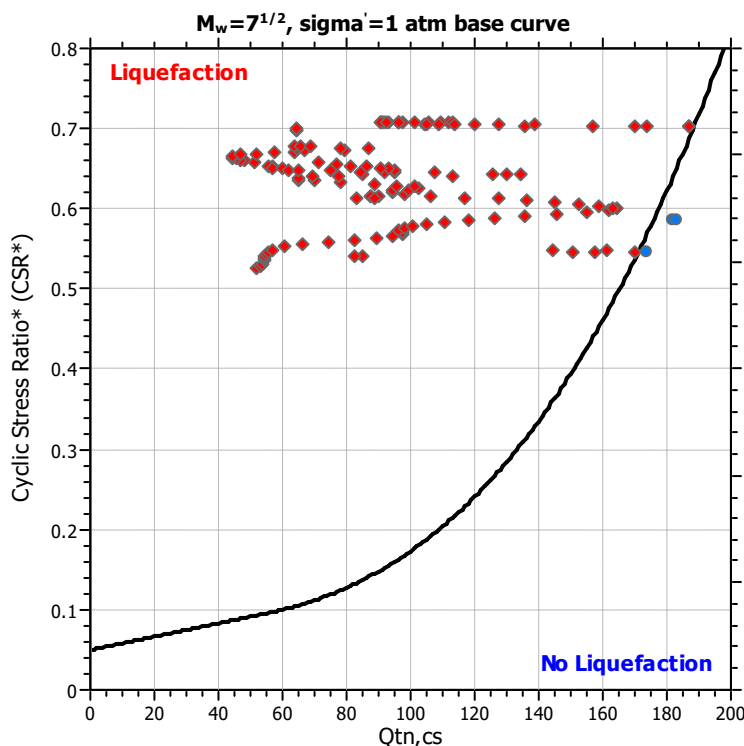
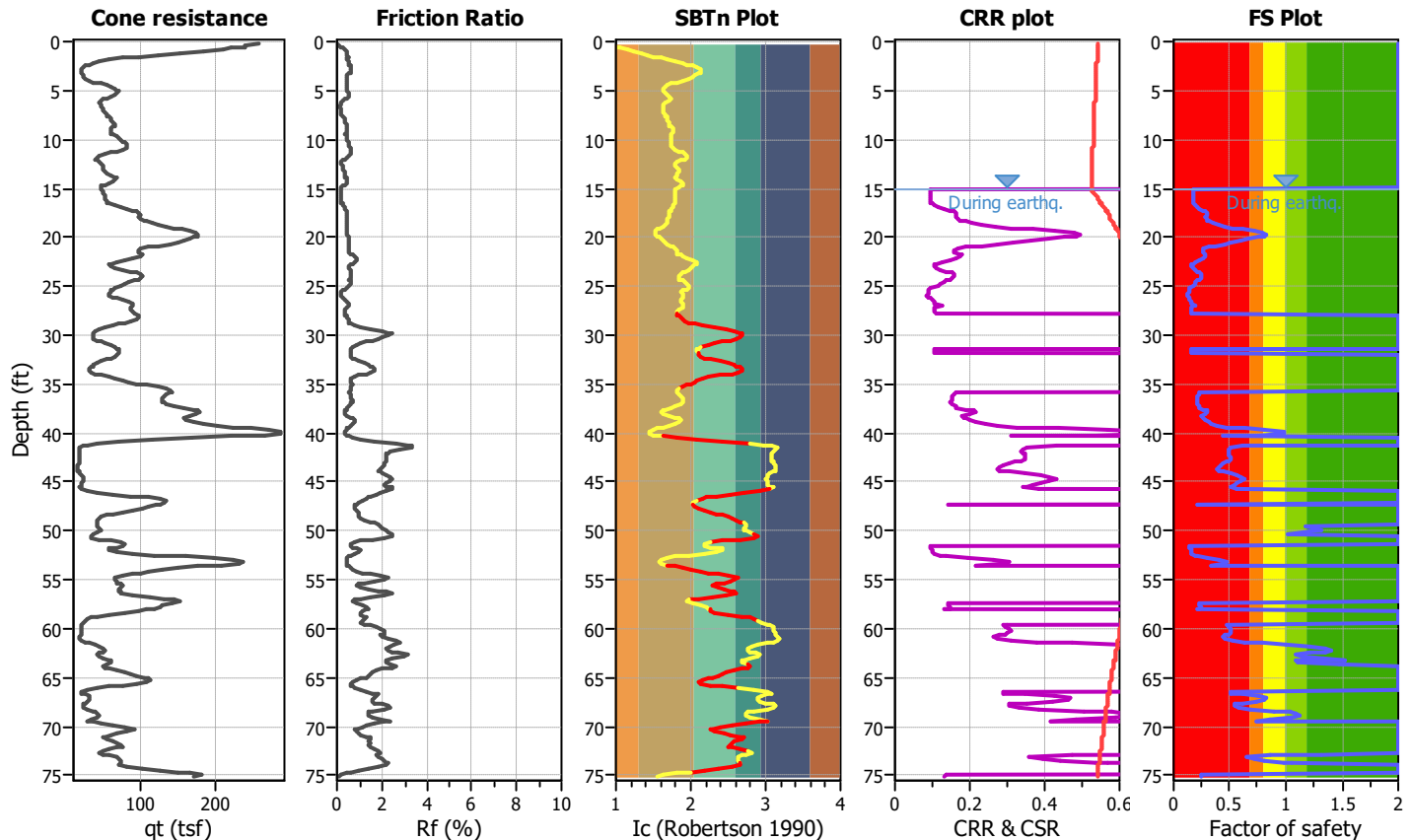
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-1**

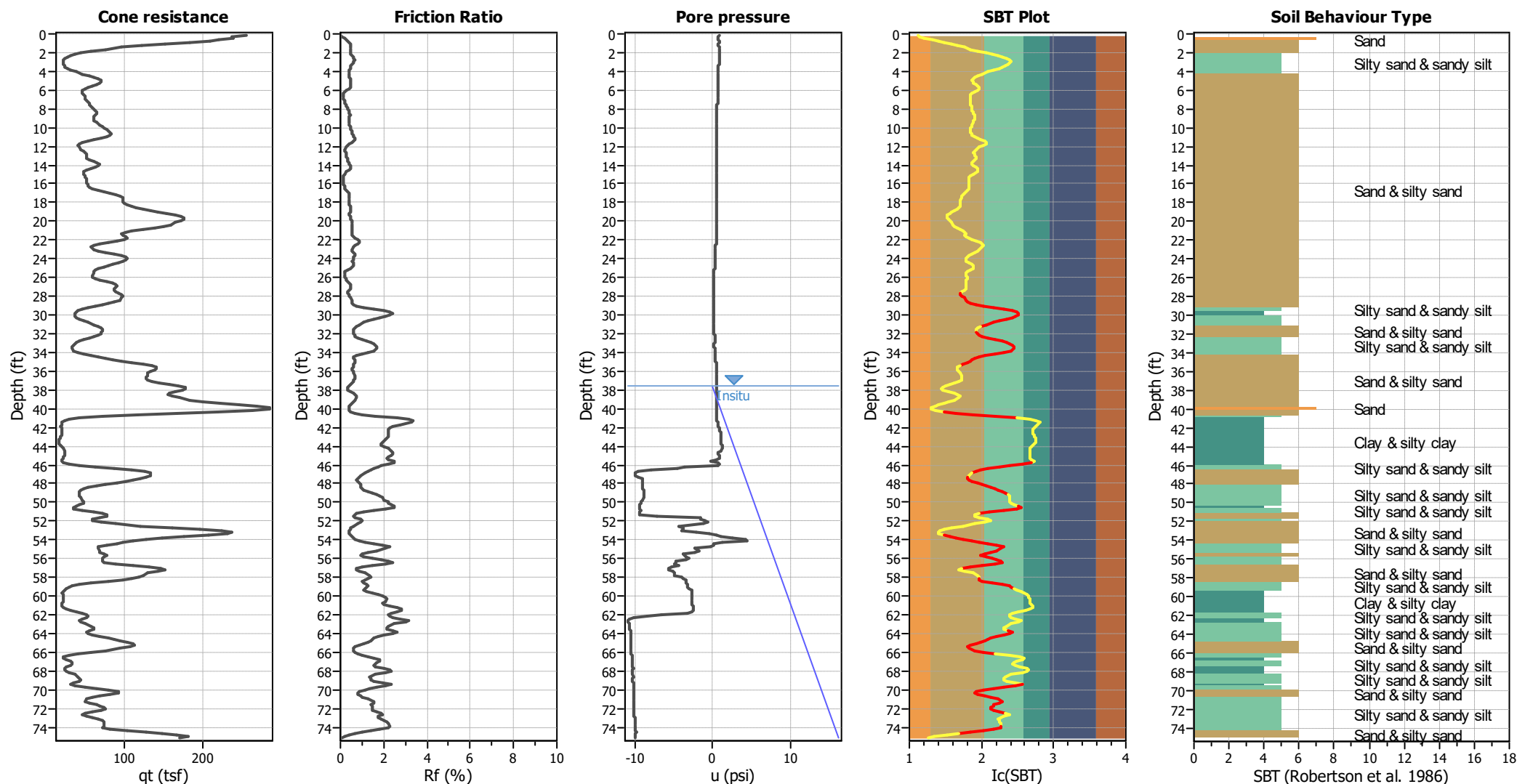
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No		



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



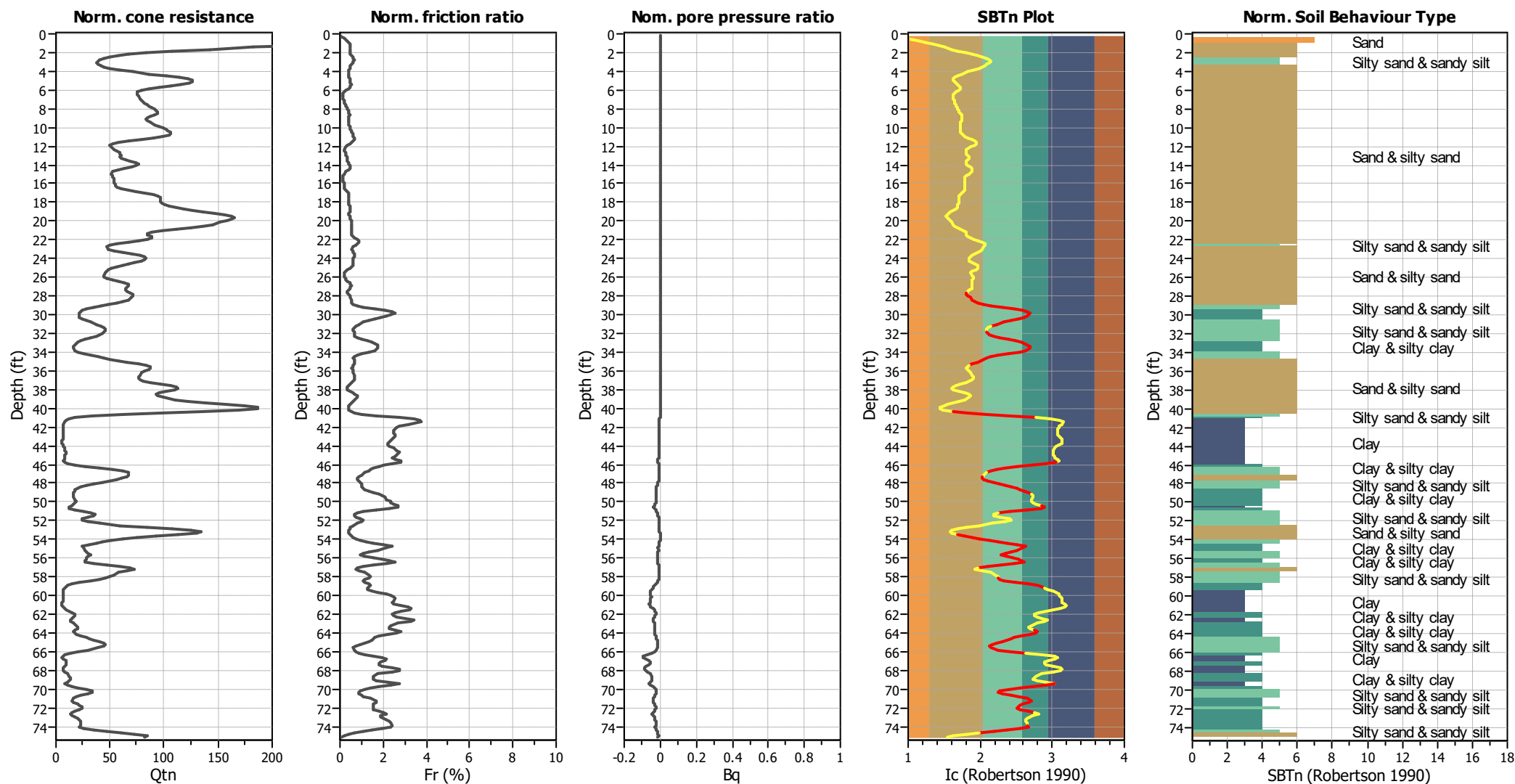
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

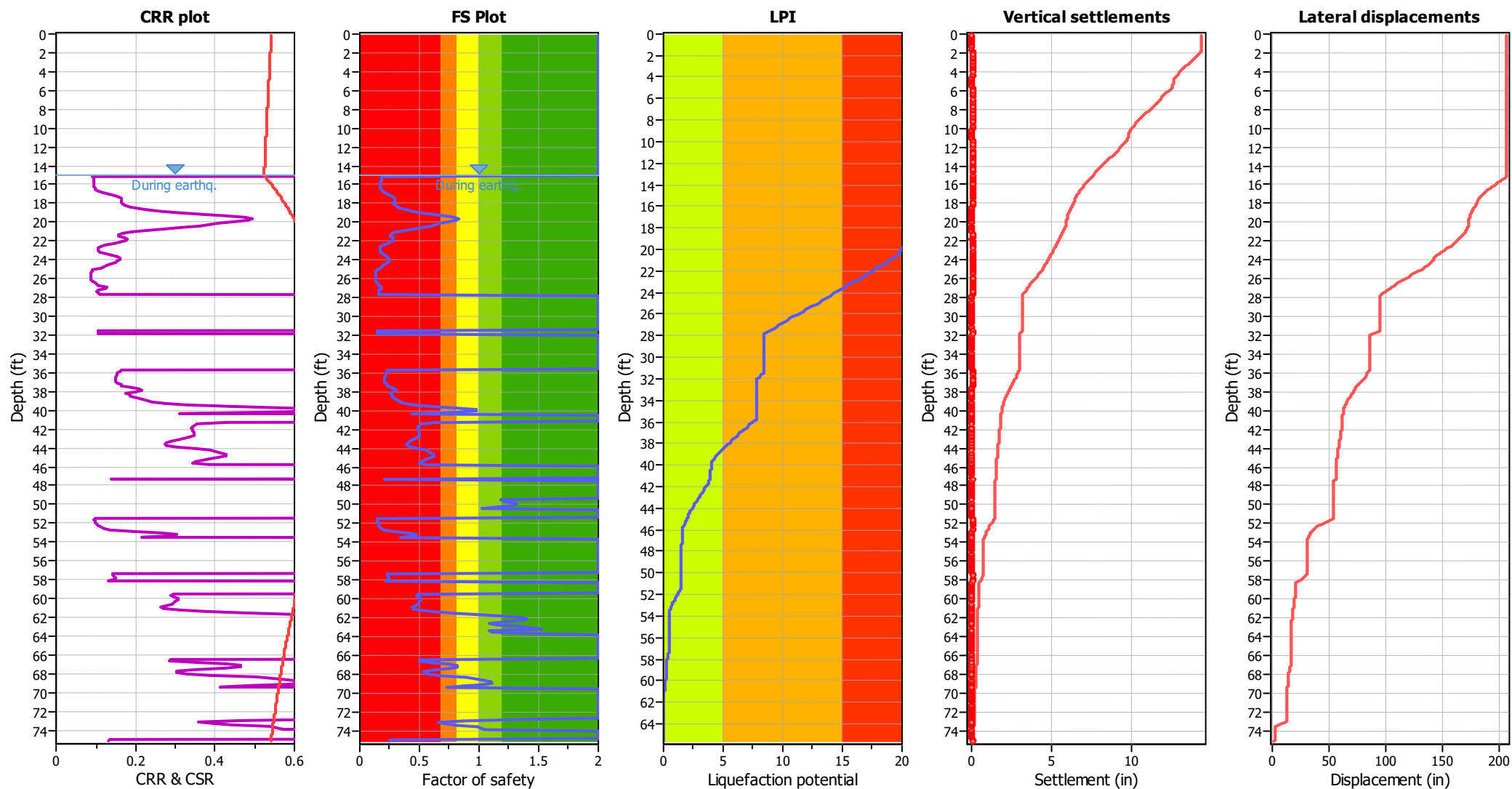
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_a$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



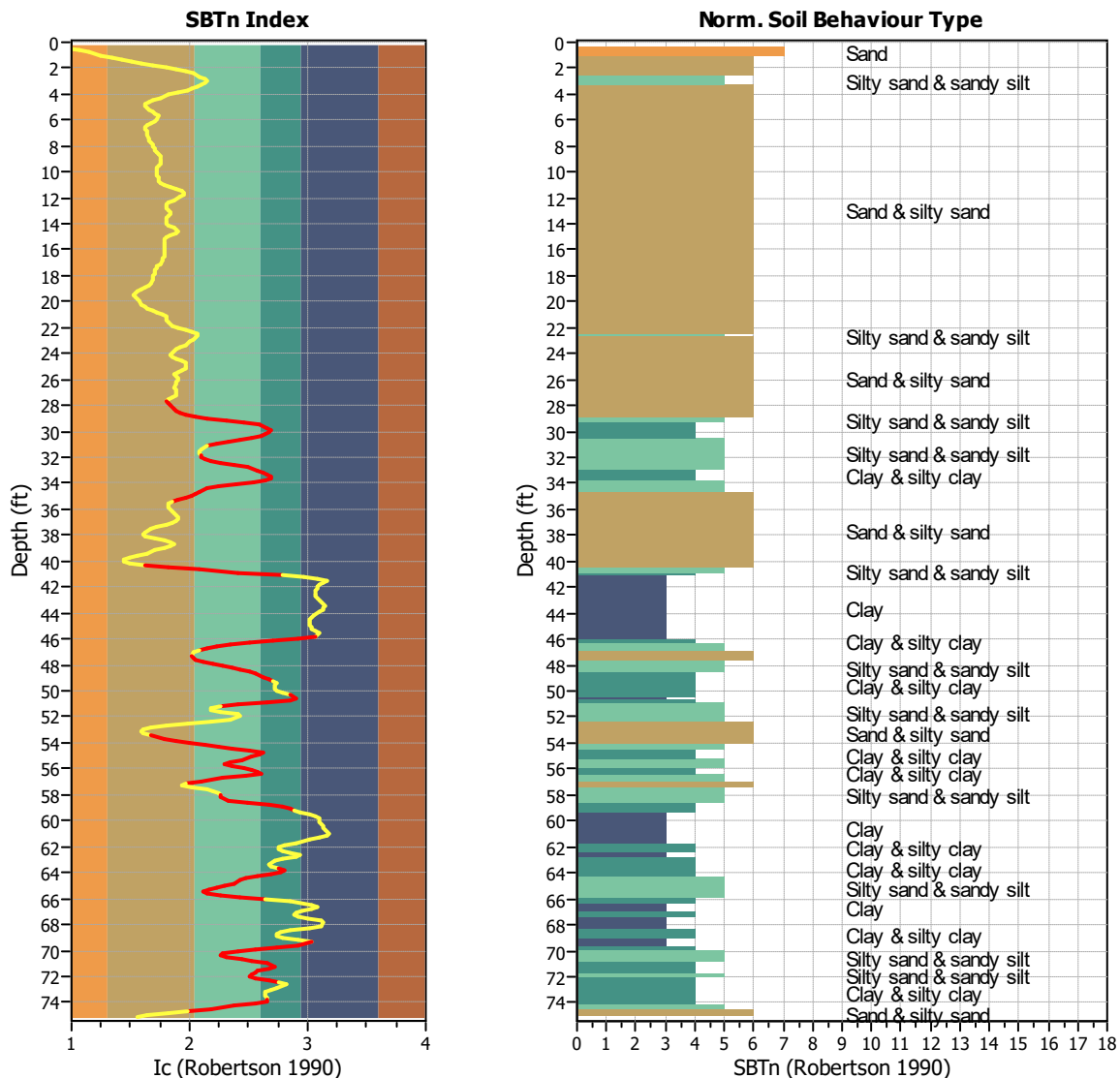
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



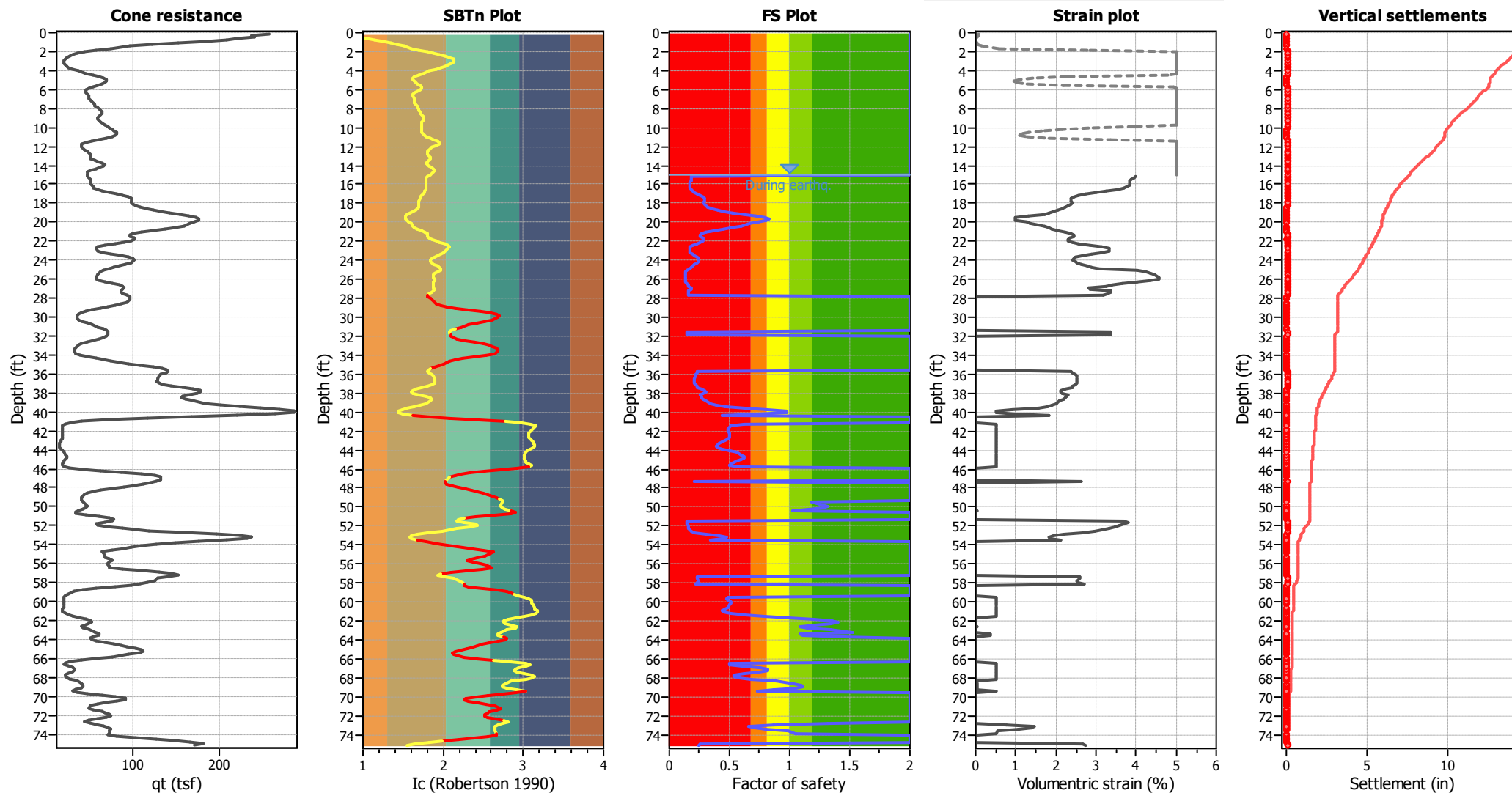
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 156  
 Exclusion percentage: 34.06%  
 Number of layers detected: 20

## Estimation of post-earthquake settlements

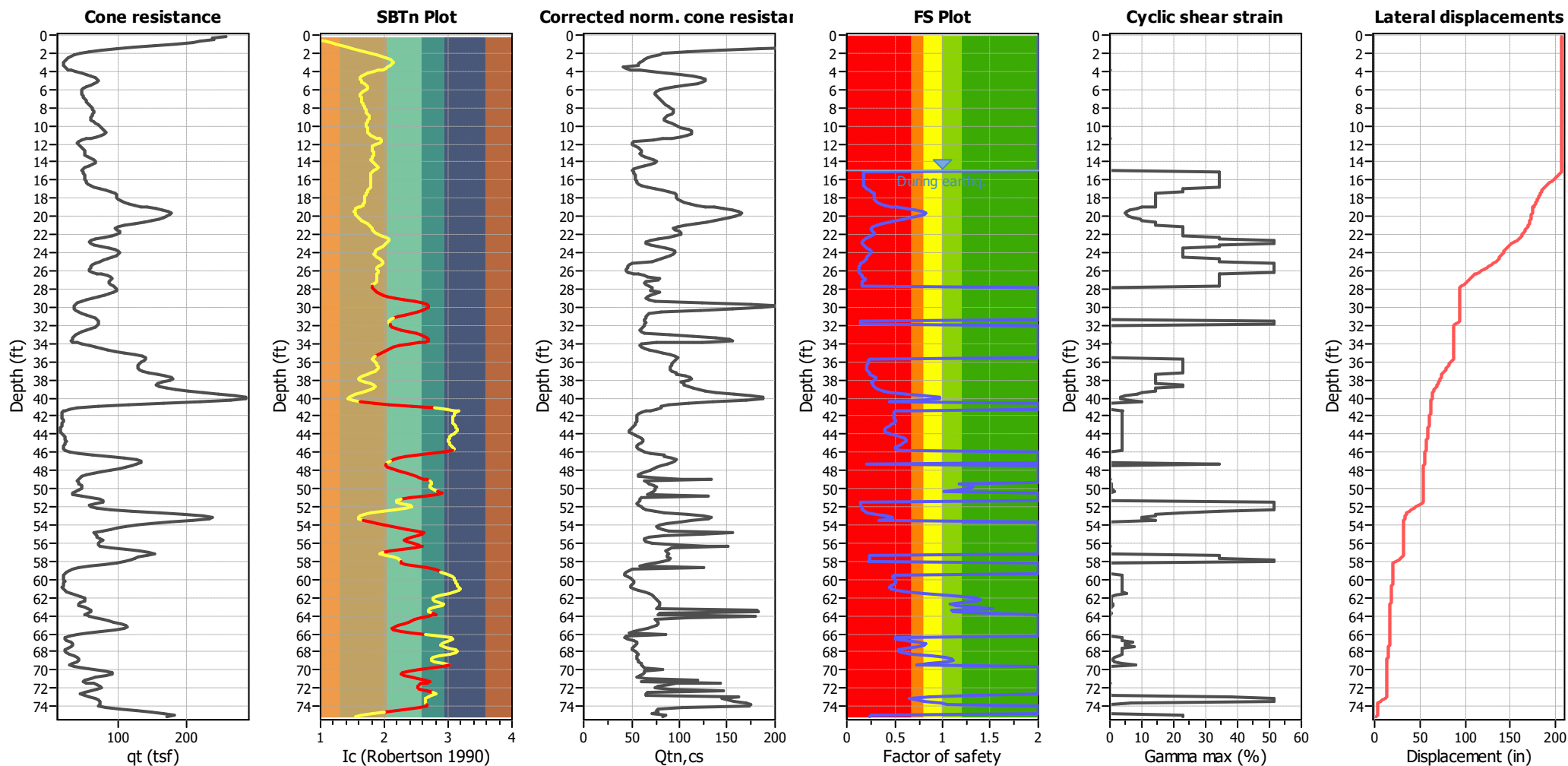


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**



### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

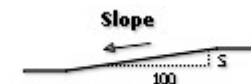
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

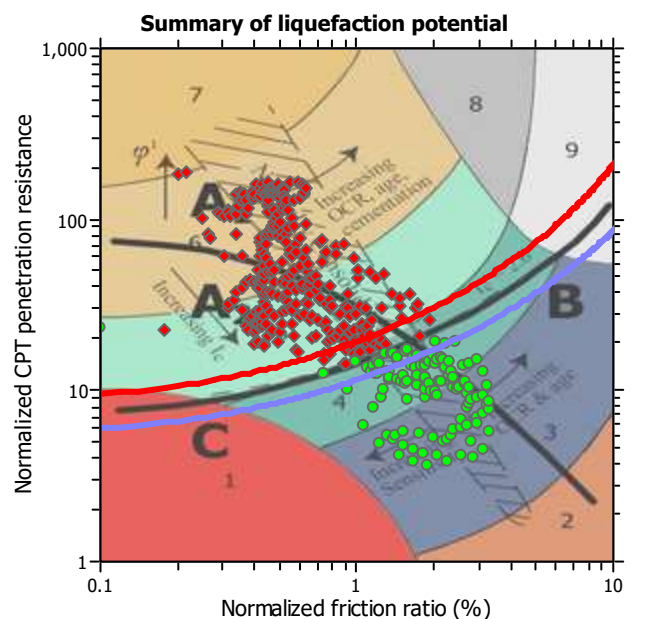
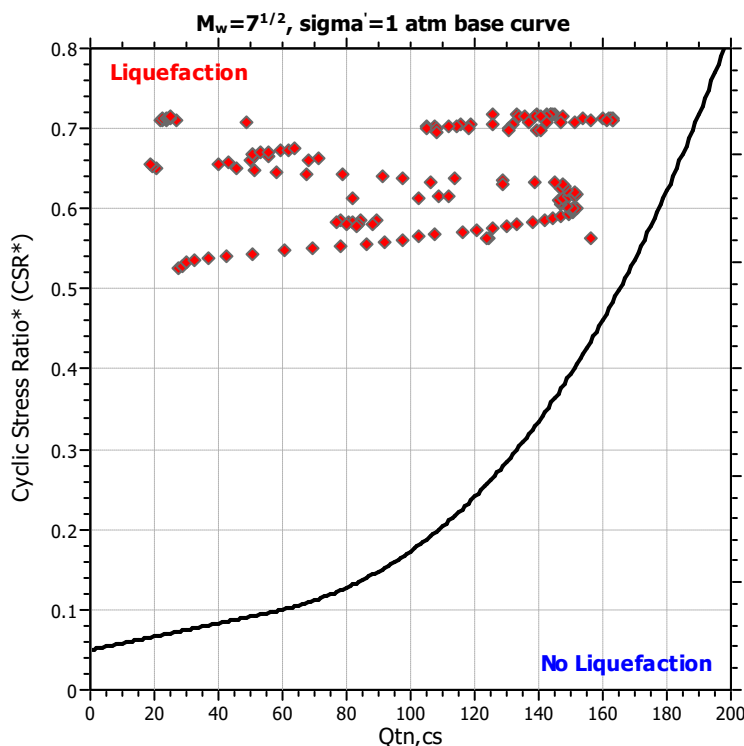
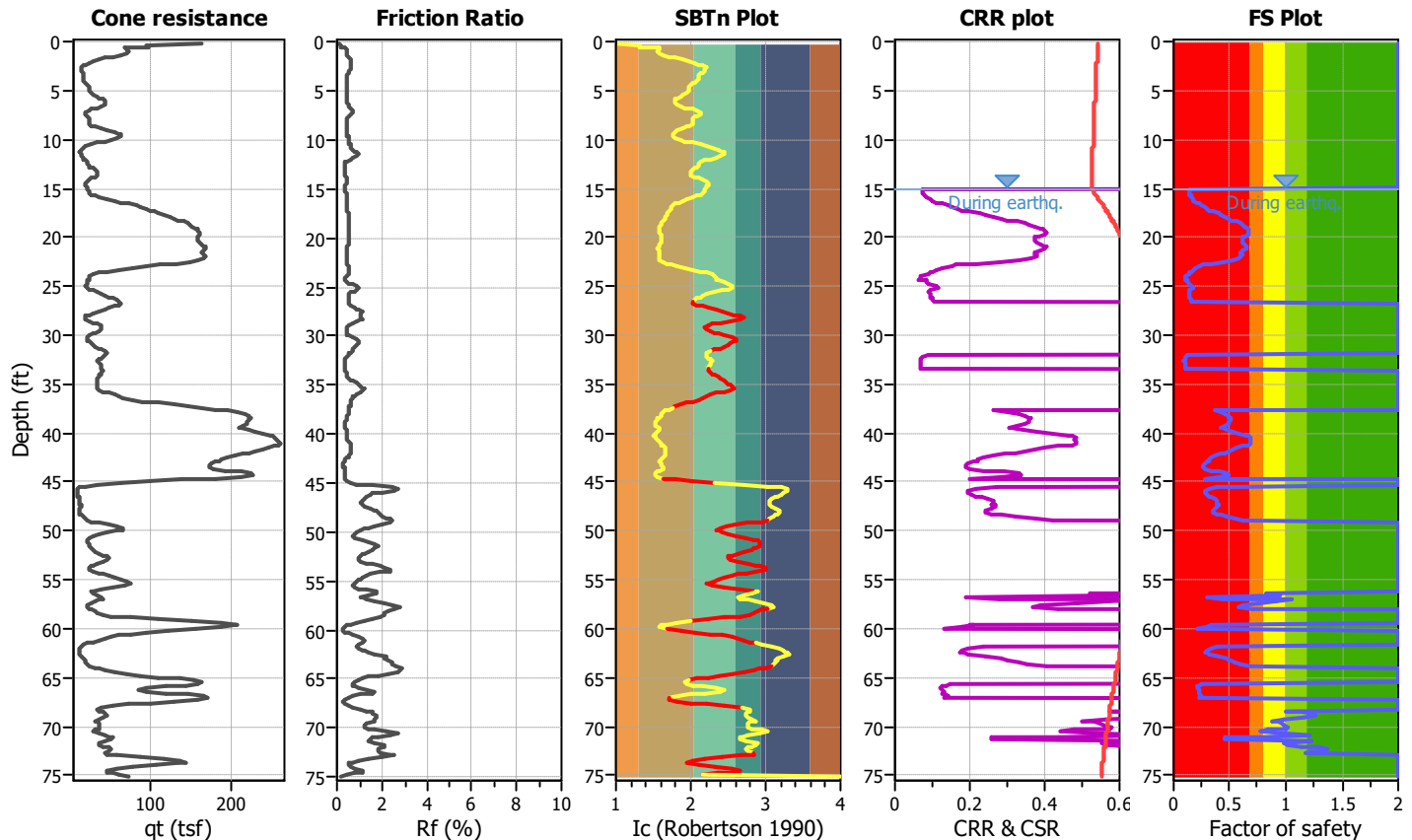
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-2**

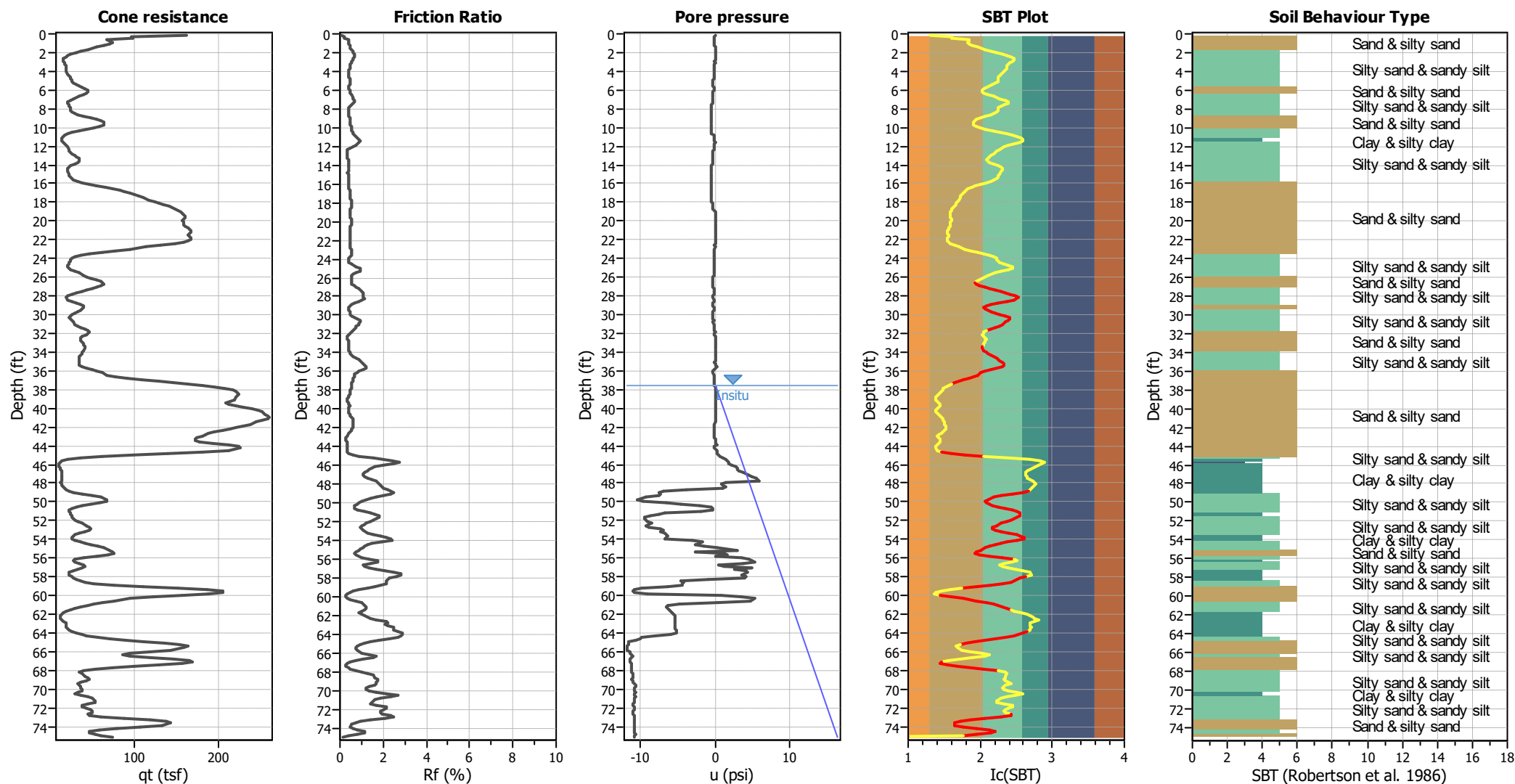
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



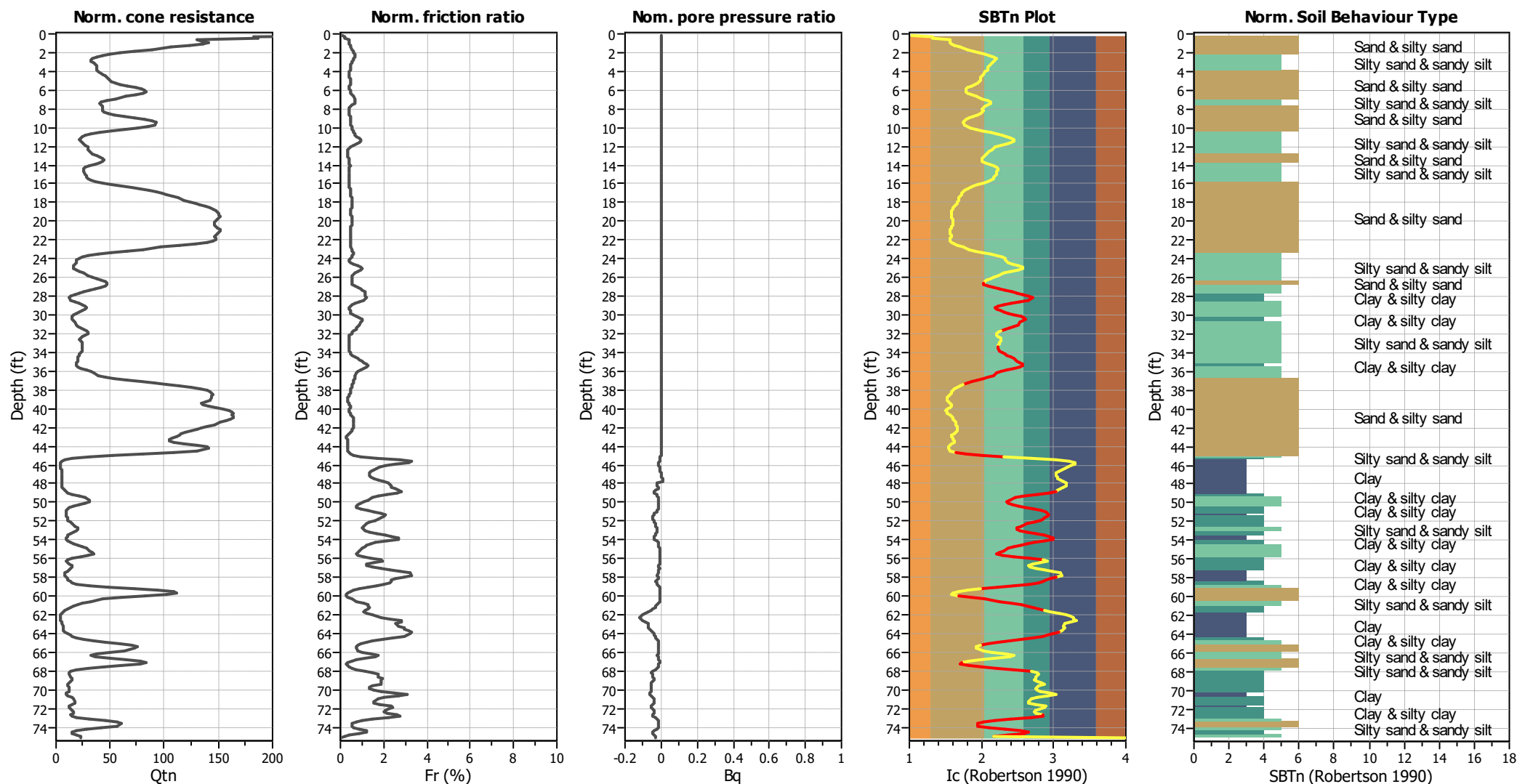
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

## CPT basic interpretation plots (normalized)

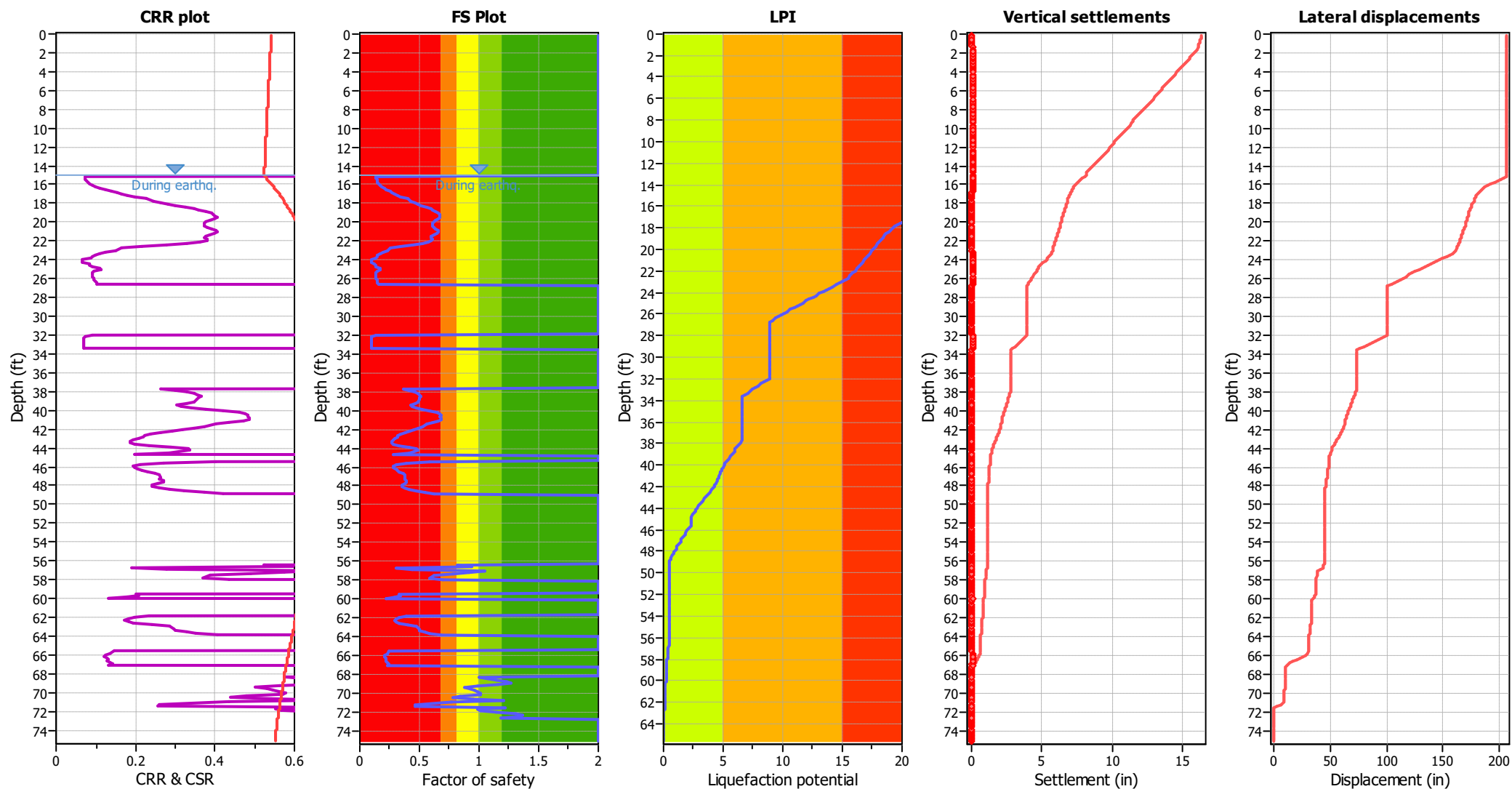


## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A



## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method: Robertson (2009)  
 Fines correction method: Robertson (2009)  
 Points to test: Based on Ic value  
 Earthquake magnitude  $M_w$ : 6.90  
 Peak ground acceleration: 1.03  
 Depth to water table (insitu): 37.50 ft

Depth to water table (earthq.): 15.00 ft  
 Average results interval: 5  
 Ic cut-off value: 2.60  
 Unit weight calculation: Based on SBT  
 Use fill: No  
 Fill height: N/A

Fill weight: N/A  
 Transition detect. applied: Yes  
 $K_\sigma$  applied: No  
 Clay like behavior applied: All soils  
 Limit depth applied: No  
 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

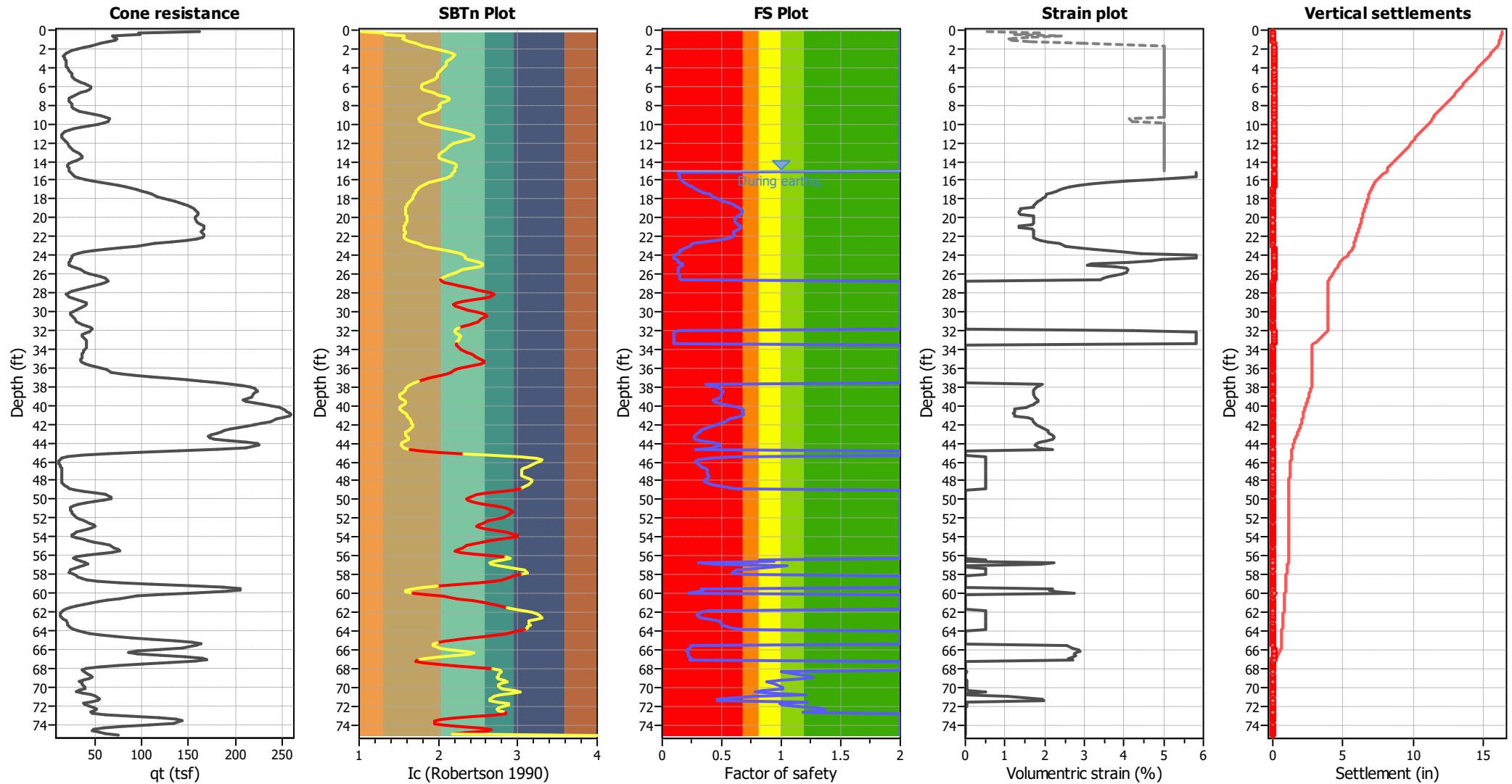
## LPI color scheme

Very high risk  
 High risk  
 Low risk





## Estimation of post-earthquake settlements

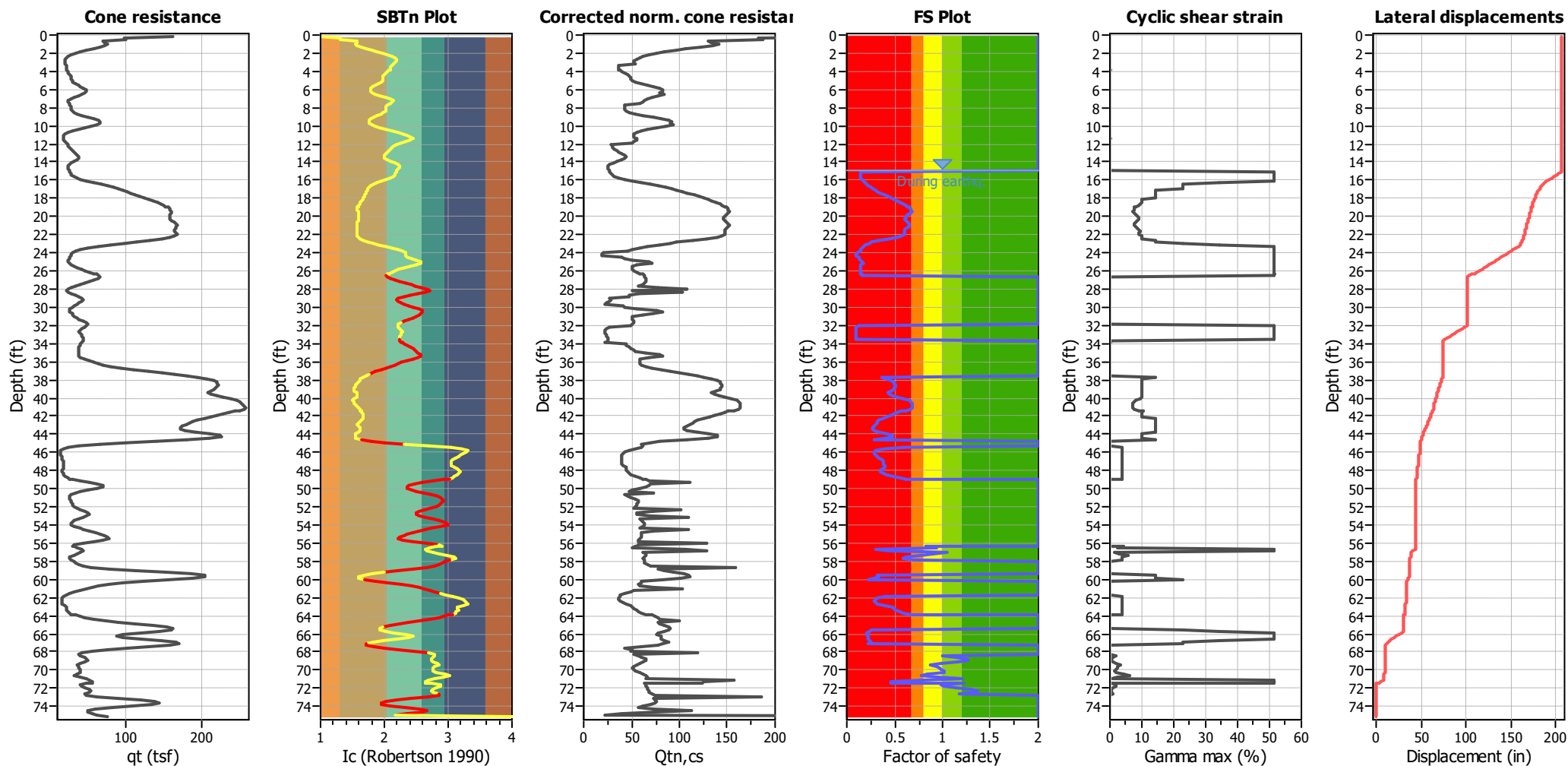


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

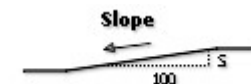
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

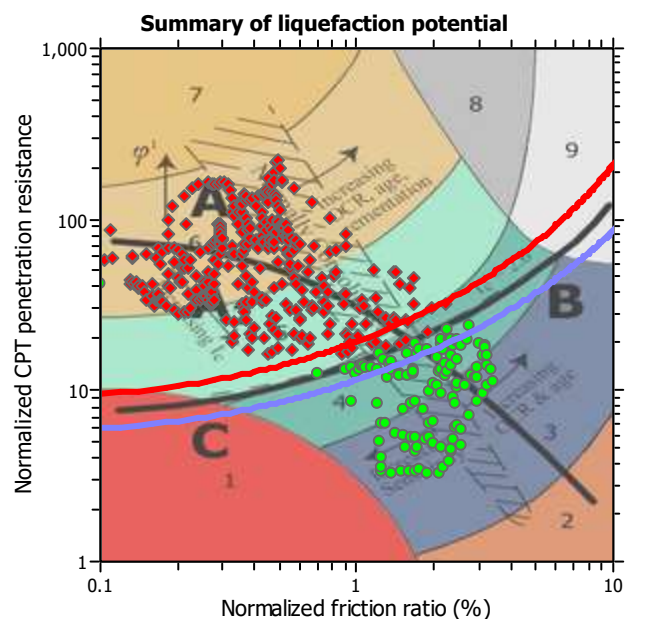
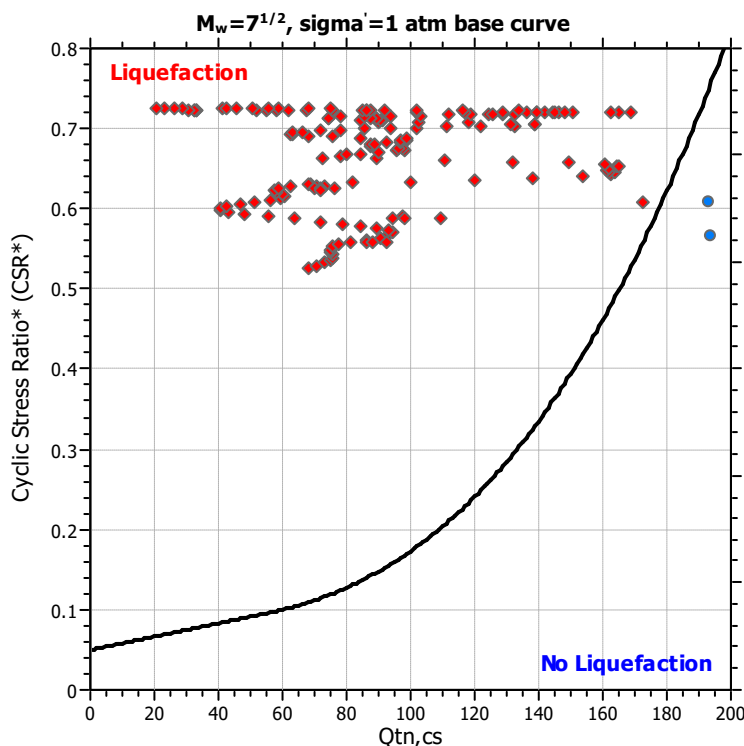
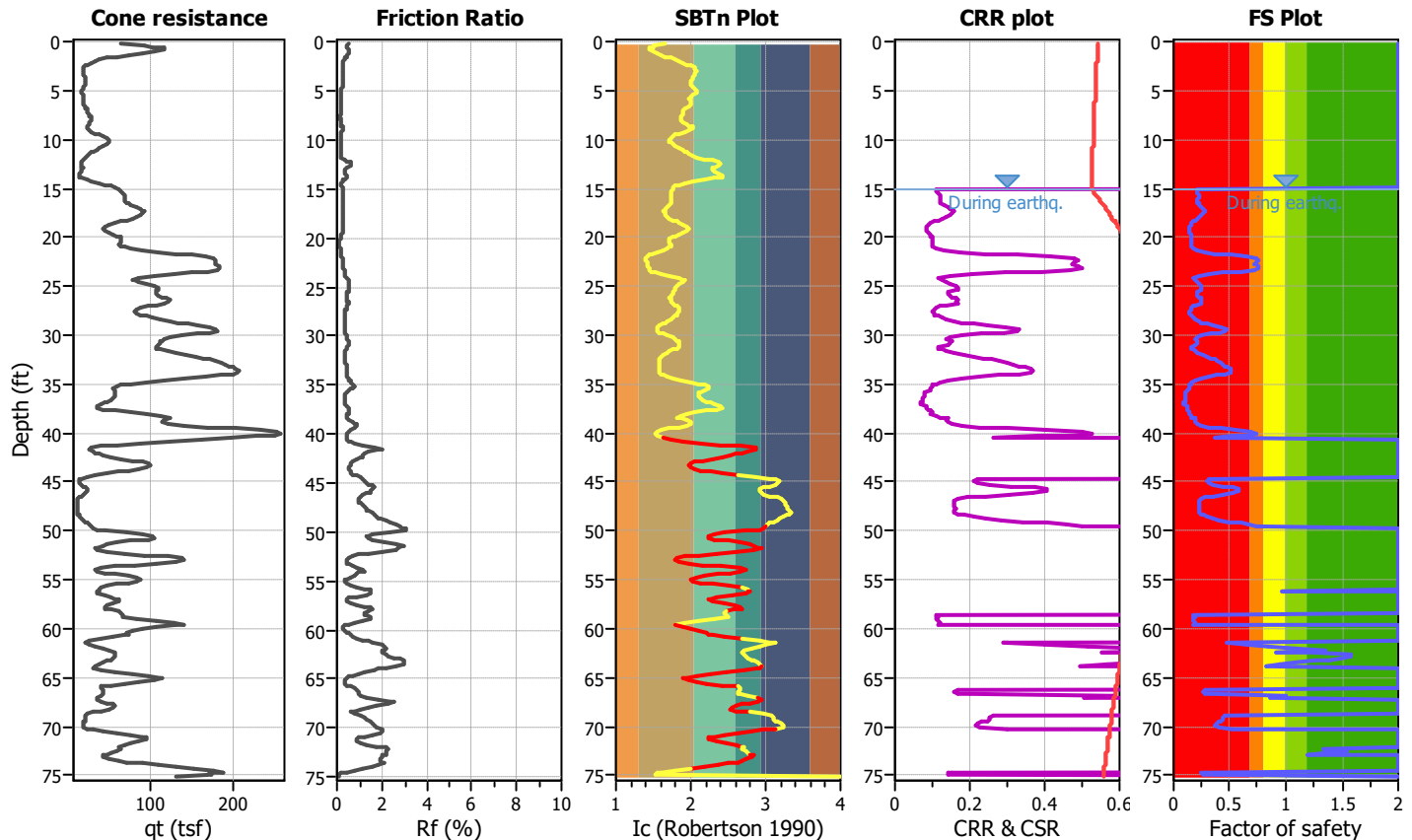
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-3**

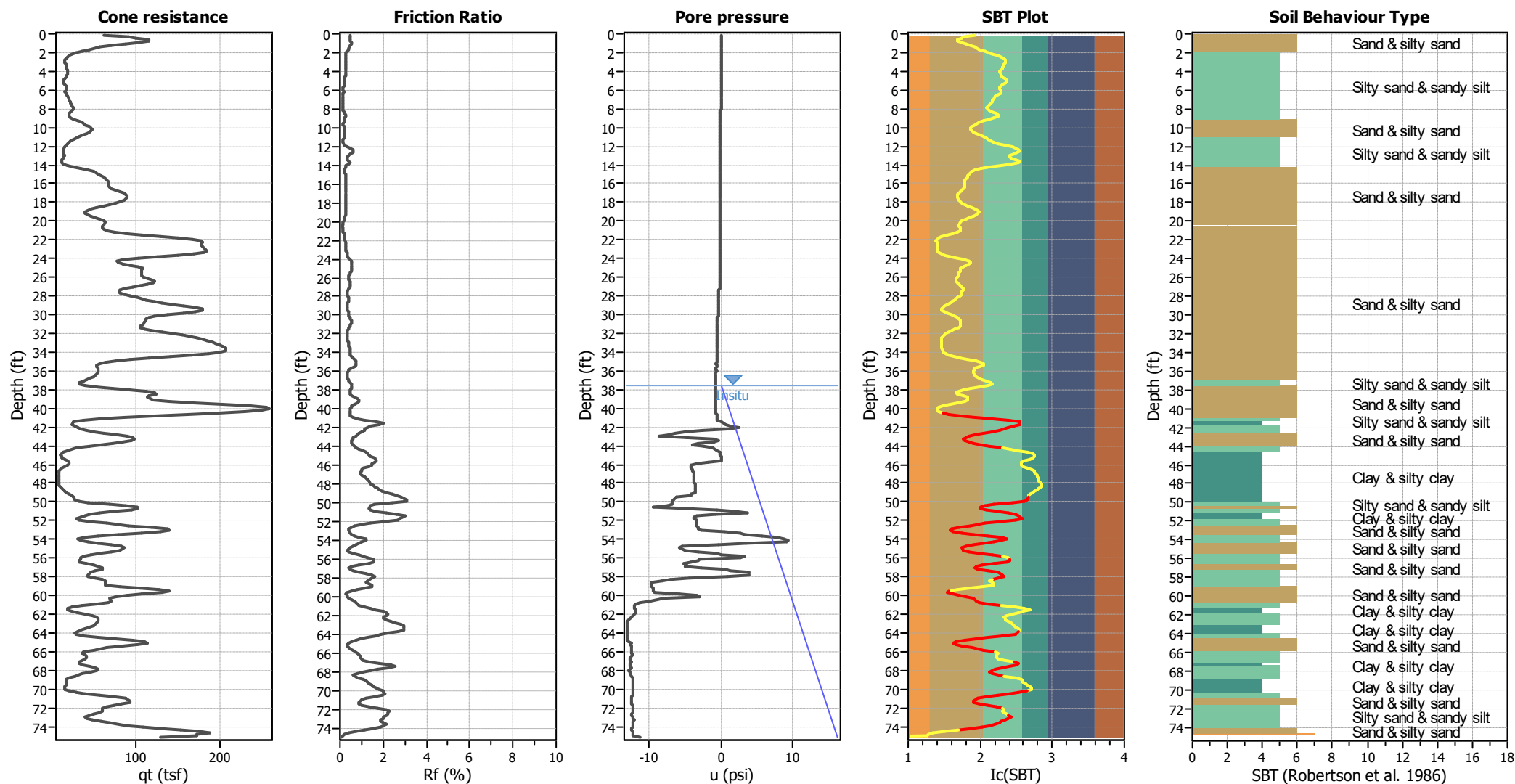
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry










## CPT basic interpretation plots



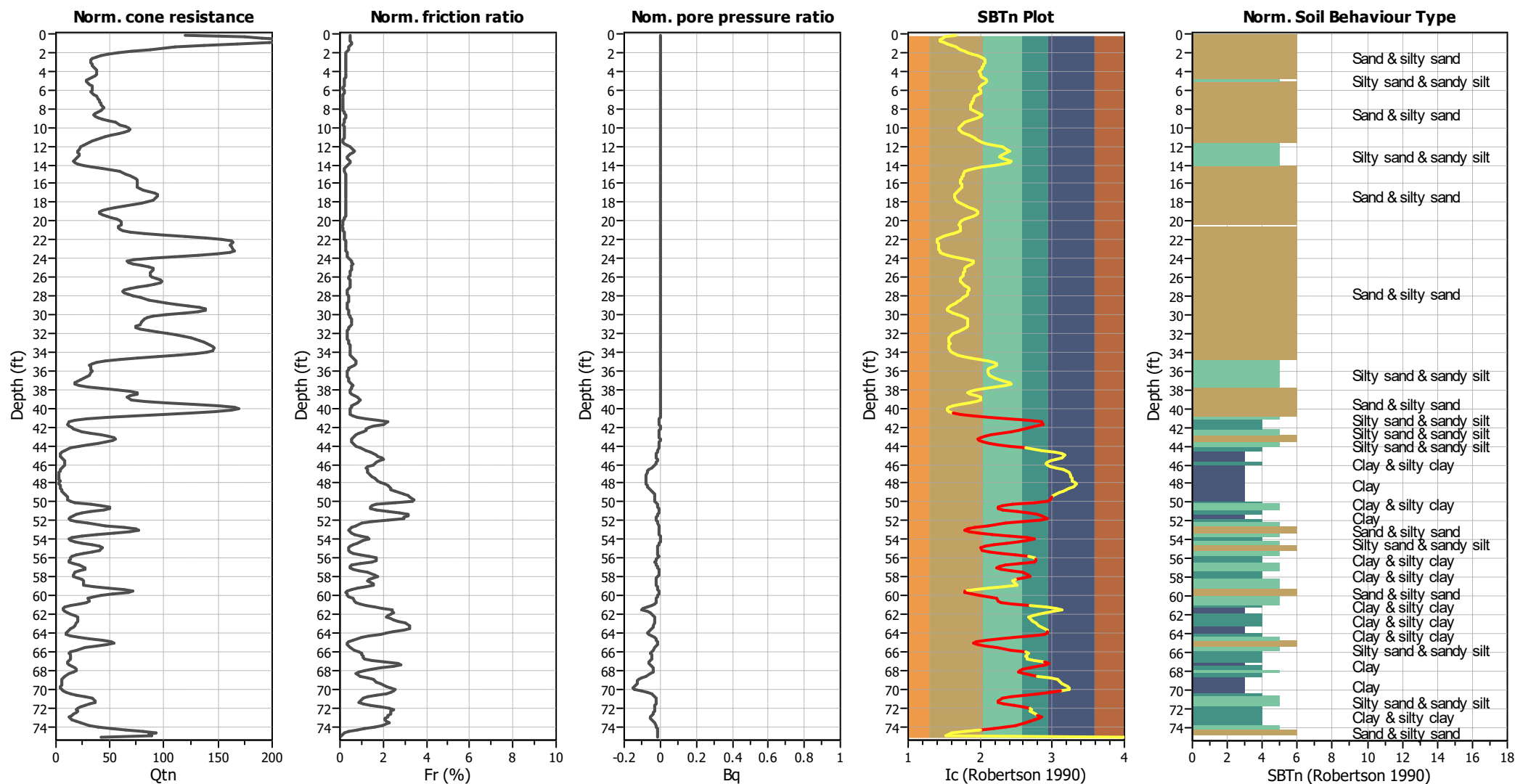
### Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

### SBT legend

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

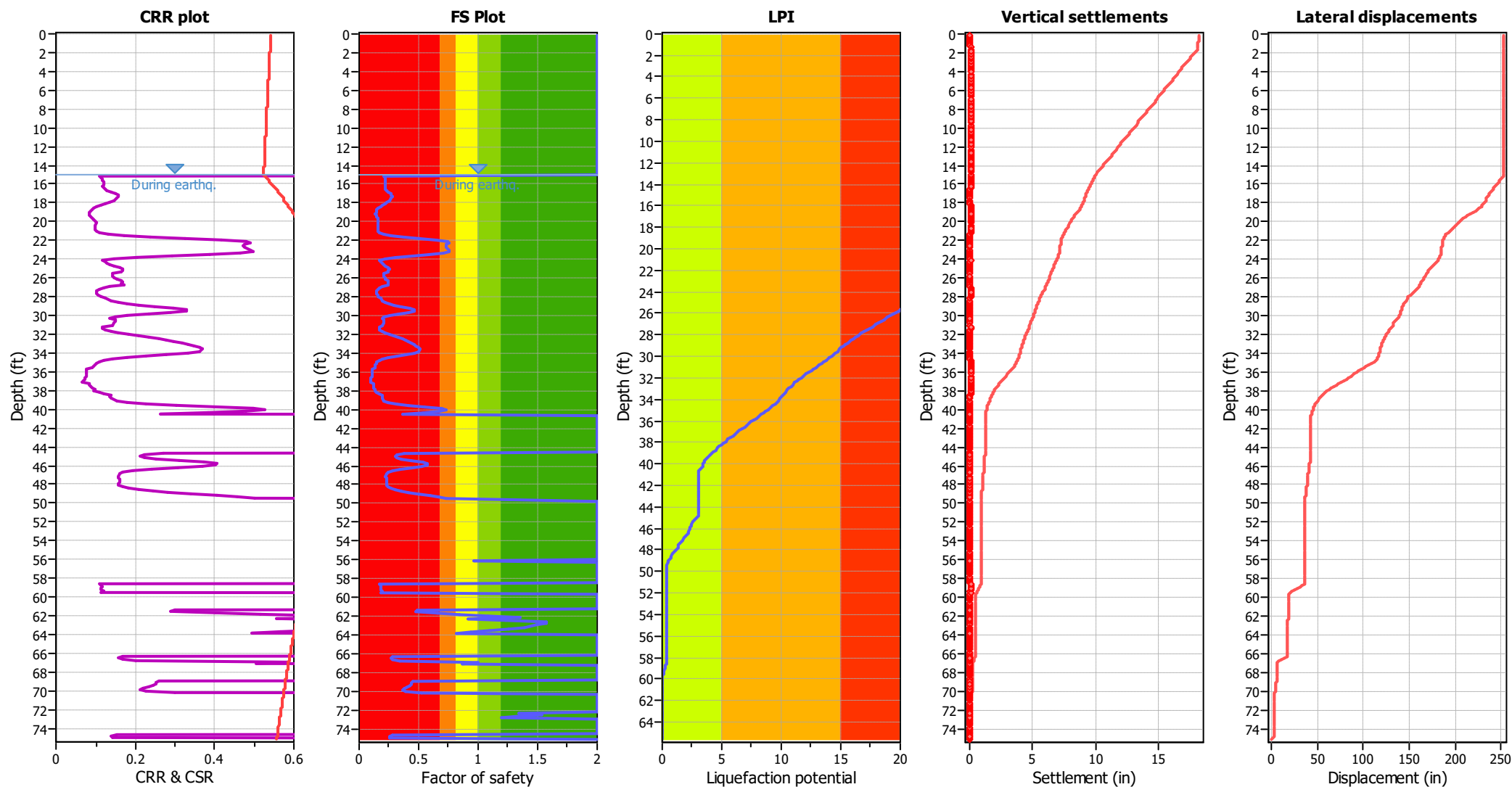
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method: Robertson (2009)  
 Fines correction method: Robertson (2009)  
 Points to test: Based on Ic value  
 Earthquake magnitude  $M_w$ : 6.90  
 Peak ground acceleration: 1.03  
 Depth to water table (insitu): 37.50 ft

Depth to water table (earthq.): 15.00 ft  
 Average results interval: 5  
 Ic cut-off value: 2.60  
 Unit weight calculation: Based on SBT  
 Use fill: No  
 Fill height: N/A

Fill weight: N/A  
 Transition detect. applied: Yes  
 $K_0$  applied: No  
 Clay like behavior applied: All soils  
 Limit depth applied: No  
 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

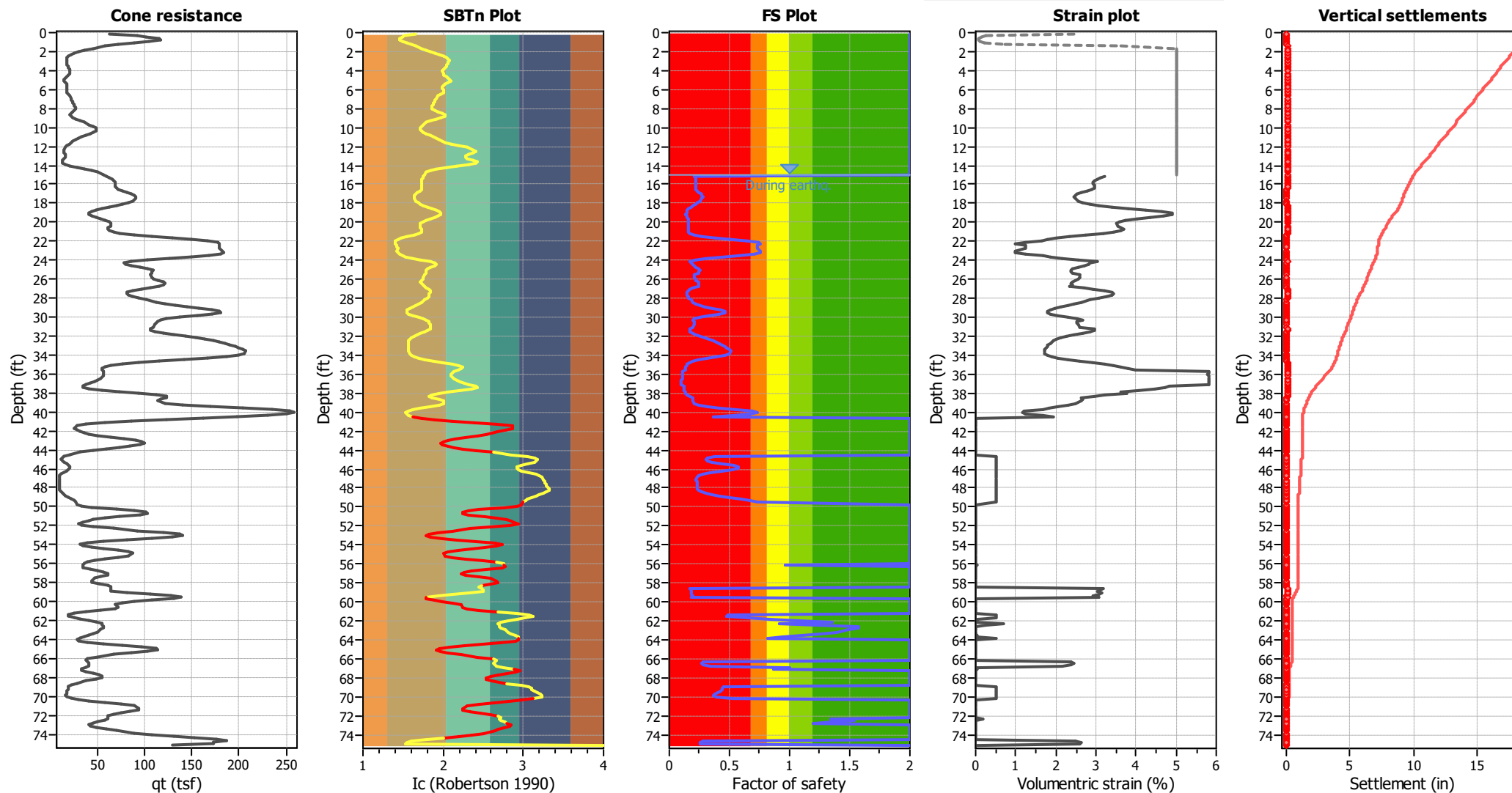
## LPI color scheme

Very high risk  
 High risk  
 Low risk





## Estimation of post-earthquake settlements



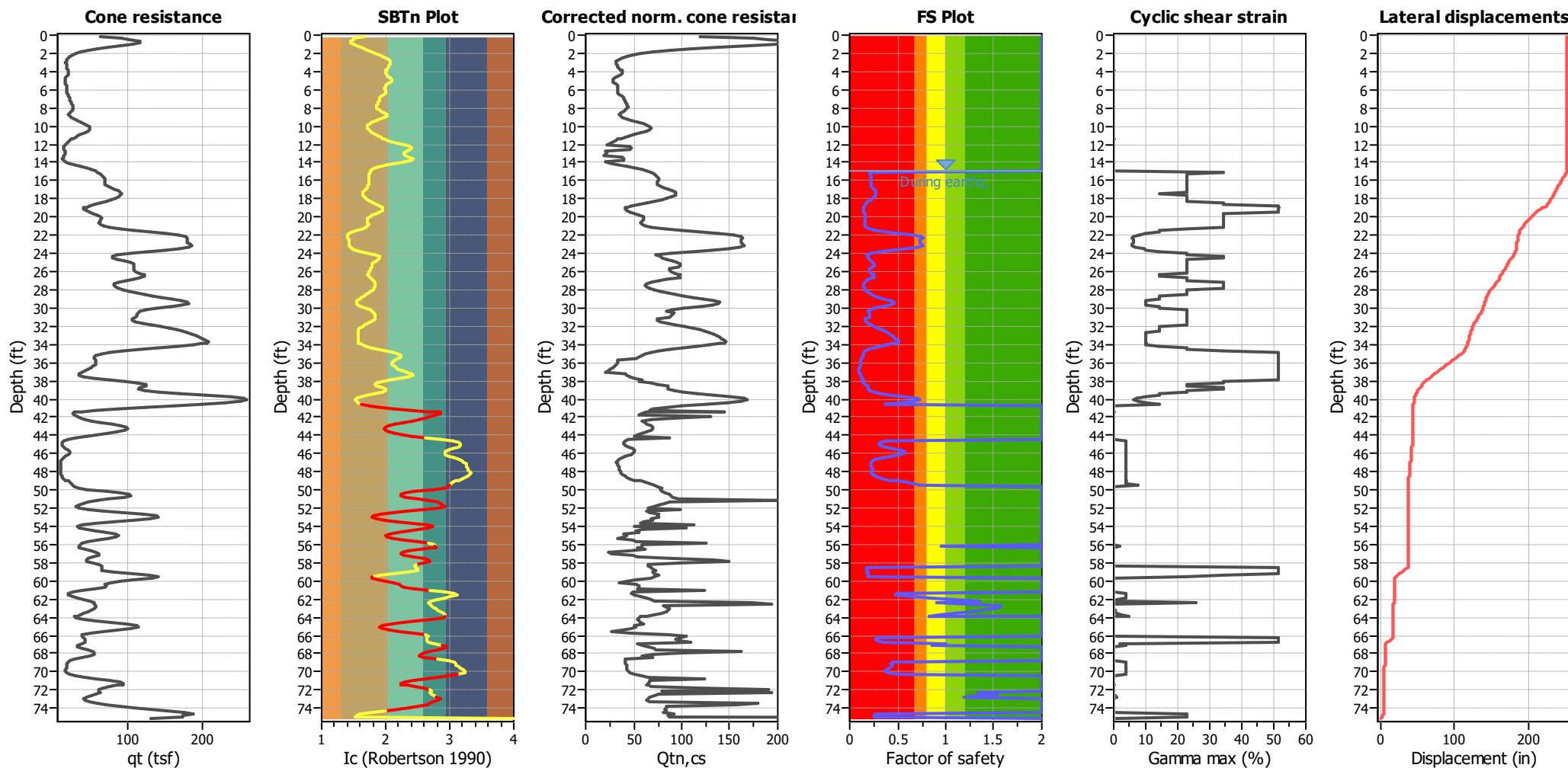
### Abbreviations

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



## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**

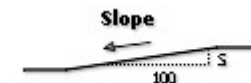


### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

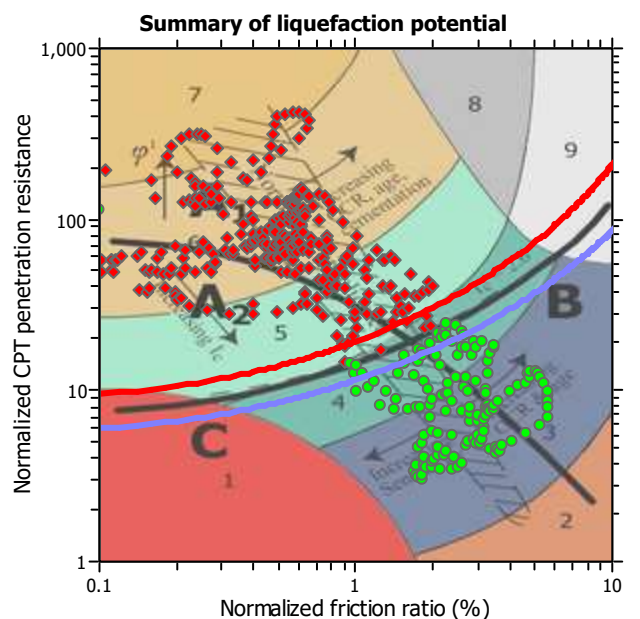
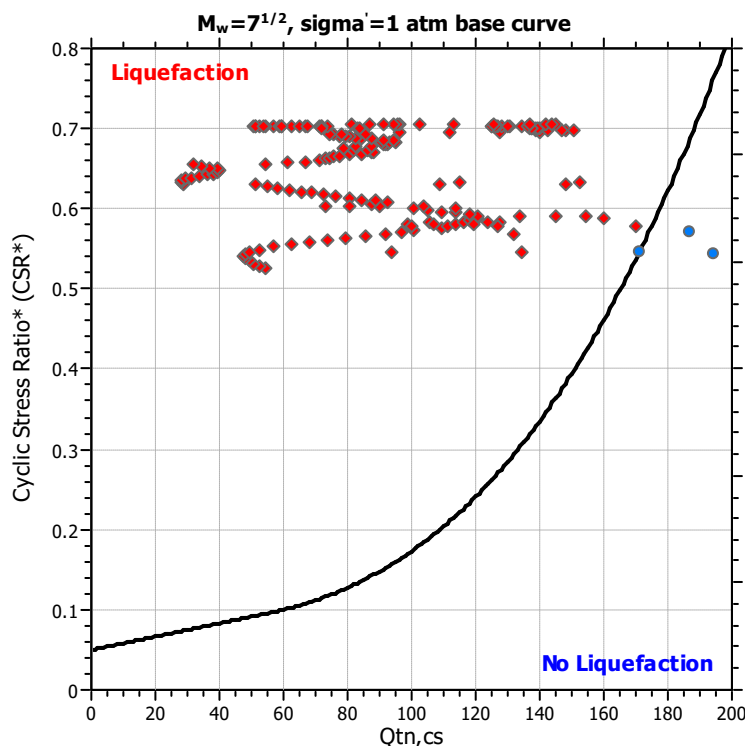
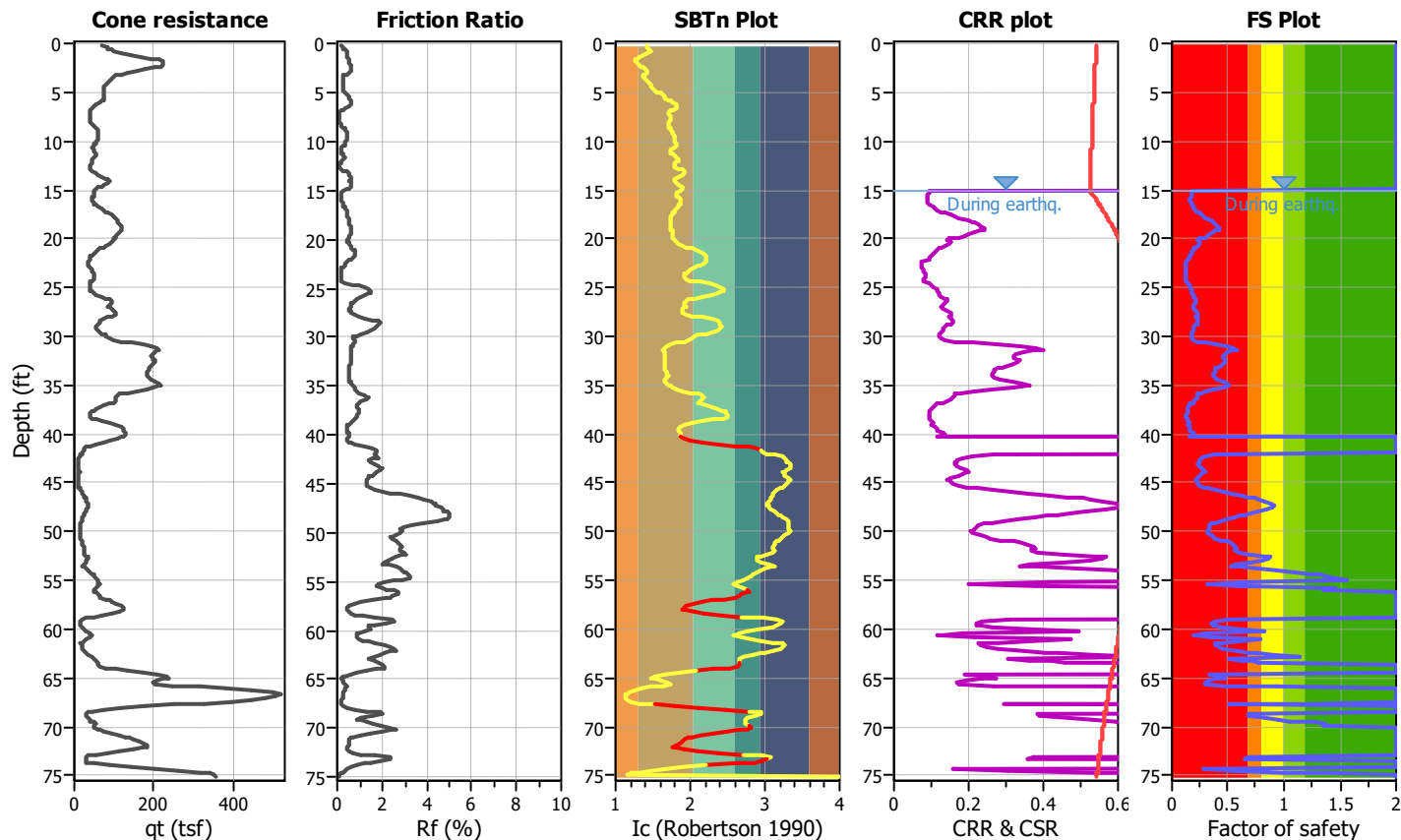
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-4**

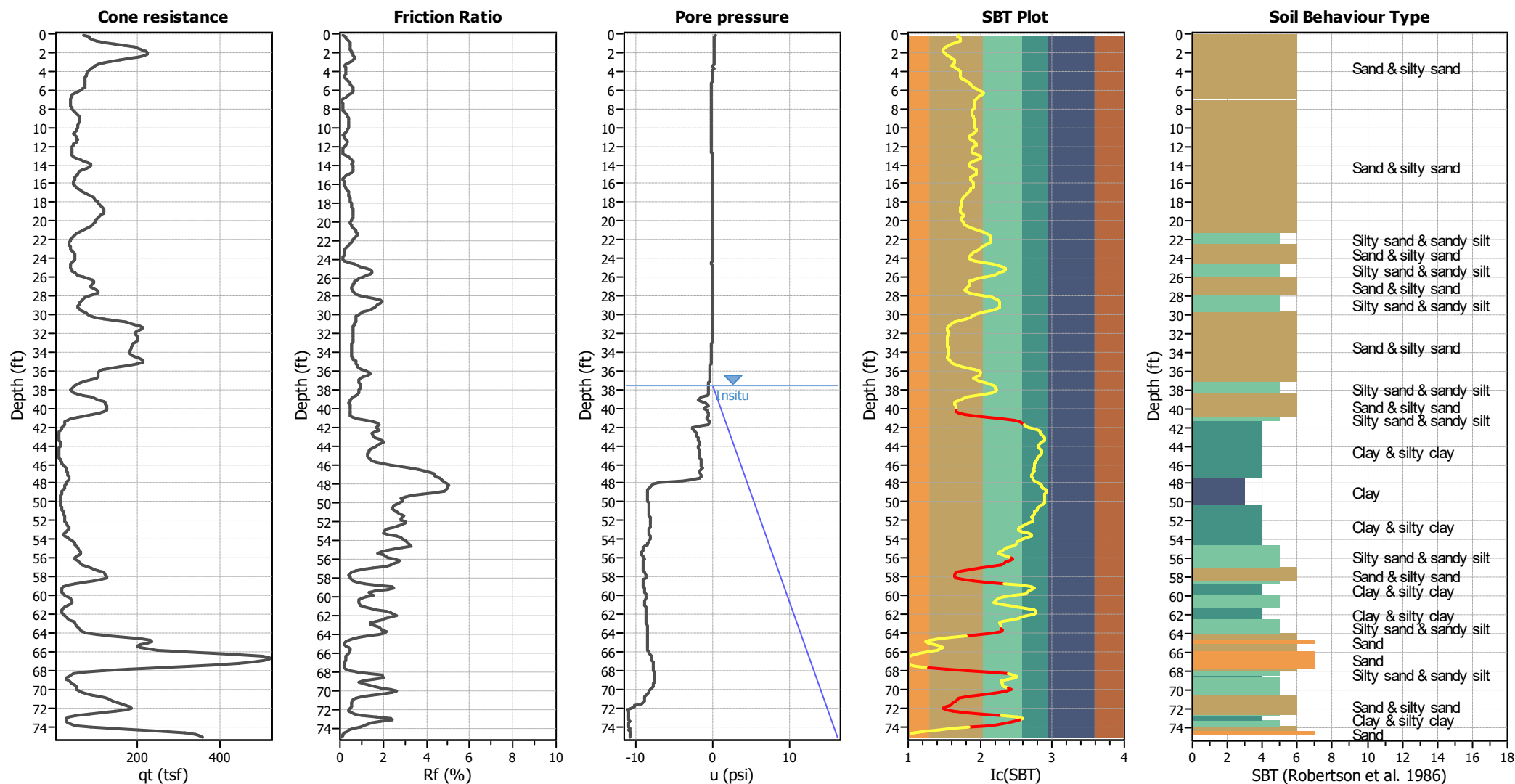
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



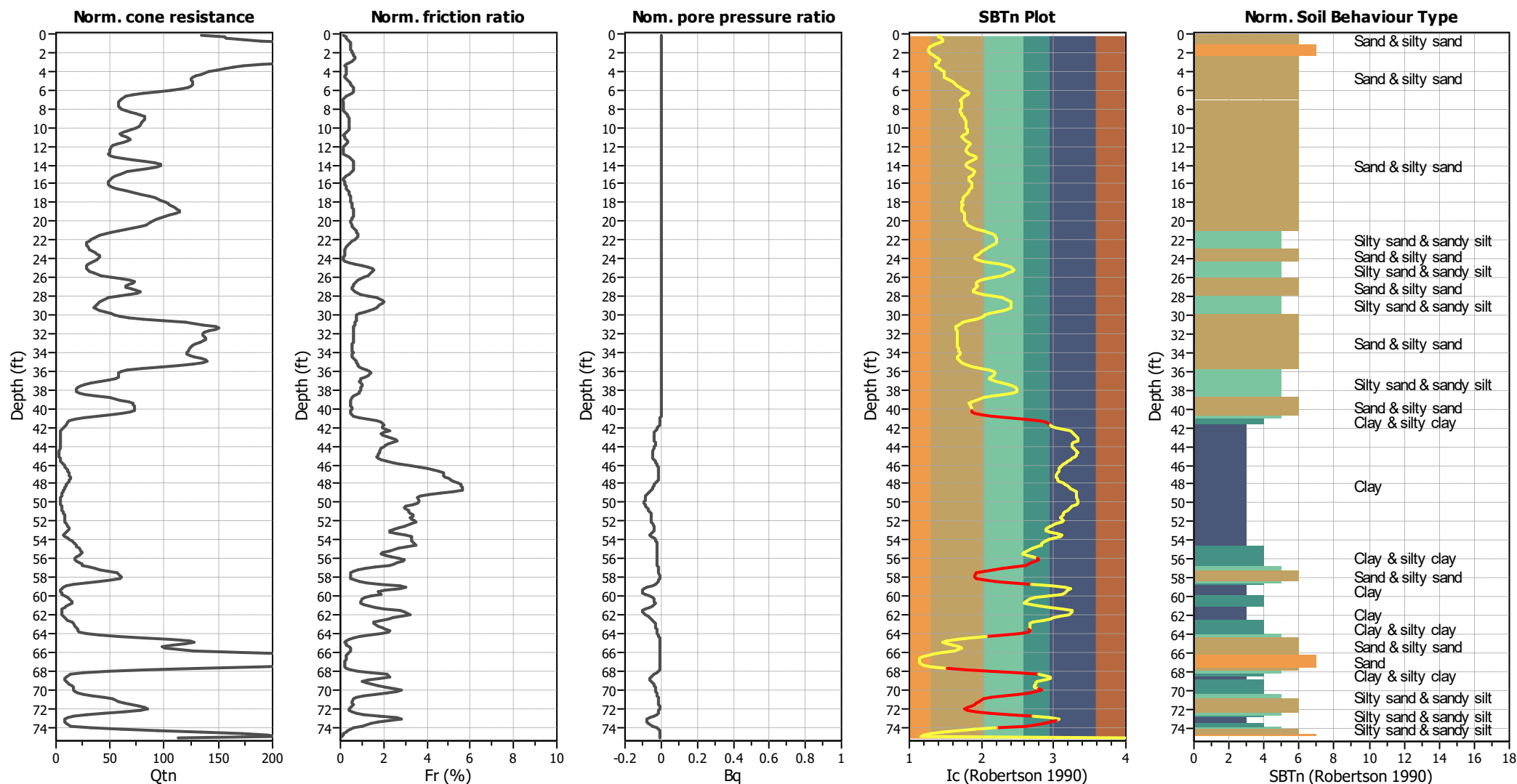
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_{\alpha}$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

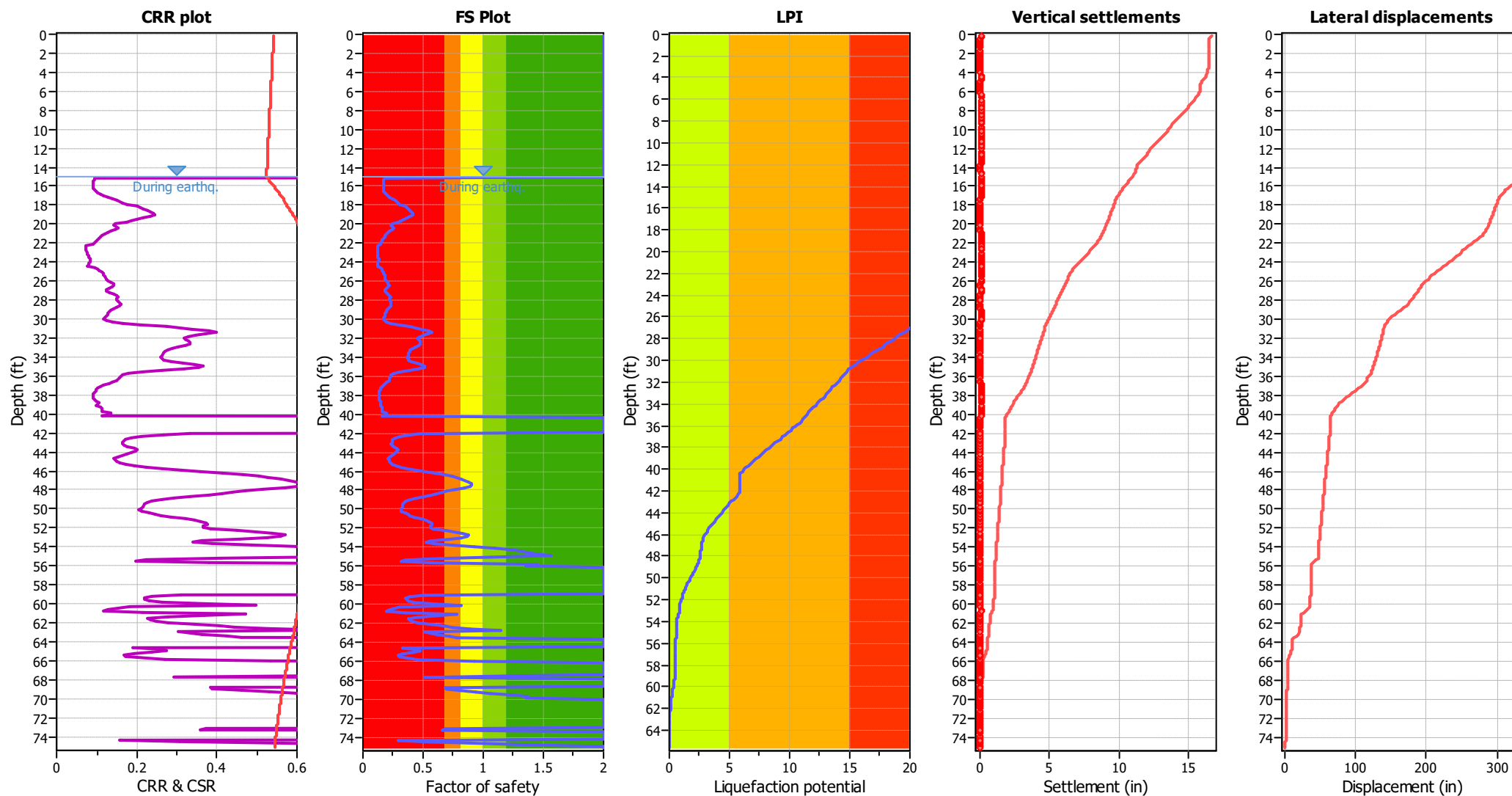
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_a$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

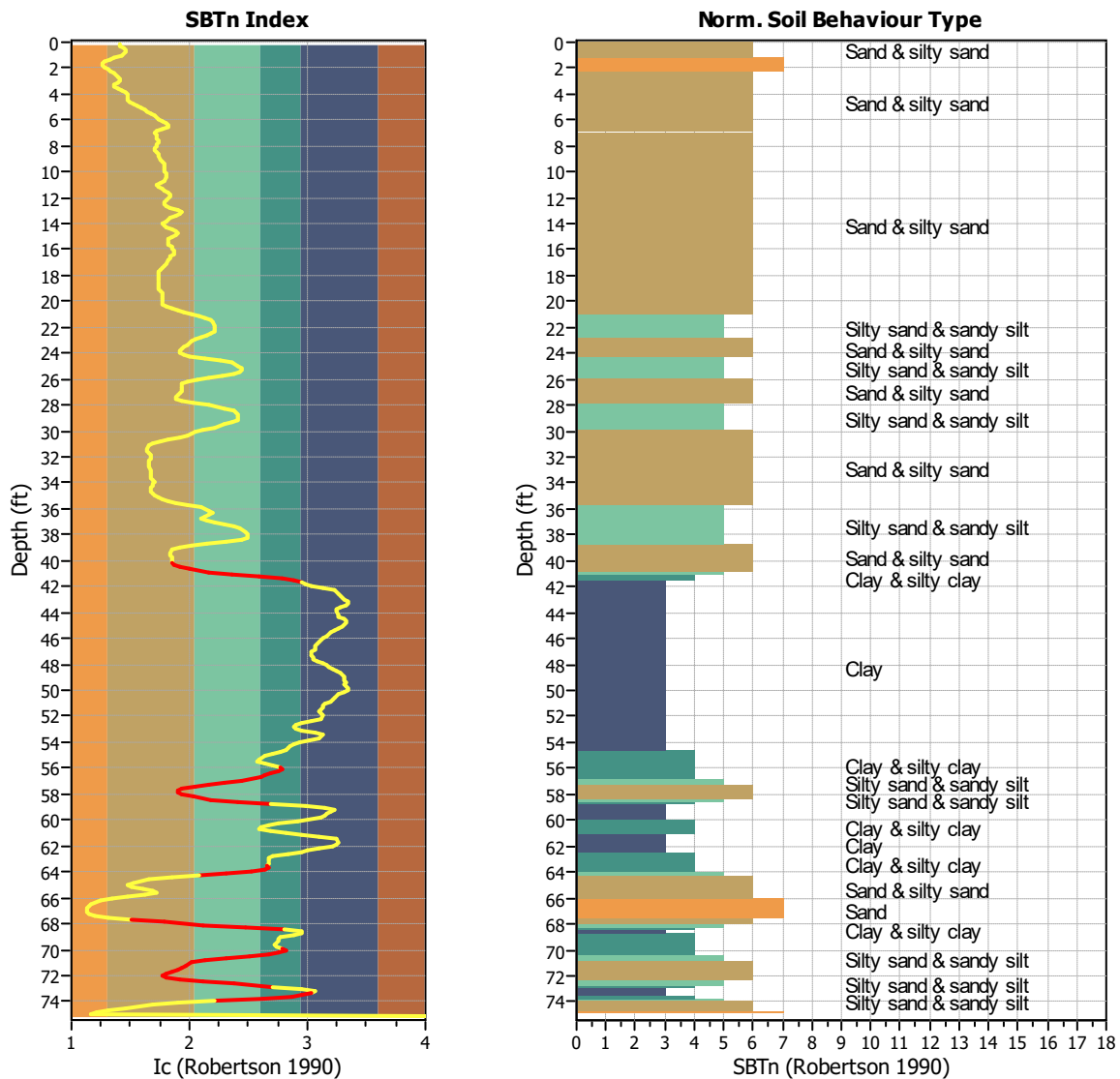
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



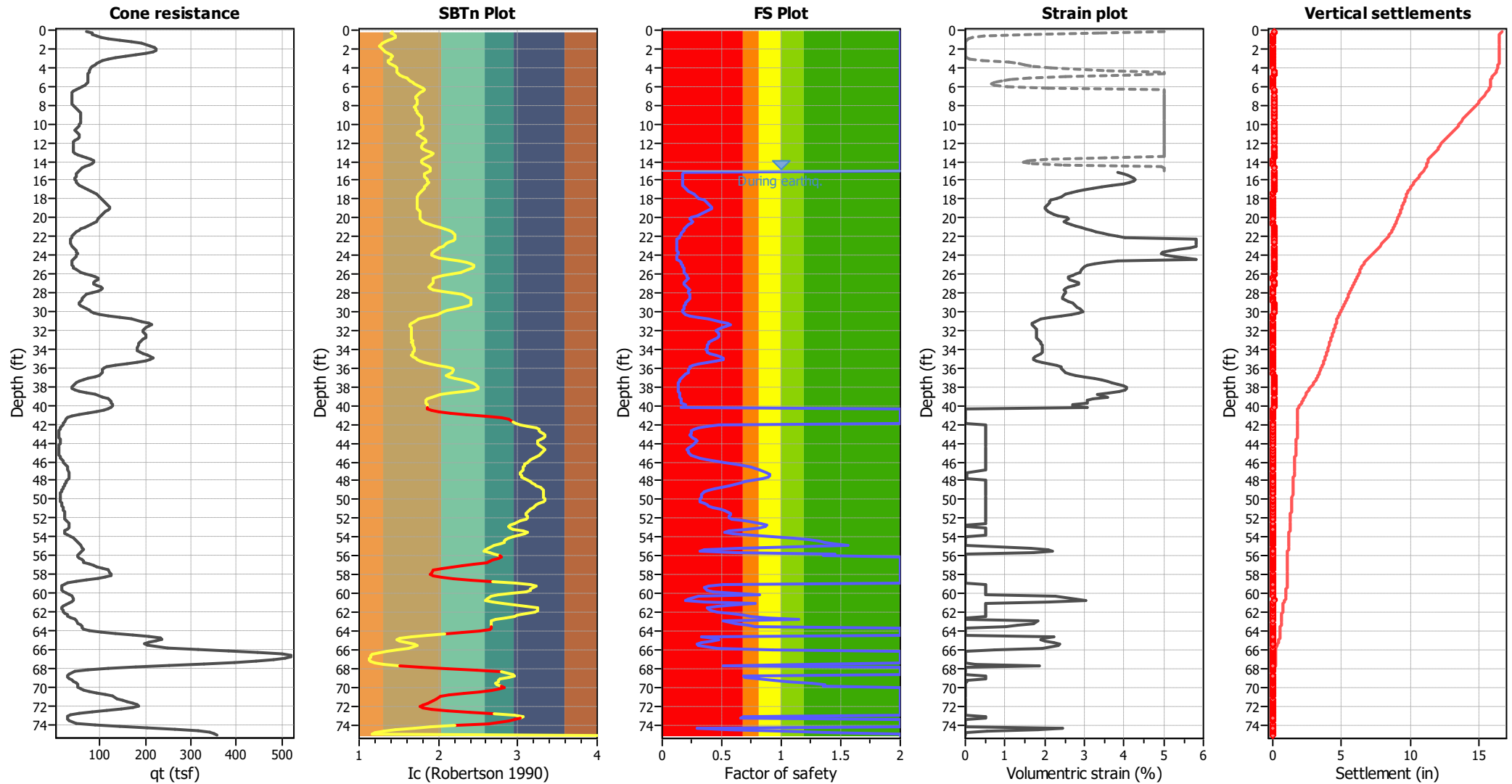
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 64  
 Exclusion percentage: 13.97%  
 Number of layers detected: 8

## Estimation of post-earthquake settlements



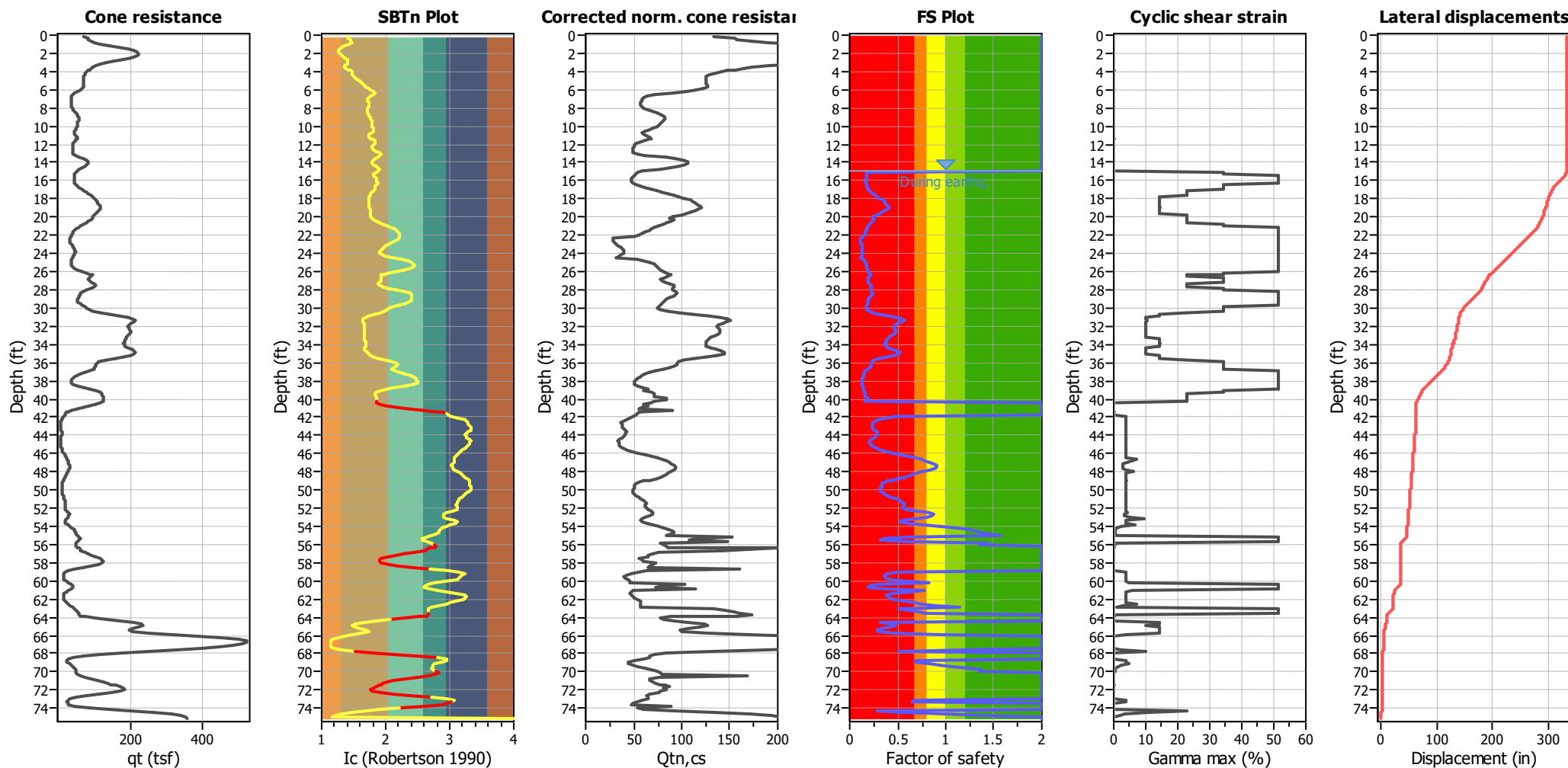
### Abbreviations

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



## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**

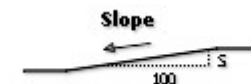


### Abbreviations

q<sub>t</sub>: Total cone resistance (cone resistance q<sub>c</sub> corrected for pore water effects)  
 I<sub>c</sub>: Soil Behaviour Type Index  
 Q<sub>tn,cs</sub>: Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 γ<sub>max</sub>: Maximum cyclic shear strain  
 LDI: Lateral displacement index

### Surface condition







## LIQUEFACTION ANALYSIS REPORT

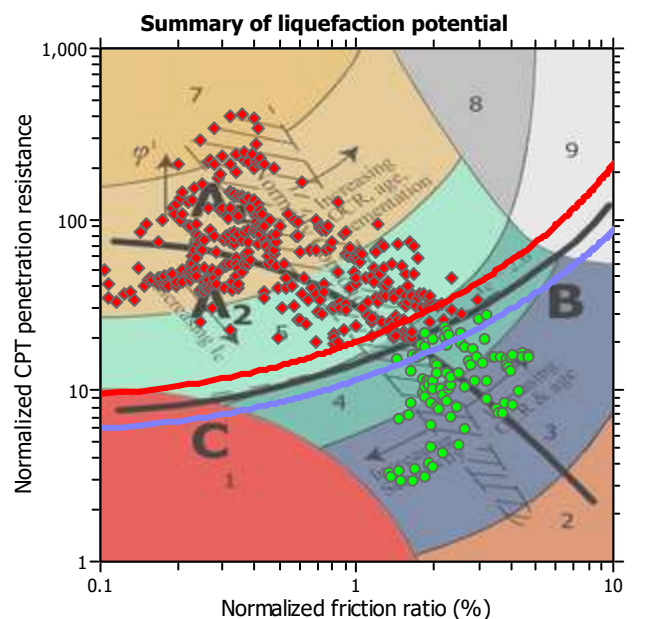
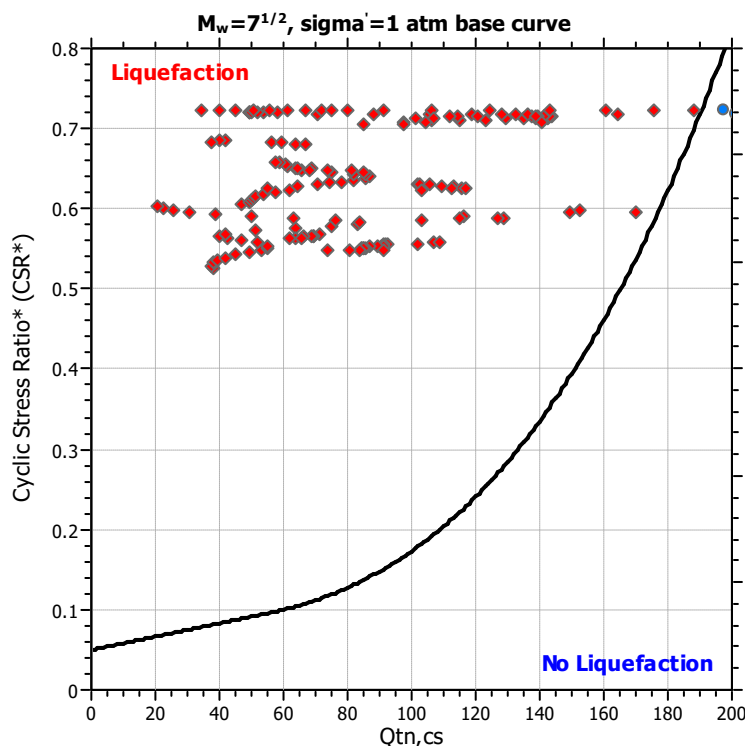
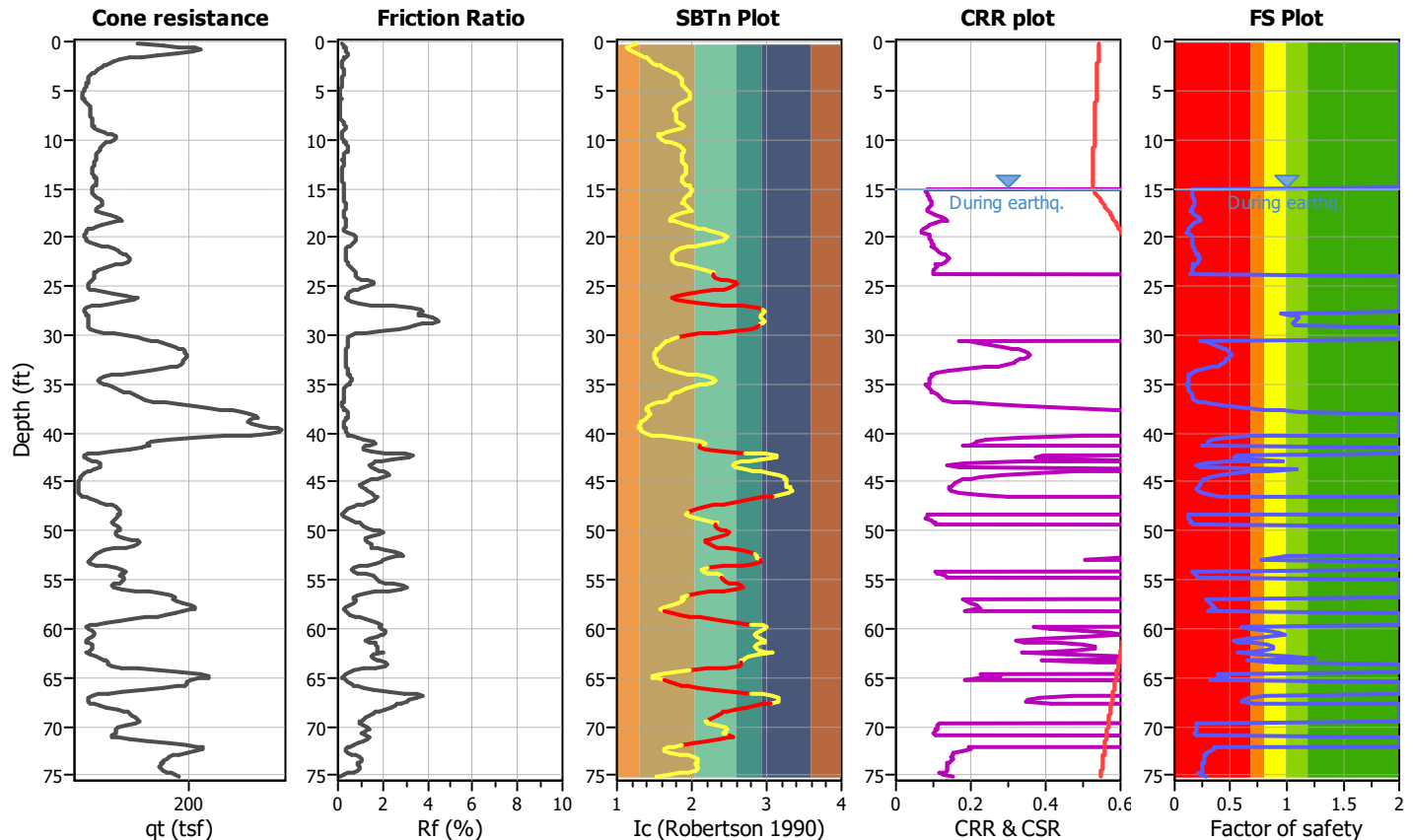
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-5**

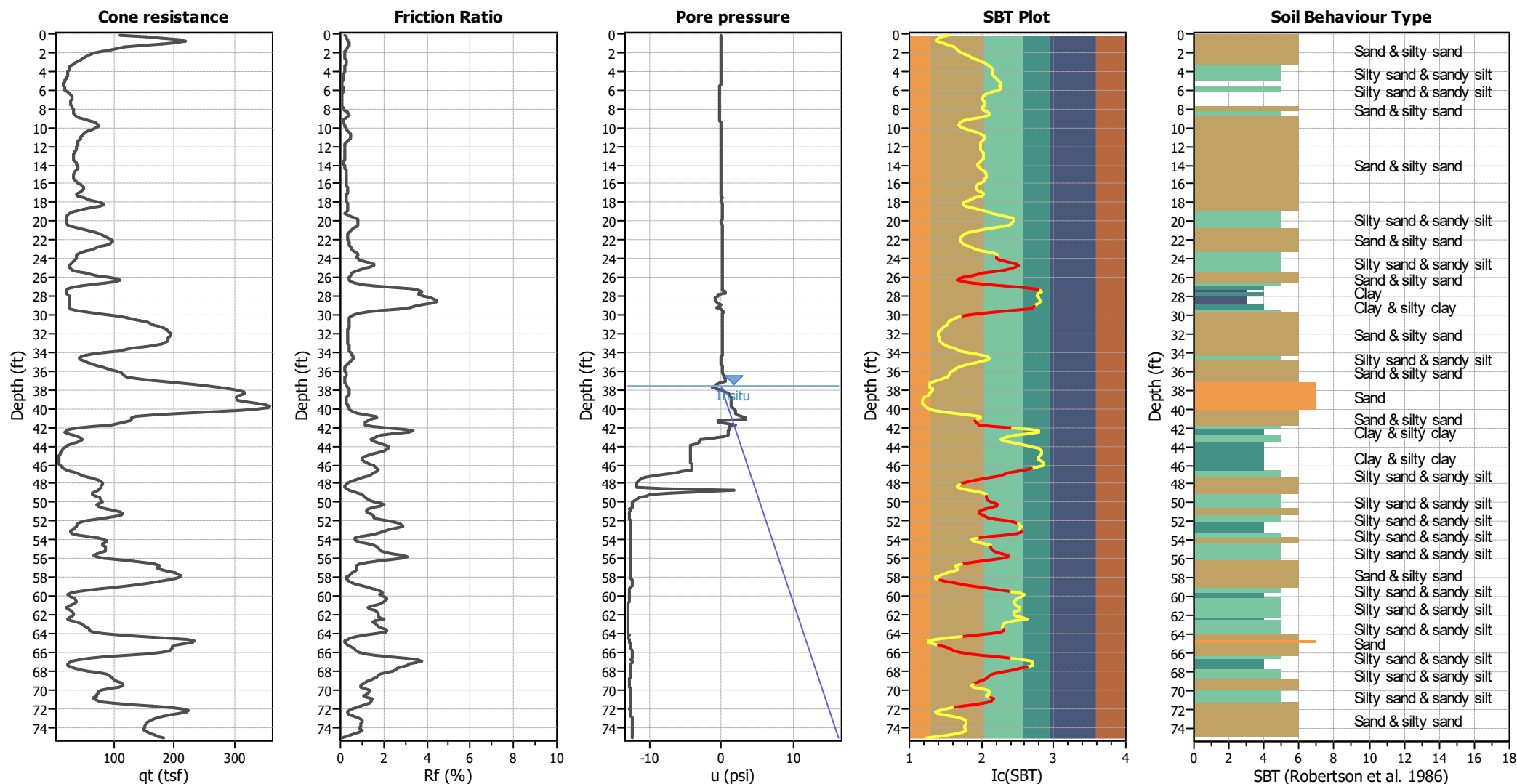
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



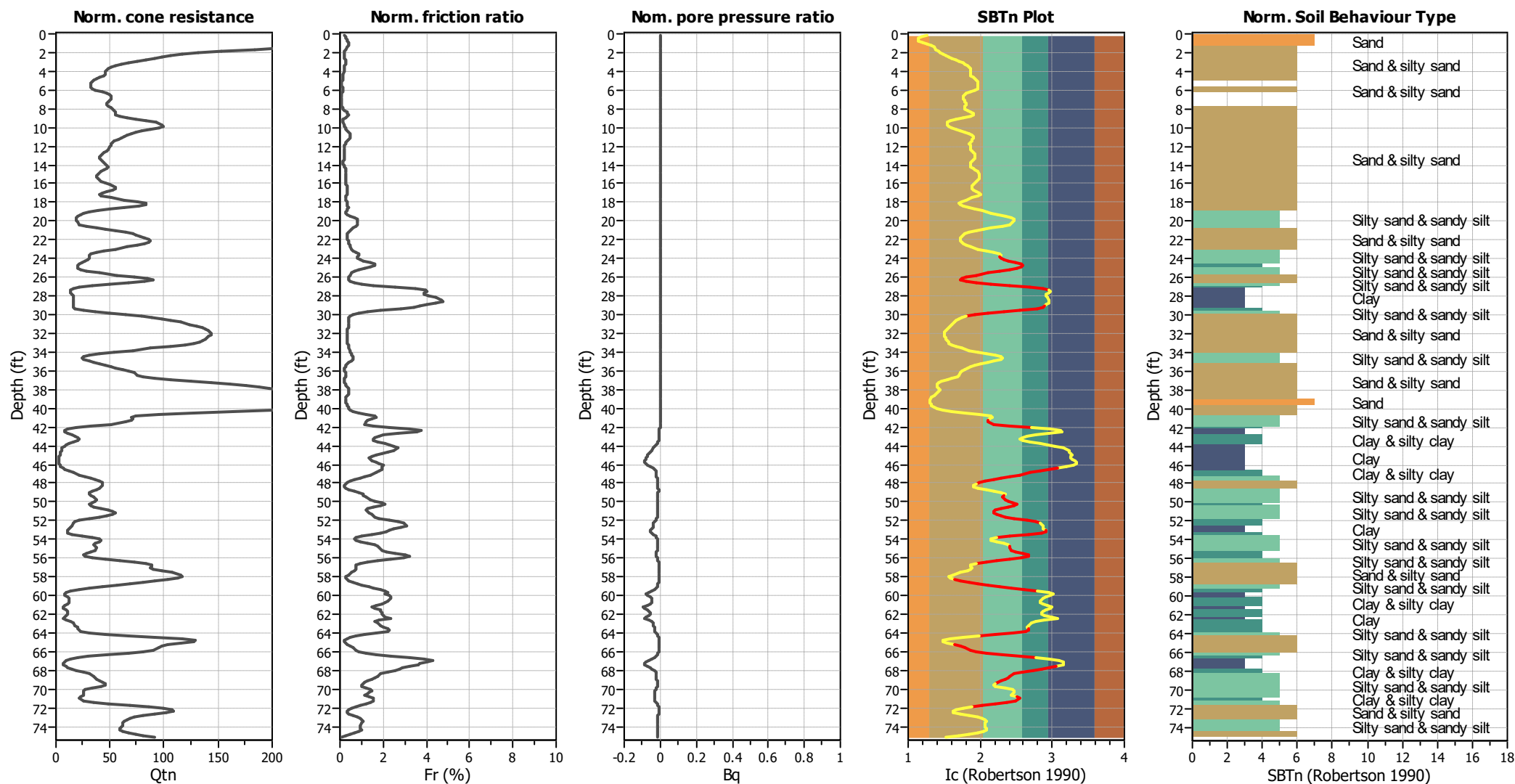
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>0</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

## CPT basic interpretation plots (normalized)



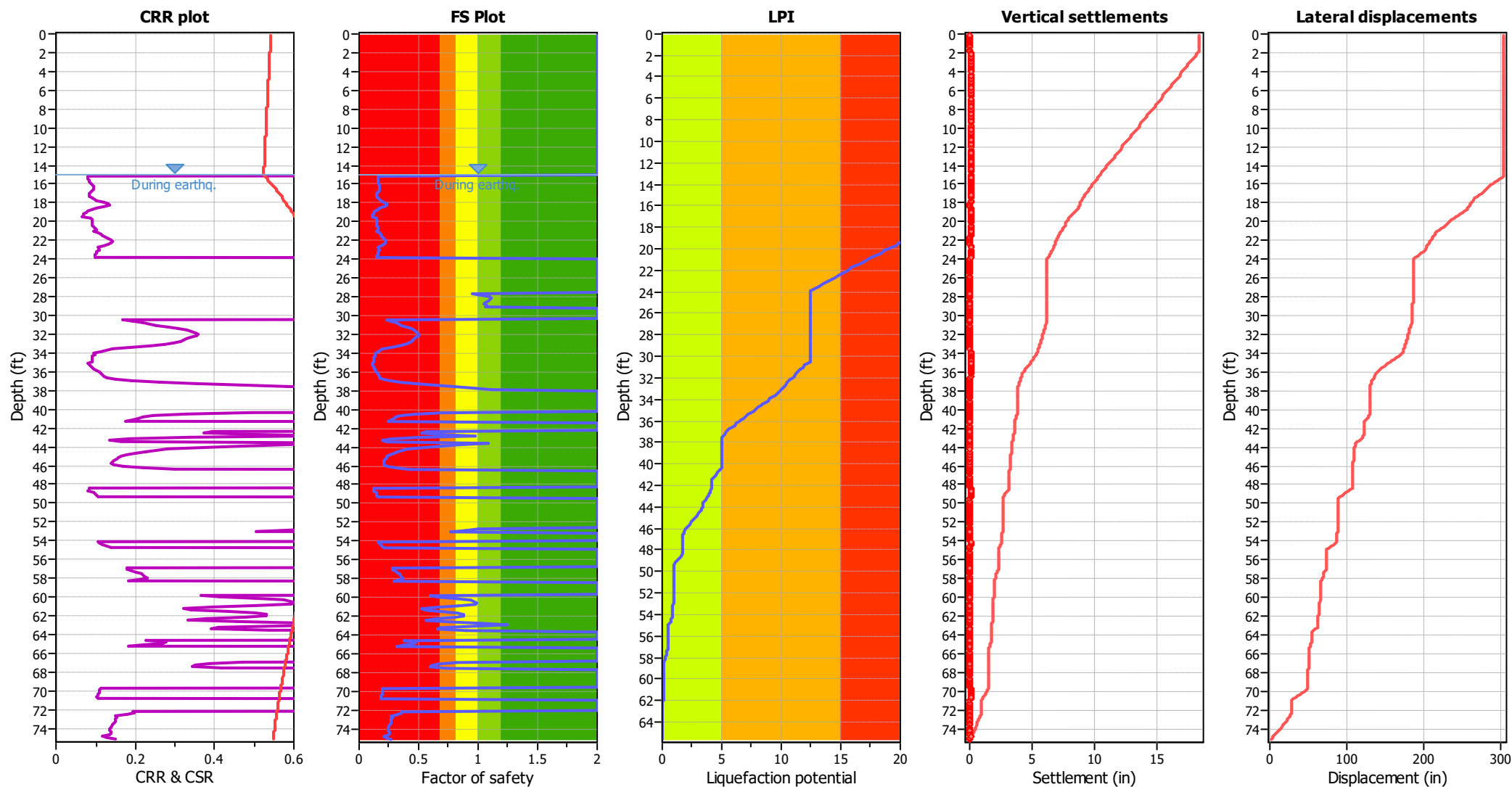
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBTn legend

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

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft
Fines correction method:	Robertson (2009)	Average results interval:	5
Points to test:	Based on Ic value	Ic cut-off value:	2.60
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT
Peak ground acceleration:	1.03	Use fill:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A

Fill weight:	N/A
Transition detect. applied:	Yes
$K_0$ applied:	No
Clay like behavior applied:	All soils
Limit depth applied:	No
Limit depth:	N/A

## F.S. color scheme

<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

## LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk

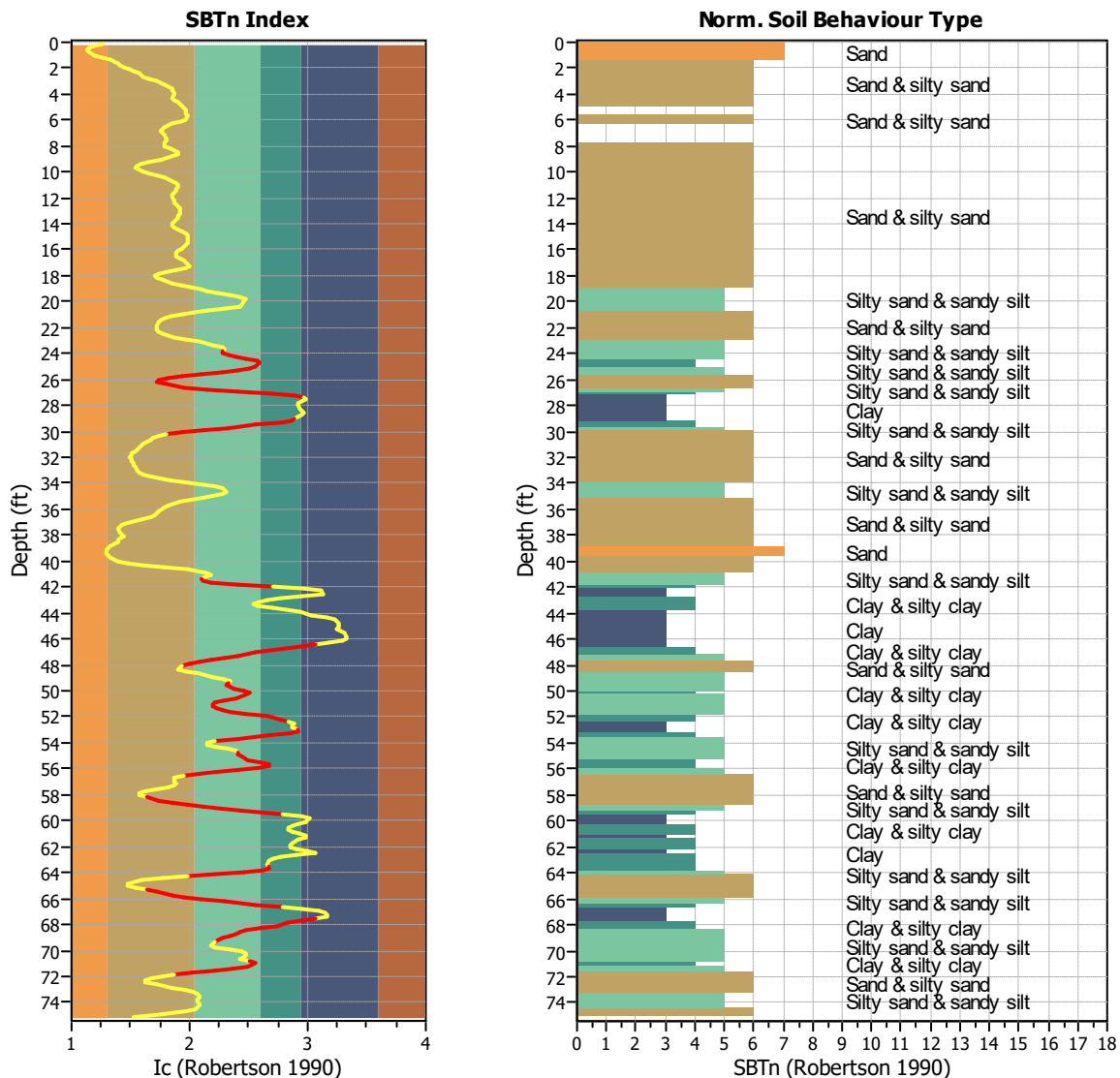
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



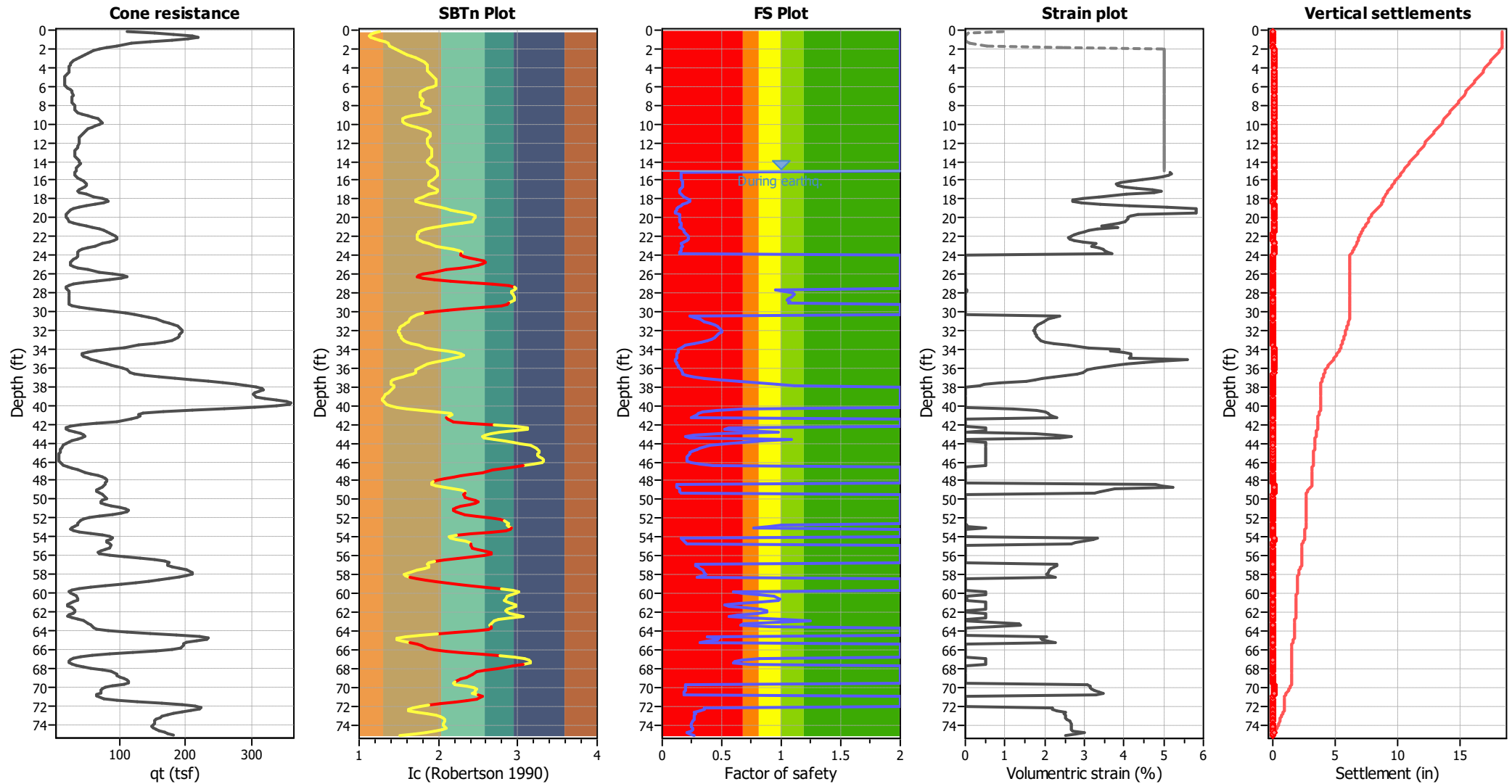
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 129  
 Exclusion percentage: 28.17%  
 Number of layers detected: 17

## Estimation of post-earthquake settlements



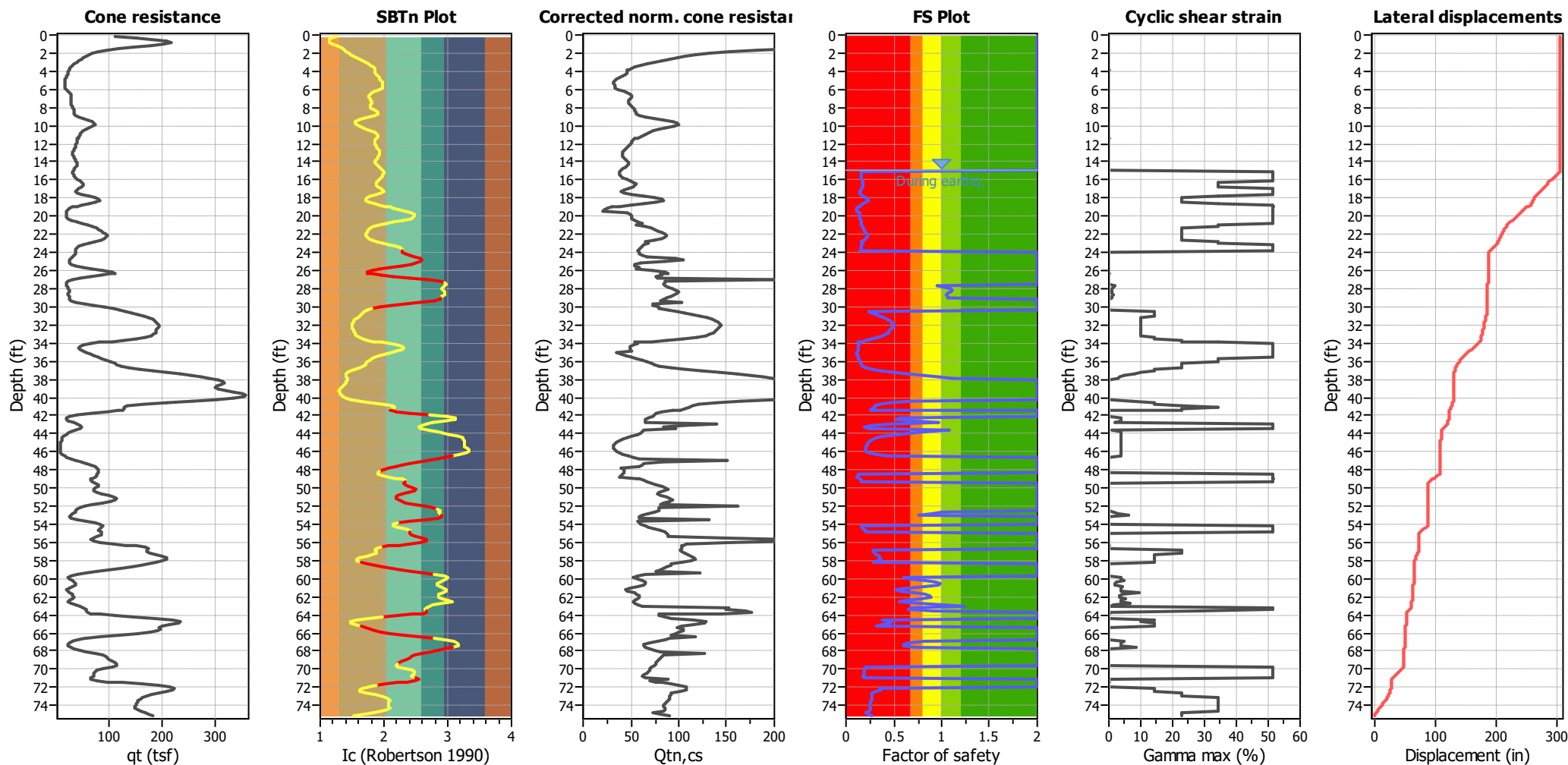
### Abbreviations

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



## Estimation of post-earthquake lateral Displacements

Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

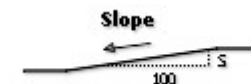
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition

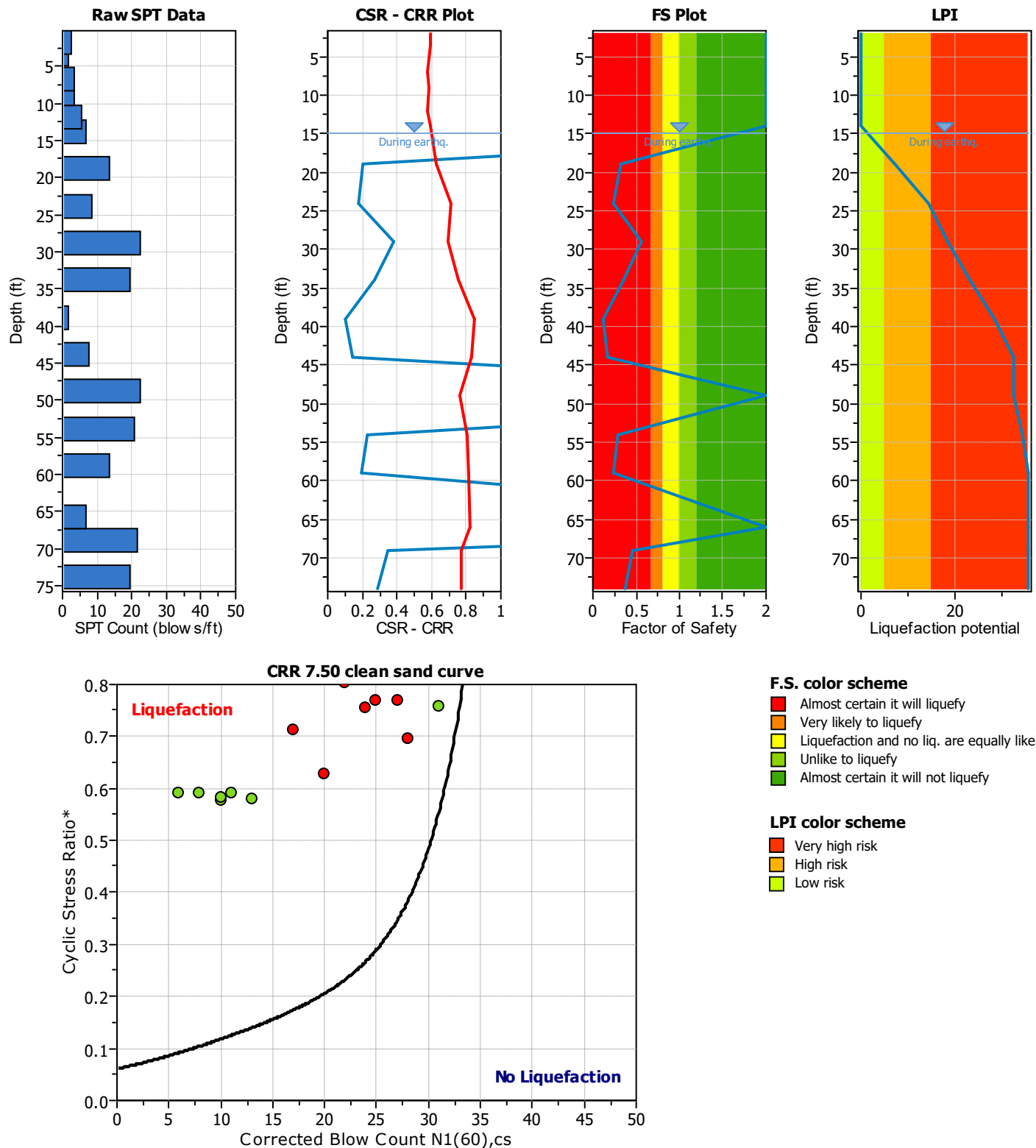




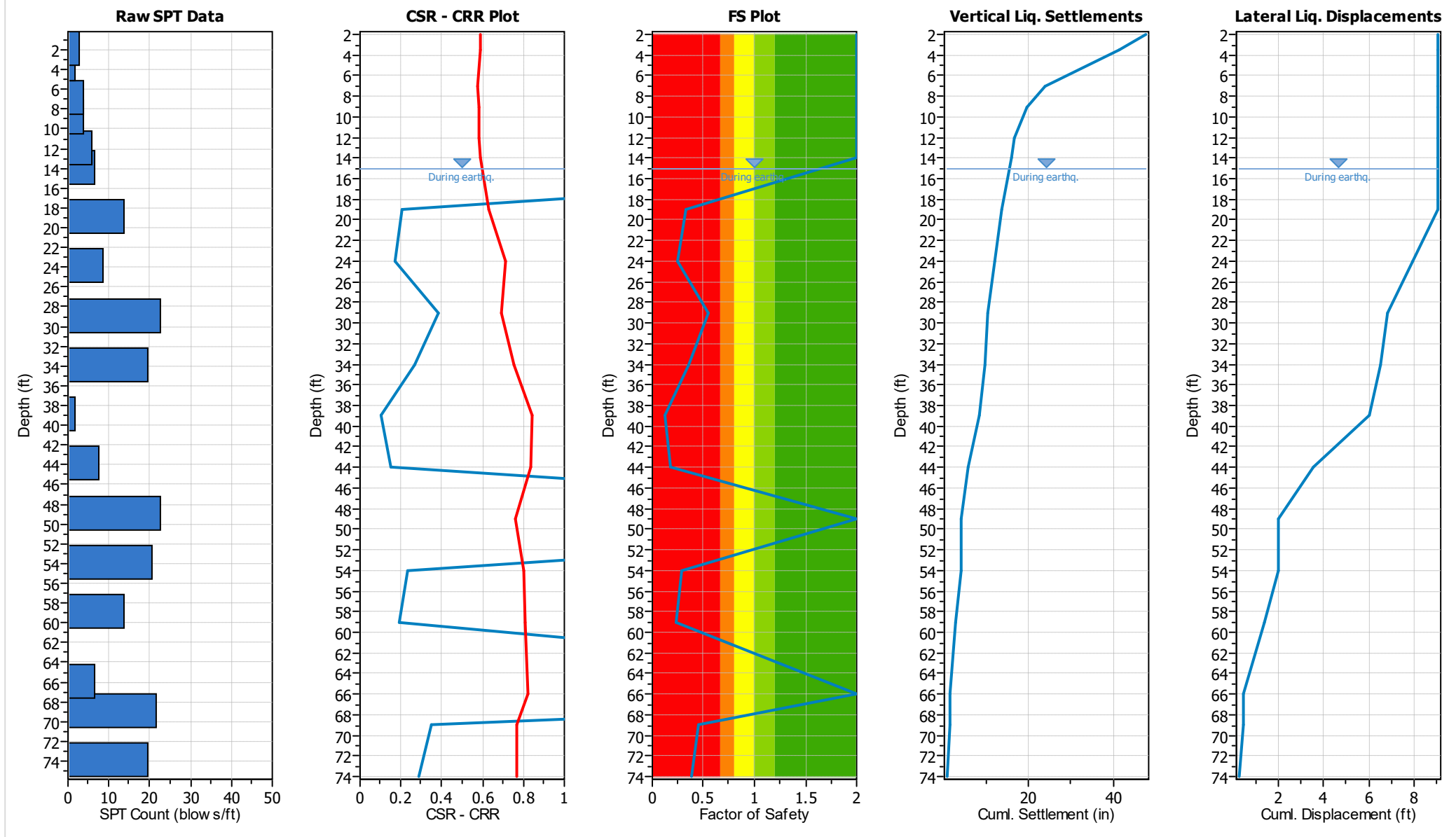
## SPT BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Library**
**SPT Name: DH #1**
**Location : High Street and Moorpark Avenue**
**:: Input parameters and analysis properties ::**

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	37.50 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	15.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude $M_w$ :	6.90 ft
Borehole diameter:	200mm	Peak ground acceleration:	1.03 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.30		





**:: Overall Liquefaction Assessment Analysis Plots ::**

**:: Field input data ::**

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.00	3	12.00	98.00	2.00	No
3.50	2	12.00	98.00	2.00	No
7.00	4	12.00	105.00	4.00	No
9.00	4	15.00	105.00	3.00	No
12.00	6	15.00	111.00	2.00	No
14.00	7	7.00	111.00	3.00	Yes
19.00	14	7.00	111.00	7.00	Yes
24.00	9	23.00	108.00	5.00	Yes
29.00	23	7.00	107.00	5.00	Yes
34.00	20	7.00	107.00	5.00	Yes
39.00	2	50.00	112.00	5.00	Yes
44.00	8	50.00	112.00	5.00	Yes
49.00	23	25.00	112.00	5.00	Yes
54.00	21	3.00	112.00	5.00	Yes
59.00	14	25.00	112.00	5.00	Yes
66.00	7	63.00	112.00	3.00	No
69.00	22	24.00	112.00	3.00	Yes
74.00	20	24.00	112.00	3.00	Yes

**Abbreviations**

Depth:	Depth at which test was performed (ft)
SPT Field Value:	Number of blows per foot
Fines Content:	Fines content at test depth (%)
Unit Weight:	Unit weight at test depth (pcf)
Infl. Thickness:	Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy:	User defined switch for excluding/including test depth from the analysis procedure

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
2.00	3	98.00	0.10	0.00	0.10	0.55	1.70	1.30	1.15	0.75	1.00	6	12.00	2.07	8	4.000
3.50	2	98.00	0.17	0.00	0.17	0.58	1.70	1.30	1.15	0.75	1.00	4	12.00	2.07	6	4.000
7.00	4	105.00	0.36	0.00	0.36	0.52	1.70	1.30	1.15	0.80	1.00	8	12.00	2.07	10	4.000
9.00	4	105.00	0.46	0.00	0.46	0.51	1.53	1.30	1.15	0.80	1.00	7	15.00	3.26	10	4.000
12.00	6	111.00	0.63	0.00	0.63	0.50	1.30	1.30	1.15	0.85	1.00	10	15.00	3.26	13	4.000
14.00	7	111.00	0.74	0.00	0.74	0.53	1.21	1.30	1.15	0.85	1.00	11	7.00	0.14	11	4.000
19.00	14	111.00	1.02	0.00	1.02	0.44	1.02	1.30	1.15	0.95	1.00	20	7.00	0.14	20	0.206
24.00	9	108.00	1.29	0.00	1.29	0.48	0.91	1.30	1.15	0.95	1.00	12	23.00	4.88	17	0.174
29.00	23	107.00	1.55	0.00	1.55	0.37	0.87	1.30	1.15	0.95	1.00	28	7.00	0.14	28	0.384
34.00	20	107.00	1.82	0.00	1.82	0.41	0.80	1.30	1.15	1.00	1.00	24	7.00	0.14	24	0.268
39.00	2	112.00	2.10	0.05	2.05	0.60	0.67	1.30	1.15	1.00	1.00	2	50.00	5.61	8	0.105
44.00	8	112.00	2.38	0.20	2.18	0.52	0.69	1.30	1.15	1.00	1.00	8	50.00	5.61	14	0.148
49.00	23	112.00	2.66	0.36	2.30	0.37	0.75	1.30	1.15	1.00	1.00	26	25.00	5.07	31	4.000
54.00	21	112.00	2.94	0.51	2.43	0.42	0.70	1.30	1.15	1.00	1.00	22	3.00	0.00	22	0.233
59.00	14	112.00	3.22	0.67	2.55	0.46	0.66	1.30	1.15	1.00	1.00	14	25.00	5.07	19	0.194
66.00	7	112.00	3.61	0.89	2.72	0.55	0.60	1.30	1.15	1.00	1.00	6	63.00	5.59	12	4.000
69.00	22	112.00	3.78	0.98	2.80	0.39	0.68	1.30	1.15	1.00	1.00	22	24.00	4.98	27	0.347
74.00	20	112.00	4.06	1.14	2.92	0.42	0.65	1.30	1.15	1.00	1.00	20	24.00	4.98	25	0.290

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	CRR <sub>7.5</sub>
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**Abbreviations**

$\sigma_v$ : Total stress during SPT test (tsf)  
 $u_o$ : Water pore pressure during SPT test (tsf)  
 $\sigma'_{vo}$ : Effective overburden pressure during SPT test (tsf)  
m: Stress exponent normalization factor  
 $C_N$ : Overburden correction factor  
 $C_E$ : Energy correction factor  
 $C_B$ : Borehole diameter correction factor  
 $C_R$ : Rod length correction factor  
 $C_S$ : Liner correction factor  
 $N_{1(60)}$ : Corrected  $N_{SPT}$  to a 60% energy ratio  
 $\Delta(N_1)_{60}$ : Equivalent clean sand adjustment  
 $N_{1(60)cs}$ : Corrected  $N_{1(60)}$  value for fines content  
CRR<sub>7.5</sub>: Cyclic resistance ratio for M=7.5

**:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::**

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	$MSF_{max}$	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	$K_{sigma}$	CSR*	FS	
2.00	98.00	0.10	0.00	0.10	1.00	1.00	0.670	1.15	8	1.03	0.649	1.10	0.590	2.000	🟢
3.50	98.00	0.17	0.00	0.17	1.00	1.00	0.667	1.13	6	1.03	0.649	1.10	0.590	2.000	🟢
7.00	105.00	0.36	0.00	0.36	0.98	1.00	0.659	1.19	10	1.04	0.633	1.10	0.575	2.000	🟢
9.00	105.00	0.46	0.00	0.46	0.98	1.00	0.654	1.19	10	1.04	0.628	1.08	0.583	2.000	🟢
12.00	111.00	0.63	0.00	0.63	0.96	1.00	0.645	1.26	13	1.06	0.611	1.05	0.580	2.000	🟢
14.00	111.00	0.74	0.00	0.74	0.95	1.00	0.639	1.21	11	1.05	0.611	1.03	0.591	2.000	🟢
19.00	111.00	1.02	0.12	0.89	0.93	1.00	0.711	1.49	20	1.11	0.643	1.02	0.628	0.328	🔴
24.00	108.00	1.29	0.28	1.00	0.90	1.00	0.775	1.38	17	1.08	0.717	1.01	0.712	0.244	🔴
29.00	107.00	1.55	0.44	1.12	0.88	1.00	0.818	1.88	28	1.19	0.688	0.99	0.695	0.552	🔴
34.00	107.00	1.82	0.59	1.23	0.85	1.00	0.843	1.67	24	1.14	0.737	0.98	0.755	0.355	🔴
39.00	112.00	2.10	0.75	1.35	0.82	1.00	0.853	1.15	8	1.03	0.826	0.98	0.844	0.124	🔴
44.00	112.00	2.38	0.90	1.48	0.79	1.00	0.855	1.29	14	1.06	0.805	0.96	0.835	0.177	🔴
49.00	112.00	2.66	1.06	1.60	0.76	1.00	0.849	2.06	31	1.23	0.692	0.91	0.759	2.000	🟢
54.00	112.00	2.94	1.22	1.72	0.73	1.00	0.840	1.58	22	1.12	0.747	0.93	0.803	0.290	🔴
59.00	112.00	3.22	1.37	1.85	0.71	1.00	0.827	1.45	19	1.10	0.753	0.93	0.811	0.239	🔴
66.00	112.00	3.61	1.59	2.02	0.67	1.00	0.806	1.24	12	1.05	0.767	0.94	0.820	2.000	🟢
69.00	112.00	3.78	1.68	2.10	0.66	1.00	0.796	1.82	27	1.18	0.677	0.88	0.770	0.450	🔴
74.00	112.00	4.06	1.84	2.22	0.64	1.00	0.781	1.72	25	1.15	0.676	0.88	0.769	0.377	🔴

**Abbreviations**

$\sigma_{v,eq}$ : Total overburden pressure at test point, during earthquake (tsf)  
 $u_{o,eq}$ : Water pressure at test point, during earthquake (tsf)  
 $\sigma'_{vo,eq}$ : Effective overburden pressure, during earthquake (tsf)  
 $r_d$ : Nonlinear shear mass factor  
 $\alpha$ : Improvement factor due to stone columns  
CSR: Cyclic Stress Ratio  
MSF: Magnitude Scaling Factor  
CSR<sub>eq,M=7.5</sub>: CSR adjusted for M=7.5  
 $K_{\sigma_{ma}}$ : Effective overburden stress factor  
CSR\*: CSR fully adjusted  
FS: Calculated factor of safety against soil liquefaction

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	$I_L$
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**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	I <sub>L</sub>
2.00	2.000	0.00	9.70	1.50	0.00
3.50	2.000	0.00	9.47	1.50	0.00
7.00	2.000	0.00	8.93	3.50	0.00
9.00	2.000	0.00	8.63	2.00	0.00
12.00	2.000	0.00	8.17	3.00	0.00
14.00	2.000	0.00	7.87	2.00	0.00
19.00	0.328	0.67	7.10	5.00	7.28
24.00	0.244	0.76	6.34	5.00	7.31
29.00	0.552	0.45	5.58	5.00	3.81
34.00	0.355	0.64	4.82	5.00	4.73
39.00	0.124	0.88	4.06	5.00	5.42
44.00	0.177	0.82	3.29	5.00	4.13
49.00	2.000	0.00	2.53	5.00	0.00
54.00	0.290	0.71	1.77	5.00	1.92
59.00	0.239	0.76	1.01	5.00	1.17
66.00	2.000	0.00	0.00	0.00	0.00
69.00	0.450	0.00	0.00	0.00	0.00
74.00	0.377	0.00	0.00	0.00	0.00

**Overall potential I<sub>L</sub> : 35.76**I<sub>L</sub> = 0.00 - No liquefactionI<sub>L</sub> between 0.00 and 5 - Liquefaction not probableI<sub>L</sub> between 5 and 15 - Liquefaction probableI<sub>L</sub> > 15 - Liquefaction certain**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60</sub>	T <sub>av</sub>	p	G <sub>max</sub> (tsf)	a	b	γ	ε <sub>15</sub>	N <sub>c</sub>	ε <sub>Nc</sub> (%)	Δh (ft)	ΔS (in)
2.00	6	0.07	0.07	0.23	0.13	25789.58	0.05	0.16	10.08	13.35	2.00	6.406
3.50	4	0.11	0.11	0.28	0.13	18434.08	0.10	0.43	10.08	36.24	2.00	17.396
7.00	8	0.23	0.24	0.47	0.14	11908.57	0.02	0.05	10.08	4.45	4.00	4.275
9.00	7	0.30	0.31	0.53	0.14	10194.92	0.02	0.05	10.08	4.25	3.00	3.060
12.00	10	0.40	0.42	0.68	0.15	8470.78	0.01	0.02	10.08	1.72	2.00	0.824
14.00	11	0.47	0.49	0.70	0.15	7681.29	0.02	0.03	10.08	2.83	3.00	2.038

**Cumulative settlement: 33.999****Abbreviations**T<sub>av</sub>: Average cyclic shear stress

p: Average stress

G<sub>max</sub>: Maximum shear modulus (tsf)

a, b: Shear strain formula variables

γ: Average shear strain

ε<sub>15</sub>: Volumetric strain after 15 cyclesN<sub>c</sub>: Number of cyclesε<sub>Nc</sub>: Volumetric strain for number of cycles N<sub>c</sub> (%)

Δh: Thickness of soil layer (in)

ΔS: Settlement of soil layer (in)

**:: Vertical & Lateral displacements estimation for saturated sands ::**

<b>Depth (ft)</b>	<b>(N<sub>1</sub>)<sub>60cs</sub></b>	<b>γ<sub>lim</sub> (%)</b>	<b>F<sub>a</sub></b>	<b>FS<sub>liq</sub></b>	<b>γ<sub>max</sub> (%)</b>	<b>e<sub>v</sub> (%)</b>	<b>dz (ft)</b>	<b>S<sub>v-1D</sub> (in)</b>	<b>LDI (ft)</b>
19.00	20	15.90	0.52	0.328	15.90	2.30	7.00	1.935	1.11
24.00	17	22.15	0.67	0.244	22.15	2.62	5.00	1.572	1.11
29.00	28	6.08	0.04	0.552	6.08	1.29	5.00	0.777	0.30
34.00	24	10.02	0.29	0.355	10.02	1.97	5.00	1.181	0.50
39.00	8	50.00	0.94	0.124	50.00	4.23	5.00	2.536	2.50
44.00	14	30.65	0.79	0.177	30.65	3.02	5.00	1.810	1.53
49.00	31	4.04	-0.16	2.000	0.00	0.00	5.00	0.000	0.00
54.00	22	12.67	0.41	0.290	12.67	2.13	5.00	1.275	0.63
59.00	19	17.78	0.57	0.239	17.78	2.40	5.00	1.441	0.89
66.00	12	0.00	0.00	2.000	0.00	0.00	3.00	0.000	0.00
69.00	27	6.92	0.11	0.450	6.92	1.53	3.00	0.549	0.21
74.00	25	8.88	0.23	0.377	8.88	1.90	3.00	0.683	0.27

**Cumulative settlements: 13.760 9.05****Abbreviations**

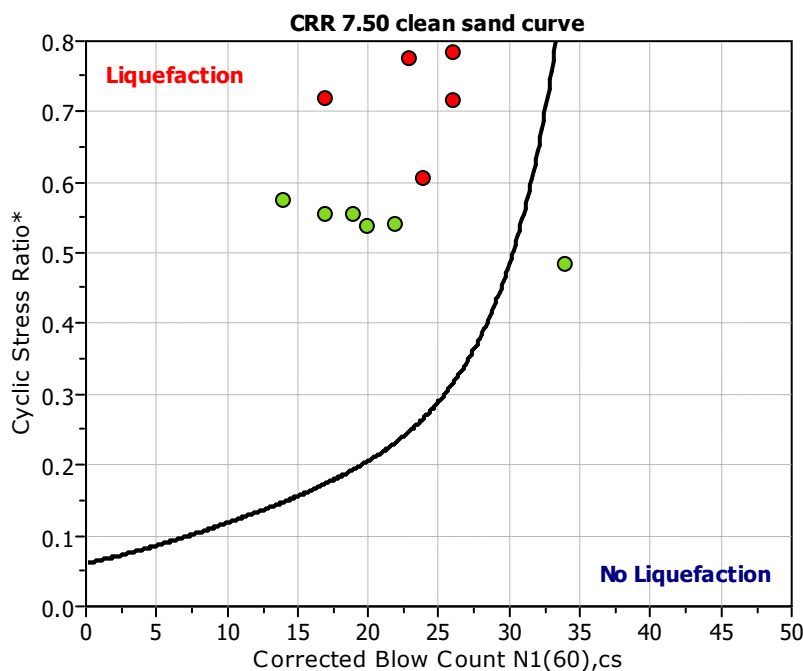
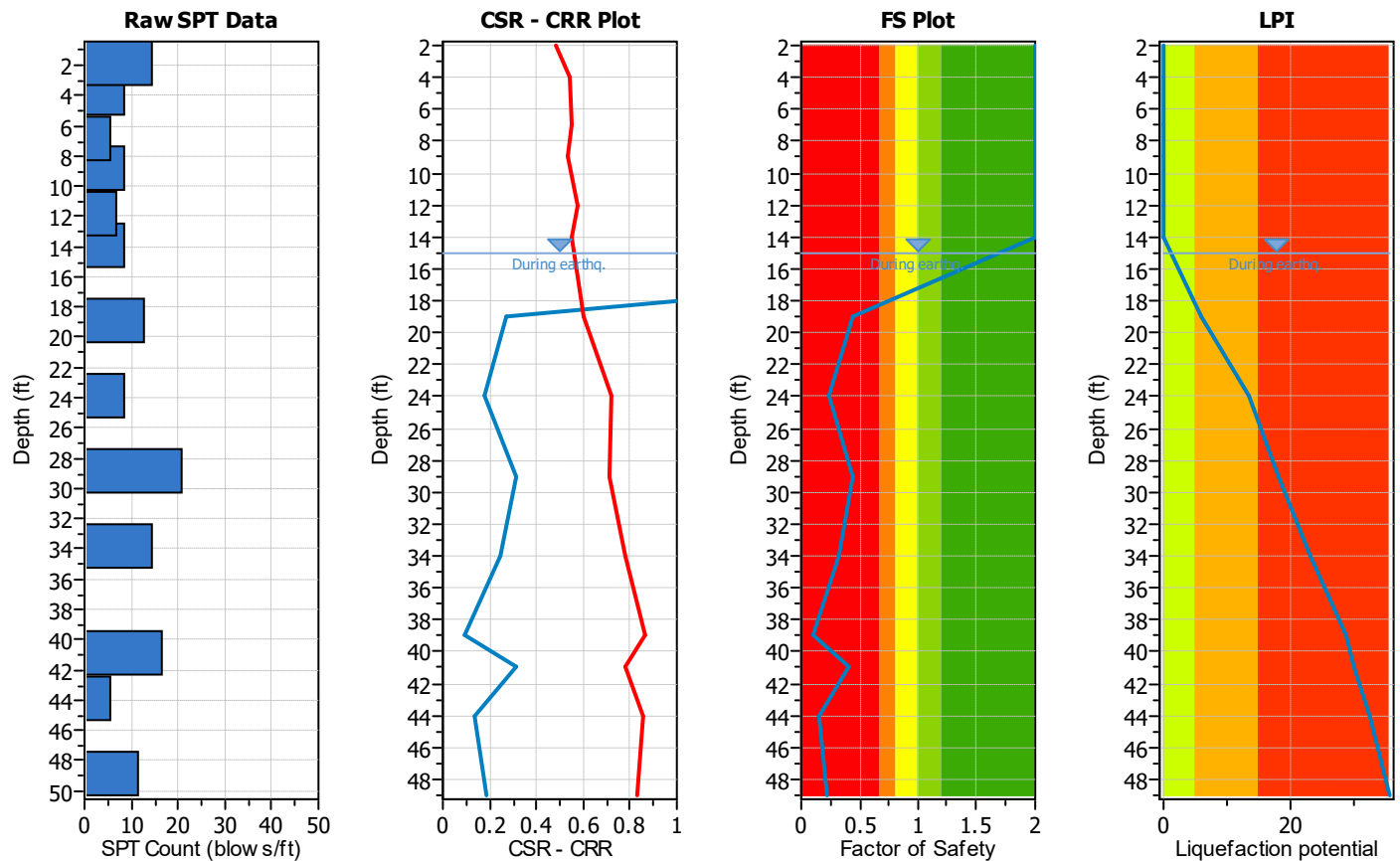
γ <sub>lim</sub> :	Limiting shear strain (%)
F <sub>a</sub> /N:	Maximum shear strain factor
γ <sub>max</sub> :	Maximum shear strain (%)
e <sub>v</sub> ::	Post liquefaction volumetric strain (%)
S <sub>v-1D</sub> :	Estimated vertical settlement (in)
LDI:	Estimated lateral displacement (ft)



## SPT BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Library**
**SPT Name: DH #2**
**Location : High Street and Moorpark Avenue**
**:: Input parameters and analysis properties ::**

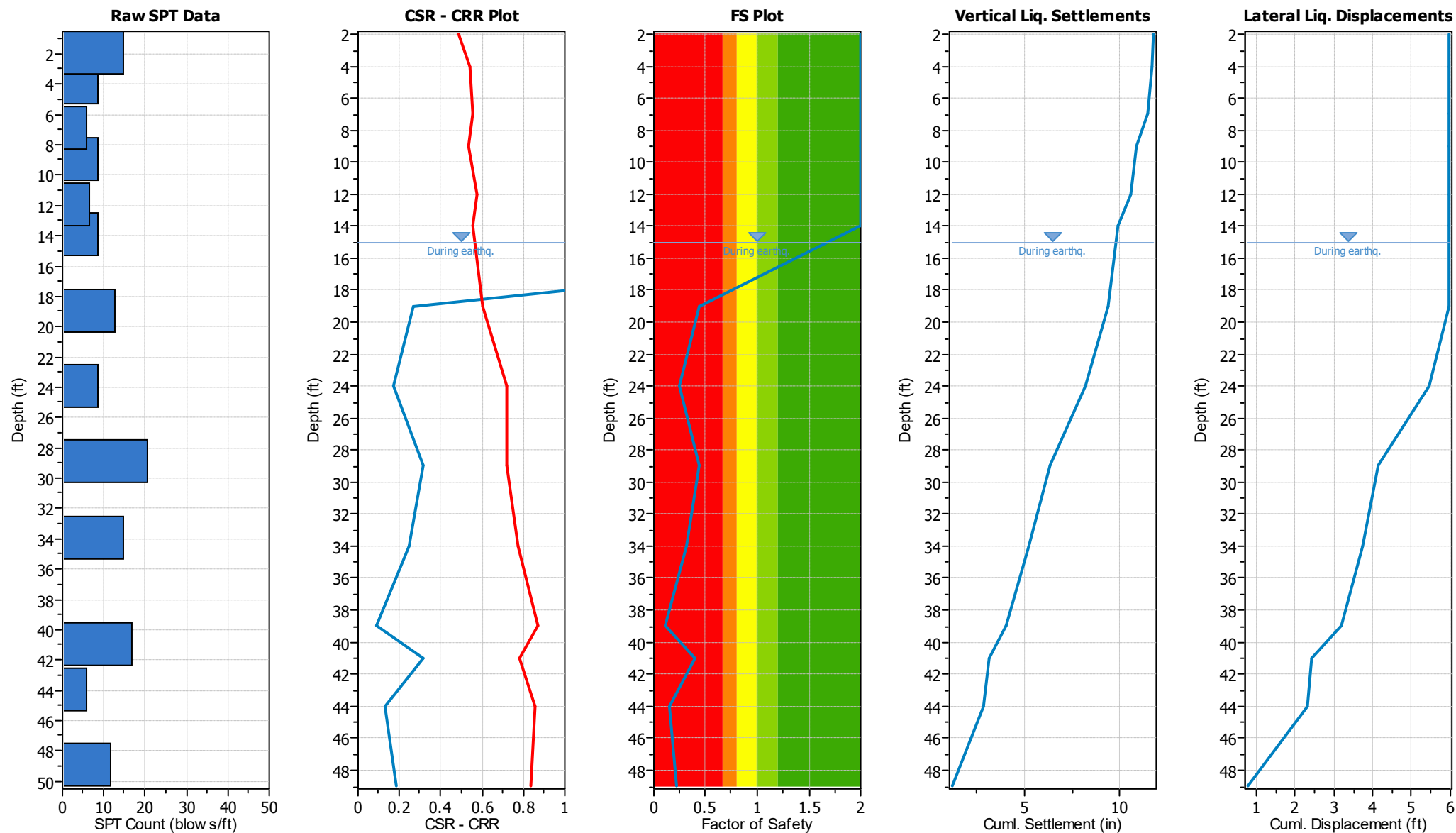
Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	37.50 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	15.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude $M_w$ :	6.90 ft
Borehole diameter:	200mm	Peak ground acceleration:	1.03 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.30		


**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

**:: Overall Liquefaction Assessment Analysis Plots ::**

**:: Field input data ::**

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.00	15	22.00	102.00	3.00	No
4.00	9	22.00	102.00	3.00	No
7.00	6	22.00	101.00	3.00	No
9.00	9	22.00	101.00	3.00	No
12.00	7	12.00	101.00	2.00	No
14.00	9	27.00	106.00	4.00	Yes
19.00	13	27.00	106.00	5.00	Yes
24.00	9	29.00	95.00	6.00	Yes
29.00	21	6.00	95.00	5.00	Yes
34.00	15	27.00	97.00	5.00	Yes
39.00	0	52.00	118.00	1.50	Yes
41.00	17	52.00	118.00	1.50	Yes
44.00	6	47.00	118.00	4.00	Yes
49.00	12	27.00	118.00	4.00	Yes

**Abbreviations**

Depth: Depth at which test was performed (ft)  
 SPT Field Value: Number of blows per foot  
 Fines Content: Fines content at test depth (%)  
 Unit Weight: Unit weight at test depth (pcf)  
 Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)  
 Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
2.00	15	102.00	0.10	0.00	0.10	0.32	1.70	1.30	1.15	0.75	1.00	29	22.00	4.77	34	4.000
4.00	9	102.00	0.20	0.00	0.20	0.40	1.70	1.30	1.15	0.75	1.00	17	22.00	4.77	22	4.000
7.00	6	101.00	0.36	0.00	0.36	0.45	1.63	1.30	1.15	0.80	1.00	12	22.00	4.77	17	4.000
9.00	9	101.00	0.46	0.00	0.46	0.42	1.43	1.30	1.15	0.80	1.00	15	22.00	4.77	20	4.000
12.00	7	101.00	0.61	0.00	0.61	0.49	1.31	1.30	1.15	0.85	1.00	12	12.00	2.07	14	4.000
14.00	9	106.00	0.71	0.00	0.71	0.44	1.19	1.30	1.15	0.85	1.00	14	27.00	5.21	19	4.000
19.00	13	106.00	0.98	0.00	0.98	0.40	1.03	1.30	1.15	0.95	1.00	19	27.00	5.21	24	0.268
24.00	9	95.00	1.22	0.00	1.22	0.47	0.94	1.30	1.15	0.95	1.00	12	29.00	5.32	17	0.174
29.00	21	95.00	1.45	0.00	1.45	0.39	0.88	1.30	1.15	0.95	1.00	26	6.00	0.03	26	0.316
34.00	15	97.00	1.70	0.00	1.70	0.42	0.82	1.30	1.15	1.00	1.00	18	27.00	5.21	23	0.249
39.00	0	118.00	1.99	0.05	1.94	0.63	0.68	1.30	1.15	1.00	1.00	0	52.00	5.61	6	0.092
41.00	17	118.00	2.11	0.11	2.00	0.41	0.77	1.30	1.15	1.00	1.00	20	52.00	5.61	26	0.316
44.00	6	118.00	2.29	0.20	2.08	0.54	0.69	1.30	1.15	1.00	1.00	6	47.00	5.61	12	0.132
49.00	12	118.00	2.58	0.36	2.22	0.47	0.70	1.30	1.15	1.00	1.00	13	27.00	5.21	18	0.184



**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	CRR <sub>7.5</sub>
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**Abbreviations**

$\sigma_v$ :	Total stress during SPT test (tsf)
$u_o$ :	Water pore pressure during SPT test (tsf)
$\sigma'_{vo}$ :	Effective overburden pressure during SPT test (tsf)
m:	Stress exponent normalization factor
$C_N$ :	Overburden correction factor
$C_E$ :	Energy correction factor
$C_B$ :	Borehole diameter correction factor
$C_R$ :	Rod length correction factor
$C_S$ :	Liner correction factor
$N_{1(60)}$ :	Corrected $N_{SPT}$ to a 60% energy ratio
$\Delta(N_1)_{60}$ :	Equivalent clean sand adjustment
$N_{1(60)cs}$ :	Corrected $N_{1(60)}$ value for fines content
CRR <sub>7.5</sub> :	Cyclic resistance ratio for M=7.5

**:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::**

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	MSF <sub>max</sub>	$(N_1)_{60cs}$	MSF	CSR <sub>eq,M=7.5</sub>	$K_{\sigma}$	CSR*	FS
2.00	102.00	0.10	0.00	0.10	1.00	1.00	0.670	2.20	34	1.26	0.533	1.10	0.485	2.000
4.00	102.00	0.20	0.00	0.20	0.99	1.00	0.666	1.58	22	1.12	0.593	1.10	0.539	2.000
7.00	101.00	0.36	0.00	0.36	0.98	1.00	0.659	1.38	17	1.08	0.609	1.10	0.554	2.000
9.00	101.00	0.46	0.00	0.46	0.98	1.00	0.654	1.49	20	1.11	0.591	1.10	0.537	2.000
12.00	101.00	0.61	0.00	0.61	0.96	1.00	0.645	1.29	14	1.06	0.608	1.06	0.574	2.000
14.00	106.00	0.71	0.00	0.71	0.95	1.00	0.639	1.45	19	1.10	0.583	1.05	0.555	2.000
19.00	106.00	0.98	0.12	0.85	0.93	1.00	0.714	1.67	24	1.14	0.625	1.03	0.604	0.444
24.00	95.00	1.22	0.28	0.94	0.90	1.00	0.788	1.38	17	1.08	0.728	1.01	0.718	0.242
29.00	95.00	1.45	0.44	1.02	0.88	1.00	0.840	1.77	26	1.17	0.721	1.01	0.716	0.441
34.00	97.00	1.70	0.59	1.10	0.85	1.00	0.874	1.62	23	1.13	0.771	0.99	0.776	0.321
39.00	118.00	1.99	0.75	1.24	0.82	1.00	0.880	1.13	6	1.03	0.857	0.99	0.868	0.106
41.00	118.00	2.11	0.81	1.30	0.81	1.00	0.880	1.77	26	1.17	0.755	0.97	0.782	0.404
44.00	118.00	2.29	0.90	1.38	0.79	1.00	0.877	1.24	12	1.05	0.835	0.97	0.857	0.154
49.00	118.00	2.58	1.06	1.52	0.76	1.00	0.867	1.42	18	1.09	0.796	0.96	0.833	0.220

**Abbreviations**

$\sigma_{v,eq}$ :	Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$ :	Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$ :	Effective overburden pressure, during earthquake (tsf)
$r_d$ :	Nonlinear shear mass factor
$\alpha$ :	Improvement factor due to stone columns
CSR :	Cyclic Stress Ratio
MSF :	Magnitude Scaling Factor
CSR <sub>eq,M=7.5</sub> :	CSR adjusted for M=7.5
$K_{\sigma}$ :	Effective overburden stress factor
CSR*:	CSR fully adjusted
FS:	Calculated factor of safety against soil liquefaction

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	$I_L$
2.00	2.000	0.00	9.70	2.00	0.00
4.00	2.000	0.00	9.39	2.00	0.00
7.00	2.000	0.00	8.93	3.00	0.00
9.00	2.000	0.00	8.63	2.00	0.00

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	I <sub>L</sub>
12.00	2.000	0.00	8.17	3.00	0.00
14.00	2.000	0.00	7.87	2.00	0.00
19.00	0.444	0.56	7.10	5.00	6.02
24.00	0.242	0.76	6.34	5.00	7.32
29.00	0.441	0.56	5.58	5.00	4.75
34.00	0.321	0.68	4.82	5.00	4.98
39.00	0.106	0.89	4.06	5.00	5.53
41.00	0.404	0.60	3.75	2.00	1.36
44.00	0.154	0.85	3.29	3.00	2.55
49.00	0.220	0.78	2.53	5.00	3.01

**Overall potential I<sub>L</sub> : 35.53**I<sub>L</sub> = 0.00 - No liquefactionI<sub>L</sub> between 0.00 and 5 - Liquefaction not probableI<sub>L</sub> between 5 and 15 - Liquefaction probableI<sub>L</sub> > 15 - Liquefaction certain**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60</sub>	T <sub>av</sub>	p	G <sub>max</sub> (tsf)	a	b	γ	ε <sub>15</sub>	N <sub>c</sub>	ε <sub>Nc</sub> (%)	Δh (ft)	ΔS (in)
2.00	29	0.07	0.07	0.38	0.13	25177.92	0.00	0.00	10.08	0.09	3.00	0.067
4.00	17	0.14	0.14	0.46	0.13	16611.23	0.00	0.00	10.08	0.35	3.00	0.254
7.00	12	0.23	0.24	0.56	0.14	11903.54	0.01	0.01	10.08	0.78	3.00	0.560
9.00	15	0.30	0.31	0.67	0.14	10245.08	0.01	0.01	10.08	0.47	3.00	0.340
12.00	12	0.39	0.41	0.69	0.15	8626.56	0.01	0.02	10.08	1.36	2.00	0.651
14.00	14	0.46	0.48	0.82	0.15	7833.59	0.01	0.01	10.08	0.54	4.00	0.516

**Cumulative settlements: 2.387****Abbreviations**T<sub>av</sub>: Average cyclic shear stress

p: Average stress

G<sub>max</sub>: Maximum shear modulus (tsf)

a, b: Shear strain formula variables

γ: Average shear strain

ε<sub>15</sub>: Volumetric strain after 15 cyclesN<sub>c</sub>: Number of cyclesε<sub>Nc</sub>: Volumetric strain for number of cycles N<sub>c</sub> (%)

Δh: Thickness of soil layer (in)

ΔS: Settlement of soil layer (in)

**:: Vertical & Lateral displacements estimation for saturated sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60cs</sub>	γ <sub>lim</sub> (%)	F <sub>a</sub>	FS <sub>liq</sub>	γ <sub>max</sub> (%)	e <sub>v</sub> (%)	dz (ft)	S <sub>v-1D</sub> (in)	LDI (ft)
19.00	24	10.02	0.29	0.444	10.02	1.97	5.00	1.181	0.50
24.00	17	22.15	0.67	0.242	22.15	2.62	6.00	1.887	1.33
29.00	26	7.85	0.17	0.441	7.85	1.79	5.00	1.076	0.39
34.00	23	11.27	0.35	0.321	11.27	2.04	5.00	1.227	0.56
39.00	6	50.00	0.95	0.106	50.00	4.86	1.50	0.875	0.75
41.00	26	7.85	0.17	0.404	7.85	1.79	1.50	0.323	0.12
44.00	12	38.03	0.86	0.154	38.03	3.34	4.00	1.604	1.52

**:: Vertical & Lateral displacements estimation for saturated sands ::**

<b>Depth (ft)</b>	<b>(N<sub>1</sub>)<sub>60cs</sub></b>	<b>γ<sub>lim</sub> (%)</b>	<b>F<sub>a</sub></b>	<b>FS<sub>liq</sub></b>	<b>γ<sub>max</sub> (%)</b>	<b>e<sub>v</sub> (%)</b>	<b>dz (ft)</b>	<b>S<sub>v-1D</sub> (in)</b>	<b>LDI (ft)</b>
49.00	18	19.85	0.62	0.220	19.85	2.51	4.00	1.204	0.79

**Cumulative settlements:    9.376       5.97**

**Abbreviations**

γ <sub>lim</sub> :	Limiting shear strain (%)
F <sub>a</sub> /N:	Maximum shear strain factor
γ <sub>max</sub> :	Maximum shear strain (%)
e <sub>v</sub> ::	Post liquefaction volumetric strain (%)
S <sub>v-1D</sub> :	Estimated vertical settlement (in)
LDI:	Estimated lateral displacement (ft)

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## OAKRIDGE GEOSCIENCE, INC.

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# **PRELIMINARY GEOTECHNICAL REPORT PROPOSED MOORPARK LIBRARY MOORPARK, CALIFORNIA**

Prepared for:  
City of Moorpark

June 17, 2017  
Job No. 030.003



PO Box 2540, Camarillo, California 93011

[www.Oakridgegeo.com](http://www.Oakridgegeo.com)

805-368-7765

June 17, 2017

Project No. 030.003

City of Moorpark  
799 Moorpark Avenue  
Moorpark, California 93021

Attention: Mr. Chris Ball

Subject: Preliminary Geotechnical Report, Proposed Moorpark Library, Moorpark, California

Dear Mr. Ball:

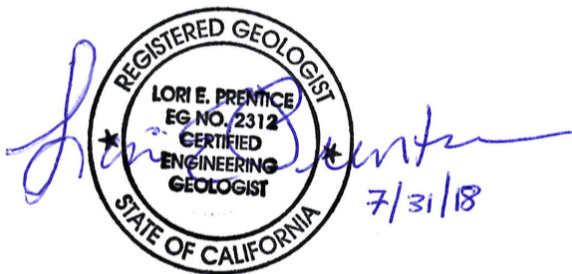
Oakridge Geoscience, Inc. (OGI) is pleased to provide this preliminary geotechnical report for the proposed library project in Moorpark, California. The purpose of the preliminary geotechnical study was to evaluate if seismic related geohazards including liquefaction, dry seismic settlement and lateral spreading, and hydroconsolidation (collapse) potential are present at the site and the need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking.

This report summarizes the geotechnical data review, field exploration, geotechnical laboratory testing, our evaluations, and our opinions of the site conditions based on the work performed. A supplemental geotechnical design report will be required as part of project design once the building type and location are selected.

#### Closure

Thank you for the opportunity to provide geotechnical services to the City of Moorpark for this project. Please contact us if you have any questions on the information presented herein or if we can be of further assistance on this project.

SINCERELY,  
OAKRIDGE GEOSCIENCE, INC.



Lori E. Prentice, CEG  
President



Rory "Tony" Robinson, GE  
Principal Geotechnical Engineer

Copies Submitted: (1 electronic copy (pdf) via email)

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APPENDIX B	LABORATORY TESTING
APPENDIX C	LIQUEFACTION EVALUATION



## **1.0 INTRODUCTION**

### **1.1 PROPOSED PROJECT AND PURPOSE**

The City of Moorpark (City) is planning to build a new library building northwest of High Street and Moorpark Avenue near the location shown on Plate 1. As described in the staff report dated November 30, 2016, the library facility has not been designed but is anticipated to consist of an 18,000-square-foot, one-story building of standard wood frame construction.

A recent geotechnical study for the nearby Area Housing Authority (AHA) site development south of Everett Street (Plate 1) recommended ground improvement to reduce potential foundation settlement associated with liquefaction and dry seismic settlement from earthquake-induced ground shaking due to subsurface conditions at that site (Geotechnologies, Inc., 2016). The City retained Oakridge Geoscience, Inc. (OGI) to perform a preliminary geotechnical evaluation of the proposed library site to evaluate whether the conditions onsite will require subsurface ground improvement similar to the AHA site, prior to hiring an architect or engineer to design the proposed structure.

### **1.2 WORK PERFORMED AND AUTHORIZATION**

The work performed for this study consisted of data review, project coordination, field exploration, laboratory testing, and geotechnical evaluation and reporting. The work was performed in general accordance with our revised proposal dated April 3, 2017 and was authorized by receipt of a Professional Services Agreement from the City, dated April 13, 2017.

#### **1.2.1 Data Review and Project Coordination**

We reviewed readily available published data and existing geotechnical reports provided by the City for the nearby AHA site to the east (Geotechnologies, Inc., 2016) and the Moorpark Apartments site (Gorian and Associates, 2013a) to the west. The approximate locations of the AHA and Moorpark Apartments sites are shown on Plate 1. Prior to field exploration, we performed a site reconnaissance to locate and mark the exploration locations for coordination with Underground Service Alert.

#### **1.2.2 Field Exploration**

Subsurface geologic conditions at the proposed library site were explored using a combination of cone penetrometer tests (CPTs) and drill holes near the locations shown on Plate 2. The CPT and drill hole logs are included in Appendix A.

**CPTs.** Five CPTs were advanced to depths of about 75 feet each on April 27 by Kehoe Testing & Engineering. The CPT is mounted on a 30-ton 3-axle truck and consists of an about 1.4-inch-diameter rod fitted with a cone at the base. The cone is sequentially connected to 1-meter-long rods and pushed into the subsurface at a constant rate by hydraulic rams using the weight of the truck as resistance. Additional rods are added to the rod length as the depth increases. The cone is equipped with electronic load cells which measure point (tip) resistance to the penetration and frictional resistance between the soils and the cylinder side (sleeve) of the cone. The subsurface stratigraphy and engineering parameters of the penetrated materials are inferred based on correlations of the recorded tip and sleeve properties. The CPT collects

nearly continuous data (2-centimeter intervals) and allows for efficient evaluation of seismic-related hazards, engineering properties, and stratigraphy.

Additionally, the CPT was equipped with a piezo-cone which measures excess pore pressure as a result of the penetration to further aid in evaluation of the depth to groundwater at the site. Pore-pressure dissipation tests were performed in CPT-3 and CPT-5.

Following the completion of each CPT, the rods were withdrawn, and the small-diameter holes were backfilled to the ground surface with fine bentonite chips.

**Drill Holes.** Two hollow-stem-auger drill holes, DH-1 and DH-2, were advanced near CPT-3 and CPT-4 by S/G Drilling on May 1, 2017 using a CME-85 drill rig equipped with 8-inch-diameter augers and a 140-pound automatic trip hammer. The drill holes were advanced to depths of 50 and 75 feet to help in evaluation of the subsurface conditions, to “ground truth” the CPT data, and to collect samples for laboratory testing and evaluation of liquefaction consistent with the guidelines published by the California Division of Mines and Geology (CDMG, now California Geologic Survey [CGS]), Special Publication 117A (CGS, 2008).

The drill holes were sampled at about 2.5-foot intervals to about 15 feet and at about 5-foot intervals to total depth using a combination of driven modified California and standard penetration test (SPT) samplers. In addition, bulk samples were collected from the near surface materials recovered from the auger flights. Our field geologist logged the recovered samples in general accordance with ASTM D2488 for visual soil classification. Groundwater depths encountered during drilling were measured and recorded on the drilling logs.

Following completion of drilling and sampling at each location, the drill holes were backfilled to the surface with the drill cuttings mixed with cement to create soil-cement and tamped.

### **1.2.3 Laboratory Testing**

Geotechnical laboratory testing was performed on selected earth materials sampled in the drill holes to characterize the materials and estimate relevant preliminary engineering design parameters. The testing consisted of moisture/density relationships, grainsize, Atterberg limits (plasticity), hydroconsolidation (collapse) potential, R-value, and soil chemistry for corrosion (pH, resistivity, sulfates, and chlorides).

The laboratory test results are presented on the drill hole logs (Appendix A) and in Appendix B.

### **1.2.4 Geotechnical Evaluation and Reporting**

We evaluated the field and laboratory geotechnical data, developed preliminary geotechnical engineering recommendations for the project, and prepared this report to summarize our findings, opinions and recommendations. Our report includes the following:

- Summary of soil and groundwater conditions encountered;
- Logs of CPT and drill hole explorations;
- Geologic cross sections depicting interpreted subsurface conditions;
- Laboratory test data;
- Evaluation of seismic-related hazards including fault rupture, liquefaction, dry seismic settlement and lateral spreading;
- Potential need for ground improvement;
- Preliminary design parameters for soil bearing and estimated settlement, and lateral earth pressures;
- Suitability of onsite soil for use as fill and select fill material;
- Anticipated excavation conditions; and
- Preliminary grading recommendations.

## **2.0 FINDINGS**

### **2.1 BACKGROUND**

Geotechnical studies for two nearby sites: 1) AHA site (Geotechnologies, Inc., 2016) and 2) Moorpark Apartments (Gorian and Associates, 2013a) have documented the potential for seismic-related geohazards (liquefaction, dry seismic settlement, lateral spreading) and hydroconsolidation (collapse) potential in the downtown Moorpark area. The approximate locations of the two sites relative to the proposed Moorpark Library site are shown on Plate 1.

**AHA Site.** At the AHA site, Geotechnologies, Inc. reported zones of medium dense granular soils ranging from less than one-foot to about 18-feet thick between depths of 15 to 75 feet. Their report indicated those soils could liquefy in response to the design earthquake event with settlements ranging from about two- to six-inches. On that basis, Geotechnologies recommended ground improvement to a depth of 30 feet to reduce total settlement to less than two inches and differential settlement to less than one inch. Their report indicated the structure could be supported on shallow spread footings following the recommended ground improvement. Alternatively, if the ground improvement could not reduce the total settlement to less than two inches the structure could be supported on a mat foundation. The report indicated the “most feasible ground improvement techniques could consist of a mixture of soil mixing, stone columns, aggregate piers or earthquake drains.” The final ground improvement design was to be performed by a specialized ground improvement contractor.

As a follow-up to our initial review of the AHA geotechnical report, we spoke briefly with the City’s Geotechnical review consultant, RJR Engineering. Mr. Rob Anderson with RJR

Engineering indicated seismic-related settlement issues have been reported at other locations within the City the Moorpark in addition to the AHA site. Sites closer to the Arroyo Simi drainage channel along the southern portion of the City seem to have a higher amount of estimated seismic settlement. The estimated seismic settlement in other areas in the City is variable.

**Moorpark Apartments Site.** Gorian and Associates (Gorian, 2006; 2013a; 2013b) prepared a geotechnical study for the Moorpark Apartments site directly west and northwest of the proposed Library Site (Plate 1). Gorian's evaluation of the subsurface conditions indicated the potential for up to nine inches of seismic-related settlement (liquefaction and dry seismic settlement) based on a groundwater level of 15 to 25 feet below the ground surface and an earthquake ground acceleration of 0.68g. Exploration by Gorian was limited to a depth of 50 feet, therefore, subsurface data are not available to evaluate if liquefaction could also occur at deeper depths for that site. We note Gorian (2006) indicates up to 15 inches of dry seismic settlement were estimated from CPT-3A, but the calculated value was not considered accurate and the soils in the upper portion of the CPT would be mitigated as part of site grading. Gorian recommended ground improvement consisting of overexcavation and recompaction of soils to a depth of 13 to 22 feet below the existing grade to mitigate soils susceptible to seismic-related settlement; the proposed mitigation reduced the estimated vertical seismic settlement to about one-and-one-half to four inches. Gorian also recommended the proposed structures be supported on a "strong mat" type foundation to reduce the potential for differential settlement.

## **2.2 GEOLOGIC SETTING**

The project site is located within the Transverse Ranges geologic/geomorphic province of California. That province is characterized by generally east-west-trending mountain ranges composed of sedimentary and volcanic rocks ranging in age from Cretaceous to Recent. Major east-trending folds, reverse faults, and left-lateral strike-slip faults reflect regional north-south compression and are characteristic of the Transverse Ranges. Several authors including Dibblee (1992), and Weber (1973) have mapped the Moorpark area.

The project site is located south of the confluence of two southerly draining tributaries (Walnut Canyon and an unnamed canyon) to the Arroyo Simi. As mapped by Dibblee (1992), the earth materials in the vicinity of the proposed library site consists of alluvial sediments of silt, sand, and gravel deposits.

## **2.3 REGIONAL GEOLOGIC HAZARDS**

Mapping by the CDMG, (now CGS, 2000) indicates the proposed library site is located in a potential liquefaction area based on a regional evaluation of geologic and geotechnical conditions. Proposed habitable developments within this zone are required to have a site-specific liquefaction evaluation performed in accordance with CGS Special Publication 117A (CGS, 2008).

## **2.4 SITE CONDITIONS**

The project site is roughly an "L"-shaped vacant lot located west of the intersection of Moorpark Avenue and West High Street, south of the existing City library and parking lot as indicated on Plate 2. Review of images on Google Earth and the USGS topographic map

indicate the project site was formerly developed with small structures that were demolished after about 2003. Asphalt concrete pavement is located in the northwest portion of the "L"-shaped property; the remainder of the site is earthen. The site topography slopes gently to the south. Based on ground surface elevations from the USGS Moorpark Quadrangle, the ground surface at the project site slopes southward from about elevation (El.) +520 feet at the northern portion of the site to about El. +514 feet at the southern portion of the site (6 feet of elevation difference) over a distance of about 270 feet (approximately a 2.2 percent slope).

## **2.5 EARTH MATERIALS**

Descriptions of soil conditions presented herein are based on visual classification of samples obtained from our field exploration combined with the results of laboratory testing.

As depicted on the attached Geologic Cross Sections A-A' and B-B' (Plates 3a and 3b), the earth materials encountered by the CPTs and drill holes for this study consist primarily of interbedded granular alluvial deposits of sand and silty sand to depths of about 40 feet and interbedded silty to clayey sand, sandy clay, and silt from about 40 to 75 feet (maximum depth explored). As shown on the CPT logs in Appendix A, the silt, clay, and sand layers below a depth of 40 feet are typically thinly bedded ranging from several inches to two feet in thickness, with occasional clay or silty sand layers to about five feet thick.

### **2.5.1 Engineering Properties**

A summary of the general engineering parameters for the earth materials encountered in the explorations advanced for this study consists of:

- Field SPT N-values ranged from about 2 to 15 blows per foot (bpf) from the ground surface to a depth of about 25 feet, and 12 to 22 bpf from about 25 to 75 feet below the ground surface (Appendix A). The SPT N-values indicate the granular soils classify as very loose to loose in the upper 25 feet and loose to medium dense from 25 to 75 feet. The fine-grained silt and clay soil layers generally classify as medium stiff, with the exception of a very soft layer at a depth of 50 feet in DH-1.
- Moisture contents generally ranged from about 2 to 8 percent in the granular alluvial deposits above the groundwater level (above 37 feet) and from about 14 to 25 percent below the encountered groundwater level.
- Dry densities of the granular soil in the upper 40 feet of the site ranged from 95 to 111 pounds per cubic foot (pcf), and the densities of interbedded soils from 40 to 75 feet ranged from 112 to 118 pcf.
- The results of grainsize analyses indicate fines contents (percent passing No. 200 sieve) ranging from about 3 to 47 percent for the tested granular soil samples and from about 50 to 63 percent for cohesive materials.
- Atterberg Limit tests indicate the tested fine-grained sandy clay layers have liquid limits of 21 to 26 and plasticity indexes of 6 to 9. Those soils classify as low plasticity sandy clay and sandy to silty clay (Appendix B).
- The hydroconsolidation (collapse) potential for three silty sand soil samples from depths of 10, 25, and 30 feet was tested in accordance with ASTM D4546, Method

B. The test results are presented in Appendix B. The samples were selected for testing based on unit weight, degree of saturation, void ratio, and fines content (percent passing No. 200 sieve). The test results indicate hydroconsolidation potentials of 2.3 percent at 10 feet, 0.05 percent at 25 feet, and 0.4 percent at 30 feet. (Appendix B).

- The near surface soil materials consist of silty sand with an R-value of 70 and an anticipated low expansion index (EI of less than 20).
- The results of the soil chemistry tests are summarized below.

## **2.6 SOIL CHEMISTRY AND CORROSION**

### **2.6.1 Test Results**

A selected soil sample obtained from our exploration was provided to Cooper Testing Laboratories for resistivity, pH, chloride, and sulfate testing. The test results are summarized below and the laboratory test report is included in Appendix B.

**Table 1. Summary of Chemical Test Results**

<b>Drill Hole</b>	<b>USCS Classification</b>	<b>Depth (feet)</b>	<b>Sulfate (mg/kg/%)</b>	<b>Chloride (mg/kg)</b>	<b>Resistivity (ohm-cm)</b>	<b>pH</b>
DH-1	Sand with Silt	0 - 5	6/0.0006	2	16,319	7.5

### **2.6.2 Corrosion and Cement Considerations**

As summarized in the table above, the measured pH of the tested sample (ASTM G51) is 7.5, the measured electrical resistivity (ASTM G57) is 16,319 ohm-centimeters, the chloride content (ASTM D4327) of the measured samples is 2 mg/kg, and the sulfate content (ASTM D4327) of the measured sample is 6mg/kg (0.0006 percent).

Caltrans (2012) classifies soils as non-corrosive if the earth materials have less than 500 ppm chlorides, less than 0.20 percent sulfates (i.e., 2,000 mg/kg or ppm), a pH of 5.5 or more, or an electrical resistivity of 1,000 ohm-centimeters or more. The data suggest the tested soil materials are not corrosive to underground steel. If applicable, the test results should be evaluated by a corrosion engineer to determine how underground utilities should be protected from corrosion.

The cement type should be selected with consideration of the sulfate content of the tested soils. Available sulfate content data suggest that, per Table 4-3-1 of ACI 318, Type II cement can be used for concrete that will be in contact with onsite granular soils.

## **2.7 GROUNDWATER CONDITIONS**

Groundwater was encountered at depths of about 36 to 37.5 feet in the drill holes advanced onsite (Appendix A). Interpretation of the CPT dissipation test data indicates similar groundwater depths of about 37 feet below ground surface at the time of our exploration on April 27, 2017 (Appendix A). Historically high groundwater levels reported by the CGS (2000)

indicate the groundwater levels at the project site have been within about 15 feet of the ground surface. Variations in groundwater levels and soil moisture conditions can occur as a result of rainfall, irrigation, runoff, and other factors.

## **2.8 DATA INTERPRETATION AND ANALYSES**

Data interpretation for this study utilized the CPTs and the SPT N-values from the drill holes advanced onsite (Appendix A). Analyses of the CPT and SPT data from this study were performed using the computer program GeoLogisMiki. Selected computer printouts from the GeoLogisMiki analyses are presented in Appendix C. A complete pdf file of the analyses can be provided upon request.

The field SPT N-values presented on the drill hole logs in Appendix A were normalized to 1 ton/square foot and corrected for rig efficiency, hammer type, sampler type (no liner), and rod length as described in the Recommended Procedures for Implementation of CGS Special Publication 117A (CGS, 2008). Recent modifications to the CGS procedures by Boulanger and Idriss (2014) are incorporated into the software evaluation. We also utilized blow counts measured for the modified California sampler (MCS) in the analyses by dividing the MCS blowcount by 1.6 to provide an equivalent SPT N-value. The SPT N-value correction factors are summarized in Table 2.

**Table 2. SPT N-Value Correction Factors**

<b>Correction Factor</b>	<b>Value</b>	<b>Comment</b>
Hammer Efficiency ( $C_E$ )	1.3	Auto trip hammer 80% efficiency
Rod Length ( $C_R$ )	$L < 15' = 0.75$ $L < 20' = 0.85$ $L < 35' = 0.95$ $L > 35' = 1.0$	L = Rod Length (feet)
Sampling Method ( $C_S$ )	1.2	
Modified California Sampler (MCS) blowcounts	$MCS/1.6 = \text{SPT N-value}$	Equivalent SPT N-Value

## **2.9 POTENTIAL VARIATION OF SUBSURFACE MATERIALS**

There is a potential for variation in the consistency, density, and strength/hardness of the materials from what was encountered in our explorations. The potential exists to encounter perched water, zones of poorly consolidated soils, or other conditions not indicated on the exploration logs. If significant variation in the geologic conditions is observed during construction, we recommend the geotechnical engineer, in conjunction with the project designer, evaluate the impact of those variations on the project design.

**2.10 SEISMIC CONSIDERATIONS AND GEOHAZARDS****2.10.1 Faults**

The project site is located in a seismically active portion of southern California and the project most likely will be subjected to strong earthquake ground motion during its lifetime. As summarized in the following table, numerous active or potentially active faults are known or postulated to exist within about 15 miles of the proposed new library site.

**Table 3. Nearby Faults**

<b>Fault</b>	<b>Approximate Distance (miles)<sup>1</sup></b>	<b>Maximum Moment Magnitude (Mmax)</b>
Simi-Santa Rosa	2.1	6.8
Oak Ridge	6.0	7.1
San Cayetano	8.1	7.1
Northridge	12.1	6.8

<sup>1</sup> Earthquake distances and magnitudes obtained from the USGS website (2017)

**2.10.2 Ground Rupture Potential**

The site is not located within a State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zone) and no known active or potentially active faults cross or trend toward the site. The potential for fault rupture to affect the site is considered low.

**2.10.3 Seismic Considerations for 2016 CBC**

We estimated the probabilistic seismic ground acceleration at the proposed library site using the USGS web application (USGS; 2017). On the basis of the web-based analyses, the peak horizontal ground acceleration (pga) at the proposed site is estimated to be 1.035g for an earthquake with a 2,475-year return period (2 percent probability of exceedance in 50 years) assuming Site Class D soil conditions. The following table summarizes the probabilistically estimated strong ground motion parameters for the project site.

**Table 4. Summary of USGS Probabilistic Seismic Hazard Deaggregation Results**

<b>Return Period (years)</b>	<b>Mean Magnitude (Mw)</b>	<b>Mean Source Distance (miles)</b>	<b>Peak Horizontal Ground Acceleration</b>
2,475	6.9	5.0	1.035g

**2.10.4 2016 CBC Seismic Design Parameters**

In accordance with Chapter 16, Section 1613 of the 2016 CBC, the following parameters have been obtained from the USGS Seismic Design Maps web application (USGS, 2017) and shall be incorporated into the seismic design at the project site. The subsurface conditions at



the site are considered to satisfy the parameters for Site Class D<sup>1</sup>. The associated seismic design parameters for Site Class D for use in generating the risk-targeted maximum considered earthquake and design level spectra are summarized in the following table.

**Table 5. 2016 CBC Seismic Design Parameters**

<b>2013 California Building Code Section 1613</b>	<b>Seismic Parameter</b>	<b>Site Class D Values</b>
---	Latitude	34.2857
---	Longitude	-118.8829
Figure 1613.3.1(1)	Mapped Acceleration Response Parameter ( $S_s$ )	2.755g
Figure 1613.3.1(2)	Mapped Acceleration Response Parameter ( $S_1$ )	0.968g
Section 1613.3.2	Site Class	D
Section 1613.3.3 and Table 1613.3.3(1)	Site Coefficient ( $F_a$ )	1.0
Section 1613.3.3 and Table 1613.3.3(2)	Site Coefficient ( $F_v$ )	1.5
Section 1613.3.3	$PGA_M$ Equation 11.8-1 $PGA_M = F_{PGA} PGA$	1.035g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{MS}$ )	2.755g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{M1}$ )	1.452g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{DS}$ )	1.837g
Section 1613.3.3	Adjusted Acceleration Response Parameter ( $S_{D1}$ )	0.968g

### 2.10.5 Liquefaction and Dry Seismic Settlement Potential

Liquefaction is described as the sudden loss of soil strength because of a rapid increase in soil pore water pressures due to cyclic loading during a seismic event. In order for liquefaction to occur, three general geotechnical characteristics must be present<sup>2</sup>: 1) groundwater must be present within the potentially liquefiable zone; 2) the potentially liquefiable soil must meet certain grainsize and classification characteristics; and 3) the potentially liquefiable granular soil must be of low to moderate relative density. If those criteria

<sup>1</sup> A Site Class D soil is defined in California Building Code (CBC) as the soil having the following average parameters for the upper 100 feet of the site: 1) shear wave velocity of 600 to 1,200 ft/sec, 2) standard penetration test SPT N-value of between 15 to 50, and 3) undrained shear strength of fine-grained soil between 1,000 to 2,000 psf. SPT N-values in the upper 50 feet of the Moorpark Library site ranged from 2 to 15 for granular soils to a depth of about 25 feet and 12 to 22 from about 25 to 75 feet (Appendix A). The average SPT N-values and soil shear strength in the upper 100 feet of the site would be consistent with Site Class D soil.

<sup>2</sup> Based on studies by Seed and Idriss (1971) and Youd and Idriss (2000), liquefaction occurs primarily in clean granular soils that classify as sand (SP) and sand with silt (SP-SM). Dense granular soils with fines contents greater than 35% (silty sand - SM and clayey sand - SC) are less likely to liquefy. Liquefaction susceptibility criteria developed by Boulanger and Idriss (2006) indicates that fine-grained soils with a PI of 6 or less can be susceptible to liquefaction. Studies by Bray and Sancio (2006) indicates that silty soils with a PI of 12 or less could potentially liquefy.

are met and strong ground motion occurs, then those soils may liquefy, depending upon the intensity and cyclic nature of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon is not restricted to depths of less than 50 feet.

As described in the Earth Materials section above, the soil profile consists primarily of interbedded granular alluvial deposits of sand and silty sand to depths of about 40 feet and interbedded silty to clayey sand, sandy clay, and silt from about 40 to 75 feet (Plates 3a and 3b). Groundwater was encountered at a depth of about 37 feet during field exploration for this study. Historic high groundwater levels summarized by the CGS (2000) are about 15 feet below the ground surface. SPT N-values from the upper 25 feet of the drill holes range from 2 to 15 bpf, indicating the granular soils are very loose to medium dense in that zone. The SPT N-values from 25 to 75 feet range from 12 to 22 bpf, indicating the granular soils are medium dense and the fine-grained silt and clay soils are medium stiff within that zone.

Research by Boulanger and Idriss<sup>2</sup> (2006) has indicated fine-grained silt and clay soils with Plasticity Index (PI) values of 6 or less can be susceptible to liquefaction and research by Bray and Sancio (2006) indicates low plasticity silt with a PI of up to 12 can liquefy during strong earthquake ground shaking. Clay soils with PI of greater than 18 generally exhibit a clay-like behavior and are considered non-liquefiable based on the criteria developed by Bray and Sancio (2006). The fine-grained sandy clay and sandy to silty clay soil layers tested for this study (Appendix B) have fines contents (percent passing the number 200 sieve) of 50 to 63 percent and PI's of 6 to 9, suggesting those layers have low plasticity and may be susceptible to liquefaction in response to strong earthquake ground shaking.

Analyses of the CPT and SPT data were performed using the program GeoLogisMiki. The input values are summarized below and selected graphics from the analyses are presented in Appendix C:

- The seismic ground motion is 1.03g for a 2 percent probability of exceedance in 50 years for the project site.
- Historic high groundwater level of 15 feet below the ground surface.
- CPT evaluation using the procedure recommended by Robertson (2009).
- SPT data evaluation using the procedure recommended by Boulanger and Idriss (2014).

Overall, the liquefaction analyses indicate the very loose to loose granular soils at the site are susceptible to liquefaction below the groundwater and dry seismic settlement above the groundwater. The estimated vertical liquefaction and dry seismic settlements are summarized in Table 6.

Seismically induced settlement or collapse can occur in soils that are loose, soft, or that are moderately dense, but weakly cemented. The onsite very loose to loose granular and silty soils above the groundwater are susceptible to seismically induced settlement. The estimated seismically induced settlement in the upper 15 feet of site is summarized in Table 6. We note the groundwater is assumed to be at 15 feet; therefore, soils below that depth are subject to liquefaction potential in the analyses even though the groundwater depth encountered by our explorations was about 37 feet below the ground surface.

**Table 6. Summary of Estimated Vertical Seismic Settlement**

<b>Exploration Location</b>	<b>Estimated Liquefaction Settlement (inches)</b>	<b>Estimated Dry Seismic Settlement (inches)</b>	<b>Total Estimated Seismic Settlement (inches)</b>	<b>Estimated Lateral Displacement (inches)</b>
CPT-1	7.5	6.9	14.4	200 inches
CPT-2	8.0	8.3	16.3	200+ inches
CPT-3	9.9	8.2	18.1	200+ inches
CPT-4	10.9	5.8	16.7	300+ inches
CPT-5	10.4	8.0	18.4	300+ inches
DH-1	13.8	34.0	37.8	108 inches
DH-2	9.4	2.4	11.8	72 inches
<b>Range (inches)</b>	<b>7.5 -13.8</b>	<b>2.4 - 34</b>	<b>11.8 – 37.8</b>	<b>-</b>
<b>Average Value (inches)</b>	<b>10</b>	<b>9.4</b>	<b>19</b>	<b>-</b>

**2.10.6 Data Summary**

Review of the data plots in Appendix C indicates:

- The liquefaction and dry seismic settlements estimated from the five CPTs advanced for this study are fairly consistent, ranging from 7 to 11 inches and 6 to 8 inches, respectively.
- The estimated liquefaction and dry seismic settlement estimated from the SPT data ranges 9.4 to 13.8 inches and 2.4 to 34 inches, respectively. The estimated liquefaction settlements from the SPT data are fairly consistent with CPT data with a slightly higher value for estimated settlement in DH-1 which extended to 75 feet (25 feet deeper than DH-2).
- The procedures for estimating dry seismic settlement from blowcount data are sensitive to low N-values such as was encountered in the near surface soil in DH-1. In DH-1, a three-foot-thick zone from 3.5 to 6.5 feet with an SPT N-value of 2 accounts for half (17 inches) of the estimated dry seismic settlement in that drill hole.
- The analyses presented in Appendix C indicate the loose granular soils and soft low plasticity silt/clay layers have a seismic factor of safety of less than 1 and an associated liquefaction potential to a depth of 75 feet (maximum depth explored).
- A majority of the estimated settlement from the CPT data occurs between the ground surface and a depth of about 40 to 50 feet.
- Estimated liquefaction settlement below a depth of about 40 feet is about 2 to 4 inches based on the CPT data (Appendix C).
- The total estimated liquefaction settlement in DH-1 (75 feet deep) is 13.8 inches; 4 inches of the settlement is estimated below about 50 feet. The analyses for DH-1

conservatively assumes all zones below a depth of 15 feet could liquefy except for a medium stiff clay from 66 to 69 feet.

### **2.10.7 Lateral Movement**

The occurrence of lateral spreading is generally associated with sites where liquefaction is possible and: 1) the ground surface is sloping, or 2) there is a free-face condition such as a road cut or riverbank. Existing analytical methods of assessing potential deformations caused by lateral spreading are based on a small number of case histories and generally involve layers of liquefiable soils of greater than about three feet (one meter). The procedures are generally considered reasonable in assessing risks where significant lateral deformations are possible (deformations of three feet or greater). The ability to reasonably predict small lateral spreading deformations is, however, considered significantly limited.

As depicted on the regional geologic/topographic map for the Moorpark Quadrangle (Dibblee, 1992), the ground surface in the vicinity of the project site slopes southward at a gradient of about 2.2 percent or less (six feet over 270 feet). From High Street southward, the regional slope gradient is one percent or less to the west. As described above, based on the CPT and drill holes advanced for this study, there is a potential for liquefaction, primarily in the upper 40 to 50 feet of the site. The lateral displacements estimated from the CPT and SPT data are summarized in Table 6 and range from 72 inches to greater than 300 inches.

CGS Special Publication 117A (CGS, 2008) defines large-scale ground displacements as areas that exceed one to three feet horizontally and four to six inches vertically. The estimated lateral displacements summarized in Table 6 range from six to 25 feet, and estimated vertical settlements (combined liquefaction and dry seismic settlement) in Table 6 average 19 inches. Based on both of those criteria, ground improvement of the subsurface soils will be required prior to construction to reduce the estimated lateral displacement to acceptable levels.

## **2.11 HYDROCONSOLIDATION (COLLAPSE) POTENTIAL**

Research by several authors including and Houston et al. (1997; 2001) and Purdue University (Howayek, 2012) indicates hydroconsolidation (collapse) typically occurs in silty and granular soil materials with densities below 105 pcf, degree of saturation of less than 25 percent, and high void ratios. In the Ventura County area, our experience indicates hydroconsolidation is commonly associated with silty soils deposited in debris-flow type environments. The depositional environment with high collapse potential previously observed in Ventura, Camarillo, and Simi Valley consists of Holocene- to Late Pleistocene-age alluvial fan deposits above the groundwater. As noted above in the Site Conditions section of this report, the proposed site is located at the mouth of tributary drainage to Arroyo Simi and is underlain by younger to older alluvial deposits; those deposits are equivalent to the Holocene- to Late Pleistocene-age fan deposits.

Based on an evaluation of the laboratory index properties (soil density, moisture content, void ratio, and fines content), three samples were selected for collapse testing per ASTM D4546, Method B. The results of those tests are presented in Appendix B and are summarized in Table 7 below. Based on published criteria (ASTM D5333), a collapse index of two percent or less is classified as slight, two to six percent is moderate, six to ten percent is moderately

severe, and above 10 percent is severe. Based on the tested samples, the amount of hydroconsolidation ranges from 0.05 to 2.3 percent. The values of less than two percent are considered slight by ASTM D5333 classification and within background levels for soils in Ventura County based on our previous experience. The sample from DH-2 at 10 feet with 2.3 percent hydroconsolidation (collapse index) indicates a moderate degree of potential collapse settlement.

The typical procedure to mitigate shallow collapse potential is to overexcavate and recompact the soil. If ground improvement is performed at the site, the near-surface soils would be densified and, in our opinion, likely reduce the hydroconsolidation potential to an acceptable level (i.e., less than two percent).

**Table 7. Summary of Hydroconsolidation (Collapse) Potential of Onsite Soils**

Location and Depth	Soil Type	Dry Density (pcf)	Moisture Content (%)	Degree of Saturation	Void Ratio (%)	Fines Content (%)	Measured Hydroconsolidation (%)
DH-2 10 feet	Silty Sand (SM)	96.9	3.5	13	0.71	22	2.3
DH-2 25 feet	Silty Sand (SM)	89.9	5.6	18	0.84	29	0.05
DH-1 30 feet	Sand w/Silt (SP-SM)	102	2.5	11	0.62	7	0.43

## **2.12 EXPANSIVE SOILS**

As described on the drill holes and laboratory data, the onsite surficial soils consist of sand and silty to clayey sand. The onsite granular soils are anticipated to have a low expansion potential.

### **3.0 OPINIONS AND RECOMMENDATIONS**

#### **3.1 SUMMARY OF SUBSURFACE SITE CONDITIONS**

The geotechnical conditions for the proposed library site were evaluated based on the explorations advanced for this study supplemented by data from previous geotechnical reports from the project vicinity. Based on the work performed, the site conditions consist of:

- Generally granular sand and silty sand soil in the upper 40 feet underlain by thinly interbedded silt, clay, and clayey sand from 40 to 75 feet (maximum depth explored).
- SPT N-values from the upper 25 feet of the drill holes range from 2 to 15 bpf, indicating the granular soils are very loose to medium dense in that zone. The SPT N-values from 25 to 75 feet range from 12 to 22 bpf, indicating the granular soils are medium dense and the fine-grained silt and clay soils are medium stiff within that zone.
- Groundwater was encountered at a depth of about 37 feet during exploration. Historic high groundwater levels in the Moorpark area are about 15 feet below the ground surface.
- The site is not located within a fault rupture hazard zone as defined by the State of California, California Geological Survey.
- The site is located in a seismically active area of Ventura County and has an estimated peak ground acceleration  $PGA_M$  of 1.03g.
- The plasticity index of fine grained soils ranges from 6 to 9. Research by Bray and Sancio (2006) indicates the fine grained soils could potentially liquefy during a seismic event.
- CPT and SPT data were evaluated (Appendix C) to estimate liquefaction and dry seismic settlement using the program GeoLogisMiki and the procedures developed by Robertson (2009) and Boulanger and Idriss (2014). The combined estimated liquefaction and dry seismic settlement ranges from about 12 to 34 inches with an average of about 19 inches in the upper 75 feet at the site.
- A majority of the estimated seismically induced settlement occurs in the granular soil layers in the upper 50 feet of the site; less than two to four inches of settlement is estimated to occur below 50 feet. Based on the liquefaction analyses, the fine-grained silt and clay soil layers do not contribute to liquefaction settlement.
- Estimated lateral spreading ranges from six feet to greater than 20 feet using the procedure developed by Robertson (2009) for CPT data and Boulanger and Idriss (2014) for SPT data.
- Estimated hydroconsolidation (collapse) potential ranges from 0.05 to 2.3 percent based on the laboratory testing on three samples of onsite soil.
- Nearby sites have estimated liquefaction/dry seismic settlement 2.5 inches (AHA Site; Geotechnologies, 2016) and 2 to 9 inches (Moorpark Apartments; Gorian, 2013). Liquefaction potential was identified to depths of about 60 feet with individual zones ranging from several feet to 18 feet thick.

- CGS Special Publication 117A (CGS, 2008) and the California Building Code (CBC) typically require projects to have seismic settlement of no more than two inches total and one inch of differential settlement. Sites with estimated settlements of more than two inches are normally required to mitigate settlement to about two inches with ground improvement. Potential ground improvement options are discussed in the following sections.

### **3.2 GROUND IMPROVEMENT OPTIONS**

As discussed above, ground improvement of the soils at the proposed library site will be required to mitigate the amount of estimated settlement to near two inches of total settlement and one inch of differential settlement. To reduce the estimated settlement to near two inches will require improving the site to a depth of approximately 50 feet. We note a 50-foot thick treatment depth would reduce the estimated settlement to less than two inches for most of the exploration locations performed for this study with the exception of DH-1. The data and analyses for DH-1 indicates up to four inches of settlement could occur from depths of 50 to 75 feet. However, in our opinion, if the upper 50 feet of soil were densified/improved, the site would have a 50-foot-thick cap of non-liquefiable improved soil to dampen any settlement below 50 feet. If the treatment depth was limited to 50 feet, a mat-type foundation may be required to reduce differential settlement to an acceptable level for the structure. The alternative would be to select a ground improvement option that could treat soil to a depth of greater than 50 feet as discussed below.

The two primary ground improvement methods to mitigate seismically induced settlements to a depth of about 50 feet with groundwater at a depth of 37 feet are: 1) vibro replacement (VR, also referred to as "stone columns"), and 2) deep soil mixing (DSM). The VR procedure consists of advancing a 30-inch diameter steel mandrel to the selected depth (approximately 50 feet) using a combination of the weight of mandrel and vibration. Once the mandrel reaches the selected depth,  $\frac{3}{4}$ -inch crushed rock is used to backfill the hole. The gravel is vibrated and "rammed" into the soft soil. The stone columns are placed on a grid pattern with a spacing typically in the range of six to nine feet on center. The soil displaced by the mandrel is "pushed" laterally into the adjacent soil, densifying the soil mass at the site to the point where it will resist liquefying and settlement in response to earthquake ground shaking. CPTs are advanced between columns after the VR is performed to evaluate the increase in soil strength/resistance to liquefaction. VR is an effective method of densifying granular soils to a depth of about 50 feet, but the process does not significantly improve the density of fine-grained silt and clay soils or highly interbedded fine-grained and granular soils. In our opinion, VR will be most effective in the upper 40 feet at the proposed library site.

DSM uses a large diameter auger mounted to a large drill rig or crane to advance the auger to the target depth (approximately 50 feet for the library project). Cement is mixed into the soil at a regulated rate of around 10 percent and mixed by the auger using several up and down passes of the auger. The amount of cement added to the soil is determined by laboratory testing to optimize the soil strength versus amount of cement utilized. Once the cement and soil are uniformly mixed, the auger is withdrawn and moved to the next location. The DSM columns can be placed in a variety of patterns (grid, tangent, overlapping) depending on the project requirements. For the proposed library project, one option is to place the DSM columns on a

grid pattern with a center to center spacing of two to three diameters with a grade beam type foundation system supported on the columns. The column configuration will depend on the column diameter selected (typically three to six feet), cement percentage, soil type, and amount of soil improvement required. Once the columns are completed, a grade-beam type foundation can be installed on top of the DSM columns to support the structure. Other column configurations such as tangent columns, overlapping columns, etc. can be utilized depending on project requirements. The advantages of the DSM method are that it can be installed to depths of greater than 50 feet and it can improve the strength of fine-grained soils.

The final design of the ground improvement system is typically performed by the specialty ground improvement contractor working with the project civil, structural, and geotechnical engineers. Other options could be considered pending an evaluation by a specialty ground improvement contractor. Both methods are established procedures and are considered feasible for the Moorpark Library site pending detailed site analyses of the proposed method and cost proposal from a qualified ground-improvement contractor. The pros and cons of the two primary methods are summarized in the following table.

**Table 8. Summary of Ground Improvement Methods**

<b>Ground Improvement Method</b>	<b>Pros</b>	<b>Cons</b>	<b>General Cost Range</b>
Vibro Replacement (VR) / Stone Columns	<ul style="list-style-type: none"> <li>Established procedure, excepted by agencies</li> <li>Densifies granular soil between individual columns</li> <li>Provides conduit to dissipate buildup of water pressure during a seismic event</li> <li>multiple contractors perform procedure – multiple bids</li> <li>No spoil generated during installation</li> </ul>	<ul style="list-style-type: none"> <li>Treatment depth limited to 50 feet</li> <li>Vibration could impact adjacent structures. Vibration monitoring recommended.</li> <li>Limited density improvement to fine-grained silt and clay soils from 40 to 50 feet below the ground surface.</li> <li>Treatment area usually extends out beyond building foundations</li> <li>Ground disturbance at surface requires upper several feet of site to be recompacted</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$60,000</li> <li>\$30/ft of column</li> <li>Column center to center spacing typically 6 to 9 feet</li> </ul>
Deep Soil Mixing (DSM)	<ul style="list-style-type: none"> <li>Established procedure excepted by agencies</li> <li>DSM columns can be extended to depths of 75 feet if required.</li> <li>Treatment area can be limited to building foundation footprint depending on site conditions</li> </ul>	<ul style="list-style-type: none"> <li>More expensive mobilization and per foot of column cost than vibro replacement</li> <li>Does not densify soil between columns</li> <li>Soil between columns can settle requiring a grade-beam type foundation to span across columns</li> <li>About 20 percent spoil generated during installation that needs to be disposed of.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$100,000 to \$150,000</li> <li>\$50/ft of column</li> <li>Replacement ratio 10%</li> </ul>



### **3.2.1 Ground Improvement Limits**

Typically, ground improvement is performed beneath the building footprint for “habitable structures” plus a minimal distance outside the building footprint (generally one column spacing) to provide lateral support for the structure. Habitable structures are defined by the CGS as structures with 2,000 man-hours occupancy per year. The remainder of the site beneath auxiliary structures is generally not improved unless the structures are considered an essential facility (such as an emergency back-up generator). The area outside of the building footprints beneath auxiliary structures and paved areas would be overexcavated per the recommendations in this report.

### **3.2.2 Surface Treatment**

Installation of VR columns typically causes the upper several feet of the ground surface to heave. Once the VR columns have been installed, the upper two feet of soil in the building foundation area should be over-excavated and recompacted to 90 percent relative compaction. The compacted material could consist of onsite granular soil or crushed rock.

For DSM projects, the loose disturbed soil in the upper portion of the site is removed to expose the upper part of the DSM columns. The surface treatment beneath the grade beam foundation treatment will be specified by the project civil and structural engineers based on the column and foundation configuration.

## **3.3 PRELIMINARY GRADING CONSIDERATIONS**

### **3.3.1 General Site Clearing and Grubbing**

Soil containing debris, organics, trees and root systems, and other unsuitable materials should be excavated and removed from improvement areas prior to commencing grading operations. Areas should be cleared of old foundations, slabs, pavement, abandoned utilities, and soils disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material should be replaced with compacted fill.

### **3.3.2 Subgrade Preparation**

For areas within the building foundation improved with VR, the ground surface should be overexcavated to a depth of two feet below the existing ground surface and replaced with compacted fill consisting of onsite granular soils or a blanket of crushed rock.

For improved areas outside of the building foundation ground improvement area, the ground surface should be overexcavated to a depth of two feet below the existing ground surface or two feet below footing depth, whichever is deeper. The resulting surface should be scarified to a depth of eight inches and compacted to 90 percent relative compaction (RC) and the fill placed above that level. Areas underlain by asphalt concrete pavement should be scarified to a depth of 12 inches and compacted to 95 percent RC.

### **3.3.3 Fill Material Selection**

Recommended fill material selection requirements for subgrade fill, aggregate base, and use of onsite materials are presented below. Areas or zones where the various fill materials may be used are described below.

**Use of Onsite Materials.** As described above, the near-surface onsite materials consist of granular silty sand soils with some gravel and cobble-size rock fragments. The material generated from the site overexcavation can be utilized as compacted fill as long as those materials satisfy criteria for general fill.

**General Fill.** General fill should consist of granular soil materials (SP, SW, SP-SM, and SM) free of organics, oversize rock (greater than six inches in diameter), trash, debris, and other deleterious or unsuitable materials, and should have an expansion index less than 20. The fill materials should have less than 15 percent larger than three inches in diameter.

**Aggregate and Miscellaneous Base.** Base materials should consist of material conforming to Caltrans Standard Specifications for Class 2 Aggregate Base, Section 26-1.02 (Caltrans, 2015) or Section 200-2.5 of the Greenbook (2015) for Processed Miscellaneous Base.

**Imported Fill.** Although importing fill is not anticipated, if material is imported, the imported subgrade fill materials should comply with recommendations for general fill or as appropriate for its intended use. Imported fill should be reviewed by the geotechnical engineer prior to being transported to the site.

### **3.3.4 Dewatering**

On the basis of our subsurface exploration and previous studies nearby, we do not anticipate groundwater will be encountered during site grading activities. Although we do not anticipate the need for dewatering, groundwater levels may vary seasonally and it is possible some seepage may be encountered in the excavations following rain events.

### **3.3.5 Fill Placement**

Fill should be placed, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. In general, we recommend the moisture content of the fill should be 0 to 2 percent above the optimum. We note the tested on-site soils have low moisture contents in the range of 2 to 8 percent. On the basis of the test results, water will need to be added during grading to bring the moisture content up near the optimum moisture content of about 10 to 11 percent. Each layer should be spread evenly and should be thoroughly blade-mixed during the spreading to provide relative uniformity of material within each layer. Soft or yielding materials should be removed and be replaced with properly compacted fill material prior to placing the next layer.

Rock, cobbles, and other oversized material greater than six inches in dimension in any direction should be removed from the fill material being placed. The contractor should be prepared to screen all native materials prior to placement as compacted fill. Rocks should not be nested and voids should be filled with compacted material. Organics, foreign matter, and other deleterious materials also should be removed from any material used in constructed fills.

Fill and backfill materials should be placed in layers that can be compacted with the equipment being used. Fill should be spread in lifts no thicker than approximately eight inches prior to being compacted. Fill and backfill materials may need to be placed in thinner lifts to achieve the recommended compaction depending on the equipment being used.

### **3.3.6 Compaction**

Fill placement and grading operations should be performed according to the City of Moorpark, Greenbook Specification 300-4, and the grading recommendations of this report. Relative compaction should be assessed based on the latest approved edition of ASTM D1557. The building and general site improvement over-excavation and upper 1-foot of paved areas (subgrade plus base materials) should be compacted to 95 percent relative compaction. We recommend general fill be compacted to a minimum of 90 percent relative compaction. Recommended specified relative compaction should extend to a minimum of three feet horizontally beyond the limits of the improvements.

## **3.4 SHALLOW FOUNDATION DESIGN**

The following sections describes preliminary shallow foundation design parameters for the site assuming the seismic geohazards have been mitigated through ground improvement. Depending on the level of improvement and building design criteria, it may be necessary to support the proposed structure on a mat type foundation. The decision on the preferred foundation type should be coordinated with the project civil and structural engineers based on building settlement tolerances. The following sections provides preliminary shallow foundation parameters consisting of isolated and continuous footings designed in accordance with current CBC and Greenbook requirements assuming that those values are suitable for the proposed structure.

### **3.4.1 Allowable Bearing Pressure**

Continuous and isolated spread footings will be supported on recompacted onsite materials underlain by alluvium. For these conditions, we recommend shallow footings be designed using a maximum allowable bearing pressure of 1,500 pounds per square foot (psf). The allowable value incorporates a factor of safety of at least 3. The toe-pressure below retaining walls or eccentrically loaded footings can exceed the recommended bearing pressure, provided the resultant pressure is within the middle-third of the footing. In accordance with 2016 CBC Section 1806.1, the bearing values indicated above are for static loads (including the total of dead and frequently applied live loads), and may be increased for short duration loading (including the effects of wind or seismic forces) as allowed in 2016 CBC Section 1605.3.2.

### **3.4.2 Minimum Embedment Depth and Width**

In general, footings should be embedded to at least two feet below the adjacent grade and have a minimum width of 18 inches. Isolated pad footings should be at least three feet in least-dimension.

### **3.4.3 Sliding and Passive Resistance**

Ultimate sliding resistance (friction) generated at the interface of concrete foundations and compacted soils can be computed by multiplying the total dead weight structural load by a coefficient of 0.40. The ultimate net passive resistance developed from lateral bearing of foundations against compacted backfill or undisturbed native soil can be estimated using an equivalent fluid weight of 300 pcf. The passive resistance for the upper one-foot of soil should be neglected unless the soils are confined at the ground surface by slab-on-grade or pavement.

Sliding resistance and passive pressure may be used together without reduction, when used with the recommended minimum factors of safety. For static conditions, minimum factors of safety of 1.5 and 2.0 are recommended for foundation overturning and sliding, respectively. The factor of safety for sliding can be reduced to 1.5, if passive resistance is neglected. The factor of safety for transient (seismic, wind) conditions should be at least 1.1.

### **3.4.4 Settlements**

**Static Settlements.** Static settlements will generally occur in response to foundation loads on the foundation support material. The structure should be designed to accommodate static differential settlements of at least one-half-inch over a distance of 30 feet (i.e., a distortion ratio of approximately 1/720) for similarly sized and loaded footings.

**Seismic Settlements.** Seismically induced settlements are discussed previously in this report. We anticipate the alluvial soils underlying the proposed excavation could experience seismic settlement of 19 inches without ground improvement and up to four inches with ground improvement to 50 feet with associated differential settlements of two-inches across the site.

### **3.5 SLAB-ON-GRADE**

At-grade floor slab thickness should be designed by the structural engineer, but should not be less than six inches thick. Control joints should be specified by the project structural engineer. The structural engineer should determine reinforcement requirements, but, at a minimum, reinforcement of on-grade floor slabs should consist of No. 4 bars at 18 inches each way, placed above slab mid-height with preferably about 1½- to 2-inches of clear cover. Means should be provided to maintain reinforcement location during construction and concrete placement.

Proper concrete placement in accordance with applicable specifications and curing of concrete slabs inhibits moisture migration. The concrete slab water cement ratio should be maintained during concrete mixing and placement. The project architect and design engineer should select the desired concrete properties based on the concrete slab-on-grade performance requirements.

The slab-on-grade should incorporate a moisture seal beneath the slab in areas where the concrete slab will be covered with flooring. The moisture seal should be bedded in sand per ACI criteria.

### **3.6 CONSTRUCTION CONSIDERATIONS**

#### **3.6.1 Existing Utilities**

We recommend any existing utilities be removed from the grading areas and relocated as necessary. The removal should consist of the excavation of the existing trench backfill and subsequent placement of new compacted fill. Excavation work required for the abandonment of utilities is anticipated to be relatively nominal but should be considered in the construction documents.

Trenches should be excavated no closer than a 1 horizontal to 1 vertical (1h:1v) projection up from the bottom of the excavation in areas where an existing utility/pipeline parallel's or subparallels the trench excavation. The minimum clear distance between an

existing utility and the trench should be evaluated by the contractor. We recommend existing utility/pipelines be supported/protected or the trench be shored to prevent loss of lateral support for existing utility/pipelines when: 1) the trench is closer than a 1h:1v projection to the existing utility, 2) the stability of the existing utility is in question, or 3) there is a potential for sloughing of the trench sidewalls adjacent to the existing utility.

### **3.6.2 Excavation Conditions**

Subsurface materials encountered in our exploratory holes consisted of very loose to loose silty sand to sand (granular) sediments to the anticipated excavation depths. We expect excavations in those soils can be made using conventional heavy-duty equipment in good working order.

### **3.6.3 Temporary Slopes and Excavations**

The contractor should be responsible for the design of temporary slopes. Subsurface materials encountered in our exploratory holes consisted of very loose to loose granular sediments to the anticipated excavation depths. Temporary slopes should be braced or sloped according to the requirements of OSHA.

As input to design, excavations without shoring that are shallower than 10 feet likely will be classified as Type C and should be sloped no steeper than 1.5h:1v as deemed appropriate based upon classification Type determined in the field per OSHA guidelines. OSHA requires excavations greater than 20 feet deep be designed by a qualified professional. We recommend all temporary excavations be monitored for signs of instability and appropriate actions (such as flattening the slope, providing shoring, and controlling groundwater, if encountered) should be undertaken if evidence of potential instability is observed.

## **3.7 PRELIMINARY PAVEMENT DESIGN**

### **3.7.1 Subgrade Preparation**

The finished subgrade surface exposed after overexcavation should be scarified to a depth of 12 inches, moisture-conditioned to within 0 to 2 percent of optimum moisture, and compacted to a relative compaction of at least 90 percent (i.e., 90 percent of the maximum dry density determined from ASTM D1557).

### **3.7.2 Fill Material Selection**

Recommended fill material selection requirements for subgrade fill, aggregate base, and use of onsite materials are presented below. Areas or zones where the various fill materials may be used are described below.

**Subgrade Fill.** General fill should be free of organics, oversize rock (greater than 3 inches in diameter), trash, debris, and other deleterious or unsuitable materials, and should have an expansion index less than 20.

**Aggregate and Miscellaneous Base.** Aggregate or miscellaneous base material should be placed below the asphalt pavement. Base materials should consist of imported material conforming to Caltrans Standard Specifications for Class 2 Aggregate Base, Section

26-1.02 (Caltrans, 2015) or Section 200-2.5 of the Greenbook (2015) for Processed Miscellaneous Base.

**Use of Onsite Materials.** Materials generated during excavation and grading in pavement areas are generally anticipated to consist primarily of granular soil materials. Material derived from the overexcavation can be used as subgrade as long as those materials satisfy criteria presented above for subgrade fill.

**Imported Fill.** Imported subgrade fill materials should comply with recommendations for subgrade fill or as appropriate for its intended use. Imported fill should be reviewed by the geotechnical engineer prior to being transported to the site.

### 3.7.3 Pavement Section

A flexible pavement design section was estimated using the County of Ventura pavement design procedures for assumed Traffic Index (TI) of 5, an R-value of 70 for the tested onsite sandy subgrade materials, and our experience. The recommended asphalt pavement sections based on the assumed TIs and the R-value test data are presented in the following table. Asphalt pavement materials should be compacted to at least 95 percent relative compaction.

**Table 9. Asphalt Pavement Section**

R-Value	Traffic Index	Thickness of Asphalt Concrete (in)	Thickness of Aggregate Base (in)
70	5	3	4

## 3.8 SITE DRAINAGE

Site grading should be provided such that positive drainage away from improvements is provided. Water should not be allowed to pond near the improvements; we recommend the construction of finish slopes of 1 to 2 percent away from improvements.

## 3.9 STORMWATER INFILTRATION

Recent regulatory agency requirements mandate stormwater generated on a new project site be infiltrated into the onsite soils. While this concept may have merit from an environmental standpoint, it increases the potential to cause foundation damage to onsite improvements due to higher groundwater levels, reduced soil strength, hydroconsolidation of onsite soils, and moisture infiltration into buried structures. If onsite stormwater disposal is implemented at the site, the design needs to consider the locations of existing and proposed structures and impacts to offsite improvements.

The liquefaction analyses performed for this study indicates up to about 12 inches of liquefaction related settlement could occur in response to the design seismic event. Infiltration of stormwater could increase groundwater levels beneath the site and reduce the shear strength of the soils which would increase the potential for liquefaction related settlement. In addition, the study indicated the potential for hydroconsolidation (collapse) of the onsite soil as high as 2.3 percent at a depth of 10 feet in areas not mitigated by ground improvement. A collapse of 2

percent over a depth of 35 feet (depth above current groundwater level) is equivalent to a collapse settlement of about 8 inches. Previous experience with collapse related settlements indicates concentrated water infiltration can cause hydroconsolidation of soils with collapse potential. Those concentrated settlements are typically associated with leaking water or sewer pipelines, but in our opinion, concentrated stormwater infiltration in a discrete basin has the potential to cause hydroconsolidation of the soils. The settlement contours from soil hydroconsolidation related settlement measured in previous forensic studies in the Ventura area documented a radial settlement pattern extending up to about 100 feet from the water infiltration source.

If storm water is infiltrated at the proposed library site, we suggest the project civil engineer consider the above factors in the design process. If concentrated stormwater infiltration is proposed in a discrete basin, that basin should be located away from project structural elements and offsite improvements (including buried utilities) that could be impacted by settlement. A setback distance of at least 100 feet from a discrete infiltration location is likely a reasonable starting point for infiltration design. Another alternative would be a diffuse infiltration system that does not concentrate infiltration in a specific location.

## **4.0 LIMITATIONS**

### **4.1 REPORT USE**

This preliminary report has been prepared for the exclusive use of the City of Moorpark for evaluation of the liquefaction potential and need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking at the library site. This preliminary report is intended to provide a summary of the site conditions, geohazard assessment, proposed ground improvement mitigations, and preliminary foundation recommendations. A supplemental geotechnical design report will be required as part of project design once the building type and location have selected, ground improvement option identified and foundation support conditions determined. The findings, conclusions, and recommendations presented herein were prepared in accordance with generally accepted geotechnical engineering practices of the project region. No other warranty, express or implied, is made.

Although information contained in this report may be of some use for other purposes, it may not contain sufficient information for other parties or uses. If any changes are made to the project as described in this report, the conclusions and recommendations in this report shall not be considered valid unless the changes are reviewed and the conclusions and recommendations of this report are modified or validated in writing by OGI.

### **4.2 HAZARDOUS MATERIALS**

This report does not provide information regarding the presence of hazardous/toxic materials in the soil, surface water, groundwater, or atmosphere.

#### **4.3 LOCAL PRACTICE**

In performing our professional services, we have used generally accepted geologic and geotechnical engineering principles and have applied the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers currently practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report.



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## **PLATES**



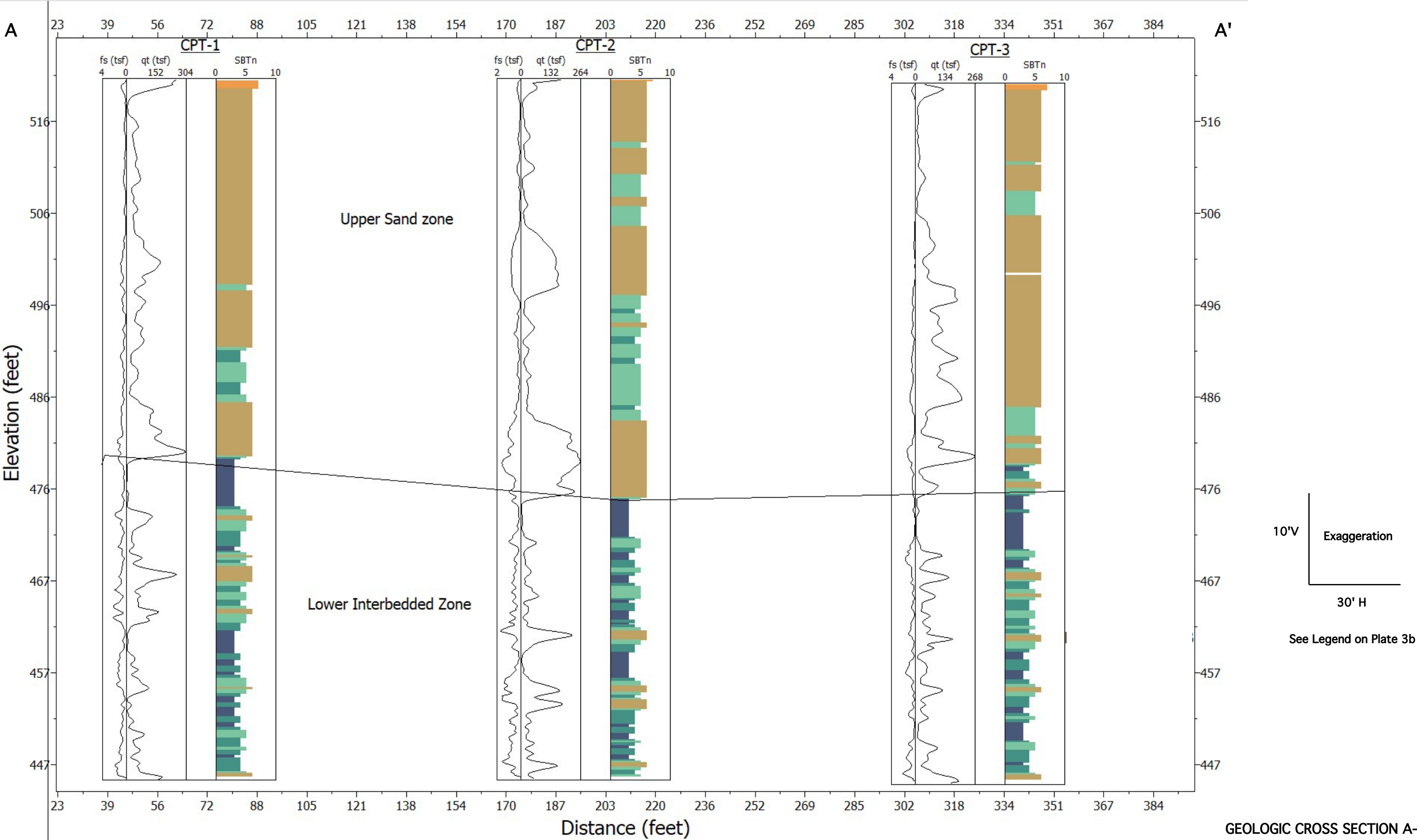
Source: Google Earth, 2017

**VICINITY MAP**  
**Proposed New Library Site**  
**Moorpark, California**

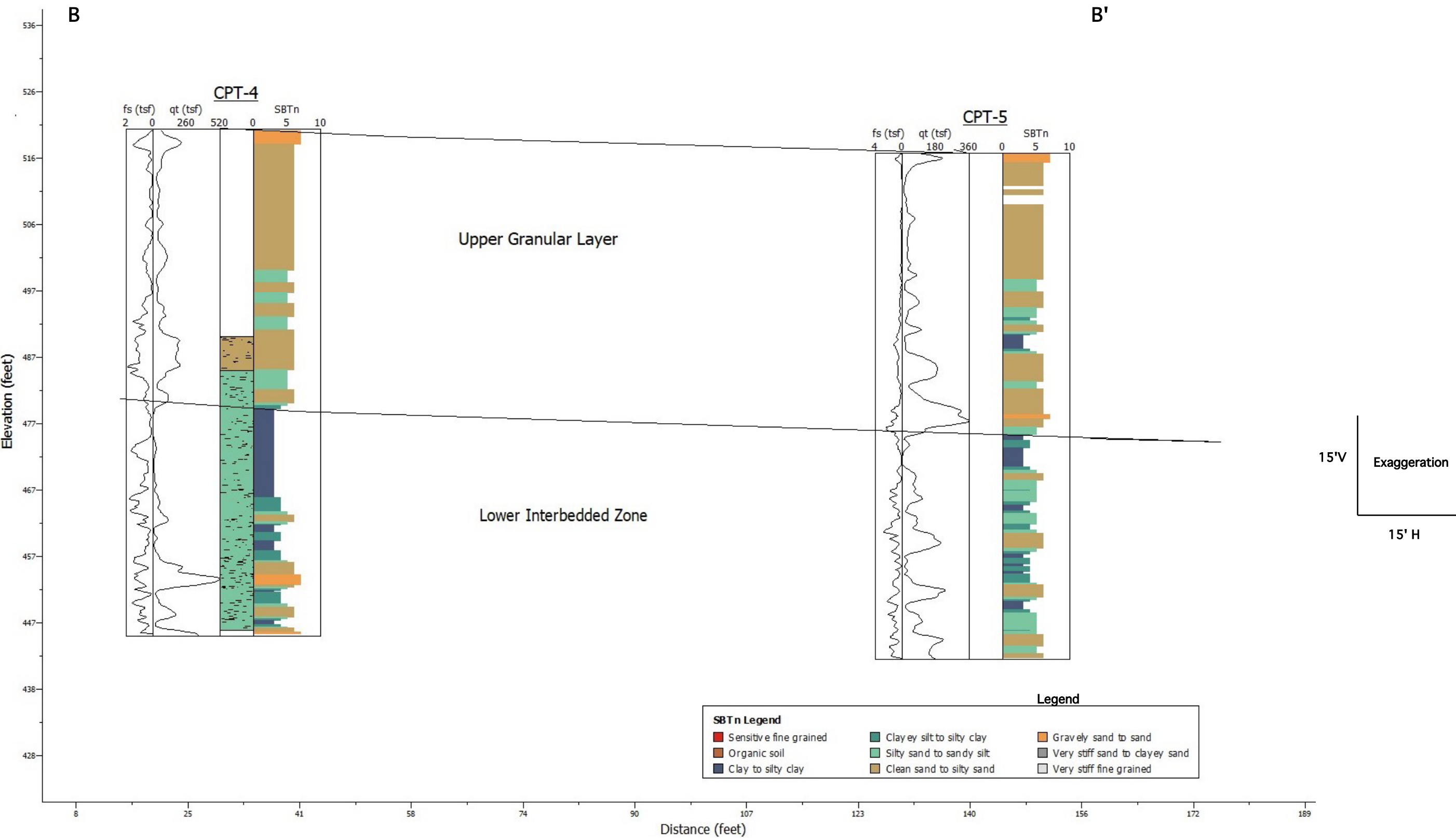




**EXPLORATION LOCATIONS**  
**Proposed New Library Site**  
**Moorpark, California**



GEOLOGIC CROSS SECTION A-A'  
Proposed New Library Site  
Moorpark, California



NOTE: Elevations are approximate and are based on USGS 7.5 minute topographic map of Moorpark quadrangle.

GEOLOGIC CROSS SECTION B-B'  
Proposed New Library Site  
Moorpark, California

## **APPENDIX A**



City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1															
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)	
					SURFACE EL. (ft): (ref. MSL datum)										
					MATERIAL DESCRIPTION										
			1		<b>ARTIFICIAL FILL (af)</b> Silty Fine SAND (SM): pale brown, dry, with gravel										
					<b>ALLUVIUM (Qal)?</b> SAND (SP): very loose, moderate yellowish brown, damp										
2			2	(5)						98	4				
4			3	2	Fine SAND with Clay (SP-SC): very loose, dark brown, damp										
6															
8			4	(7)	- loose, at 7'					105	8				
10			5	4	Silty Fine to Medium SAND (SM): very loose, moderate yellowish brown, damp, with scattered coarse grains, and with few fine rounded gravel to 1/2"-dia.						6		15		
12			6	(10)	Clayey SILT with Sand (ML): medium stiff, moderate to dark brown, damp					111	15				
14					SAND with Clay (SP-SC): loose, moderate brown, damp, with scattered coarse sand										
16			7	7	SAND with Silt (SP-SM): loose, moderate yellowish brown, damp, with fine rounded gravel to 1/2"-dia.						5		7		
18															
			8	(23)	- with medium dense, dark brown sand with clay, from 19' to 21.25'					108	2				
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):		75.5'			
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):		37.5'			
BACKFILL:					Cuttings with Portland					LOGGED BY:		L Prentice			
DATE:					May1-2, 2017					CHECKED BY:		C Prentice			
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.															

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MOORPARK LIBRARY  
Moorpark, California

PLATE A-1a



City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)															
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)	
					SURFACE EL. (ft): (ref. MSL datum)										
					MATERIAL DESCRIPTION										
22															
24			9	9	Silty Fine to Medium SAND (SM): loose, pale yellowish brown, damp, with few scattered coarse sand and 3/4" gravel fragments						5		23		
26															
28															
30			10	(37)	Fine to Medium SAND with Silt (SP-SM): medium dense, pale yellowish brown, damp					102	3				
32															
34			11	20	- with 1.5"-thick moderate yellowish brown clayey fine sand, at 34.5'						8		7		
36															
38			12	2	Clayey SAND (SC)/Sandy CLAY (CL): very loose, moderate brown, wet; shut down after sampling for 5 min.; measured water at 37.5'						21		50		
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):		75.5'			
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):		37.5'			
BACKFILL:					Cuttings with Portland					LOGGED BY:		L Prentice			
DATE:					May1-2, 2017					CHECKED BY:		C Prentice			
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.															

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**MOORPARK LIBRARY**  
Moorpark, California

PLATE A-1b

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map							DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
42					- loose, at 44' - flowing/caving sand below 44'; adding water to augers prior to sampling below 49'							112	19			p 0.5
44			13	(12)												
46																
48					Clayey SAND (SC): medium dense, moderate brown, wet - sand slough in sampler, blow counts may be affected							112	17		25	
50			14	(36)												
52					Fine to Medium SAND (SP): loose to medium dense, pale yellowish brown, wet, with moderate brown clayey fine sand in sampler shoe; sand slough in sampler							14		3		
54			15	21												
56			15b		Clayey SAND (SC): medium dense, moderate brown, wet							16		25		
58			16	14												
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):			75.5'			
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):			37.5'			
BACKFILL:					Cuttings with Portland					LOGGED BY:			L Prentice			
DATE:					May1-2, 2017					CHECKED BY:			C Prentice			
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

MOORPARK LIBRARY  
Moorpark, California

PLATE A-1c

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-1 (Continued)															
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)	
					SURFACE EL. (ft): (ref. MSL datum)										
					MATERIAL DESCRIPTION										
62															
64															
66															
68			17	7	Fine Sandy CLAY (CL): medium stiff, moderate to dark brown, wet slightly micaceous, silty					24		63			
70			18	22	Fine to Medium Clayey SAND (SC): medium dense, moderate brown, wet, with few coarse sand										
72															
74			19	20	Silty Fine SAND (SM): medium dense, moderate brown, wet					25		24			
76															
78															
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):		75.5'			
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):		37.5'			
BACKFILL:					Cuttings with Portland					LOGGED BY:		L Prentice			
DATE:					May1-2, 2017					CHECKED BY:		C Prentice			
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MOORPARK LIBRARY  
Moorpark, California

PLATE A-1c

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-2																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)		
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
					<b>ARTIFICIAL FILL (af)</b> Silty Fine SAND (SM): with gravel, medium dense, grayish brown, dry to damp											
2			1													
			2	15	<b>ARTIFICIAL FILL (af)/ALLUVIUM (Qal)?</b> Clayey SAND (SC): medium dense, dark brown, dry to damp											
4			3	(15)	<b>ALLUVIUM (Qal)</b> Silty Fine SAND (SM): loose, moderate brown, dry to damp					97	4					
6																
8			4	6	- loose, damp, fine to medium grained, at 7'						4		22			
10			5	(14)	- fine to medium grained, darker, at 9' - with dark brown fine silty lenses, at 9.75'					101	4					
12			6	7	Fine to Medium SAND with Silt (SP-SM): loose, moderate brown, damp						3		12			
14			7	(15)	Silty Fine SAND (SM): loose, moderate brown, damp - with medium stiff, moderate brown silt with slight mottling and few fine root hairs and minor fine caliche, at 14 to 15' - fine to medium grained with few scattered coarse sand, at 15'					106	5		32			
16																
18																
			8	13	medium dense, pale yellowish brown, at 19'											
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):					50.5'	
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):					36'	
BACKFILL:					Cuttings with Portland					LOGGED BY:					L Prentice	
DATE:					May1-2, 2017					CHECKED BY:					C Prentice	
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

**MOORPARK LIBRARY**  
Moorpark, California

PLATE A-2a

LOG OF DRILL HOLE DH-2 (Continued)																
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map					DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)		
					SURFACE EL. (ft): (ref. MSL datum)											
					MATERIAL DESCRIPTION											
22					- loose, at 24'  - with finely laminated sandy silt and silt in sampler shoe, at 25.5'					90	6		29			
24			9	(15)												
26																
28					Fine to Medium SAND (SP): medium dense, pale yellowish brown, damp, with few coarse sand and few angular gravel fragments to about 1/2"-dia.											
30			10	21												
32																
34					Clayey Fine to Medium SAND (SC): medium dense, dark brown, moist to wet					97	18		27			
36			11	(24)												
					Medium to Coarse SAND (SP): medium dense, moderate brown, moist to wet											
38																
			12	WOH	Sandy Silty CLAY (CL-ML): very soft, dark brown, wet						21		52	p 0.1		
CONTRACTOR:					S/G Drilling, Inc.					TOTAL DEPTH (ft):					50.5'	
METHOD:					8"-dia. Hollow-stem-auger					WATER DEPTH (ft):					36'	
BACKFILL:					Cuttings with Portland					LOGGED BY:					L Prentice	
DATE:					May1-2, 2017					CHECKED BY:					C Prentice	
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.																

NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

LOG OF DRILL HOLE DH-2 (Continued)											
DEPTH (feet)	MATERIAL SYMBOL	SAMPLE	NUMBER	BLOW COUNT	LOCATION: See Location Map		DRY DEN. (pcf)	MOISTURE CONTENT %	PLASTICITY (LL/PI)	% PASSING No. 200	TV or PP (tsf)
					SURFACE EL. (ft): (ref. MSL datum)						
					MATERIAL DESCRIPTION						
42			13	(27)	- shut down after sampling for 5 min.; measured water at 36'		118	16		47	p 2.3 p 2.7
					- very stiff, at 41'						
					Medium to Coarse Clayey SAND (SC): medium dense, dark brown, wet						
44			NR	(10)	- no recovery after sampling at 44'						
46											
48											
50			14	(19)	- no recovery after sampling at 49'; recovered sample with SPT.			17		27	
52											
54											
56											
58											
CONTRACTOR:					S/G Drilling, Inc.		TOTAL DEPTH (ft):		50.5'		
METHOD:					8"-dia. Hollow-stem-auger		WATER DEPTH (ft):		36'		
BACKFILL:					Cuttings with Portland		LOGGED BY:		L Prentice		
DATE:					May1-2, 2017		CHECKED BY:		C Prentice		
NOTE: The log and data presented herein are a simplification of actual subsurface conditions encountered at the time of exploration at the specific location explored. Subsurface conditions may differ at other locations and at this location with the passage of time.											

MOORPARK LIBRARY  
Moorpark, California

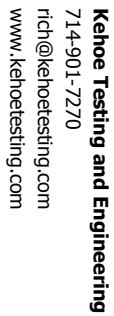
PLATE A-2c

Summary of Sampling Details					
Symbol	Number	Blowcount Push, or grab	Sampler Type	Blowcount Information	
	1	Bulk	Bulk Sample		
	2	23	Standard Penetration Test (SPT) Sampler (1-3/8" ID/2" OD) driven	63	63 blows for 1' penetration after initial 6" seating
				89/11	89 blows for 11" penetration after initial 6" seating
				33/6	33 blows for 6" drive after initial 6" seating
	3	(23)	Modified California Liner Sampler driven ( 2-3/8" ID/3" OD)	Ref	>50 blows for initial 6" seating
				(23)	Blowcounts for modified California sampler
	4	Push	Thin-walled sampler pushed ( 2-7/8" ID/3" OD)		

Material Symbols and Classifications					
	LEAN CLAY (CL)		Sandy SILT (ML)		CLAYSTONE
	FAT CLAY (CH)		Silty SAND (SM)		SILTSTONE
	Sandy CLAY (CL)		SAND with Silt (SP-SM)		SANDSTONE
			SAND with Clay (SP-SC)		
	SILT (ML)		SAND (SP)		VOLCANIC
	Sandy SILT (ML)				
	ELASTIC SILT (MH)		Clayey SAND (SC)		DOLOMITIC
			GRAVEL (GP)		SILICEOUS

Other Symbols	
	Groundwater
	Strata break

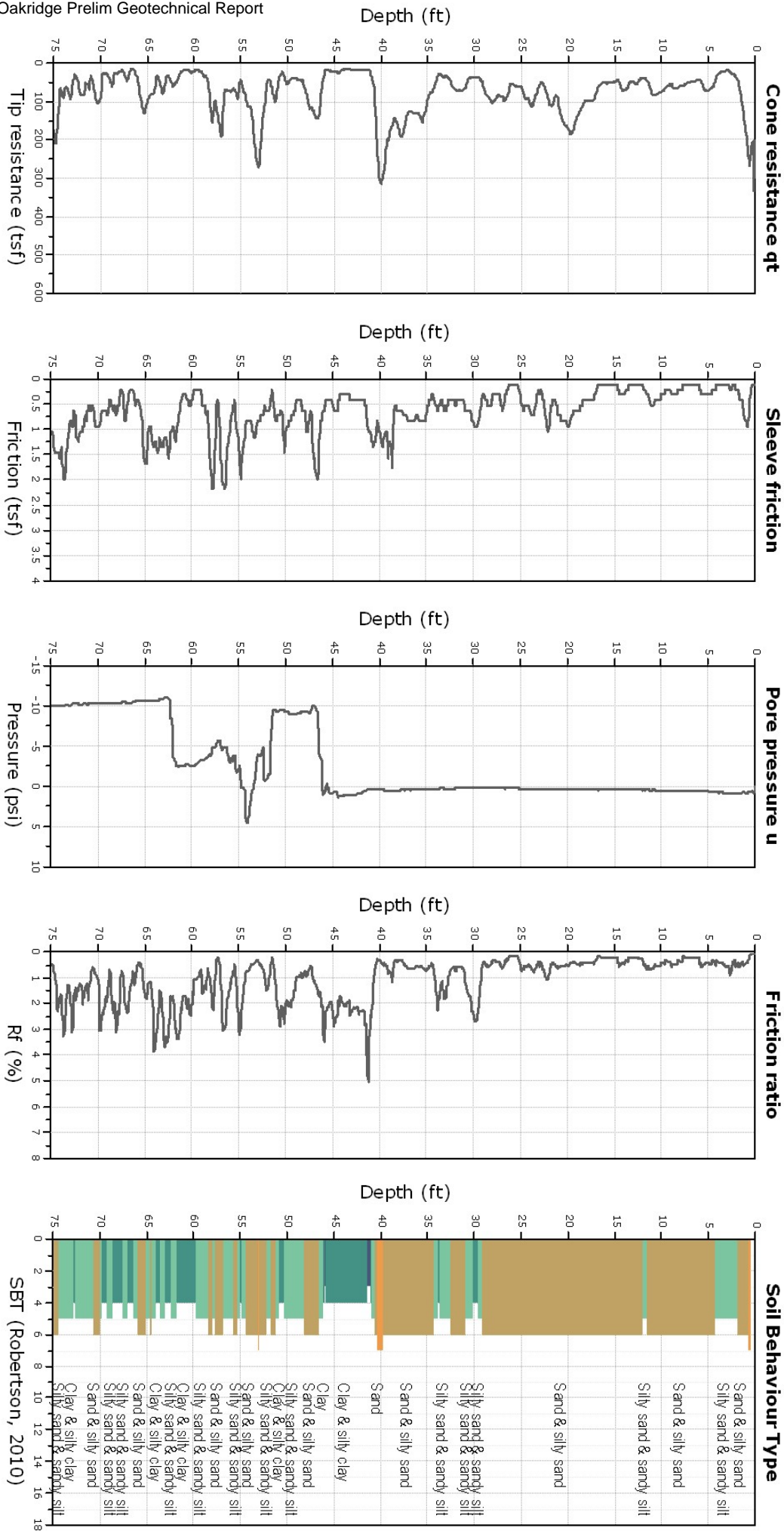
SUMMARY OF TERMS AND SYMBOLS  
USED ON LOGS



**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.29 ft, Date: 4/27/2017

Cone Type: Vertek





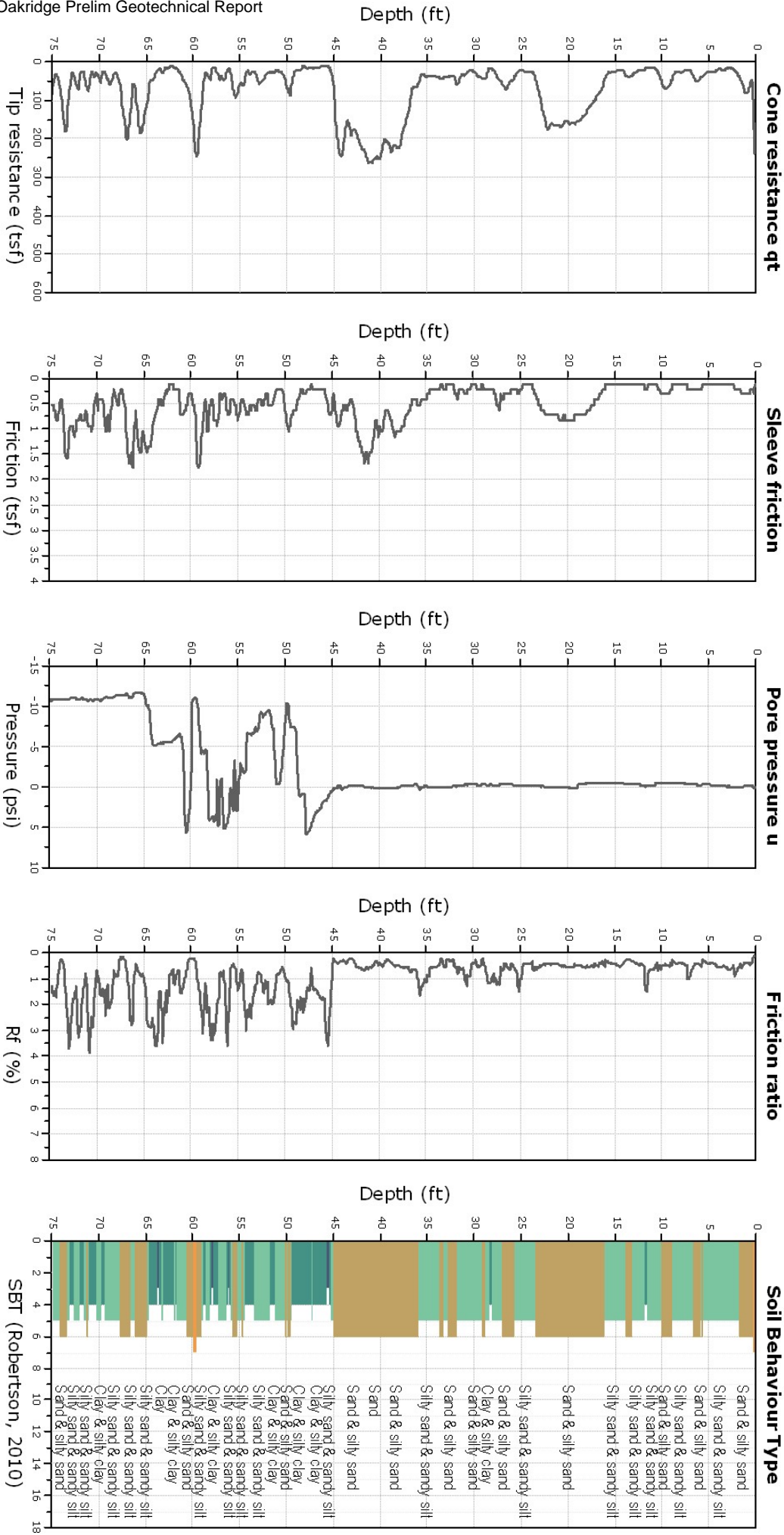


**Keohoe Testing and Engineering**  
714-901-7270  
rich@kehoetesting.com  
www.kehoetesting.com

**Project:** Oakridge Geoscience, Inc./Moorpark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

**CPT-2**

Total depth: 75.14 ft, Date: 4/27/2017  
Cone Type: Vertek



**PLATE A-5**

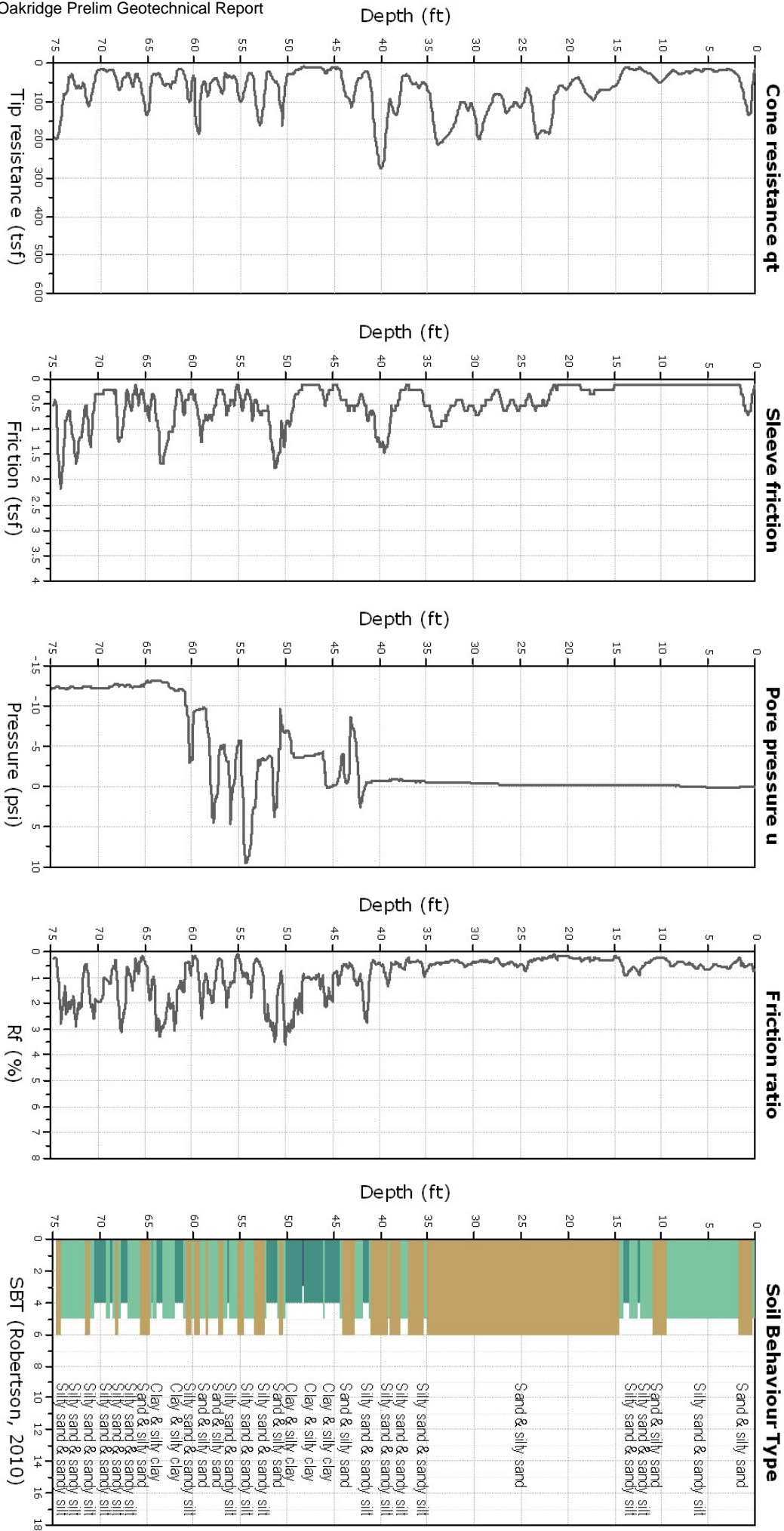
CPeT-IT v.2.0.1.55 - CPTU data presentation & interpretation software - Report created on: 4/28/2017, 11:49:57 AM  
Project file: C:\Oakridge\moorpark-17\Plot Data\Plots.cpt

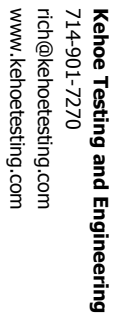


**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.07 ft, Date: 4/27/2017

Cone Type: Vertek

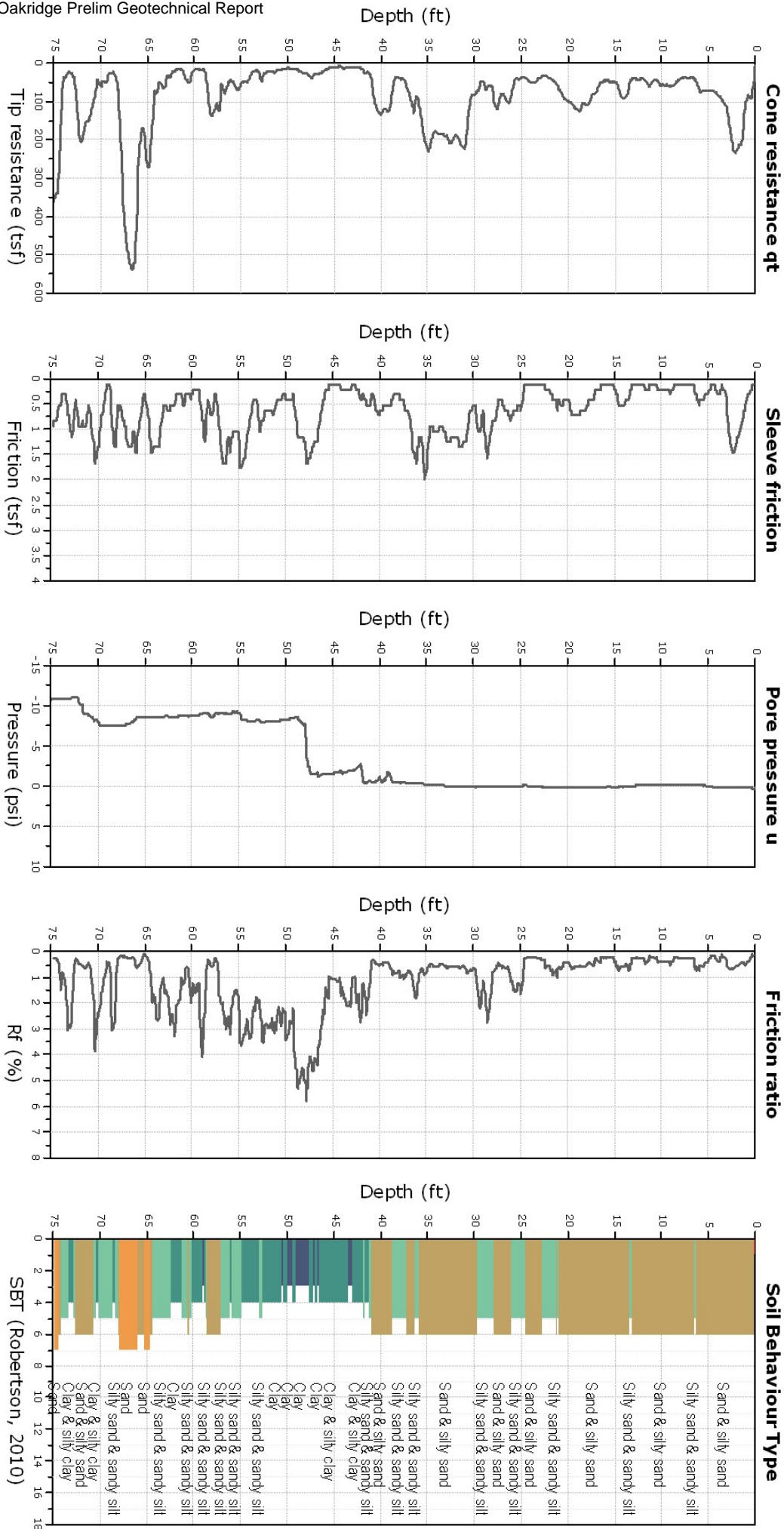




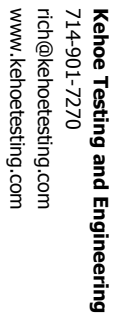
**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.16 ft, Date: 4/27/2017

Cone Type: Vertek





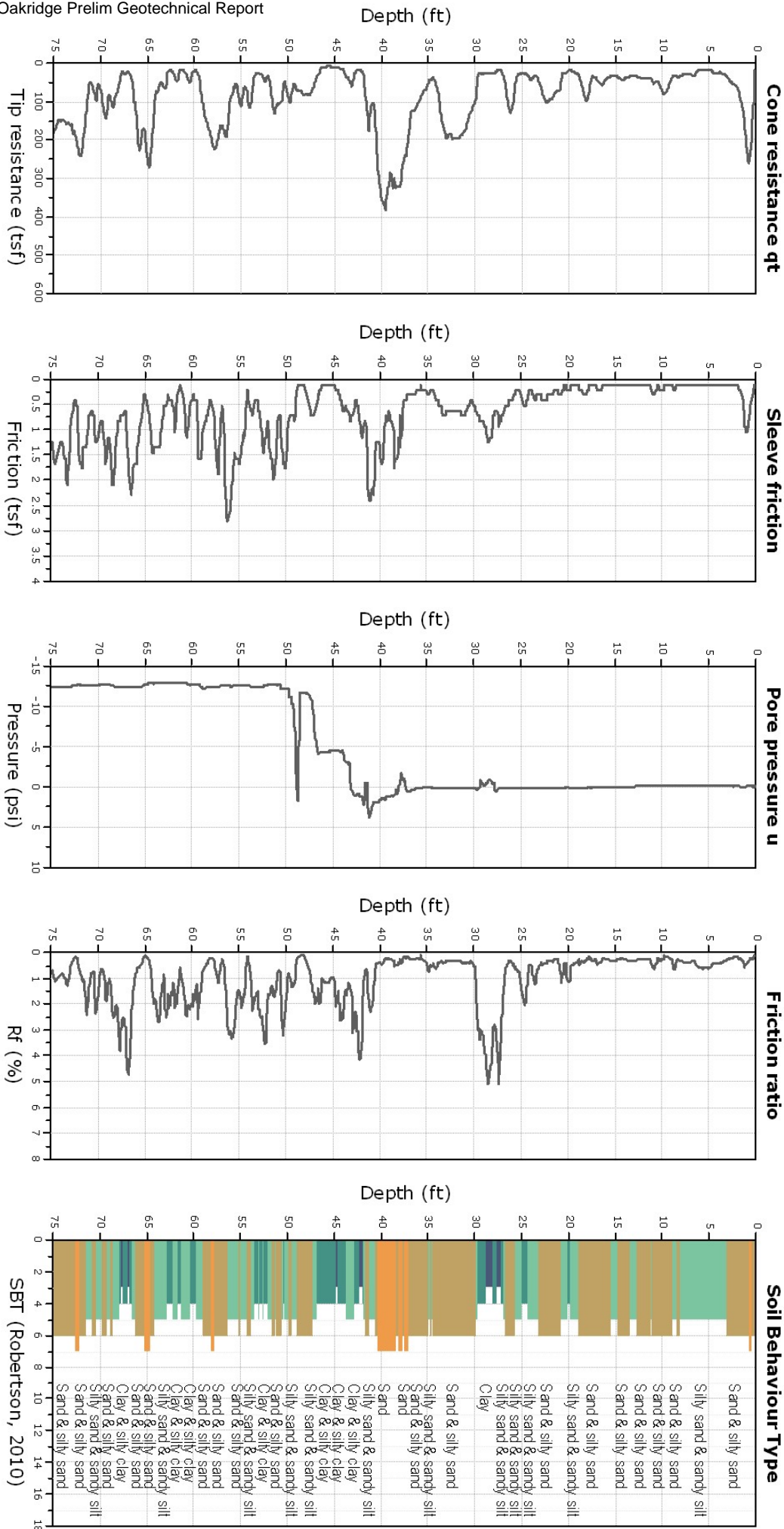


714-901-7270  
rich@kehoetesting.com  
www.kehoetesting.com

**Project:** Oakridge Geoscience, Inc./MoorPark Library Project  
**Location:** W. High St & Moorpark Ave Moorpark, CA

Total depth: 75.27 ft, Date: 4/27/2017

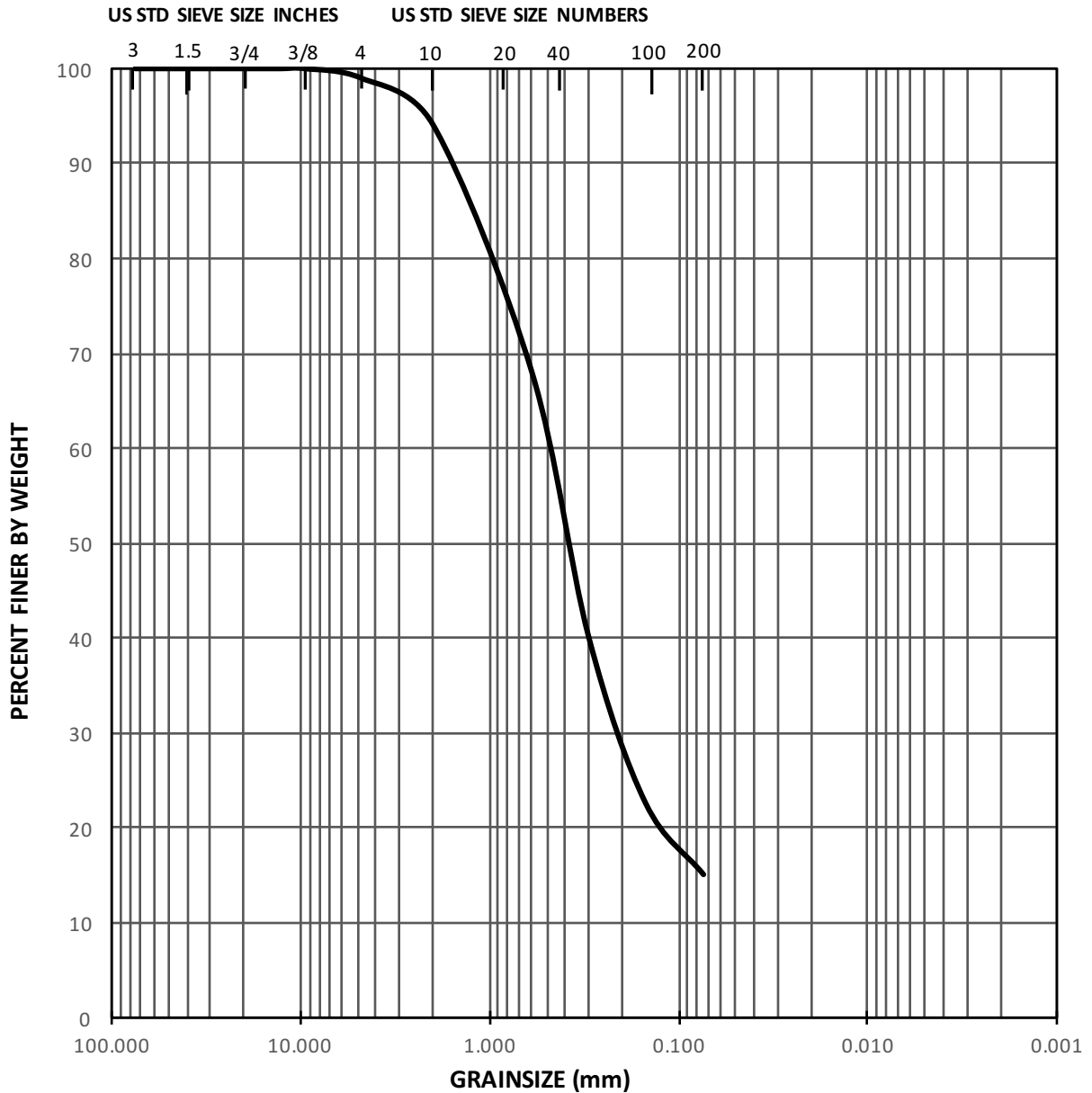
Cone Type: Vertek



CPeT-IT v2.0.1.55 - CPU data presentation & interpretation software - Report created on: 4/28/2017, 11:50:37 AM  
Project file: C:\Oakridge\MoorPK-4-17\Plot\_Data\Plots.cpt

**PLATE A-8**

## **APPENDIX B**



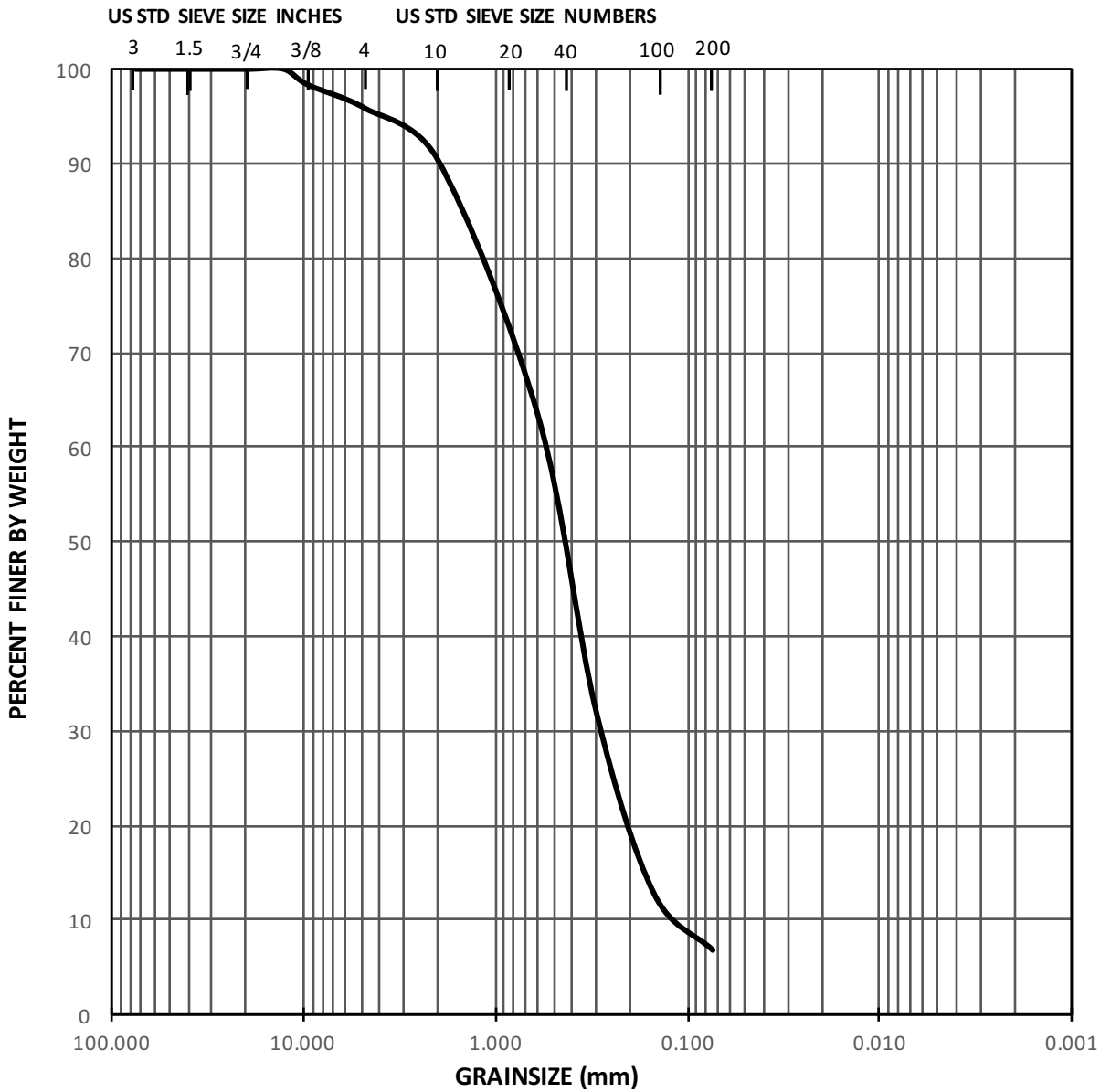
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION      DH-1  
DEPTH        10'

CLASSIFICATION  
Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)  
15

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**



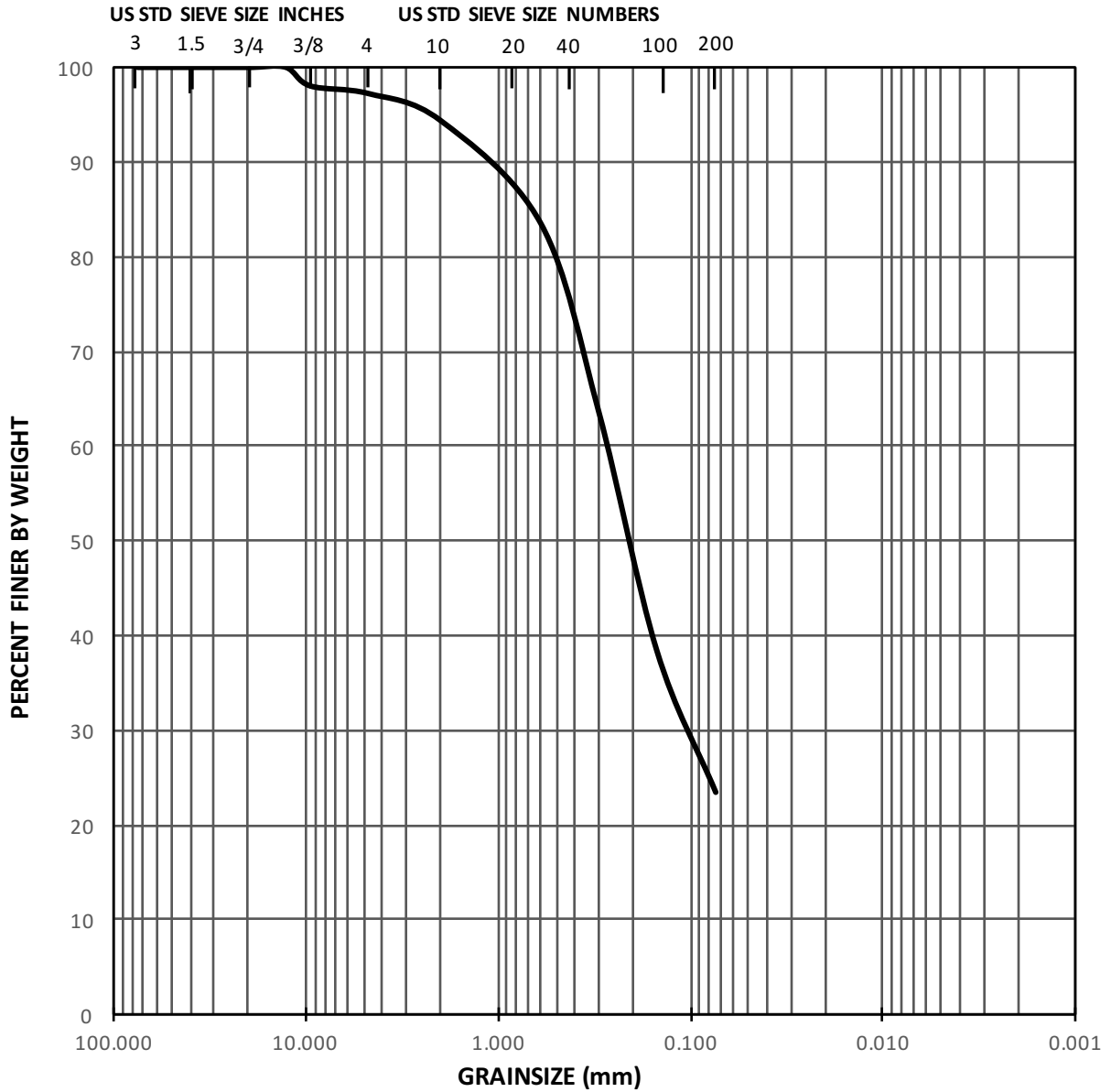
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-1  
DEPTH 15'

CLASSIFICATION  
Fine to Medium SAND with Silt (SP-SM)

PASSING NO. 200 (%)  
7

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

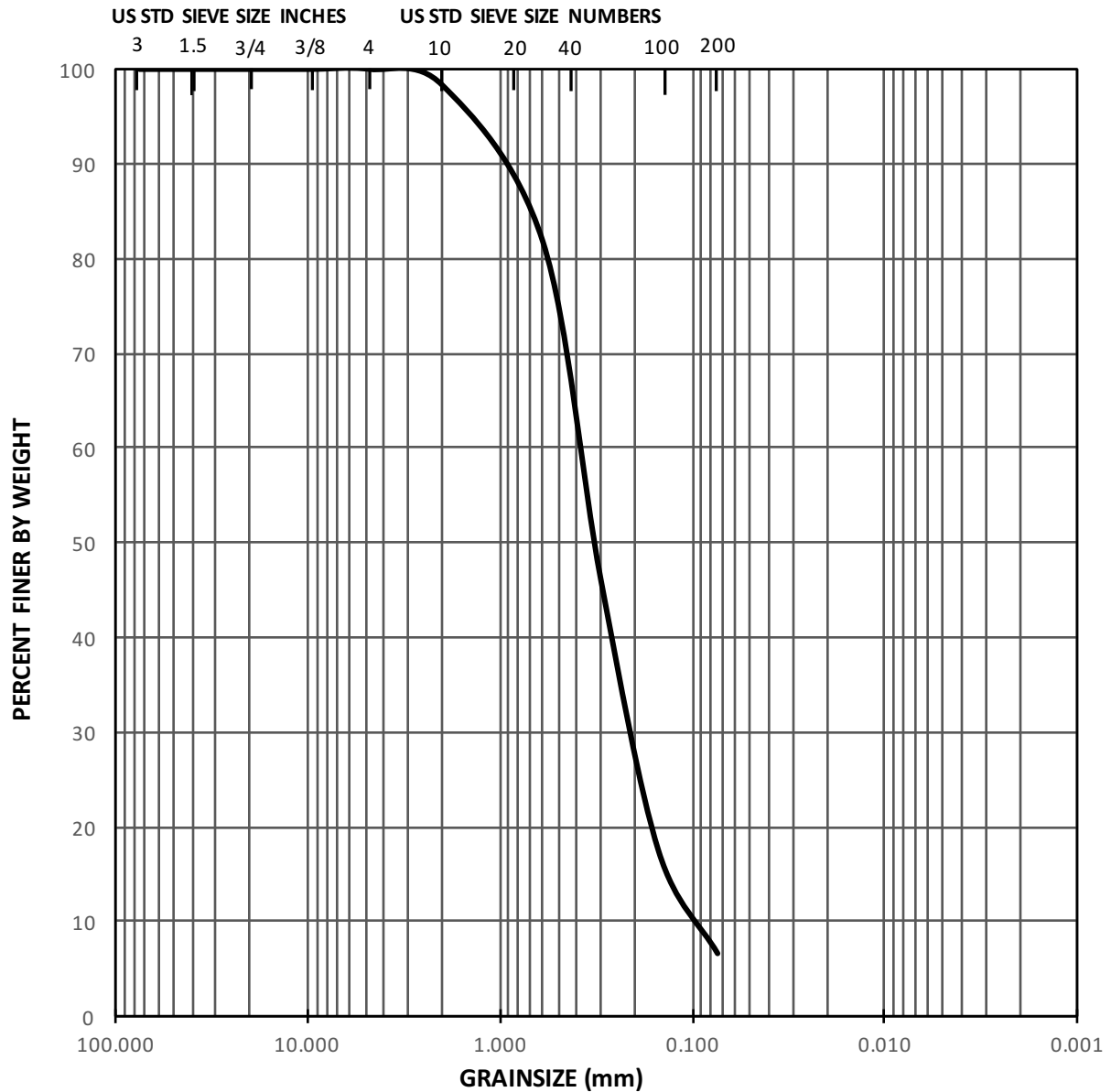
LOCATION    DH-1  
DEPTH    25'

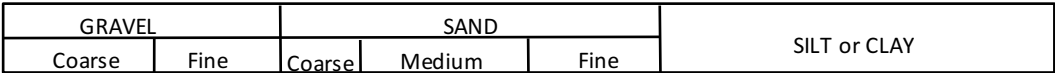
CLASSIFICATION  
Silty Fine to Medium SAND (SM)

PASSING NO. 200 (%)  
23

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**





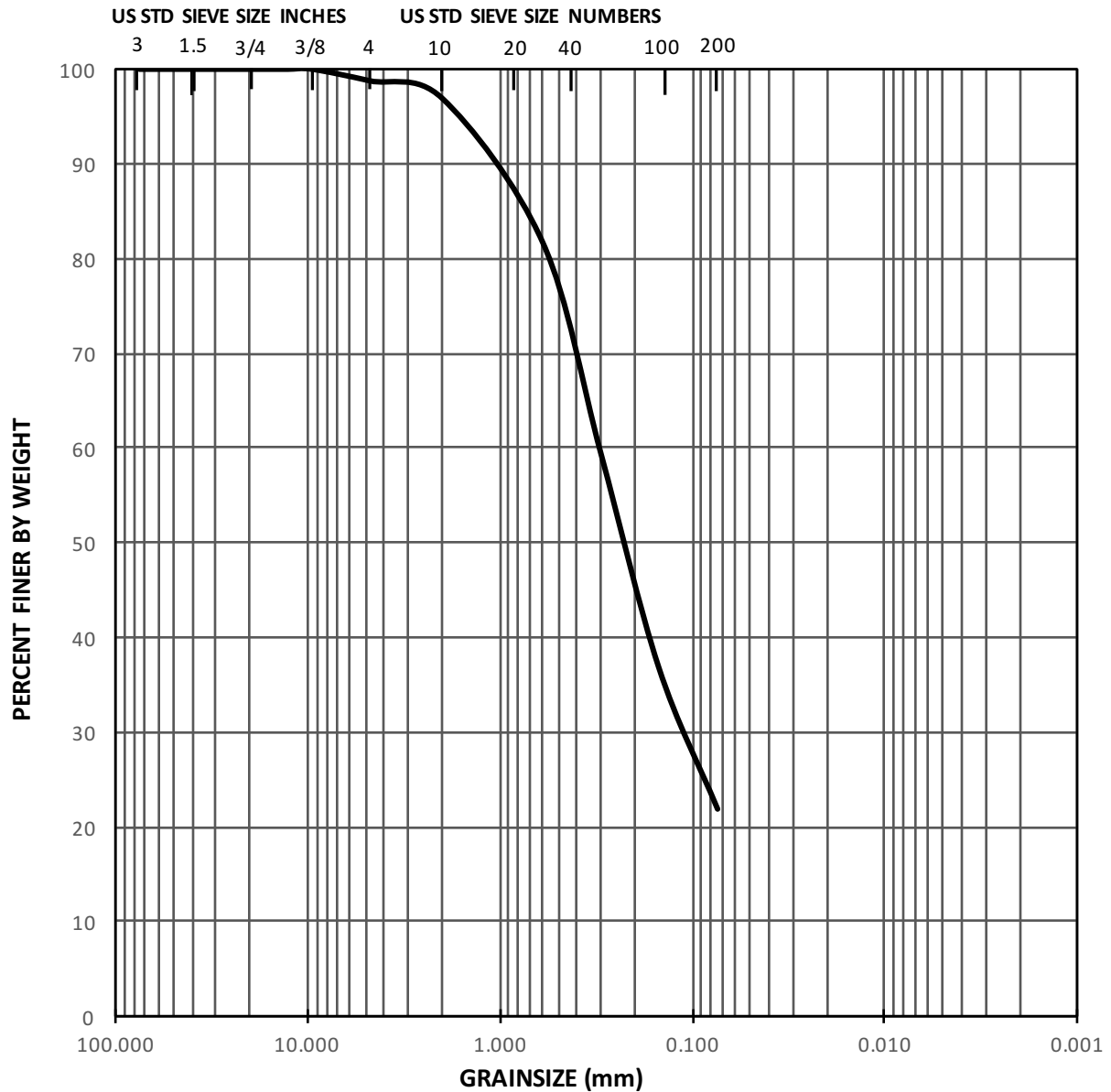


<u>LOCATION</u>	DH-1
<u>DEPTH</u>	55'

**CLASSIFICATION**  
Fine to Medium SAND (SP)

**PASSING NO. 200 (%)**  
3

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

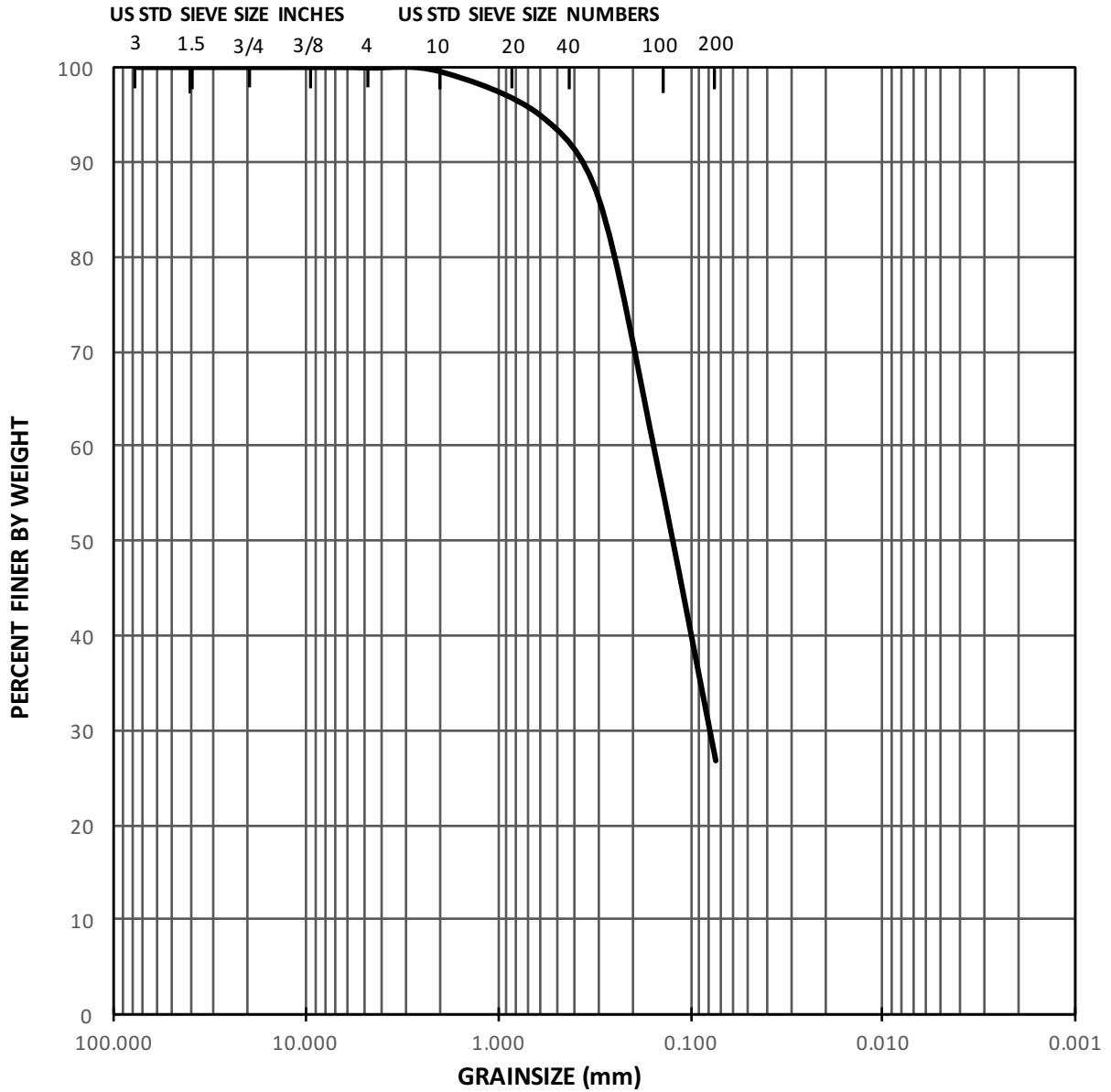
LOCATION DH-2  
 DEPTH 8'

**CLASSIFICATION**  
 Silty Fine to Medium SAND (SM)

**PASSING NO. 200 (%)**  
 22

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**





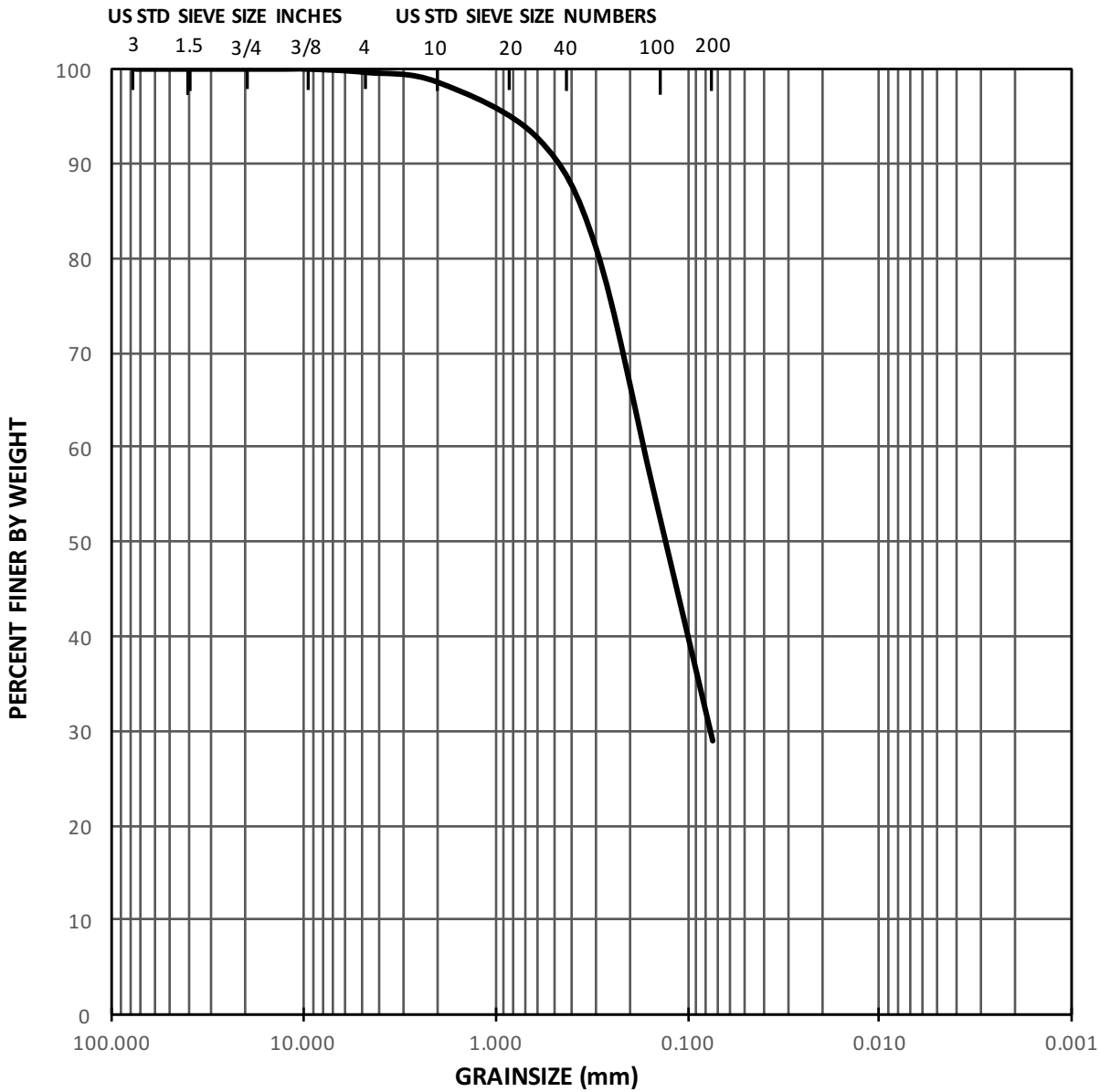
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION    DH-2  
DEPTH    15'

CLASSIFICATION  
Silty Fine SAND (SM)

PASSING NO. 200 (%)  
27

**GRAINSIZE DISTRIBUTION**  
**Moorpark Library**  
**Moorpark, California**



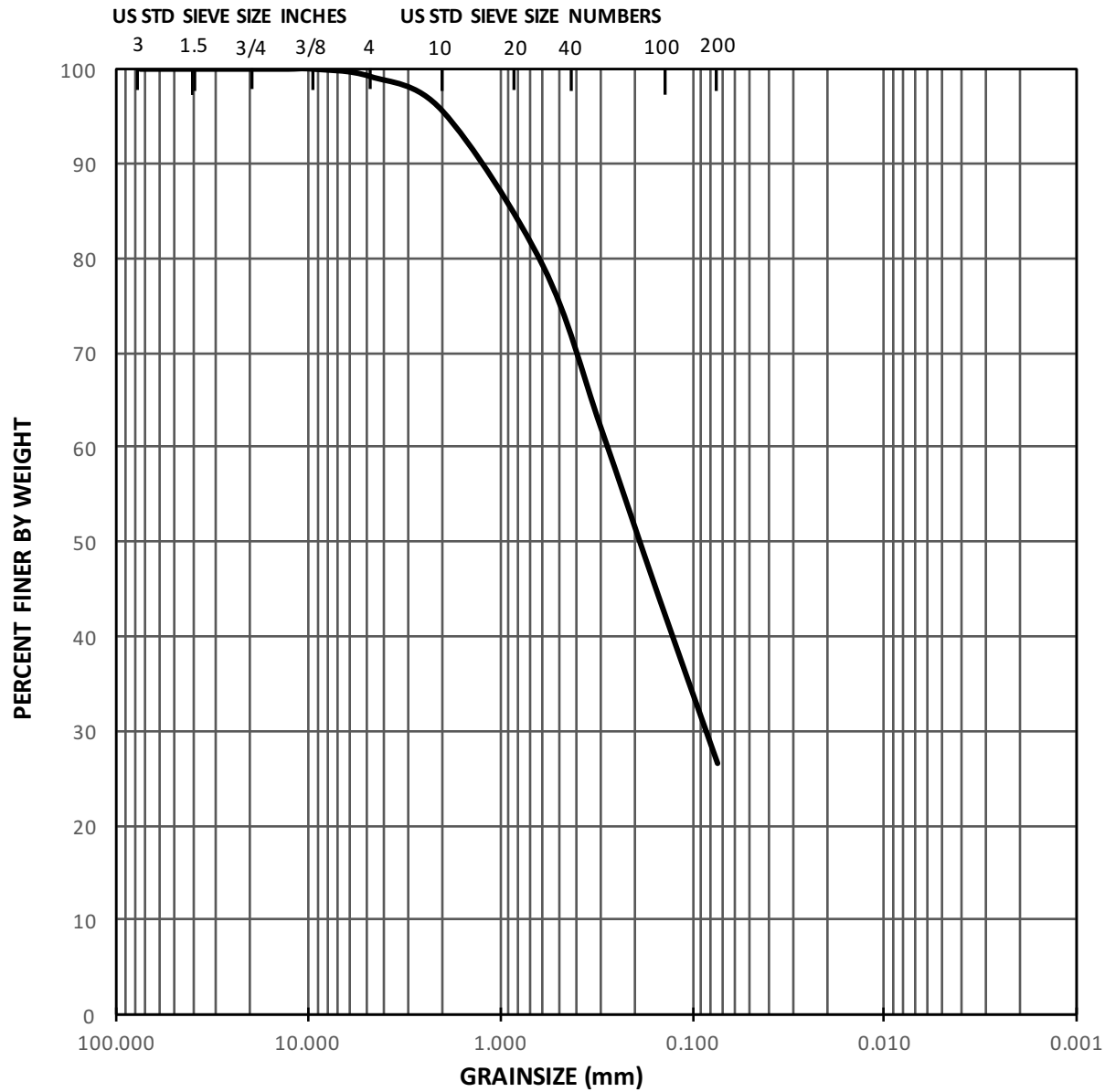
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
DEPTH 25'

CLASSIFICATION  
Silty Fine SAND (SM)

PASSING NO. 200 (%)  
29

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



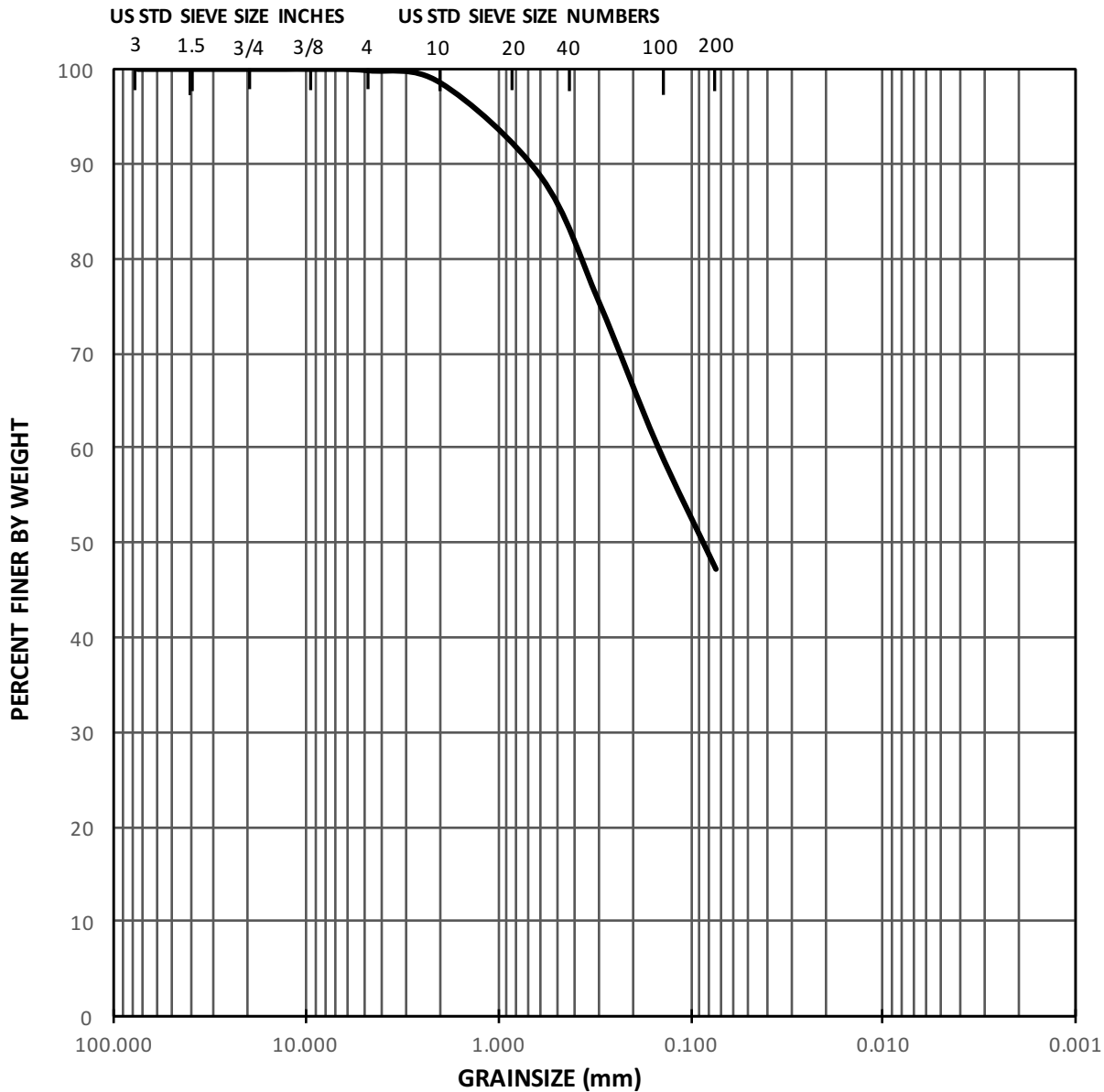
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
DEPTH 34'

CLASSIFICATION  
Clayey Fine to Medium SAND (SC)

PASSING NO. 200 (%)  
27

GRAINSIZE DISTRIBUTION  
Moorpark Library  
Moorpark, California



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LOCATION DH-2  
 DEPTH 42'

CLASSIFICATION  
 Sandy Silty CLAY (CL-ML)

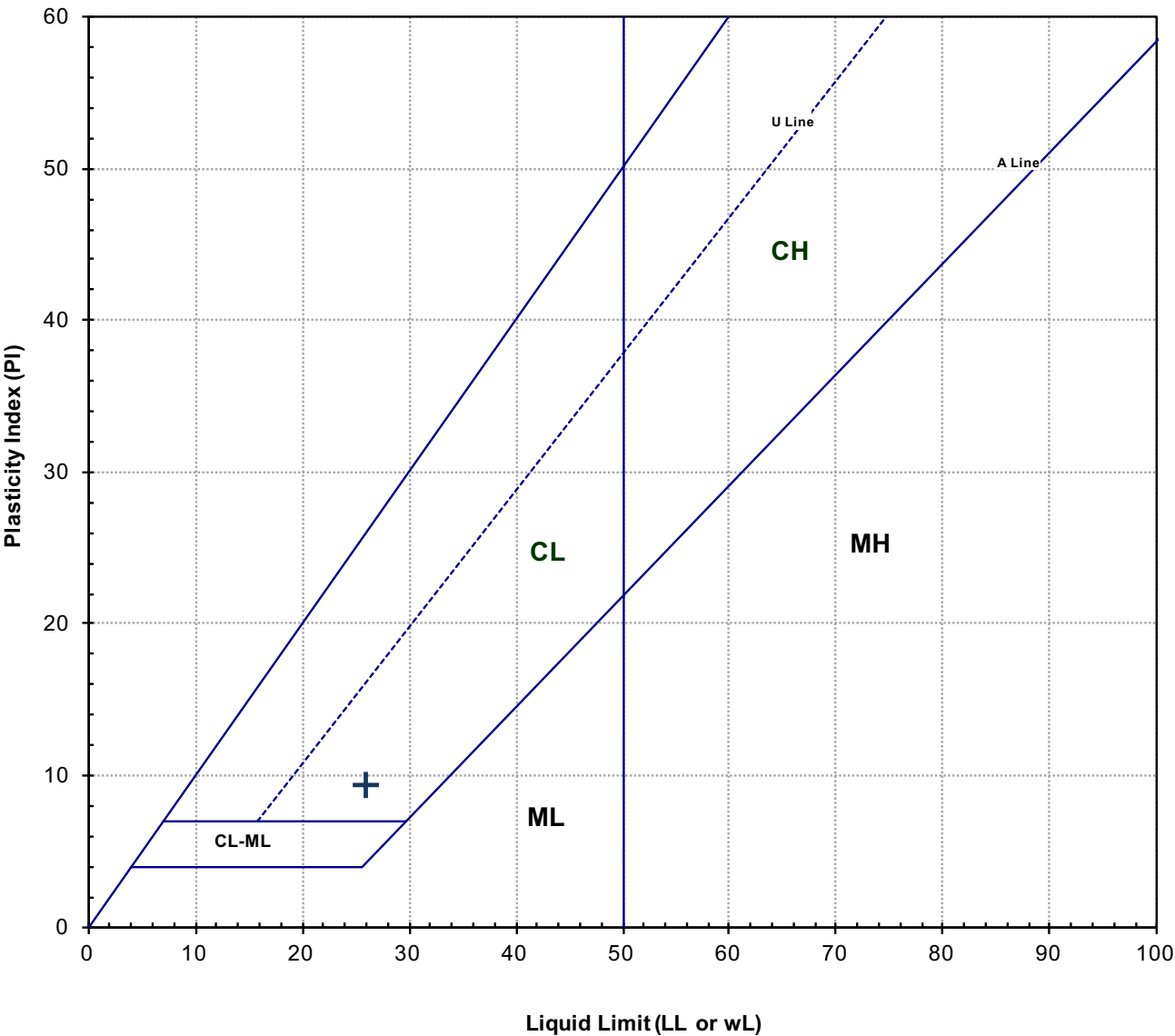
PASSING NO. 200 (%)  
 47

GRAINSIZE DISTRIBUTION  
 Moorpark Library  
 Moorpark, California



City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.



<u>LOCATION</u>	DH-1
<u>DEPTH</u>	67'

CLASSIFICATION

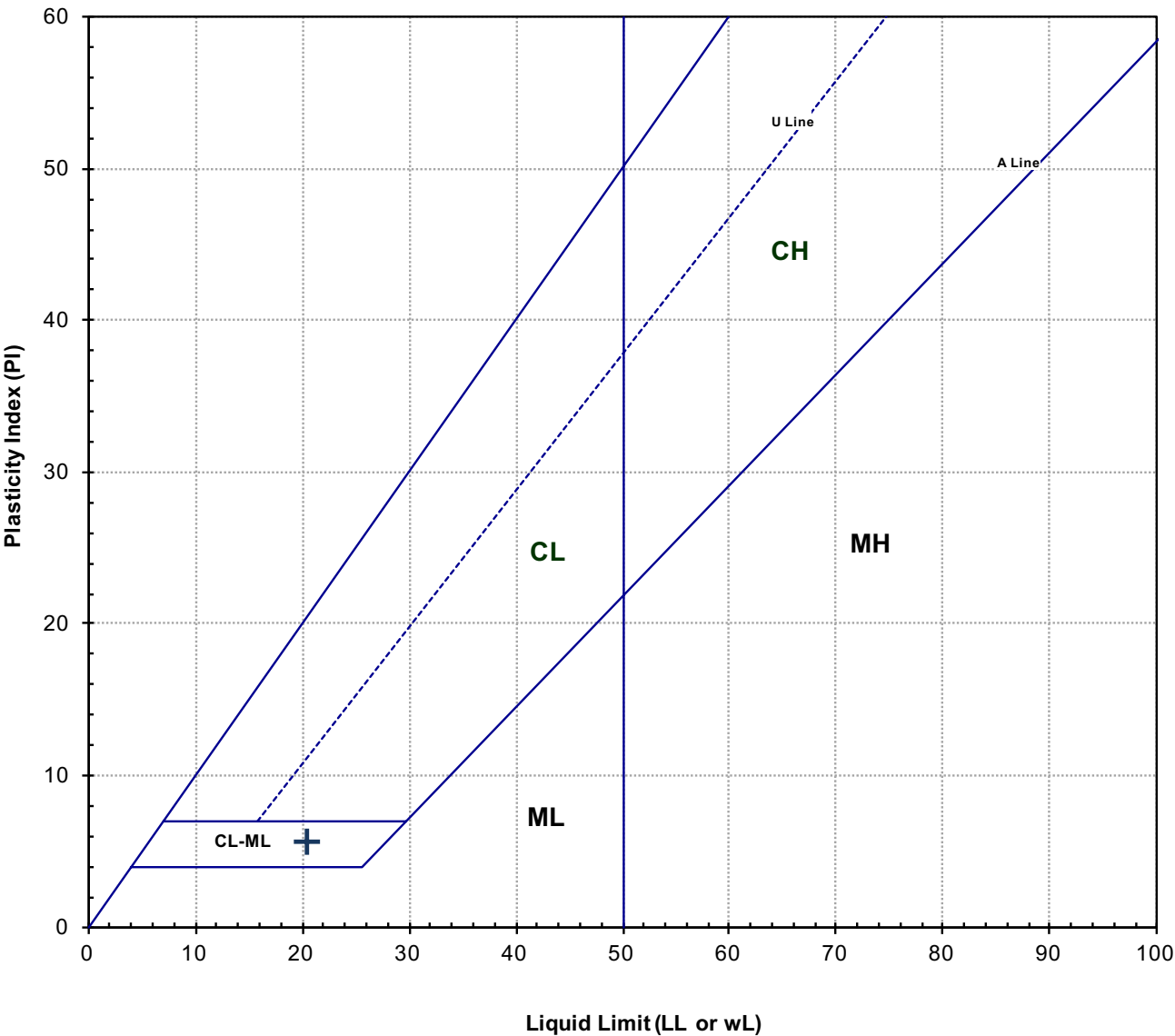
Clayey SAND (SC)

LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
26	17	9

MOORPARK LIBRARY  
Moorpark, California

City of Moorpark  
Project No. 030.003

OAKRIDGE GEOSCIENCE, INC.

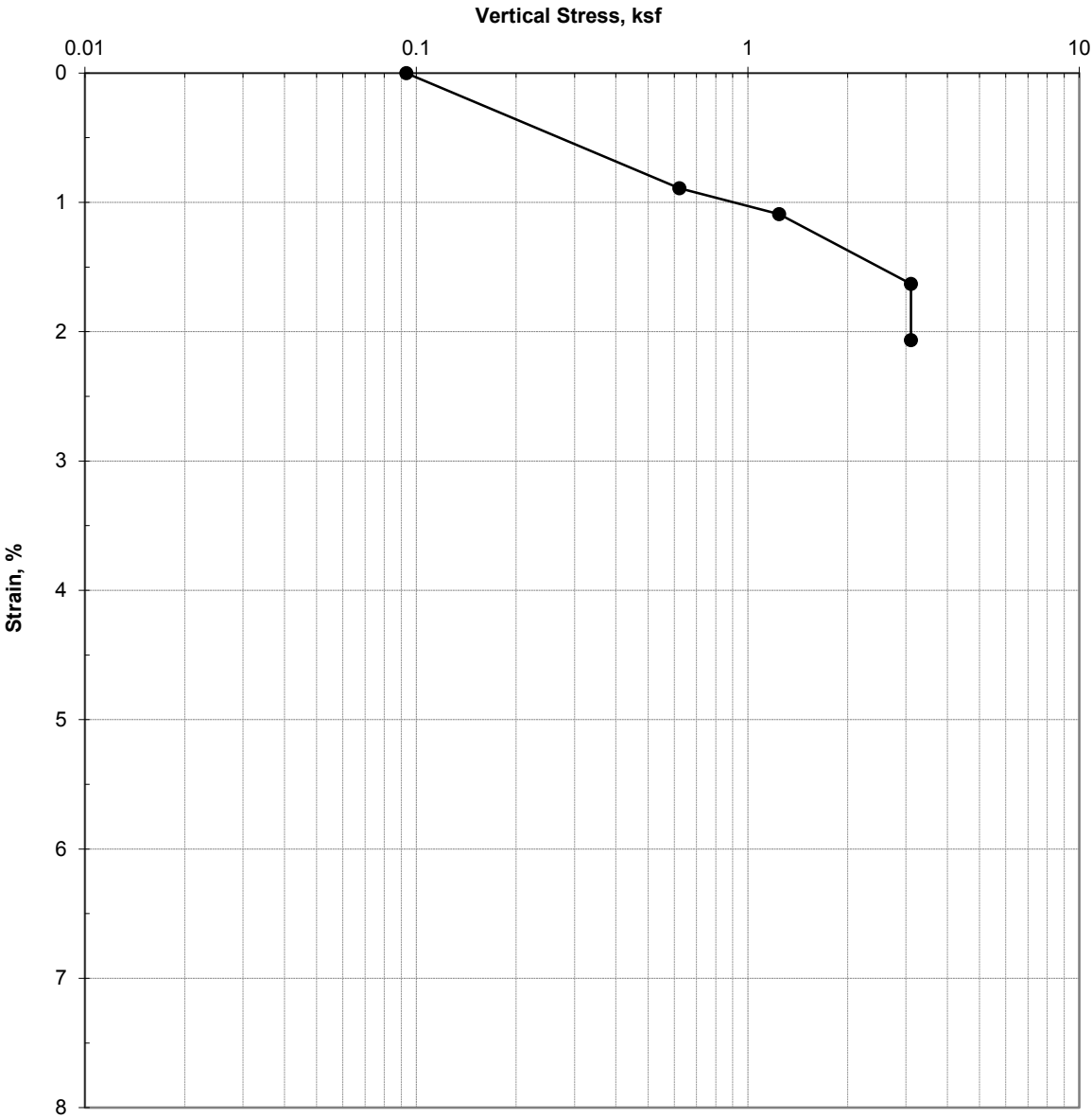


<u>LOCATION</u>	DH-2
<u>DEPTH</u>	40'

CLASSIFICATION  
Sandy Silty CLAY (CL-ML)

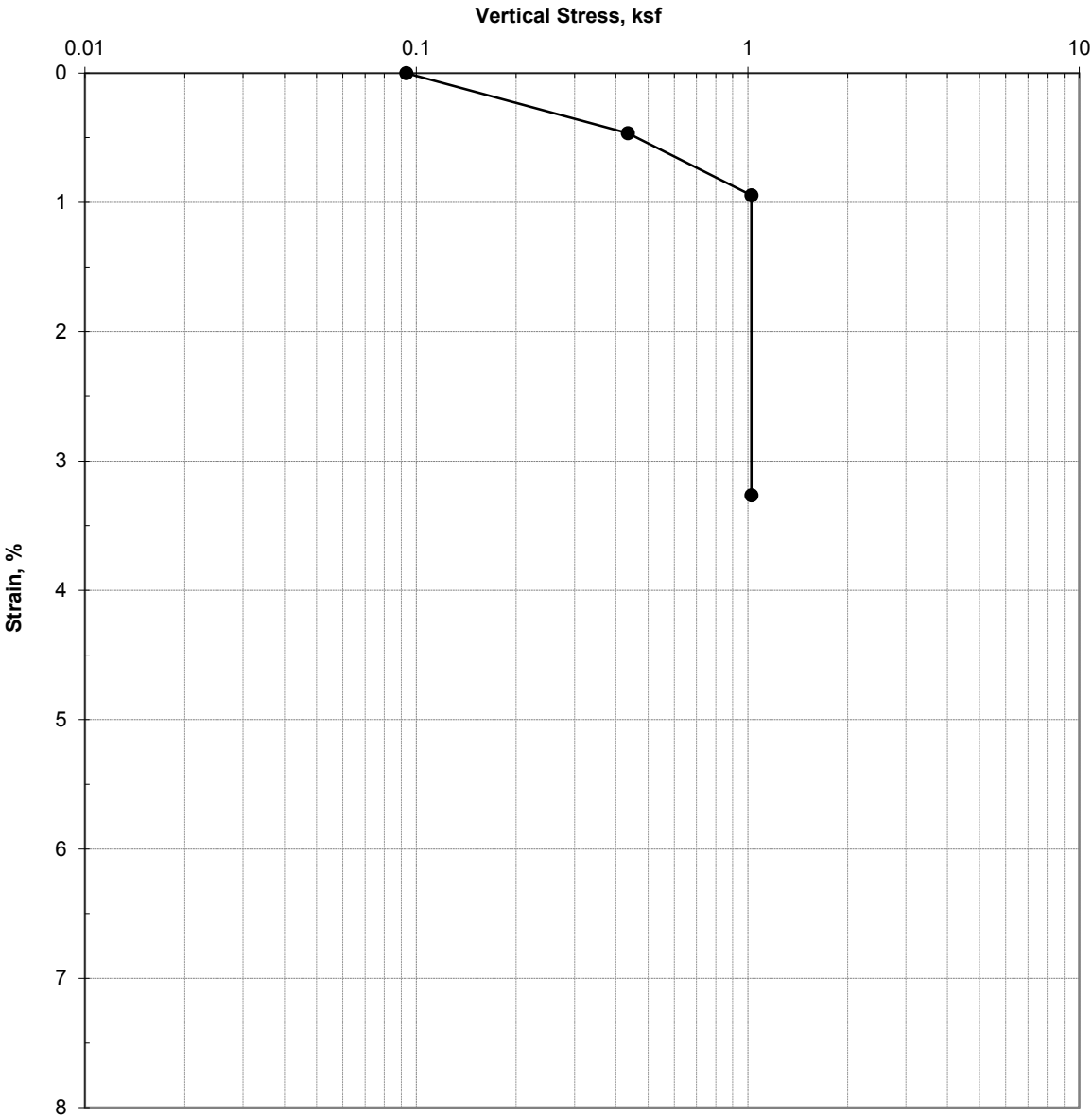
LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
21	15	6

MOORPARK LIBRARY  
Moorpark, California



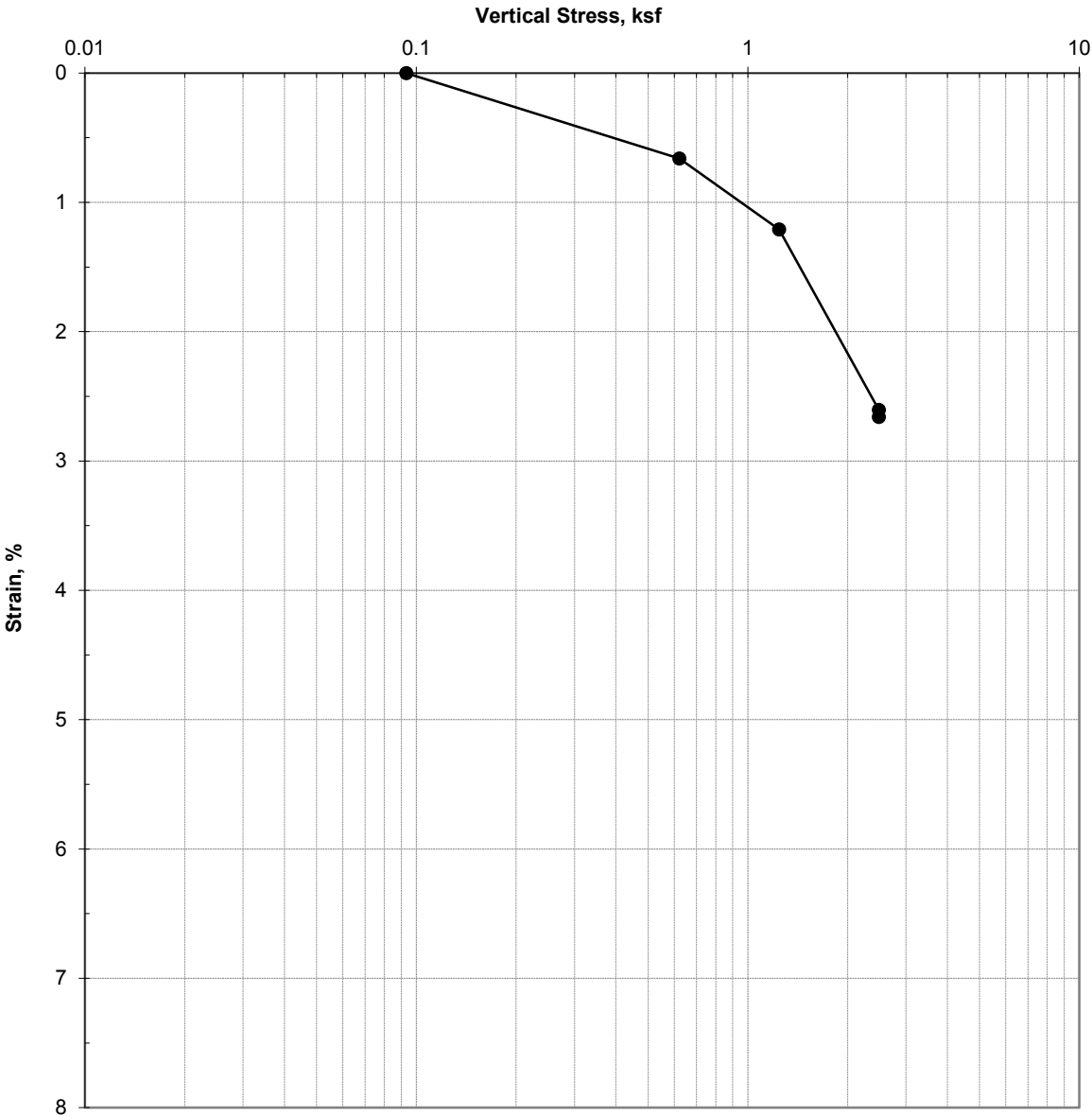
SAMPLE ID	Boring, Sample #, Depth	DH-1 , #10 , 30.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND (SP): yellow, dry			Inundation Increment, ksf	3.11
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	2.5%	18.6%		Plastic Limit	---
	Dry Unit Weight, pcf	102.0	104.1		Plasticity Index	---
	Saturation, %	11%	84%		Passing #200	---
	Void Ratio	0.62	0.59		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library After adding water the specimen collapsed 0.43% at a stress of 3.11ksf.	
	Height, in	1.00	0.98			

ONE DIMENSIONAL COLLAPSE TEST



SAMPLE ID	Boring, Sample #, Depth	DH-2 , #5 , 10.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND with silt (SP-SM): light brown, dry, lightly cemented			Inundation Increment, ksf	1.03
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	3.5%	21.0%		Plastic Limit	---
	Dry Unit Weight, pcf	96.9	100.1		Plasticity Index	---
	Saturation, %	13%	85%		Passing #200	---
	Void Ratio	0.71	0.65		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library  After adding water the specimen collapsed 2.32% at a stress of 1.03ksf.	
	Height, in	1.00	0.97			

ONE DIMENSIONAL COLLAPSE TEST



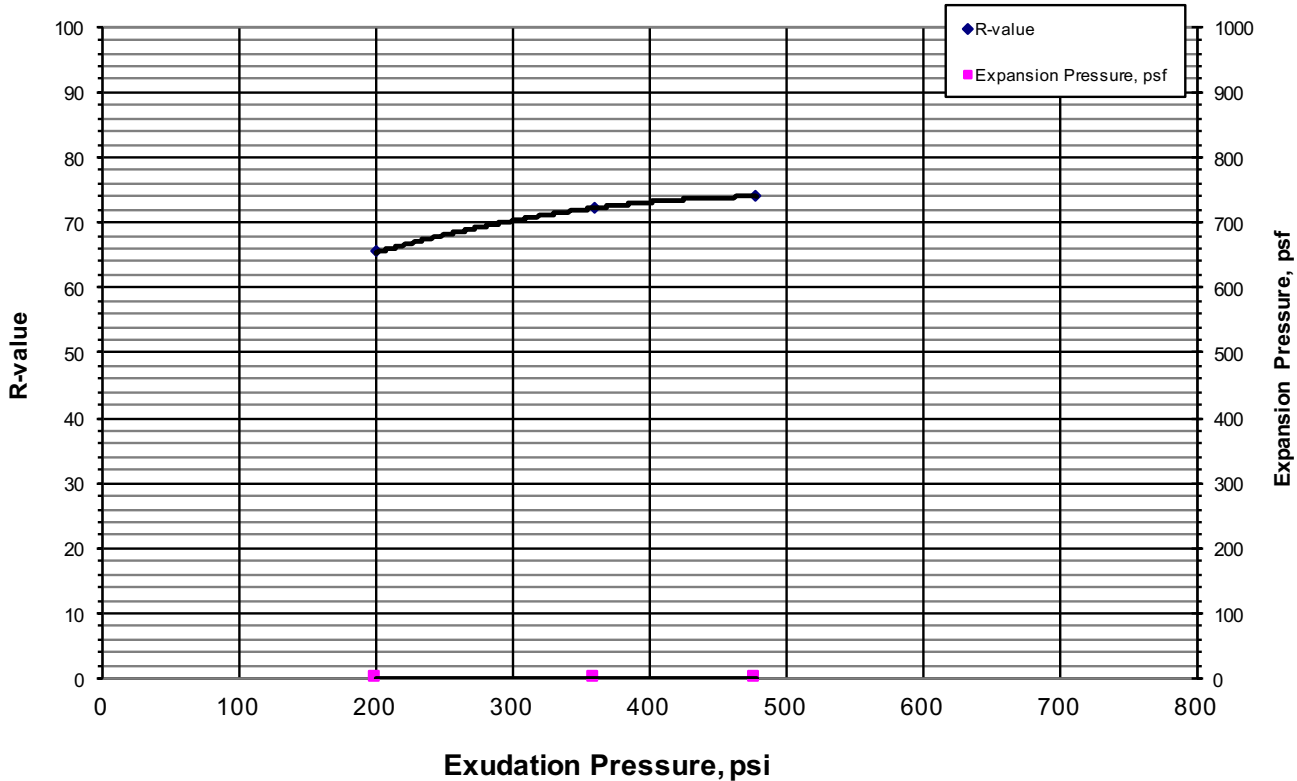
SAMPLE ID	Boring, Sample #, Depth	DH-2, #9, 25.0 ft		SUMMARY	Preconsolidation Pressure, ksf	---
	USCS Classification:	Poorly-graded SAND (SP): yellow brown, moist, fine			Inundation Increment, ksf	2.49
PROPERTIES		Initial	Final		Liquid Limit	---
	Water Content, %	5.6%	24.6%		Plastic Limit	---
	Dry Unit Weight, pcf	89.9	92.4		Plasticity Index	---
	Saturation, %	18%	82%		Passing #200	---
	Void Ratio	0.84	0.79		Estimated Gs	2.65
	Diameter, in	2.42	2.42	REMARKS	Test Method: ASTM D4546, Method B 030.003 - Moorpark Library After adding water the specimen collapsed 0.05% at a stress of 2.49ksf.	
	Height, in	1.00	0.97			

ONE DIMENSIONAL COLLAPSE TEST



# R-value Test Report (Caltrans 301)

Job No.:	903-017	Date:	05/22/17	Initial Moisture,	6.6
Client:	Oakridge Geoscience	Tested	PJ	R-value	70
Project:	Moorpark Library - 030.003	Reduced	RU	Expansion Pressure	0 psf
Sample	DH-1 @ 0-5'	Checked	DC	Remarks:	
Soil Type:	Brown SAND w/ Silt				
Specimen Number	A	B	C	D	
Exudation Pressure, psi	200	360	478		
Prepared Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	60	50	45		
Weight of Soil & Mold, grams	3137	3143	3132		
Weight of Mold, grams	2083	2090	2089		
Height After Compaction, in.	2.50	2.50	2.42		
Moisture Content, %	11.9	11.0	10.6		
Dry Density, pcf	114.2	115.0	118.2		
Expansion Pressure, psf	0	0	0		
Stabilometer @ 1000					
Stabilometer @ 2000	34	26	22		
Turns Displacement	4.90	4.95	5.15		
R-value	65	72	74		



**CTL #** 903-017  
**Client:** Oakridge Geoscience

Date: \_\_\_\_\_ Tested By: PJ  
Project: Moorpark Library

Checked: PJ  
Proj. No: 030.003

[illegible]

## **APPENDIX C**





**GeoLogismiki**  
Geotechnical Engineers  
Merarhias 56  
<http://www.geologismiki.gr>

## LIQUEFACTION ANALYSIS REPORT

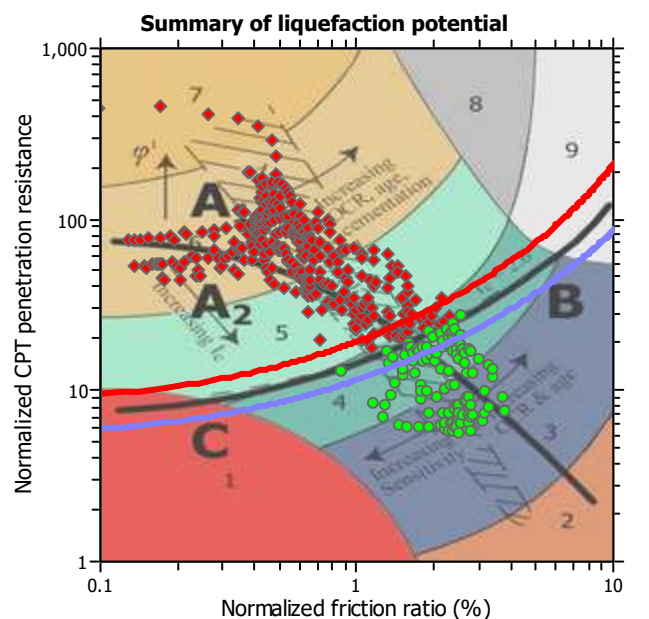
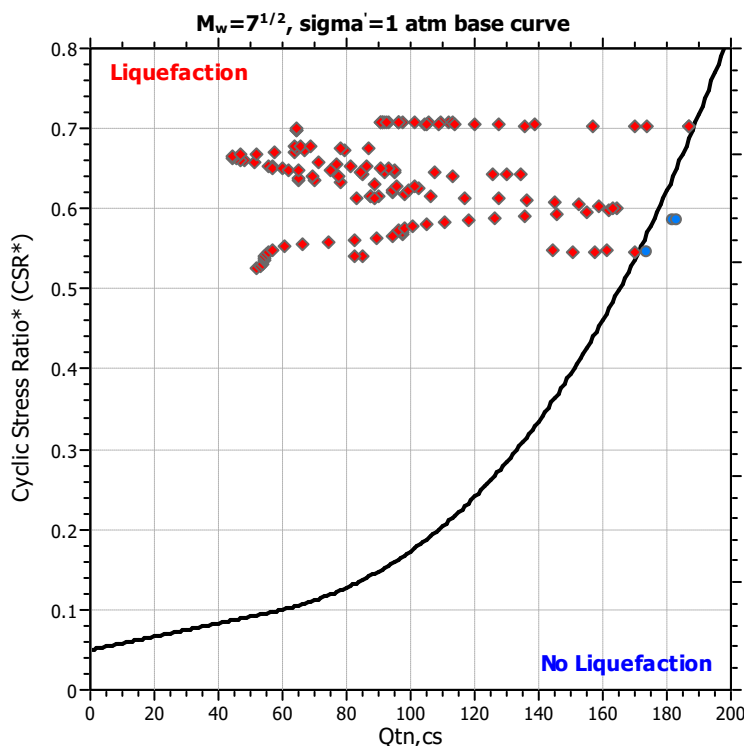
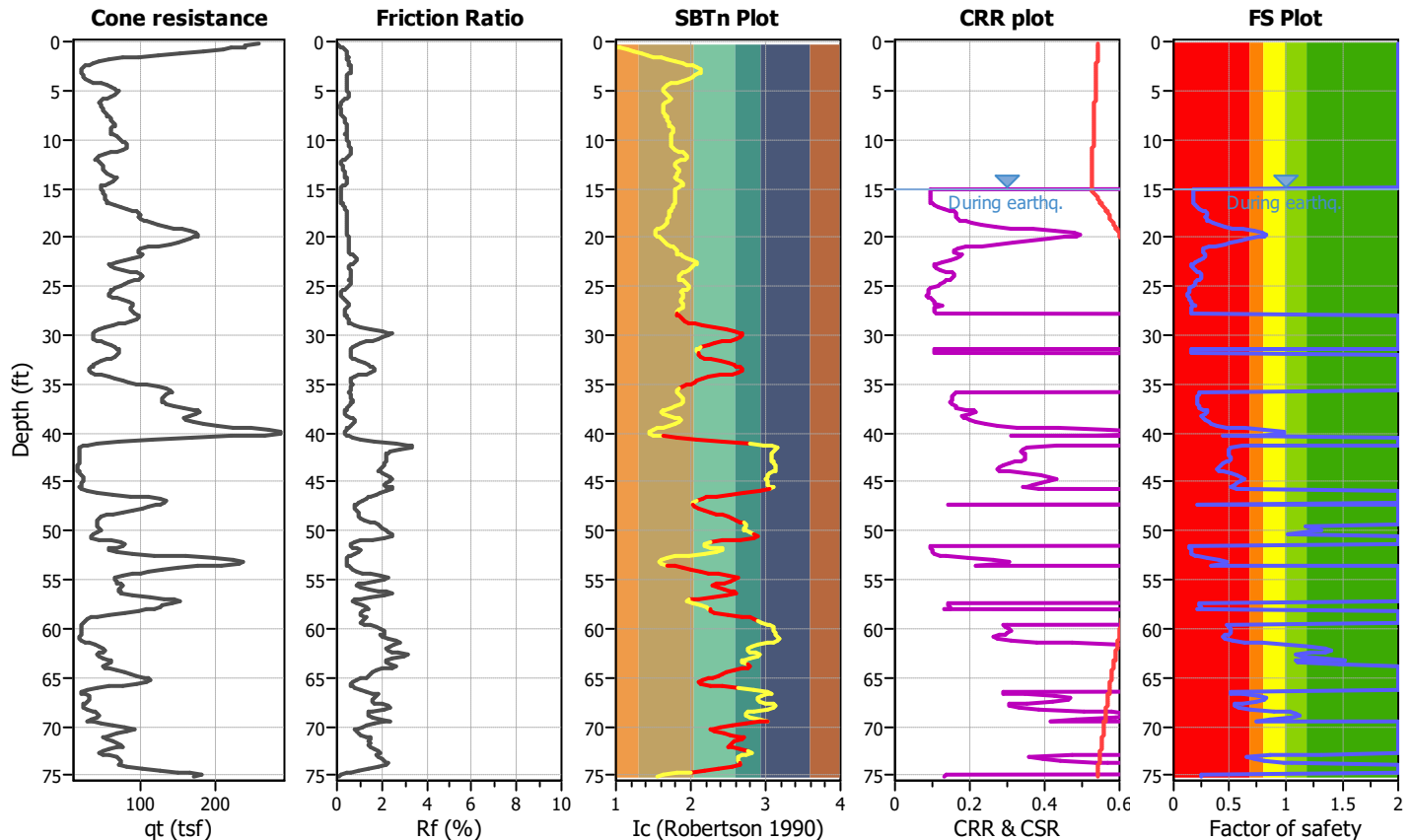
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-1**

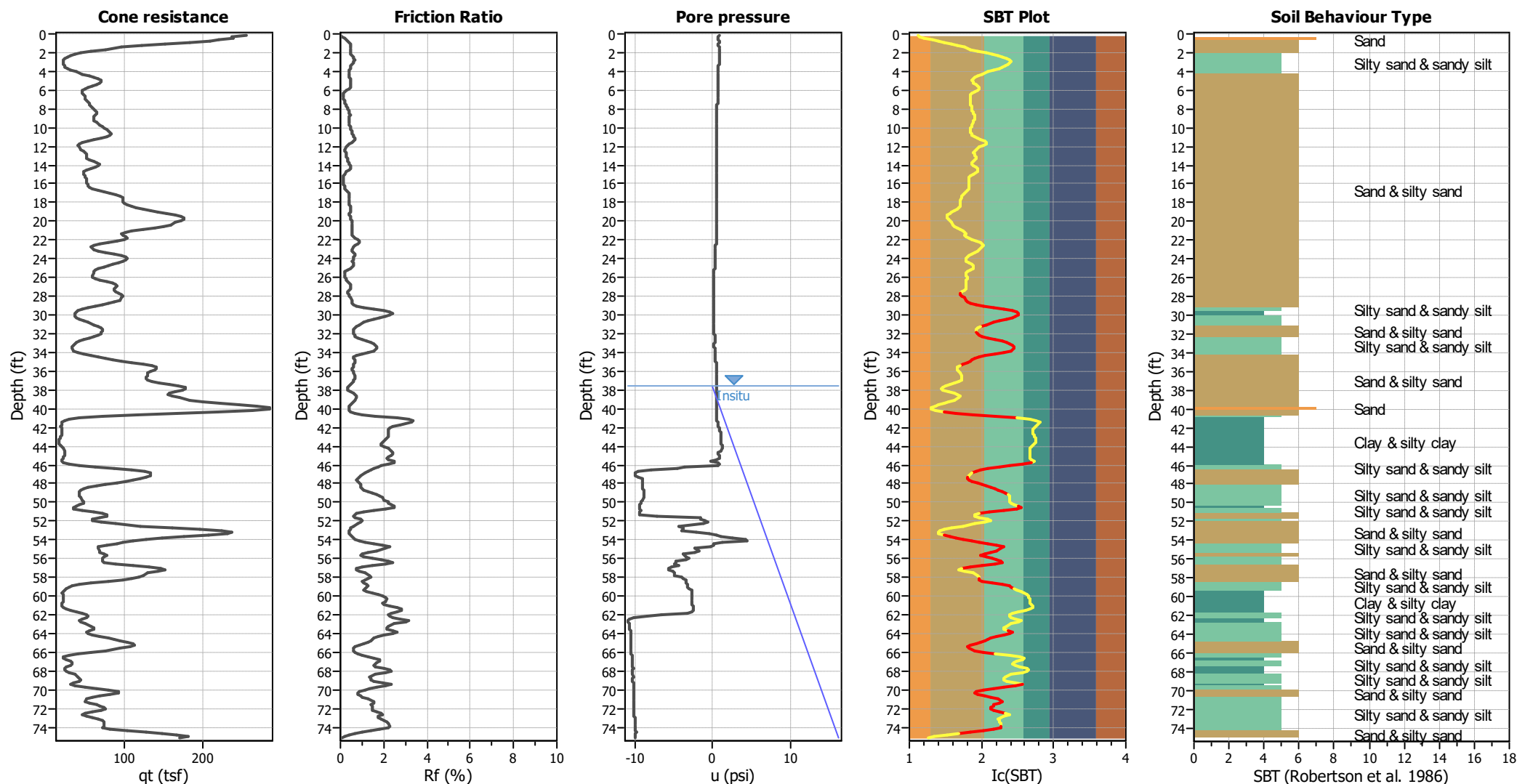
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



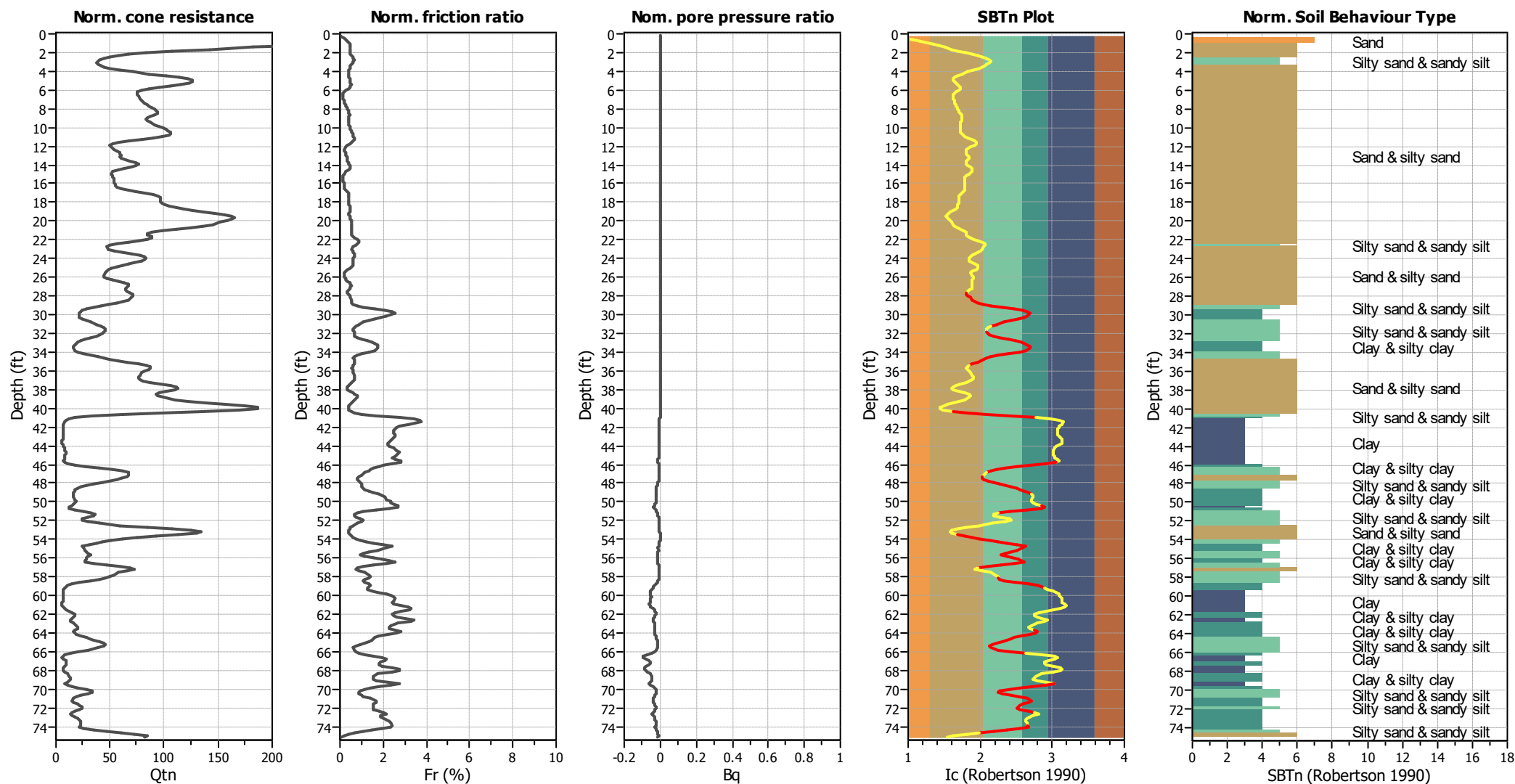
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

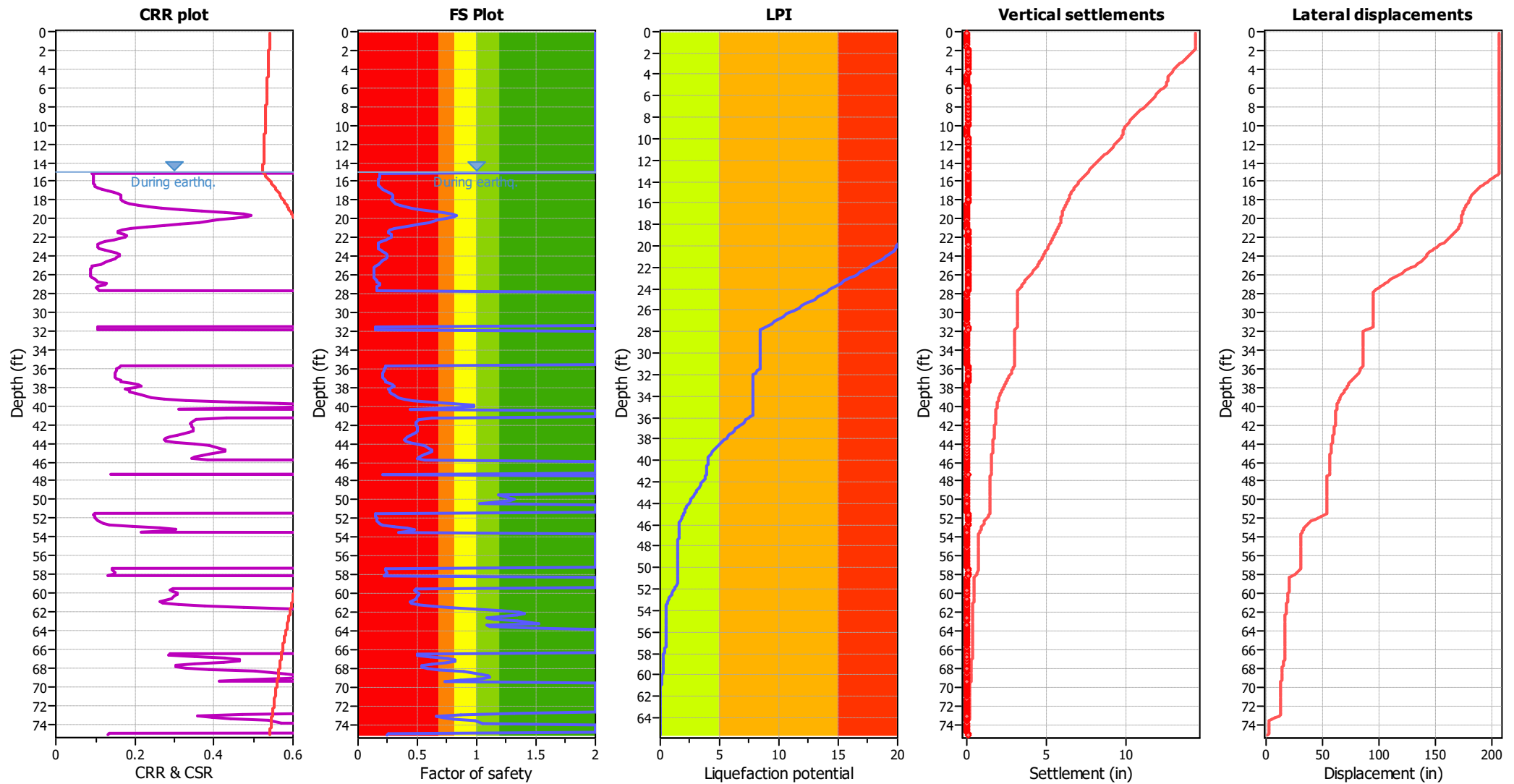
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



### Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_a$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

### F.S. color scheme

<span style="color: red;">■</span>	Almost certain it will liquefy
<span style="color: orange;">■</span>	Very likely to liquefy
<span style="color: yellow;">■</span>	Liquefaction and no liq. are equally likely
<span style="color: lightgreen;">■</span>	Unlike to liquefy
<span style="color: green;">■</span>	Almost certain it will not liquefy

### LPI color scheme

<span style="color: red;">■</span>	Very high risk
<span style="color: orange;">■</span>	High risk
<span style="color: yellow;">■</span>	Low risk

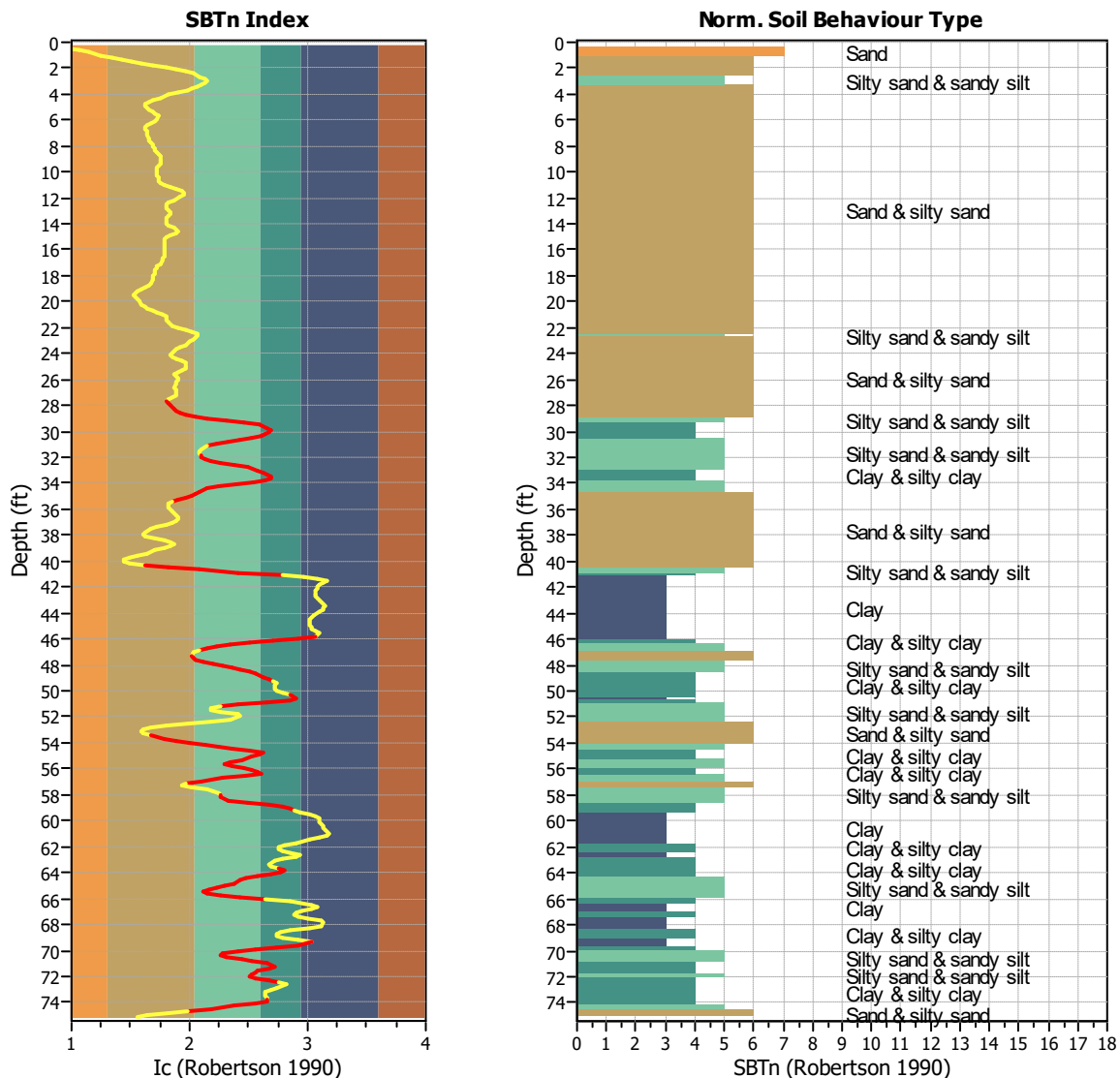
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



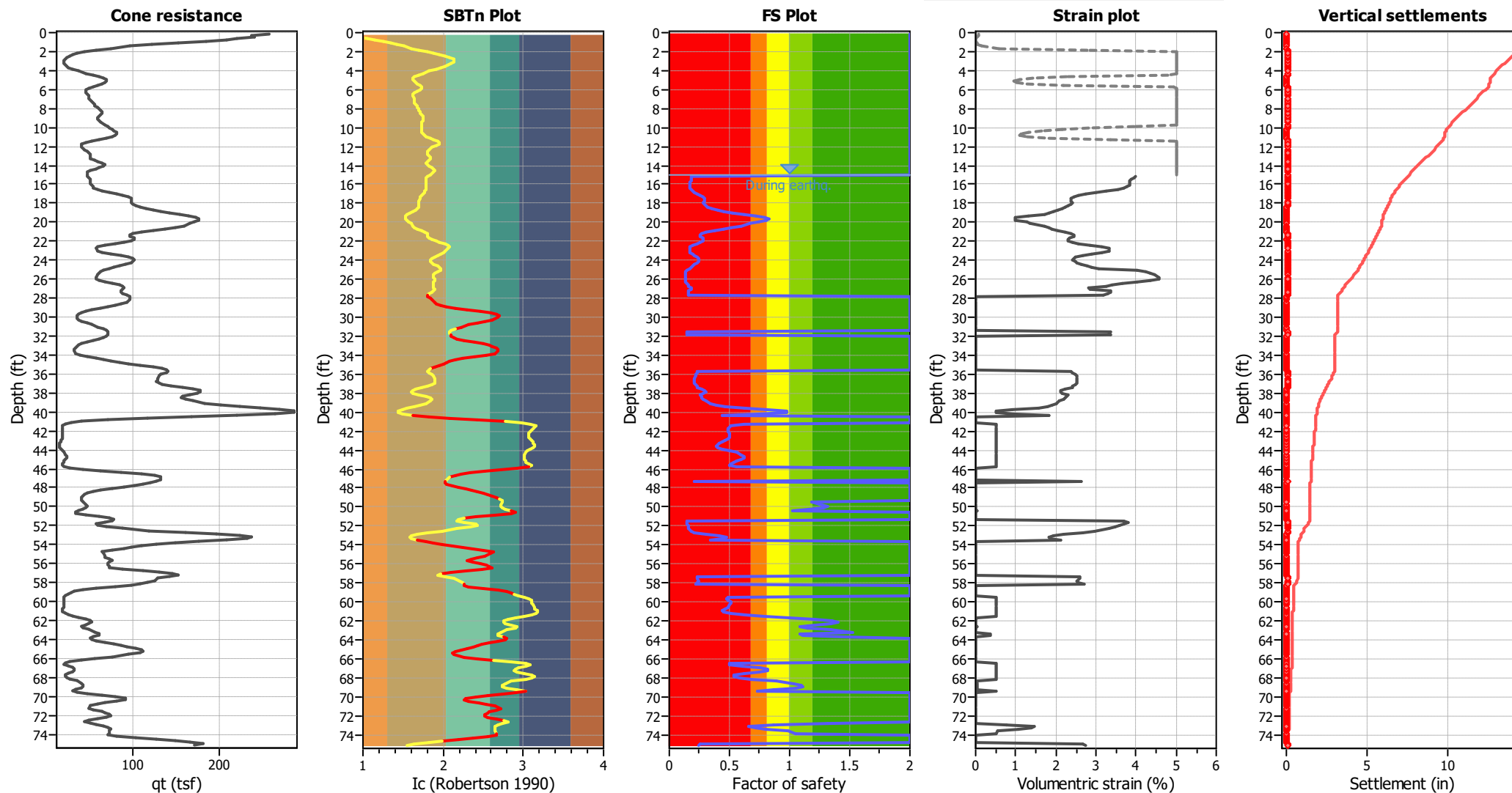
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 156  
 Exclusion percentage: 34.06%  
 Number of layers detected: 20

## Estimation of post-earthquake settlements

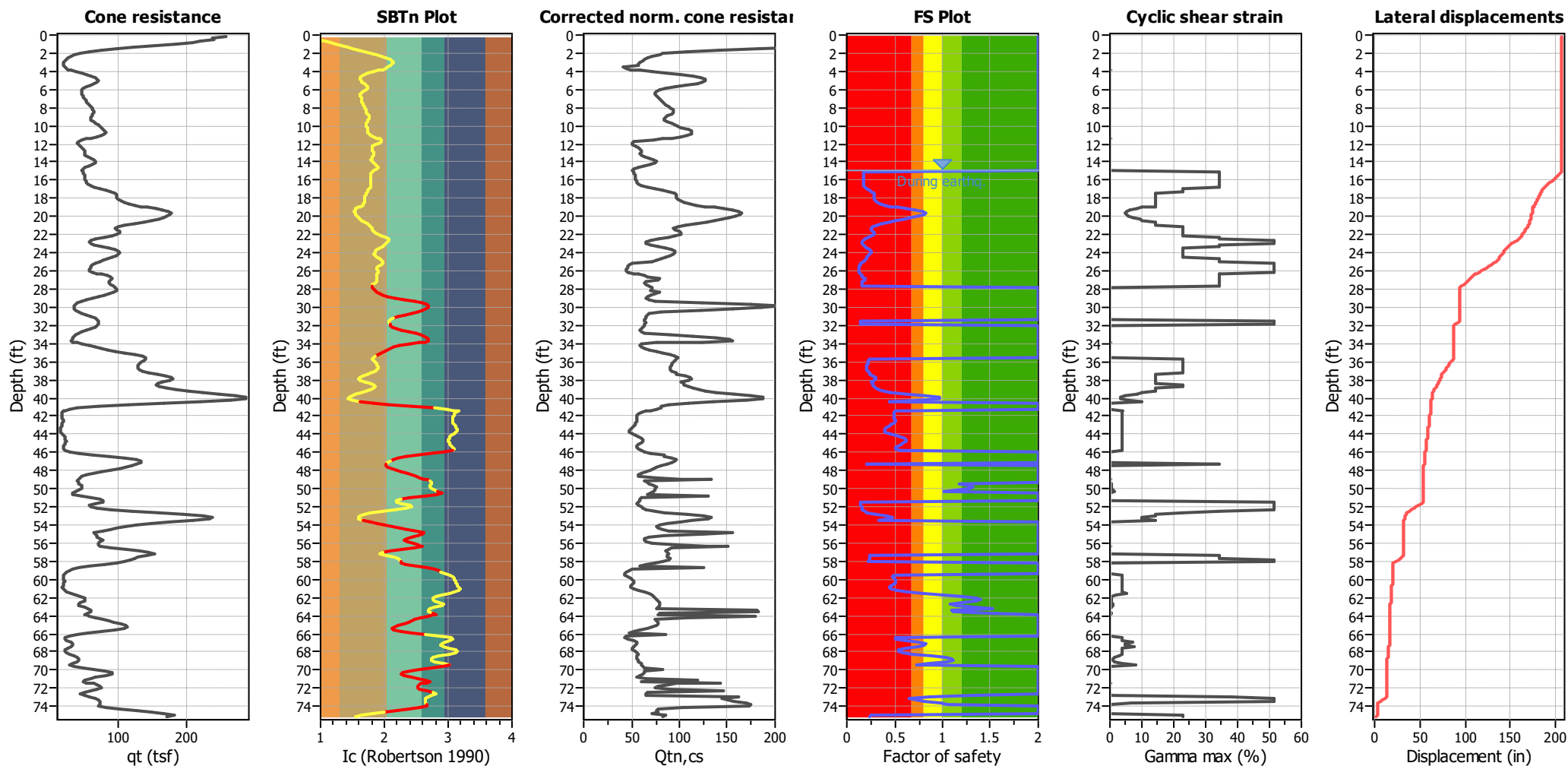


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**



### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

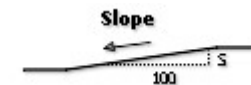
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

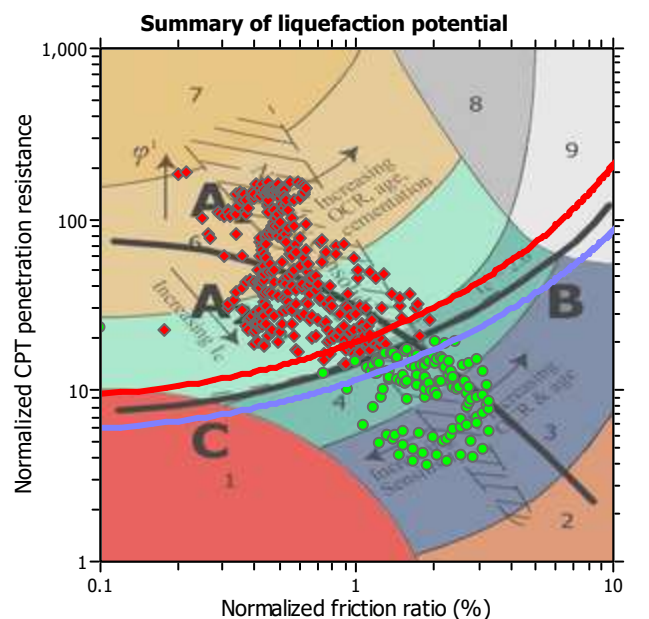
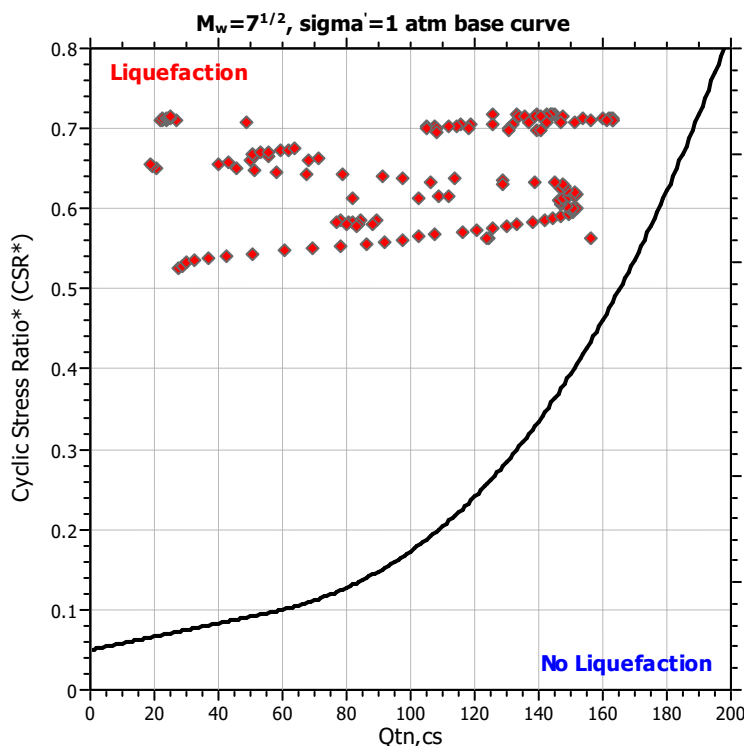
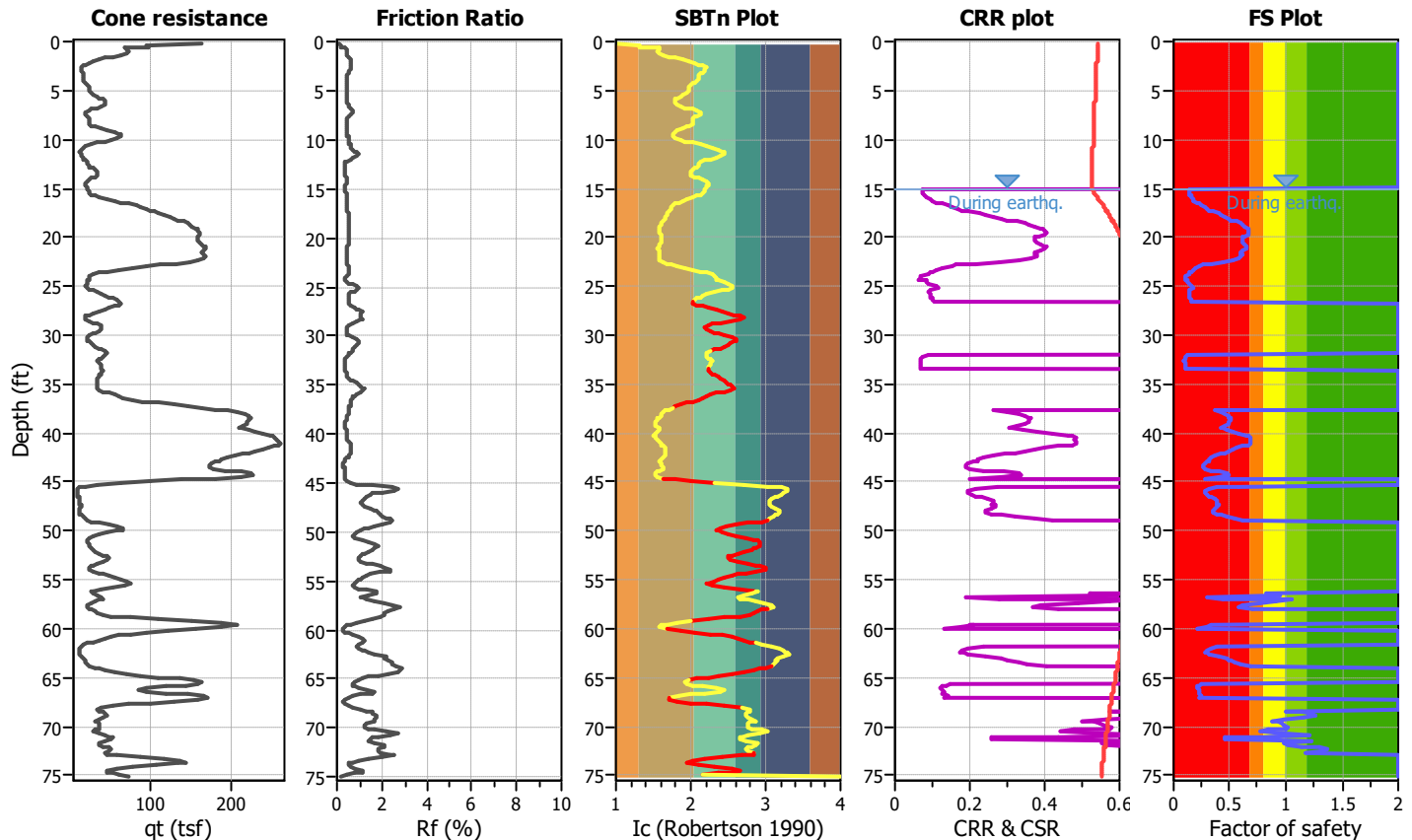
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-2**

**Input parameters and analysis data**

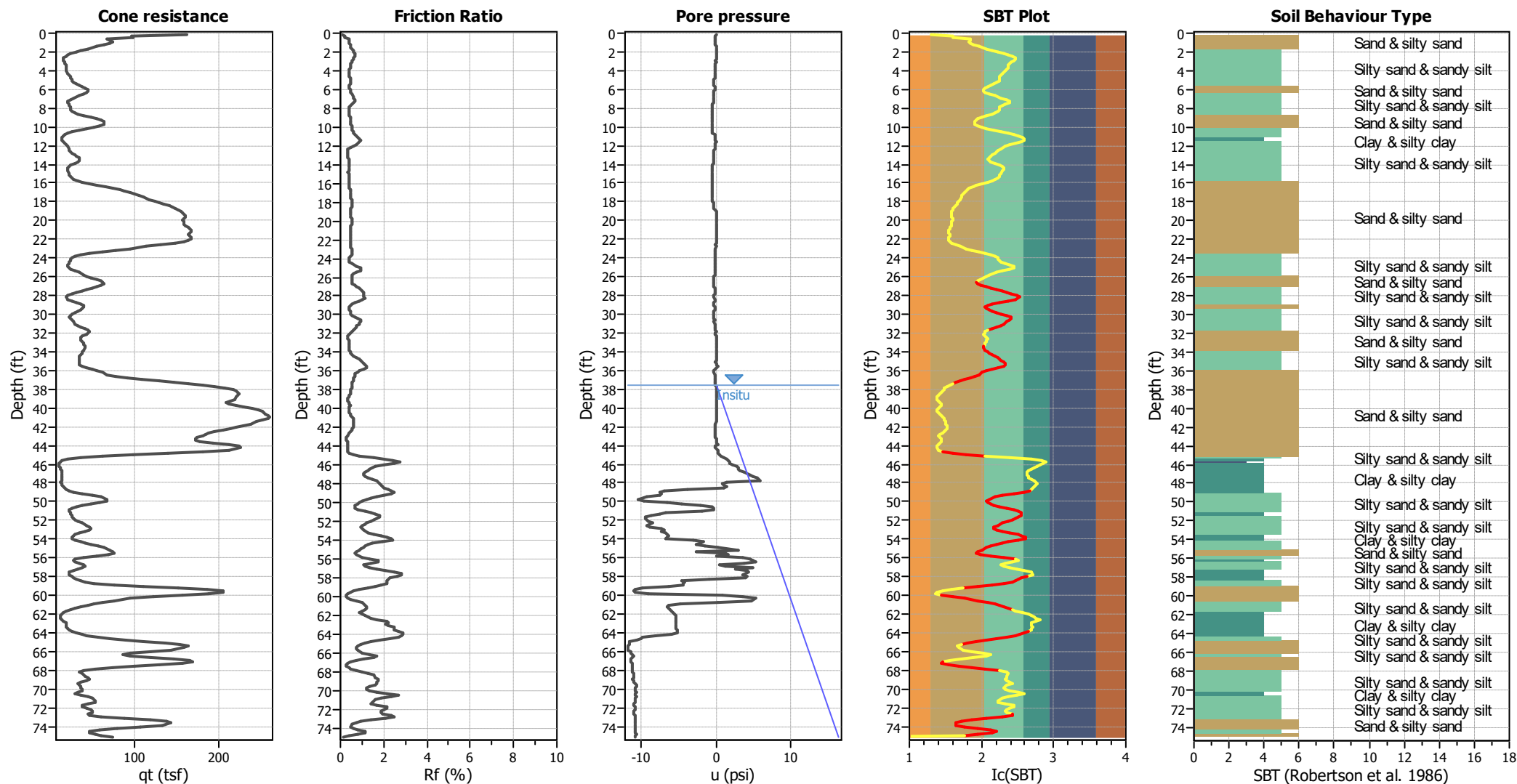
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plots



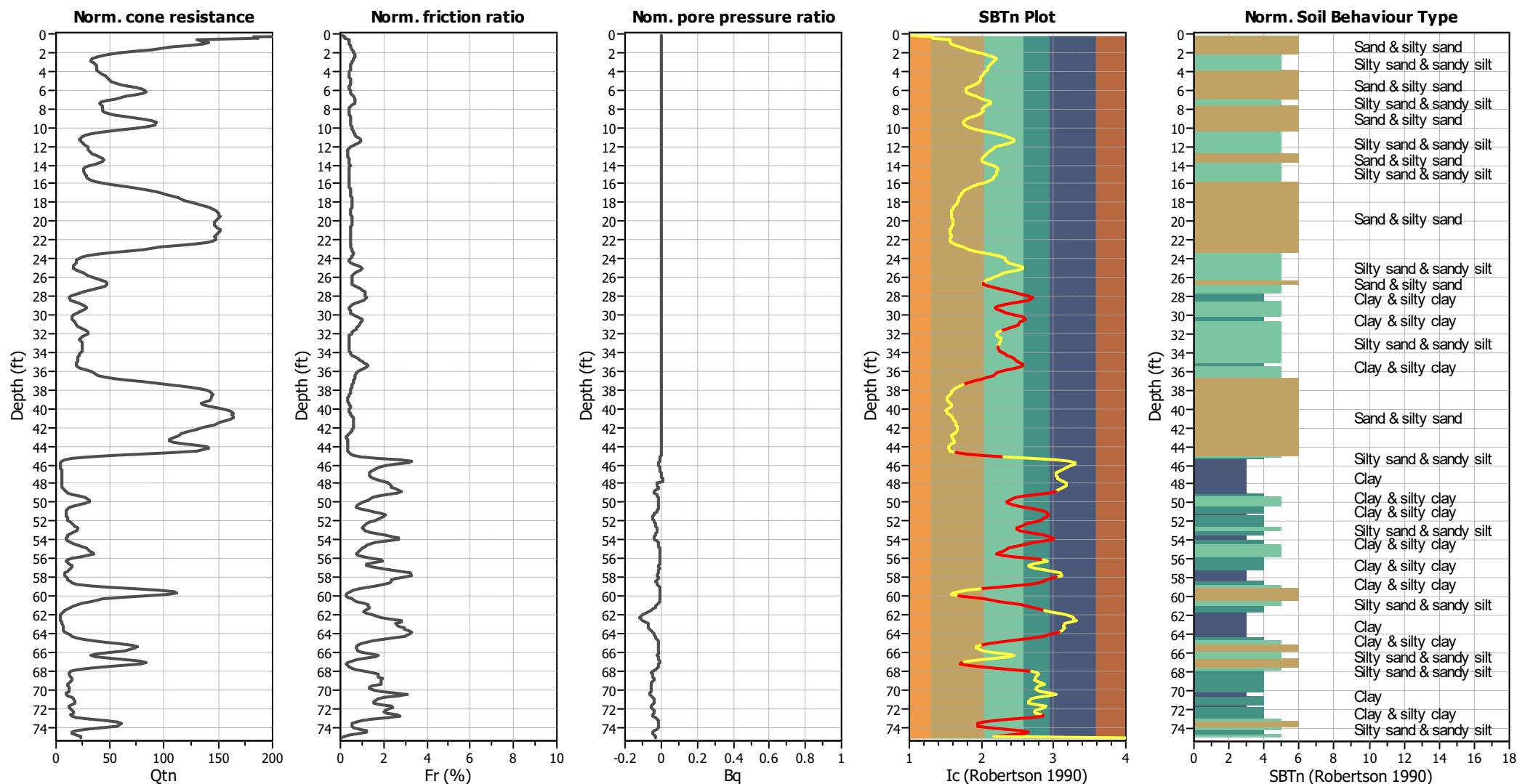
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_a$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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

## CPT basic interpretation plots (normalized)



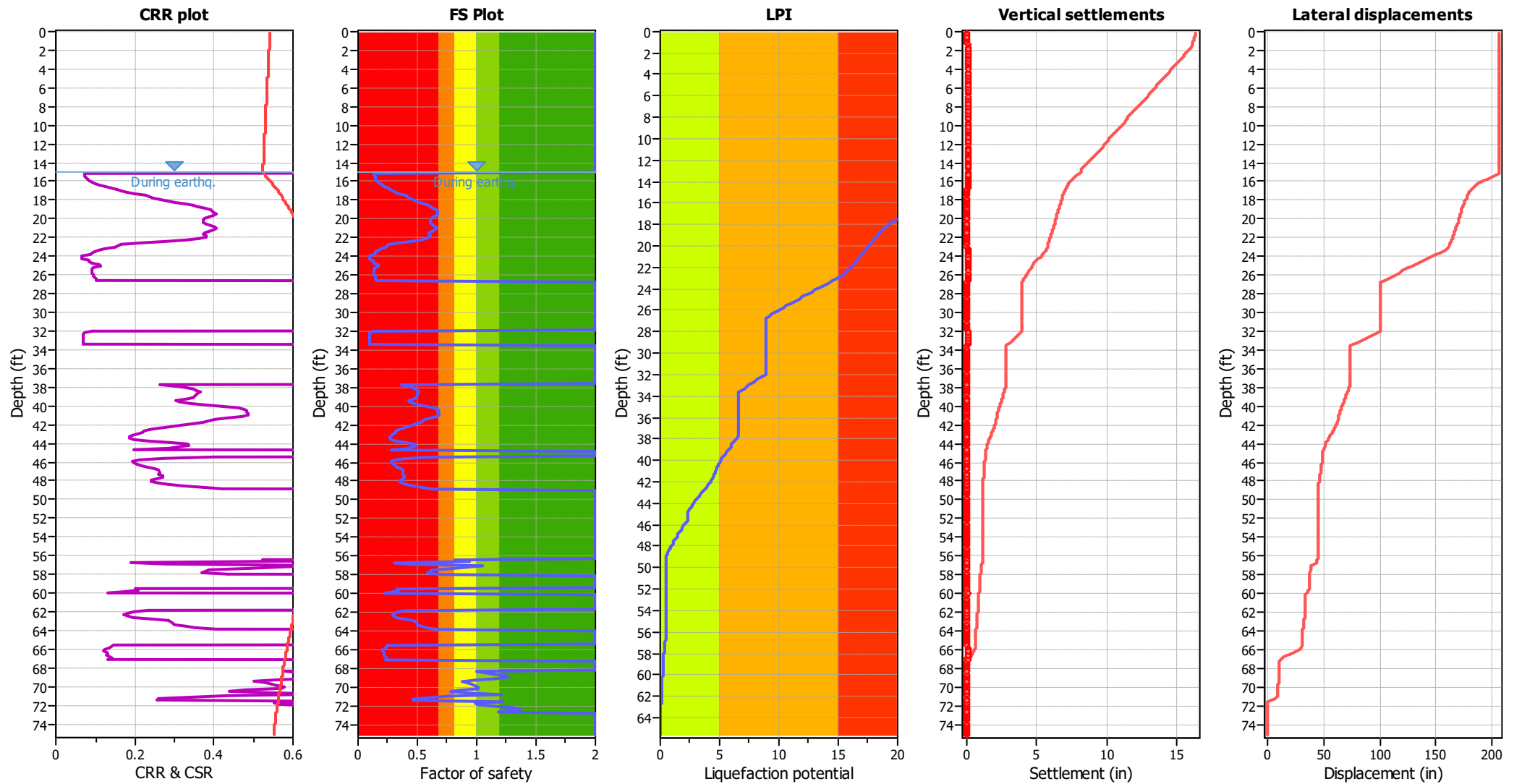
## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBTn legend

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

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_0$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## F.S. color scheme

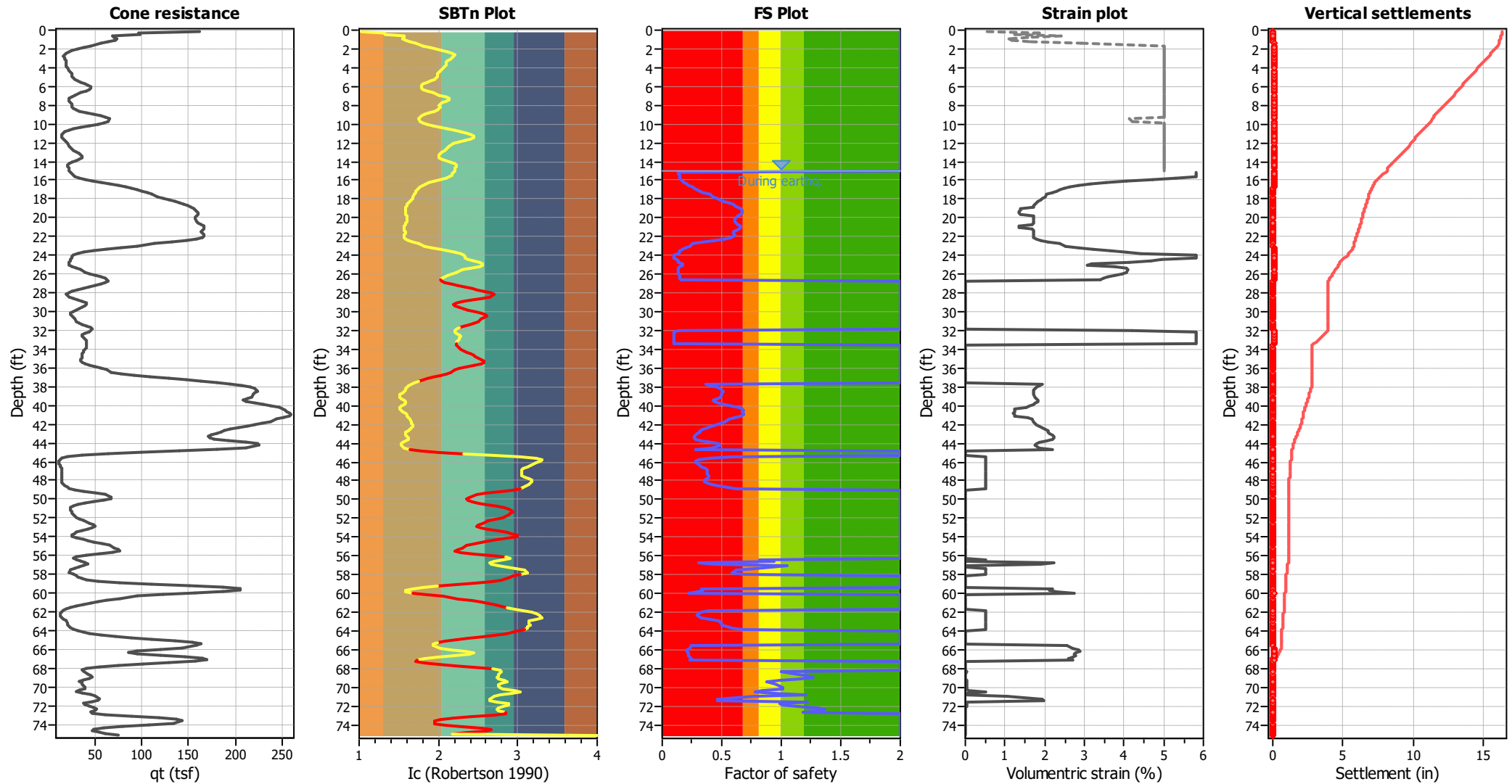
Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



## Estimation of post-earthquake settlements

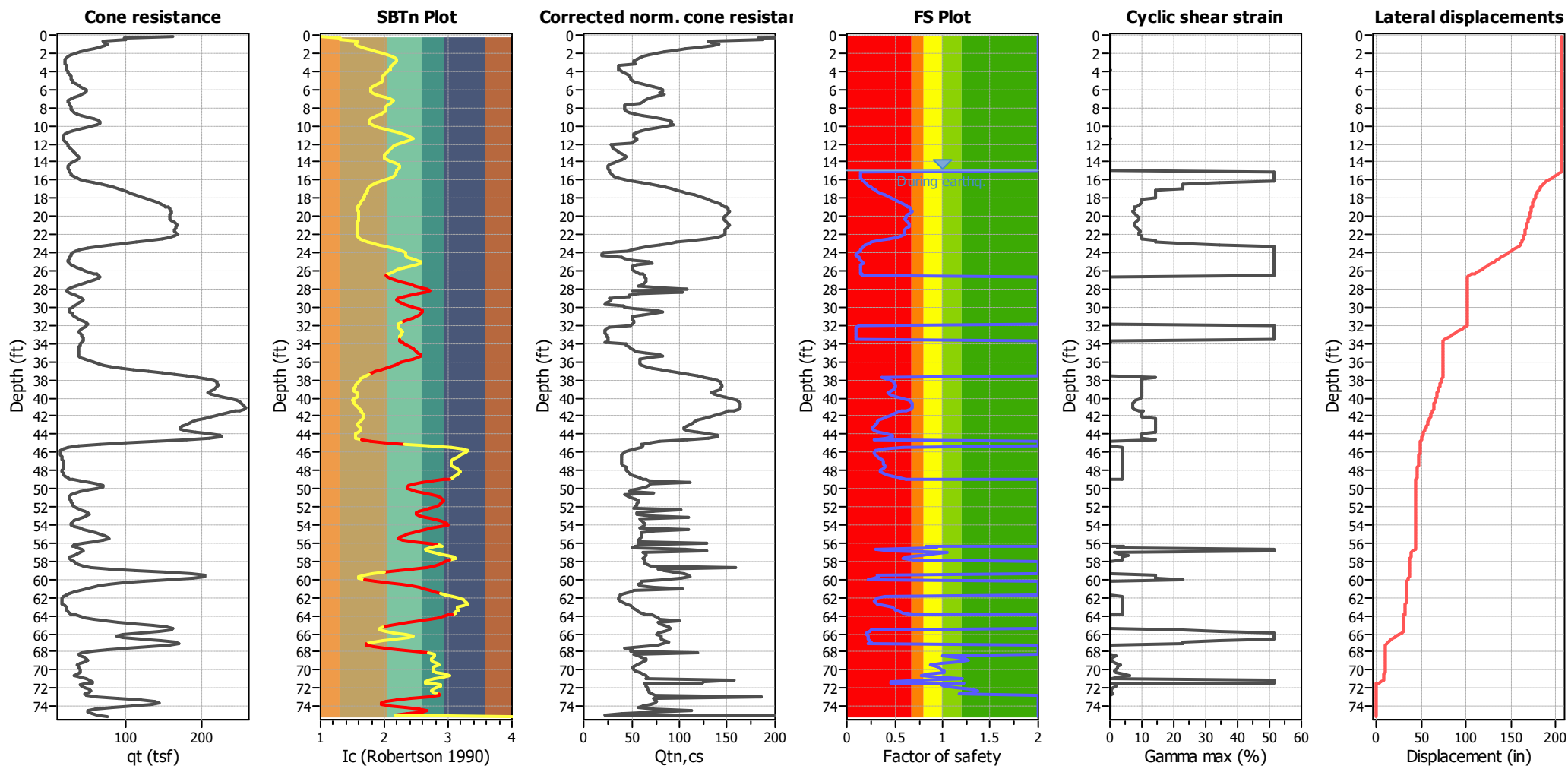


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

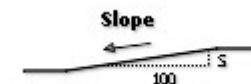
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition







## LIQUEFACTION ANALYSIS REPORT

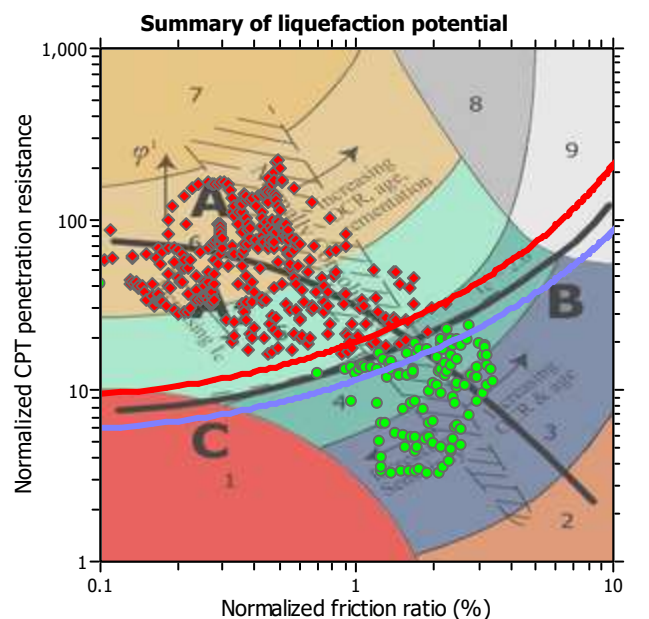
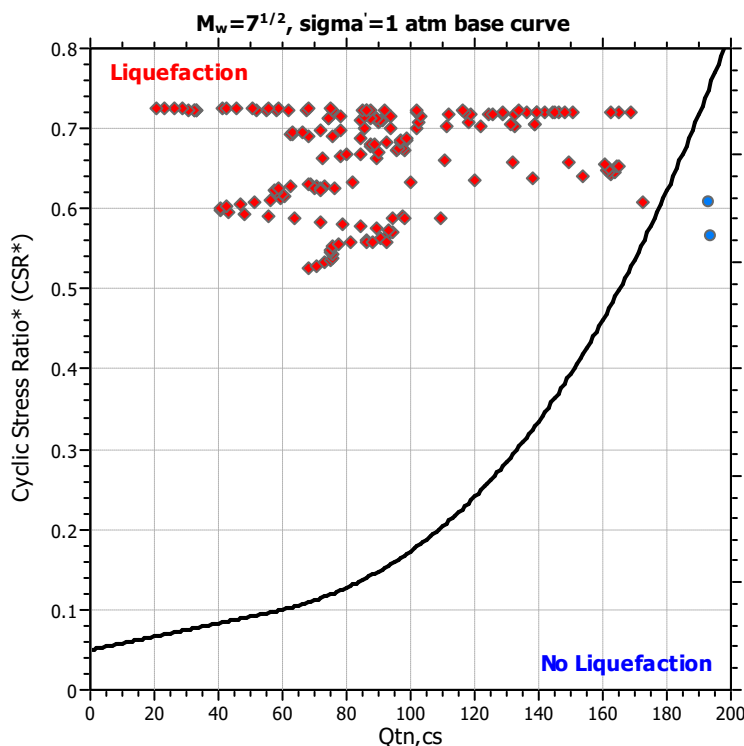
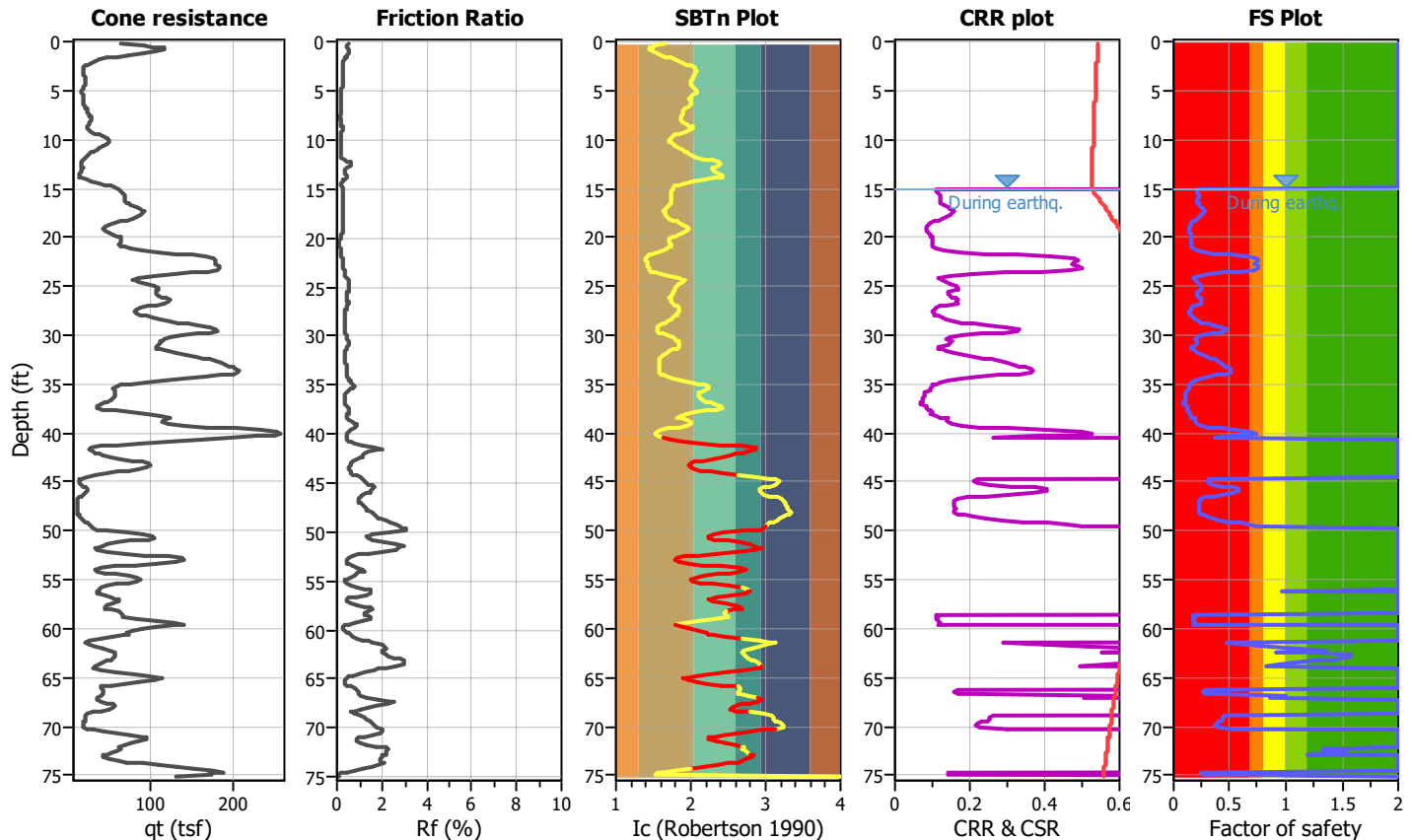
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-3**

### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based

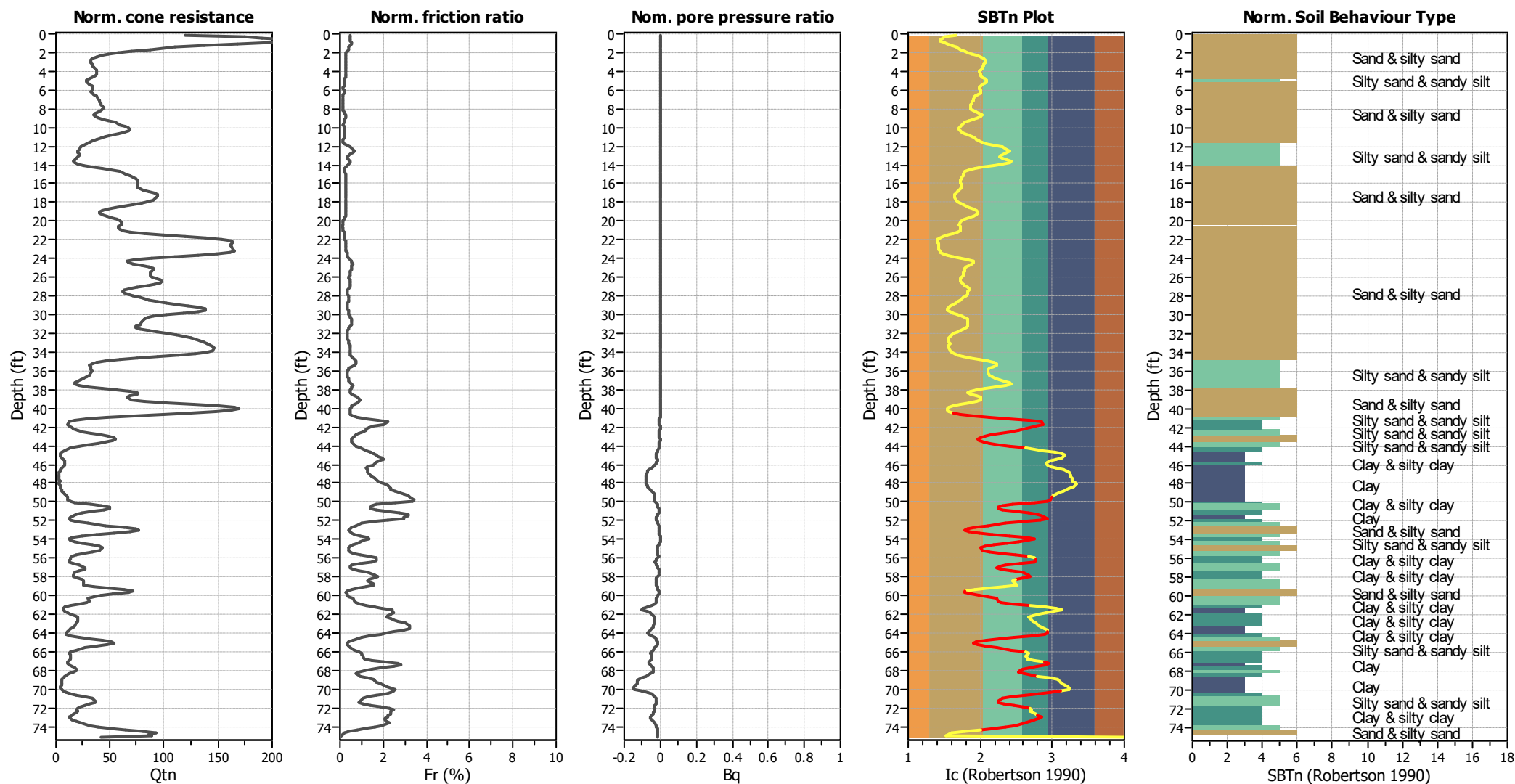


Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry





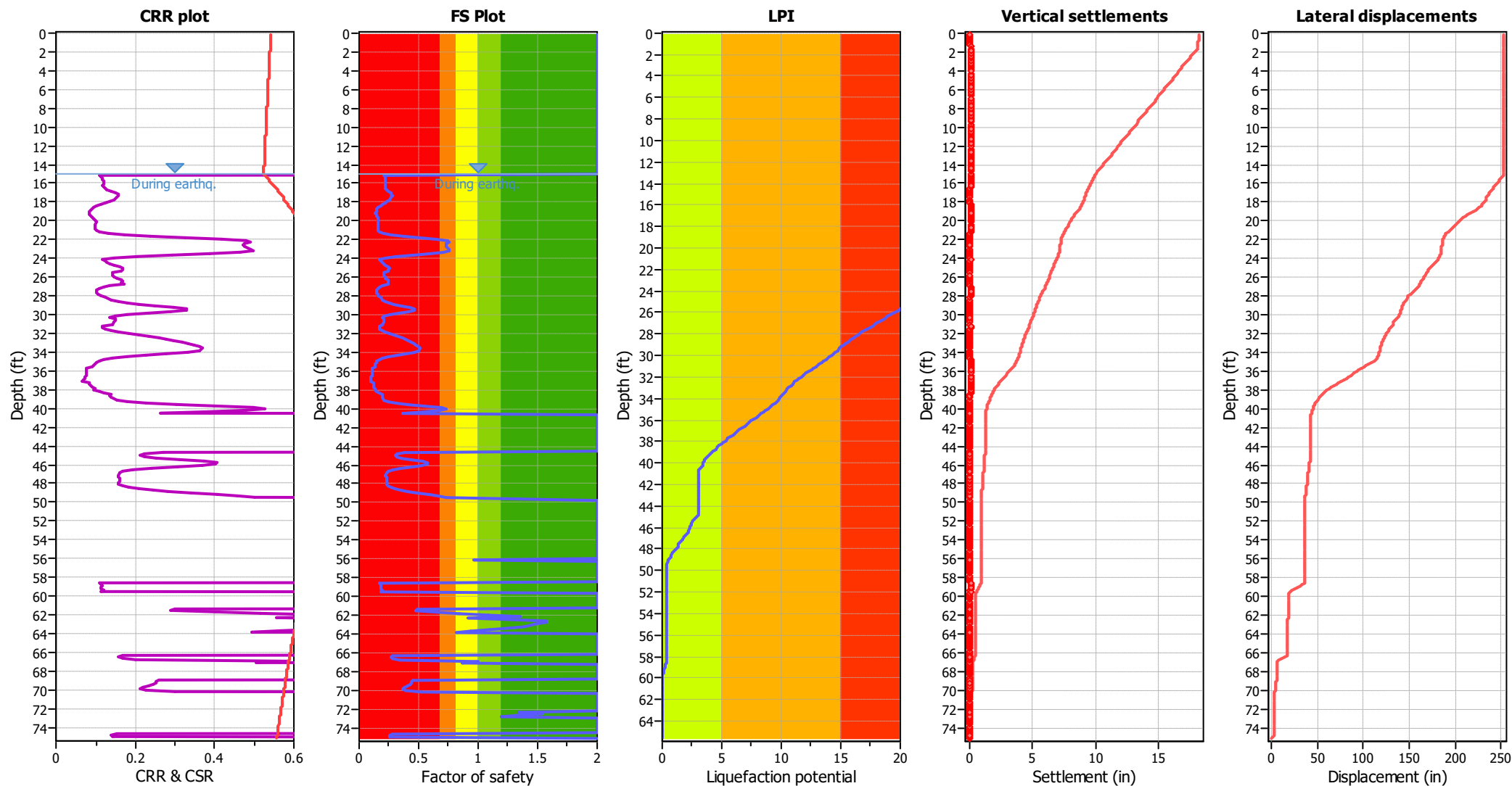
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method: Robertson (2009)  
 Fines correction method: Robertson (2009)  
 Points to test: Based on Ic value  
 Earthquake magnitude  $M_w$ : 6.90  
 Peak ground acceleration: 1.03  
 Depth to water table (insitu): 37.50 ft

Depth to water table (earthq.): 15.00 ft  
 Average results interval: 5  
 Ic cut-off value: 2.60  
 Unit weight calculation: Based on SBT  
 Use fill: No  
 Fill height: N/A

Fill weight: N/A  
 Transition detect. applied: Yes  
 $K_0$  applied: No  
 Clay like behavior applied: All soils  
 Limit depth applied: No  
 Limit depth: N/A

## F.S. color scheme

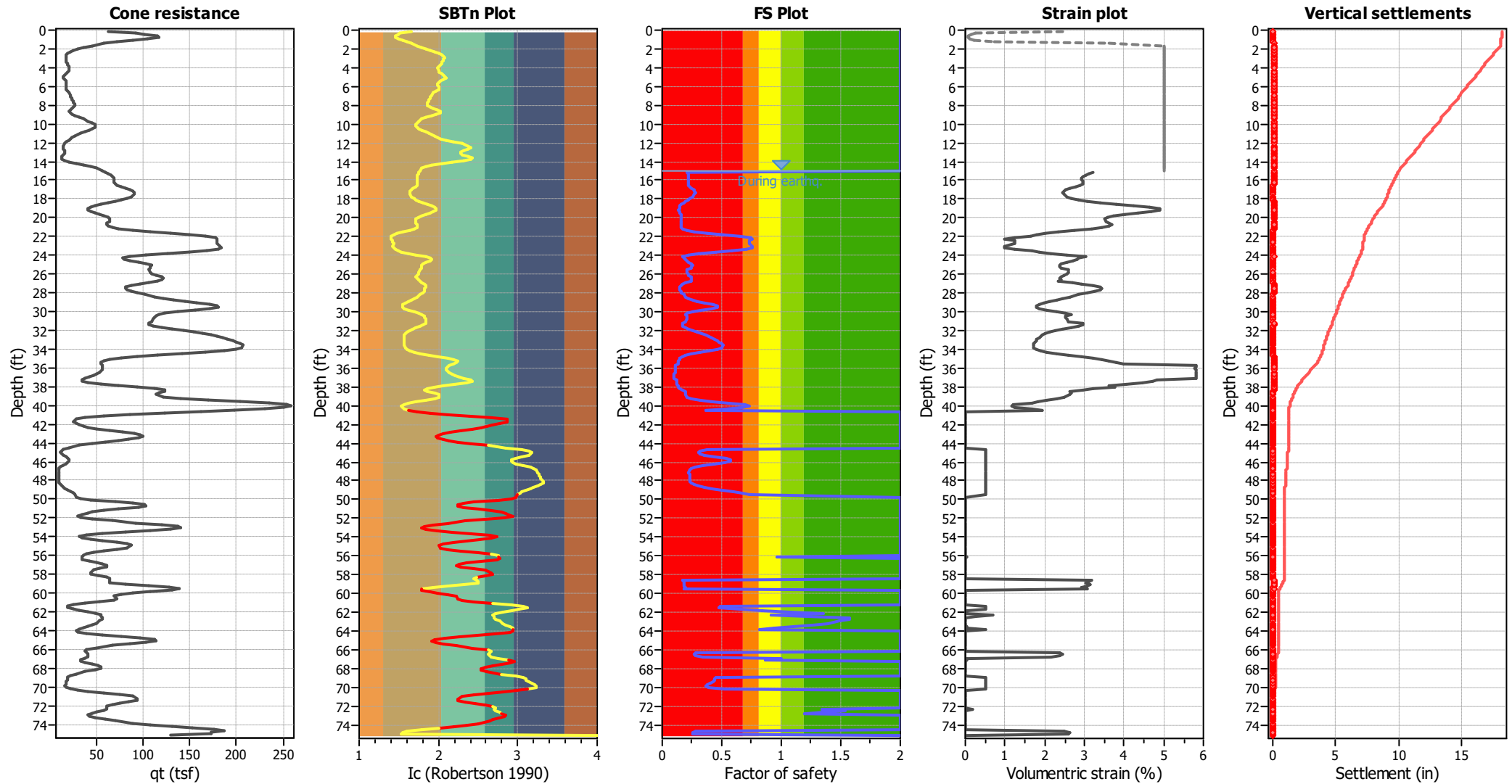
Almost certain it will liquefy  
 Very likely to liquefy  
 Liquefaction and no liq. are equally likely  
 Unlike to liquefy  
 Almost certain it will not liquefy

## LPI color scheme

Very high risk  
 High risk  
 Low risk



## Estimation of post-earthquake settlements

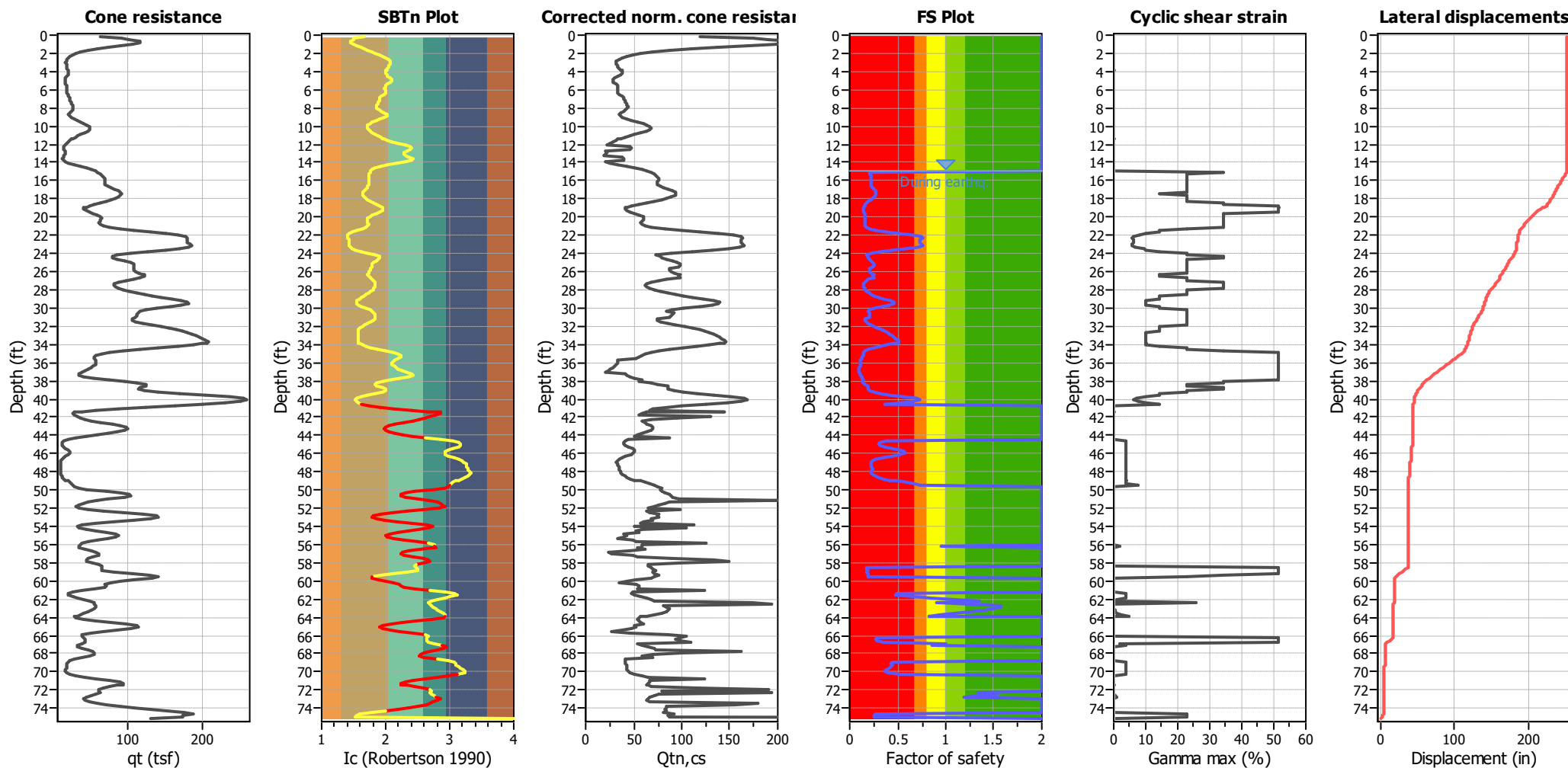


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**

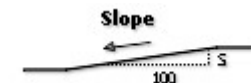


### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

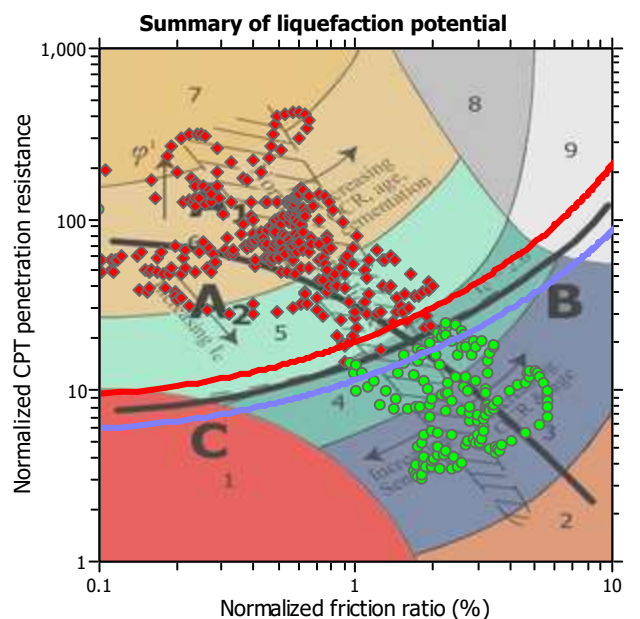
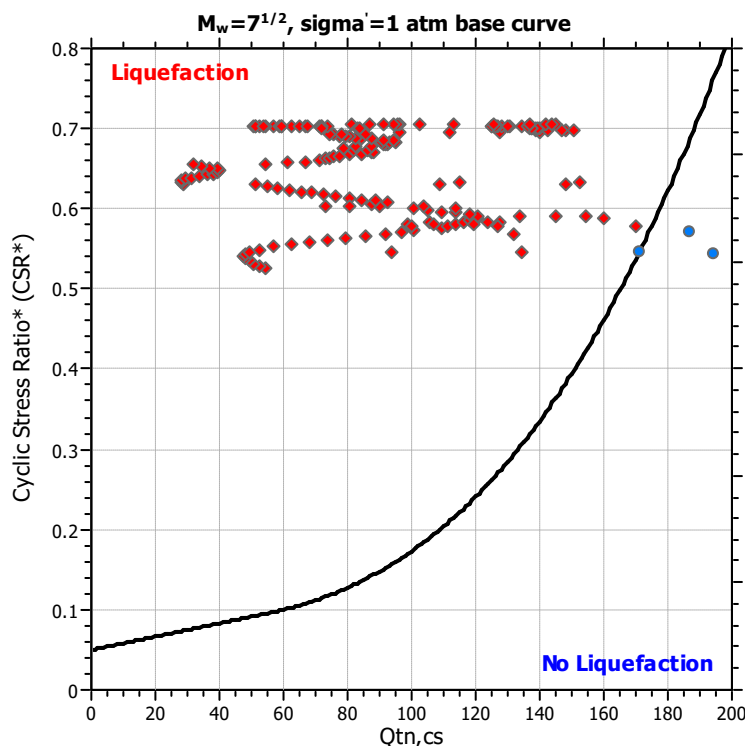
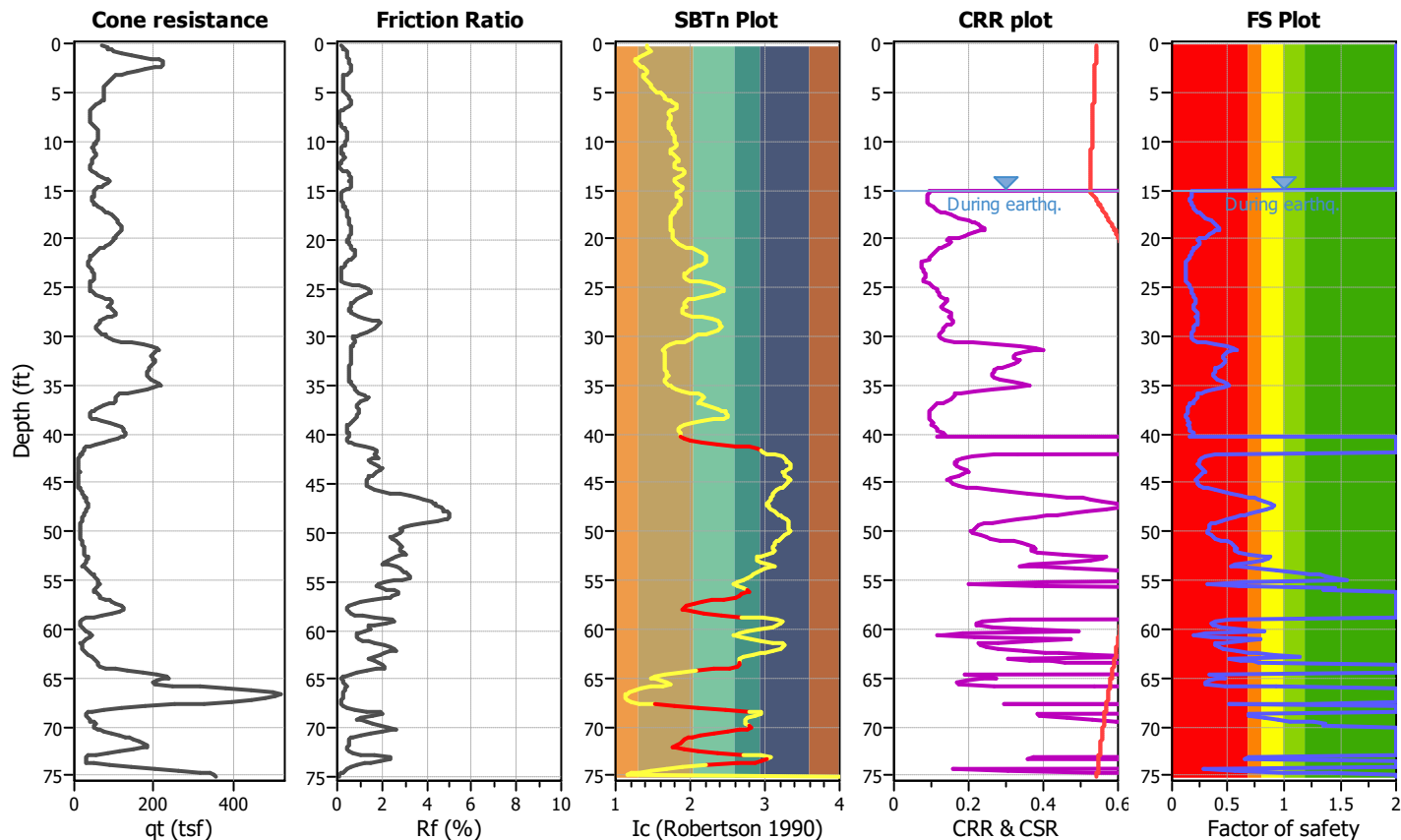
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-4**

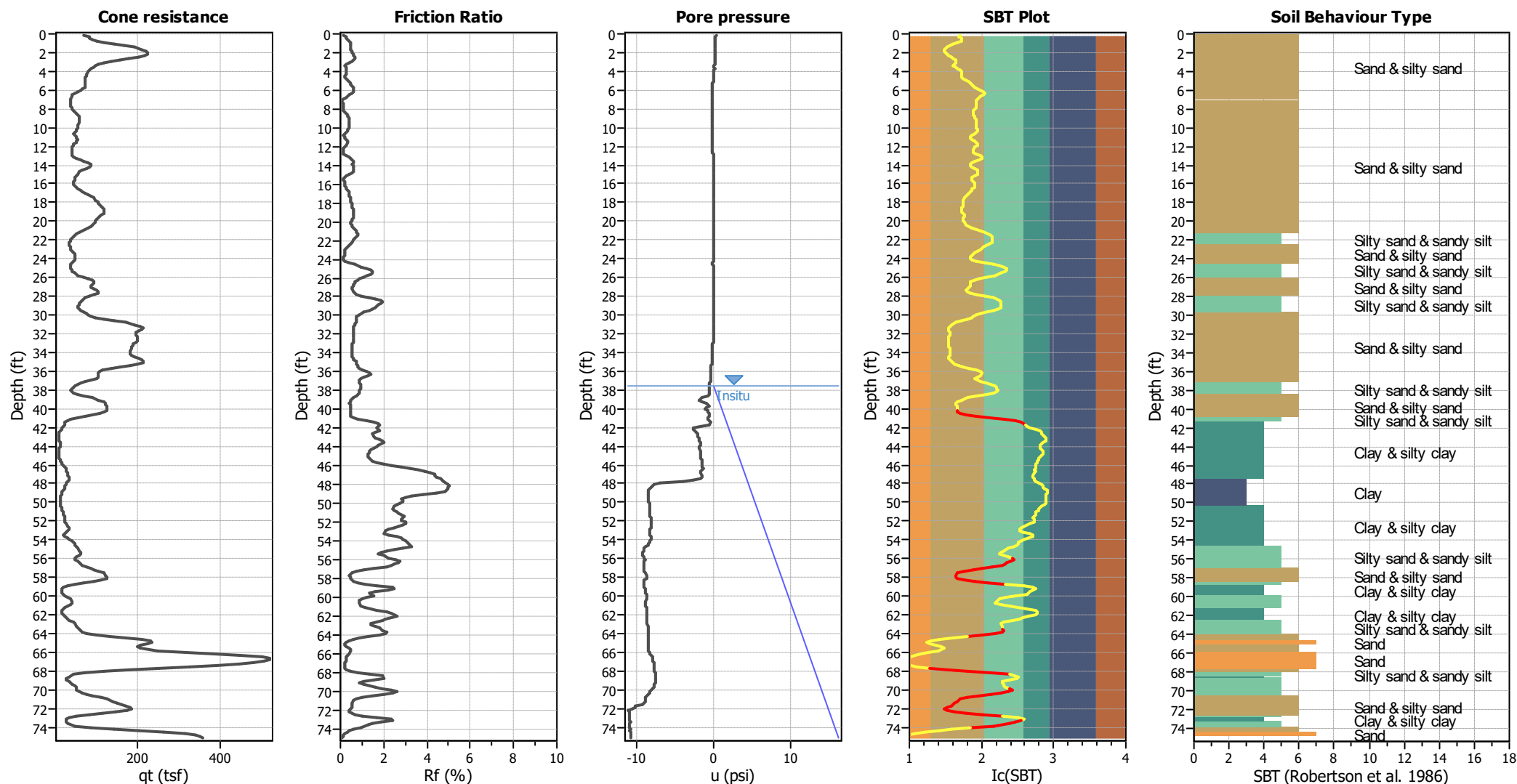
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



## Input parameters and analysis data

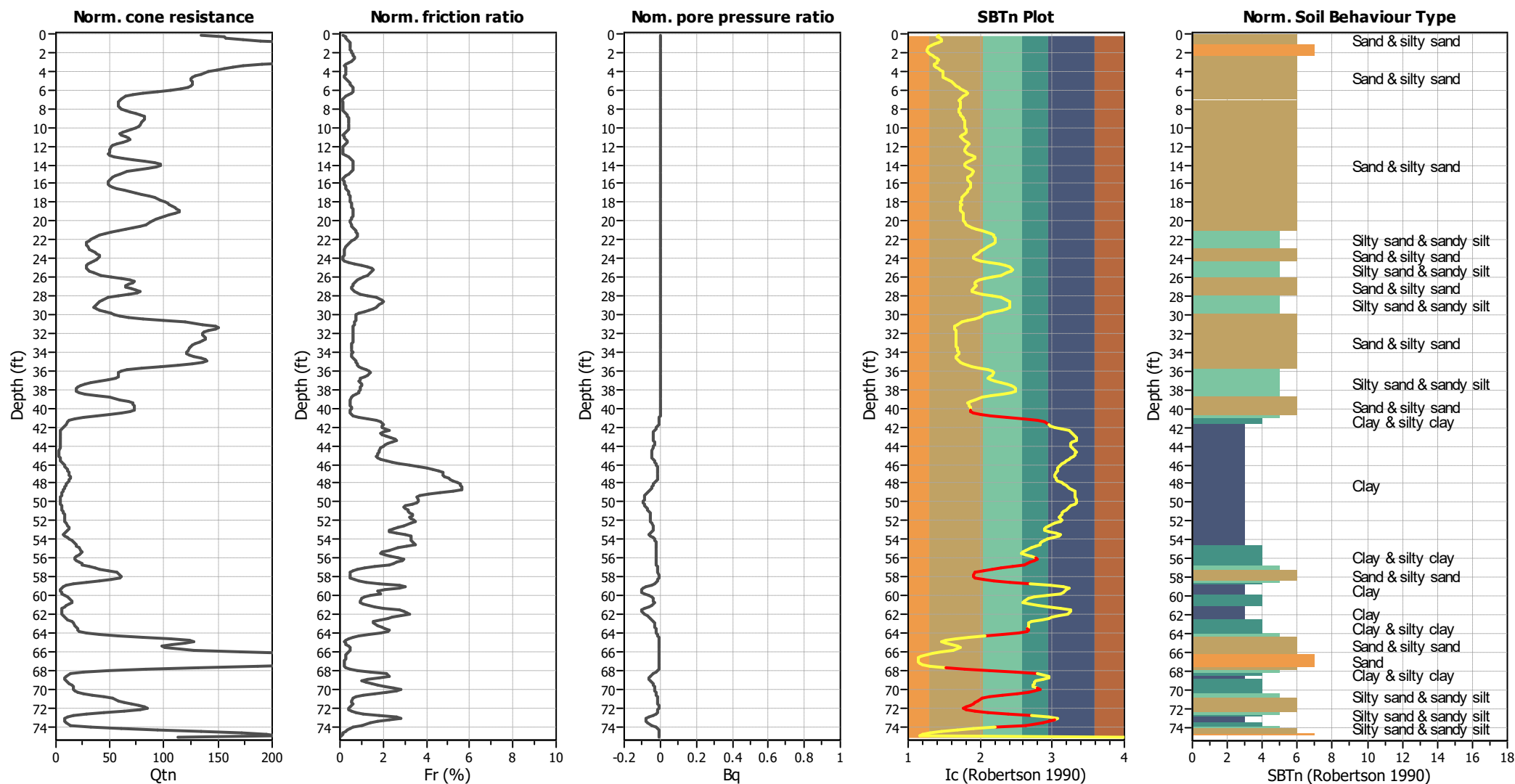
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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



## CPT basic interpretation plots (normalized)

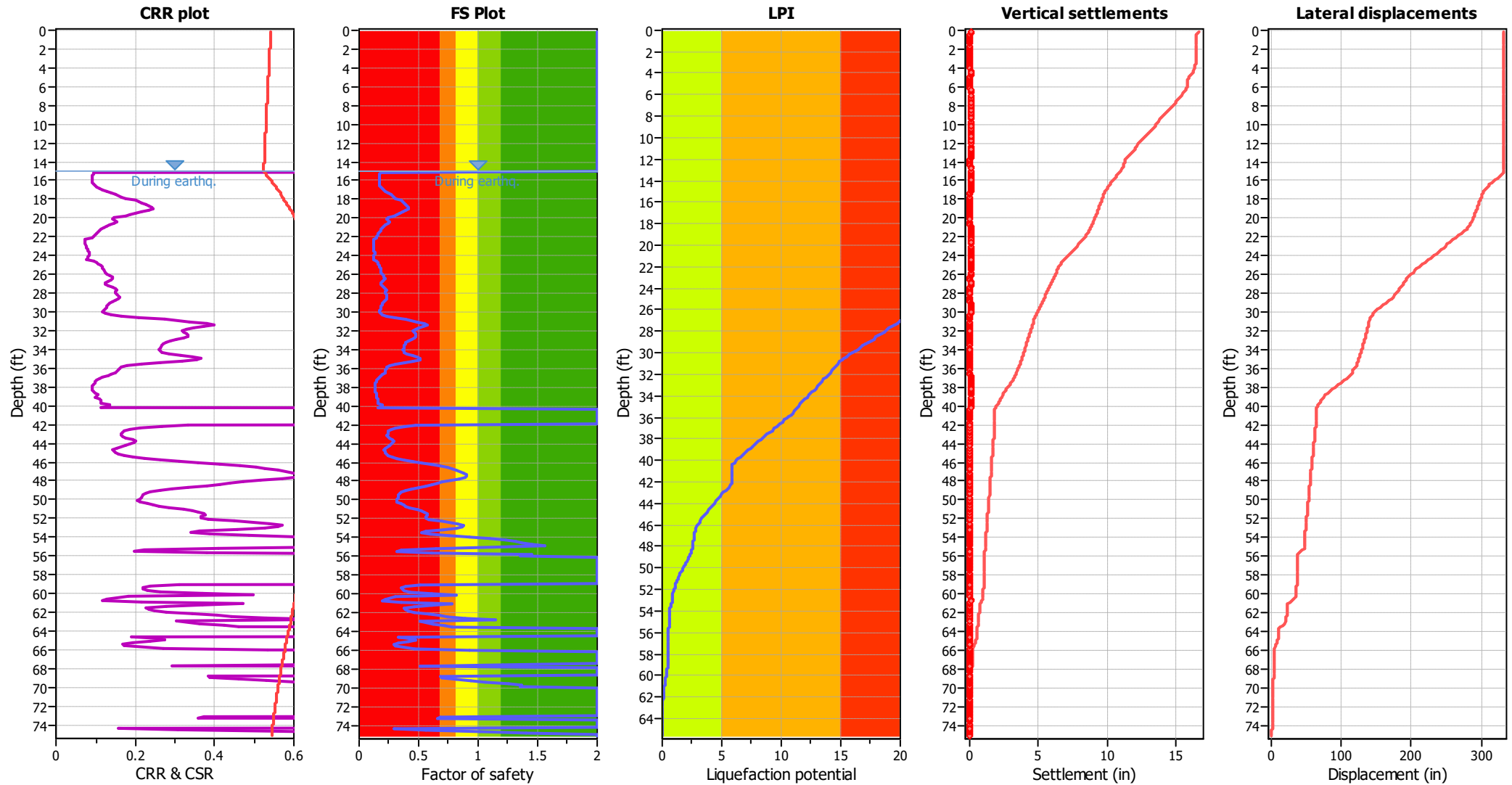


## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A



## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_G$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

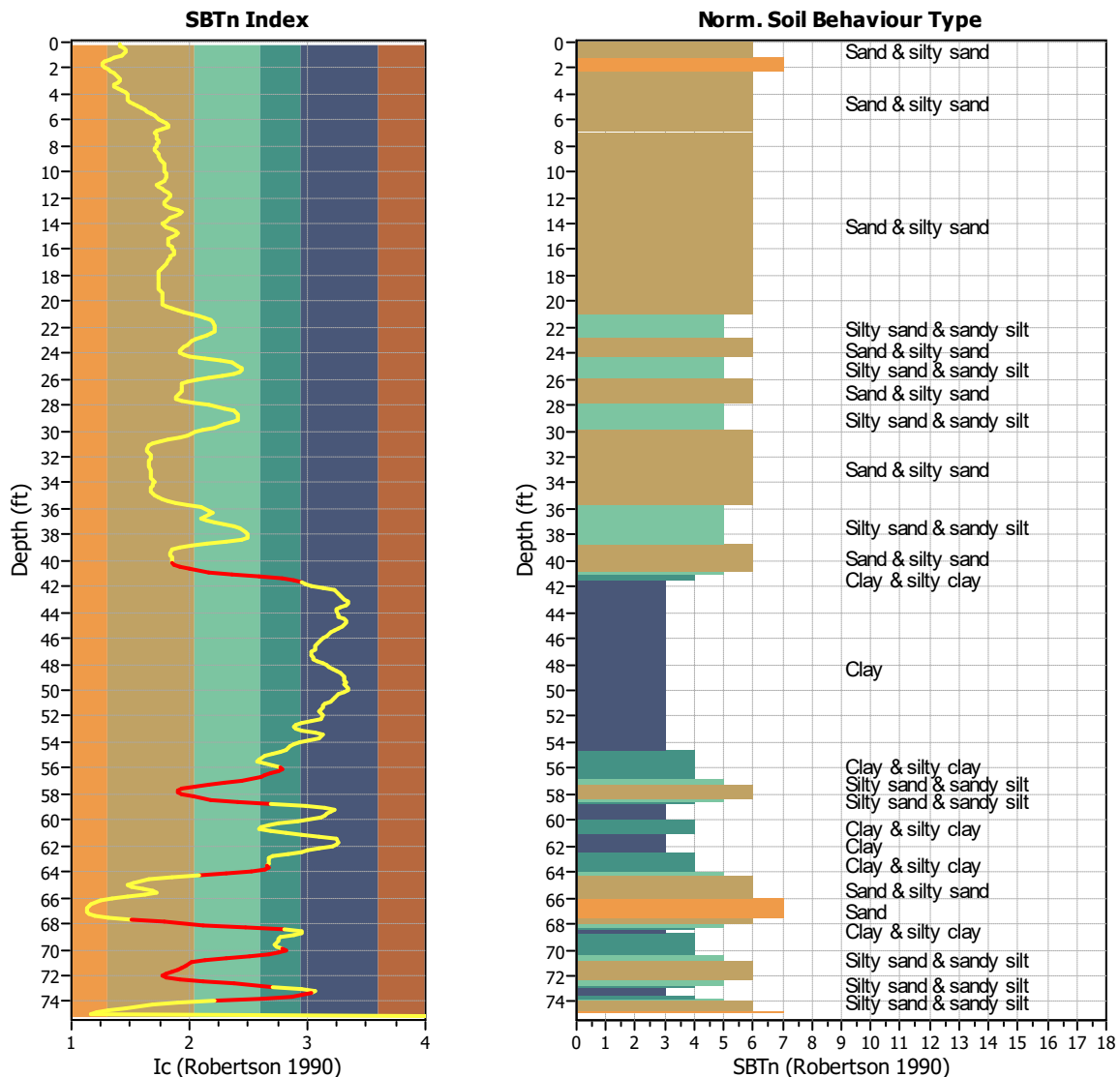
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



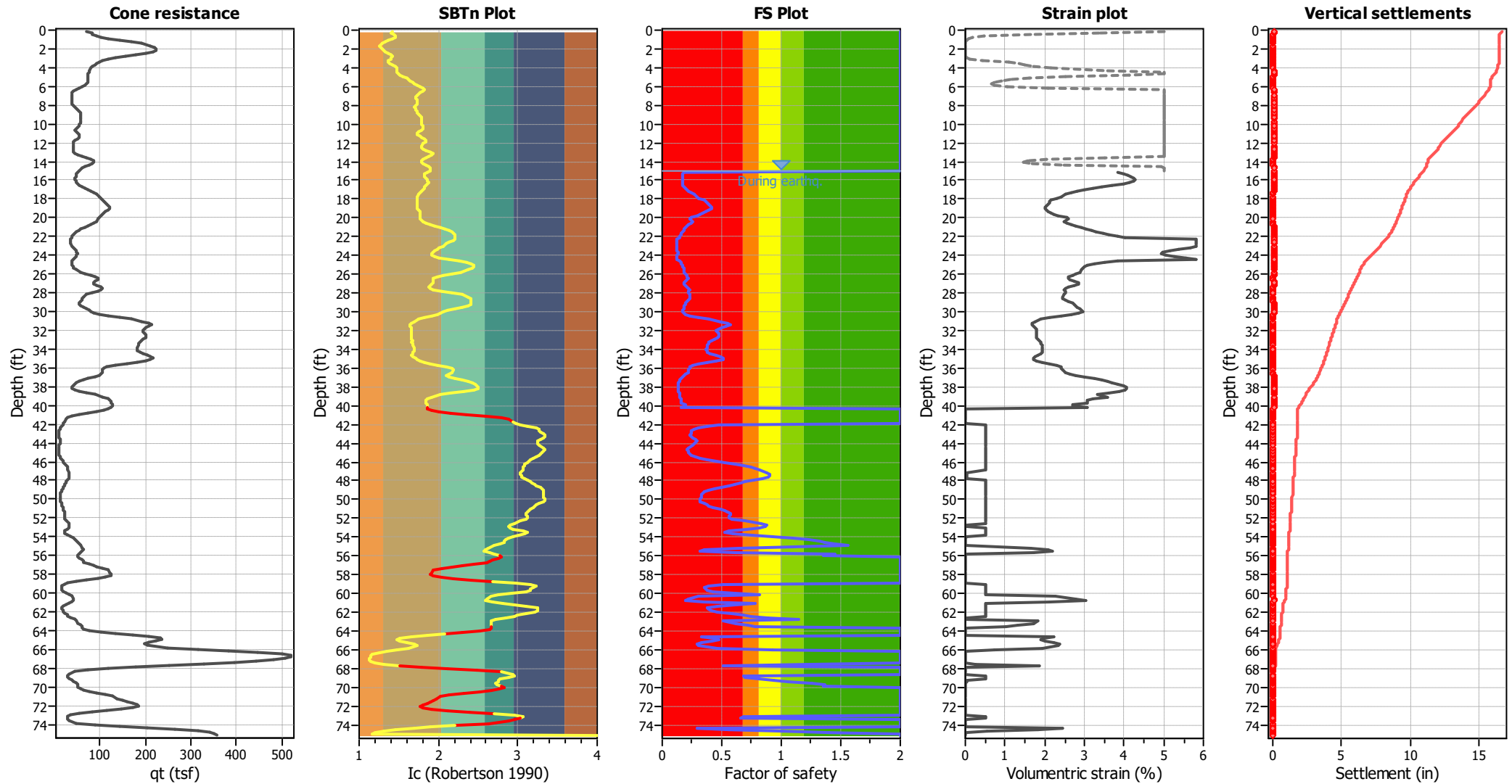
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 64  
 Exclusion percentage: 13.97%  
 Number of layers detected: 8

## Estimation of post-earthquake settlements

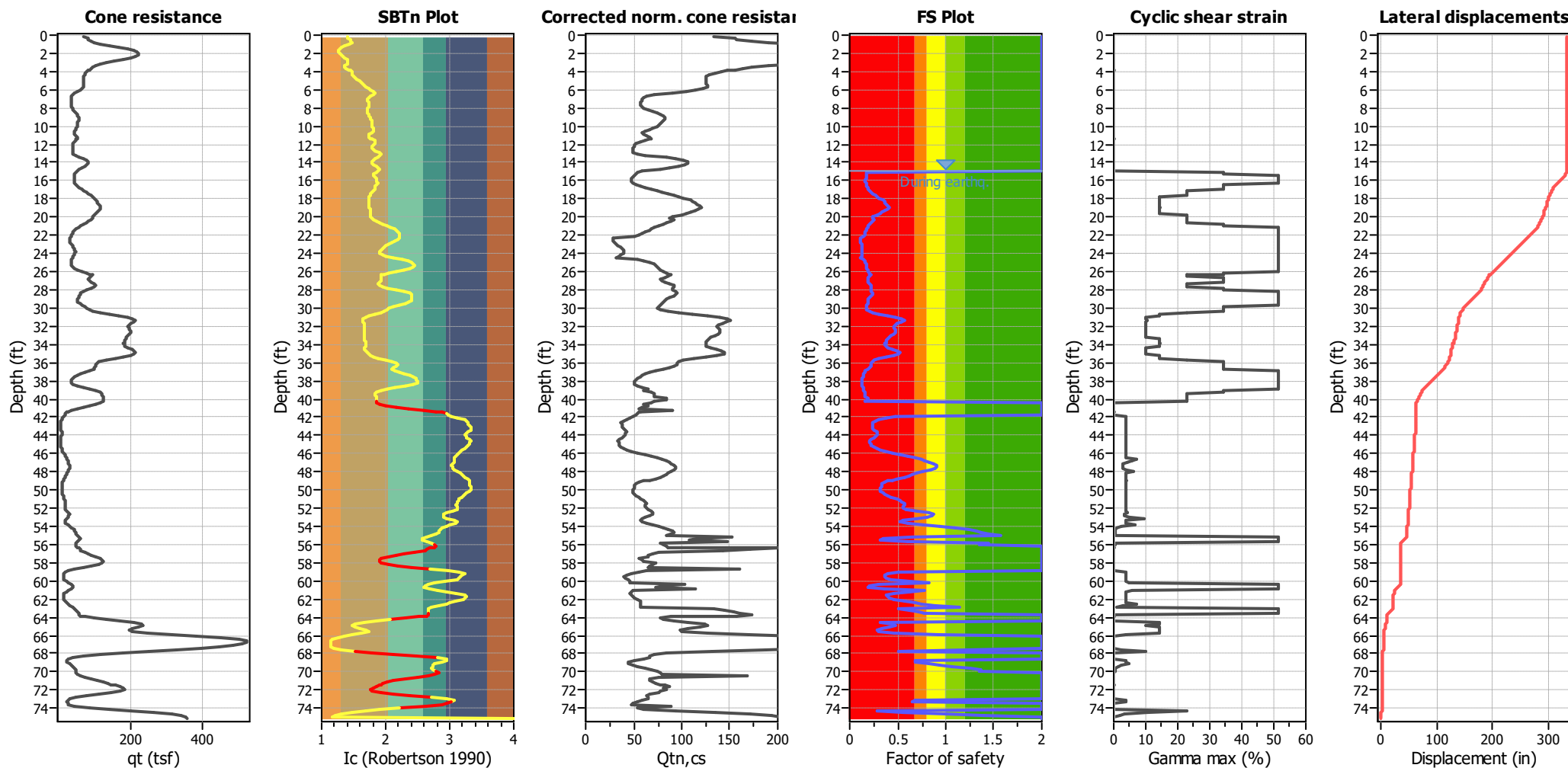


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**



### Abbreviations

$q_t$ : Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)

$I_c$ : Soil Behaviour Type Index

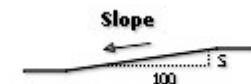
$Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety

$\gamma_{max}$ : Maximum cyclic shear strain

LDI: Lateral displacement index

### Surface condition





## LIQUEFACTION ANALYSIS REPORT

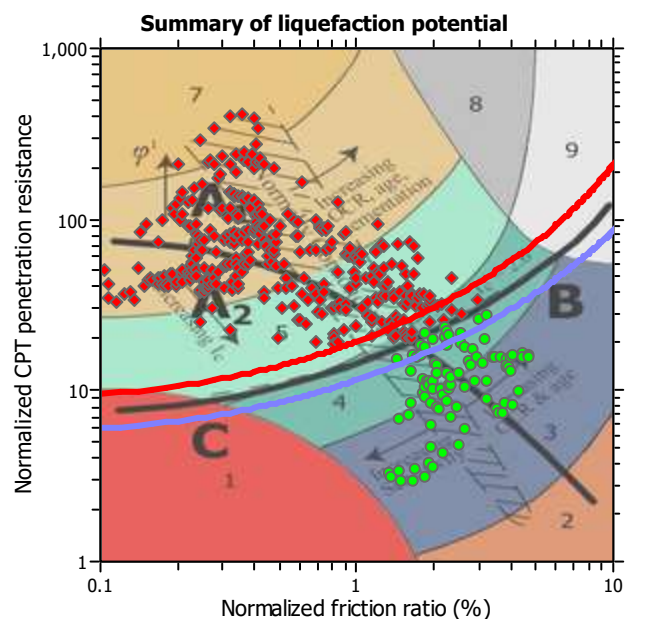
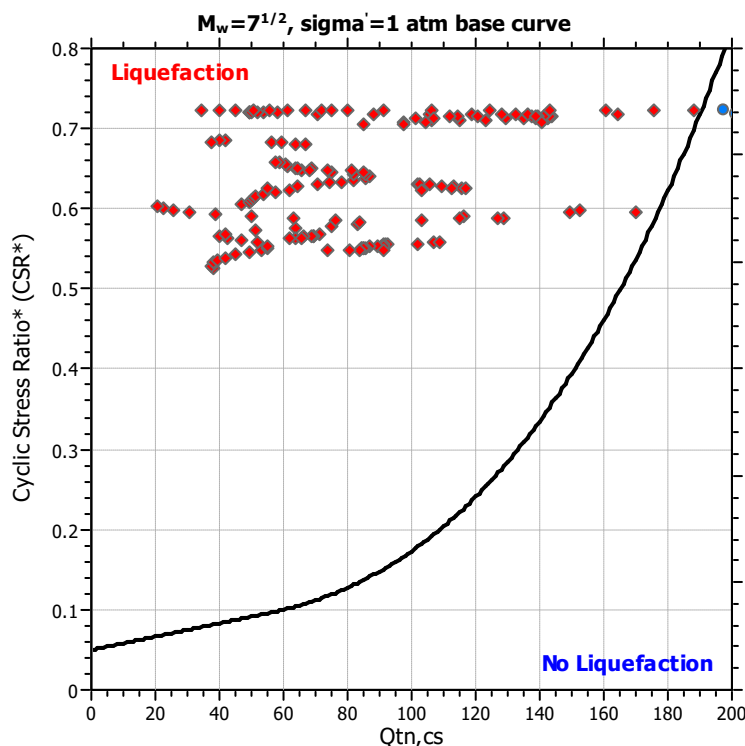
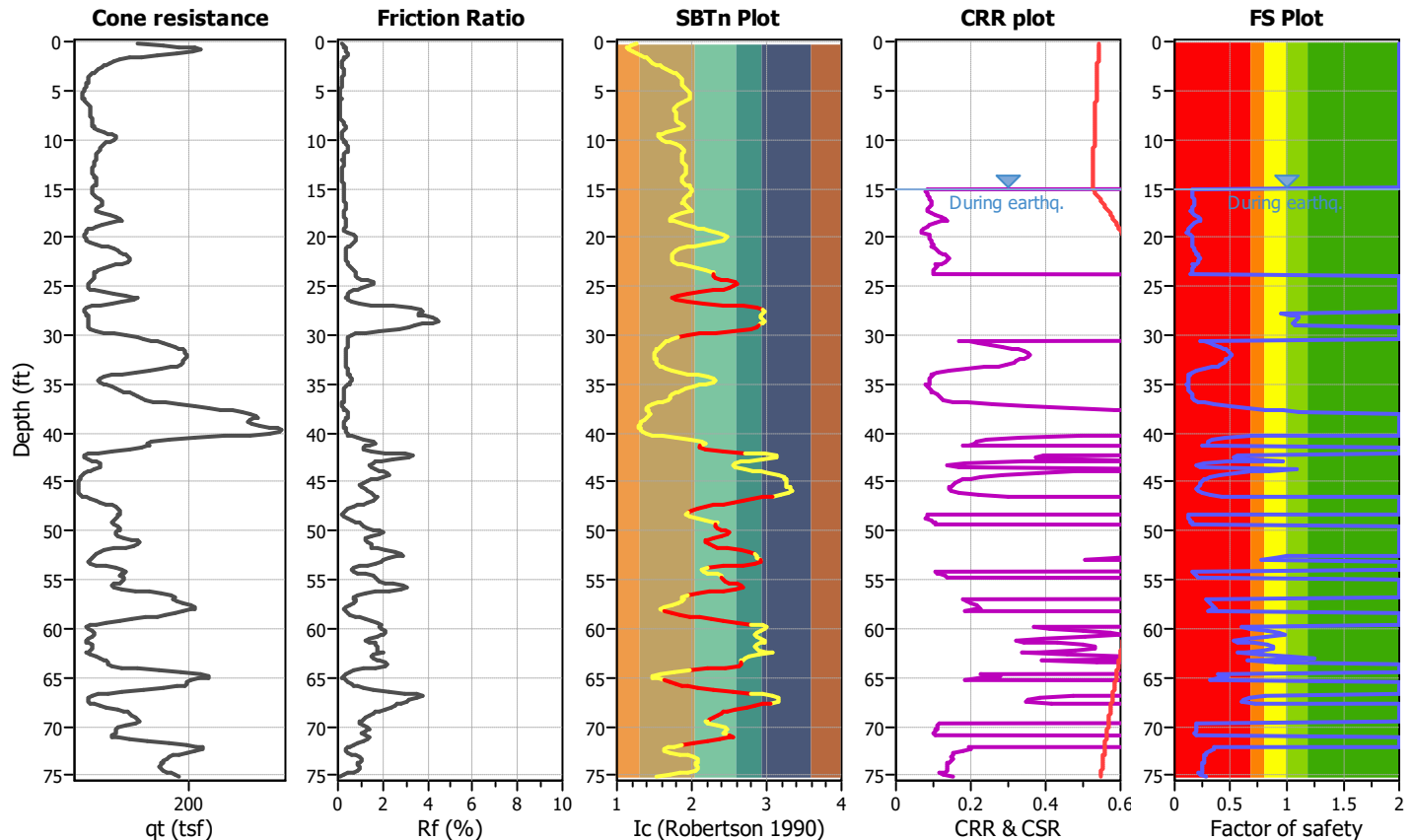
**Project title : Moorpark Library**

**Location : High Street and Moorpark Avenue, Moorpark, California**

**CPT file : CPT-5**

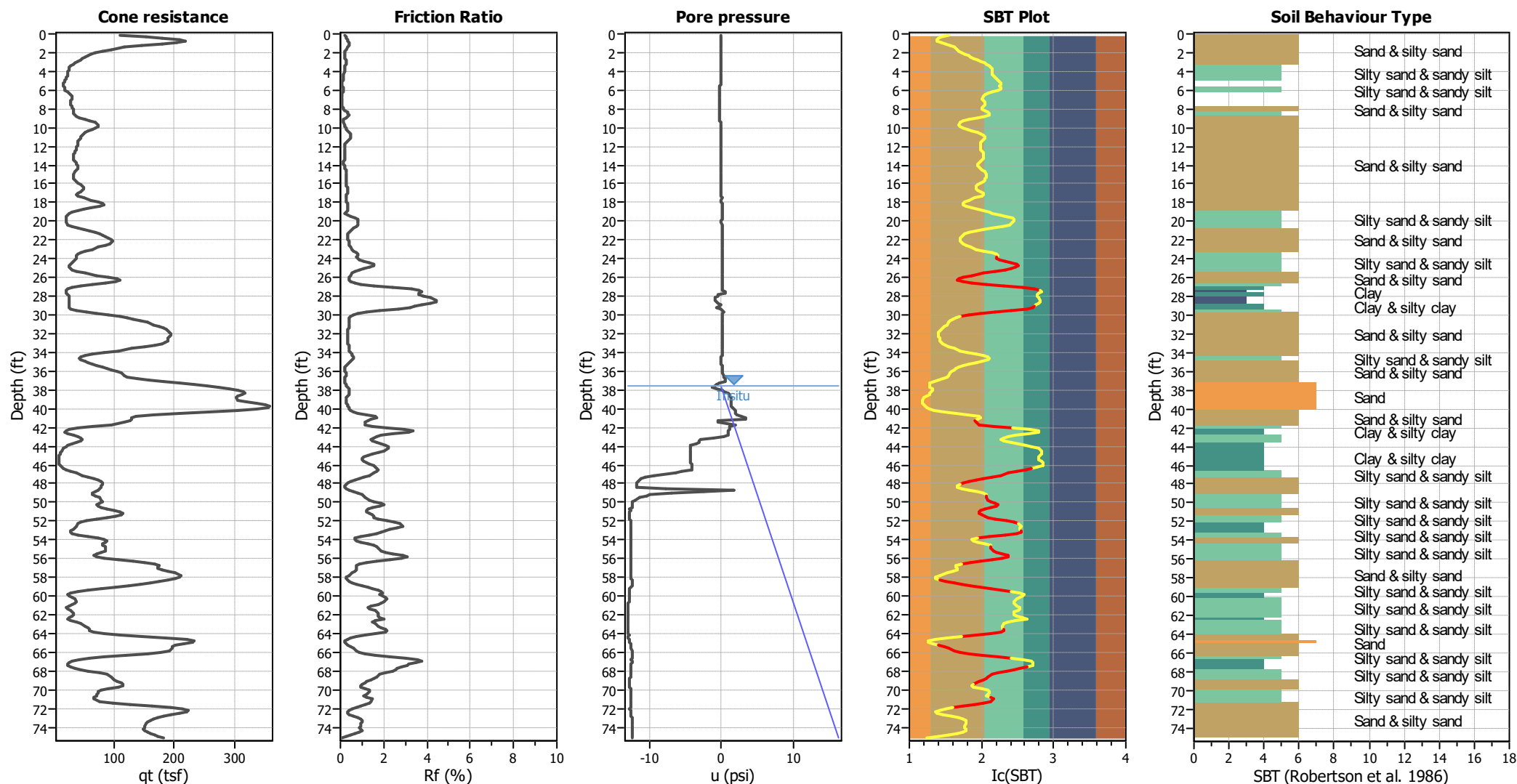
### Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	37.50 ft	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.90	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	No	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plots



## Input parameters and analysis data

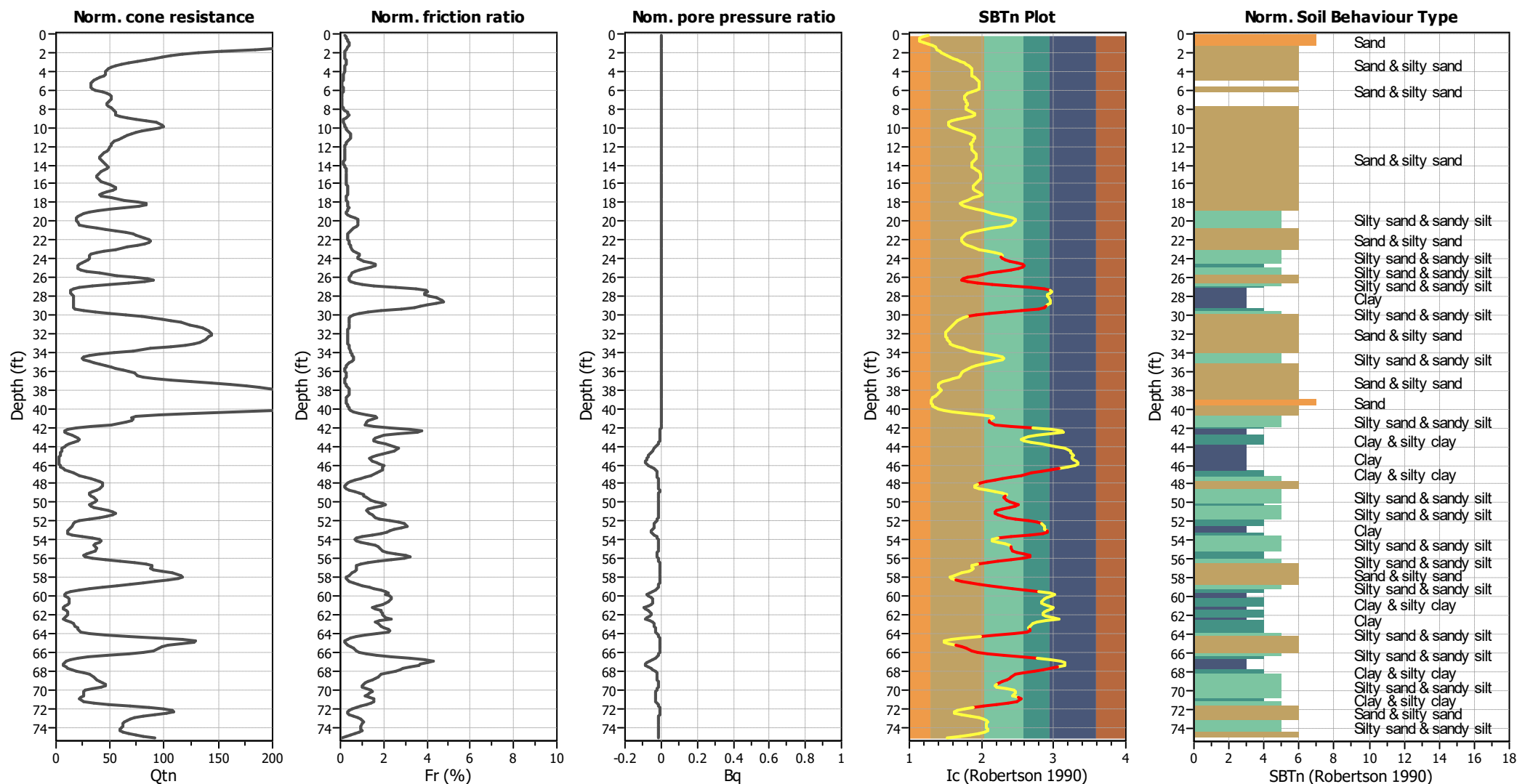
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>g</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## SBT legend

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



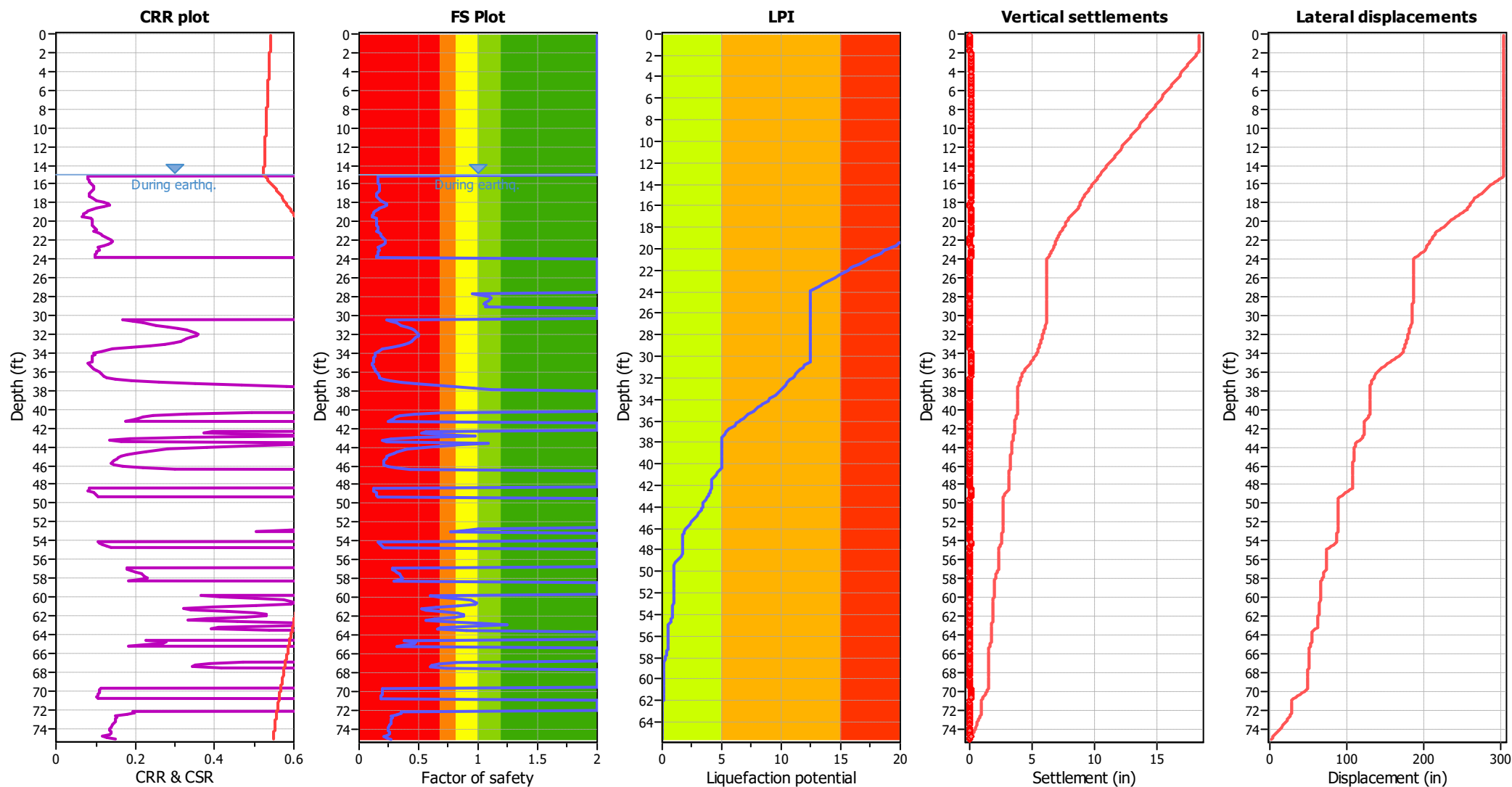
## CPT basic interpretation plots (normalized)



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	No
Earthquake magnitude M <sub>w</sub> :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## Liquefaction analysis overall plots



## Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (earthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_a$ applied:	No
Earthquake magnitude $M_w$ :	6.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	37.50 ft	Fill height:	N/A	Limit depth:	N/A

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



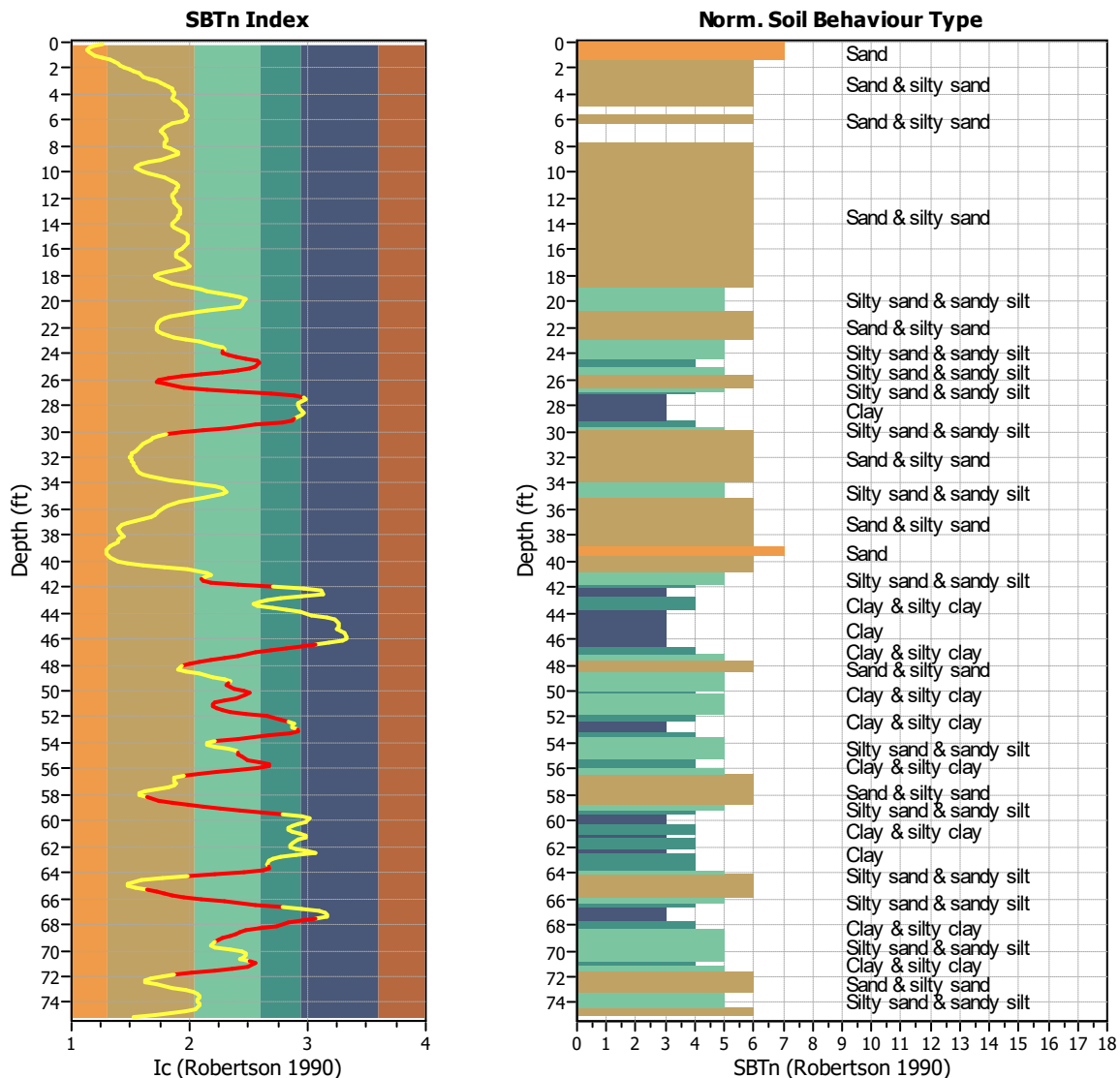
## TRANSITION LAYER DETECTION ALGORITHM REPORT

### Summary Details & Plots

#### Short description

The software will delete data when the cone is in transition from either clay to sand or vice-versa. To do this the software requires a range of  $I_c$  values over which the transition will be defined (typically somewhere between  $1.80 < I_c < 3.0$ ) and a rate of change of  $I_c$ . Transitions typically occur when the rate of change of  $I_c$  is fast (i.e.  $\Delta I_c$  is small).

The  $SBT_n$  plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



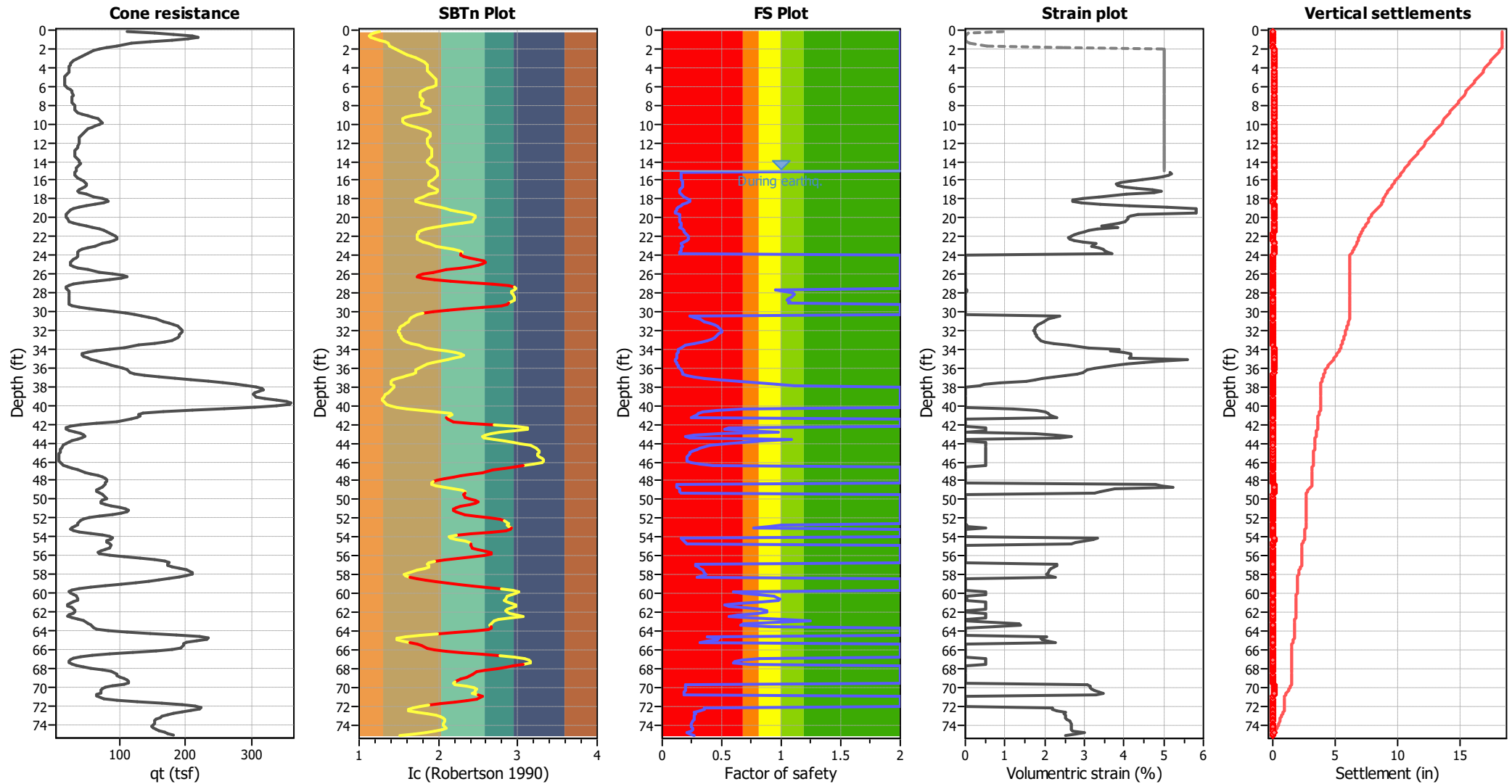
#### Transition layer algorithm properties

$I_c$  minimum check value: 1.70  
 $I_c$  maximum check value: 3.00  
 $I_c$  change ratio value: 0.0100  
 Minimum number of points in layer: 4

#### General statistics

Total points in CPT file: 458  
 Total points excluded: 129  
 Exclusion percentage: 28.17%  
 Number of layers detected: 17

## Estimation of post-earthquake settlements

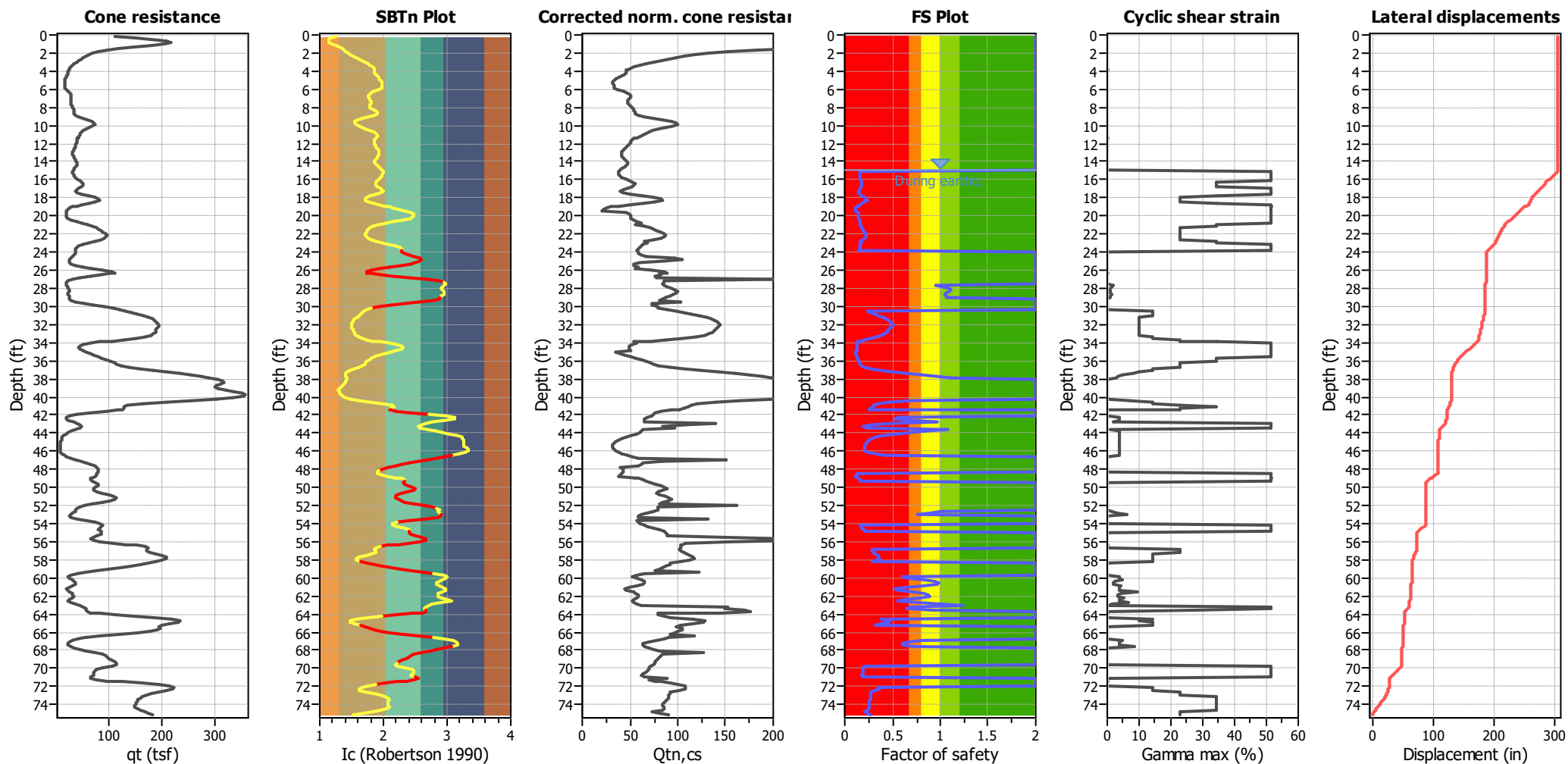


### Abbreviations

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

## Estimation of post-earthquake lateral Displacements

**Geometric parameters: Gently sloping ground without free face (Slope 2.50 %)**

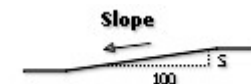


### Abbreviations

qt: Total cone resistance (cone resistance  $q_c$  corrected for pore water effects)  
 $I_c$ : Soil Behaviour Type Index  
 $Q_{tn,cs}$ : Equivalent clean sand normalized CPT total cone resistance

F.S.: Factor of safety  
 $\gamma_{max}$ : Maximum cyclic shear strain  
 LDI: Lateral displacement index

### Surface condition

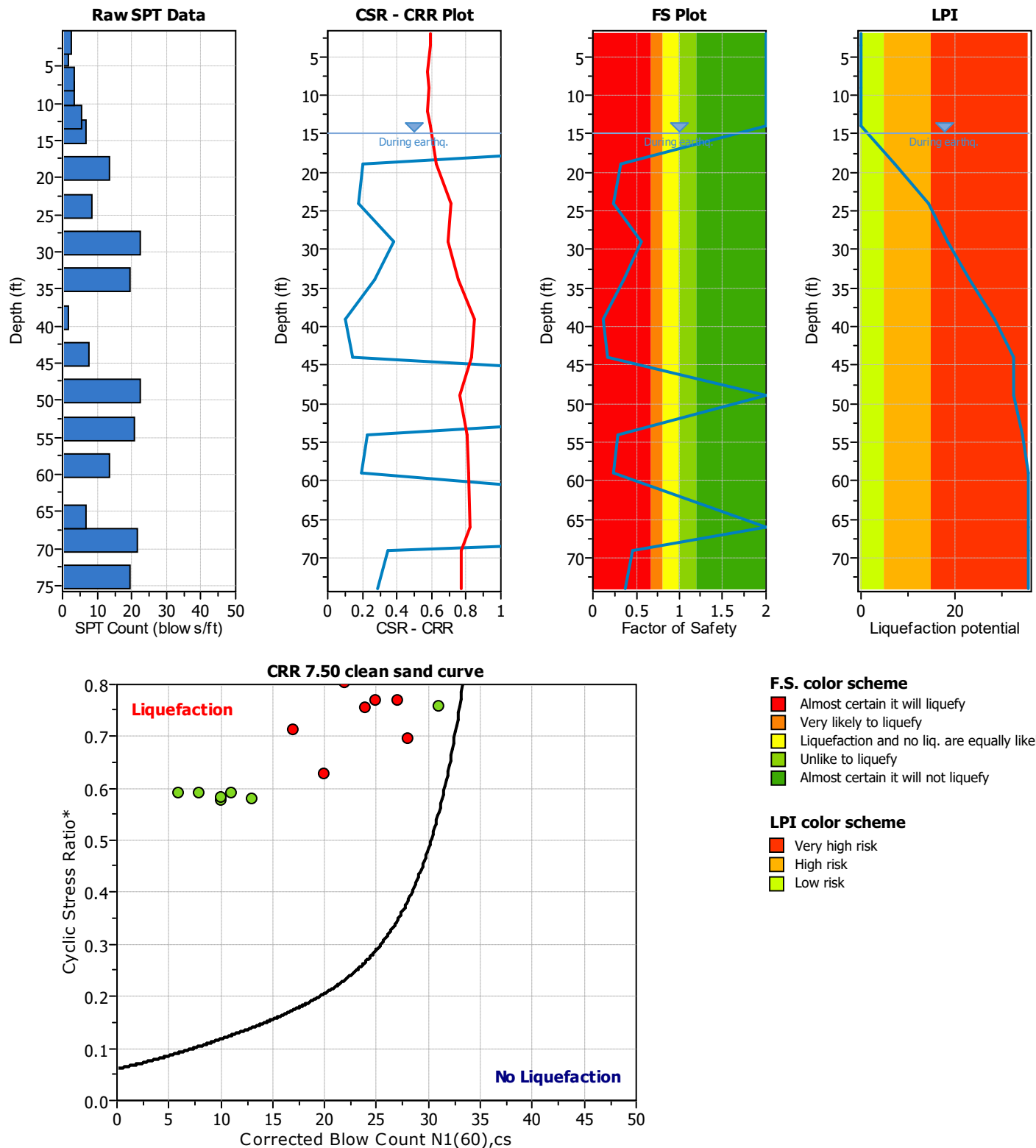


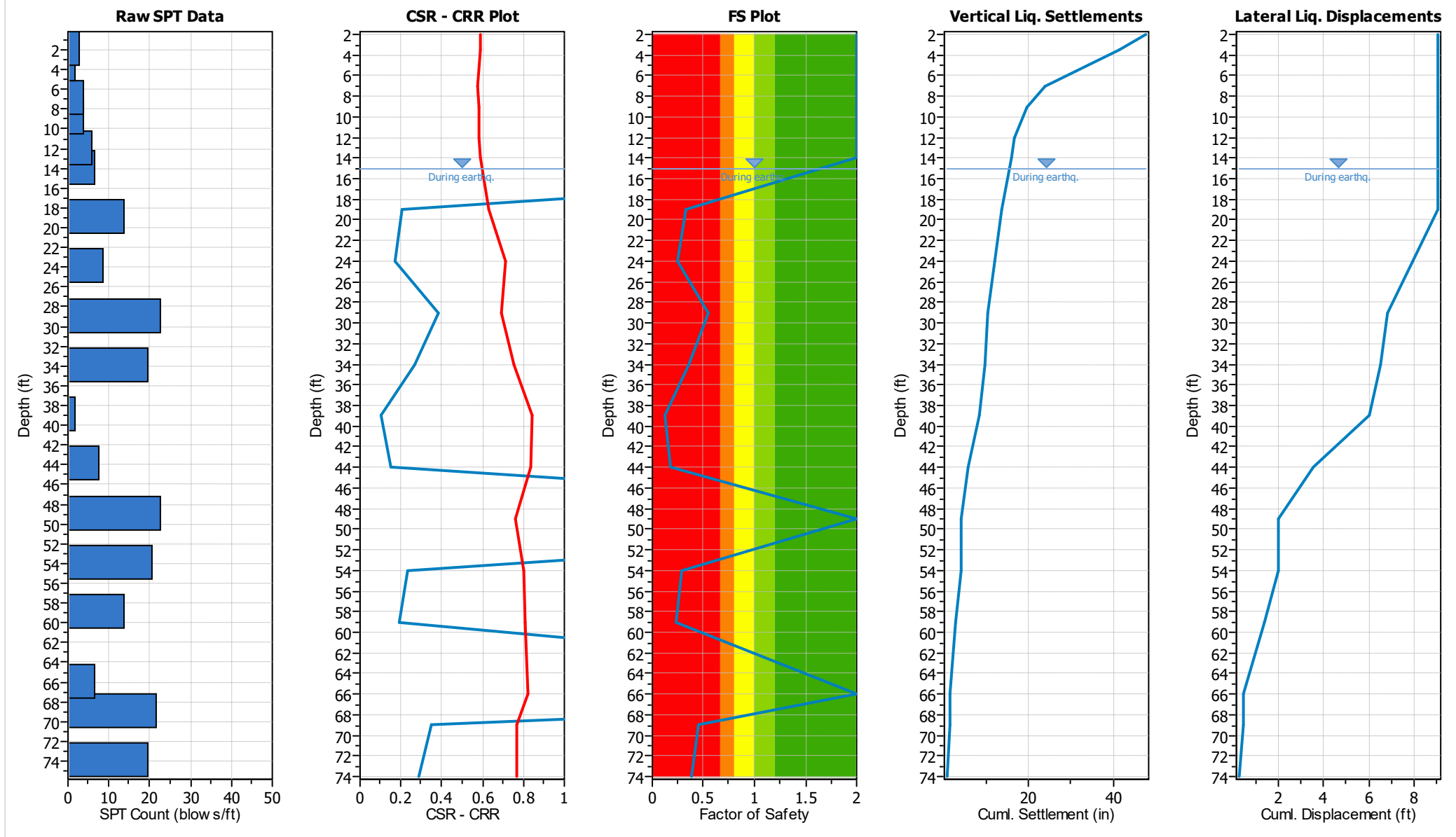


## SPT BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Library**
**SPT Name: DH #1**
**Location : High Street and Moorpark Avenue**
**:: Input parameters and analysis properties ::**

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	37.50 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	15.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude $M_w$ :	6.90 ft
Borehole diameter:	200mm	Peak ground acceleration:	1.03 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.30		



**:: Overall Liquefaction Assessment Analysis Plots ::**

**:: Field input data ::**

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.00	3	12.00	98.00	2.00	No
3.50	2	12.00	98.00	2.00	No
7.00	4	12.00	105.00	4.00	No
9.00	4	15.00	105.00	3.00	No
12.00	6	15.00	111.00	2.00	No
14.00	7	7.00	111.00	3.00	Yes
19.00	14	7.00	111.00	7.00	Yes
24.00	9	23.00	108.00	5.00	Yes
29.00	23	7.00	107.00	5.00	Yes
34.00	20	7.00	107.00	5.00	Yes
39.00	2	50.00	112.00	5.00	Yes
44.00	8	50.00	112.00	5.00	Yes
49.00	23	25.00	112.00	5.00	Yes
54.00	21	3.00	112.00	5.00	Yes
59.00	14	25.00	112.00	5.00	Yes
66.00	7	63.00	112.00	3.00	No
69.00	22	24.00	112.00	3.00	Yes
74.00	20	24.00	112.00	3.00	Yes

**Abbreviations**

Depth:	Depth at which test was performed (ft)
SPT Field Value:	Number of blows per foot
Fines Content:	Fines content at test depth (%)
Unit Weight:	Unit weight at test depth (pcf)
Infl. Thickness:	Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy:	User defined switch for excluding/including test depth from the analysis procedure

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
2.00	3	98.00	0.10	0.00	0.10	0.55	1.70	1.30	1.15	0.75	1.00	6	12.00	2.07	8	4.000
3.50	2	98.00	0.17	0.00	0.17	0.58	1.70	1.30	1.15	0.75	1.00	4	12.00	2.07	6	4.000
7.00	4	105.00	0.36	0.00	0.36	0.52	1.70	1.30	1.15	0.80	1.00	8	12.00	2.07	10	4.000
9.00	4	105.00	0.46	0.00	0.46	0.51	1.53	1.30	1.15	0.80	1.00	7	15.00	3.26	10	4.000
12.00	6	111.00	0.63	0.00	0.63	0.50	1.30	1.30	1.15	0.85	1.00	10	15.00	3.26	13	4.000
14.00	7	111.00	0.74	0.00	0.74	0.53	1.21	1.30	1.15	0.85	1.00	11	7.00	0.14	11	4.000
19.00	14	111.00	1.02	0.00	1.02	0.44	1.02	1.30	1.15	0.95	1.00	20	7.00	0.14	20	0.206
24.00	9	108.00	1.29	0.00	1.29	0.48	0.91	1.30	1.15	0.95	1.00	12	23.00	4.88	17	0.174
29.00	23	107.00	1.55	0.00	1.55	0.37	0.87	1.30	1.15	0.95	1.00	28	7.00	0.14	28	0.384
34.00	20	107.00	1.82	0.00	1.82	0.41	0.80	1.30	1.15	1.00	1.00	24	7.00	0.14	24	0.268
39.00	2	112.00	2.10	0.05	2.05	0.60	0.67	1.30	1.15	1.00	1.00	2	50.00	5.61	8	0.105
44.00	8	112.00	2.38	0.20	2.18	0.52	0.69	1.30	1.15	1.00	1.00	8	50.00	5.61	14	0.148
49.00	23	112.00	2.66	0.36	2.30	0.37	0.75	1.30	1.15	1.00	1.00	26	25.00	5.07	31	4.000
54.00	21	112.00	2.94	0.51	2.43	0.42	0.70	1.30	1.15	1.00	1.00	22	3.00	0.00	22	0.233
59.00	14	112.00	3.22	0.67	2.55	0.46	0.66	1.30	1.15	1.00	1.00	14	25.00	5.07	19	0.194
66.00	7	112.00	3.61	0.89	2.72	0.55	0.60	1.30	1.15	1.00	1.00	6	63.00	5.59	12	4.000
69.00	22	112.00	3.78	0.98	2.80	0.39	0.68	1.30	1.15	1.00	1.00	22	24.00	4.98	27	0.347
74.00	20	112.00	4.06	1.14	2.92	0.42	0.65	1.30	1.15	1.00	1.00	20	24.00	4.98	25	0.290

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	CRR <sub>7.5</sub>
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**Abbreviations**

$\sigma_v$ : Total stress during SPT test (tsf)  
 $u_o$ : Water pore pressure during SPT test (tsf)  
 $\sigma'_{vo}$ : Effective overburden pressure during SPT test (tsf)  
m: Stress exponent normalization factor  
 $C_N$ : Overburden correction factor  
 $C_E$ : Energy correction factor  
 $C_B$ : Borehole diameter correction factor  
 $C_R$ : Rod length correction factor  
 $C_S$ : Liner correction factor  
 $N_{1(60)}$ : Corrected  $N_{SPT}$  to a 60% energy ratio  
 $\Delta(N_1)_{60}$ : Equivalent clean sand adjustment  
 $N_{1(60)cs}$ : Corrected  $N_{1(60)}$  value for fines content  
CRR<sub>7.5</sub>: Cyclic resistance ratio for M=7.5

**:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::**

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	$MSF_{max}$	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	$K_{sigma}$	CSR*	FS	
2.00	98.00	0.10	0.00	0.10	1.00	1.00	0.670	1.15	8	1.03	0.649	1.10	0.590	2.000	🟢
3.50	98.00	0.17	0.00	0.17	1.00	1.00	0.667	1.13	6	1.03	0.649	1.10	0.590	2.000	🟢
7.00	105.00	0.36	0.00	0.36	0.98	1.00	0.659	1.19	10	1.04	0.633	1.10	0.575	2.000	🟢
9.00	105.00	0.46	0.00	0.46	0.98	1.00	0.654	1.19	10	1.04	0.628	1.08	0.583	2.000	🟢
12.00	111.00	0.63	0.00	0.63	0.96	1.00	0.645	1.26	13	1.06	0.611	1.05	0.580	2.000	🟢
14.00	111.00	0.74	0.00	0.74	0.95	1.00	0.639	1.21	11	1.05	0.611	1.03	0.591	2.000	🟢
19.00	111.00	1.02	0.12	0.89	0.93	1.00	0.711	1.49	20	1.11	0.643	1.02	0.628	0.328	🔴
24.00	108.00	1.29	0.28	1.00	0.90	1.00	0.775	1.38	17	1.08	0.717	1.01	0.712	0.244	🔴
29.00	107.00	1.55	0.44	1.12	0.88	1.00	0.818	1.88	28	1.19	0.688	0.99	0.695	0.552	🔴
34.00	107.00	1.82	0.59	1.23	0.85	1.00	0.843	1.67	24	1.14	0.737	0.98	0.755	0.355	🔴
39.00	112.00	2.10	0.75	1.35	0.82	1.00	0.853	1.15	8	1.03	0.826	0.98	0.844	0.124	🔴
44.00	112.00	2.38	0.90	1.48	0.79	1.00	0.855	1.29	14	1.06	0.805	0.96	0.835	0.177	🔴
49.00	112.00	2.66	1.06	1.60	0.76	1.00	0.849	2.06	31	1.23	0.692	0.91	0.759	2.000	🟢
54.00	112.00	2.94	1.22	1.72	0.73	1.00	0.840	1.58	22	1.12	0.747	0.93	0.803	0.290	🔴
59.00	112.00	3.22	1.37	1.85	0.71	1.00	0.827	1.45	19	1.10	0.753	0.93	0.811	0.239	🔴
66.00	112.00	3.61	1.59	2.02	0.67	1.00	0.806	1.24	12	1.05	0.767	0.94	0.820	2.000	🟢
69.00	112.00	3.78	1.68	2.10	0.66	1.00	0.796	1.82	27	1.18	0.677	0.88	0.770	0.450	🔴
74.00	112.00	4.06	1.84	2.22	0.64	1.00	0.781	1.72	25	1.15	0.676	0.88	0.769	0.377	🔴

**Abbreviations**

$\sigma_{v,eq}$ : Total overburden pressure at test point, during earthquake (tsf)  
 $u_{o,eq}$ : Water pressure at test point, during earthquake (tsf)  
 $\sigma'_{vo,eq}$ : Effective overburden pressure, during earthquake (tsf)  
 $r_d$ : Nonlinear shear mass factor  
 $\alpha$ : Improvement factor due to stone columns  
CSR: Cyclic Stress Ratio  
MSF: Magnitude Scaling Factor  
CSR<sub>eq,M=7.5</sub>: CSR adjusted for M=7.5  
 $K_{\sigma_{ma}}$ : Effective overburden stress factor  
CSR\*: CSR fully adjusted  
FS: Calculated factor of safety against soil liquefaction

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	$I_L$
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**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	I <sub>L</sub>
2.00	2.000	0.00	9.70	1.50	0.00
3.50	2.000	0.00	9.47	1.50	0.00
7.00	2.000	0.00	8.93	3.50	0.00
9.00	2.000	0.00	8.63	2.00	0.00
12.00	2.000	0.00	8.17	3.00	0.00
14.00	2.000	0.00	7.87	2.00	0.00
19.00	0.328	0.67	7.10	5.00	7.28
24.00	0.244	0.76	6.34	5.00	7.31
29.00	0.552	0.45	5.58	5.00	3.81
34.00	0.355	0.64	4.82	5.00	4.73
39.00	0.124	0.88	4.06	5.00	5.42
44.00	0.177	0.82	3.29	5.00	4.13
49.00	2.000	0.00	2.53	5.00	0.00
54.00	0.290	0.71	1.77	5.00	1.92
59.00	0.239	0.76	1.01	5.00	1.17
66.00	2.000	0.00	0.00	0.00	0.00
69.00	0.450	0.00	0.00	0.00	0.00
74.00	0.377	0.00	0.00	0.00	0.00

**Overall potential I<sub>L</sub> : 35.76**I<sub>L</sub> = 0.00 - No liquefactionI<sub>L</sub> between 0.00 and 5 - Liquefaction not probableI<sub>L</sub> between 5 and 15 - Liquefaction probableI<sub>L</sub> > 15 - Liquefaction certain**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60</sub>	T <sub>av</sub>	p	G <sub>max</sub> (tsf)	a	b	γ	ε <sub>15</sub>	N <sub>c</sub>	ε <sub>Nc</sub> (%)	Δh (ft)	ΔS (in)
2.00	6	0.07	0.07	0.23	0.13	25789.58	0.05	0.16	10.08	13.35	2.00	6.406
3.50	4	0.11	0.11	0.28	0.13	18434.08	0.10	0.43	10.08	36.24	2.00	17.396
7.00	8	0.23	0.24	0.47	0.14	11908.57	0.02	0.05	10.08	4.45	4.00	4.275
9.00	7	0.30	0.31	0.53	0.14	10194.92	0.02	0.05	10.08	4.25	3.00	3.060
12.00	10	0.40	0.42	0.68	0.15	8470.78	0.01	0.02	10.08	1.72	2.00	0.824
14.00	11	0.47	0.49	0.70	0.15	7681.29	0.02	0.03	10.08	2.83	3.00	2.038

**Cumulative settlement: 33.999****Abbreviations**T<sub>av</sub>: Average cyclic shear stress

p: Average stress

G<sub>max</sub>: Maximum shear modulus (tsf)

a, b: Shear strain formula variables

γ: Average shear strain

ε<sub>15</sub>: Volumetric strain after 15 cyclesN<sub>c</sub>: Number of cyclesε<sub>Nc</sub>: Volumetric strain for number of cycles N<sub>c</sub> (%)

Δh: Thickness of soil layer (in)

ΔS: Settlement of soil layer (in)



**:: Vertical & Lateral displacements estimation for saturated sands ::**

<b>Depth (ft)</b>	<b>(N<sub>1</sub>)<sub>60cs</sub></b>	<b>γ<sub>lim</sub> (%)</b>	<b>F<sub>a</sub></b>	<b>FS<sub>liq</sub></b>	<b>γ<sub>max</sub> (%)</b>	<b>e<sub>v</sub> (%)</b>	<b>dz (ft)</b>	<b>S<sub>v-1D</sub> (in)</b>	<b>LDI (ft)</b>
19.00	20	15.90	0.52	0.328	15.90	2.30	7.00	1.935	1.11
24.00	17	22.15	0.67	0.244	22.15	2.62	5.00	1.572	1.11
29.00	28	6.08	0.04	0.552	6.08	1.29	5.00	0.777	0.30
34.00	24	10.02	0.29	0.355	10.02	1.97	5.00	1.181	0.50
39.00	8	50.00	0.94	0.124	50.00	4.23	5.00	2.536	2.50
44.00	14	30.65	0.79	0.177	30.65	3.02	5.00	1.810	1.53
49.00	31	4.04	-0.16	2.000	0.00	0.00	5.00	0.000	0.00
54.00	22	12.67	0.41	0.290	12.67	2.13	5.00	1.275	0.63
59.00	19	17.78	0.57	0.239	17.78	2.40	5.00	1.441	0.89
66.00	12	0.00	0.00	2.000	0.00	0.00	3.00	0.000	0.00
69.00	27	6.92	0.11	0.450	6.92	1.53	3.00	0.549	0.21
74.00	25	8.88	0.23	0.377	8.88	1.90	3.00	0.683	0.27

**Cumulative settlements: 13.760 9.05****Abbreviations**

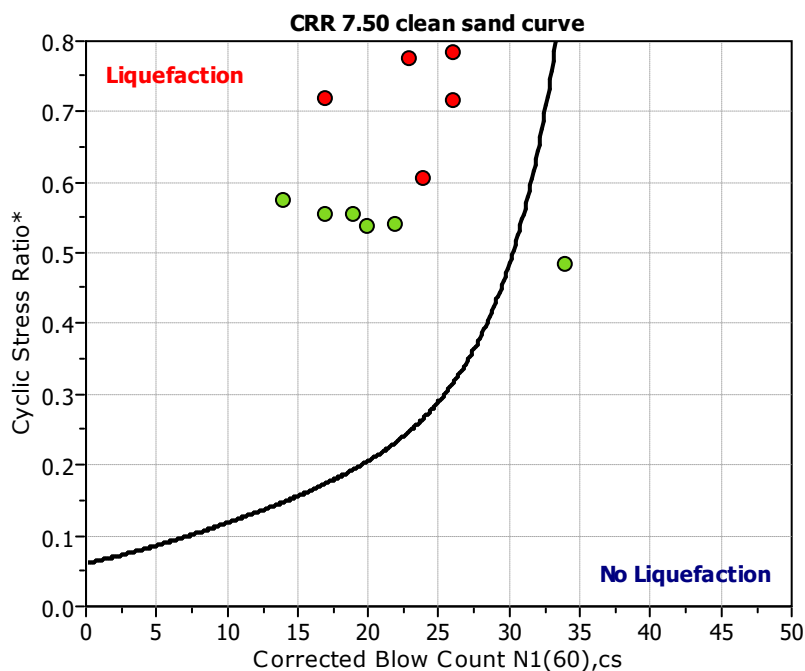
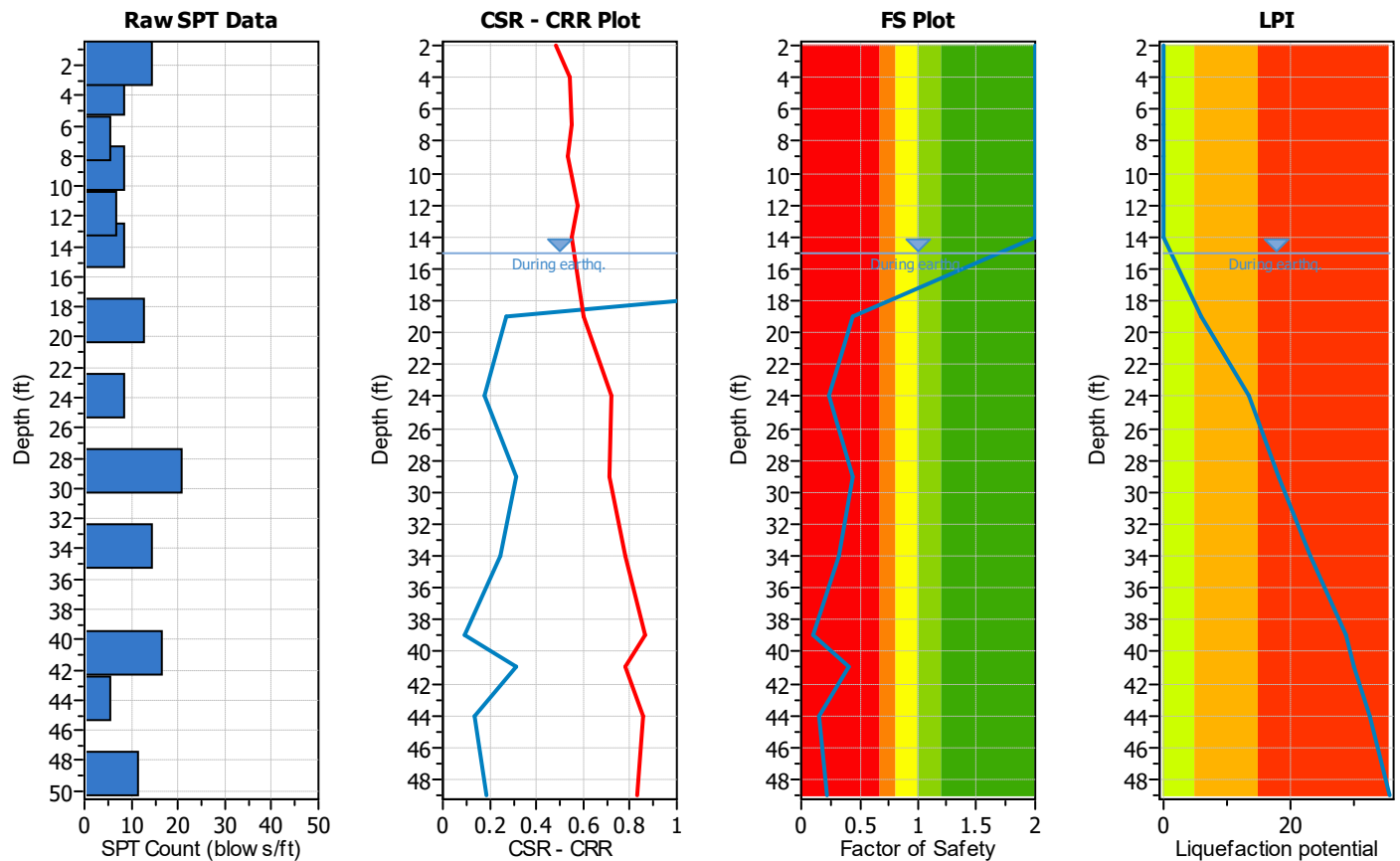
γ <sub>lim</sub> :	Limiting shear strain (%)
F <sub>a</sub> /N:	Maximum shear strain factor
γ <sub>max</sub> :	Maximum shear strain (%)
e <sub>v</sub> ::	Post liquefaction volumetric strain (%)
S <sub>v-1D</sub> :	Estimated vertical settlement (in)
LDI:	Estimated lateral displacement (ft)



## SPT BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Library**
**SPT Name: DH #2**
**Location : High Street and Moorpark Avenue**
**:: Input parameters and analysis properties ::**

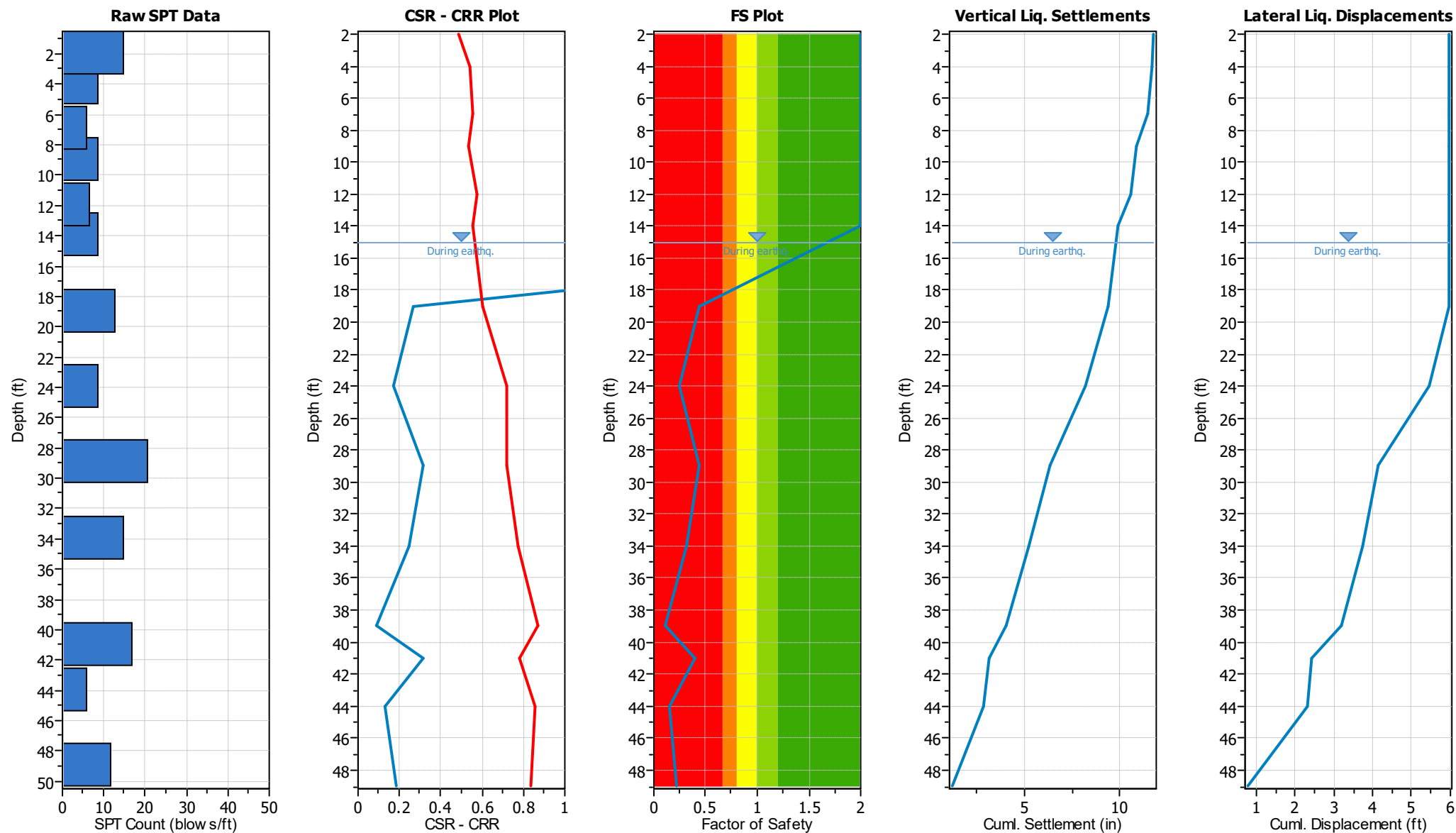
Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	37.50 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	15.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude $M_w$ :	6.90 ft
Borehole diameter:	200mm	Peak ground acceleration:	1.03 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.30		


**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

**:: Overall Liquefaction Assessment Analysis Plots ::**

**:: Field input data ::**

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.00	15	22.00	102.00	3.00	No
4.00	9	22.00	102.00	3.00	No
7.00	6	22.00	101.00	3.00	No
9.00	9	22.00	101.00	3.00	No
12.00	7	12.00	101.00	2.00	No
14.00	9	27.00	106.00	4.00	Yes
19.00	13	27.00	106.00	5.00	Yes
24.00	9	29.00	95.00	6.00	Yes
29.00	21	6.00	95.00	5.00	Yes
34.00	15	27.00	97.00	5.00	Yes
39.00	0	52.00	118.00	1.50	Yes
41.00	17	52.00	118.00	1.50	Yes
44.00	6	47.00	118.00	4.00	Yes
49.00	12	27.00	118.00	4.00	Yes

**Abbreviations**

Depth: Depth at which test was performed (ft)  
SPT Field Value: Number of blows per foot  
Fines Content: Fines content at test depth (%)  
Unit Weight: Unit weight at test depth (pcf)  
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)  
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
2.00	15	102.00	0.10	0.00	0.10	0.32	1.70	1.30	1.15	0.75	1.00	29	22.00	4.77	34	4.000
4.00	9	102.00	0.20	0.00	0.20	0.40	1.70	1.30	1.15	0.75	1.00	17	22.00	4.77	22	4.000
7.00	6	101.00	0.36	0.00	0.36	0.45	1.63	1.30	1.15	0.80	1.00	12	22.00	4.77	17	4.000
9.00	9	101.00	0.46	0.00	0.46	0.42	1.43	1.30	1.15	0.80	1.00	15	22.00	4.77	20	4.000
12.00	7	101.00	0.61	0.00	0.61	0.49	1.31	1.30	1.15	0.85	1.00	12	12.00	2.07	14	4.000
14.00	9	106.00	0.71	0.00	0.71	0.44	1.19	1.30	1.15	0.85	1.00	14	27.00	5.21	19	4.000
19.00	13	106.00	0.98	0.00	0.98	0.40	1.03	1.30	1.15	0.95	1.00	19	27.00	5.21	24	0.268
24.00	9	95.00	1.22	0.00	1.22	0.47	0.94	1.30	1.15	0.95	1.00	12	29.00	5.32	17	0.174
29.00	21	95.00	1.45	0.00	1.45	0.39	0.88	1.30	1.15	0.95	1.00	26	6.00	0.03	26	0.316
34.00	15	97.00	1.70	0.00	1.70	0.42	0.82	1.30	1.15	1.00	1.00	18	27.00	5.21	23	0.249
39.00	0	118.00	1.99	0.05	1.94	0.63	0.68	1.30	1.15	1.00	1.00	0	52.00	5.61	6	0.092
41.00	17	118.00	2.11	0.11	2.00	0.41	0.77	1.30	1.15	1.00	1.00	20	52.00	5.61	26	0.316
44.00	6	118.00	2.29	0.20	2.08	0.54	0.69	1.30	1.15	1.00	1.00	6	47.00	5.61	12	0.132
49.00	12	118.00	2.58	0.36	2.22	0.47	0.70	1.30	1.15	1.00	1.00	13	27.00	5.21	18	0.184

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	SPT Field Value	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_0$ (tsf)	$\sigma'_{vo}$ (tsf)	m	$C_N$	$C_E$	$C_B$	$C_R$	$C_S$	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	CRR <sub>7.5</sub>
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**Abbreviations**

$\sigma_v$ : Total stress during SPT test (tsf)  
 $u_0$ : Water pore pressure during SPT test (tsf)  
 $\sigma'_{vo}$ : Effective overburden pressure during SPT test (tsf)  
m: Stress exponent normalization factor  
 $C_N$ : Overburden correction factor  
 $C_E$ : Energy correction factor  
 $C_B$ : Borehole diameter correction factor  
 $C_R$ : Rod length correction factor  
 $C_S$ : Liner correction factor  
 $N_{1(60)}$ : Corrected  $N_{SPT}$  to a 60% energy ratio  
 $\Delta(N_1)_{60}$ : Equivalent clean sand adjustment  
 $N_{1(60)cs}$ : Corrected  $N_{1(60)}$  value for fines content  
CRR<sub>7.5</sub>: Cyclic resistance ratio for M=7.5

**:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::**

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	$MSF_{max}$	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	$K_{sigma}$	$CSR^*$	FS	
2.00	102.00	0.10	0.00	0.10	1.00	1.00	0.670	2.20	34	1.26	0.533	1.10	0.485	2.000	🟢
4.00	102.00	0.20	0.00	0.20	0.99	1.00	0.666	1.58	22	1.12	0.593	1.10	0.539	2.000	🟢
7.00	101.00	0.36	0.00	0.36	0.98	1.00	0.659	1.38	17	1.08	0.609	1.10	0.554	2.000	🟢
9.00	101.00	0.46	0.00	0.46	0.98	1.00	0.654	1.49	20	1.11	0.591	1.10	0.537	2.000	🟢
12.00	101.00	0.61	0.00	0.61	0.96	1.00	0.645	1.29	14	1.06	0.608	1.06	0.574	2.000	🟢
14.00	106.00	0.71	0.00	0.71	0.95	1.00	0.639	1.45	19	1.10	0.583	1.05	0.555	2.000	🟢
19.00	106.00	0.98	0.12	0.85	0.93	1.00	0.714	1.67	24	1.14	0.625	1.03	0.604	0.444	🔴
24.00	95.00	1.22	0.28	0.94	0.90	1.00	0.788	1.38	17	1.08	0.728	1.01	0.718	0.242	🔴
29.00	95.00	1.45	0.44	1.02	0.88	1.00	0.840	1.77	26	1.17	0.721	1.01	0.716	0.441	🔴
34.00	97.00	1.70	0.59	1.10	0.85	1.00	0.874	1.62	23	1.13	0.771	0.99	0.776	0.321	🔴
39.00	118.00	1.99	0.75	1.24	0.82	1.00	0.880	1.13	6	1.03	0.857	0.99	0.868	0.106	🔴
41.00	118.00	2.11	0.81	1.30	0.81	1.00	0.880	1.77	26	1.17	0.755	0.97	0.782	0.404	🔴
44.00	118.00	2.29	0.90	1.38	0.79	1.00	0.877	1.24	12	1.05	0.835	0.97	0.857	0.154	🔴
49.00	118.00	2.58	1.06	1.52	0.76	1.00	0.867	1.42	18	1.09	0.796	0.96	0.833	0.220	🔴

**Abbreviations**

$\sigma_{v,eq}$ : Total overburden pressure at test point, during earthquake (tsf)  
 $u_{0,eq}$ : Water pressure at test point, during earthquake (tsf)  
 $\sigma'_{vo,eq}$ : Effective overburden pressure, during earthquake (tsf)  
 $r_d$ : Nonlinear shear mass factor  
 $\alpha$ : Improvement factor due to stone columns  
CSR: Cyclic Stress Ratio  
MSF: Magnitude Scaling Factor  
CSR<sub>eq,M=7.5</sub>: CSR adjusted for M=7.5  
 $K_{\sigma}$ : Effective overburden stress factor  
CSR\*: CSR fully adjusted  
FS: Calculated factor of safety against soil liquefaction

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	$I_L$
2.00	2.000	0.00	9.70	2.00	0.00
4.00	2.000	0.00	9.39	2.00	0.00
7.00	2.000	0.00	8.93	3.00	0.00
9.00	2.000	0.00	8.63	2.00	0.00

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	I <sub>L</sub>
12.00	2.000	0.00	8.17	3.00	0.00
14.00	2.000	0.00	7.87	2.00	0.00
19.00	0.444	0.56	7.10	5.00	6.02
24.00	0.242	0.76	6.34	5.00	7.32
29.00	0.441	0.56	5.58	5.00	4.75
34.00	0.321	0.68	4.82	5.00	4.98
39.00	0.106	0.89	4.06	5.00	5.53
41.00	0.404	0.60	3.75	2.00	1.36
44.00	0.154	0.85	3.29	3.00	2.55
49.00	0.220	0.78	2.53	5.00	3.01

**Overall potential I<sub>L</sub> : 35.53**I<sub>L</sub> = 0.00 - No liquefactionI<sub>L</sub> between 0.00 and 5 - Liquefaction not probableI<sub>L</sub> between 5 and 15 - Liquefaction probableI<sub>L</sub> > 15 - Liquefaction certain**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60</sub>	T <sub>av</sub>	p	G <sub>max</sub> (tsf)	a	b	γ	ε <sub>15</sub>	N <sub>c</sub>	ε <sub>Nc</sub> (%)	Δh (ft)	ΔS (in)
2.00	29	0.07	0.07	0.38	0.13	25177.92	0.00	0.00	10.08	0.09	3.00	0.067
4.00	17	0.14	0.14	0.46	0.13	16611.23	0.00	0.00	10.08	0.35	3.00	0.254
7.00	12	0.23	0.24	0.56	0.14	11903.54	0.01	0.01	10.08	0.78	3.00	0.560
9.00	15	0.30	0.31	0.67	0.14	10245.08	0.01	0.01	10.08	0.47	3.00	0.340
12.00	12	0.39	0.41	0.69	0.15	8626.56	0.01	0.02	10.08	1.36	2.00	0.651
14.00	14	0.46	0.48	0.82	0.15	7833.59	0.01	0.01	10.08	0.54	4.00	0.516

**Cumulative settlements: 2.387****Abbreviations**T<sub>av</sub>: Average cyclic shear stress

p: Average stress

G<sub>max</sub>: Maximum shear modulus (tsf)

a, b: Shear strain formula variables

γ: Average shear strain

ε<sub>15</sub>: Volumetric strain after 15 cyclesN<sub>c</sub>: Number of cyclesε<sub>Nc</sub>: Volumetric strain for number of cycles N<sub>c</sub> (%)

Δh: Thickness of soil layer (in)

ΔS: Settlement of soil layer (in)

**:: Vertical & Lateral displacements estimation for saturated sands ::**

Depth (ft)	(N <sub>1</sub> ) <sub>60cs</sub>	γ <sub>lim</sub> (%)	F <sub>a</sub>	FS <sub>liq</sub>	γ <sub>max</sub> (%)	e <sub>v</sub> (%)	dz (ft)	S <sub>v-1D</sub> (in)	LDI (ft)
19.00	24	10.02	0.29	0.444	10.02	1.97	5.00	1.181	0.50
24.00	17	22.15	0.67	0.242	22.15	2.62	6.00	1.887	1.33
29.00	26	7.85	0.17	0.441	7.85	1.79	5.00	1.076	0.39
34.00	23	11.27	0.35	0.321	11.27	2.04	5.00	1.227	0.56
39.00	6	50.00	0.95	0.106	50.00	4.86	1.50	0.875	0.75
41.00	26	7.85	0.17	0.404	7.85	1.79	1.50	0.323	0.12
44.00	12	38.03	0.86	0.154	38.03	3.34	4.00	1.604	1.52

**:: Vertical & Lateral displacements estimation for saturated sands ::**

<b>Depth (ft)</b>	<b>(N<sub>1</sub>)<sub>60cs</sub></b>	<b>γ<sub>lim</sub> (%)</b>	<b>F<sub>a</sub></b>	<b>FS<sub>liq</sub></b>	<b>γ<sub>max</sub> (%)</b>	<b>e<sub>v</sub> (%)</b>	<b>dz (ft)</b>	<b>S<sub>v-1D</sub> (in)</b>	<b>LDI (ft)</b>
49.00	18	19.85	0.62	0.220	19.85	2.51	4.00	1.204	0.79

**Cumulative settlements:    9.376       5.97**

**Abbreviations**

γ <sub>lim</sub> :	Limiting shear strain (%)
F <sub>a</sub> /N:	Maximum shear strain factor
γ <sub>max</sub> :	Maximum shear strain (%)
e <sub>v</sub> ::	Post liquefaction volumetric strain (%)
S <sub>v-1D</sub> :	Estimated vertical settlement (in)
LDI:	Estimated lateral displacement (ft)

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October 12, 2019  
Project No. 050.001

CWA AIA  
320 Arden Avenue  
Glendale, California 91203

Attention: Mr. Steven Finney

Subject: Updated Summary of Interpreted Site Conditions, Proposed Moorpark Civic Center Project, Moorpark, California

Dear Mr. Finney:

Oakridge Geoscience, Inc. (OGI) is pleased to provide this updated summary of interpreted site conditions for the proposed Moorpark Civic Center project in Moorpark, California. The proposed project consists of design of a new Civic Center complex and associated facilities in Moorpark near the intersection of Moorpark Avenue and High Street.

At the request of the City of Moorpark and CWA AIA, OGI advanced five cone penetrometer tests (CPT's) at the Moorpark Civic Center site in September 2019 to evaluate the subsurface site conditions and provide site-specific data to evaluate seismic hazards and preliminary foundation design.

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

The purpose of this letter is to summarize the interpreted site conditions in the vicinity of the proposed Moorpark Civic Center project site based on the work performed by OGI and other geotechnical consultants.

In 2017 and 2018, OGI performed a preliminary geotechnical report for conceptual development of the library site and evaluated geohazards at several locations in the City of Moorpark. The purpose of those geotechnical studies was to evaluate if seismic related geohazards including liquefaction, dry seismic settlement and lateral spreading, and hydroconsolidation (collapse) potential are present at the sites and the need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking. The data from the studies by OGI as well as other nearby sites are summarized below to provide a setting for the Moorpark Civic Center project.

## **1.2 SUMMARY OF SITE CONDITIONS**

### **1.2.1 Basis of Interpretation**

Our interpretation of the geotechnical conditions at the Civic Center site is based on geotechnical data from the following projects in the site vicinity.

- Five cone penetration tests (CPT) were advanced on the Civic Center site by OGI in September 2019;
- Geohazard report for various City-owned properties in the downtown Moorpark area (OGI, 2018);
- Preliminary geotechnical study for the Moorpark Library project site (OGI, 2017);
- AHA site east of Walnut Canyon Road, about 500 feet east of the existing City Hall building (Geotechnologies, Inc., 2016);
- Moorpark Apartments site west of City Hall (Gorian and Associates, 2006 and 2013a); and
- Proposed library expansion/renovation and civic center for the proposed library site, the City Hall site to the north, and the vacant land west of the library site and south of the Moorpark Apartments site (Rybak Geotechnical, Inc. (2012).
- Preliminary Geotechnical Site Investigation, Casey Road Elementary School, Gorian and Associates (1999).

The approximate location of the proposed civic center site and previous geotechnical studies summarized above are shown on Plate 1. The following section summarizes site conditions reported by previous studies in the project vicinity.

### **1.2.2 Background**

As summarized in OGI (2019), previous studies performed near the Civic Center site identified the potential for seismically-induced settlement to occur in the alluvial soils and recommended mitigations to reduce settlement to meet code requirements. The amount of estimated total and differential settlements in the vicinity of the Moorpark Civic Center complex ranged from 12 to 36 inches and 6 to 18 inches, respectively. Also, estimated total and differential settlement ranged from 3 to 19 inches and 2 to 10 inches, respectively, at sites studied by OGI in the downtown Moorpark area. The variability in estimated settlement is likely related to several factors, including:

- Depths of exploration - Explorations by Rybak and Gorian were conducted to maximum depths of 50 feet, so potential settlement within alluvial sediments below those depths was not able to be considered in their evaluations. OGI's 2017 exploration of the project site extended to depths of about 75 feet; our evaluations indicate the potential for settlement to occur in the granular soils below the shallower (50-foot) depths evaluated by others in the project area. Geotechnologies advanced exploration to maximum depths of about 75 feet at the AHA site.
- Ground accelerations - Estimated peak ground accelerations (pga) in the project area (and Ventura County in general) have increased due to evolving geologic models – Rybak (2012) used a pga of 0.48g, Gorian (2013a) used a pga of 0.68g,

and OGI (2017) used a pga of 1.03. Higher ground accelerations typically result in increased settlement estimates.

- Depths of recommended ground improvement - Based on their respective evaluations: 1) Geotechnologies recommended ground improvement to depths of 30 feet at the AHA site, 2) OGI recommended ground improvement to a depth of about 50 feet at the proposed Library site, 3) Gorian recommended overexcavation and recompaction of soils to a depth of 13 to 22 feet at the Moorpark Apartments site to the west (however the estimated liquefaction related settlement below the mitigation depth ranges from 2 to 4 inches), and 4) Rybak recommended ground improvement for the Civic Center site, but did not provide a recommended depth.
- The depth of the alluvial sediments within Walnut Canyon thickens southward, downstream, toward the Arroyo; similarly, the thickness of potentially seismically induced settlement-prone granular sediments also appears to increase southward.
- Lateral spreading - The Walnut Canyon drainage slopes southward at about 3 percent. The ground surface in the vicinity of Downtown Moorpark near High Street slopes westward at about 0.7 percent. Historically, lateral spreading has occurred on slopes as flat as 0.1 percent, although data for sites less than 1 percent are limited. There is not a free-face condition in the vicinity of the Moorpark Civic Center. Estimated lateral movement associated with the design earthquake for the Moorpark Library area by OGI near High Street ranges from 72 to 300+ inches. Estimated lateral spreading for the proposed High Street Station project (southeastern corner of High Street and Moorpark Avenue) is 15 to 55 inches (OGI, 2019). Other consultants indicated the potential for lateral spreading was low following ground improvement but did not provide analyses for lateral spreading.

## **2.0 FINDINGS**

### **2.1 2019 Civic Center Explorations**

At the request of the City of Moorpark and CWA AIA, OGI advanced five CPT's (CPT-101 through CPT-105) at the Moorpark Civic Center site in September 2019 to evaluate the subsurface site conditions and provide data to evaluate seismic hazards and preliminary foundation design. The CPT's were advanced to depths of about 75 feet near the locations shown on Plate 2. Additionally, seismic shear wave velocities were measured in CPT-103 to aide in our evaluation of the site conditions. The CPT data are provided in Appendix A.

### **2.2 Subsurface Characterization**

The interpreted subsurface conditions at the project site are summarized on Cross Sections A-A' on Plate 3. As depicted on Plate 3, the earth materials at the site are interpreted to consist of interbedded silty to clayey sand and sand with lesser amounts of fine-grained silt and sandy clay of alluvial origin to the depths explored (75 feet). The CPT profiles for CPT-101, CPT-102, and CPT-103 suggest the lithology in the northern portion of site is more granular while the CPT profiles for CPT-104 and CPT-105 in the southern portion of the site appear to have a higher percentage of finer-grained silty to clayey sand and clay layers. The CPT tip resistance in sands range from a low of about 50 tons per square foot (tsf) to a high of about 300 tsf. In general, granular soil materials require a normalized tip resistance of greater than about 200 tsf to resist liquefaction.

The shear wave velocities measured in CPT-103 range from a low of 835 feet per second (ft/sec) to a high of about 1,200 ft/sec, with an average shear wave velocity 1,005 ft/sec for the 75-foot-deep CPT. The average shear wave velocity of 1,005 ft/sec at the Civic Center site is consistent with a Type D soil profile per CBC (2016). For comparison, the measured shear wave velocities near the intersection of Moorpark Avenue and High Street near the proposed Library site ranged from about 610 to 1,524 ft/sec with an average value of 840 ft/sec (OGI, 2018).

Groundwater was measured at a depth of about 55 feet below the ground surface in several of the CPTs advanced for this study after the rods were removed from the hole and prior to backfilling. For reference, groundwater was encountered at a depth of about 37 feet in OGI's 2017 explorations at the Library site and Gorian (2001) reported groundwater at depth of 27 to 38 feet for the Moorpark Apartments site directly west of the Civic Center site. Historic high groundwater levels in the relatively level areas of Moorpark from High Street southward are about 15 feet below the ground surface (CGS, 2002). The Civic Center site is about 15 feet above the relatively level alluvial plain located between High Street and Los Angeles Avenue/Arroyo Simi. Based on our evaluation of the site conditions and other previous studies which utilized modified groundwater levels in their analyses, we believe a design groundwater depth of 30 feet is applicable to the Civic Center site.

Topographic mapping by the US Geologic Survey for the Moorpark Quadrangle indicates the ground surface in the Walnut Canyon/Moorpark Civic Center area slopes westward at about 3 percent. The ground slope is a component of the seismic hazard/lateral spreading evaluation for the site.

### **2.3 Seismic Hazard Evaluation**

Evaluation of the potential for seismic related hazards associated with liquefaction and dry seismic settlement are two key factors associated with the seismic design of structure foundations. Liquefaction is the sudden loss of shear strength in saturated, granular soils due to seismic ground shaking during an earthquake. Dry seismic settlement occurs in unsaturated granular soil above the groundwater in response to strong earth ground shaking. The estimated settlement related to liquefaction and dry seismic settlement is commonly referred to as seismic settlement. Lateral spreading is downslope movement of earth materials associated with reduced shear strength during liquefaction. American Society of Civil Engineers (ASCE) Standard 7-1, Chapter 12, Section 13 (Tables 12.13-2 and -3) provides guidance on acceptable settlement due to seismic events.

**2.3.1 Differential Settlement Thresholds**

Table 12.13-3 provides differential settlement thresholds for various types of structures and Structure Risk Categories (I, II, III, IV). The differential settlement thresholds are summarized in the following table.

**Table 1. Differential Settlement Thresholds  
(from ASCE Table 12.13-3)**

Structure Type	Risk Category		
	I or II	III	IV
Single-story structures with concrete or masonry wall systems	0.0075L	0.005L	0.002L
Other single-story structures	0.015L	0.010L	0.002L
Multistory structures with concrete or masonry wall systems	0.005L	0.003L	0.002L
Other multistory structures	0.010L	0.006L	0.002L

L = Differential settlement over a defined distance, for example wall or footing spacing.

**2.3.2 Upper Limit for Lateral Spreading Horizontal Ground Displacements**

Table 12.13-2 indicates the following upper limit on lateral spreading from horizontal ground displacements for shallow foundations. Displacements exceeding the upper limits require deep foundations.

**Table 2. Upper Limit for Lateral Spreading Horizontal Ground Displacements  
(from ASCE Table 12.13-2)**

Risk Category	I or II	III	IV
Limit Inches (millimeters)	18 (455)	12 (305)	4 (100)

We note that deep foundations also could include ground improvement to improve the existing onsite soils to reduce the estimated lateral seismic movement to less than the code values.

**2.4 Evaluation of Seismic Settlement and Lateral Spreading**

We utilized the engineering program GeoLogMiki to evaluate the CPT data and estimate the amount of seismic settlement and lateral spreading associated with the design earthquake event for the project site. The design earthquake has a magnitude of 7.0 and a peak ground acceleration of 1.03g per the 2016 CBC. The GeoLogMiki program utilizes the CPT data (tip resistance and sleeve friction) to evaluate the soil type, consistency/density, and potential to liquefy and settle during an earthquake. The estimated settlement is summarized by CPT location and category in Table 3. Based on an assumed groundwater depth of 30 feet, the dry seismic

settlement is estimated for the upper 30 feet of the CPT location and liquefaction related settlement is estimated below a depth of 30 feet to a maximum depth of 60 feet. Lateral spreading is estimated considering the liquefaction potential and slope angle (approximately 3 percent). The following table summarizes the estimated values based on evaluation of the CPT data.

**Table 3. Summary of Estimated Seismically Induced Settlement**

<b>CPT Number</b>	<b>Estimated Dry Seismic Settlement (inches)</b>	<b>Estimated Liquefaction Settlement (inches)</b>	<b>Total Seismic Settlement (inches)</b>	<b>Estimated Lateral Displacement (inches)</b>
CPT-101	4	6	10	50
CPT-102	7	7	14	30
CPT-103	5	7	12	30
CPT-104	10	4	14	12
CPT-105	8	2	10	3
Shear Wave Velocity (CPT-103)	1/2	1 1/2	2	45
Range of Values	1/2 to 10	1-1/2 to 7	2 to 14	3 to 50
<b>Average value</b>	<b>6</b>	<b>4 1/2</b>	<b>10</b>	<b>28</b>

The total seismic settlement estimated from CPT-101 to CPT-105 ranges from about 10 to 14 inches. CPT-101 to CPT-103 generally have a more granular profile and similar amounts of dry seismic settlement (above groundwater) and liquefaction settlement (below groundwater). CPT-104 and CPT-105 have higher amounts of estimated dry seismic settlement (8 to 10 inches in upper 30 feet of profile) versus liquefaction related settlement (2 to 4 inches) in the lower portion of the profile (30 to 60 feet). Review of the interpreted CPT profiles for CPT-104 and CPT-105 (Appendix A) indicates those CPTs tend to have a higher percentage of interbedded clay layers in the lower portion of the profile below 40 feet that reduces the amount of granular soil that can liquefy.

To utilize shallow foundations per the 2016 CBC, the estimated seismic settlement will need to be reduced to about 4 inches or less and the lateral spreading potential will need to be reduced to 18 inches or less. Based on our evaluation of the September 2019 CPT data, the controlling CPT profiles are CPT-101 through CPT-103 located in the northern portions of the site. Based on our evaluations of the data from those CPT's, the in-place densities of the granular soil layers on-site will need to be improved to a depth of about 40 feet to reduce the estimated vertical settlement and lateral spreading potential to allow for shallow foundations per the CBC. Several potential mitigation options are discussed in the following sections. The preliminary analyses indicate the lateral spreading potential will require improvement to a depth of about 50 feet to reduce the lateral spreading potential to below values allowed in the CBC.

### **3.0 CONCLUSIONS**

#### **3.1 Proposed Structures**

Based on discussions with the project team, the proposed Civic Center structures will consist of one- to two-story structures with CMU shear wall buildings with a risk category (RC) of II.

#### **3.2 Settlement Criteria**

Chapter 12, Section 13, Foundation Design, of ASCE 7-16 provides guidance on foundation design, including the amount of allowable lateral spreading for shallow foundations (ASCE Table 12.13-2; Table 2 above) and differential settlement threshold for single and multi-story masonry wall and wood frame structures based on structure RC (ASCE Table 12.13-3; Table 1 above). The project's structural engineer, Mr. Greg Orozco with John A. Martin & Associates, has indicated the preliminary structure RC for the proposed sites is II. Per Table 12.13-3, multi-story structures founded on shallow foundations with a RC of II are allowed to have a differential settlement threshold of  $0.005L$  where  $L$  is the distance between footings. For this preliminary evaluation we assumed a footing distance of 30 feet (360 inches) which produces a maximum differential settlement of 1.8 inches. Differential settlement is typically estimated as one-half of total settlement, so the estimated total seismic settlement would be about 3-1/2 to 4 inches. Per ASCE Table 12.13-2, the upper limit of lateral spreading horizontal ground displacement for shallow foundations for a RC of I or II is 18 inches.

#### **3.3 Preliminary Settlement Evaluation and Potential Mitigations**

Based on the recent CPT data collected for the Civic Center Site, the estimated total seismic settlement (liquefaction plus dry seismic settlement) ranges from about 10 to 14 inches (Table 3). The proposed structures can incorporate a differential settlement of approximately 2 inches (total estimated settlement of 4 inches). On that basis, the total estimated vertical seismic settlement will need to be reduced by about 6 to 10 inches to utilize shallow footings. That level of improvement likely will require mitigation using some type of ground improvement. Ground improvement to a depth of 50 feet likely will be required to reduce the lateral spreading potential to within the CBC limits of 18 inches for Type II structure. Deep pile foundations could potentially be used but the pile foundations would need to be designed to resist loading associated with lateral spreading which could add significant costs to the pile foundation system.

The mitigation plan would need to treat the soil to a depth of about 40 to 50 feet to reduce the vertical settlement to 4 inches or less and estimated lateral displacement to 18 inches or less in the northern portion of the site (CPT locations CPT-101 through CPT-103). Based on our interpretation of the inferred finer-grained lithology indicated on the CPT profiles for CPT-104 and CPT-105, a shallower treatment zone to a depth of about 30 to 40 feet may be possible in the southern portion of the site. It may be possible to combine two ground improvement methods to provide a cost-effective mitigation plan as summarized below.

### **3.3.1 Overexcavation and Recomposition**

Gorian recommended overexcavation and recompaction of the upper 15 to 22 feet of soil for the adjacent Moorpark Apartments site to the west of the Civic Center site (Gorian, 2013). Overexcavation and recompaction will reduce dry seismic settlement potential of the near surface soils but will not improve the liquefaction settlement and lateral spreading potential of the soils below the treatment depth of about 15 to 20 feet. The estimated liquefaction related settlement below the mitigation zone for the Moorpark Apartments site ranges from about 2 to 4 inches; however, the estimated seismic settlement below 15 to 20 feet at the Civic Center site is about 7 to 8 inches. The overexcavation and recompaction treatment mitigation does not address the potential for vertical liquefaction settlement and lateral spreading potential below the overexcavation and recompaction treatment zone. Our cursory evaluation of the data from Gorian (2013) suggests a potential for about 25 inches of lateral spreading associated with the liquefiable soils at depths of greater than 20 feet. We note the Moorpark Apartments site is currently undeveloped open ground that can be graded without disruption of existing improvements and infrastructure. However, a similar overexcavation for the Civic Center site would need to consider existing improvements, infrastructure, and temporary storage of material while grading is ongoing. The largest open area available appears be the adjacent Moorpark Apartments site directly west of the Civic Center.

### **3.3.2 Rammed Aggregate Piers (RAP) or Rapid Impact Compaction (RIC) – Shallow Ground Improvement**

RAP was utilized to improve the site conditions at the AHA site (east of the Civic Center site) to a depth of about 30 feet. The improved soil materials in the upper 30 feet reduced the seismic related settlement to an acceptable level that allowed shallow foundations on a mat type foundation. RAP could potentially be a mitigation option for the Civic Center structures if the shallow ground improvement procedure can reduce the vertical settlement and lateral spreading to acceptable levels (less than 4 inches total settlement and 18 inches of lateral movement per ASCE 7-16) for the Civic Center structures. As depicted on the settlement analyses plots (Appendix A), the estimated liquefaction related settlement extends to depths of 40 to about 55 feet below the ground surface.

RIC involves placing a vibratory compactor at the surface and inducing vibration into the granular soils to densify the soils to depths of about 15 to 20 feet. RIC is most effective in clean granular soils. Soils with soft clay beds and high fines contents reduce the effective treatment depth of RIC. The CPT data indicate the site has zones of both clay soils and silty to clayey sands with fines contents above 25 percent which would potentially reduce the effectiveness of RIC at the Civic Center site.

For RAP or RIC ground improvement to be an effective mitigation for both vertical liquefaction settlement as well as lateral spreading potential, it likely would need to be combined with an overexcavation component of 15 to 20 feet to reach an effective treatment depth that would reduce overall vertical settlements and lateral movements to within code values. A mat type slab would be a prudent mitigation measure to help reduce potential future differential settlements.



### **3.3.3 Deep Ground Improvement (Vibro Replacement or Deep Soil Mixing)**

Vibro Replacement (VR) or Deep Soil Mixing (DSM) can be effective mitigations to treat soils to depths of about 50 feet or more. We note VR is not as effective in soils with high fines content of about 25 percent or more such as clayey sand and clay soil layers at the Civic Center and Library sites. DSM could be used to improve both granular and fine-grained silt and clay soils to reduce settlement and control lateral spreading. The deeper ground improvement methods will likely have an increased cost versus the shallow ground improvement methods. Based on our preliminary analyses, the ground improvement likely would need to extend to a depth of at least 50 feet below the ground surface to reduce the lateral spreading potential to less than 18 inches.

## **4.0 RECOMMENDATIONS**

### **4.1 Approach**

As described above, subsurface exploration at the Civic Center site indicates the potential for seismic settlement and lateral spreading potential to impact the foundation design. The estimated amount of seismic settlement ranges from about 10 to 14 inches and includes zones from near the ground surface to a depth of about 55 to 60 feet. Several potential mitigation options are available to reduce the estimated seismic settlement for the site to allow for the proposed improvements to be founded on shallow foundations. If a temporary soil storage area can be obtained, a potential cost-effective treatment option could be an overexcavation of about 10+ feet, with ground improvement to a depth of 40 feet (50 feet below original grade) followed by replacement of the upper 10 feet of compacted fill. We suggest that a mat slab be incorporated into the structure design to help reduce the potential for damage associated with the estimated 4 inches of future vertical settlement.

### **4.2 Estimated Ground Improvement Cost**

At the request of CWA AIA, we have provided a summary of potential methods, attributes, and initial preliminary fee estimates for overexcavation and recompaction, vibro-replacement, and DSM.

**Table 4. Summary of Potential Ground Improvement Methods**

<b>Ground Improvement Method</b>	<b>Pros</b>	<b>Cons</b>	<b>General Cost Range</b>
Overexcavation and Recompaction	<ul style="list-style-type: none"> <li>Proven procedure with relatively low cost.</li> <li>Can potentially be used to reduce the depth of more expensive ground improvement methods such as VR or DSM</li> </ul>	<ul style="list-style-type: none"> <li>Limited depth of treatment</li> <li>Need space to store spoil generated during excavation process and prior to backfill.</li> <li>Potentially disruptive to ongoing operations and utilities.</li> <li>Improves dry seismic settlement but does not address liquefaction or lateral spreading.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$15,000 to 20,000 (depending on equipment).</li> <li>About \$10 per cubic yard for shallow excavations and temporary stock pile.</li> </ul>
Vibro Replacement (VR) / Stone Columns	<ul style="list-style-type: none"> <li>Established procedure, excepted by agencies</li> <li>Densifies granular soil between individual columns</li> <li>Provides conduit to dissipate buildup of water pressure during a seismic event</li> <li>multiple contractors perform procedure – multiple bids</li> <li>No spoil generated during installation</li> </ul>	<ul style="list-style-type: none"> <li>Treatment depth typically to 50 feet.</li> <li>Vibration could impact adjacent structures. Vibration monitoring recommended.</li> <li>Limited density improvement to fine-grained silt and clay soils.</li> <li>Treatment area usually extends out beyond building foundations by about 10 feet.</li> <li>Ground disturbance at surface requires upper several feet of site to be recompact.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$60,000</li> <li>\$30/ft of column</li> <li>Column center to center spacing typically 6 to 9 feet, assume 7 feet due to high fines content and interlayered clay soils.</li> </ul>
Deep Soil Mixing (DSM)	<ul style="list-style-type: none"> <li>Established procedure excepted by agencies</li> <li>DSM columns can be extended to depths of 75 feet if required.</li> <li>Treatment area can be limited to building foundation footprint depending on site conditions</li> </ul>	<ul style="list-style-type: none"> <li>More expensive mobilization and per foot of column cost than vibro replacement.</li> <li>Does not densify soil between columns.</li> <li>Soil between columns can settle requiring a grade-beam type foundation to span across columns.</li> <li>Up to about 20 percent spoil generated during installation requiring disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$100,000 to \$150,000</li> <li>\$50/ft of column</li> <li>Replacement ratio 10%</li> </ul>

The following preliminary ground improvement cost estimates are provided as requested by CWA AIA and the City of Moorpark. To prepare the estimates we assumed a new Civic Center building with a footprint of approximately 9,000 square feet and new Library with a footprint of approximately 18,000 square feet for a total building area of 27,000 square feet. The estimates summarized below are provided for initial planning purposes only. We recommend the project civil and structural engineers contact ground improvement contractors to obtain project and site-specific cost estimates based on the selected ground improvement method(s) developed by the ground improvement contractor. The preliminary estimates provided below do not include contingencies, design or construction management fees which we have assumed are included in the overall cost estimate. We note the estimated costs can vary depending on many factors and that these preliminary estimates need to be revised based on actual design parameters and include contractor input on selected method and cost.

**Table 5. Summary of Preliminary Cost Estimates for Planning Purposes**

Procedure	Assumptions	Estimated Ground Improvement Cost		
		Civic Center (9,000 sq. ft.)	Library (18,000 sq. ft.)	Estimated Total with Mobilization (27,000 sq. ft.)
Overexcavation and Recompaction	Depth of about 10 feet, volume = 13,200 cubic yards .	\$32,000	\$70,000	\$112,000
Vibro Replacement	Depth of 50 feet, 3-foot diameter columns, spacing of about 7 feet, treatment to about 10 feet beyond foundation footprint, approximately 800 columns, 40,000 feet of column, gravel load transfer platform.	\$460,000	\$810,000	\$1,330,000
Deep Soil Mixing	Depth of 50 feet, 4-foot diameter columns, replacement ratio of 12 percent, spacing 10 feet, approximately 320 columns, 16,000 feet of column, mat slab foundation.	\$275,000	\$525,000	\$950,000
Grade Beam System	Assume about 6,000 feet of grade beam for both structures, with 600 cubic yards of concrete in addition to standard 6-inch concrete floor slab.	\$80,000	\$120,000	\$200,000

CWA AIA  
Project No. 050.001

**OAKRIDGE GEOSCIENCE, INC.**

### 4.3 Ground Improvement Test Strip

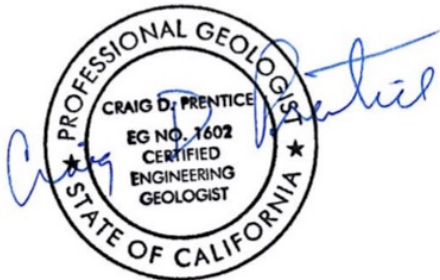
After the project team evaluates the available ground improvement options and selects a preferred option, we suggest a test strip be performed. The purpose of the test strip is to: 1) demonstrate the effectiveness of the method in a small area prior to mobilizing equipment for full scale production, and 2) provide prospective ground improvement contractors with data that can be used during the project bidding phase to help refine the estimated ground improvement cost since the method has been successfully demonstrated on-site in a field test.

### CLOSURE

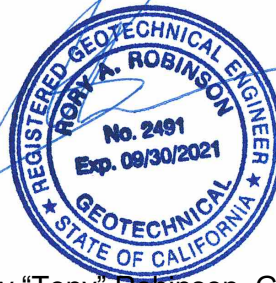
Thank you for the opportunity to provide geotechnical services to CWA AIA for this project. Please contact us if you have any questions on the information presented herein and the proposed next steps for the geotechnical services for the Civic Center project.

Sincerely,

OAKRIDGE GEOSCIENCE, INC.



Craig D. Prentice, CEG  
Principal Engineering Geologist



Rory "Tony" Robinson, GE  
Principal Geotechnical Engineer

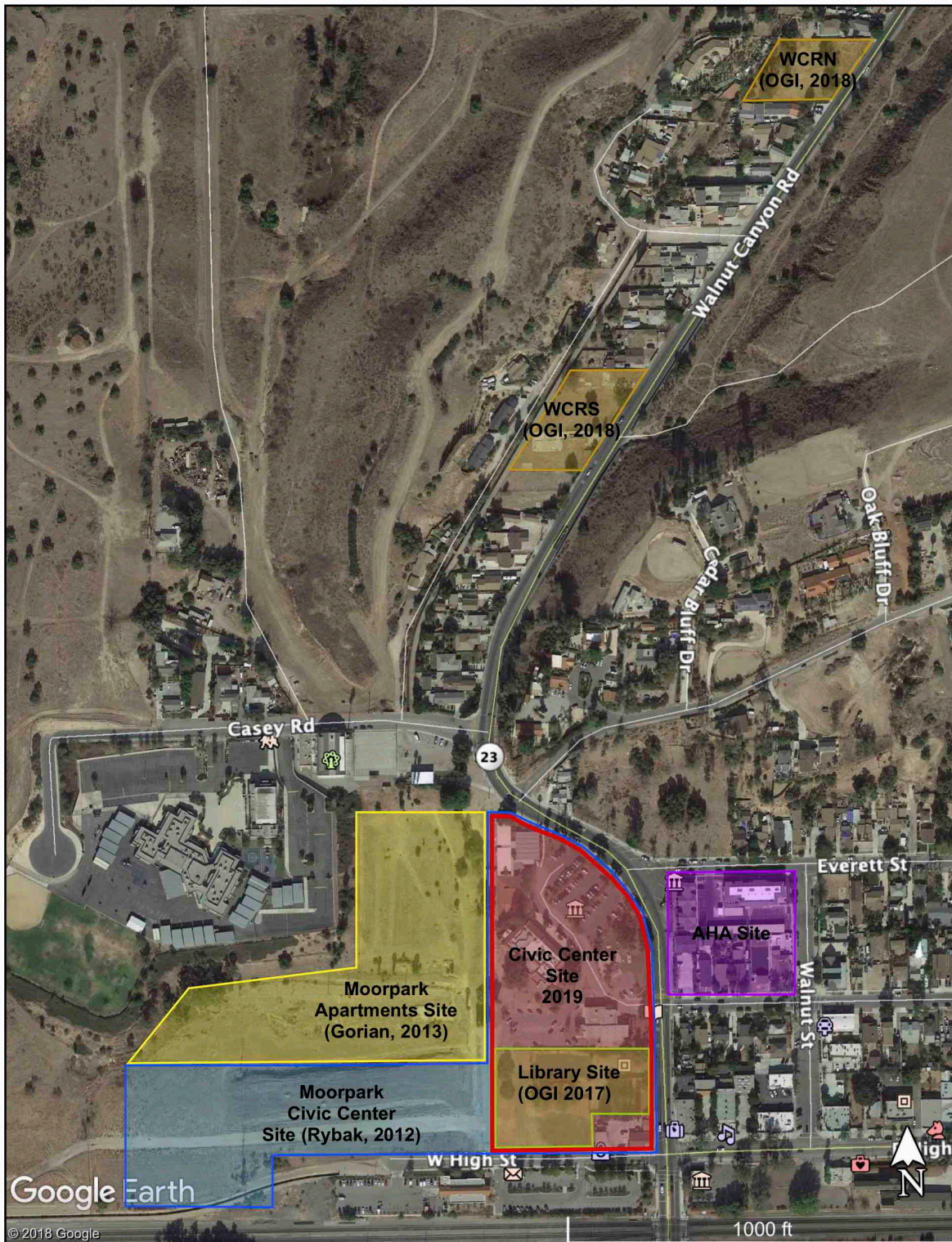
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## REFERENCES

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- California Building Code (2016), 2016 California Building Code, published by the International Conference of Building Officials, Whittier, California.
- California Geological Survey (2008), Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A,
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- Geotechnologies, Inc. (2016), Geotechnical Engineering Investigation, Proposed Residential Development, Southwest Corner of Everett Street and Walnut Canyon Road, Moorpark, California, File Number 21312, dated August 29.
- Gorian and Associates, Inc. (2006), Geotechnical Investigation, Moorpark Apartments, Southwest Corner of Casey Road and Walnut Canyon Road, City of Moorpark, California, dated August 29.
- \_\_\_\_\_ (2013a), Updated Geotechnical Report and Grading Plan Review, Moorpark Apartments, Southwest Corner of Casey Road and Walnut Canyon Road, City of Moorpark, California, dated October 3.
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- USGS (2017), <https://earthquake.usgs.gov/designmaps/us/application.php>

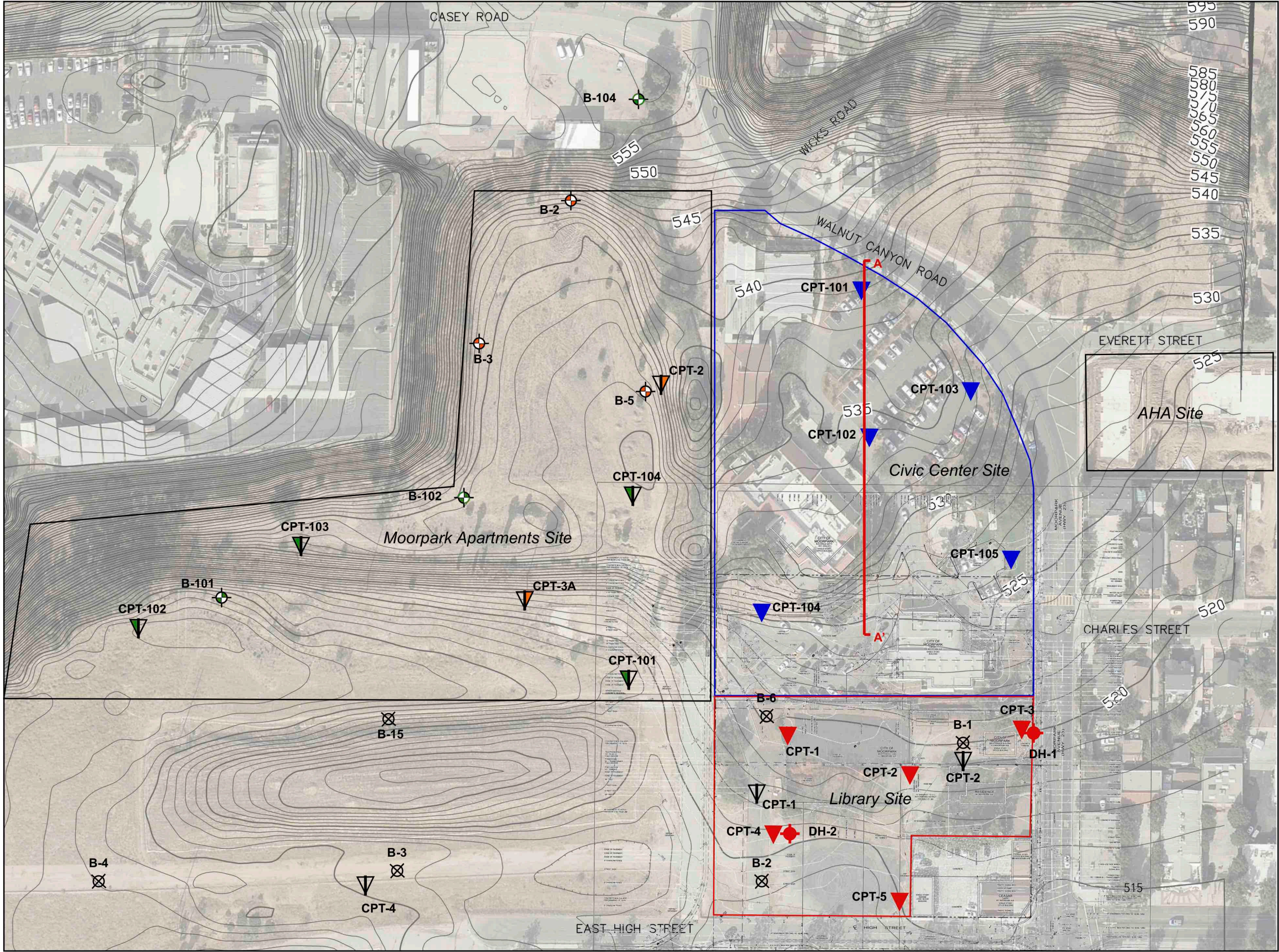
## **PLATES**



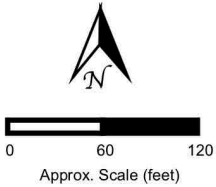


**LOCATION MAP**  
**Proposed Moorpark Civic Center Project**  
**Moorpark, California**



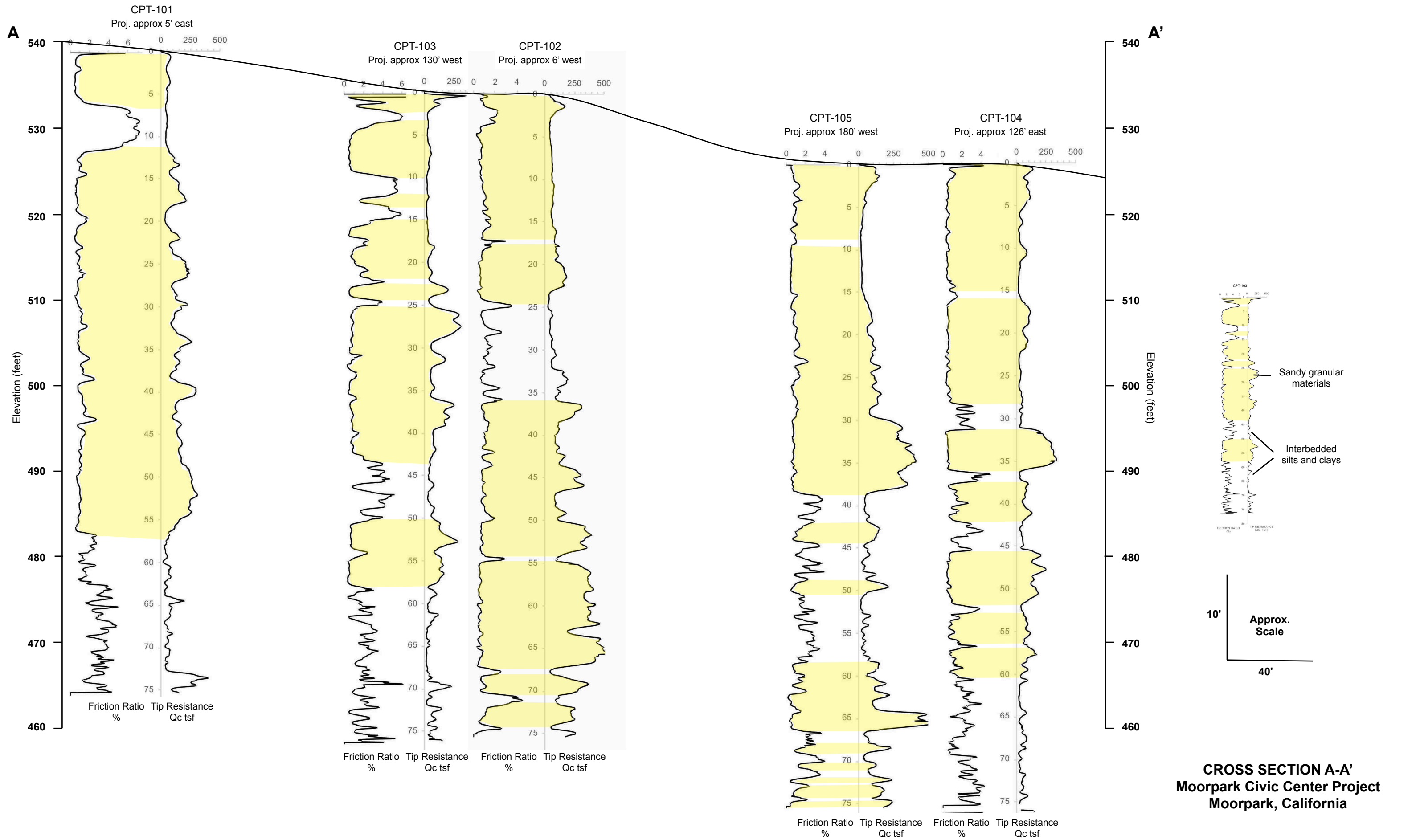


- CPT-101 Approximate location of CPT this study
- CPT-1 Approximate location of CPT OGI (2017)
- DH-1 Approximate location of Drill Hole OGI (2017)
- CPT-102 Approximate location of CPT Gorian and Assoc. (2006)
- B-102 Approximate location of boring Gorian and Assoc. (2006)
- CPT-3 Approximate location of CPT Gorian and Assoc. (2001)
- B-3 Approximate location of boring Gorian and Assoc. (2001)
- B-4 Approximate location of boring Rybak Geotechnical (2012)
- CPT-4 Approximate location of CPT Rybak Geotechnical (2012)
- Approximate location of Cross Section



EXPLORATION LOCATIONS  
Moorpark Civic Center Project  
Moorpark, California





## **APPENDIX A**

## LIQUEFACTION ANALYSIS REPORT

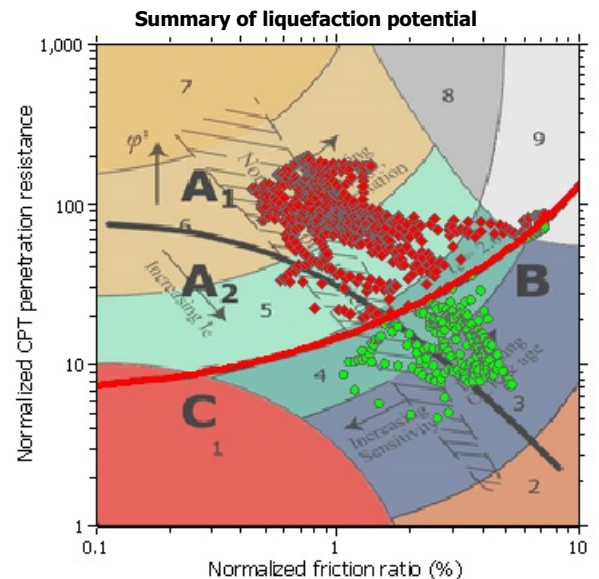
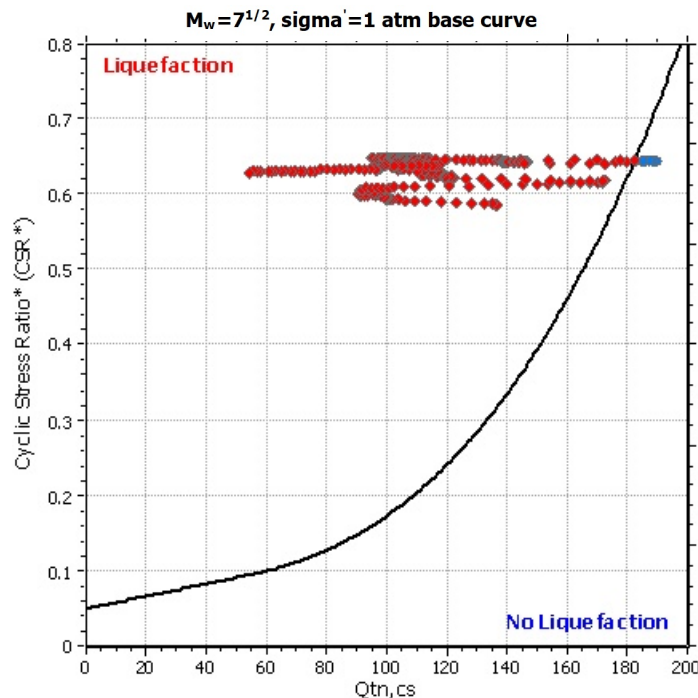
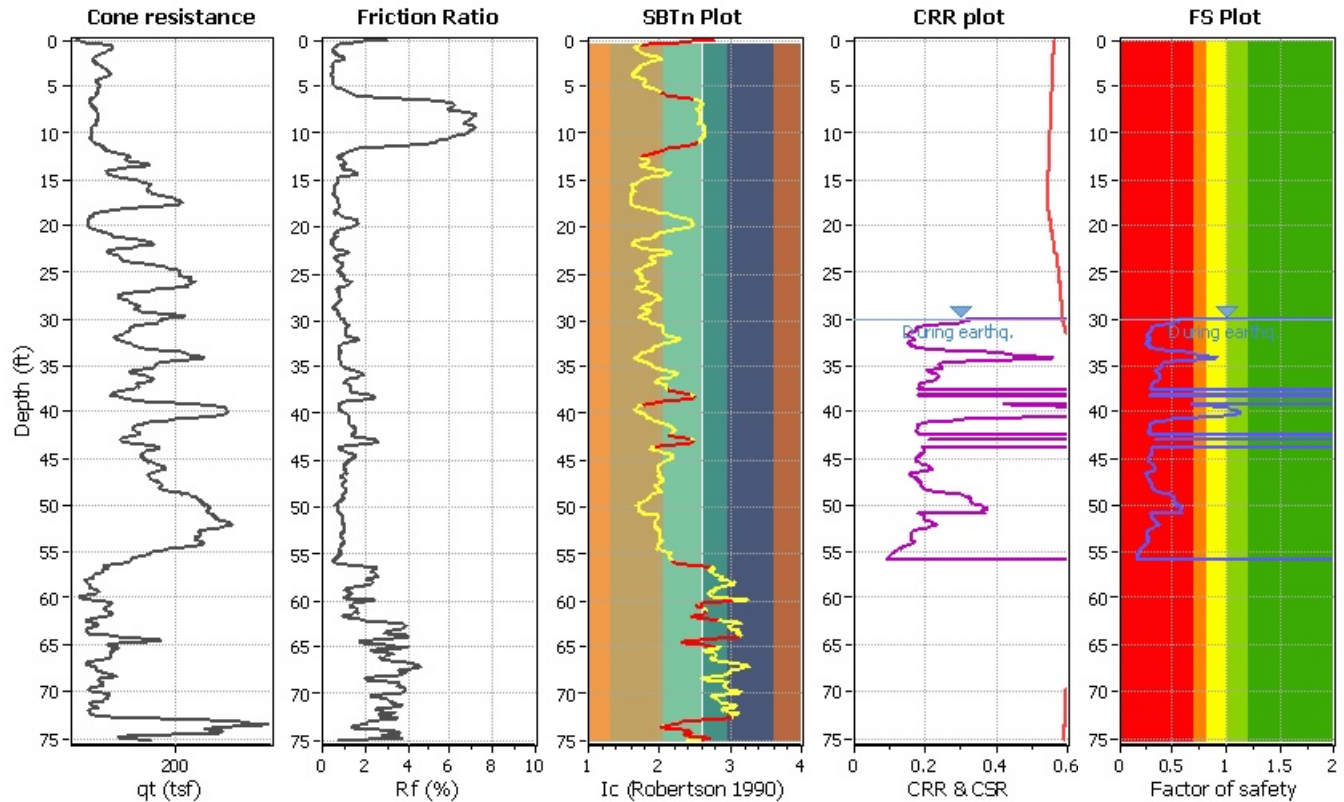
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

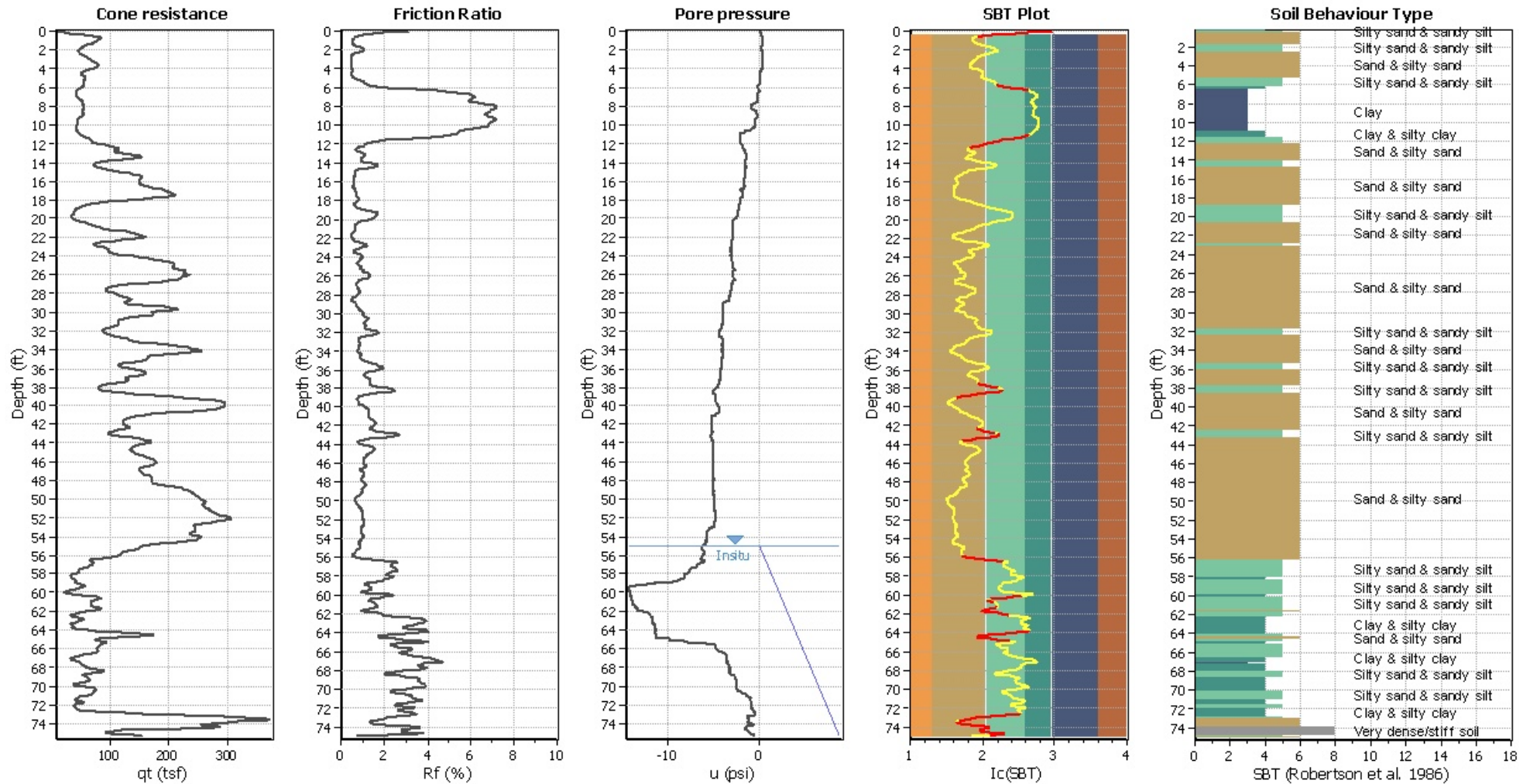
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Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



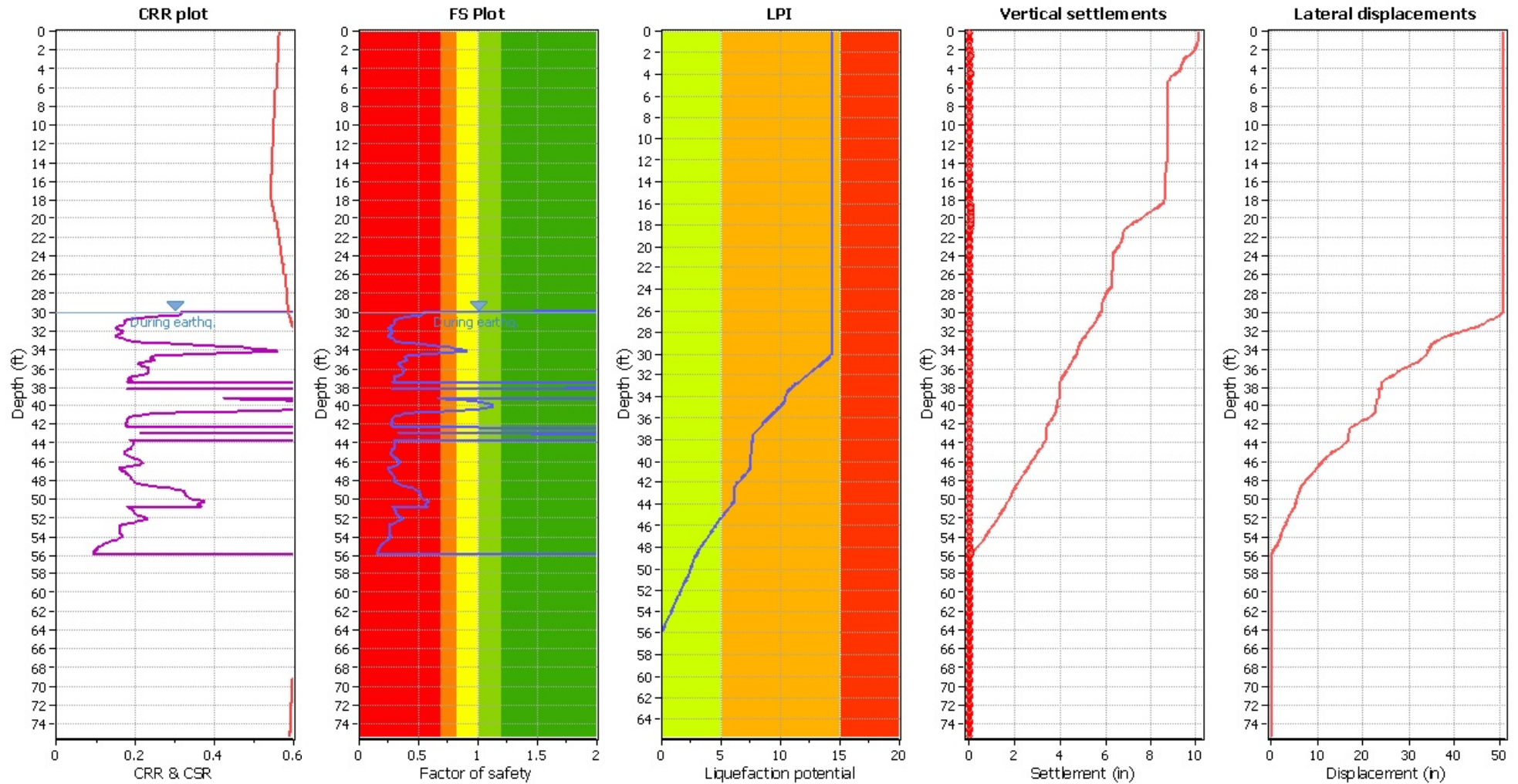
Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
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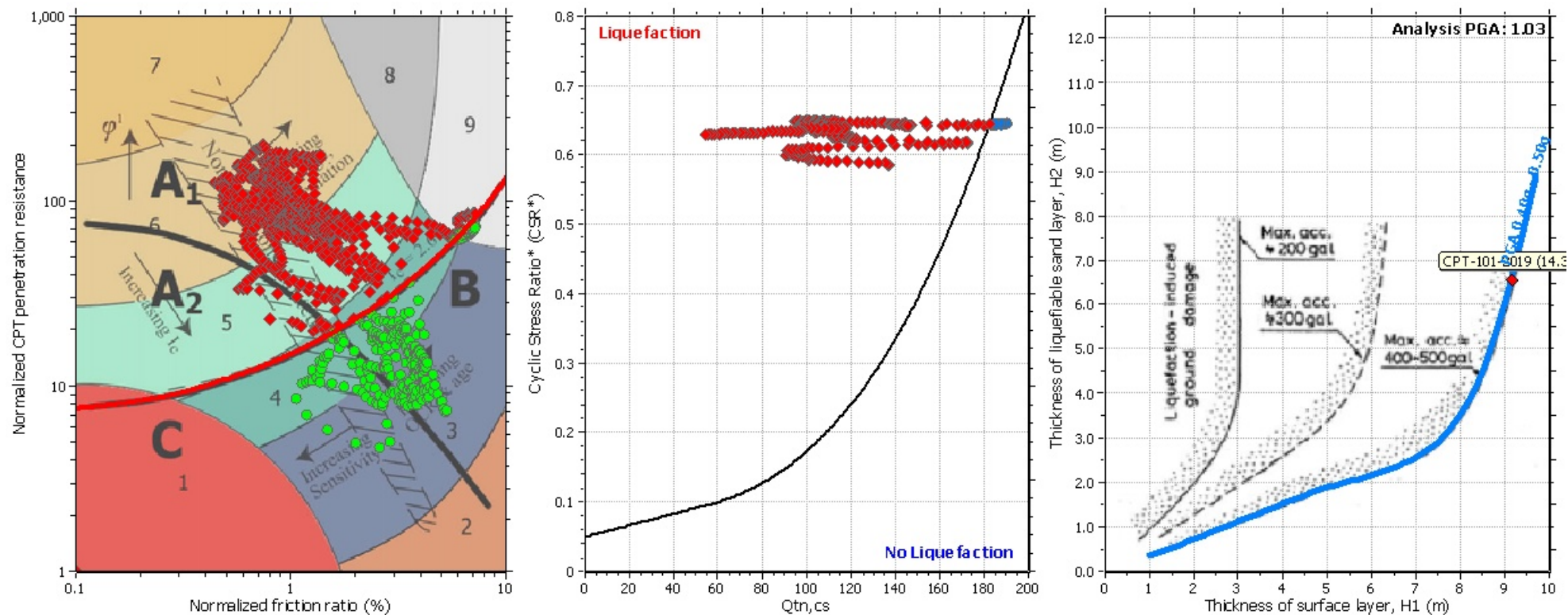
## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
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Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



**LIQUEFACTION ANALYSIS REPORT**

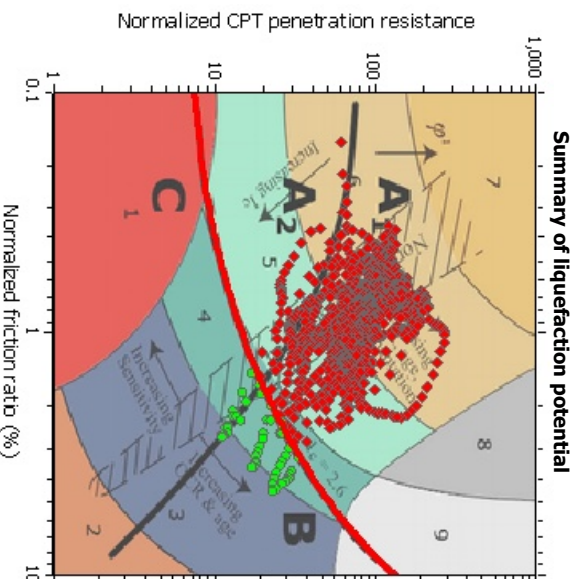
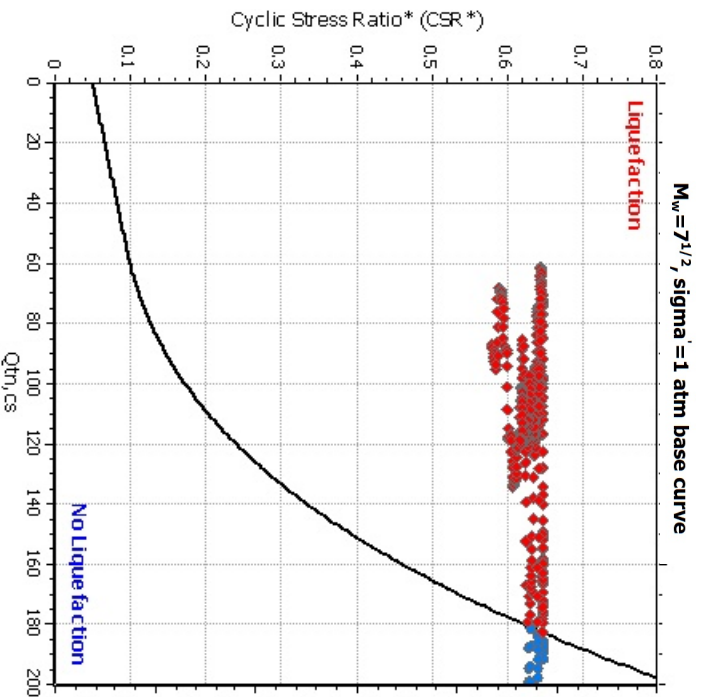
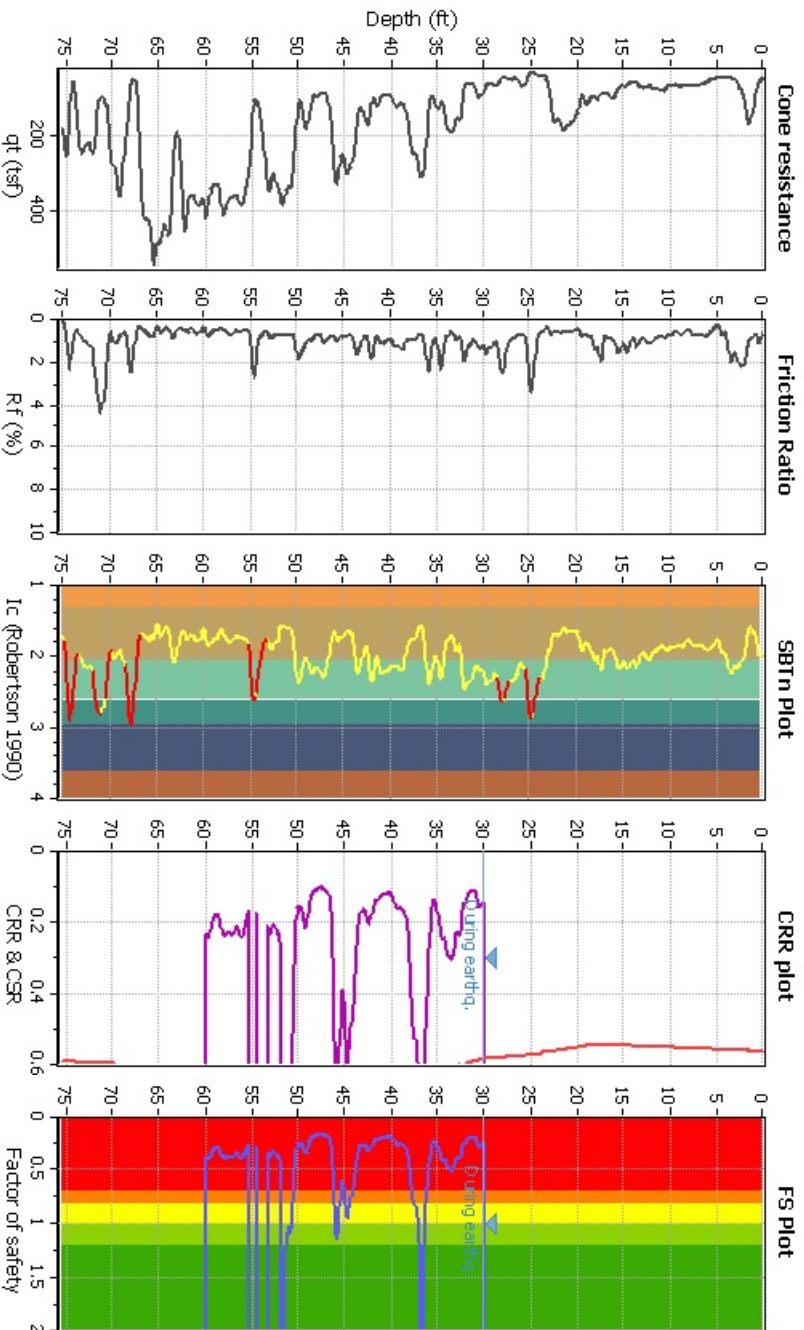
**Project title :** Moorpark Civic Center

**Location :** 799 Moorpark Avenue, Moorpark, California

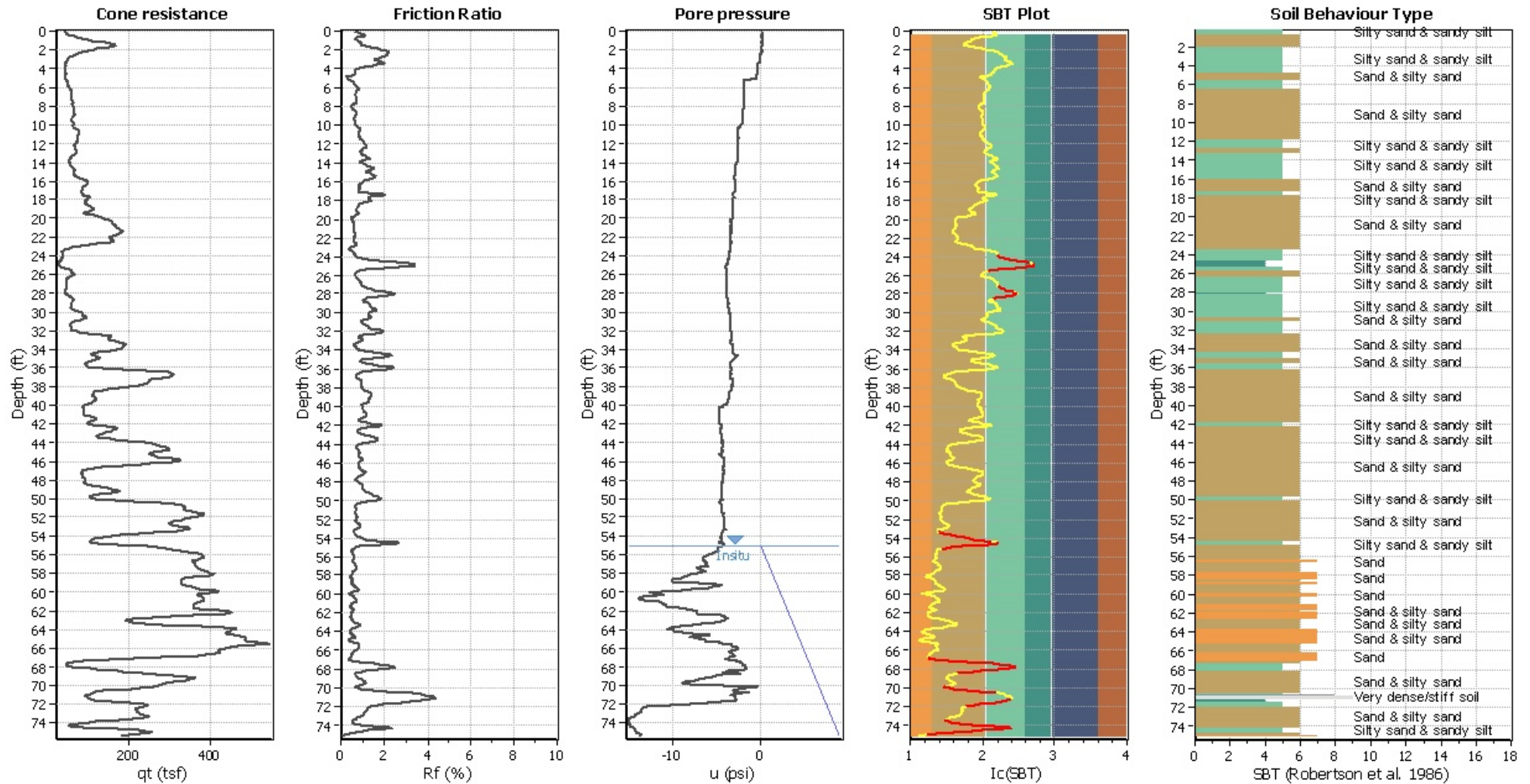
**CPT file :** CPT-102-2019

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Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes		



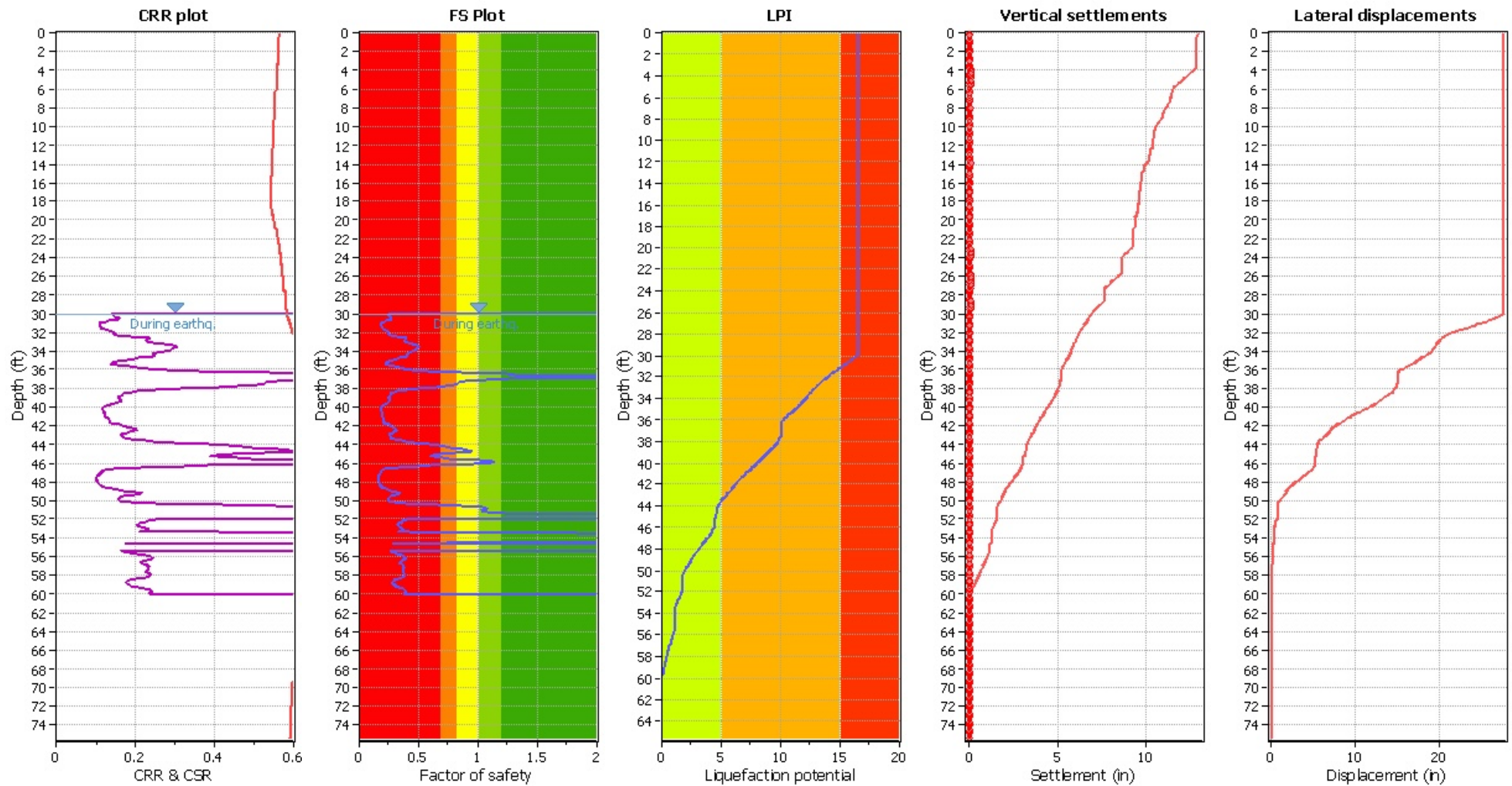
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Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

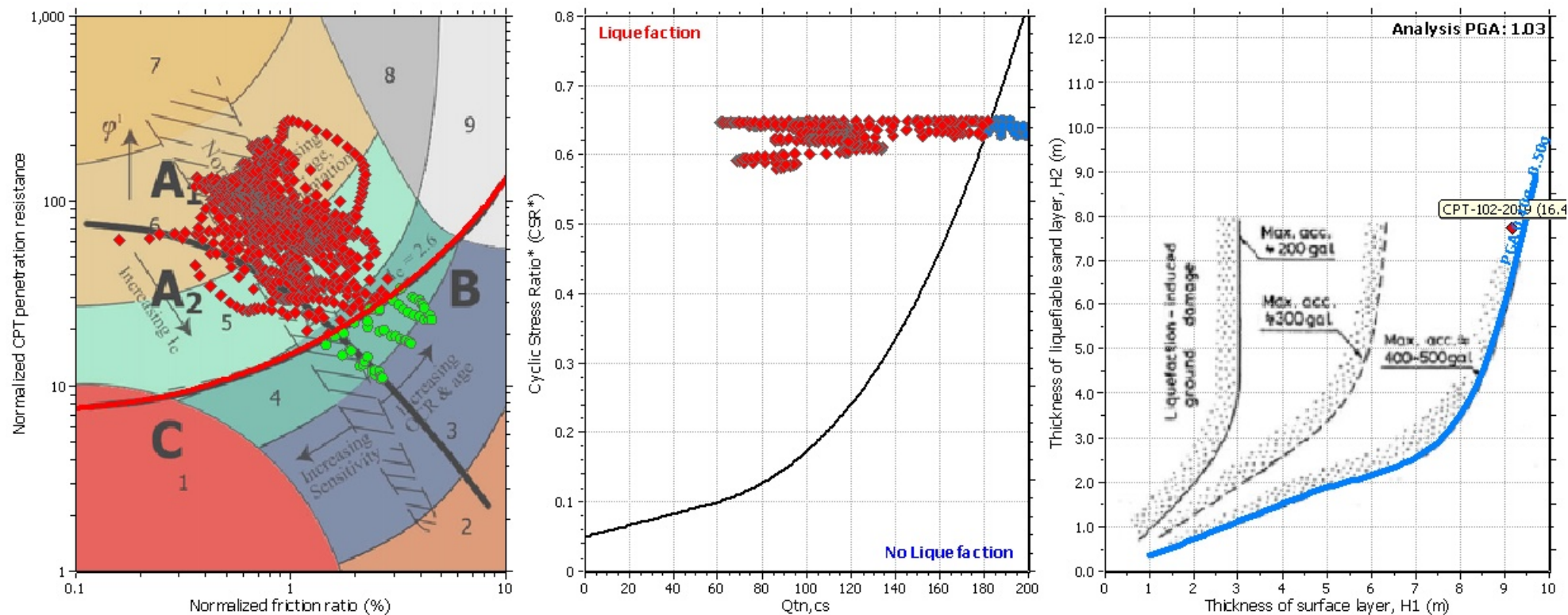
## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## LIQUEFACTION ANALYSIS REPORT

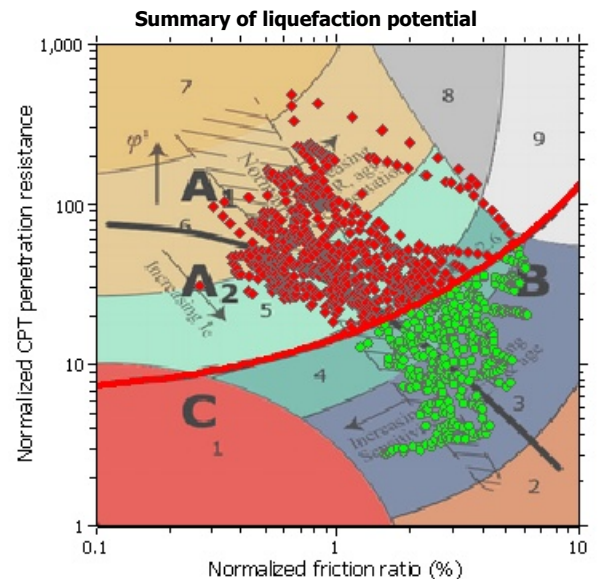
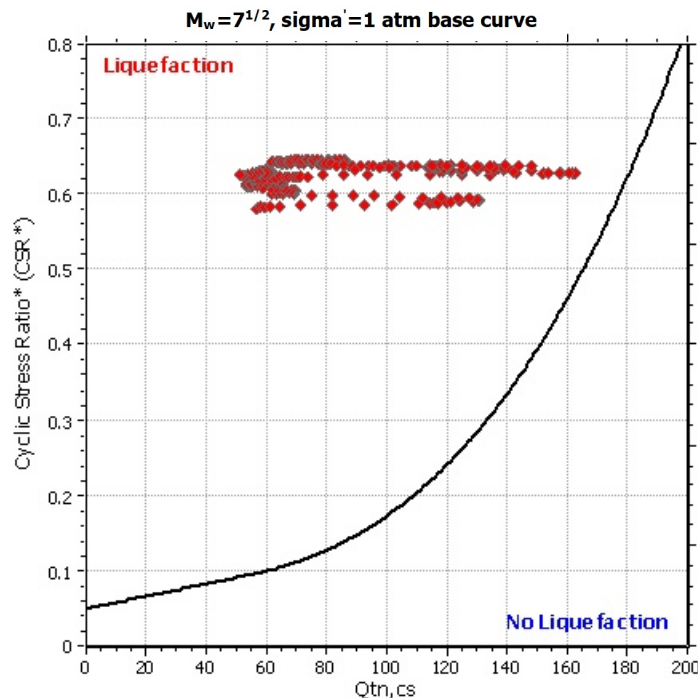
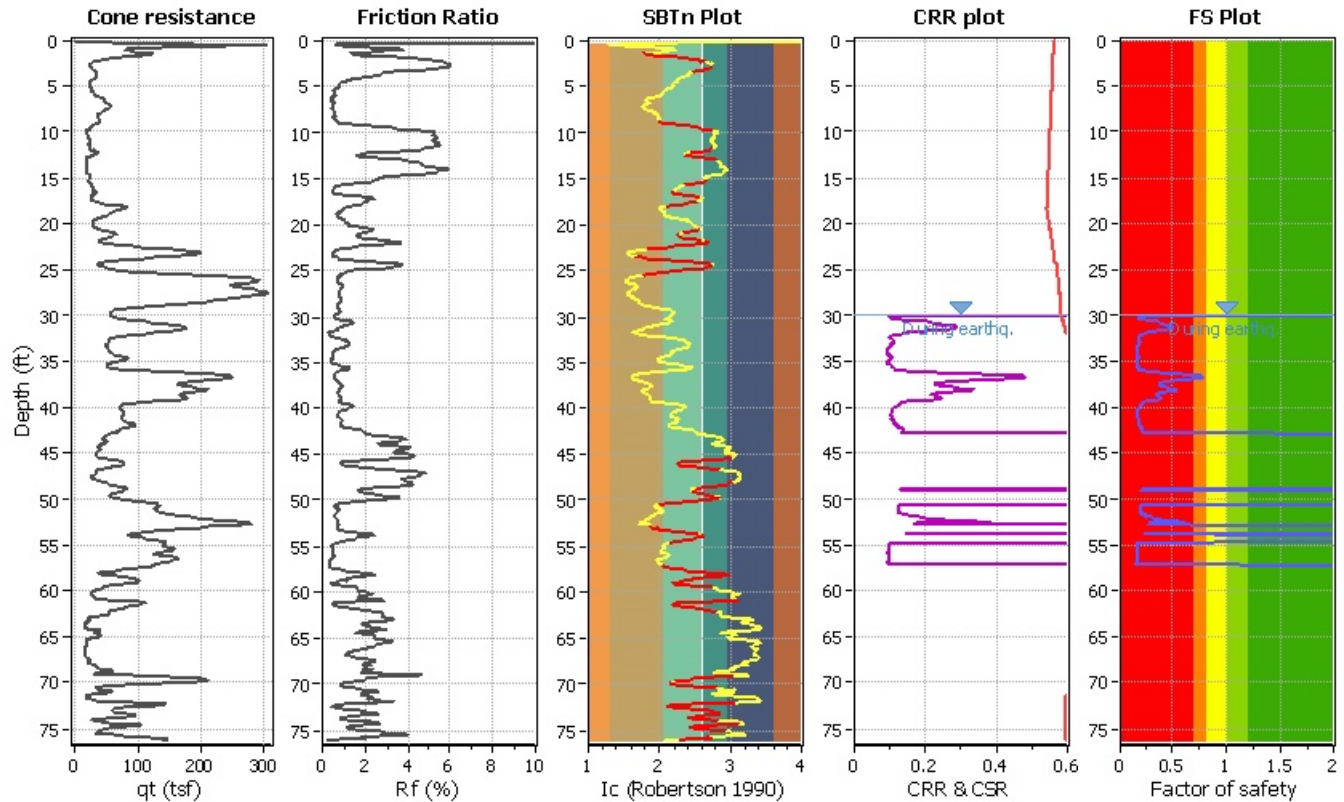
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-103-2019**

### Input parameters and analysis data

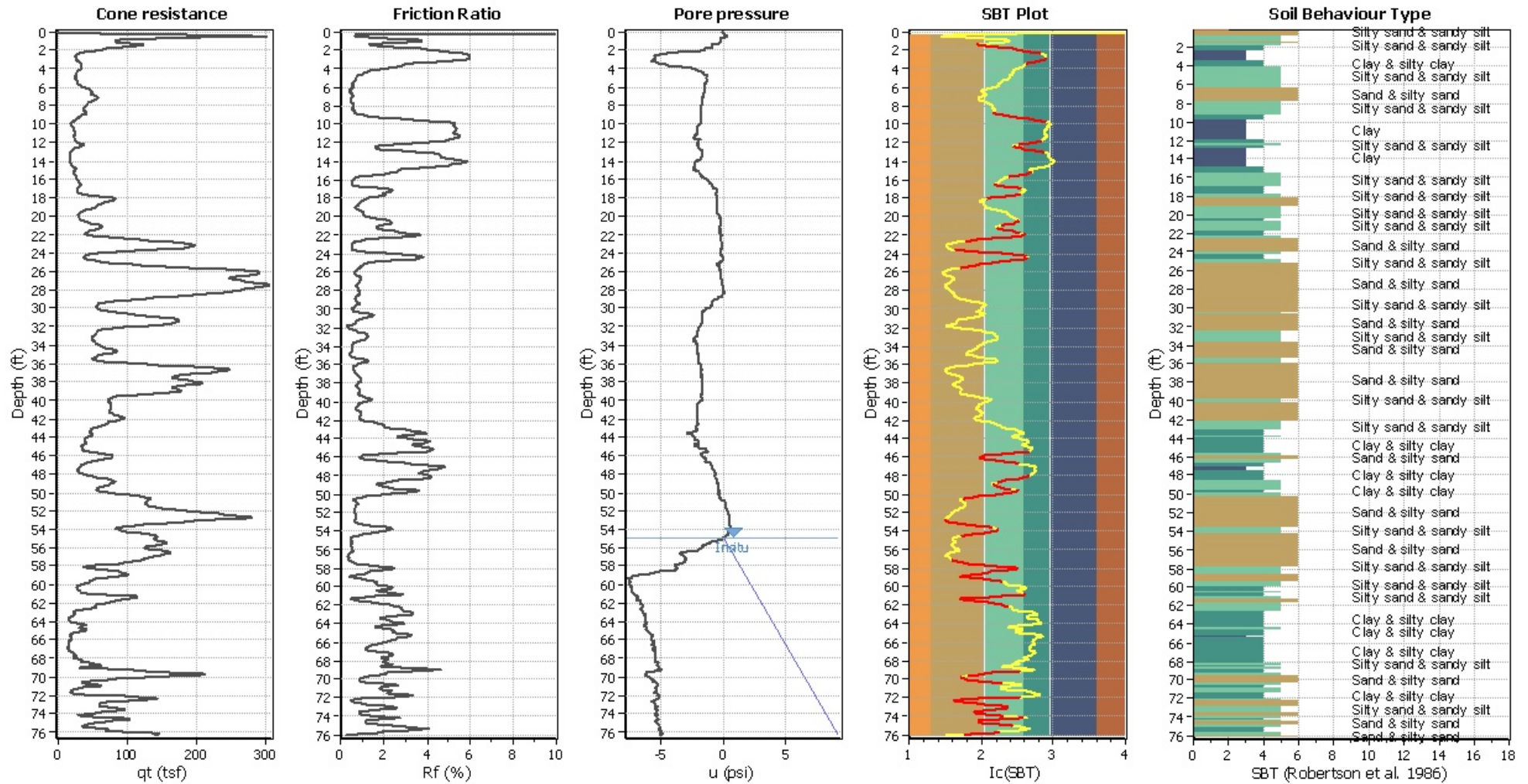
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plo



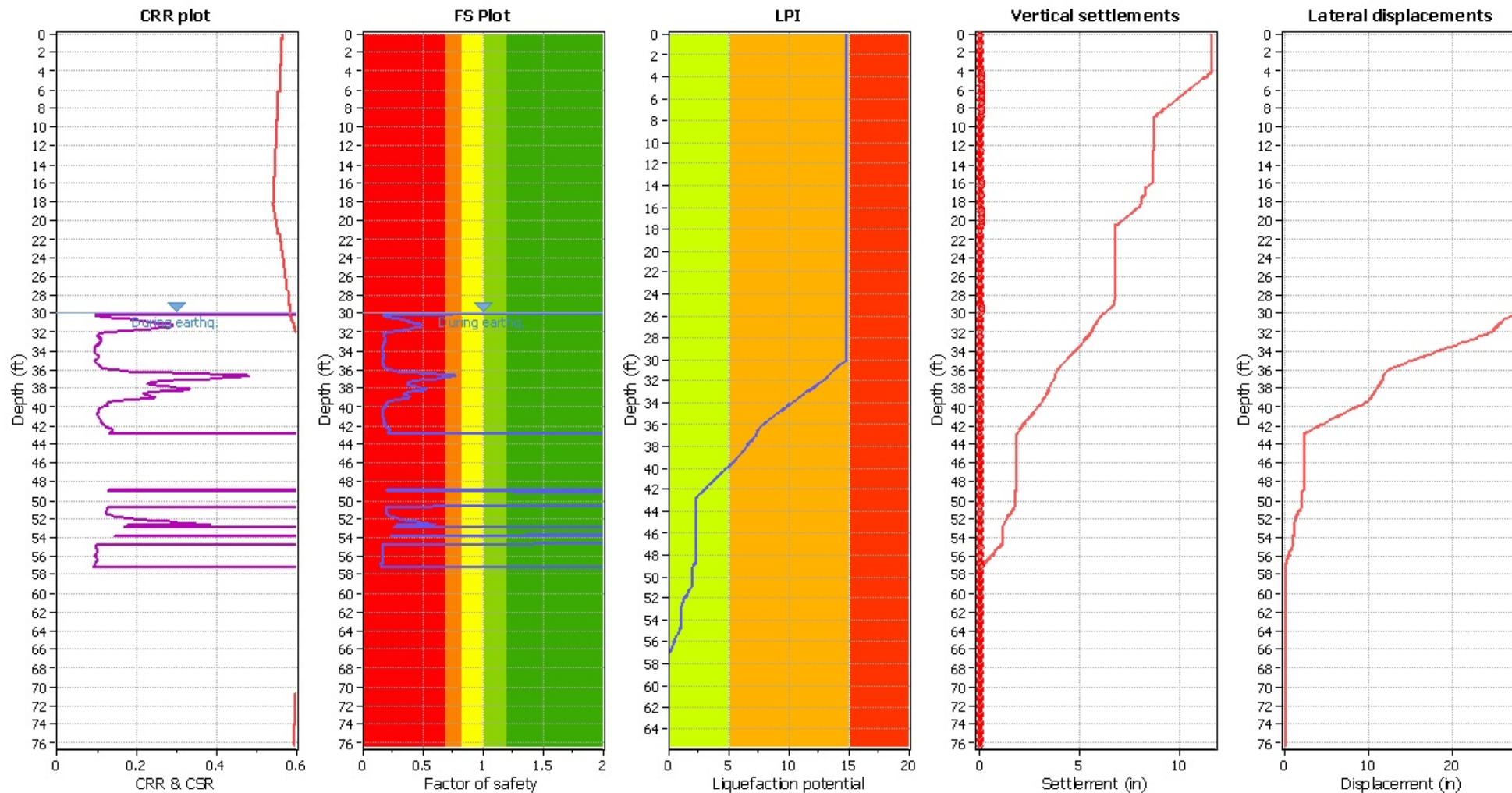
## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## SBT legend

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

## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

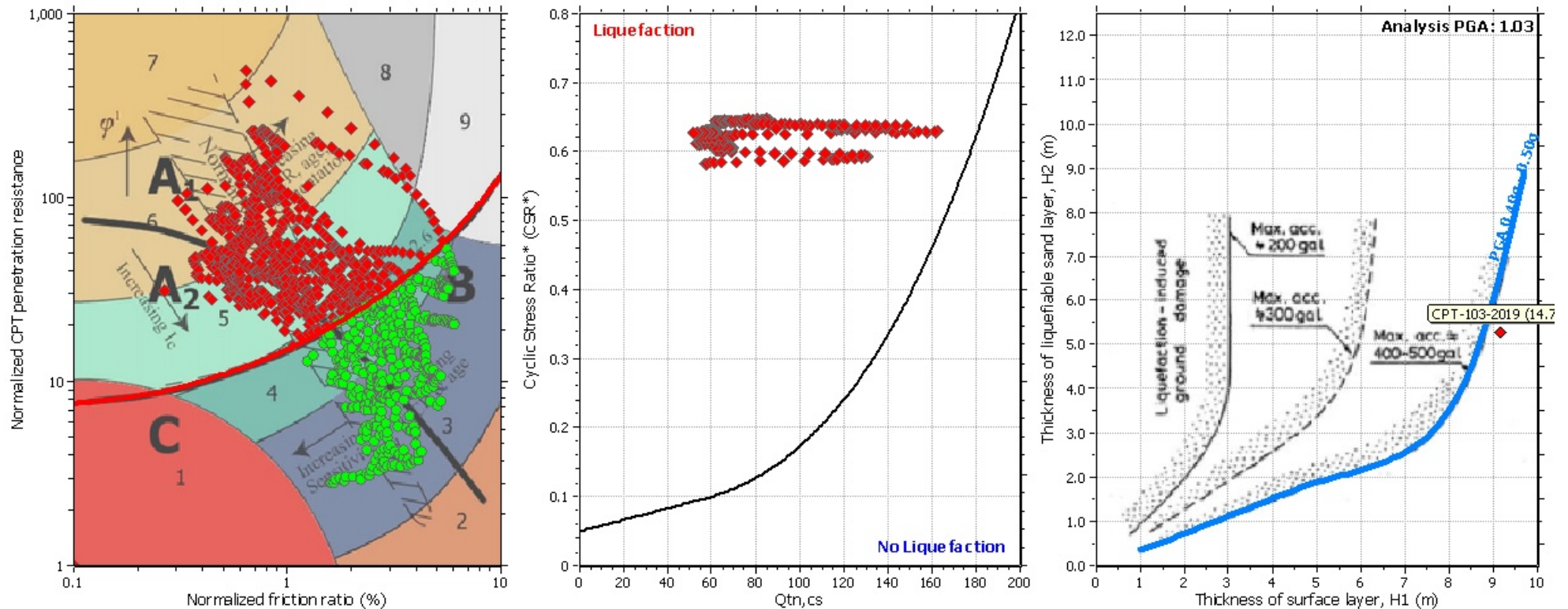
## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



## LIQUEFACTION ANALYSIS REPORT

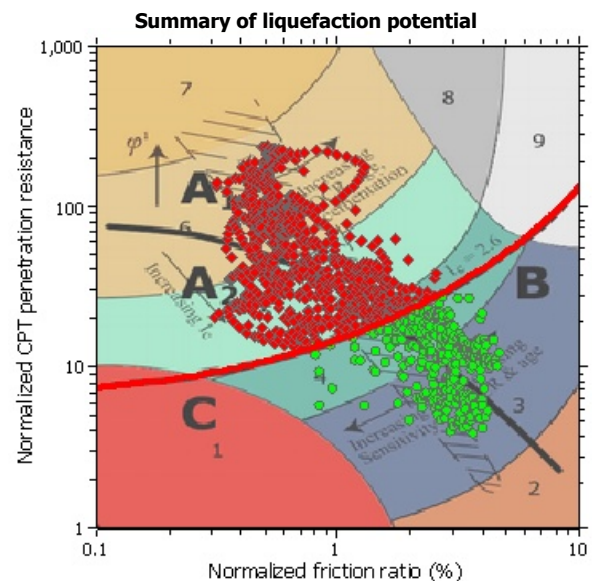
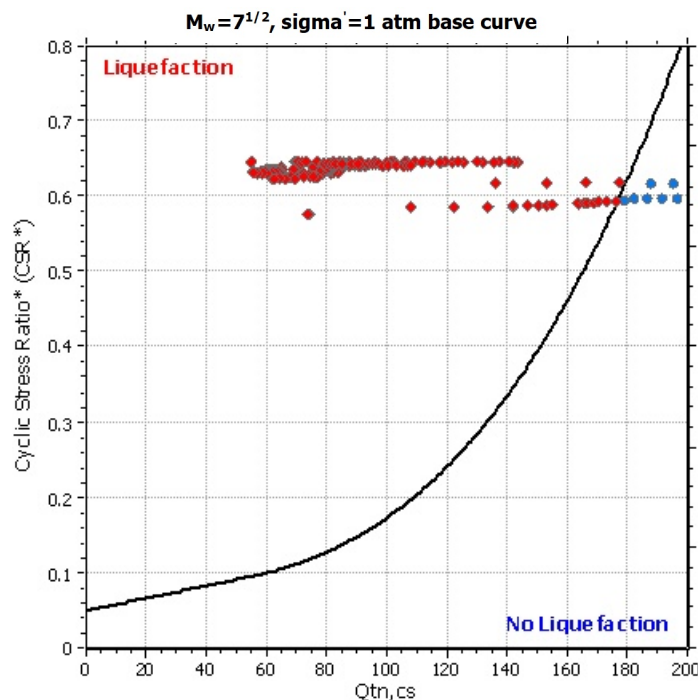
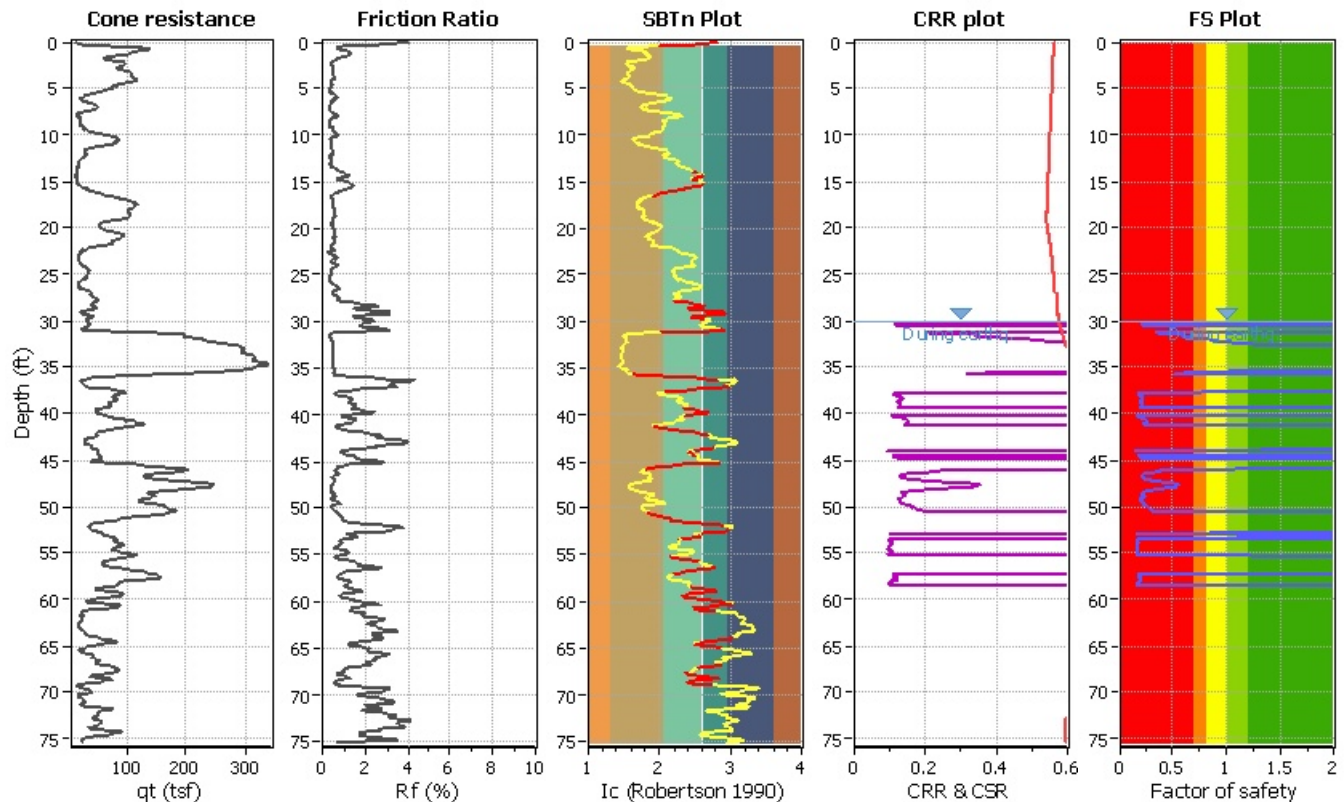
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-104-2019**

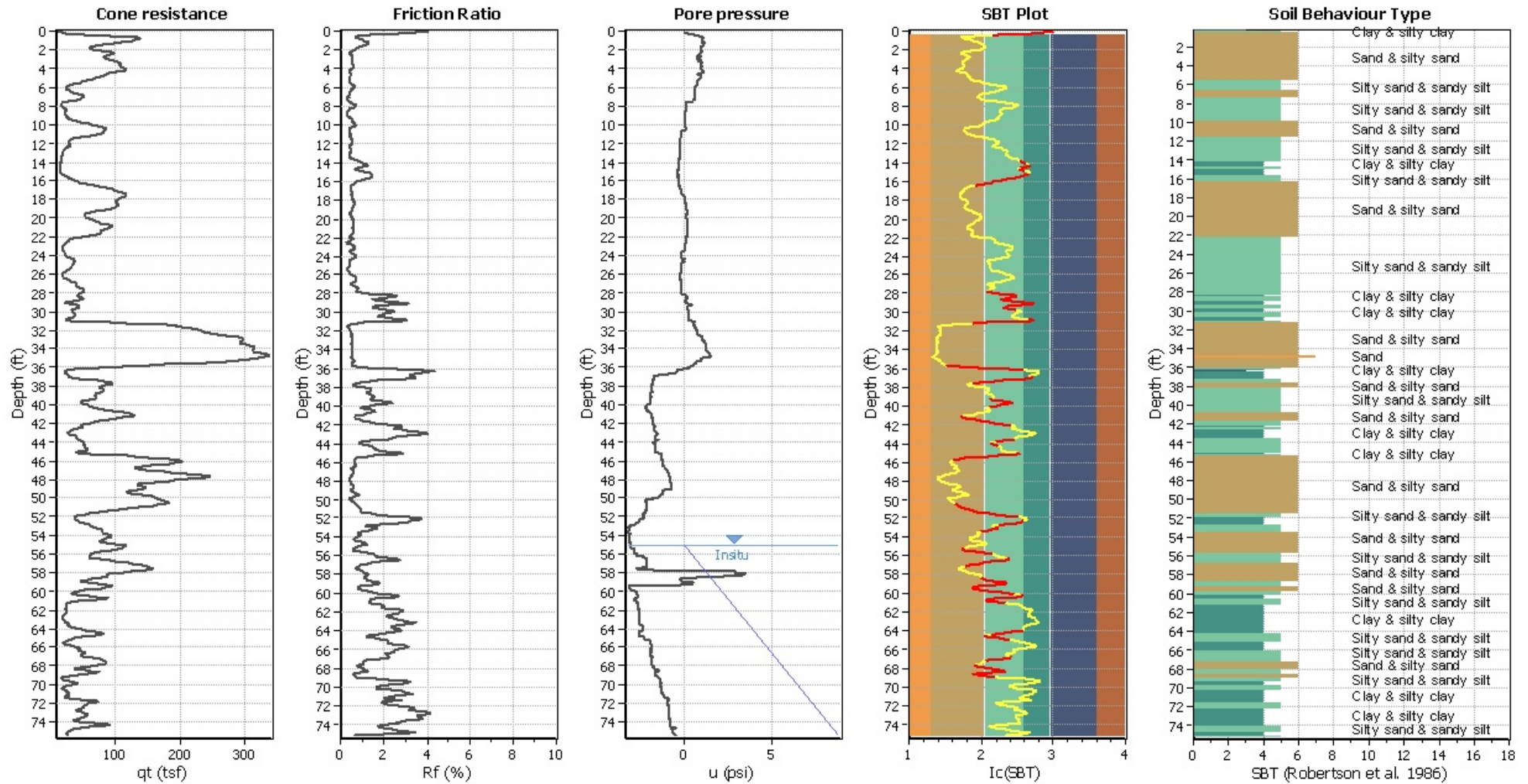
### Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plo



## Input parameters and analysis data

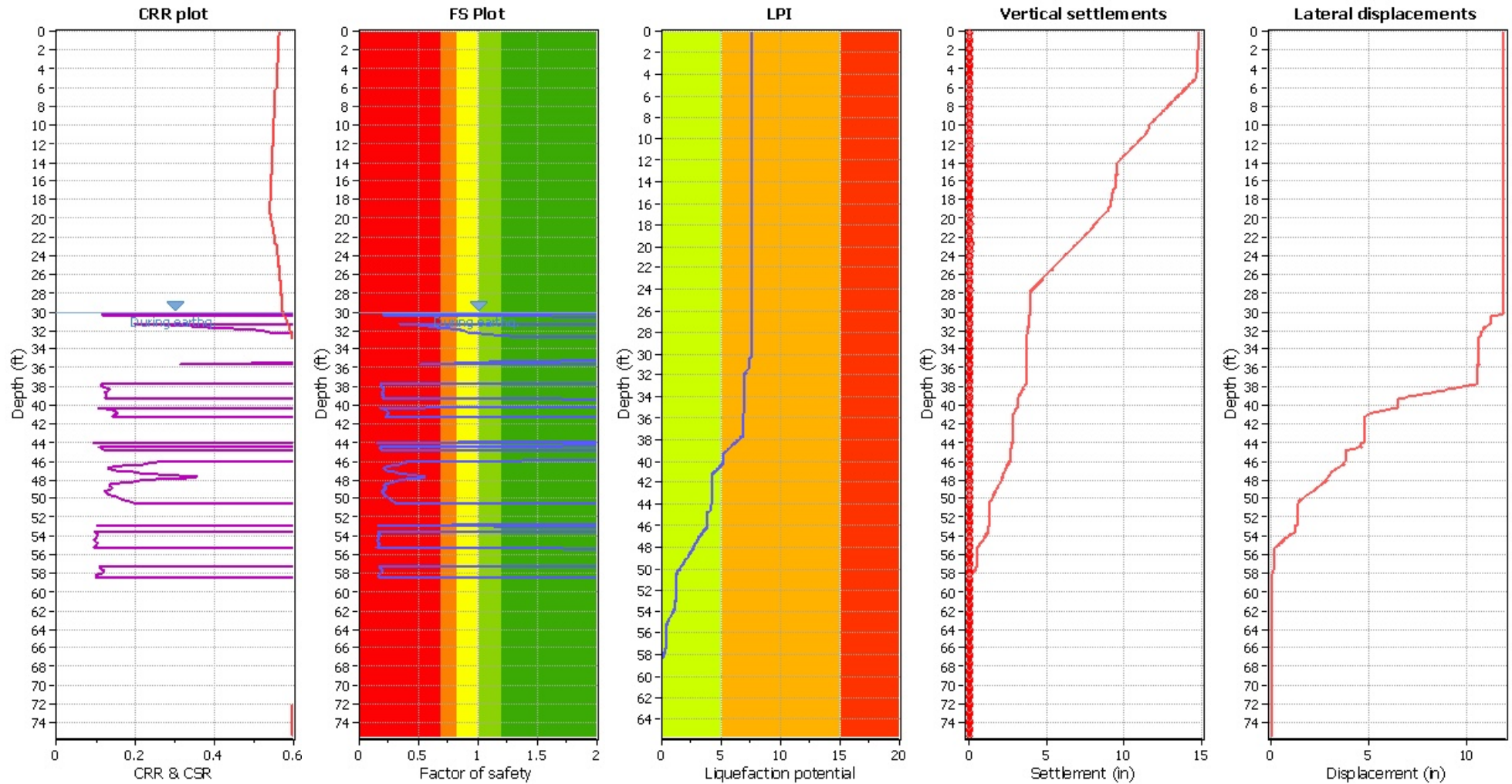
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## SBT legend

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



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

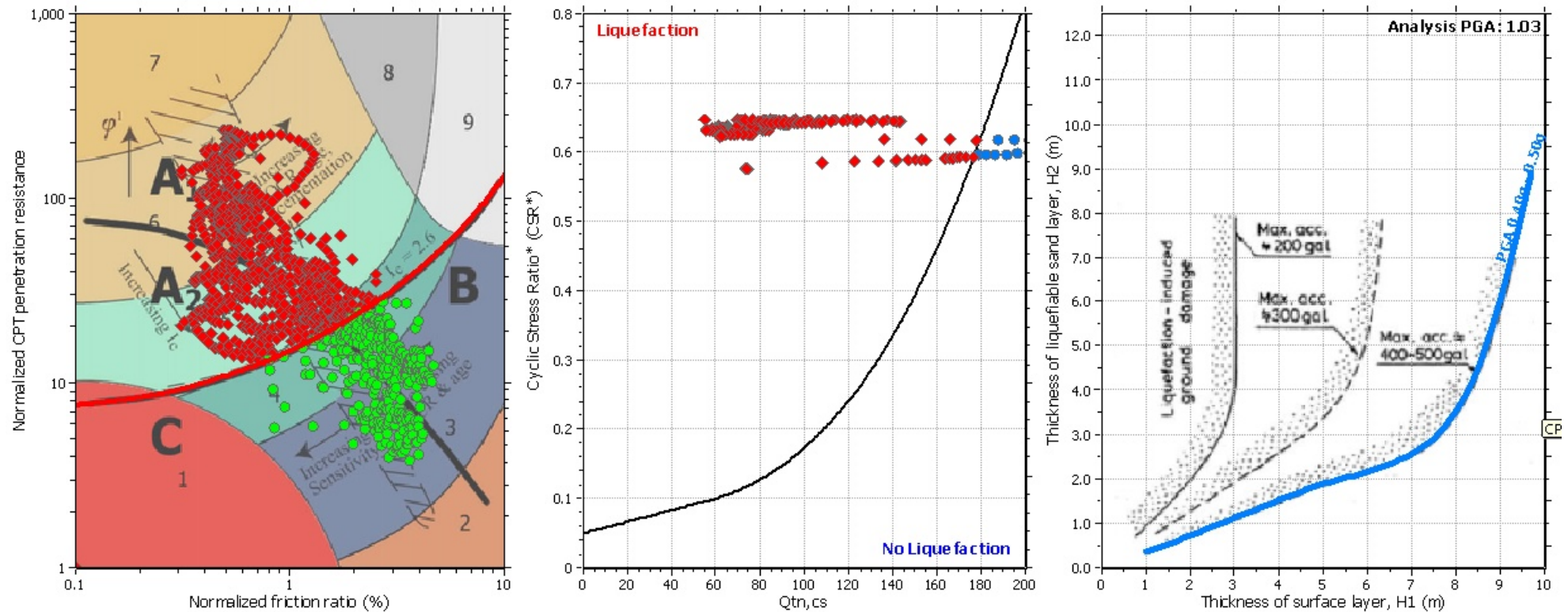
## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## LIQUEFACTION ANALYSIS REPORT

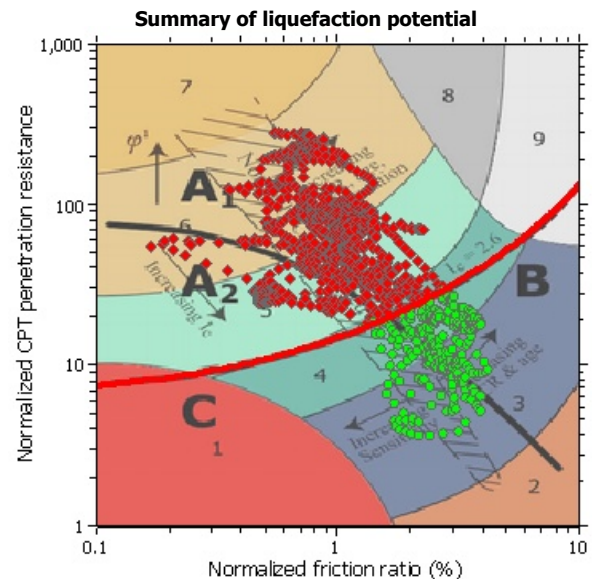
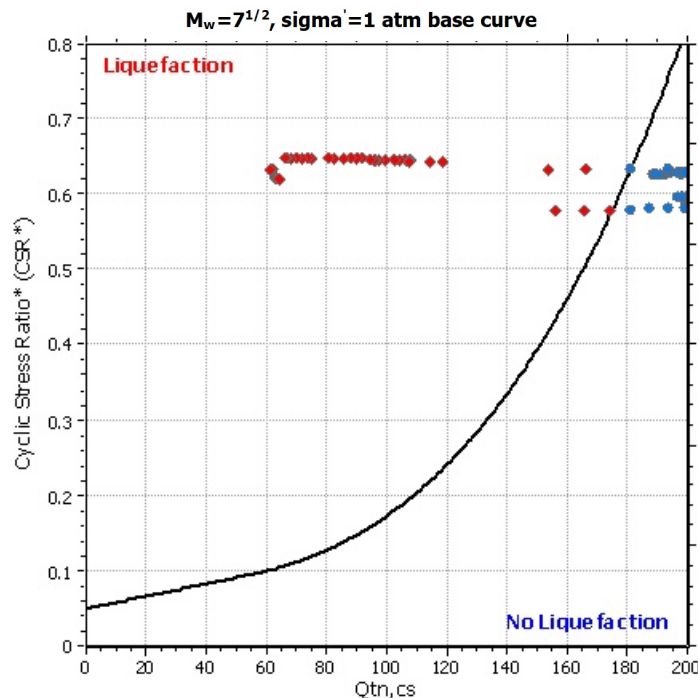
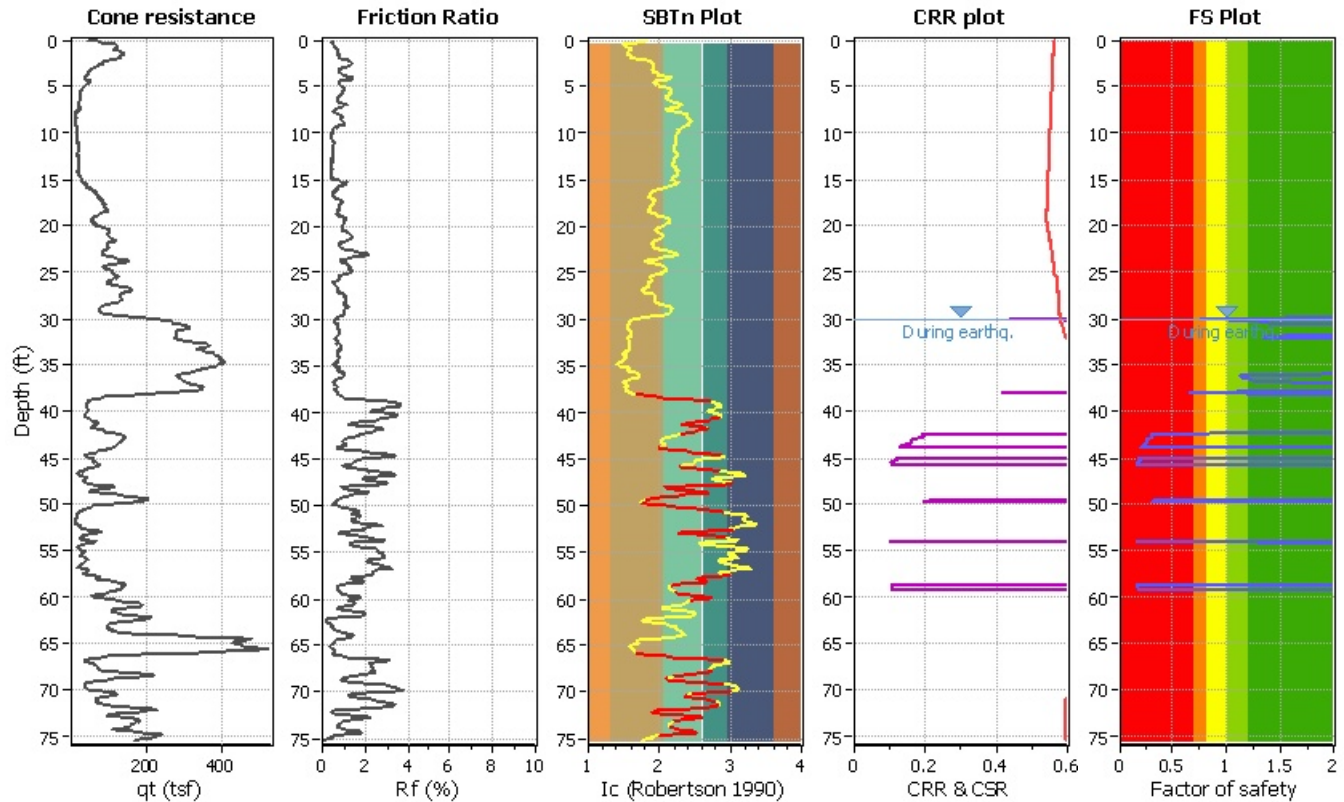
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-105-2019**

### Input parameters and analysis data

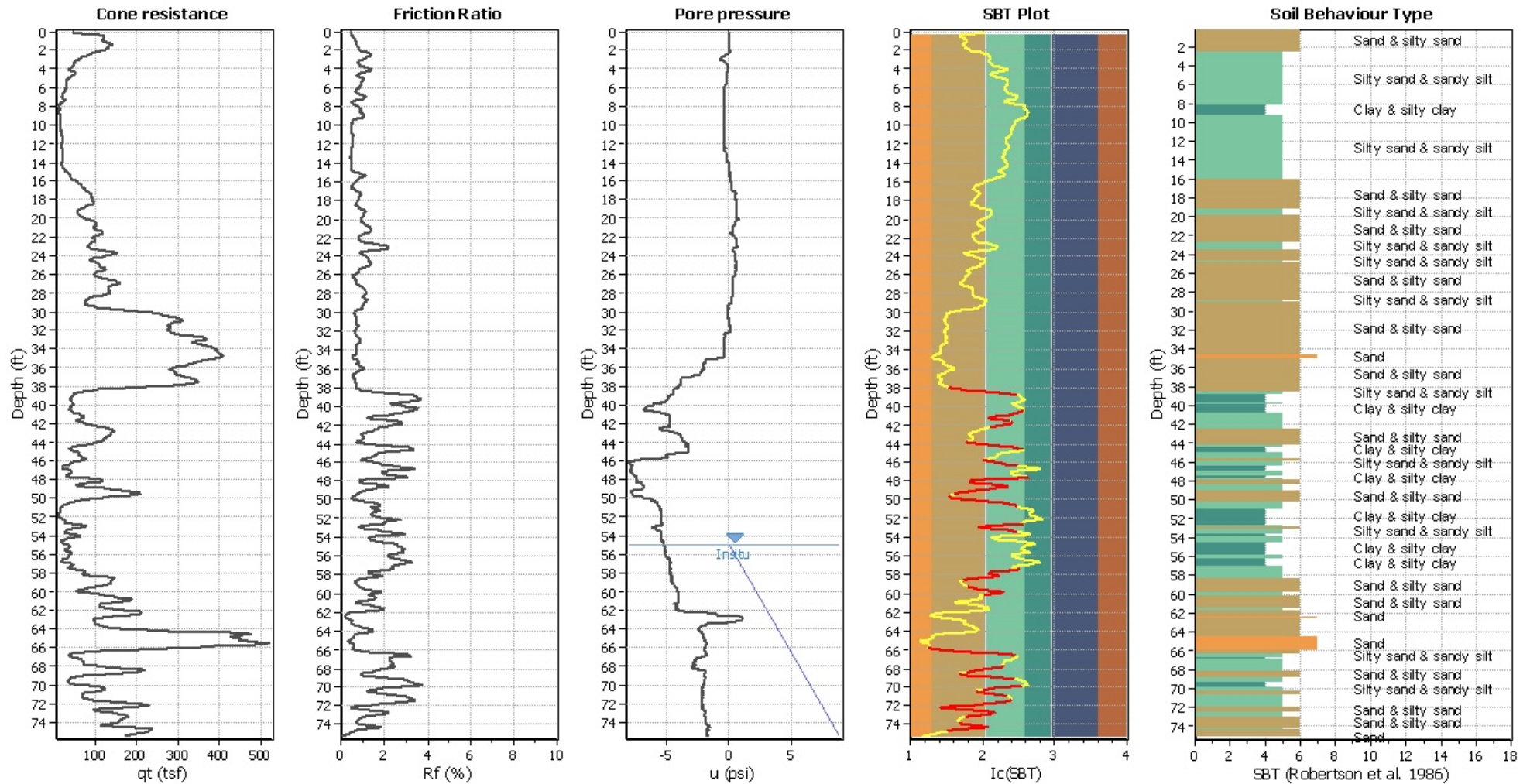
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plo



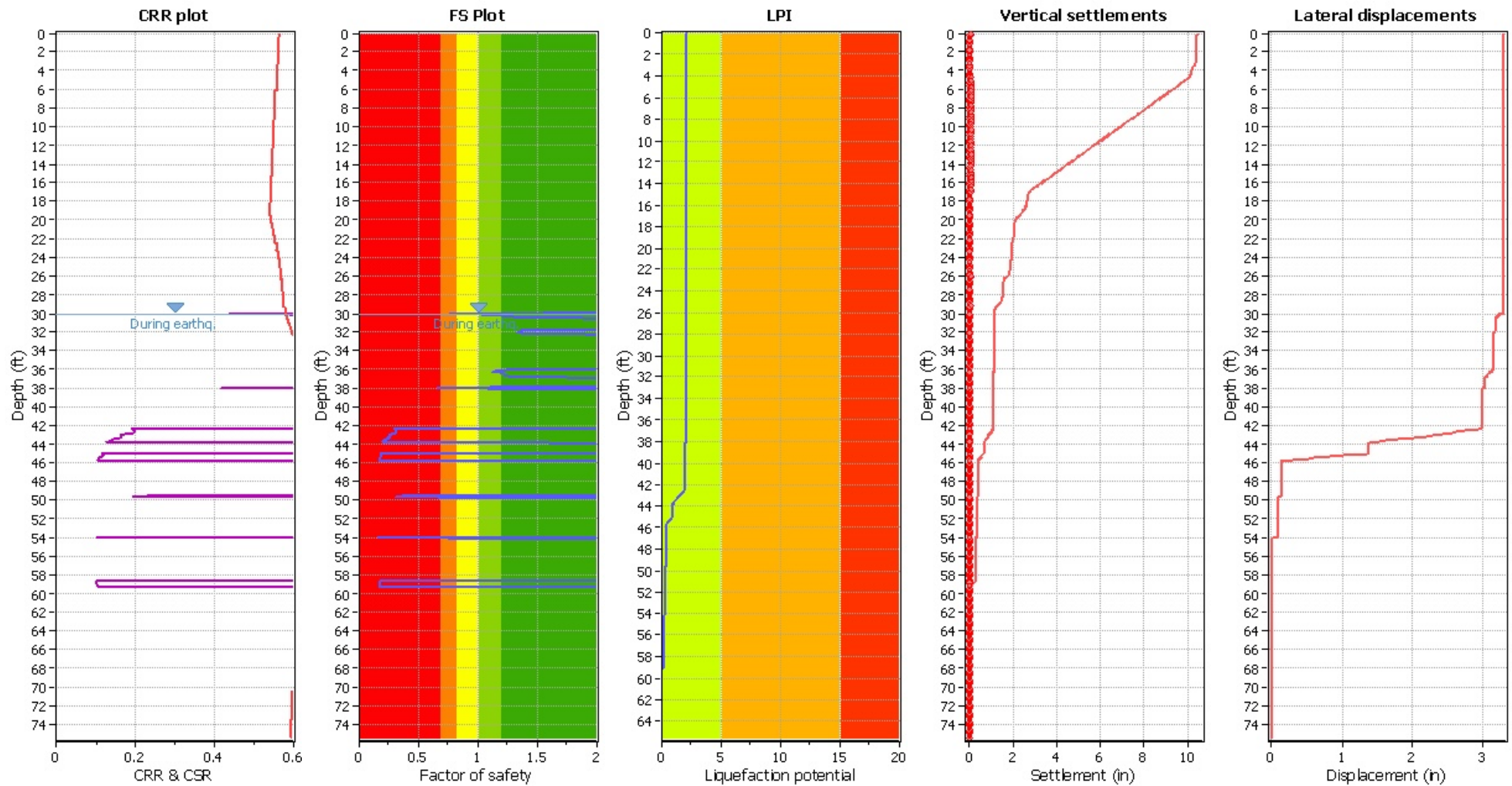
## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## SBT legend

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

## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk





## LIQUEFACTION ANALYSIS REPORT

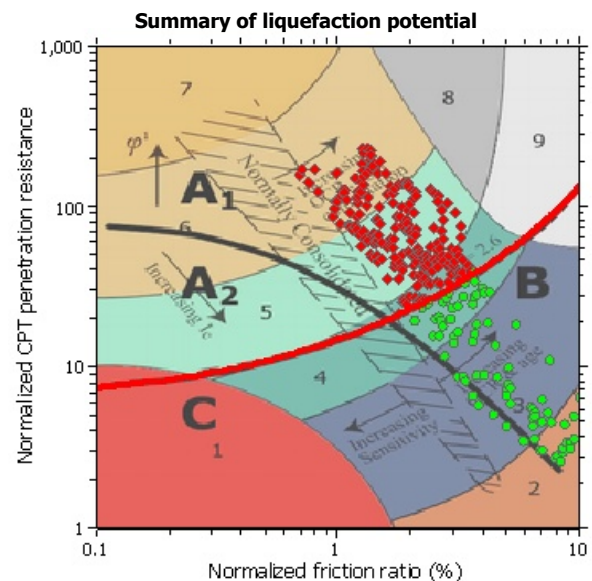
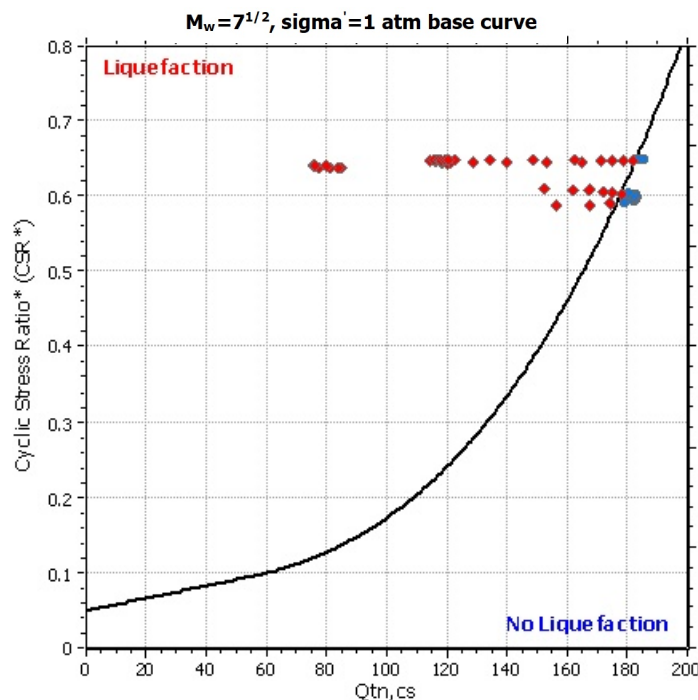
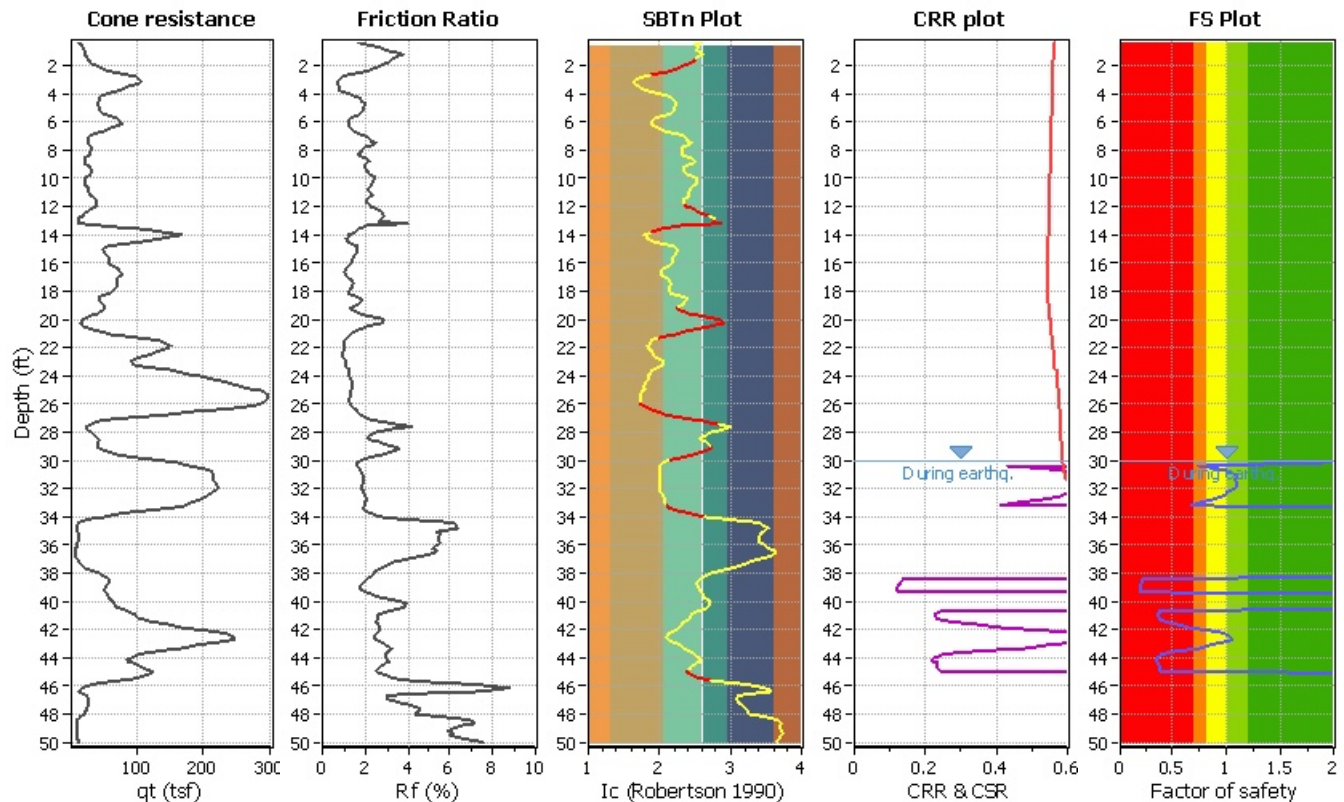
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

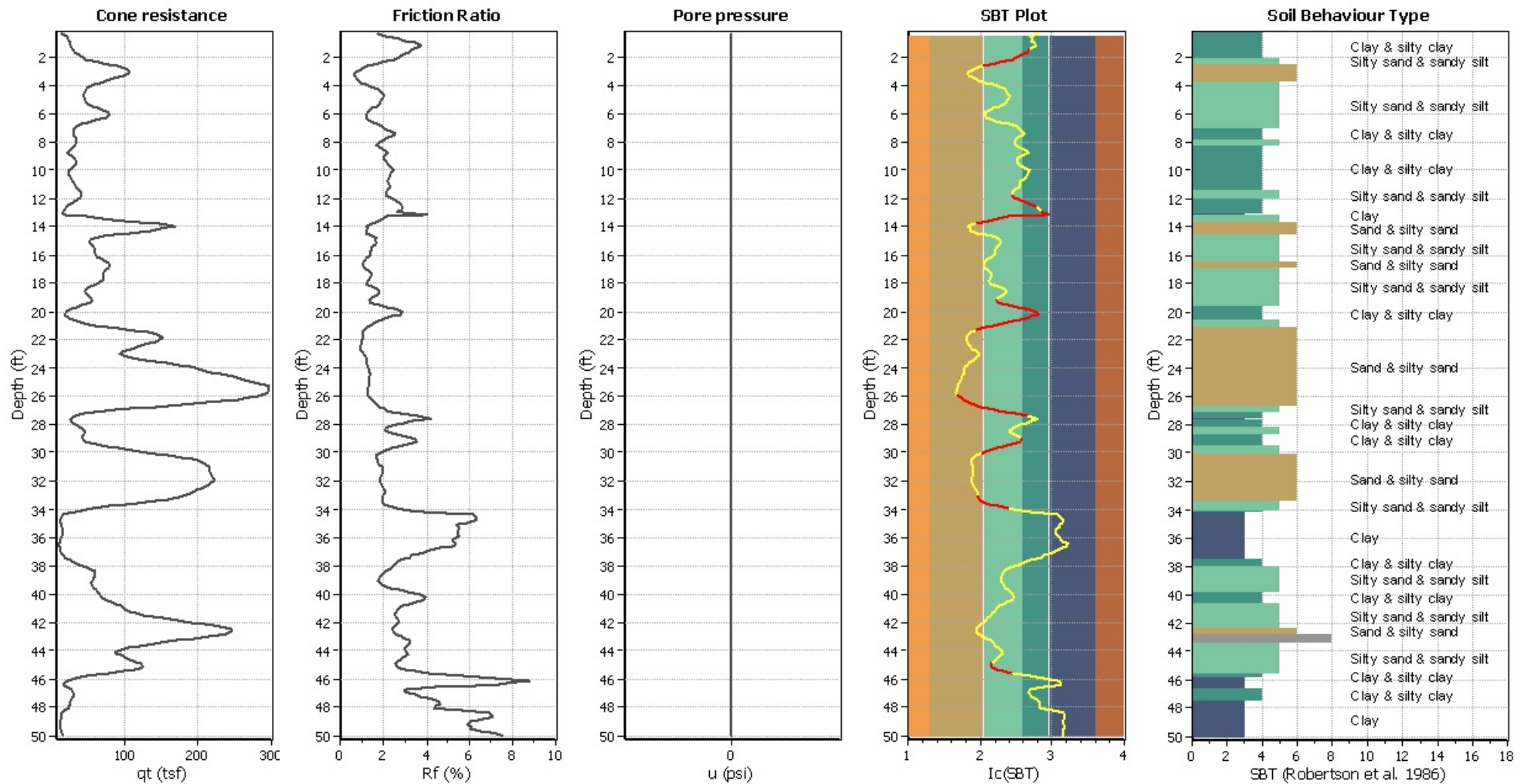
**CPT file : Gorian CPT-2**

### Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



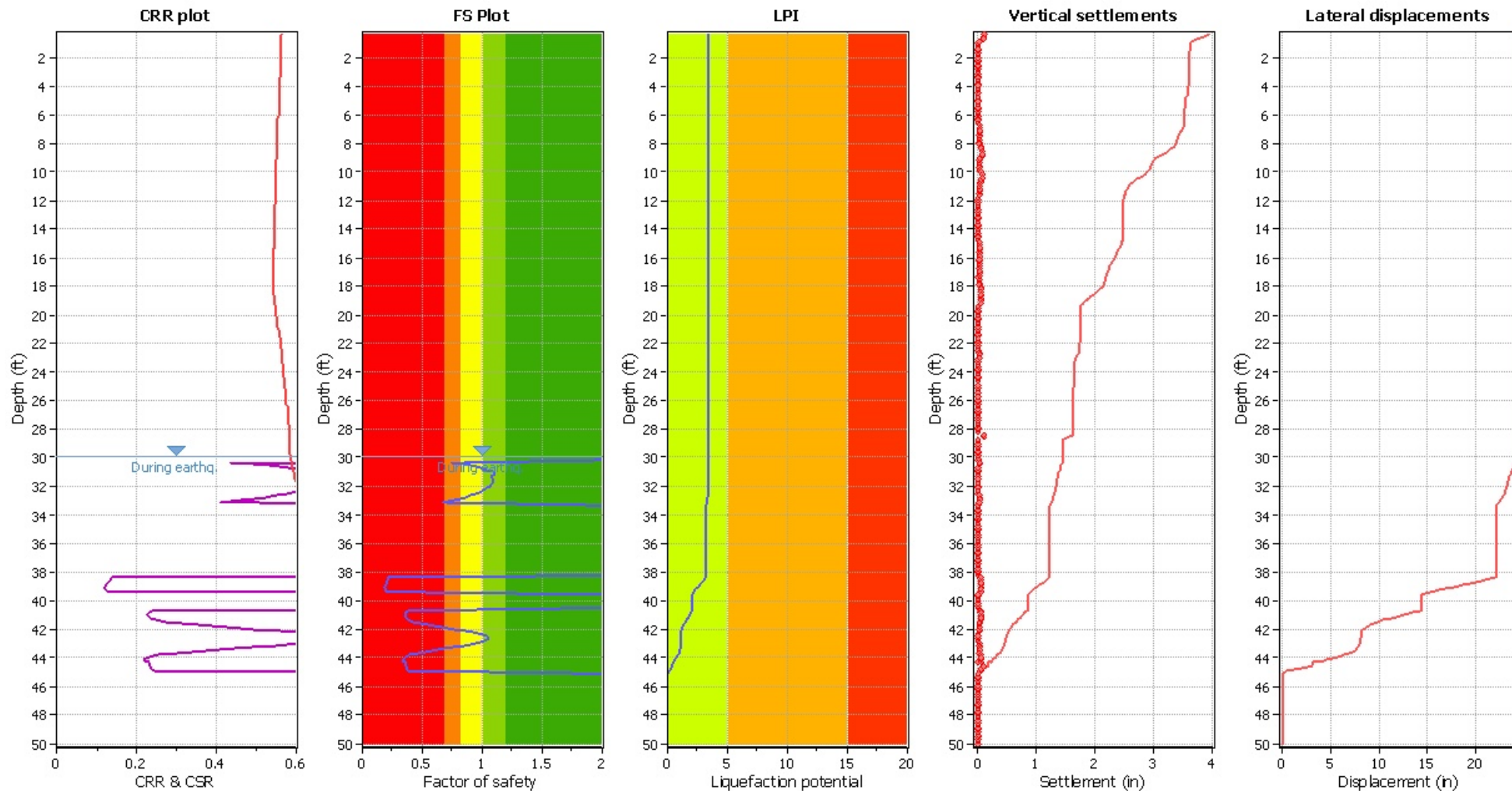
Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>0</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



### Liquefaction analysis overall plot



#### Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

#### F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

#### LPI color scheme

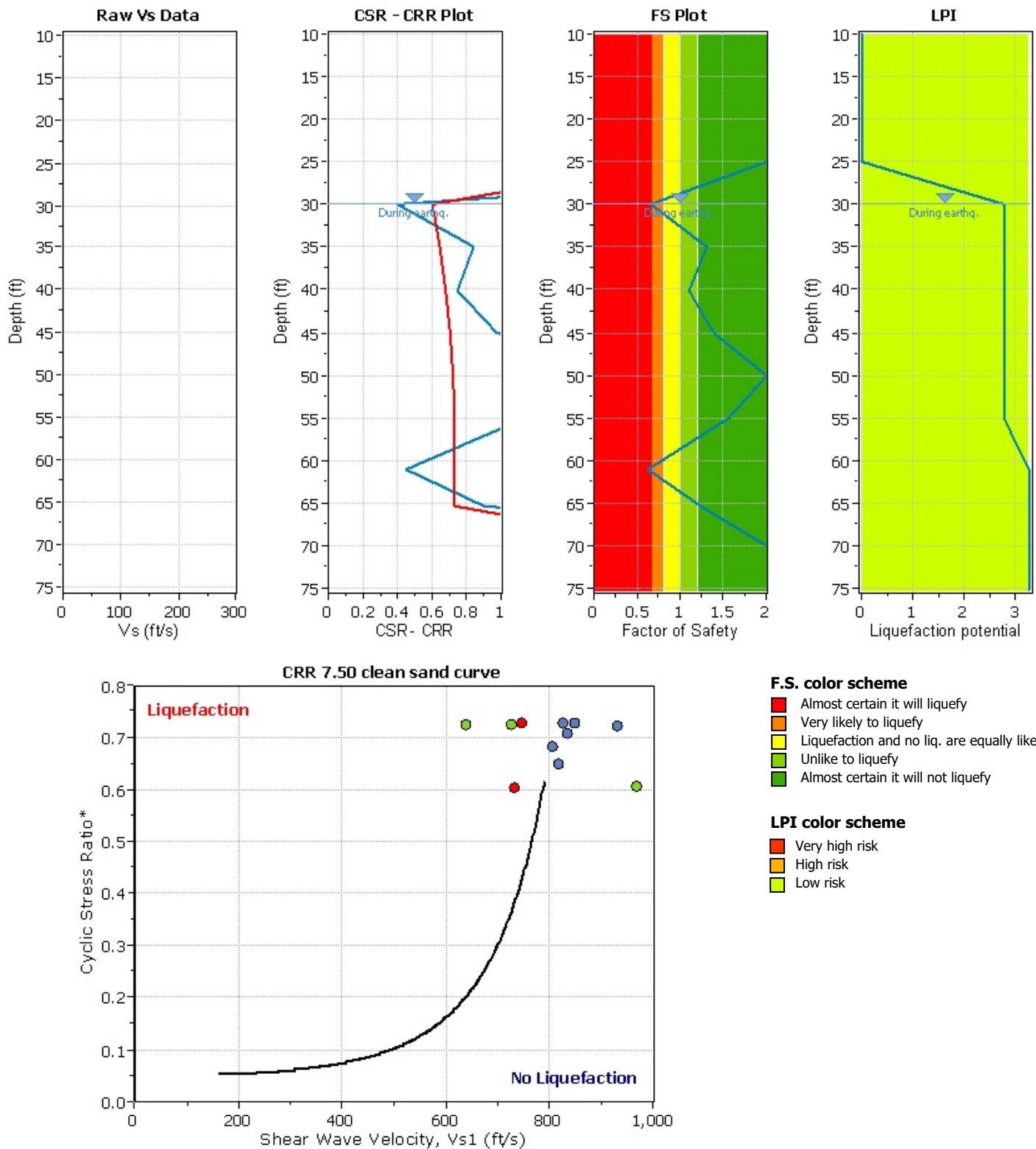
Red	Very high risk
Orange	High risk
Yellow	Low risk



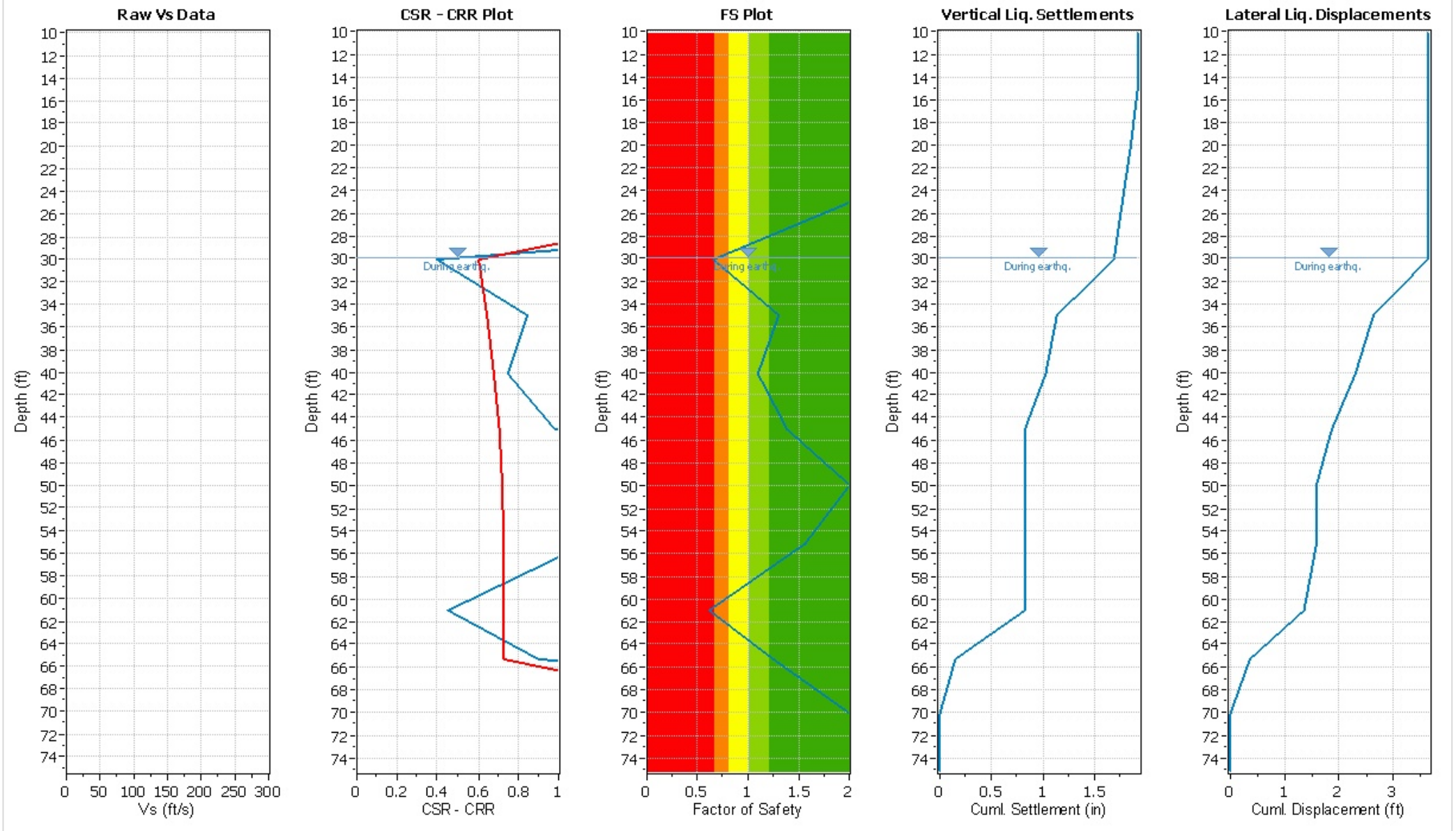
## V<sub>s</sub> BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Civic Center**
**V<sub>s</sub> Name: OGI CPT-103**
**Location : 799 Moorpark Avenue, Moorpark, California**
**:: Input parameters and analysis properties ::**

Analysis method: Kayen et al. 2013  
 G.W.T. (in-situ): 55.00 ft  
 G.W.T. (earthq.): 30.00 ft  
 Earthquake magnitude  $M_w$ : 7.00  
 Peak ground acceleration: 1.03 g  
 Eq. external load: 0.00 tsf



**:: Overall Liquefaction Assessment Analysis Plots ::**



**:: Field input data ::**

Test Depth (ft)	V <sub>s</sub> Field Value (ft/s)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
10.07	907.03	60.00	120.00	5.00	No
15.06	1054.43	35.00	120.00	5.00	Yes
20.08	1000.60	35.00	120.00	5.00	Yes
25.07	1057.11	35.00	120.00	5.00	Yes
30.02	836.59	35.00	120.00	5.00	Yes
35.01	972.64	35.00	120.00	5.00	Yes
40.09	990.70	35.00	120.00	5.00	Yes
45.08	1055.98	35.00	120.00	5.00	Yes
50.00	1210.70	35.00	120.00	5.00	Yes
55.09	1130.26	35.00	120.00	5.00	Yes
61.06	1007.83	35.00	120.00	5.00	Yes
65.26	1122.41	35.00	120.00	5.00	Yes
70.05	876.89	50.00	120.00	5.00	No
75.12	1005.56	35.00	120.00	5.00	Yes

**Abbreviations**

Depth: Depth at which test was performed (ft)  
 Vs Field Value: Measured shear waves velocity (ft/s)  
 Fines Content: Fines content at test depth (%)  
 Unit Weight: Unit weight at test depth (pcf)  
 Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)  
 Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

**:: Cyclic Resistance Ratio (CRR) calculation data ::**

Depth (ft)	V <sub>s</sub> Field Value (ft/s)	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	Norm. Factor	V <sub>s1</sub> (ft/s)	CRR <sub>7.5</sub>
10.07	907.03	120.00	0.60	0.00	0.60	1.15	1043.42	4.000
15.06	1054.43	120.00	0.90	0.00	0.90	1.04	1096.87	4.000
20.08	1000.60	120.00	1.20	0.00	1.20	0.97	968.64	4.000
25.07	1057.11	120.00	1.50	0.00	1.50	0.92	968.11	4.000
30.02	836.59	120.00	1.80	0.00	1.80	0.88	732.41	0.398
35.01	972.64	120.00	2.10	0.00	2.10	0.84	819.41	0.839
40.09	990.70	120.00	2.41	0.00	2.41	0.81	806.82	0.747
45.08	1055.98	120.00	2.70	0.00	2.70	0.79	835.13	0.976
50.00	1210.70	120.00	3.00	0.00	3.00	0.77	933.02	2.822
55.09	1130.26	120.00	3.31	0.00	3.30	0.75	850.35	1.136
61.06	1007.83	120.00	3.66	0.19	3.47	0.74	748.68	0.453
65.26	1122.41	120.00	3.92	0.32	3.60	0.74	826.69	0.900
70.05	876.89	120.00	4.20	0.47	3.73	0.73	639.81	4.000
75.12	1005.56	120.00	4.51	0.63	3.88	0.72	726.69	4.000

**Abbreviations**

$\sigma_v$ : Total stress during SPT test (tsf)  
 $u_o$ : Water pore pressure during SPT test (tsf)  
 $\sigma'_{vo}$ : Effective overburden pressure during SPT test (tsf)  
 Norm. Factor: overburden-stress correction factor  
 V<sub>s1</sub>: Overburden-stress corrected shear wave velocity  
 CRR<sub>7.5</sub>: Cyclic resistance ratio for M=7.5



**:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::**

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	MSF	CSR <sub>eq,M=7.5</sub>	K <sub>sigma</sub>	CSR*	FS	
10.07	120.00	0.60	0.00	0.60	1.00	1.00	0.669	1.10	0.607	1.00	0.607	2.000	●
15.06	120.00	0.90	0.00	0.90	1.00	1.00	0.668	1.10	0.607	1.00	0.607	2.000	●
20.08	120.00	1.20	0.00	1.20	1.00	1.00	0.667	1.10	0.606	1.00	0.606	2.000	●
25.07	120.00	1.50	0.00	1.50	0.99	1.00	0.666	1.10	0.604	1.00	0.604	2.000	●
30.02	120.00	1.80	0.00	1.80	0.99	1.00	0.663	1.10	0.602	1.00	0.602	0.662	●
35.01	120.00	2.10	0.16	1.94	0.98	1.00	0.712	1.10	0.646	1.00	0.646	1.299	●
40.09	120.00	2.41	0.31	2.09	0.97	1.00	0.750	1.10	0.681	1.00	0.681	1.097	●
45.08	120.00	2.70	0.47	2.23	0.96	1.00	0.777	1.10	0.706	1.00	0.706	1.384	●
50.00	120.00	3.00	0.62	2.38	0.94	1.00	0.794	1.10	0.721	1.00	0.721	2.000	●
55.09	120.00	3.31	0.78	2.52	0.91	1.00	0.801	1.10	0.727	1.00	0.727	1.561	●
61.06	120.00	3.66	0.97	2.69	0.88	1.00	0.801	1.10	0.727	1.00	0.727	0.622	●
65.26	120.00	3.92	1.10	2.82	0.86	1.00	0.799	1.10	0.725	1.00	0.725	1.241	●
70.05	120.00	4.20	1.25	2.95	0.84	1.00	0.796	1.10	0.723	1.00	0.723	2.000	●
75.12	120.00	4.51	1.41	3.10	0.82	1.00	0.796	1.10	0.723	1.00	0.723	2.000	●

**Abbreviations**

$\sigma_{v,eq}$ : Total overburden pressure at test point, during earthquake (tsf)  
 $u_{o,eq}$ : Water pressure at test point, during earthquake (tsf)  
 $\sigma'_{vo,eq}$ : Effective overburden pressure, during earthquake (tsf)  
 $r_d$ : Nonlinear shear mass factor  
 $\alpha$ : Improvement factor due to stone columns  
 CSR : Cyclic Stress Ratio  
 MSF : Magnitude Scaling Factor  
 CSR<sub>eq,M=7.5</sub>: CSR adjusted for M=7.5  
 K<sub>sigma</sub>: Effective overburden stress factor  
 CSR\*: CSR fully adjusted  
 FS: Calculated factor of safety against soil liquefaction

**:: Liquefaction potential according to Iwasaki ::**

Depth (ft)	FS	F	wz	Thickness (ft)	I <sub>L</sub>
10.07	2.000	0.00	8.47	4.99	0.00
15.06	2.000	0.00	7.70	4.99	0.00
20.08	2.000	0.00	6.94	5.02	0.00
25.07	2.000	0.00	6.18	4.99	0.00
30.02	0.662	0.34	5.42	4.95	2.77
35.01	1.299	0.00	4.66	4.99	0.00
40.09	1.097	0.00	3.89	5.08	0.00
45.08	1.384	0.00	3.13	4.99	0.00
50.00	2.000	0.00	2.38	4.92	0.00
55.09	1.561	0.00	1.60	5.09	0.00
61.06	0.622	0.38	0.69	5.97	0.48
65.26	1.241	0.00	0.05	4.20	0.00
70.05	2.000	0.00	0.00	0.00	0.00
75.12	2.000	0.00	0.00	0.00	0.00

**Overall potential I<sub>L</sub> : 3.25**

I<sub>L</sub> = 0.00 - No liquefaction  
 I<sub>L</sub> between 0.00 and 5 - Liquefaction not probable  
 I<sub>L</sub> between 5 and 15 - Liquefaction probable  
 I<sub>L</sub> > 15 - Liquefaction certain

**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	V <sub>s1,cs</sub> (ft/s)	(N <sub>1</sub> ) <sub>60,cs</sub>	T <sub>av</sub>	p	G <sub>max</sub> (tsf)	a	b	γ	ε <sub>15</sub>	N <sub>c</sub>	ε <sub>Nc</sub> (%)	Δh (ft)	ΔS (in)
10.07	1443.14	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.000
15.06	1591.54	50	0.60	0.61	1281.3	0.16	6801.34	0.00	0.00	10.85	0.06	5.00	0.069
20.08	1257.57	50	0.80	0.81	1479.5	0.17	5723.10	0.00	0.00	10.85	0.06	5.00	0.077
25.07	1256.34	50	1.00	1.01	1653.1	0.18	5009.53	0.00	0.00	10.85	0.07	5.00	0.085

**Cumulative settlements: 0.231****Abbreviations**

V<sub>s1,cs</sub>: Normalized shear wave velocity clean sand equivalent  
 (N<sub>1</sub>)<sub>60,cs</sub>: Estimated normalized corrected clean sand SPT  
 T<sub>av</sub>: Average cyclic shear stress  
 p: Average stress  
 G<sub>max</sub>: Maximum shear modulus (tsf)  
 a, b: Shear strain formula variables  
 γ: Average shear strain  
 ε<sub>15</sub>: Volumetric strain after 15 cycles  
 N<sub>c</sub>: Number of cycles  
 ε<sub>Nc</sub>: Volumetric strain for number of cycles N<sub>c</sub> (%)  
 Δh: Thickness of soil layer (in)  
 ΔS: Settlement of soil layer (in)

**:: Vertical settlements estimation for saturated sands ::**

Depth (ft)	V <sub>s1,cs</sub> (ft/s)	q <sub>t1N,cs</sub>	e <sub>v</sub> (%)	Δh (ft)	s (in)
30.02	811.61	65644.53	0.92	5.00	0.551
35.01	954.12	132231.62	0.18	5.00	0.106
40.09	932.10	119519.72	0.35	5.00	0.211
45.08	982.35	150024.41	0.00	5.00	0.000
50.00	1177.49	328708.64	0.00	5.00	0.000
55.09	1010.46	169508.76	0.00	5.00	0.000
61.06	836.60	74855.21	1.11	5.00	0.667
65.26	967.10	140200.62	0.25	5.00	0.150
70.05	681.94	30897.60	0.00	5.00	0.000
75.12	802.99	62678.05	0.00	5.00	0.000

**Cumulative settlements: 1.685****Abbreviations**

V<sub>s1,cs</sub>: Normalized shear wave velocity clean sand equivalent  
 q<sub>t1N,cs</sub>: Estimated normalized corrected clean sand cone resistance  
 e<sub>v</sub>: Post liquefaction volumetric strain (%)  
 Δh: Thickness of soil layer to be considered (ft)  
 s: Estimated settlement (in)

**:: Lateral displacements estimation for saturated sands ::**

Depth (ft)	V <sub>s1,cs</sub> (ft/s)	(N <sub>1</sub> ) <sub>60,cs</sub>	D <sub>r</sub> (%)	γ <sub>max</sub> (%)	d <sub>z</sub> (ft)	LDI	LD (ft)
10.07	1443.14	50	100.00	0.00	5.00	0.000	0.00
15.06	1591.54	50	100.00	0.00	5.00	0.000	0.00
20.08	1257.57	50	100.00	0.00	5.00	0.000	0.00
25.07	1256.34	50	100.00	0.00	5.00	0.000	0.00
30.02	811.61	50	100.00	6.20	5.00	0.310	0.99
35.01	954.12	50	100.00	2.03	5.00	0.102	0.33

:: Lateral displacements estimation for saturated sands ::							
Depth (ft)	V <sub>s1,cs</sub> (ft/s)	(N <sub>1</sub> ) <sub>60,cs</sub>	D <sub>r</sub> (%)	γ <sub>max</sub> (%)	d <sub>z</sub> (ft)	LDI	LD (ft)
40.09	932.10	50	100.00	2.76	5.00	0.138	0.44
45.08	982.35	50	100.00	1.82	5.00	0.091	0.29
50.00	1177.49	50	100.00	0.00	5.00	0.000	0.00
55.09	1010.46	50	100.00	1.46	5.00	0.073	0.23
61.06	836.60	50	100.00	6.20	5.00	0.310	0.99
65.26	967.10	50	100.00	2.21	5.00	0.111	0.35
70.05	681.94	50	100.00	0.00	5.00	0.000	0.00
75.12	802.99	50	100.00	0.00	5.00	0.000	0.00

**Cumulative lateral displacements: 3.63**

#### Abbreviations

V<sub>s1,cs</sub>: Normalized shear wave velocity clean sand equivalent  
 (N<sub>1</sub>)<sub>60,cs</sub>: Estimated normalized corrected clean sand SPT  
 D<sub>r</sub>: Relative density (%)  
 γ<sub>max</sub>: Maximum amplitude of cyclic shear strain (%)  
 d<sub>z</sub>: Soil layer thickness (ft)  
 LDI: Lateral displacement index (ft)  
 LD: Actual estimated displacement (ft)



**PROJECT REQUIREMENTS (Y/N)**

EDISON EASEMENT REQUIRED ☐

PWRD 88 REQUIRED UG ☐

CIVIL ONLY WORK ORDER ☐

PERMIT REQUIRED ☐

PERMIT TYPE: EXCAV/ENCROACH

OUTAGE REQUIRED ☐

OUTAGE DATE: TIME:

TRAFFIC CONTROL REQUIRED ☐

PED. TRAFFIC CONTROL REQ'D ☐

CONVEYANCE LETTER REQ'D ☐

ENVIRONMENTAL REQUIREMENTS DOCUMENT (ERD) REQUIRED ☐

CSD 140 (TLM) REQ'D ☐

CIRCUIT MAP CHANGE REQ'D (TD 203) ☐

DIG ALERT APP ☐

VERIFIED ACTIVE AND CONFIRMED USA TICKETS ☐

UTILIQUEST NOTIFIED ☐

FAA MARKING REQ'D ☐

FAA TYPE: N/A

STANDARD ADHERENCE: 4\_Q\_2024\_Y

0124: 02/23/24

- NOTES TO CUSTOMER:**
- SEE MANDATORY SCE INSPECTION AND SCHEDULING NOTES
  - INSTALL SCHEDULE 80 PVC CONDUIT WHERE EXPOSED.
  - INSTALL SCHEDULE 40 PVC CONDUIT WHERE BURIED.
  - INSTALL 1/4" POLY PULL ROPE IN ALL DUCTS.
  - POT HOLE LOCATION AT WHICH NEW STRUCTURES ARE GOING TO BE INSTALLED TO AVOID DAMAGING OTHER EXISTING UTILITIES.
  - PROVIDE PROTECTION OF SCE INFRASTRUCTURE FROM VEHICULAR ACCESS USING BOLLARDS. PROVIDE REMOVABLE BOLLARDS IF REQUIRED CLEARANCE CAN'T BE MAINTAINED.
  - PROVIDE ADDRESS DECAL ON SWITCH BOARD.
  - ELECTRICAL ROOM TO COMPLY WITH SCE STANDARD PER THE ESR AND TO BE ACCESSIBLE TO SCE FOR 24 HRS. SCE TO PROVIDE LOCK BOX AND CUSTOMER TO PROVIDE KEY TO ELECTRICAL ROOM.
  - PROVIDE FULL ENCASEMENT FOR PORTIONS OF THE (5) CONDUITS & SEMI-ENCASEMENT WITH (4) CONDUITS.
  - BEFORE SCE CAN ENERGIZE:
    - PANEL INSTALLED AND INSPECTED BY AHI.
    - TRENCH AND CONDUIT ALL INSTALLED STRUCTURES INSPECTED BY SCE INSPECTOR.
    - RECEIVED FULL PAYMENT FOR ANY INVOICE (IF APPLICABLE).
    - SCE METER TECH TO SET CT'S AND METER.
    - LINE EXT CONTRACT SIGNED AND RETURNED.
    - LEGAL CONTACT TO CONTACT SCE SERVICE CENTER AT 800-655-4555 TO COMPLETE A MOVE-IN (APPLICATION OF SERVICE). PROVIDE THE FOLLOWING NUMBERS WHEN PROMPTED - SERVICE ORDER #XXXXXXX & PREMISE #XXXXXXX.
    - SCE CIVIL CONTRACTOR TO PERFORM HOT TIE IN AT SPLICE BOX X5627638. PLEASE SEE TIE IN NOTE BELOW.

- NOTES TO CREW/PSPEC:**
- PROJECT INVOLVES PULLING NEW PRI CABLE, SETTING 300KVA XFMR, INSTALLING METER & CT'S FOR 1000A SVC. (2) RUNS OF 700 CBL SERVICE, & REPLACING DEAD BREAK J-BARS & ELBOWS WITH LOADBREAK IN EX SPLICE BOX.
  - PROJECT AREA IS TRUCK ACCESSIBLE
  - JOB SITE CONTACT - MICHAEL GARTEN @ 562-536-2066 & ROBERT VARELY @ 805-517-6283.
  - METER TECH TO SET CT'S & METER PRIOR TO ENERGIZING SWITCH BOARD.
  - SCE CIVIL CONTRACTORS TO PERFORM HOT TIE IN AT SPLICE BOX X5627638. PWRD-88 INVOLVED.

**SCE Inspection**

Contact SCE 48 Hours in advance for a Pre-Construction meeting and/or Inspection.

Email: TODD.A.HAWSE@SCE.COM

Phone: (805) 390-0175

**SCE Scheduling Note**

YOUR JOB WILL BE SENT TO SCE FIELD SCHEDULING DEPARTMENT AFTER ALL PRE-CONSTRUCTION REQUIREMENTS HAVE BEEN MET. THIS PROCESS TAKES A MINIMUM OF 24 DAYS TO START CONSTRUCTION.

T.L.M. DATA: P5788674

SIZE	KVA	CUST	% LOAD
EXIST.	—	—	—
PROP.	300	282	1 94%

VOLTAGE DROP: —

FUCKER FACTOR: —

PRI. CIRCUIT: STRATHERN

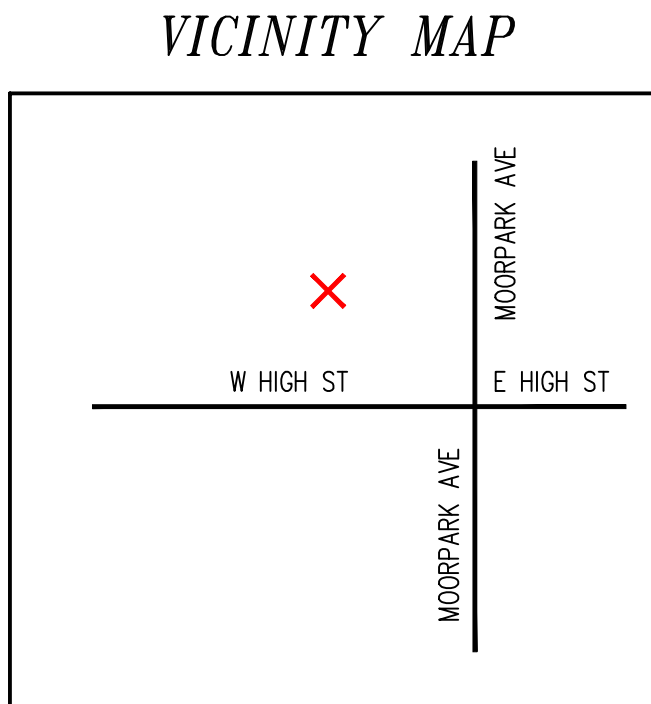
**UNDERGROUND SERVICE ALERT**

Contact USA  
Dial 811 or 800-422-4133  
www.digalert.org/contact

For Underground Locating  
Two Working Days Before You Dig

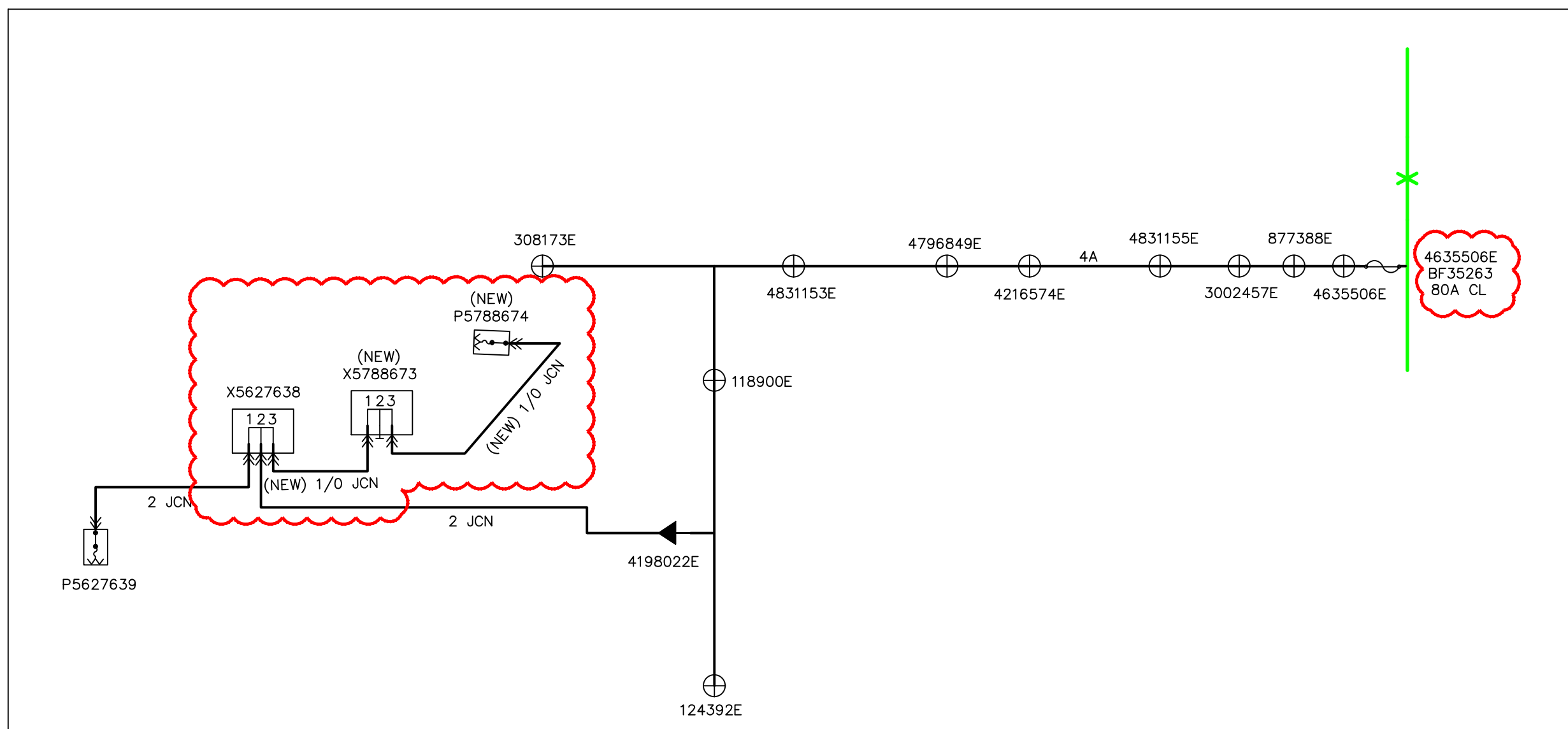
027: REV. 12/10/21

016: Rev. 05/29/20



## PROPOSED SINGLE LINE

STRATHERN - 16KV % MOORPARK



TD2334415  
CO: P5788674  
SLAB BOX

8'x10' CONCRETE

CO: 1 - S SB 8' X 10' CONC

IN: 4 - CNN HYLUGS PM 3-700 1-350 12/16KV 3P

IN: 1 - CNN BOLT PM 1 TO 4-RUNS 4/O AND UP

IN: 1 - TR PM F DE 300KVA 16KV 277/480Y 3P+ SN:

IN: 1 - GR #2 STR PM/BURD TRANS 150-300KVA W/ROD

IN: 120' - CBL (3) 700, (1) 350 600V CLP PLEX (P8674 TO PNL)

MI: 70' - CBL (3) 700, (1) 350 600V CLP PLEX

IN: 1 - MTR X-RANGE CT BAR TO 600/5 277/480 3P 4W

TD2334415  
CI: X5788673  
PULL BOX

3'x5'x4' CONCRETE FULL TRAFFIC

CI: 1 - S SPL BOX PB 3'x5'x4' CNC LFT AST CVR

CF: 1 - SS TAX EXCV CST FOR BD/PAD/PB/PME/SB/SOE

IN: 6 - JJ LBE 1/0 200A 16KV

IN: 3 - JJ LB INS CAP 200A 25KV

IN: 1 - SL CBL RACK STL 30" FOR PB

IN: 1 - JJ LB JUNC BAR 3WY 200A 25KV

CF: 19' - CM DUCT 5" (X8673 TO PL)

CF: 19' - CM DUCT FOR EXCAVATION (X8673 TO PL)

IN: 235' - CBL 1/0 AL 3-1/C 17KV CLP PJ (X8673 TO X8674)

MI: 70' - CBL 1/0 AL 3-1/C 17KV CLP PJ

TD2334415  
EX: X5627638  
PULL BOX

RPM PARKWAY

3'x5'x4'

TIE-IN REQUIRED

RM: 6 - JJ DBE W/BAIL #2 200A

RM: 3 - JJ DBE #2 200A W/INS PLG

RM: 3 - JJ DB JUNC BAR 3WY 200A 15KV

IN: 9 - JJ LBE 1/0 200A 16KV

CF: 124' - CM DUCT 5" (X7638 TO X8673)

CF: 124' - CM DUCT FOR EXCAVATION (X7638 TO X8673)

IN: 124' - CBL 1/0 AL 3-1/C 17KV CLP PJ (X7638 TO X8673)

MI: 40' - CBL 1/0 AL 3-1/C 17KV CLP PJ

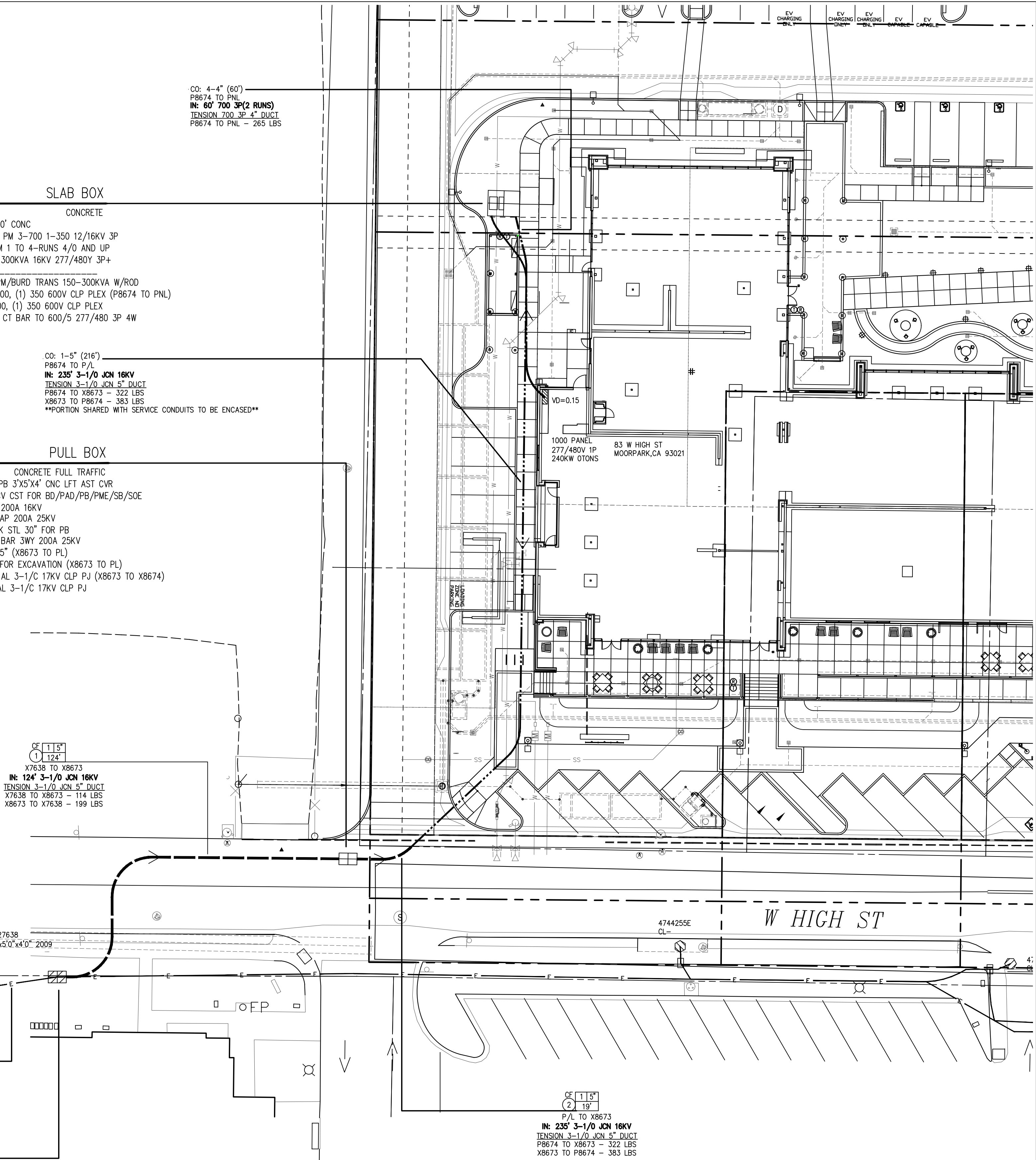
IN: 3 - JJ LB JUNC BAR 3WY 200A 25KV

**TIE-IN MADE THROUGH SIDE WALL OF STRUCTURE**

(VAULT, MANHOLE, RMC, SUE/EST, BURD, SLAB BOX, PULL BOX, PMO)

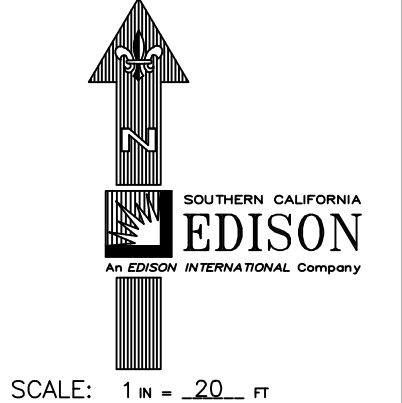
THE CUSTOMER IS RESPONSIBLE TO TRENCH TO THE STRUCTURE ENTRANCE POINT AND BRING THE CONDUIT TO WITHIN 5' OF THE STRUCTURE BEING ENTERED. THE CUSTOMER IS TO PROVIDE SLIP COUPLING AND CONDUIT.

009: 03/22/24



## PRELIMINARY

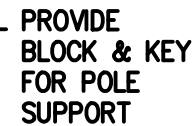
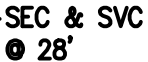
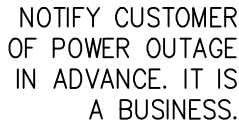
NOT FOR CONSTRUCTION



DISTRICT 35 - THOUSAND OAKS	PROJ. MGR. NAMPUMUZA, AIDEN PHONE 8053365120	PLANNER NAMPUMUZA, AIDEN PHONE 8053365120	DESIGNER NAMPUMUZA, AIDEN
PROJECT NO. 2956402	SERVICE REQUEST 3837576	PRODUCT-1 2334415-LINE EXTENSION	ASSOC DESIGN
CIRCUIT / VOLTAGE STRATHERN / 16KV	GPS	PRODUCT-2	ASSOC DESIGN
SUB / PG NO. MOORPARK	CIRCUIT CODE	PRODUCT-3	ASSOC DESIGN
INVENTORY MAP	J.P.A. NO.	PROPOSED CONSTRUCTION (LOCATION) CITY OF MOORPARK LIBRARY 83 W HIGH ST MOORPARK, CA 93021	DESIGN/DRWG NO. 1786374_0.01
TYPE	DATE	APPROVED BY	CHECKED BY
		DRAWN BY	PAX #







D124: 02/23/24

STANDARD ADHERENCE: 4 Q/ 2024 Y

- PROJECT INVOLVES RELOCATING SECONDARY POLE TO CLEAR AREA FOR FUTURE CONSTRUCTION PLANS.
- FOR ACCESS TO PROPERTY, PLEASE CONTACT ROBERT VALERY – 805-517-6283. PLEASE CALL A DAY BEFORE TO MAKE AN APPOINTMENT.
- AREA IS TRUCK ACCESSIBLE.



SOUTHERN CALIFORNIA  
**EDISON**  
AN INTERNATIONAL Company

DISTRICT 35 — THOUSAND OAKS				PROJ. MGR. NAMPUMUZA, AIDEN PHONE 8053365120			PLANNER NAMPUMUZA, AIDEN PHONE 8053365120			DESIGNER NAMPUMUZA, AIDEN		
PROJECT NO. 2953242		SERVICE REQUEST 3834477		MSR NO.		PRODUCT-1 <b>2332346—RELOCATE FACILITIES</b>						ASSOC DESGN
CIRCUIT / VOLTAGE STRATHERN / 16KV				GPS		PRODUCT-2						ASSOC DESGN
SUB / PG NO. MOORPARK				CIRCUIT CODE		PRODUCT-3						ASSOC DESGN
INVENTORY MAP				J.P.A. NO.			PROPOSED CONSTRUCTION (LOCATION) CITY OF MOORPARK 83 W HIGH ST MOORPARK CA 93021					
TYPE		DATE	APPROVED BY	CHECKED BY	DRAWN BY	PAX #	SHEET 1 OF 1			DESIGN\DRWG NO. 1784787_0.01		
Southern California Edison Company												



- # FINAL DESIGN
- ## APPROVED FOR CONSTRUCTION

DISTRICT 35 - THOUSAND OAKS		PROJ. MGR. NAMPUMUZA, AIDEN PHONE 8053365120		PLANNER NAMPUMUZA, AIDEN PHONE 8053365120		DESIGNER NAMPUMUZA, AIDEN	
PROJECT NO. 2806952	SERVICE REQUEST 3690121	MSR NO.	PRODUCT-1 2236230-REMOVE M&S			ASSOC DESGN	
CIRCUIT / VOLTAGE GABBERT / 16KV		GPS	PRODUCT-2			ASSOC DESGN	
SUB / PG NO. MOORPARK		CIRCUIT CODE	PRODUCT-3			ASSOC DESGN	
INVENTORY MAP		J.P.A. NO.		PROPOSED CONSTRUCTION (LOCATION) CITY OF MOORPARK LIBRARY 699 MOORPARK AVE MOORPARK CA 93021			
TYPE	DATE	APPROVED BY	CHECKED BY	DRAWN BY	PAX #	SHEET 1 OF 1	
Southern California Edison Company						DESIGN\DRWG NO. 1709491_0.01	



RESOLUTION NO. PC-2024-706

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, CERTIFYING A FINAL ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT INCLUDING A MITIGATION MONITORING AND REPORTING PROGRAM, APPROVAL OF CONDITIONAL USE PERMIT NO. CD-CUP-2023-0013 TO DEVELOP A 17,272 SQUARE FOOT PUBLIC LIBRARY, LOCATED AT 83 HIGH STREET, AND DEMOLITION OF AN EXISTING 7,900 SQUARE FOOT PUBLIC LIBRARY, IN CONNECTION THEREWITH, ON THE APPLICATION OF JESSICA SANDIFER ON BEHALF OF THE CITY OF MOORPARK.

WHEREAS, on February 8, 2023, an application was filed by Jessica Sandifer, Deputy Parks and Recreation Director ("Applicant"), on behalf of the City of Moorpark for a Conditional Use Permit ("CUP") CD-CUP-2023-0013 to develop a 17,272 square foot public library located at 83 E. High Street, and demolish an existing 7,900 square foot public library located at 699 Moorpark Avenue ("Project"); and

WHEREAS, at a duly noticed public hearing on February 27, 2024, the Planning Commission considered CUP CD-CUP-2023-0013, including the agenda report and any supplements thereto and written public comments; opened the public hearing and took and considered public testimony both for and against the proposal; and

WHEREAS, on May 9, 2022, the City of Moorpark Community Development Department published pursuant to California Environmental Quality Act ("CEQA") an Initial Study and Notice of Preparation ("NOP") of an Environmental Impact Report ("EIR") related to the Civic Center Master Plan ("Civic Center") to receive input from interested public and private parties on issues to be addressed in the EIR between May 9, 2022, and June 8, 2022. In addition, a public scoping meeting was held on May 23, 2022, to provide information on the Project and receive additional comments on issues to be addressed in the EIR; and

WHEREAS, on May 22, 2023, the City of Moorpark Community Development Department published pursuant to CEQA a Notice of Availability and the Draft EIR for the Moorpark Civic Center Master Plan (State Clearinghouse Number 2022050175) analyzing the Project's potential impacts on the environment and accepted public comments in accordance with CEQA Guidelines Section 15105 for a period of 45 days between May 22, 2023 and July 6, 2023; and

WHEREAS, the City prepared written responses to all comments received on the Draft EIR and those responses to comments are incorporated into the Final EIR. The Responses to Comments were distributed with the Final EIR to all public agencies that submitted comments on the Draft EIR at least 10 days prior to certification of the Final EIR; and

WHEREAS, the Final EIR is comprised of the Draft EIR dated May 2023 and all appendices thereto, the Comments and Responses to Comments on the Draft EIR, the clarifications, revisions, and corrections to the Draft EIR, and the Mitigation Monitoring and Reporting Program, and the July 2023 Final EIR.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The findings made in this Resolution are based upon the information and evidence set forth in the Final EIR (attached hereto as Exhibit B) and upon other substantial evidence that has been presented at the hearings and in the record of the proceedings. The Final EIR, agenda reports, technical studies, appendices, plans, specifications, and other documents and materials that constitute the record of proceedings on which this Resolution is based are on file for public examination during normal business hours at the City of Moorpark Community Development Department, 799 Moorpark Avenue, Moorpark, CA 93021. Each of these documents is incorporated herein by reference.

SECTION 2. The Planning Commission finds that agencies and interested members of the public have been afforded ample notice and opportunity to comment on the Final EIR and Project.

SECTION 3. Prior to taking action, the Planning Commission has heard, been presented with, reviewed and considered the information and data in the record, including oral and written testimony presented for and during public hearings. The City's independent environmental consultants, City staff, and the Project Applicant's environmental consultants reviewed and analyzed the comments received on the Project's environmental review. No comments or any additional information submitted to the City have produced any substantial new information requiring additional environmental review or re-circulation of the EIR pursuant to CEQA because no new significant environmental impacts were identified, nor was any substantial increase in the severity of any previously disclosed environmental impacts identified.

SECTION 4. The Planning Commission, pursuant to CEQA Guidelines Section 15090, certifies that the Final EIR: 1) reflects the Planning Commission's independent judgment and analysis; 2) was presented to, and reviewed and considered by, the Planning Commission; and 3) has been completed in compliance with CEQA.

SECTION 5. Pursuant to Public Resources Code section 21081.6, the Planning Commission adopts the Mitigation Monitoring and Reporting Program included herewith in Exhibit B and incorporated herein by reference, and adopt each mitigation measure set forth therein, and impose each mitigation measure as a condition of the Project's approval.

SECTION 8. FINDING OF GENERAL PLAN CONSISTENCY: The Planning Commission hereby finds the Project and all associated actions to be consistent with the

General Plan based upon the information set forth in the staff report(s), accompanying studies, the Project Final EIR and appendices, and oral and written public testimony, including but not limited to the General Plan Consistency Analysis provided in Section 4.10 (Land Use and Planning) of the Draft EIR incorporated by reference.

SECTION 2. CONDITIONAL USE PERMIT FINDINGS: Based upon the information set forth in the staff report(s), accompanying studies, and oral and written public testimony, the Planning Commission makes the following findings in accordance with City of Moorpark, Municipal Code Section 17.44.040(C):

- A. The proposed use is consistent with the provisions of the General Plan, zoning ordinance, and all applicable regulations in that the proposed use would be permitted within Mixed-Use Medium (MUM) zone and the Downtown Specific Plan area. The proposed use is also consistent, with General Plan Land Use Element Goal No. 3.8: Public services and facilities: Support a diversity of uses and services supporting Moorpark's residents such as facilities for governance and administration, public safety, seniors and youth, community gatherings, and comparable activities and General Plan Land Use Element Goal No. 9.18: Library and lifelong learning: Provide and promote a state-of-the-art library that offers resources and engaging programs to meet the varied educational, cultural, civic, and general business needs of all residents and support opportunities for lifelong learning and enrichment. Additionally, the proposed use is consistent with General Plan Land Use Element Goal No. 17.1: Services supporting Moorpark's residents: Provide public facilities and services that are cost effective, and contribute to the health, safety, welfare, and personal development of all residents and General Plan Land Use Element Goal No. 19.1: Core community district: Support the continued development of the area along High Street as a distinct place identified as the symbolic and functional downtown of Moorpark. The proposed use is also consistent with Downtown Specific Plan Land Use Goal No. 3.3.3 f): Continue to maintain a civic presence in downtown through the expansion of the Civic Center area to provide for an enlarged City Hall and Library.
- B. The proposed use is compatible with both existing and permitted land uses in the surrounding area. The proposed Project would replace the existing City library located to the north east, located on the City's Civic Center site. Surrounding uses include commercial stores and services, residences, post office, and City Hall.
- C. The proposed use is compatible with the scale, visual character, and design of surrounding properties. The proposed structure has undergone significant public review by the public, City Council, and Planning Commission to find the agrarian architectural style desirable in the downtown core. The architectural style, scale, features, and design are consistent with design guidelines set forth in the Downtown Specific Plan and applicable design standards in the MUM zone.
- D. The proposed use would not be obnoxious or harmful or impair the utility of neighboring property or uses. The proposed Project would operate with similar



programing, hours of operation, and staff as the existing library which it will replace, which has been beneficial to the surrounding community.

- E. The proposed use would not be detrimental to the public health, safety, convenience, or welfare in that Conditions of Approval (Exhibit B) have been included to ensure the Project would not generate negative impacts on the surrounding area and the proposed library is planned to operate similarly as the existing library which has not demonstrated negative impacts to public health, safety, convenience, or welfare.

SECTION 3. PLANNING COMMISSION APPROVAL: The Planning Commission hereby approves CUP CD-CUP-2023-0013 subject to the Conditions of Approval found in Exhibit A attached.

SECTION 4. FILING OF THE RESOLUTION: The Community Development Director shall cause a certified resolution to be filed in the book of original resolutions.

The action of the foregoing direction was approved by the following vote:

AYES: Commissioner Alva, Di Cecco, Hamalainen, Landis and Chair Barrett

NOES:

ABSENT:

ABSTAIN:

PASSED, AND ADOPTED this 27<sup>th</sup> day of February 2024.

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Christopher Barrett, Chair

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Carlene Saxton  
Community Development Director

Exhibit A – Conditions of Approval

Exhibit B – Final Environmental Impact Report dated July 2023, including Mitigation Monitoring and Reporting Program

programing, hours of operation, and staff as the existing library which it will replace, which has been beneficial to the surrounding community.

- E. The proposed use would not be detrimental to the public health, safety, convenience, or welfare in that Conditions of Approval (Exhibit B) have been included to ensure the Project would not generate negative impacts on the surrounding area and the proposed library is planned to operate similarly as the existing library which has not demonstrated negative impacts to public health, safety, convenience, or welfare.

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ABSTAIN:

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Christopher Barrett, Chair



Carlene Saxton  
Community Development Director

Exhibit A – Conditions of Approval

Exhibit B – Final Environmental Impact Report dated July 2023, including Mitigation Monitoring and Reporting Program

## EXHIBIT A

### CITY OF MOORPARK CONDITIONS OF APPROVAL

**Project Approval Date:**

**Expiration Date:**

**Location:** 83 High Street, Moorpark

**Entitlements:** Conditional Use Permit No. CD-CUP-2023-0013

**Project Description:** Allow the development and operation of a new 17,272 square foot City library and associated site improvements located at 83 High Street ("Project Site"), and demolition of the existing 7,900 square foot public library structure located at 699 Moorpark Avenue ("Project"), on an application of Jessica Sandifer on behalf of the City of Moorpark ("Applicant").

**The applicant/permittee is responsible for the fulfillment of all conditions and standard development requirements, unless specifically stated otherwise.**

#### **General Conditions**

In addition to complying with all applicable City, County, State and Federal Statutes, Codes, Ordinances, Resolutions and Regulations, Development Agreements, Permittee expressly accepts and agrees to comply with the following Conditions of Approval and Standard Development Requirements of this Permit:

1. The Conditions of Approval of this entitlement and all provisions of the Subdivision Map Act, City of Moorpark Municipal Code and adopted City policies at the time of the entitlement approval, supersede all conflicting notations, specifications, dimensions, typical sections and the like which may be shown on said plans or on the entitlement application. This language shall be added as a notation to the to the final plans for the entitlement. [CDD]
2. Conditions of this entitlement may not be interpreted as permitting or requiring any violation of law or any unlawful rules or regulations or orders of an authorized governmental agency. [CDD]
3. Should continued compliance with these Conditions of Approval not be met, the Community Development Director may modify the conditions in accordance with Municipal Code Section 17.44.100 and sections amendatory or supplementary thereto, declare the project to be out of compliance, or the Director may declare, for some other just cause, the project to be a public nuisance. The applicant shall be liable to the City

for any and all costs and expenses to the City involved in thereafter abating the nuisance and in obtaining compliance with the Conditions of Approval or applicable codes. If the applicant fails to pay all City costs related to this action, the City may enact special assessment proceedings against the parcel of land upon which the nuisance existed (Municipal Code Section 1.12.170). [CDD]

4. If any of the conditions or limitations of this approval are held to be invalid, that holding does not invalidate any of the remaining conditions or limitations set forth. [CDD]
5. All facilities and uses, other than those specifically requested in the application and approval and those accessory uses allowed by the Municipal Code, are prohibited unless otherwise permitted through application for Modification consistent with the requirements of the zone and any other adopted ordinances, specific plans, landscape guidelines, or design guidelines. [CDD]
6. Condition Compliance: Prior to the issuance of any zoning clearance, building permit, grading permit, or advanced grading permit, the applicant shall submit to the Community Development Department the Condition Compliance review deposit and a matrix indicating how each condition has been complied with. [CDD]
7. Any expansion, alteration, or change in architectural elements requires prior approval of the Community Development Director. Those changes in architectural elements that the Director determines may only be allowed, if, in the judgment of the Community Development Director such change is compatible with the surrounding area. Any approval granted by the Director must be consistent with the approved Design Guidelines (if any) for the planned development and applicable Zoning Code requirements. A Permit Modification application may be required as determined by the Community Development Director. [CDD]
8. If any hazardous waste or material is encountered during the construction of this project, all work must be immediately stopped and the Ventura County Environmental Health Department, the Ventura County Fire Protection District, the Moorpark Police Department, and the Moorpark City Engineer and Public Works Director must be notified immediately. Work may not proceed until clearance has been issued by all of these agencies. [CDD, VCFPD, MPD, VCEHD, & PW]
9. Mechanical equipment for the operation of the building should be ground mounted and screened to the satisfaction of the Community Development Director, except as otherwise permitted by this CUP to allow screened roof mounted equipment within a roof parapet. The Community Development Director may approve other roof-mounted equipment, in which case, all parts of the roof mounted equipment (such as vents, stacks, blowers, air conditioning equipment, etc.) should be screened below the lowest parapet on the roof; and should be painted the same color as the roofing material. No piping, roof ladders, vents, exterior drains and scuppers or any other exposed equipment may be visible on the roof, except as required by Building Code. [CDD]

10. Any outdoor ground level equipment, facilities or storage areas including, but not limited to loading docks, trash enclosures, cooling towers, generators, must be architecturally screened from public view with masonry wall and/or landscaping as determined by the Community Development Director. [CDD]
11. Prior to the issuance of a grading permit for each project phase, the applicant shall demonstrate adequate sight distance at all street intersections, in a manner meeting the approval of the City's Public Works Department. [CDD & PW]
12. Prior to the issuance of any grading permits, the applicant shall demonstrate that applicable improvements for that phase from the Project's Traffic Study have been incorporated into Project design, in a manner meeting the approval of the City's Public Works Department. [CDD & PW]
13. The building plans must be in substantial conformance to the plans approved under this entitlement and must specifically include the following:
  - a. Transformers, backflow prevention devices, fire department apparatus, and cross connection water control devices (subject to approval by Ventura County Waterworks District No. 1), screened from street view with a masonry wall and/or landscaping as determined by the Community Development Director.
  - b. Bicycle racks or storage facilities, shall be provided in quantities as required by the Municipal Code.
  - c. If drains from the loading area are connected to the sewer system, they are subject to the approval of Ventura County Waterworks District No. 1.
  - d. Final exterior building materials and paint colors consistent with the approved plans under this permit. Any changes to the building materials and paint colors are subject to the review and approval of the Community Development Director.
  - e. Identification of coating or rust-inhibitive paint for all exterior metal building surfaces to prevent corrosion and release of metal contaminants into the storm drain system.
  - f. Trash disposal and recycling areas in locations which will not interfere with circulation, parking, or access to the building. Exterior trash areas and recycling bins must use impermeable pavement and be designed to have a cover and so that no other area drains into it. The trash areas and recycling bins must be depicted on the final construction plans, the size of which must be approved by the Community Development Director, City Engineer and Public Works Director and the City's Solid Waste Management staff. When deemed appropriate, drains from the disposal and recycling areas must be connected to the sewer system and subject to the approval of Ventura County Waterworks District

No. 1. Review and approval shall be accomplished prior to the issuance of a zoning clearance for building permit. [CDD & BS]

14. A final landscape plan shall be prepared to align with the library site plan and to address all requirements of the City's Landscape Design Standards and Guidelines and the Ventura County Fire Department standards for landscape in the High Fire Severity Zone or applicable fire zone at the time of approval. The final landscape plan shall be approved by the Ventura County Fire Department and the Community Development Director prior to installation. [CDD & VCFPD]
15. All landscaping must be maintained in a healthy and thriving condition, free of weeds, litter and debris. All paved surfaces: including, but not limited to, the parking area and aisles, drive-through lanes, on-site walkways must be maintained free of litter, debris and dirt. Walkways, parking areas and aisles and drive-through lanes must be swept, washed, or vacuumed regularly. When swept or washed, litter, debris and dirt must be trapped and collected to prevent entry to the storm drain system in accordance with NPDES requirements. [CDD & PW]
16. Prior to issuance of a building permit, the Applicant shall pay all required fees for applicable Development Impact Fees required of the Project by outside agencies. [CDD & BS]
17. Tree Survey and Landscaping Plan. Prior to the issuance of a grading permit, a tree survey must be prepared to determine the valuation of the mature trees to be removed. Thereafter, a landscaping plan shall be prepared which incorporates replacement tree plantings consistent with the City's Tree Ordinance, which would be submitted to the City's Community Development Director for review and approval. [CDD & PRCS]
18. A 15-mile per hour speed limit must be observed with all construction areas. This condition shall be noted on all grading or building permits plans prior to permit issuance. [CDD & PW]
19. The Project's grading, construction, and demolition activities shall comply with Section 15.26 of the City's Municipal Code, which requires contractors to not engage in or conduct any noise-generating outdoor construction work, except between the hours of 7:00 AM and 7:00 PM, Monday through Saturday, unless a permit for different hours has been issued. [CDD, BS, & PW]
20. The Project shall comply with Chapters 9.28, 10.04, 12.24 and 17.53 of the Moorpark Municipal Code and any provision amendatory or supplementary thereto, as a standard requirement for construction noise reduction. [CDD & BS]
21. Beginning in 2030, prior to issuance of a grading permit, the Project's Construction Manager shall demonstrate to the City's Community Development Department that construction documents require the construction contractors to implement the following



measures: a. All off-road diesel-powered construction equipment greater than 50 horsepower (hp) used during phases 3 and 4 shall, at a minimum, meet Tier 3 off-road emissions standards. b. A copy of each unit's certified offroad engine Tier specification shall be provided to the City at the time of mobilization of each applicable unit of equipment. [CDD & APCD]

22. As applicable, during construction of the Project, the Applicant and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) Rule 62.7, Asbestos-Demolition and Renovation, which imposes notification, emission control, training and licensing, warning signage, containment area, and record keeping requirements on projects involving the demolition and renovation operations and the associated disturbance of asbestos-containing material (ACM). [CDD, BS, & APCD]
23. Nesting Bird Survey. If construction and/or vegetation removal must be initiated during the peak nesting season (i.e., February 1 to August 31), a preconstruction nesting bird survey shall be conducted by a qualified Biologist within 14 days prior to the beginning of Project-related activities (including but not limited to clearing, grubbing, vegetation removal, grading, and building demolition). If project-related construction activities lapse for greater than 14 days during the peak nesting season, an additional nest survey shall be conducted before work can be reinitiated. If the Biologist finds an active nest within or adjacent to the construction area (within 200 feet for all birds protected under California Fish and Game Code and the Migratory Bird Treaty Act and within 500 feet for raptors), the Biologist shall identify an appropriate protective buffer zone around the nest depending on the sensitivity of the species, the nature of the construction activity, and the amount of existing disturbance in the vicinity. In general, the Biologist should designate a buffer of 10 to 200 feet for common nesting birds and 200 to 500 feet for special status nesting birds and nesting raptors. Construction activities within the buffer shall only proceed after a qualified biologist determines the nest is no longer active due to natural causes (e.g., young have fledged, predation, or other non-human causes of nest failure) to maintain compliance with California Fish and Game Code and the Migratory Bird Treaty Act. [CDD]
24. Jurisdictional Drainage Avoidance and Regulatory Permitting. Impacts to jurisdictional waters within the Project Site will be avoided to the extent feasible. If such impacts are unavoidable, then permits/ certifications/ agreements from the United States Army Corp of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) are required. A pre-application meeting with these agencies is recommended prior to submittal of permit applications to discuss existing conditions; confirm the agencies' jurisdiction over water resources on the study area; discuss impacts to these resources that would result from the Project; discuss proposed avoidance, minimization, and mitigation measures to offset these impacts; and to discuss the regulatory permitting process. Following the preapplication meeting, the Project Applicant would prepare and process the appropriate permits (e.g., a Section 404 Permit from the USACE in the form of a Nationwide Permit or Individual Permit, a Section 401 Water Quality Certification from the RWQCB, and/or a CDFW Section 1602



Notification of Lake or Streambed Alteration). Additional permit conditions may be required by the resource agencies regarding impacts to areas under their respective jurisdictions. Standard construction Best Management Practices (BMPs) shall be implemented to prevent toxins, chemicals, or petroleum products from entering the culverts and degrading water quality. [CDD]

25. Greenhouse Gas Emissions - The Project is required to comply with the applicable requirements established under the Green Building Standards Code Title 24 development standards. [CDD & BS]
26. Hazardous Materials - Applicant/operator shall store, manifest, transport, and dispose of all on-site generated waste that meets hazardous waste criteria in accordance with California Code of Regulations Title 22 and in a manner to the satisfaction of the Manager, HCA/Hazardous Materials Program. Applicant shall keep storage, transportation, and disposal records on site and open for inspection to any government agency upon request. [CDD & BS]
27. Transport of Hazardous Materials - Transport of materials deemed as hazardous must comply with the requirements of Title 22, Division 4.5 of the California Code of Regulations, the U.S. Department of Transportation regulations in the Code of Federal Regulations (specifically, Title 49, Hazardous Materials Transportation Act and Title 40, Part 263, Subtitle C of Resource Conservation and Recovery Act), California Department of Transportation (Caltrans) standards, and Occupational Safety and Health Administration (OSHA) standards. [CDD & BS]
28. Prior to issuance of a demolition permit for any buildings or facilities, building materials shall be assessed by a qualified Environmental Professional as defined in Section 312.10 of 40 CFR Part 312 for the presence of lead-based paints (LBPs), asbestos-containing materials (ACM), and other common hazardous building materials (e.g., polychlorinated biphenyl [PCB]- containing lighting ballasts and mercury-containing light tubes and switches). If determined to be present, the Applicant shall prepare an abatement plan for their removal and safe transport in compliance with State and federal regulations, including Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (specifically Title 29, Part 1926) and South Coast Air Quality Management District (SCAQMD) Rule 1403. The abatement plan shall meet the satisfaction of the County Environmental Health Division. [CDD & BS]
29. As applicable, any future tenant or operator that may handle store, or transport hazardous materials, or generate hazardous waste at or above the reportable thresholds shall be reported to the Ventura County Environmental Health Division's Certified Unified Program Agency (CUPA). [CDD & VCEHD]
30. Prior to issuance of a building permit for each new building within the Project Site, the applicant is required to obtain a will-serve letter or equivalent from dry utility providers demonstrating their capacity to serve the Project for electricity, natural gas, and

telecommunications, if needed. The will-serve letters must be submitted to the Community Development Department for review prior to issuance of a building permit. [CDD & BS]

31. Prior to issuance of a building or demolition permit for each new building or building to be demolished within the Project Site, the applicant shall submit a Construction and Demolition Materials Management Plan Estimate for the review and approval of the City's Solid Waste Management staff and Building and Safety Division for recycling of waste materials consistent with applicable City and State requirements. The Plan must include estimated quantities for each type of material to be diverted or landfilled. [CDD & BS]
32. Prior to issuance of Certificate of Occupancy for new structures within the Project Site, the applicant must submit a Final Report Construction and Demolition Waste Letter of Documentation (including premium gate tickets) to the Building and Safety Division, demonstrating compliance with the Construction and Demolition Materials Management Plan Estimate and indicating the total amount of construction and demolition waste diverted. [CDD & BS]

### **Mitigation Monitoring and Reporting Program**

33. All mitigation measures required as part of an approved Mitigation Monitoring Report and Program (MMRP) for this entitlement are hereby adopted and included as requirements of this entitlement. Where conflict or duplication between the MMRP and the Conditions of Approval occurs the Community Development Director shall determine compliance so long as it does not conflict with the California Environmental Quality Act and the more restrictive measure or condition shall apply. Applicable mitigation measures have been reproduced below for reference. Mitigation measures that are applicable to future phases of the Project have not been shown in the Conditions of Approval for Phase 1 for construction of a new library and demolition of the existing library. The complete text of the MMRP is included in Exhibit B, starting on page 4-1, attached to Resolution No. PC-2024-706. [CDD]
34. MMRP BIO-2 - The Applicant shall retain a qualified biologist to conduct a pre-construction survey for the burrowing owl between 14 and 30 days prior to the initial ground disturbance on the western portion of the Project Site. The preconstruction survey shall include the area of proposed disturbance plus a 500-foot buffer (if access is available and habitat is present). If an active burrow is observed outside the breeding season (September 1 to January 31) and it cannot be avoided, the burrowing owl shall be passively excluded from the burrow following methods described in California Department of Fish and Wildlife ("CDFW") 2012. Prior to any burrowing owl exclusion efforts, an exclusion plan will be prepared and submitted to CDFW for review and approval. The plan will include all details on passive relocation including that one-way doors shall be used to exclude owls from the burrows; doors shall be left in place for at least 48 hours. Once the burrow is determined to be unoccupied, the burrow shall be closed by a qualified Biologist who shall excavate the burrow using hand tools. Prior to excluding an owl from an active

burrow, a receptor burrow survey shall be conducted to confirm that at least two potentially suitable unoccupied burrows are within approximately 688 feet prior to installation of the one-way door. If two natural receptor burrows are not located, one artificial burrow shall be created for every burrow that would be closed. If an active burrow is observed outside the breeding season (September 1 to January 31) and it can be avoided, the Biologist shall determine an appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 160 feet to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an environmentally sensitive area (ESA) on construction plans. If an active burrow is observed during the breeding season (February 1 to August 31), the active burrow shall be protected until nesting activity has ended (i.e., all young have fledged from the burrow). The Biologist shall determine the appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 650 to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an ESA on construction plans. Construction shall be allowed to proceed when the qualified Biologist has determined that all fledglings have left the nest. [CDD]

35. MMRP CUL-1- Prior to the start of Project phases that involve work within 75 feet of the Tanner Building, protection measures shall be developed in a formal plan for the adjacent Tanner Corner Building at 601 Moorpark Avenue. Protection measures shall include at a minimum: (1) clear denotation in the project construction plans that the project is located directly adjacent to an historical resource, marking the location of the Tanner Corner Building; (2) a protocol for informing all construction workers of the presence of the historical resource and making them aware of the protocol to avoid and protect it; (3) a list of approved construction equipment/distances in consideration of any identified groundborne vibration impacts; (4) recommendations for specific protective fencing and signage to be implemented during construction; and (5) if determined appropriate based on the results of the groundborne vibration analysis, recommendations for construction monitoring (pre-, post-, and during construction). The protection plan shall be prepared by a qualified architectural historian/historic preservation professional, clearly identify all responsible parties with their contact information, and be appended to the final set of construction plans. (Also see MMRP NOI-2, Noise, which relates to vibration monitoring requirements). [CDD, BS, & PW]
36. MMRP GEO-1- Prior to approval of grading plans, the Applicant shall demonstrate, to the satisfaction of the City's Planning Division that the recommendations in the project's geotechnical reports and in any future geotechnical reports have been fully and appropriately incorporated (OGI 2017a and 2017b). [CDD & PW]
37. MMRP NOI-1- Prior to the start of grading of each Project phase, the Project applicant shall provide evidence acceptable to the City's Community Development Department, that: a. All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. b. Stationary equipment, such as generators and air compressors, would be located as far from local residences and Walnut Canyon

Elementary School, as feasible. c. Equipment maintenance and staging areas would be located as far away from local residences and Walnut Canyon Elementary School, as feasible. d. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings and Walnut Canyon Elementary School. [CDD, BS, & PW]

38. MMRP NOI-2- During construction activities, the Project Applicant will ensure that ongoing vibration monitoring is conducted for Project activities within 75 feet of the Tanner Corner Building as specified below.

- Whenever vibratory replacement activities occur within 75 feet of the Tanner Corner Building.
- Whenever Deep Soil Mixing activities occur within 50 feet of the Tanner Corner Building.
- Whenever general construction equipment is utilized within 25 feet of the Tanner Corner Building.

If vibration levels at the Tanner Corner Building reach or exceed 0.25 ppv, there is a potential for building damage and an immediate stop work order will be issued. Alternative construction methods or vibration reduction measures will then be determined that keep vibration exposure levels below 0.25 ppv. [CDD, BS, & PW]

### **Ground Disturbances**

39. Archeological Training: Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training conducted by a qualified archaeologist. Issues that shall be included in the basic training will be geared toward training the applicable construction crews in the identification of archaeological deposits, further described below. Training will include written notification of the restrictions regarding disturbance and/or removal of any portion of archaeological, paleontological, or historical deposits and the procedures to follow should a resource be identified. The construction contractor, or its designee, shall be responsible for implementation of this measure. A tribal monitor shall be provided an opportunity to attend the pre-construction briefing if requested. Staff from the Community Development Department shall be made aware of the training and have the opportunity to attend the training. [CDD]

40. Historical Resource Training: Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training regarding the historical resource located adjacent to the Project Site, identified as Tanner Corner. As part of the archeological training identified in Condition No. 52, or as part of a separate training, all construction personnel shall be made aware of the sensitivity of the historic resource and protocols identified in MMRP CUL-1. Staff from the Community Development Department shall be made aware of the training and have the opportunity to attend the training. [CDD]

41. If any archeological, paleontological, or historical finds are uncovered during grading or excavation operations, all grading or excavation shall immediately cease in the immediate

area and the find must be left untouched. The applicant, in consultation with the project paleontologist or archeologist, shall assure the preservation of the site and immediately contact the Community Development Director by phone, in writing by email or hand delivered correspondence informing the Director of the find. In the absence of the Director, the applicant shall so inform the City Manager and Planning Manager. The applicant shall be required to obtain the services of a qualified paleontologist or archeologist, whichever is appropriate to recommend disposition of the site. The paleontologist or archeologist selected must be approved in writing by the Community Development Director. The applicant shall pay for all costs associated with the investigation and disposition of the find. [CDD]

42. Inadvertent Discovery of Human Remains. In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or are believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, the disposition of the human remains. [CDD]

43. Paleontological Plan. If paleontological remains are discovered, a paleontological mitigation plan outlining procedures for paleontological data recovery must be prepared and submitted to the Community Development Director for review and approval. The development and implementation of this Plan must include consultations with the Applicant's engineering geologist as well as a requirement that the curation of all specimens recovered under any scenario will be through the Los Angeles County Museum of Natural History (LACMNH). All specimens become the property of the City of Moorpark unless the City chooses otherwise. If the City accepts ownership, the curation location may be revised. The monitoring and data recovery should include periodic inspections of excavations to recover exposed fossil materials. The cost of this data recovery is limited to the discovery of a reasonable sample of available material. The interpretation of reasonableness rests with the Community Development Director. [CDD]

#### **Permit Specific Conditions – Conditional Use Permit**

44. This CUP is granted or approved with the City's designated approving body retaining and reserving the right and jurisdiction to review and to modify the permit-including the conditions of approval-based on changed circumstances. Changed circumstances include, but are not limited to, major modification of the use; a change in scope, emphasis,



size, or nature of the use; the expansion, alteration, reconfiguration, or change of use; or the fact that the use is negatively impacting surrounding uses by virtue of impacts not identified at the time of application for the conditional use permit or impacts that are much greater than anticipated or disclosed at the time of application for the CUP. The reservation of right to review any permit granted or approved under this chapter by the City's designated approving body is in addition to, and not in lieu of, the right of the City, its Planning Commission, City Council, and designated approving body to review and revoke or modify any permit granted or approved under this chapter for any violations of the conditions imposed on such permit.

45. Parking areas must be developed and maintained in accordance with the requirements of the Moorpark Municipal Code. All parking space and loading bay striping must be maintained so that it remains clearly visible during the life of the development. [CDD]
46. Project Site shall provide a minimum of 65 parking spaces onsite, as stipulated by this CUP. The Project includes 70 parking spaces. Minor revisions to the parking space count, layout, or design may be authorized by the Community Development Director. [CDD]
47. Outdoor live entertainment, amplified music, or sound shall not begin before 7 a.m. nor conclude after 10 p.m., except for hours being expanded for special events or temporary use permits with express consent of the Community Development Director or their designee. [CDD]
48. The applicant shall comply with "Chapter 8.32 Prohibiting Smoking In Public Places" at all times and shall provide signs consistent with Section 8.32.040 of the Moorpark Municipal Code to the satisfaction of the Community Development Director, prior to initiation of the uses allowed by this permit. [CDD]
49. All necessary building permits must be obtained from the Building and Safety Department and the Public Works Department prior to start of construction activities. [CDD, BS, & PW]
50. No hazardous materials shall be used, stored, or generated on site that are subject to regulation under any federal or state or local laws from time to time in effect concerning hazardous, toxic or radioactive materials. The foregoing restriction shall not extend to hazardous substances typically found or used in establishments within first class enclosed regional Shopping Centers and are maintained only in such quantities as are reasonably necessary for Applicant's operations in the premises. [CDD]

### **Department and Agency Requirements**

#### **Public Works and Engineering Department (PW)**

##### **ENGINEERING DIVISION**

51. Prior to construction, applicant shall submit a construction traffic control plan for the review and acceptance by the City Engineer and Public Works Director. Traffic control

plan shall include construction advisory speed limits, speed limit posting locations, and enforcement measures if needed. [PW]

52. Prior to any work being conducted within any State, County, or City right-of-way, the applicant shall obtain all necessary encroachment permits from the appropriate agencies and provide copies of these approved permits and the plans associated with the permits to the City Engineer and Public Works Director. [PW]
53. Reactive organic compounds, Nitrogen oxides (ozone/smog precursor), and particulate matter (aerosols/dust) generated during construction operations must be minimized in accordance with the City of Moorpark standards and the standards of the Ventura County Air Pollution Control District (APCD). When an air pollution Health Advisory has been issued, construction equipment operations (including but not limited to grading, excavating, earthmoving, trenching, material hauling, and roadway construction) and related activities must cease in order to minimize associated air pollutant emissions. [PW & VCAPCD]
54. The applicant shall utilize all prudent and reasonable measures (including installation of a 6-foot-high chain link fence around the construction site(s) and/or provision of a full-time licensed security guard) to prevent unauthorized persons from entering the work site at any time and to protect the public from accidents and injury. [PW, CDD, & BS]
55. Prior to construction, the applicant shall post, in a conspicuous location, the construction hour limitations and make each construction trade aware of the construction hour limitations to the satisfaction of the City. [CDD & PW]
56. Prior to the issuance of a grading permit, whichever comes first, the applicant shall post sufficient surety with the City, in a form acceptable to the City Engineer and Public Works Director, guaranteeing completion of all onsite and offsite improvements required by these Conditions of Approval and/or the Municipal Code including, but not limited to grading, street improvements, storm drain improvements, temporary and permanent Best Management Practice (BMP) for the control of non-point water discharges, landscaping, fencing, and bridges. Grading and improvements must be designed, bonded, and constructed as a single project. [PW]
57. Prior to the issuance of a grading permit, whichever occurs first, the applicant shall provide written proof to the City Engineer and Public Works Director that any and all wells that may exist or have existed within the project have been properly sealed, destroyed or abandoned per Ventura County Ordinance No. 2372 or Ordinance No. 3991 and per California Department of Conservation, Division of Oil, Gas, and Geothermal Resources requirements. [PW]
58. During grading, the project geotechnical engineer shall observe and approve all keyway excavations, removal of fill and landslide materials down to stable bedrock or in-place material, and installation of all sub-drains including their connections. All fill slope construction must be observed and tested by the project geotechnical engineer, and the



density test results and reports submitted to the City Engineer and Public Works Director to be kept on file. Cuts and slopes must be observed and mapped by the project geotechnical and civil engineers who will provide any required slope modification recommendations based on the actual geologic conditions encountered during grading. Written approval from the City Engineer and Public Works Director must be obtained prior to any modification. [PW]

59. Written weekly progress reports and a grading completion report must be submitted to the City Engineer and Public Works Director by the project geotechnical engineers. These reports must include the results and locations of all compaction tests, as-built plans of all landslide repairs and fill removal, including geologic mapping of the exposed geology of all excavations showing cut cross-sections and sub-drain depths and locations. The lists of excavations approved by the engineering geologist must also be submitted. Building permits will not be issued without documentation that the grading and other pertinent work has been performed in accordance with the geotechnical report criteria and applicable Grading Ordinance provisions. [PW]
60. During grading, colluvial soils and landslide deposits within developed portions of the properties must be re-graded to effectively remove the potential for seismically-induced landslides in these materials. Additional buttressing, keying and installation of debris benches must be provided in transition areas between non-graded areas and development as recommended in the final geotechnical reports by the project geotechnical engineer. [PW]
61. Temporary irrigation, hydroseeding and erosion control measures, approved by the Community Development Director, City Engineer and Public Works Director, must be implemented on all temporary grading. Temporary grading is defined to be any grading partially completed and any disturbance of existing natural conditions due to construction activity. These measures will apply to a temporary or permanent grading activity that remains or is anticipated to remain unfinished or undisturbed in its altered condition for a period of time greater than thirty (30) calendar days except that during the rainy season (October 1 to April 15), these measures will be implemented immediately. [CDD & PW]
62. Grading may occur during the rainy season from October 1 to April 15, subject to timely installation of erosion control facilities when approved in writing by the City Engineer, Public Works Director and the Community Development Director and when erosion control measures are in place. In order to start or continue grading operations between October 1 and April 15, project-specific erosion control plans that provide detailed Best Management Practices for erosion control during the rainy season must be submitted to the City Engineer and Public Works Director no later than September 1 of each year that grading is in progress. During site preparation and construction, the contractor shall minimize disturbance of natural groundcover on the project site until such activity is required for grading and construction purposes. During the rainy season, October 1 through April 15, all graded slopes must be covered with a woven artificial covering immediately after completion of each graded slope. Grading operations must cease if the applicant fails to place effective best management measures on graded slopes

immediately after construction. No slopes may be graded or otherwise created when the National Weather Service local three-day forecast for rain is twenty percent (20%), or greater, unless the applicant is prepared to cover the permanent and temporary slopes before the rain event. The artificial covering and planting will be to the satisfaction of the Community Development Director, City Engineer, and Public Works Director. [CDD & PW]

63. Prior to construction, the applicant shall comply with the City of Moorpark standard requirements for dust control, including, but not be limited to, minimization of ground disturbance, application of water/chemicals, temporary/permanent ground cover/seeding, street sweeping, and covering loads of dirt for the review and approval of the City Engineer and Public Works Director. All clearing, grading, earth moving, excavation, soil import and/or soil export operations must cease during periods of high winds (greater than 15 mph averaged over one hour). [PW]
64. At least one (1) week prior to commencement of grading or construction, the applicant shall prepare a notice that grading or construction work will commence. This notice shall be posted at the site and mailed to all owners and occupants of property within five-hundred feet (500') of the exterior boundary of the project site, as shown on the latest equalized assessment roll. The notice must include current contact information for the applicant, including all persons with authority to indicate and implement corrective action in their area of responsibility, including the name of the contact responsible for maintaining the list. The names of individuals responsible for noise and litter control, tree protection, construction traffic and vehicles, erosion control, and the twenty-four (24) hour emergency number, must be expressly identified in the notice. The notice must be re-issued with each phase of major grading and construction activity. A copy of all notices must be concurrently transmitted to the Community Development Department. The notice record for the City must be accompanied by a list of the names and addresses of the property owners notified and a map identifying the notification area. [CDD & PW]
65. Applicant has full right to exercise the service of a new engineer in charge at any time during a project. When there is a change in engineer, the applicant/owner shall notify the City Engineer and Public Works Director in writing within 48 hours of such change. Said letter shall specify successor California Registered Civil Engineer and shall be stamped and signed and dated by said engineer in responsible charge and shall accept responsibility of project. The letter will be kept on file at the City. [PW]

#### PUBLIC AND PRIVATE STREETS AND RELATED IMPROVEMENTS

66. Prior to construction of any public improvement, the applicant shall submit to the City Engineer and Public Works Director, for review and acceptance, street improvement plans prepared by a California Registered Civil Engineer, and enter into an agreement with the City of Moorpark to complete public improvements, with sufficient surety posted to guarantee the complete construction of all improvements, except as specifically noted in these Standard Conditions or Special Conditions of Approval. [PW]

67. Prior to issuance of the first building permit, all existing and proposed utilities, including electrical transmission lines less than 67Kv, must be under-grounded consistent with plans approved by the City Engineer, Public Works Director and Community Development Director. [CDD & PW]
68. Prior to final inspection of improvements, the project Registered Civil Engineer shall submit certified original "record drawing" plans and the appropriate plan revision review fees to the City Engineer and Public Works Director along with electronic files in a format satisfactory to the City Engineer and Public Works Director. These "record drawing" plans must incorporate all plan revisions and all construction deviations from the approved plans and revisions thereto. The plans must be "record drawings" on 24" X 36" Mylar® sheets (made with proper overlaps) with a City title block on each sheet. In addition, the applicant shall provide an electronic file update of the City's Master Base Map electronic file, incorporating all streets, sidewalks, streetlights, traffic control facilities, street striping, signage and delineation, storm drainage facilities, water and sewer mains, lines and appurtenances and any other utility facility installed for this project. [PW]
69. Prior to reduction of improvement bonds, the applicant must submit reproducible centerline tie sheets on 3-mil polyester film to the City Engineer and Public Works Director. [PW]

#### DRAINAGE AND HYDROLOGY

70. Prior to final review of a grading plan, the applicant shall submit a drainage plan with calculations that analyze conditions before and after development, as well as potential development proposed, approved, or shown in the General Plan for the review and approval of the City Engineer and Public Works Director. Quantities of water, water flow rates, major watercourses, drainage areas and patterns, diversions, collection systems, flood hazard areas, sumps, sump locations, detention and NPDES facilities and drainage courses must be addressed. [PW]
71. Hydrology calculations must be per current Ventura County Watershed Protection Agency Standards and to the satisfaction of the City Engineer and Public Works Director. Development projects within a 100-year flood zone may require a Conditional Letter of Map Revisions (CLOMR) and Letter of Map Revision (LOMR) as determined by the City Engineer and Public Works Director. [PW]
72. Prior to final review and acceptance of grading plan, a drainage plan showing all proposed storm drainage facilities must be designed to the standards of the Ventura County Watershed Protection District Design Hydrology Manual. This includes, but not limited to, hydrologic modeling, design storm modeling, and development mitigation criteria. The development mitigation criteria must address how to mitigate 100-yr developed condition peak back to the 10-yr developed condition peak. [PW]

73. The project shall attenuate the 100-year developed peak flow condition to the 10-year developed condition. This includes no increase in peak flow for the 10-year, 25-year, 50-year, and 100-year design storms. [PW]

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

74. Prior to the start of grading or any ground disturbance, the applicant shall identify a responsible person experienced in NPDES compliance who is acceptable to the City Engineer and Public Works Director. The designated NPDES person (superintendent) shall be present, on the project site Monday through Friday and on all other days when the probability of rain is forty percent (40%) or greater and prior to the start of and during all grading or clearing operations until the release of grading bonds. The superintendent shall have full authority to rent equipment and purchase materials to the extent needed to effectuate Best Management Practices (BMPs). The superintendent shall be required to assume NPDES compliance during the construction of streets, storm drainage systems, all utilities, buildings, and final landscaping of the site. [PW]
75. Prior to the start of grading and any ground disturbance, all storm water quality requirements shall conform to the latest NPDES and MS4 permit requirements. Post-Construction Storm Water Quality BMPs shall conform to the most current Ventura County Technical Guidance Manual for Stormwater Quality Control Measures. [PW]
76. Prior to construction, a Storm Water Quality Report with a post-construction maintenance covenant shall be submitted to the City for review and acceptance by the City Engineer. [PW]
77. Prior to the issuance of any construction/grading permits, the applicant shall demonstrate compliance under California's General Permit for Stormwater Discharges associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing in a manner meeting the satisfaction of the Community Development Department and/or Public Works Department. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the Project Site and be available for review on request. [PW]
78. As part of the project storm drain maintenance covenant, the applicant and/or property owner shall provide verification to the City Engineer and Public Works Director that all on-site storm drains have been cleaned at least twice a year, once immediately prior to October 1st (the rainy season) and once in January. Additional cleaning may be required by the City Engineer and Public Works Director depending upon site and weather conditions. [PW]
79. Prior to Certificate of Occupancy, a Final Storm Water Quality Report and Operations & Maintenance Manual shall be reviewed by the City Engineer for acceptance. [PW]

80. Prior to Certificate of Occupancy, a Storm Water Maintenance Covenant shall be reviewed by the City Engineer for acceptance and recorded with the Ventura County Recorder's Office. [PW]

SITE SPECIFIC ENGINEERING CONDITIONS

81. Prior to construction of the bus turnout, proposed design must meet Ventura County Road Standards Plate D-13, "Bus turnout". Any deviations from the design standards shall be reviewed by the City Engineer and Public Works Director. [PW]
82. Prior to submittal of construction plans, applicant must ensure that all onsite improvements are designed within the legal parcel boundary. [PW]
83. Applicant shall prepare and submit separate, off-site street improvement plans to the City Engineer for review and acceptance. [PW]
84. Applicant shall ensure that all offsite improvements along High Street include a vehicular lane, and a bicycle lane in both the east and west direction. The vehicular and bicycle lane design must accommodate road alignment plans for the future Hitch Ranch project. [PW]
85. Angled parking design along High Street must conform with the City's and/or the American Association of State Highway and Transportation Officials (AASHTO) design standards. [PW]
86. Project building and site planning shall consider the following:
- Future 60' public right-of-way for construction; and
  - Ultimate 80' right-of-way for design. (PW)
87. Prior to final review and acceptance of engineering plans, the applicant shall record a Lot Merger for the parcels identified as Assessor Parcel Numbers ("APNs") 511-0-050-175, 511-0-050-090, and 511-0-050-080, recorded with the Ventura County Recorder's Office. [CDD & PW]
88. Prior to Certificate of Occupancy, applicant shall set all property and centerline monuments.
89. Prior to the issuance of a grading permit for each Project phase, a geotechnical report will be prepared and submitted to the City for review and approval. The geotechnical report shall be prepared by a registered Civil Engineer or certified Engineering Geologist and shall contain site-specific evaluations of the seismic and geologic hazards affecting the project and shall identify recommendations for earthwork and construction. All recommendations from forthcoming site-specific geotechnical studies shall be included in the site preparation and building design specifications. Compliance with this requirement shall be verified by the City as part of the plan approval process. [PW]



90. Prior to the issuance of any grading or building permits, the applicant shall submit for review and approval by the Community Development Department, a Water Quality Management Plan (WQMP) that must include the following minimum contents:
  - Address Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, and conserving natural areas;
  - Incorporate applicable Routine Source Control BMPs; and
  - Include an Operation and Maintenance (O&M) Plan that identifies the mechanism(s) by which long-term O&M of all structural BMPs will be provided. [PW]
91. Prior to the issuance of a certificate of use and occupancy, the applicant shall demonstrate compliance with the WQMP in a manner meeting the satisfaction of the Community Development Department, including:
  - Demonstrate that all structural Best Management Practices (BMPs) described in the project's WQMP have been implemented, constructed and installed in conformance with approved plans and specifications;
  - Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP; • Submit for review and approval an Operations and Maintenance (O&M) Plan for all structural BMPs for attachment to the WQMP; and
  - Demonstrate that copies of the project's approved WQMP (with attached O&M Plan) are available for each of the incoming occupants. [PW]

**Ventura County Waterworks District No. 1 (VCWD1)**

92. Prior to issuance of a grading permit, the Applicant shall prepare for Ventura County Waterworks District No. 1 (VCWD1) review and acceptance, a water and sewer improvement plans. Plans shall be prepared by a California registered Civil Engineer in accordance with VCWD1 rules and regulations, standards, guidelines, and requirements. [VCWD1]
93. No hardscaping, other than asphalt, shall be constructed above the VCWD1 sewer main. [VCWD1]
94. Any proposed work needs to remain clear of the VCWD1's right of way as indicated by existing easements. [VCWD1]
95. All planned trees shall remain clear of the VCWD1's easements at full maturity, as indicated in related easements. [VCWD1]
96. Prior to issuance of a grading permit, provide an assessment of 300 feet of existing sewer main extending from manhole in High Street and extending North 300 feet by a registered Civil Engineer to determine condition of sewer main and any remediation or relocation necessary to ensure the continued service to the citizens of Moorpark. [VCWD1]
97. Applicant shall apply for a will serve letter and construction permit for a watered meter service to serve the proposed library, prior to issuance of a building permit. Applicant shall

provide a plan and complete application package indicating water demand and proposed meter location. VCWD1 shall determine fees to be paid for the proposed service [VCWD1].

98. Prior to issuance of a grading or building permit, provide copies of the latest, including any changes to, of the grading, street, landscape, and storm drain plans. Plans may be provided in digital format. [VCWD1]
99. Prior to issuance of a grading or building permit, provide a plan denoting the location of fire hydrants and copy of approvals by the Ventura County Fire Protection District for fire hydrant locations. [VCWD1]
100. Prior to issuance of a grading or building permit, provide cost estimates for water and sewer improvements. [VCWD1]
101. Prior to issuance of grading or building permit, pay all applicable plan check deposits, construction inspection deposits, capital improvement charges, sewer connection fees, and meter charges per phase of the project as calculated by the VCWD1. [VCWD1]
102. Prior to issuance of a will serve letter, all recorded easements dedicated to the District for water and sewer facility improvements as shown on the recorded final map or other recorded document. Dedicated easements shall be over and across all streets and parking lots for access to maintain and repair of the District's substructures and facilities. Separate deeds of conveyance for easements and/or lands in fee if these are not conveyed on the final map. [VCWD1]
103. Prior to issuance of a will serve letter, all easements shall be approved by VCWD1 and be designed to provide sufficient clearances to perform operation and maintenance activities. No permanent improvements such as buildings, block walls, monuments, fences, curbs and gutters, parking stalls, large trees and shrubs, and related appurtenances shall be placed over the easement. [VCWD1]
104. The VCWD1 will provide "Will Serve Letters" upon completed review and acceptance of the water and sewer improvement plans and payment of applicable fees and charges. [VCWD1]
105. Following the acceptance of the above items, the Applicant shall enter into an Agreement to Install improvements and provide a Surety Bond. Template copies of the Agreement to Install and Surety Bond are available upon request. [VCWD1]
106. The applicant shall at all times comply with all applicable provisions of the Rules and Regulations of the VCWD1. [VCWD1]
107. Prior to issuance of a grading or building permit, the sewer lateral will not tie into Trunk Line that runs westerly in High Street. It should tie into the new proposed 10" Line to the west of the library. [VCWD1]



108. Prior to issuance of a grading or building permit, the sewer line terminal cleanout should be installed north of the existing sewer later to remain at 601 Moorpark Road. [VCWD1]
109. Prior to issuance of a grading or building permit, the rear parking lot fire hydrant should be routed behind fire flow backflow. [VCWD1]

**Parks, Recreation, and Community Services Department (PRCS)**

110. Prior to issuance of a building permit, the Applicant shall design trash enclosure(s) for trash, recycling, organic bins or carts equivalent to: 1 - 3 cubic yards trash, 1 - 3 cubic yards recycle, and a minimum 96-gallon cart for organics/food waste, as outlined on the "Aerial Waste Enclosure Design Examples". The Applicant shall show a detail on building plans to ensure that doors have cane bolts and that the trash enclosure is ADA accessible with appropriate path of travel. Applicant shall refer to "Aerial Waste Enclosure Design Examples" provided by Waste Management for specific design criteria. [PRCS]

**Finance and Administrative Services Department (FAS)**

111. Prior to issuance of a building permit, the Applicant shall provide two, two-inch conduits for future fiberoptic cables in the following two locations, as shown on the Building Plans:
  - One between the Telecommunications Room and the High Street right-of-way for tie-in to future fiber-optic conduit within the High Street right-of-way; and
  - The second between the Telecommunications Room and the existing audio-video room in the Moorpark Active Adult Center's Apricot Room. [FAS]

**Moorpark Police Department (MPD)**

112. Prior to issuance of a building permit, the Applicant shall provide the MPD with a security plan for review and approval prior to occupancy. The plan should include details such as door/window sensors, glass break sensors, motion sensors, panic alarms, camera type/locations, and theft prevention steps. [MPD]
113. Prior to installation of bike racks and/or bike lockers, the Applicant shall provide details to the MPD regarding the type of bike racks and how the bike lockers will be issued and secured. [MPD]
114. Prior to installation of landscaping, ensure a landscape maintenance plan is implemented, to include maintaining tree canopies to a height of no lower than 6' and all shrubbery no higher than 2'. [MPD]
115. Prior to issuance of a building permit, ensure all exterior doors have, at minimum, a viewport so patrons and staff can exit safely. [MPD]
116. Applicant should consider placing convex mirrors that allow staff and patrons to see down each aisle of bookshelves. This adds to staff and patron safety, as they can see if someone is in an aisle prior to entering the aisle. [MPD]

**Ventura County Air Pollution Control District (VCAPCD)**

117. Prior to issuance of a grading permit, and to ensure that fugitive dust and particulate matter that may result from site preparation, construction and/or grading activities are reduced, the applicant shall comply with the provisions of applicable VCAPCD Rules and Regulations, which include, but are not limited to, Rule 50 (Opacity), Rule 51 (Nuisance), and Rule 55 (Fugitive Dust), and the Air Quality Assessment Guidelines. Applicant shall comply with Rule 51 that the construction site installs temporary signage with the APCD 24-hour Complaints Hotline phone number (805) 303-3700 near the fence entrance/exits. This can be as simple as a plastic-laminated sign attached to the fence with font large enough for the public to view and in an easily accessible location. [VCAPCD]
118. Prior to issuance of a grading permit, and to ensure that ozone precursor and particulate emissions from diesel-powered mobile construction equipment are reduced to the greatest amount feasible, the applicant shall comply with the provisions of all applicable California State Laws and APCD Rules and Regulations, and the Air Quality Assessment Guidelines regarding portable construction equipment and construction vehicles. [VCAPCD]
119. Prior to issuance of a demolition permit, the applicant shall submit Form AB3205 for the review and approval of VCAPCD. In addition, the contractor shall notify VCAPCD 10 business days prior to the abatement commencement, if applicable, by submitting a Notification of Demolition or Renovation Form. Demolition and/or renovation activities shall be conducted in compliance with APCD Rule 62.7, Asbestos – Demolition and Renovation. Enforcement of notification requirements for both forms and compliance with the VCAPCD Asbestos Rule will be enforced by APCD Asbestos Inspectors or on a complaint-basis. See <http://vcapcd.org/Rulebook/RuleIndex.htm> for more information on VCAPCD Rule 62.7- Asbestos Demolition and Renovation. [VCAPCD]
120. Prior to issuance of a zoning clearance for building permit, a Ventura County Air Pollution Control District (APCD) “Authority to Construct” must be obtained for all equipment or operations subject to an APCD Permit, pursuant to APCD Rule 10, Permits Required. Final Certificate of Occupancy will not be granted until compliance with all applicable APCD Rules & Regulations has been satisfactorily demonstrated. See <http://vcapcd.org/Rulebook/RuleIndex.htm> for more information on APCD Rule 10-Permits Required. The condition may apply if the facility proposed to install a diesel-powered emergency backup generator with a HP rating of 50 or over, or any other combustion equipment subject to air permits, such as a natural-gas heater or boiler rated at 1,000,00 BTUs/Hour or greater. [VCAPCD]

**Ventura County Watershed Protection District (VCWPD)**

121. To comply with the Ventura County Watershed Protection District Ordinance WP-2, as amended. Requirements: The proposed development shall incorporate mitigation measures to address cumulative impacts due to the proposed increase in

imperviousness. The project shall either reduce the developed condition peaks to the pre-project condition peaks for the 10-, 25-, 50-, and 100-year storms, or apply the city standard; whichever is more restrictive. Documentation: The applicant shall submit a drainage study evaluating the existing and proposed conditions and presenting the design of a drainage system that will mitigate any increases in peak runoff to the above requirements. Acceptance of the drainage study will be completed as part of the City's standard plan-check process. Timing: The drainage study shall be reviewed and accepted as meeting the applicable requirements prior to obtaining a Building permit, grading permit, or prior to project start date if no grading or building permits are required. Monitoring and Reporting: Prior to issuance of the first certificate of occupancy, County staff shall inspect the improvements to assure that construction was completed in accordance with the approved plans. [VCWPD]

122. The Permittee shall obtain a Watercourse/Encroachment Permit. The permit application shall include the following: a. Construction plans prepared, signed, and stamped by a California licensed civil engineer including but not limited to, a site plan depicting general drainage trends, existing and proposed topography with elevations, proposed improvements in both plan and profile, and construction details that meet the standards of the City of Moorpark and the VCWPD. b. Site specific hydrology for existing and proposed conditions that conforms to the WP's Hydrology Manual. c. Hydraulics using a methodology and/or computer model applicable to the proposed improvements and acceptable to the VCWPD. The final model shall confirm there are no adverse impacts to Walnut Canyon, including no loss of storage volume and no increase in water surface elevation for the 1-percent chance flood peak discharge on adjacent parcels. d. Any other information or studies required by the Permit Section to administer the requirements of watershed Ordinance WP-2. Documentation: A VCWPD Permit application package shall be prepared and signed by the Permittee or a duly authorized agent and submitted to and logged by the VCWPD Permit Section. Timing: The applicant shall obtain an encroachment permit prior to obtaining a Building permit or grading permit or prior to project start date if no grading or Building permits are required. Monitoring and Reporting: Prior to permit closure, VCWPD staff shall inspect the improvements to assure that construction was completed, in accordance with the approved plans and the Permit. [VCWPD]

### **Ventura County Fire Protection District (VCFPD)**

123. Fire Department Clearance (Submit prior to Building & Safety approval) – Applicant shall obtain VCFD Form #610 "Fire Permit Application" and Form #625 "Fire Flow Verification" prior to obtaining a Building permit for any new structures or additions to existing structures. [VCFPD]
124. Building Plan Review (Submit prior to Building & Safety approval) - Building plans of all A occupancies shall be submitted, with payment for plan check, to the Fire District for review and approval prior to obtaining a Building permit. [VCFPD]

125. Water System Plans (Submit prior to Building & Safety approval) - Plans for water systems supplying fire hydrants and / or fire sprinkler systems and not located within a water purveyor's easement, shall be submitted to the Fire District for review and approval prior to issuance of grading and/or Building permits or signing of Mylar plans, whichever is first. Plans shall reflect only dedicated private fire service lines and associated appurtenances. Plan shall be design and submitted with the appropriate fees in accordance with VCFPD Standard 14.7.2. [VCFPD]
126. Access Road Width, Private Roads/Driveways - Private roads shall comply with Public Road Standards. The access road width of 24 feet shall be required with no on-street parking permitted, or per Public Road Standards whichever is stricter. [VCFPD]
127. Building Location on Property - Buildings housing Group A occupancies shall front directly on or discharge to a public street not less than 20 feet in width. The exit discharge to the public street shall be a minimum 20-foot wide right of way, unobstructed and maintained only as exit discharge to the public street. The main entrance to the building shall be located on a public street or on the exit discharge. Reference California Building Code Requirements. NOTE: Fire District requires minimum 25-foot access roads. [VCFPD]
128. Fire Hydrant(s) Required - Fire hydrant(s) shall be provided in accordance with current adopted edition of the International Fire Code, Appendix C and adopted amendments. Onsite fire hydrants may be required as determined by the Fire District. [VCFPD]
129. Fire Flow Verification - Prior to issuance of a Building permit, the applicant shall provide to the Fire District, verification from the water purveyor that the purveyor can provide the required fire flow of 2,250 gallons per minute at 20 psi for a minimum (2) hour duration. [VCFPD]
130. Fire Sprinklers - All structures shall be provided with an automatic fire sprinkler system in accordance with current VCFPD Ordinance at time of Building permit application. [VCFPD]
131. Fire Alarm System - A fire alarm system shall be installed in all buildings in accordance with California Building and Fire Code requirements. [VCFPD]
132. Fire Protection Plan (Submit prior to building permit). A fire protection plan shall be submitted to the Fire Code Official for this project as part of the building permit application. The Fire Protection Plan (FPP) shall be prepared to determine the acceptability of fire protection and life safety measures designed to mitigate wildfire hazards presented for the property under consideration and reducing the impact on the community's fire protection delivery system. The FPP shall address all requirements of the State Minimum Fire Safe Regulations (Title 14 CCR), and VCFD Ordinance and Standards, whichever are more restrictive. The FPP shall also include a wildfire behavior modeling report. The FPP shall be prepared by a registered design professional, qualified landscape architect, qualified fire safety specialist or similar specialist acceptable to the fire code official and shall analyze the wildfire risk of the building, project, premises, or region to recommend

necessary changes. See VCFD Ordinance 32 Section 4903.1 for more information.  
[VCFPD]

133. The Developer shall comply with all applicable codes, ordinances, and regulations, including the most current edition of the California Fire Code and the City of Moorpark Municipal Code, regarding fire prevention and suppression measures; fire hydrants; fire access; water availability; and other, similar requirements. Prior to issuance of building permits, the City of Moorpark Community Development Department and the Ventura County Fire Department shall verify compliance with applicable codes and that appropriate fire safety measures are included in the Project design. All such codes and measures shall be implemented prior to occupancy. [VCFPD]

[END]

## RESOLUTION NO. PC-2025-711

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, APPROVING MODIFICATION NO. 1 to CONDITIONAL USE PERMIT No. CD-CUP-2023-0013, MODIFYING SPECIFIC CONDITIONS OF APPROVAL IN PLANNING COMMISSION RESOLUTION NO PC-2024-706 FOR THE DEVELOPMENT OF A 17,272 SQUARE-FOOT PUBLIC LIBRARY, LOCATED AT 83 HIGH STREET, AND MAKING A DETERMINATION THAT THIS ACTION IS CONSISTENT WITH A PREVIOUSLY-CERTIFIED ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, ON THE APPLICATION OF JESSICA SANDIFER DEPUTY PARKS AND RECREATION DIRECTOR ON BEHALF OF THE CITY OF MOORPARK.

WHEREAS, at a duly noticed public hearing on February 27, 2024, the Planning Commission adopted Resolution No. PC-2024-706, certifying a Final Environmental Impact Report (EIR / State Clearinghouse No. 2022050175) pursuant to the California Environmental Quality Act (CEQA) and approving Conditional Use Permit No. CD-CUP-2023-0013 (CUP) for development of a 17,272 square-foot public library located at 83 High Street, on the application of Jessica Sandifer, Deputy Parks and Recreation Director, on behalf of the City of Moorpark; and

WHEREAS, on March 20, 2025, an application was submitted for Modification No. 1 to the CUP to make changes to specific conditions of approval associated with Resolution No. PC-2024-706; and

WHEREAS, at a duly noticed public hearing on March 25, 2025, the Planning Commission considered Modification No. 1 to the CUP, including the agenda report and any supplements thereto and written public comments; opened the public hearing, and took and considered public testimony regarding the proposal; and

WHEREAS, the Community Development Director has determined that Modification No. 1 is consistent with the previously-certified EIR because the proposed amendments to certain conditions of approval do not alter the project's consistency with the EIR. Therefore, no further environmental review is required pursuant to CEQA.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. ENVIRONMENTAL DETERMINATION: The Planning Commission, based on its own independent analysis and judgment, concurs with the Community Development Director's determination that the project is consistent with the previously certified EIR, including the agenda reports, technical studies, appendices, plans, specifications, and other documents and materials that constitute the record of proceedings on which this certification was based. These documents are on file for public examination during normal business hours at the City of Moorpark Community

Development Department, 323 Science Drive, Moorpark, CA 93021. Each of these documents is incorporated herein by reference. The modifications to certain conditions of approval do not alter the project's consistency with the EIR. Therefore, no further environmental review is required pursuant to CEQA.

SECTION 2. CONDITIONAL USE PERMIT FINDINGS: Based upon the information set forth in the staff report(s), accompanying studies, and oral and written public testimony, the Planning Commission makes the following findings in accordance with City of Moorpark, Municipal Code Section 17.44.040(C):

- A. The proposed use is consistent with the provisions of the General Plan, zoning ordinance, and all applicable regulations in that the proposed use would be permitted within Mixed-Use Medium (MUM) zone and the Downtown Specific Plan area. The proposed use is also consistent, with General Plan Land Use Element Goal No. 3.8: Public services and facilities: Support a diversity of uses and services supporting Moorpark's residents such as facilities for governance and administration, public safety, seniors and youth, community gatherings, and comparable activities and General Plan Land Use Element Goal No. 9.18: Library and lifelong learning: Provide and promote a state-of-the-art library that offers resources and engaging programs to meet the varied educational, cultural, civic, and general business needs of all residents and support opportunities for lifelong learning and enrichment. Additionally, the proposed use is consistent with General Plan Land Use Element Goal No. 17.1: Services supporting Moorpark's residents: Provide public facilities and services that are cost effective, and contribute to the health, safety, welfare, and personal development of all residents and General Plan Land Use Element Goal No. 19.1: Core community district: Support the continued development of the area along High Street as a distinct place identified as the symbolic and functional downtown of Moorpark. The proposed use is also consistent with Downtown Specific Plan Land Use Goal No. 3.3.3 f): Continue to maintain a civic presence in downtown through the expansion of the Civic Center area to provide for an enlarged City Hall and Library.
- B. The proposed use is compatible with both existing and permitted land uses in the surrounding area. The proposed Project would replace the existing City library located to the northeast, located on the City's Civic Center site. Surrounding uses include commercial stores and services, residences, post office, and City Hall.
- C. The proposed use is compatible with the scale, visual character, and design of surrounding properties. The proposed structure has undergone significant public review by the public, City Council, and Planning Commission to find the agrarian architectural style desirable in the downtown core. The architectural style, scale, features, and design are consistent with design guidelines set forth in the Downtown Specific Plan and applicable design standards in the MUM zone.



- D. The proposed use would not be obnoxious or harmful or impair the utility of neighboring property or uses. The proposed Project would operate with similar programming, hours of operation, and staff as the existing library which it will replace, which has been beneficial to the surrounding community.
- E. The proposed use would not be detrimental to the public health, safety, convenience, or welfare in that Conditions of Approval have been included to ensure the Project would not generate negative impacts on the surrounding area and the proposed library is planned to operate similarly as the existing library which has not demonstrated negative impacts to public health, safety, convenience, or welfare.

SECTION 3. PLANNING COMMISSION APPROVAL: The Planning Commission hereby approves Modification No. 1 to CUP CD-CUP-2023-0013 and modifies the following Conditions of Approval of Planning Commission Resolution No. PC-2024-706, where underlined indicates added text and strikethrough indicates removed text. Except for the items noted below, all other condition of approval of Resolution No. PC-2024-706 will remain in full force and effect, as applicable:

72. Prior to final review and acceptance of grading plan, a drainage plan showing all proposed storm drainage facilities must be designed to the standards of the Ventura County Watershed Protection District Design Hydrology Manual. This includes, but not limited to, hydrologic modeling, design storm modeling, and development mitigation criteria. If the entire site discharges directly into County Watershed facilities, the proposed development shall conform to the mitigation criteria set forth by the County and obtain the applicable permit, i.e. County Watershed Encroachment, County Storm Drain Connection, or County Watercourse Permit. County Acceptance of the site development discharge and connection to County facility shall be obtained prior to final acceptance of the grading and drainage plan. Otherwise, the development mitigation criteria must address how to mitigate 100-yr developed condition peak back to the 10-yr developed condition peak. [PW]

73. The project shall attenuate the 100-year developed peak flow condition to the 10-year developed condition. This includes no increase in peak flow for the 10-year, 25-year, 50- year, and 100-year design storms. If the entire site discharges directly into County Watershed facilities, the proposed development shall conform to the mitigation criteria set forth by the County and obtain the applicable permit, i.e. County Watershed Encroachment, County Storm Drain Connection, or County Watercourse Permit. County Acceptance of the site development discharge and connection to County facility shall be obtained prior to final acceptance of the grading and drainage plan. [PW]

~~81. Prior to construction of the bus turnout, proposed design must meet Ventura County Road Standards Plate D-13, "Bus turnout". Any deviations from the design standards shall be reviewed by the City Engineer and Public Works Director. [PW]~~

~~84. Applicant shall ensure that all offsite improvements along High Street include a vehicular lane, and a bicycle lane in both the east and west direction. The vehicular and bicycle lane design must accommodate road alignment plans for the future Hitch Ranch project. [PW]~~

SECTION 4. FILING OF THE RESOLUTION: The Community Development Director shall cause a certified resolution to be filed in the book of original resolutions.

The action of the foregoing direction was approved by the following vote:

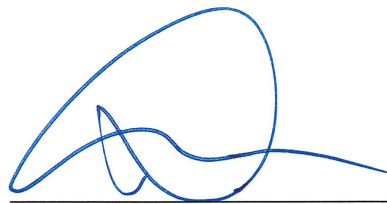
AYES: Commissioner Di Cecco, Hamalainen, Winters, and Chair Landis

NOES:

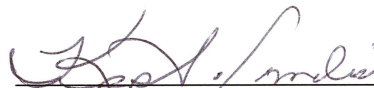
ABSENT: Commissioner Alva

ABSTAIN:

PASSED, AND ADOPTED this 25<sup>th</sup> day of March 2025.



Doug Spondello, AICP  
Community Development Director

  
Kipp Landis  
Chair

## **4.0 MITIGATION MONITORING AND REPORTING PROGRAM**

Section 21082.3 of CEQA and Section 15097 of the State CEQA Guidelines require a public agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) to ensure the implementation of required mitigation measures to reduce or avoid significant environmental effects that are identified in the EIR. Also, the specific reporting and/or monitoring requirements that will be enforced during Project implementation shall also be adopted simultaneously with final Project approval by the responsible decision-making body.

The MMRP for this Project is provided as Table 4-1, beginning on the next page. The MMRP consists of mitigation measures (MMs) identified in the EIR that are required for Project implementation. The MM identifier is provided in the first column. The text of each MM is provided in the second column. The timing of each MM's implementation is provided in the third column. The agency or party responsible for monitoring implementation of each MM is provided in the fourth column.

TABLE 4-1  
MITIGATION MONITORING AND REPORTING PROGRAM

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Aesthetics									
COA AES-1	Tree Removal Permits	As required by Section 12.12.070 of the City's Municipal Code, <b>Tree Removal Permits</b> – Requirements, no native oak tree, historic tree or other mature tree, where that tree is on public or private property, except as provided for in subsection B of this section, or is associated with a proposal for urban development, shall be removed, cut down, or otherwise destroyed, unless a tree removal permit has been issued by the city. The Parks, Recreation, and Community Services Department Director shall establish the format and information required for a tree removal permit consistent with this chapter. In no event shall a permit be denied if to do so would cause interference with the economic use and enjoyment of the property.	Prior to construction	City of Moorpark Parks, Recreation, and Community Services Department Director.	Contractor				
Air Quality									

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA AQ-1	<b>Rule 55, Fugitive Dust</b>	During construction of the Project, the City and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) <b>Rule 55, Fugitive Dust</b> , which requires, among other provisions, that "No person shall cause or allow the emissions of fugitive dust from any applicable source such that the dust remains visible beyond the midpoint (width) of a public street or road adjacent to the property line of the emission source or beyond 50 feet from the property line if there is not an adjacent public street or road" (VCAPCD 2008).	During Project Construction	Ventura County Air Pollution Control District (VCAPCD)	Contractor				
COA AQ-2	<b>15-mile per hour speed limit</b>	A <b>15-mile per hour speed limit</b> must be observed within all construction areas	During Project Construction	Contractor	Contractor				
COA AQ-3	<b>particulate matter (aerosols/dust)</b>	Reactive organic compounds, nitrogen oxides (ozone/smog precursor), and <b>particulate matter (aerosols/dust)</b> generated during construction operations must be minimized in accordance with City of Moorpark standards and the standards of the Ventura County Air Pollution Control District. When an air pollution Health Advisory has been issued, construction equipment operations (including but not limited to grading, excavating, earthmoving, trenching, material hauling, and roadway construction) and related activities must cease in order to minimize associated air pollutant emissions. Additionally, all paints used during phase 3	During Project Construction	Contractor/VCAPCD	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		of the Project shall have a maximum VOC content of 30g/L to minimize VOC emissions.							
COA AQ-4	soil import and/or soil export operations	During clearing, grading, earth moving, excavation, <b>soil import and/or soil export operations</b> , the applicant shall comply with the City of Moorpark standard requirements for dust control, including, but not limited to, minimization of ground disturbance, application of water/chemicals, temporary/permanent ground cover/seeding, street sweeping, and covering loads of dirt. All clearing, earth moving, excavation, soil import, and/or soil export operations must cease during periods of high winds (greater than 15 miles per hour [mph] averaged over one hour)	During Project Construction	Contractor	Contractor				
COA AQ-5	issuance of a grading permit	Beginning in 2030, prior to <b>issuance of a grading permit</b> , the Project's Construction Manager shall demonstrate to the City's Community Development Department that construction documents require the construction contractors to implement the following measures: a. All off-road diesel-powered construction equipment greater than 50 horsepower (hp) used during phases 3 and 4 shall, at a minimum, meet Tier 3 off-road emissions standards. b. A copy of each unit's certified offroad engine Tier specification shall be provided to the City at the time of mobilization of each applicable unit of equipment.	Prior to Issuance of a grading permit	Project Construction Manager/ City's Community Development Department	Project Construction Manager				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA AQ-6	Rule 62.7, Asbestos-Demolition and Renovation	As applicable, during construction of the Project, the City and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) Rule 62.7, Asbestos- Demolition and Renovation, which imposes notification, emission control, training and licensing, warning signage, containment area, and record keeping requirements on projects involving the demolition and renovation operations and the associated disturbance of asbestos-containing material (ACM).	Prior to Issuance of a grading permit	Project Construction Manager/ City's Community Development Department/VCAPCD	Contractor				
Biological Resources									
COA BIO-1	Nesting Bird Survey	Nesting Bird Survey. If construction and/or vegetation removal must be initiated during the peak nesting season (i.e., February 1 to August 31), a pre- construction nesting bird survey shall be conducted by a qualified Biologist within 14 days prior to the beginning of Project-related activities (including but not limited to clearing, grubbing, vegetation removal, grading, and building demolition). If project-related construction activities lapse for greater than 14 days during the peak nesting season, an additional nest survey shall be conducted before work can be reinitiated. If the Biologist finds an active nest within or adjacent to the construction area (within 200 feet for all birds protected under California Fish and Game Code and the Migratory Bird Treaty	Prior to construction, during construction (if active nests are identified)	Qualified Biologist	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		Act and within 500 feet for raptors), the Biologist shall identify an appropriate protective buffer zone around the nest depending on the sensitivity of the species, the nature of the construction activity, and the amount of existing disturbance in the vicinity. In general, the Biologist should designate a buffer of 10 to 200 feet for common nesting birds and 200 to 500 feet for special status nesting birds and nesting raptors. Construction activities within the buffer shall only proceed after a qualified biologist determines the nest is no longer active due to natural causes (e.g., young have fledged, predation, or other non-human causes of nest failure) to maintain compliance with California Fish and Game Code and the Migratory Bird Treaty Act.							
COA BIO-2	Drainage Avoidance and Regulatory Permitting	Jurisdictional <b>Drainage Avoidance and Regulatory Permitting.</b> Impacts to jurisdictional waters within the Project Site will be avoided to the extent feasible. If such impacts are unavoidable, then permits/certifications/ agreements from the United States Army Corp of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) are required. A pre-application meeting with these agencies is recommended prior to submittal of permit applications to discuss existing conditions; confirm the agencies’ jurisdiction	Prior to construction	USACE, RWQCB, CDFW	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		over water resources on the study area; discuss impacts to these resources that would result from the Project; discuss proposed avoidance, minimization, and mitigation measures to offset these impacts; and to discuss the regulatory permitting process. Following the pre- application meeting, the Project Applicant would prepare and process the appropriate permits (e.g., a Section 404 Permit from the USACE in the form of a Nationwide Permit or Individual Permit, a Section 401 Water Quality Certification from the RWQCB, and/or a CDFW Section 1602 Notification of Lake or Streambed Alteration). Additional permit conditions may be required by the resource agencies regarding impacts to areas under their respective jurisdictions. Standard construction best management practices (BMPs) shall be implemented to prevent toxins, chemicals, or petroleum products from entering the culverts and degrading water quality.							
COA BIO-3	Tree Survey and Landscaping Plan	<b>Tree Survey and Landscaping Plan.</b> Prior to the issuance of a grading permit for each Project phase, a tree survey must be prepared to determine the valuation of the mature trees to be removed. Thereafter, a landscaping plan shall be prepared which incorporates replacement tree plantings consistent with the City’s Tree Ordinance, which would be submitted to the City’s	Prior to the issuance of a grading permit.	City of Moorpark Community Development Director	Architect/Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		Community Development Director for review and approval.							
MM BIO-1	Botanical surveys	<p>Prior to ground disturbance on the western portion of the Project Site associated with Phase 2 of the Project, the applicant shall retain a qualified Biologist (one with experience conducting <b>botanical surveys</b>) to conduct a focused <b>survey for special status plant species</b>. The survey shall be performed during the target species' peak blooming period in accordance with the most current protocols approved by the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS). If focused plant surveys determine that no special status plant species are present in the project impact area, then no future measures are necessary.</p> <p>If any <b>plant species listed as threatened or endangered</b> by the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA) is determined to be present and take of individuals cannot be avoided, then the applicant shall obtain take authorization from the listing agencies before impacting the species (FESA Consultation with the United States Fish and Wildlife Service (USFWS) and CESA Section 2080 from the CDFW). Consultation with the listing agencies shall determine the appropriate conservation measure(s) to mitigate for impacts on the</p>	<p>Prior to ground disturbance.</p>	City/Qualified Biologist/California Department of Fish and Wildlife (CDFW)	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		<p>species. The mitigation may include collecting seed from individuals in the impact area and planting them within a mitigation site with the appropriate microhabitat for this species and/or paying a fee to a mitigation bank and/or a qualified Plant Science Program to conduct germination or other research studies on the species. The applicant shall retain a qualified Biologist to prepare a detailed Special Status Plant Species Conservation Plan for approval by the USFWS and/or the CDFW. The conservation plan shall include the following topics: (1) responsibilities and qualifications of the personnel to implement and supervise the plan; (2) mitigation site selection criteria; (3) site preparation and planting implementation; (4) implementation schedule; (5) maintenance plan/guidelines; (6) monitoring plan; (7) long-term preservation. The applicant shall implement the Plan as approved.</p> <p>If focused surveys determine that CNPS List 1 or List 2 species are present and the necessary take of individuals would be greater than ten percent of</p>							

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		species' population within a one-mile radius of the Project Site, then compensatory mitigation shall be required. Mitigation may include collection of seed from individuals in the impact area and planting them within a mitigation site with the appropriate microhabitat for this species. If project timing requires that ground disturbance of potentially suitable habitat be performed prior to the species' peak blooming period and focused surveys cannot be performed, then the species shall be presumed present in the impact area. The applicant shall retain a qualified Biologist to prepare a detailed Special Status Plant Species Conservation Plan for approval by CDFW. The conservation plan shall include the following topics: (1) responsibilities and qualifications of the personnel to implement and supervise the plan, (2) mitigation site selection criteria, (3) site preparation and planting implementation, (4) implementation schedule, (5) maintenance plan/guidelines, (6) monitoring plan, (7) long-term preservation. The applicant shall implement the Plan as approved.							

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM BIO-2	Burrowing Owl breeding season	<p>Per the Staff Report on Burrowing Owl Mitigation (CDFW 2012), the applicant shall retain a qualified Biologist to conduct a pre-construction survey for the burrowing owl between 14 and 30 days prior to the initial ground disturbance on the western portion of the Project Site. The pre-construction survey shall include the area of proposed disturbance plus a 500-foot buffer (if access is available and habitat is present).</p> <p>If an active burrow is observed outside the <b>breeding season (September 1 to January 31)</b> and it cannot be avoided, the <b>burrowing owl</b> shall be passively excluded from the burrow following methods described in California Department of Fish and Wildlife (CDFW) 2012. Prior to any burrowing owl exclusion efforts, an exclusion plan will be prepared and submitted to CDFW for review and approval. The plan will include all details on passive relocation including that one-way doors shall be used to exclude owls from the burrows; doors shall be left in place for at least 48 hours. Once the burrow is determined to be unoccupied, the burrow shall be closed by a qualified Biologist who shall excavate the burrow using hand tools. Prior to excluding an owl from an active burrow, a receptor burrow survey shall be conducted to confirm that at least two potentially suitable unoccupied burrows are within approximately</p>	Prior to initial ground disturbance/During Construction if Necessary	Qualified Biologist	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		688 feet prior to installation of the one-way door. If two natural receptor burrows are not located, one artificial burrow shall be created for every burrow that would be closed.If an active burrow is observed outside the breeding season (September 1 to January 31) and it can be avoided, the Biologist shall determine an appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 160 feet to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an environmentally sensitive area (ESA) on construction plans.If an active burrow is observed during the breeding season (February 1 to August 31), the active burrow shall be protected until nesting activity has ended (i.e., all young have fledged from the burrow). The Biologist shall determine the appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 650 to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an ESA on construction plans. Construction shall be allowed to proceed when the qualified Biologist has determined that all fledglings have left the nest.							
Cultural Resources									



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-1	archaeological, paleontological, or historical finds	If any <b>archaeological, paleontological, or historical finds</b> are uncovered during grading or excavation operations, all grading or excavation shall immediately cease in the immediate area and the find must be left untouched. The applicant, in consultation with the project paleontologist or archeologist, shall assure the preservation of the site and immediately contact the Community Development Director by phone, in writing by email or hand delivered correspondence informing the Director of the find. In the absence of the Director, the applicant shall so inform the City Manager and Planning Manager. The applicant shall be required to obtain the services of a qualified paleontologist or archeologist, whichever is appropriate to recommend disposition of the site. The paleontologist or archeologist selected must be approved in writing by the Community Development Director. The applicant shall pay for all costs associated with the investigation and disposition of the find.	During Grading/Excavation n (if significant discovery is identified)	Project Paleontologist or Archeologist/City of Moorpark Community Development Director	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-2	human remains are found	In accordance with Section 7050.5 of the California Health and Safety Code, if <b>human remains are found</b> , the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or are believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, the disposition of the human remains.	During construction (if significant discovery is identified)	County Coroner	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-3	human remains are found	Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training conducted by a qualified archaeologist. Issues that shall be included in the basic training will be geared toward training the applicable construction crews in the identification of <b>archaeological deposits</b> , further described below. Training will include written notification of the restrictions regarding disturbance and/or removal of any portion of archaeological, paleontological, or historical deposits and the procedures to follow should a resource be identified. The construction contractor, or its designee, shall be responsible for implementation of this measure. A tribal monitor shall be provided an opportunity to attend the pre-construction briefing if requested.	Prior to any ground disturbing activities.	Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM CUL-1	75 feet of the Tanner Building	Prior to the start of Project phases that involve work within <b>75 feet of the Tanner Building</b> , protection measures shall be developed in a formal plan for the adjacent Tanner Corner Building at 601 Moorpark Avenue. Protection measures shall include at a minimum: (1) clear denotation in the project construction plans that the project is located directly adjacent to an historical resource, marking the location of the Tanner Corner Building; (2) a protocol for informing all construction workers of the presence of the historical resource and making them aware of the protocol to avoid and protect it; (3) a list of approved construction equipment/distances in consideration of any identified groundborne vibration impacts; (4) recommendations for specific protective fencing and signage to be implemented during construction; and(5) if determined appropriate based on the results of the groundborne vibration analysis, recommendations for construction monitoring (pre-, post-, and during construction). The protection plan shall be prepared by a qualified architectural historian/historic preservation professional, clearly identify all responsible parties with their contact information, and be appended to the final set of construction plans. (Also see MM NOI-2 in Section 4.11, Noise, which relates to vibration monitoring requirements).	Prior to the start of Project phases that involve work within 75 feet of the Tanner Building	Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Geology and Soils									
COA GEO-1	geotechnical report	Prior to the issuance of a grading permit for each Project phase, a <b>geotechnical report</b> will be prepared and submitted to the City for review and approval. The geotechnical report shall be prepared by a registered Civil Engineer or certified Engineering Geologist and shall contain site-specific evaluations of the seismic and geologic hazards affecting the project and shall identify recommendations for earthwork and construction. All recommendations from forthcoming site-specific geotechnical studies shall be included in the site preparation and building design specifications. Compliance with this requirement shall be verified by the City as part of the plan approval process.	Prior to the Issuance of a grading permit.	Geologist Engineer.	Contractor				
COA CUL-1	geotechnical report	See COA CUL-1 above.	Prior to See COA CUL-1 above.	See COA CUL-1 above.					
COA CUL-3	geotechnical report	See COA CUL-3 above.	See COA CUL-3 above.	See COA CUL-3 above.					
MM GEO-1	project's geotechnical reports	Prior to approval grading plans, the Applicant shall demonstrate, to the satisfaction of the City's Planning Division that the recommendations in the <b>project's geotechnical reports</b> and in any future geotechnical reports have been fully and appropriately incorporated (OGI 2017a and 2017b).	Prior to approval of grading plans.	City of Moorpark Planning Division.	Applicant				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Greenhouse Gas Emissions									
COA GHG-1	Title 24 development standards	The Project is required to comply with the requirements established under the <b>Title 24 development standards.</b>	During Project Construction and Operations	Project Applicant/Operator	Contractor				
Hazards and Hazardous Materials									
COA HAZ-1	manifest, transport, and dispose	Applicant/operator shall store, <b>manifest, transport, and dispose</b> of all on-site generated waste that meets hazardous waste criteria in accordance with California Code of Regulations Title 22 and in a manner to the satisfaction of the Manager, HCA/Hazardous Materials Program. Applicant shall keep storage, transportation, and disposal records on site and open for inspection to any government agency upon request.	During Project Construction and Operations	Project Applicant/Operator	Contractor				
COA HAZ-2	Transport of materials deemed as hazardous	<b>Transport of materials deemed as hazardous</b> must comply with the requirements of Title 22, Division 4.5 of the California Code of Regulations, the U.S. Department of Transportation regulations in the Code of Federal Regulations (specifically, Title 49, Hazardous Materials Transportation Act and Title 40, Part 263, Subtitle C of Resource Conservation and Recovery Act), California Department of Transportation (Caltrans) standards, and Occupational Safety and Health Administration (OSHA) standards.	During Project construction and Operations	Project Applicant/Operator	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HAZ-3	<b>demolition permit</b>	Prior to issuance of a <b>demolition permit</b> for any buildings or facilities, building materials shall be assessed by a qualified Environmental Professional as defined in Section 312.10 of 40 CFR Part 312 for the presence of lead-based paints (LBPs), asbestos-containing materials (ACM), and other common hazardous building materials (e.g., polychlorinated biphenyl [PCB]- containing lighting ballasts and mercury-containing light tubes and switches). If determined to be present, the Applicant shall prepare an abatement plan for their removal and safe transport in compliance with State and federal regulations, including Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (specifically Title 29, Part 1926) and South Coast Air Quality Management District (SCAQMD) Rule 1403. The abatement plan shall meet the satisfaction of the County Environmental Health Division..	Prior to issuance of a demolition permit	City /South Coast Air Quality Management District (SCAQMD)/Contractor	Contractor				
COA HAZ-4	<b>food facilities</b>	As applicable, future land uses involving any <b>food facilities</b> shall submit plans to the Ventura County Environmental Health Division, Community Services Section to obtain plan approval prior to beginning any construction of any food facility. A permit to Operate form the Division shall also be required prior to beginning any retail food operations.	Prior to issuance of a demolition permit	City of Moorpark Community Development Department	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HAZ-5	transport hazardous materials	Any future tenant that may handle store, or <b>transport hazardous materials</b> , or generate hazardous waste at or above the reportable thresholds shall be reported to the Ventura County Environmental Health Division's Certified Unified Program Agency (CUPA).	Prior to issuance of a demolition permit	City of Moorpark Community Development Department	Contractor				
Hydrology and Water Quality									
COA HWQ-1	Permit for Stormwater Discharges Associated	Prior to the issuance of any grading or building permit for each project phase, the applicant shall demonstrate compliance under California's <b>General Permit for Stormwater Discharges Associated</b> with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing in a manner meeting the satisfaction of the Community Development Department. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the Project Site and be available for County review on request.	Prior to Issuance of any grading or building permit	City of Moorpark Community Development Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HWQ-2	grading or building permits	Prior to the issuance of any <b>grading or building permits</b> , the applicant shall submit for review and approval by the Community Development Department, a Water Quality Management Plan (WQMP) that must include the following minimum contents: <ul style="list-style-type: none"> <li>· Address Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, and conserving natural areas;</li> <li>· Incorporate applicable Routine Source Control BMPs; and</li> <li>· Include an Operation and Maintenance (O&amp;M) Plan that identifies the mechanism(s) by which long-term O&amp;M of all structural BMPs will be provided.</li> </ul>	Prior to Issuance of any grading or building permits	City of Moorpark Community Development Department	Contractor				
COA HWQ-3	certificate of use and occupancy	Prior to the issuance of a <b>certificate of use and occupancy</b> , the applicant shall demonstrate compliance with the WQMP in a manner meeting the satisfaction of the Community Development Department, including: <ul style="list-style-type: none"> <li>· Demonstrate that all structural Best Management Practices (BMPs) described in the project's WQMP have been implemented, constructed and installed in conformance with approved plans and specifications;</li> <li>· Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP;</li> </ul>	Prior to Issuance of a certificate of use and occupancy	City of Moorpark Community Development Department	certificate of use and occupancy				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		<ul style="list-style-type: none"> <li>Submit for review and approval an Operations and Maintenance (O&amp;M) Plan for all structural BMPs for attachment to the WQMP; and</li> <li>Demonstrate that copies of the project's approved WQMP (with attached O&amp;M Plan) are available for each of the incoming occupants.</li> </ul>							
<b>Land Use</b>									
COA AES-1		See COA AES-1 above.	See COA AES-1 above.	See COA AES-1 above.					
<b>Noise</b>									
COA NOI-1	noise-generating	The Project shall comply with Section 15.26 of the City's Municipal Code, which requires contractors to not engage in or conduct any <b>noise-generating outdoor construction work</b> , except between the hours of <b>7:00 AM and 7:00 PM, Monday through Saturday</b> , unless a permit for different hours has been issued.	During Construction	Contractor	Contractor				
COA NOI-2	construction noise reduction	The Project shall comply with Chapters 9.28, 10.04, 12.24 and 17.53 of the Moorpark Municipal Code and any provision amendatory or supplementary thereto, as a standard requirement for <b>construction noise reduction</b> .	During Construction	Contractor	Contractor				
COA NOI-3	construction hour limitations	The Project shall include the posting, in a conspicuous location, of the construction hour limitations and make each construction trade aware of the construction hour limitations.	During Construction	Project Applicant/Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM NOI-1	start of grading	Prior to the <b>start of grading of each Project phase</b> , the Project applicant shall provide evidence acceptable to the City's Community Development Department, that: a. All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. b. Stationary equipment, such as generators and air compressors, would be located as far from local residences and Walnut Canyon Elementary School, as feasible. c. Equipment maintenance and staging areas would be located as far away from local residences and Walnut Canyon Elementary School, as feasible. d. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings and Walnut Canyon Elementary School.	Prior to grading activities	City/City of Moorpark Community Development Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM NOI-2	Ongoing vibration monitoring	During construction activities, the Project applicant will ensure that ongoing vibration monitoring is conducted for Project activities within 75 feet of the Tanner Corner Building as specified below.· Whenever vibratory replacement activities occur within 75 feet of the Tanner Corner Building.· Whenever Deep Soil Mixing activities occur within 50 feet of the Tanner Corner Building.· Whenever general construction equipment is utilized within 25 feet of the Tanner Corner Building.If vibration levels at the Tanner Corner Building reach or exceed 0.25 ppv, there is a potential for building damage and an immediate stop work order will be issued. Alternative construction methods or vibration reduction measures will then be determined that keep vibration exposure levels below0.25 ppv. (Also see MM CUL-1 in Section 4.3, Cultural Resources, which includes requirements for the development of a construction monitoring plan for work in proximity to the Tanner Corner Building).	During Project Construction	City/Contractor	Contractor				
Public Services									

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA PUB-1	prevention and suppression measures;	The Developer shall comply with all applicable codes, ordinances, and regulations, including the most current edition of the California Fire Code and the City of Moorpark Municipal Code, regarding fire <b>prevention and suppression measures</b> ; fire hydrants; fire access; water availability; and other, similar requirements. Prior to issuance of building permits, the City of Moorpark Community Development Department and the Ventura County Fire Department shall verify compliance with applicable codes and that appropriate fire safety measures are included in the Project design. All such codes and measures shall be implemented prior to occupancy.	Prior to Issue of Building Permits	Project Developer/City of Moorpark Community Development Department/Ventura County Fire Department	Project Developer				
COA PUB-2	prevention and suppression measures;	The Developer shall pay all applicable <b>Development Impact Fees (DIFs)</b> prior to the issuance of building permits, for parkland dedication, parkland improvements, public safety facilities, other governmental facilities, and outside agency fees including school district fees.	Prior to the issuance of building permits.	City/Developer	City/Developer				
Transportation									
COA TRA-1	Grading permit	<b>Prior to the issuance of a grading permit</b> for each project phase, the applicant shall demonstrate adequate sight distance at all street intersections, in a manner meeting the approval of the City's Public Works Department.	Prior to the issuance of a grading permit	City of Moorpark Public Works Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA TRA-2	Grading permits	Prior to the issuance of any grading permits, the applicant shall demonstrate that applicable improvements for that phase from the Project's Traffic Study have been incorporated into Project design, in a manner meeting the approval of the City's Public Works Department.	Prior to the Issuance of any Grading Permits	City of Moorpark Public Works Department	Contractor				
COA TRA-3	Project phase	Prior to beginning each project phase, the applicant shall submit a construction traffic control plan for the review and approval of the City Engineer and Public Works Director. Traffic control plan shall include construction advisory speed limits, speed limit posting locations, and enforcement measures if needed.	Prior to the beginning of each Project phase	City Engineer/Public Works Director	Contractor				
<b>Tribal Cultural Resources</b>									
COA CUL-1	grading permits	See COA CUL-1 above.	See COA CUL-1 above.	See COA CUL-1 above.	Contractor				
COA CUL-2	Grading permits	See COA CUL-2 above.	See COA CUL-2 above.	See COA CUL-2 above.	Contractor				
COA CUL-3	Project phase	See COA CUL-3 above.	See COA CUL-3 above.	See COA CUL-3 above.	Contractor				
<b>Utilities</b>									
COA HWQ-2	grading or building permits	See COA HWQ-2 above.	See COA HWQ-2 above.	See COA HWQ-2 above.	Contractor				
COA HWQ-3	certificate of use and occupancy	See COA HWQ-3 above.	See COA HWQ-3 above.	See COA HWQ-3 above.	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA UTL-1	Building permit	Prior to issuance of a <b>building permit for each new building</b> within the Project Site, the applicant would be required to obtain a <b>will-serve letter</b> or equivalent from Ventura County Waterworks District No. 1 (VCWWD No. 1) demonstrating their capacity to serve the Project for water and wastewater services. The will-serve letter must be submitted to the Community Development Department for review prior to issuance of a building permit.	Prior to issuance of a building permit for each new building within the Project Site	Ventura County Waterworks/ City of Moorpark Community Development Department	Contractor				
COA UTL-2	Building permit	Prior to issuance of a <b>building permit</b> for each new building within the Project Site, the applicant would be required to obtain a will-serve letter or equivalent from dry utility providers demonstrating their capacity to serve the Project for electricity, natural gas, and telecommunications if needed. The will-serve letters must be submitted to the Community Development Department for review prior to issuance of a building permit.	Prior to issuance of a building permit for each new building within the Project Site	City of Moorpark Community Development Department	Contractor				
COA UTL-3	Building permit	Prior to issuance of a <b>building permit</b> for each new building within the Project Site, the applicant shall submit a Construction and Demolition Materials Management Plan Estimate for the review and approval of the City's Solid Waste Management staff and Building and Safety Division for recycling of waste materials consistent with applicable City and State requirements. The Plan must include estimated quantities for each type of material to be diverted or landfilled.	Prior to issuance of a building permit for each new building within the Project Site	City's Solid Waste Management staff and Building and Safety Division	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA UTL-4	certificate of occupancy	Prior to issuance of <b>certificate of occupancy</b> for new structures within the Project Site, the applicant must submit a Final Report Construction and Demolition Waste Letter of Documentation (including premium gate tickets) to the Building and Safety Division, demonstrating compliance with the Construction and Demolition Materials Management Plan Estimate and indicating the total amount of construction and demolition waste diverted.	Prior to issuance of certificate of occupancy for new structures within the Project Site	City Building and Safety Division	Contractor				

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## **5.0 REFERENCES**

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Moorpark, City of 2023d (May). Draft Environmental Impact Report for the Civic Center Master Plan Project. <https://ceqanet.opr.ca.gov/2022050175/2>

———.2023c. (May 22). Notice of Availability (NOA). <https://ceqanet.opr.ca.gov/2022050175/2>

## EXHIBIT M



OFFICE OF COMMUNITY PLANNING  
AND DEVELOPMENT

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
WASHINGTON, DC 20410-7000

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Special Attention of:  
All CPD Division Directors  
HUD Field Offices  
HUD Regional Offices  
All CDBG Grantees  
All CoC Grantees  
All HOME Participating Jurisdictions  
All HTF Grantees  
All ESG Grantees  
All HOPWA Grantees

NOTICE: **CPD-25-01**

Issued: **January 13, 2025**

Supersedes: CPD-2023-12

Expires: This Notice remains in effect until  
amended, superseded, or rescinded.

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Cross Reference:

Sections 70901-52 of Pub. L. No. 117-58

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Subject: CPD Implementation Guidance for the Build America, Buy America Act's Buy America Preference.

### **Overview**

This updated Community Planning and Development (CPD) Notice supersedes CPD Notice 2023-12 to provide clarified implementation guidance for the "Buy America Preference" (BAP) imposed by the Build America, Buy America Act (BABA) enacted under Division G, Title IX of the Infrastructure Investment and Jobs Act (IIJA, Pub. L. No. 117-58) signed into law on November 15, 2021. It describes how grantees can use covered CPD program funds for public infrastructure projects to bolster America's industrial base, protect national security, and support high-paying jobs.

The refreshing of this Notice is intended to provide greater clarity to grantees implementing BABA. Specifically, the Notice clarifies how the BAP applies to public infrastructure for housing projects. Projects with one- to four-units should be classified as private and not subject to BABA. Housing projects with five or more units should be considered as public infrastructure subject to BABA unless another BABA waiver or exemption applies. In addition, the Notice includes a reclassification of HOME-ARP to CPD programs not covered by the BAP, clarification on determining a project scope, BAP applicability to program income, additional recordkeeping considerations, guidance on using HUD's online project-specific waiver application website, and new resources to assist with compliance and determining when a project-specific waiver is appropriate.

This Notice also highlights issues that grantees will want to consider when preparing for

HUD’s full implementation of the BAP in FY2025, as described in “Public Interest Phased Implementation Waiver for FY 2022 and 2023 of Build America, Buy America Provisions as Applied to Recipients of HUD Federal Financial Assistance” (88 Fed. Reg. 17001, effective March 15, 2023 (“Phased Implementation Waiver”), which establishes BAP implementation points according to a schedule across HUD programs.

More in-depth technical assistance related to both BABA compliance and best practices is available on the HUD Exchange and hud.gov websites. HUD also encourages grantees to contact their assigned local field offices to discuss issues and concerns within the regulatory framework. This Notice uses the term “grantee” generically to also include HOME participating jurisdictions. The guidance provided in this Notice is subject to change if the Office of Management and Budget (OMB) updates guidance on the application of BABA for Federal financial assistance (FFA) programs for infrastructure.

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## **I. The Build America, Buy America Act (BABA)**

The Build America, Buy America Act (BABA) was signed into law by President Biden on November 15, 2021, as part of the Infrastructure Investment and Jobs Act (IIJA) as Sections 70901-52 of Pub. L. No. 117-58. In addition to providing funding for roads, bridges, rails, and high-speed internet access, it created an incentive to increase domestic manufacturing across the country through the inclusion of BABA's "Buy America Preference" (BAP). In general, the BAP requires that all iron, steel, manufactured products, and construction materials used in public infrastructure projects funded with Federal financial assistance (FFA), as outlined in Section 70914(a) of BABA, must be produced in the United States. The intent of the BAP is to stimulate private-sector investments in domestic manufacturing, bolster critical supply chains, and support the creation of well-paying jobs for people in the United States. The preference is also intended to bolster American firms' ability to compete and lead globally for years to come by requiring entities that receive Federal infrastructure funds to use American materials and products.

The BAP applies to all spending on public infrastructure projects by Federal agencies, including HUD. In BABA, and for purposes of this Notice, the Federal infrastructure spending with a BAP is referred to as "Federal financial assistance" or "FFA." Under Section 70912(7), FFA for public infrastructure "projects" includes the "construction, alteration, maintenance, or repair of infrastructure in the United States". Under Section 70914(a), the use of American iron and steel, construction materials, and manufactured products generally applies to funding from CPD programs for public infrastructure projects. However, the BAP does not apply to "pre and post disaster or emergency response expenditures" under Section 70912(4)(B). A list of CPD disaster or emergency funding meeting these criteria can be found in Section IV.

Effective May 14, 2022, the BAP applies to infrastructure spending unless an agency issues a waiver in three limited situations: 1) when applying the domestic content procurement preference would be inconsistent with the public interest, 2) when types of iron, steel, manufactured products or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality, or 3) where the inclusion of those products and materials will increase the cost of the overall project by more than 25 percent. Before issuing a waiver, HUD, must make a detailed written explanation for the proposed determination to issue the waiver publicly available and provide a period of not less than 15 days for public comment on the proposed waiver. Additional details on waivers can be found in Sections VIII and IX of this Notice.

### **A. Federal Government-wide Guidance on BABA**

As a part of the Federal government's support of domestic production and manufacturing through infrastructure investments, OMB and HUD have taken several steps to implement the BAP by providing guidance and issuing HUD general waivers.

On August 23, 2023, OMB issued final rules for 2 CFR Parts 184 and 200 and provided further guidance on implementing the statutory requirements and improving FFA management and transparency (88 Fed. Reg. 57750, effective October 23, 2023). These government-wide regulations apply to HUD programs and provide direction on implementing a BAP waiver process. The new and revised regulations also provide additional guidance on construction material standards, the cost



components of manufactured products, and their definitions.

On October 25, 2023, OMB issued guidance to all Federal agencies on how to implement BABA consistently across the government. The [“Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure” \(M-24-02\)](#) (OMB Guidance) directs Federal agencies, including HUD, on how to apply the BAP and provides an overview of the BAP waiver requirements. OMB may also issue additional or updated guidance in the future, and HUD will update its guidance as necessary.

## **B. HUD Actions and Guidance on BABA**

BABA is a new and complex statute that became effective in 2022. As such, establishing governmentwide guidance on these new statutory requirements has been an iterative process. Since the passage of BABA, HUD has worked diligently to implement the BAP for all HUD programs. Before the law became effective on May 14, 2022, HUD established a Department-wide BABA leadership committee. On June 1, 2022, HUD issued a Request for Information (RFI) to collect public comments on potential BABA implications for HUD grantees (87 FR 33193). To ease the transition in complying with the BAP, HUD proposed and received several general applicability waivers for covered FFA, which includes CPD programs. These waivers and other BABA information are available on HUD’s website at <https://www.hud.gov/baba>. Further details on these waivers and their application to CPD programs are provided in Section V of this Notice.

CPD has taken several actions to notify and communicate with stakeholders and grantees on BABA requirements and their impact on CPD programs. Since Fiscal Year (FY) 2022, all grant transmittal letters and notices of funding opportunities (NOFOs) have included a reference to the BAP under BABA. For the FY2023 and FY2024 funding allocations, all CPD grant agreements with covered FFA included a clause to require that the grantee must comply with BABA, as applicable, which will remain in place for future allocations. Throughout 2023 and 2024, CPD has held BABA information sessions for CPD grantees and operates a dedicated email box at [CPDBABA@hud.gov](mailto:CPDBABA@hud.gov) to answer questions from individual grantees and stakeholders. In October 2023, CPD established a HUD Exchange page ([hudexchange.info/programs/baba/](https://hudexchange.info/programs/baba/)) as a central resource for grantees. CPD has developed technical assistance products, including quick guides, webinars, and frequently asked questions (FAQs), that are available to CPD grantees on this site.

## **II. Definitions**

CPD has aligned its definitions regarding policy interpretations of BABA with regulations at 2 CFR part 184 and Appendix 1 of OMB guidance M-24-02 as stated below.

1. Build America, Buy America Act is defined in 2 CFR § 184.3 and means division G, title IX, subtitle A, parts I–II, sections 70901 through 70927 of the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58).
2. Buy America Preference is defined in 2 CFR § 184.3 and means the “domestic content procurement preference” set forth in section 70914 of BABA, which requires the head of each Federal agency to ensure that none of the funds made available for a Federal award for

an infrastructure project may be obligated unless all of the iron, steel, manufactured products, and construction materials incorporated into the project are produced in the United States.

3. Categorization of Articles. The term “categorization of articles” refers to the requirement that articles, materials, and supplies should only be classified into one of the following categories:
  - i. Iron or steel products;
  - ii. Manufactured products;
  - iii. Construction materials; or
  - iv. Section 70917(c) materials.

Each article, material, or supply should be classified in only one of the categories listed above. In some cases, an article, material, or supply may not fall under any of the categories listed in this paragraph. The classification of an article, material, or supply as falling into one of the categories listed in this paragraph must be made based on its status at the time it is brought to the work site for incorporation into an infrastructure project. In general, the work site is the location of the infrastructure project at which the iron, steel, manufactured products, and construction materials will be incorporated.

4. Component is defined in 2 CFR § 184.3 and means an article, material, or supply, whether manufactured or unmanufactured, incorporated directly into: a manufactured product; or, where applicable, an iron or steel product.
5. Construction Materials is defined in 2 CFR § 184.3 and means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.
  - (1) The listed items are:
    - i. Non-ferrous metals;
    - ii. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
    - iii. Glass (including optic glass);
    - iv. Fiber optic cable (including drop cable);
    - v. Optical fiber;
    - vi. Lumber;
    - vii. Engineered wood, and
    - viii. Drywall.
  - (2) Minor additions of articles, materials, supplies or binding agents to a construction material do not change the categorization of the construction material.
6. Covered Materials includes the following when used in connection with an Infrastructure Project:
  - (A) all iron and steel;

- (B) all Manufactured Products; and
- (C) all Construction Materials.

7. Covered CPD Programs. The term “covered CPD programs” means any Federal financial assistance administered by CPD that is used for public infrastructure projects, excepting expenditures related to pre and post disaster or emergency response.
8. Grantee. The term “grantee,” as defined at 24 CFR 5.100, means the person or legal entity to which a grant is awarded and that is accountable for the use of the funds provided.
9. Federal Financial Assistance (FFA) has the meaning given to the term in 2 CFR 200.1 (or successor regulations) and includes all expenditures by a Federal agency to a Non-Federal Entity for an Infrastructure Project, except that it does not include:
  - (A) expenditures for assistance authorized under section 402, 403, 404, 406, 408, or 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170a, 5170b, 5170c, 5172, 5174, or 5192) relating to a major disaster or emergency declared by the President under section 401 or 501, respectively, of such Act (42 U.S.C. 5170, 5191); or
  - (B) pre and post disaster or emergency response expenditures.
10. Infrastructure as described in 2 CFR 184.4(c), encompasses public infrastructure projects in the United States, which includes, at a minimum: the structures, facilities, and equipment for roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property; and structures, facilities, and equipment that generate, transport, and distribute energy including electric vehicle (EV) charging. See also 2 CFR 184.4(d).
11. Infrastructure Project The term “infrastructure project” is defined in 2 CFR 184.3 and means any activity related to the construction, alteration, maintenance, or repair of public infrastructure in the United States regardless of whether infrastructure is the primary purpose of the project. See also 2 CFR 184.4(c) and (d).
12. Iron and Steel Products The term “iron and steel products” is defined in 2 CFR 184.3 and means articles, materials, or supplies that consists wholly or predominantly of iron or steel, or a combination of both.
13. Predominantly of iron or steel or a combination of both is defined in 2 CFR 184.3 and means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components.

14. Made in America Office. The term “Made in America Office” or “MIAO” means the office at the Office of Management and Budget, established by section 70923 of BABA, that is charged with implementing the BAP and establishing the procedures to review waiver requests.
15. Manufactured Products is defined in 2 CFR 184.3 and means:
- (1) Articles, materials, or supplies that have been:
    - (i) Processed into a specific form and shape; or
    - (ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
  - (2) If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under 2 CFR 184.4(e) and the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 2 CFR 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials.
16. Manufacturer is defined in 2 CFR 184.3 and means the entity that performs the final manufacturing process that produces a manufactured product.
17. Non-Federal Entity means a State, local government, Indian tribe, Institution of Higher Education (IHE), or nonprofit organization that carries out a Federal award as a recipient or subrecipient., as provided in 2 CFR 200.1.
18. Not Listed Construction Materials The term “not listed construction materials” refers to the category of construction materials that are subject to the BAP, but not included in HUD’s specifically listed construction materials, as defined in the Phased Implementation Waiver. This includes:
- i. plastic and polymer-based products other than composite building materials or plastic and polymer-based pipe or tube;
  - ii. glass (including optic glass); and
  - iii. drywall.
19. Obligate means an action taken by HUD that creates a legal liability of the government for the payment of goods and services ordered or received or that administratively recognizes a legal duty on the part of the Agency that could mature into a legal liability by virtue of actions outside of HUD’s control. The milestone in the federal assistance award process that establishes the obligation date varies for each program, but for many CPD programs the obligation date occurs upon HUD’s execution of the grant agreement.
20. OMB Guidance. The term “OMB guidance” refers to 2 CFR Part 184, the "[Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure](#)” (M-24-02), issued October 25, 2023, by the Office of Management and Budget, and any subsequent guidance to rescind or replace M-24-02. This

guidance is applicable to the heads of all Federal agencies for the implementation of BABA's Buy America Preference.

21. Pre and Post Disaster or Emergency Response Expenditures. The term "pre and post disaster or emergency response expenditures" means Federal funding authorized under section 402, 403, 404, 406, 408, or 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) relating to a major disaster or emergency declared by the President under section 401 or 501, respectively. The BAP does not apply to pre- and post-disaster or emergency response expenditures authorized by statutes other than the Stafford Act and made in anticipation of or in response to an event that qualifies as an emergency or major disaster within the meaning of the Stafford Act.
22. Produced in the United States is defined in 2 CFR 184.3 and means:
- i. In the case of iron or steel products, all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
  - ii. In the case of manufactured products:
    - 1. The product was manufactured in the United States; and
    - 2. The cost of components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product. See 2 CFR 184.2(a). The costs of components of a manufactured product are determined according to 2 CFR 184.5.
  - iii. In the case of construction materials, all manufacturing processes for the construction material occurred in the United States. See 2 CFR 184.6 for more information on the meaning of "all manufacturing processes" for specific construction materials.
23. Section 70917(c) Materials. The term "section 70917(c) materials" is defined in 2 CFR 184.3 and means cement and cementitious materials; aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

The Federal Register Notice implementing new BABA regulations at 2 CFR 184 (88 FR 57787) clarifies that all categorizations of Covered Materials should be made based on the status of the material when it arrives at the work site. Section 70917(c) materials that are used at the work site, such as wet concrete or hot asphalt, are not subject to the BAP. However, Section 70917(c) materials may be components of manufactured products if, for example, they are used to produce precast concrete products before being transported to the work site.

24. Specifically listed construction materials. The term "specifically listed construction materials" for HUD programs includes:

- a. non-ferrous metals;
- b. lumber;
- c. composite building materials; and
- d. plastic and polymer-based pipe and tube.

### **III. Applicability of the BAP to CPD Programs and Projects**

The BAP applies to the purchase of iron, steel, manufactured products, and construction materials for Covered CPD Programs when funds are used for the construction, alteration, maintenance, or repair of public infrastructure, as defined by BABA. This list of Covered CPD Programs is subject to change if there are any changes to the eligible uses of funds or the establishment of new programs that fund public infrastructure projects and are covered by BABA. Covered CPD Programs currently include:

- Community Development Block Grant Formula Programs (CDBG)
- Section 108 Loan Guarantee
- HOME Investment Partnerships Program (HOME)
- Housing Trust Fund (HTF)
- Recovery Housing Program (RHP)
- Emergency Solutions Grants (ESG)
- Continuum of Care (CoC)
- Housing Opportunities for Persons With AIDS (HOPWA)
- Self-Help Homeownership Opportunity Program (SHOP)
- Special NOFA for unsheltered and rural homeless
- Veterans Housing Rehabilitation and Modification Program (VHRMP)
- Community Project Funding (CPF)/Economic Development Initiatives (EDI)
- Section 4 Capacity Building
- Rural Capacity Building
- Pathways to Removing Obstacles to Housing (PRO Housing)
- Preservation and Reinvestment Initiative for Community Enhancement (PRICE)
- Continuum of Care Builds Notice of Funding Opportunity (CoCBuilds NOFO)

BABA applies to any project that involves the construction, alteration, maintenance, or repair of public infrastructure, regardless of whether infrastructure is the primary purpose of the project. Since the term “infrastructure” includes the structures, facilities, and equipment for “buildings and real property”, the BAP generally applies to Covered CPD Program funds provided for housing projects. OMB acknowledged at 2 CFR 184.4(d) that some projects may be “private” in nature and are not considered public infrastructure subject to BABA. An example OMB provided in M-24-02 is a project consisting solely of the purchase, construction, or improvement of a private single-family home for personal use.

Through this notice, CPD provides further clarification on when grantees should apply BABA’s requirements to housing projects as described in M-24-02.

1. Housing projects with one to four units are considered “private,” consistent with HUD’s definition of single-family housing. Housing projects with one to four units, including

onsite utilities and related activities are therefore not considered public infrastructure and are not subject to the BAP.

2. Housing projects with five or more units are considered public infrastructure. Housing projects with five or more units are therefore subject to the BAP unless another BABA waiver or exemption applies.

Covered Materials incorporated into the public infrastructure project are subject to the BAP, regardless of the specific project costs for which Covered CPD Program funds are expended. To determine the scope of an individual public infrastructure project for BABA purposes, grantees should use the definition of a project as determined by the Covered CPD Program in question. For example, 24 CFR 92.2 defines a HOME project as “a site or sites together with any building (including a manufactured housing unit) or buildings located on the site(s) that are under common ownership, management, and financing and are to be assisted with HOME funds as a single undertaking under this part. The project includes all the activities associated with the site and building.”<sup>1</sup>

Where no program-specific definition of a project exists, grantees should use the definition of a “project” at 24 CFR 58 to assist with determining project scope: “an activity or group of integrally related activities designed by the recipient to accomplish, in whole or in part, a specific objective.” Grantees cannot split an infrastructure project to avoid application of the BAP to the project, such as by dividing procurements, subgrants, cooperative agreements, etc., into separate and smaller awards or contracts, particularly where the procurements, subgrants, cooperative agreements, etc., are integrally and proximately related to the whole.

#### **IV. CPD Programs and Funding Not Covered by the BAP**

The BAP does not apply to Federal funds for “pre and post disaster or emergency response.” The following list of CPD funds are administered for disaster or emergency-related purposes and therefore the BAP does not apply to them.

- Community Development Block Grant – Disaster Recovery Funds (CDBG-DR)
- Community Development Block Grant – Mitigation (CDBG-MIT)
- Community Development Block Grant – National Disaster Resilience Competition (CDBG-NDR)
- Community Development Block Grant CARES Act (CDBG-CV)
- HOME Investment Partnerships American Rescue Plan Program (HOME-ARP)
- Housing Opportunities for Persons With AIDS CARES Act (HOPWA-CV)
- Emergency Solutions Grants CARES Act (ESG-CV)
- Rapid Unsheltered Survivor Housing (RUSH)

In addition to the funding sources listed above, the BAP does not apply to projects funded solely with program income generated through any Covered CPD Program. Program income is not considered FFA.

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<sup>1</sup> See also 24 CFR 93.2 for HTF, 24 CFR 578.3 for CoC, etc.



BABA does not apply to projects that do not include any construction, alteration, maintenance, or repair of public infrastructure. Equipment, tools, and supplies that are brought to a construction site and removed upon completion of the project or furnishings used within the finished project that are not permanently affixed to the public infrastructure project are not covered by the BAP.

## V. HUD’s General Waivers Applicable to Covered CPD Programs

BABA requirements may be waived by HUD and OMB when applying the BAP would be inconsistent with the public interest, when Covered Materials are not reasonably available in sufficient quantities or quality, or if the inclusion of Covered Materials produced in the United States will increase the overall project by more than 25 percent. The term “general applicability waiver” refers to waivers that have broad applicability across multiple HUD programs. The general applicability waivers for HUD FFA that are currently in effect for all Covered CPD Programs as of publication of this Notice are listed below.

General public interest waivers may be applied to all or a portion of a project without prior approval from HUD when a project meets the conditions established by the waiver. Grantees should maintain documentation demonstrating that the project meets the conditions of each general waiver applied to the project. HUD is responsible for processing and reviewing all waivers, which may only apply prospectively to future expenditures incurred after the effective date of the final waiver. The table below is current as of the publication of this Notice. Details of all proposed and approved waivers can be found at HUD’s website at <https://www.hud.gov/baba>.

General Waiver Type	Purpose	Effective Dates
<b>Public Interest Phased Implementation</b>	HUD issued a public interest waiver, <a href="#"><i>“Public Interest Phased Implementation Waiver for FY 2022 and 2023 of Build America, Buy America Provisions as Applied to Recipients of HUD Federal Financial Assistance”</i></a> to allow for orderly implementation of the BAP across HUD programs. The Phased Implementation Waiver establishes a schedule for the phased implementation of the BAP across CPD programs and infrastructure materials.	The public interest waiver was issued in March 2023 and established a phased implementation schedule for the application of the BAP to HUD programs through FY2025. The BAP has been in effect since November 15, 2022, for the use of iron and steel for infrastructure projects funded with newly obligated FFA through the CDBG program.
<b>Exigent Circumstances</b>	HUD issued a public interest waiver for exigent circumstances, <a href="#"><i>“Public Interest Waiver of Build America, Buy America Provisions for Exigent Circumstances as Applied to Certain Recipients of HUD Federal Financial Assistance”</i></a> . This waiver applies when there is an urgent need by a CPD grantee to immediately	The public interest waiver for exigent circumstances is effective from November 23, 2022, until November 23, 2027, or such shorter time as HUD may announce via Notice.

General Waiver Type	Purpose	Effective Dates
	complete an infrastructure project because of a threat to life, safety, or property of residents and the community.	
<b>De Minimis and Small Grants</b>	<p>HUD issued a public interest titled “<a href="#"><i>Public Interest De Minimis and Small Grants Waiver of Build America, Buy America Provisions as Applied to Certain Recipients of HUD Federal Financial Assistance</i></a>”. This waives the BAP for all infrastructure projects whose total cost (from all funding sources) is equal to or less than the simplified acquisition threshold at 2 CFR 200.1, which is currently \$250,000.</p> <p>This Notice also waives the application of the BAP for a <i>de minimis</i> portion of an infrastructure project, meaning a cumulative total of no more than five percent of the total cost of the iron, steel, manufactured products, and construction materials used in and incorporated into the infrastructure project, up to a maximum of \$1 million.</p>	The public interest <i>de minimis</i> , and small grants waiver is effective from November 23, 2022, until on November 23, 2027, or such shorter time as HUD may announce via Notice.
<b>Tribal Recipients Waiver</b>	HUD issued a public interest waiver, “ <a href="#"><i>Extension of Public Interest, General Applicability Waiver of Build America, Buy America Provisions as Applied to Tribal Recipients of HUD Federal Financial Assistance</i></a> ” for the BAP as it applies to Tribal recipients.	The waiver of the BAP as it applies to Tribal recipients was effective for FFA obligated by HUD from May 23, 2023, until September 30, 2024.
<b>Pacific Island Territory Waiver</b>	HUD issued a “ <a href="#"><i>Public Interest, General Applicability Waiver of Build America, Buy America Provisions as Applied to Pacific Island Territory Recipients of HUD Federal Financial Assistance: Final Notice</i></a> ” which waives the BAP for any FFA used for infrastructure projects in the Commonwealth of the Northern Mariana Islands, Guam, and American Samoa.	The waiver is effective from November 15, 2023, until February 15, 2025.

## **VI. Understanding HUD’s Public Interest Phased Implementation General Waiver**

Under Section 70914(a), the BAP was required to be in effect for all FFA for public infrastructure projects no later than 180 days after it was signed into law. Thus, starting May 14, 2022, all new awards of covered FFA for infrastructure projects obligated by HUD would have been required to comply with the BAP. Due to the short implementation period of 180 days, and to allow for the domestic industry and FFA recipients to have the time and notice necessary to implement BABA efficiently and effectively, HUD issued a Phased Implementation Waiver. This waiver enabled HUD to implement the BAP in an incremental process, resulting in full compliance with the BAP for all HUD obligations in FY 2025.

Covered CPD Programs began applying the BAP to public infrastructure projects beginning with CDBG funds obligated by HUD on and after November 15, 2022. The table below outlines the timeline for applicability of the BAP to each classification of Covered Materials incorporated into public infrastructure projects undertaken with Covered CPD Program funds. The columns identify categories of Covered Materials subject to the BAP and the rows identify covered HUD FFA, some of which are Covered CPD Programs and some of which are FFA from other HUD offices that may contribute funding to CPD-funded projects. Note that HUD’s Phased Implementation Waiver divides the statutorily defined category of construction materials into two separate buckets for purposes of applying the BAP. See definitions of specifically listed and not listed construction materials in Section II.

To use the table, find the program(s) that funds the project under consideration, then identify which Covered Materials will be used in the project. The cell in the table where the applicable row and column intersect indicates the date on which the BAP will begin applying to each classification of Covered Materials used in the project. It is important to note that the date of obligation is typically the date on which HUD executed the legal instrument creating the relationship between HUD and the grantee for an award of FFA, commonly the date the grant agreement is signed by HUD. The date on which the grantee commits funds to a project or awards funds to a subrecipient does not impact applicability of the BAP.

For example, a grantee uses FY24 CDBG funding to build a new senior center and the HUD grant agreement was signed by the CPD Director on September 15, 2024. The grantee would use the phased implementation table to determine that:

- Since the funds were from FY24 appropriations and HUD executed the grant agreement after November 15, 2022, the BAP applies to all iron or steel materials and any specifically listed construction materials incorporated into the public infrastructure project; and
- Any not listed construction materials and manufactured products incorporated into the project are not subject to the BAP.
- However, if the grantee were to add funds from an FY25 CDBG grant in the future, then the BAP would apply to all Covered Materials used in the public infrastructure project.

A public infrastructure project may use funding from multiple Covered CPD Programs that impose the BAP to Covered Materials at different points in time. In that case, the procurement of Covered Materials for the project must comply with the program that applies the BAP most broadly.

For example, a public infrastructure project uses FY23 CDBG funding and FY24 HOME funding in the construction of a new multifamily housing development with 12 total units. HUD executed the CDBG grant agreement on September 15, 2023, and HUD executed the HOME grant agreement on September 12, 2024. The phased implementation table is used to determine that:

- HUD executed the CDBG grant agreement after November 15, 2022, but prior to FY24 appropriations. The BAP would apply to iron and steel products incorporated in the public infrastructure project.
- HUD executed the HOME grant agreement after August 23, 2024. The BAP would apply to iron and steel products, construction materials, and manufactured products (all Covered Materials) incorporated into the public infrastructure project.
- In this case, the HOME requirements are broader. Therefore, the procurement of all iron and steel products, construction materials, and manufactured products incorporated in the public infrastructure project must comply with the BAP.

Grantees who are considering adding Covered CPD Program funds for construction, maintenance, alteration, or repair of an infrastructure project that was not previously subject to BABA should contact their local CPD Field Office for technical assistance.

<b>BAP will apply to...</b>	<b>Iron and Steel</b>	<b>Construction Materials – Specifically Listed</b>	<b>Construction Materials – Not Listed</b>	<b>Manufactured Products</b>
<b>CDBG Formula Grants</b>	All funds obligated on or after November 15, 2022	As of the date HUD obligates new FFA from Fiscal Year 2024 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations
<b>Choice Neighborhood, Lead Hazard Reduction, and Healthy Homes Production Grants</b>	New FFA obligated by HUD on or after February 22, 2023	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024
<b>Recovery Housing Program (RHP) Grants</b>	New FFA obligated by HUD on or after August 23, 2023	As of the date HUD obligates new FFA from Fiscal Year 2024 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations
<b>All other HUD FFA except HOME, Housing Trust Fund, and Public Housing FFA used for maintenance projects</b>	New FFA obligated by HUD on or after February 22, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024
<b>HOME, Housing Trust Fund, and Public Housing FFA used for maintenance projects</b>	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024

## **VII. Applying the BAP and HUD General Waivers to Covered CPD Programs**

Grantees should assess each project undertaken with Covered CPD Program funds to determine which Covered Materials incorporated into the project are subject to the BAP based on the effective dates in the Phased Implementation Waiver described above. This section describes the process grantees should follow to determine whether a project is subject to the BAP and if the project may be exempted in whole or in part by one of HUD’s general waivers.

As a part of its record-keeping, a CPD grantee should document its process to analyze if the

BAP applies to a public infrastructure project using the approach described below. An optional “Buy America Preference Applicability Checklist” is included in Appendix 2 of this Notice. Grantees may choose to use or adapt the tool to serve as a record of the analysis completed for each project.

### **Step 1: Type of project/activity**

Determine if the project is a public infrastructure project as defined in Sections II and III of this Notice. If the project is a public infrastructure project, the analysis continues to step 2.

### **Step 2: Funding sources**

Identify the source(s) of the project funding, including Covered CPD Programs, other HUD funds, or other Federal agency funding. If the project includes funding from a Covered CPD Program listed in this Notice, the analysis continues to Step 3.

### **Step 3: Covered Materials**

Identify and classify all the materials that will be incorporated into the project. Each material should be classified into only one category: iron and steel, specifically listed construction materials, not listed construction materials, or manufactured products. It is important to classify all Covered Materials used in the project to accurately determine BAP applicability because the BAP may only apply to some Covered Materials used in the project under the Phased Implementation Waiver.

The classification must be made based on the material’s status at the time it is brought to the location for incorporation into a public infrastructure project. If the project contains any Covered Materials, continue to Step 4.

### **Step 4: Date of obligation**

Use the phased implementation table provided in Section VI of this Notice to determine when the BAP applies to each classification of Covered Materials, based on the obligation date for the Covered CPD Program funds. If the project uses any Covered CPD Program funds subject to the BAP based on the HUD obligation date, identify which Covered Materials must be produced in the United States. The obligation date is generally the date that HUD makes a legal commitment for Covered CPD Program funds to the grantee. The date on which a grantee commits funds to a specific project does not impact the applicability of the BAP.

The obligation date is typically when HUD executes the grant agreement, but this may vary by program. For example, the obligation date for CDBG funds can be found in the CDBG grant agreement. Refer to Appendix 1 or contact your local CPD Field Office for assistance regarding the obligation date. If the project needs a waiver of the BAP for any Covered Materials, continue the analysis to Step 5.

## **Step 5: General waivers**

Analyze each available HUD general waiver, based upon the specific requirements of that waiver. Public infrastructure projects that meet the conditions of a general waiver may be exempt in whole or in part from the BAP. Most HUD general waivers provide exemptions for an entire public infrastructure project that meets the waiver's conditions. Grantees that apply a general waiver to an entire project should maintain documentation in their project records.

The *De Minimis and Small Grants Waiver* is uniquely useful for public infrastructure projects that are not covered in their entirety by the other general waivers. The *De Minimis and Small Grants Waiver* offers flexibility to incorporate Covered Materials of foreign or unknown origin up to 5% of the total cost of Covered Materials used in the project or \$1 million, whichever is less. The total cost of Covered Materials includes all classifications of materials, regardless of whether they are subject to the BAP based on HUD's Phased Implementation Waiver. This waiver advances compliance with the BAP by reducing the administrative burden to grantees where the costs of compliance with the BAP could distract from the focus on higher value BAP-compliant items. When using the *De Minimis* waiver, the grantee should document which Covered Materials the waiver was applied to in the project records.

For example, if the total cost of Covered Materials in a project is \$100,000, then the grantee should calculate 5% of that total, which equals \$5,000. The grantee may use the *De Minimis* waiver to use Covered Materials from foreign or unknown sources up to \$5,000. This flexibility can be used towards a specific high-value item or multiple items with lesser values, up to a total of \$5,000.

Grantees should calculate this limit for all public infrastructure projects and maximize this flexibility before seeking project-/product-specific waivers. For projects where general waivers do not provide relief for Covered Materials that cannot be procured from domestic sources, a project-/product-specific waiver may be appropriate. Continue the analysis in Step 6.

## **Step 6: Project-/Product-Specific Waivers**

If the BAP applies to a project and all general waiver flexibilities have been utilized, but there are remaining Covered Materials that can only be sourced from foreign or unknown sources, then a grantee may apply for a project-/product-specific waiver. Prior to submitting a project-/product-specific waiver, the grantee must conduct market research to demonstrate its efforts to procure domestic products. One optional resource for conducting market research is the National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP) center in the grantee's state. Grantees are encouraged to collaborate with relevant members of the project team to identify Covered Materials that cannot be obtained from domestic sources as early as possible in the project life cycle. [NIST MEP's free supplier scouting resources](#) can attempt to identify a domestic manufacturer that can supply the necessary materials or conduct the necessary market research to support the need for a project-/product-specific waiver.

As a part of its record-keeping, a grantee should document its process to analyze how the



BAP applies to a public infrastructure project using the approach described in this section and in Appendix 2. Grantees may also consult their local CPD Field Office for assistance in confirming the analysis completed for a specific project before applying for a project-/product-specific waiver.

### **VIII. Federal Government-wide Guidance on Project-/Product-Specific Waivers**

Once a grantee has completed the analysis described in Section VII and determined that a project-/product-specific waiver is required, the grantee should consider which type of project/product-specific waiver is appropriate, as described below.

The three types of project-/product-specific waivers for which a grantee may apply are described below.

1. A **nonavailability waiver** may be requested if the types of iron, steel, manufactured products, or construction materials required for the project are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality
2. An **unreasonable cost waiver** may be requested when the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.
3. A **public interest waiver** may be requested if the use of American made products would be inconsistent with the public interest. Grantees should explain how waiving the BABA requirement for this project or covered material will serve the public interest and demonstrate definite impacts on the community if specific items, products, or materials are not utilized in an infrastructure project to support this waiver type.

#### **A. Waivers for Infrastructure Projects Funded by Multiple Federal Agencies**

If a waiver is required for a public infrastructure project funded by multiple Federal agencies, the Federal agency contributing the greatest amount of Federal funds for the project may be considered the Cognizant Agency for Made in America (“Cognizant Agency”) and may take responsibility for coordinating with the other Federal awarding agencies. Each Federal agency waiving the BAP must make its own waiver determination. A Cognizant Agency cannot independently issue a waiver that applies to other agencies. Grantees that fund public infrastructure projects with other Federal agencies should contact the local CPD office as early as possible to coordinate review with other Federal agencies in the event a project-/product-specific waiver is needed.

OMB guidance outlined the waiver review process for agencies to follow before issuing a waiver. Based on this guidance, HUD has developed a Department-wide project-/product-specific waiver submission process, described in Section IX.

## IX. Applying for a HUD Specific Waiver

This section describes the process a grantee should follow to request a project-/product-specific waiver. Only the direct HUD recipient should submit a waiver request. Subrecipients and/or subcontractors may not submit a waiver request. The direct recipient should work with project partners to obtain necessary information. Project-/product-specific waivers cannot be approved retroactively for items that have already been purchased or incorporated into a project, so grantees should determine if a project-/product-specific waiver is needed as early as possible in the planning process.

1. Complete the BAP analysis described in Section VII of this Notice to confirm that the project is subject to the BAP and that the grantee has maximized the flexibility provided by HUD general waivers. Grantees may use the optional recordkeeping tool in Appendix 2 and contact the local CPD Field Office if technical assistance is needed.
  - a) This step should always include calculating the *De Minimis* limit allowed by HUD's *De Minimis* waiver and applying that flexibility to the products used in the project that cannot be procured from domestic manufacturers, as described in Section VII, Step 5.
2. Complete the necessary market research to support the need for a waiver. Market research may be completed by the grantee or the subrecipient/contractor who has been awarded funds and is purchasing the materials that will be incorporated into the infrastructure project. Acceptable market research strategies may include one or more of the following:
  - b) Document the report showing results of supplier scouting services provided by the NIST MEP, or similar supplier scouting service. For more information about the supplier scouting process, contact the [local MEP center](#).
  - c) Document that the purchaser has made a good faith effort to contact a minimum of three (3) manufacturers or suppliers to determine if a BABA-compliant material is available in sufficient quantity and satisfactory quality. Documentation may include PDF files or screenshots of Internet searches or email communications, or documentation of phone conversations that notes the date and time of the call, the contact person with whom the purchaser spoke, and a summary of the information received.
3. Collect the required information to complete a waiver application using HUD's [BABA Waiver Submission Site \(https://babawaiver.hud.gov/s/\)](https://babawaiver.hud.gov/s/). Access the [PDF version](#) of the application form to see questions ahead of time to assist with preparation. Once started, the application cannot be saved, so make sure all information has been collected in advance.
4. Submit a BABA waiver application through the BABA Waiver Submission Site. For help with completing the application, access the [Grantee User Manual](#) or view the [BABA Waiver System Training video](#). For additional technical assistance navigating the waiver system, please email [BuildAmericaBuyAmerica@hud.gov](mailto:BuildAmericaBuyAmerica@hud.gov).
5. HUD may contact the grantee for additional information as part of a review of the waiver application to validate the need for a waiver.

6. If an application is approved, HUD will post the proposed waiver in the Federal Register for a minimum 15-day public comment period and submit the request to the Made In America Office (MIAO). The MIAO will then review the proposed waiver and public comments for final approval, and communicate a final decision to HUD, which will communicate it to the grantee.

## **X. Documentation of Compliance with the BAP**

This section describes documentation that grantees should maintain to demonstrate compliance with the BAP for Covered Materials, including required terms and conditions of subawards. Project records should describe the public infrastructure project, identify the Covered Materials subject to the BAP, and include documentation that all iron and steel, manufactured products, and construction materials were produced in the United States or evidence of how a waiver was applicable.

Grantees are encouraged to coordinate with relevant members of the public infrastructure project team to ensure that the Covered Materials delivered to the project site are accompanied by documentation that demonstrates compliance with the BAP. Early and frequent coordination, such as pre-bid meetings to identify any Covered Materials that may be a challenge to source domestically, are recommended.

Grantees must maintain documentation of compliance with the BAP in hard copy or electronic formats, or in grant management software and must make it available to HUD upon request for monitoring purposes. Records should be consistent with existing records retention requirements for each of the Covered CPD programs. If there are no CPD program-specific records requirements, the CPD grantee may follow “retention requirements for records,” under 2 CFR § 200.334 as applicable to Federal grants. The compliance documentation must support the following:

- Documentation of the determination of BAP applicability to the Covered Materials used in the public infrastructure project. Even if the project is determined to be exempt, documentation of that determination should be retained in the grant files to support the determination. See Section VII and the optional BAP Applicability Checklist in Appendix 2.
- If a project is subject to the BAP, documentation that all Covered Materials subject to the BAP were procured from BABA-compliant sources, as determined by HUD’s Phased Implementation Waiver.
- If a general waiver was applied to the project, documentation that supports that the project meets the conditions of the waiver.
- If a project-/product-specific waiver was obtained for the project, a copy of the approved waiver and market research supporting the need for the waiver.

CPD grantees are required to identify whether an activity is an infrastructure project, as defined by BABA, in the Integrated Disbursement and Information System (IDIS) or the Disaster Recovery Grant Reporting System (DRGR), depending on the covered CPD program. Grantees will be prompted to answer a question regarding BAP applicability when creating a new activity or adding new funds to an existing activity. Grantees should answer the question based on the analysis in Section VII.

If the project is subject to the BAP requirements, the following are examples of information and documentation that the grantee may retain to demonstrate compliance. This is not an exhaustive or mandatory list and simply provides examples of documentation that can be maintained to support the conditions outlined above.

- A. Project budget specifying the total project cost and the cost of Covered Materials.
- B. Procurement list(s) of Covered Materials purchased for the public infrastructure project, either by the grantee, subrecipient, or contractor. This list(s) should reflect, for example:
  - a. Type of covered material, (iron, steel, manufactured product, or construction material);
  - b. Product or Material;
  - c. FFA Source(s);
  - d. FFA Obligation Date(s);
  - e. Costs per unit;
  - f. Total cost of product purchase or contract;
  - g. Manufacturer or Vendor;
  - h. Actual purchaser (grantee, sub-recipient, contractor);
  - i. Special Quality Standards, if applicable; and
  - j. U.S. Made verification, if available (Made in the USA label, product specifications, vendor or contractor certification, etc.).
- C. Documentation supporting the Covered Materials incorporated into the public infrastructure were made in the United States, for example:
  - a. A copy of the label indicating the product was made in the United States;
  - b. A copy of the product description or technical specifications that provides sufficient detail to conclude that the Covered Materials comply with BABA;
  - c. A certificate or other documentation from the manufacturer demonstrating that the Covered Materials comply with BABA;
  - d. A signed certification from the contractor of a project certifying compliance with BABA. (See Appendix 3 for an example.);
  - e. A signed certification from the manufacturer of the Covered Materials certifying compliance with BABA.
- D. Results of market research and product sourcing to include, for example, the following:
  - a. Results of a supplier scouting search conducted by NIST MEP or another supplier scouting service;
  - b. Copies of web searches used (e.g., PDF/JPEG copies of web pages showing search terms and results including sources considered, eliminated, and chosen for further research);
  - c. Copies of email, fax, or mail correspondence with Covered Materials manufacturers or suppliers; and

- d. Records of phone communications with Covered Materials manufacturers or suppliers, including:
  - i. Dates and times of phone calls,
  - ii. Phone numbers used,
  - iii. Whether the phone communication was successful in making it possible to reach a staff person manufacturer or supplier able to respond to questions about BABA compliance, or whether the attempt at communication was 14 unsuccessful (e.g., left a message, phone line was busy, or phone line was disconnected),
  - iv. If the phone communication resulted in reaching someone, the name of the person contacted,
  - v. Notes describing the substance of the conversation (e.g., manufactured product is assembled in U.S., but the manufacturer is uncertain whether 55% of the value of the materials/components are sourced in the United States).

## **XI. Subrecipient Compliance with BABA Requirements**

The terms and conditions of Federal awards attach to the FFA and flow down to subrecipients at all tiers. This means that all subgrantees, contractors, developers, etc., who receive Covered CPD Program funds through a CPD grantee must comply with BABA requirements. Language notifying subrecipients that the procurement of materials for public infrastructure projects must comply with the BAP must be included in all subawards, contracts, purchase orders, requests for proposals, and all other relevant procurement and bid documents. Sample language that grantees may use for this purpose is included below.

“Pursuant to the Build America, Buy America Act (BABA), enacted as part of the Infrastructure Investment and Jobs Act (IIJA). Pub. L. 117-58, 41 U.S.C. § 8301 note, the Federal Financial Assistance used to fund this infrastructure project is required to apply a domestic content procurement preference (the “Buy America Preference” or “BAP”) for all construction, alteration, maintenance, or repair of infrastructure, including buildings and real property, unless application of the BAP has been waived by HUD. Additional details on fulfilling the BABA requirements can be found at <https://www.hud.gov/baba>.

## **XII. Contact Information**

Grantees that have questions on this Notice should contact their assigned CPD Field Office Representative or request technical assistance from CPD staff at CPDBABA@hud.gov.

## **Appendix 1 - Frequently Asked Questions**

This Notice includes CPD-specific frequently asked questions (FAQs). For additional FAQs, please view the BABA HUDEXchange site, [hudexchange.info/programs/baba](http://hudexchange.info/programs/baba).

### **1. What projects or activities does the BAP apply to?**

The BAP applies to the Covered Materials used in construction, alteration, maintenance, or repair of public infrastructure projects funded by Covered CPD Programs. The term “infrastructure” includes the structures, facilities, and equipment for projects traditionally considered infrastructure, and buildings and real property. For CPD programs, this may include, but is not limited to, certain funding for:

- road and sidewalk improvement projects;
- water, sewer, and other utility projects;
- broadband infrastructure;
- affordable housing construction and rehabilitation of buildings with five or more units;
- community facility construction and rehabilitation;
- homeless shelter construction and rehabilitation; and
- other activities that are defined as public infrastructure according to BABA.

### **2. What projects or activities are not subject to the BAP?**

The BAP does not apply to projects undertaken with Covered CPD Program funds that do not involve any construction, alteration, maintenance, or repair of public infrastructure. Examples of CPD-funded projects to which the BAP does not apply include planning, capacity building, program administration, public services, training, counseling, short-term rental assistance, land acquisition and demolition projects where there are no articles, materials or supplies that are consumed in, incorporated into, or affixed to infrastructure. The BAP does not apply to affordable housing development projects with one to four units.

### **3. How can I find products that are Made in the USA?**

The Federal Trade Commission requires that products advertised or labeled as “Made in the USA” are generally assembled with parts and materials made of U.S. origin. Some manufacturers provide certification letters available on their website or upon request. HUD encourages grantees to coordinate with their local NIST [Manufacturing Extension Partnership \(MEP\)](#) center or similar supplier scouting service to find potential domestic manufacturers of items that cannot readily be sourced domestically.

### **4. If a project is already underway with funds not subject to the BAP and new funding is added that is subject to the BAP, does the entire project need to comply with the BAP?**

Yes, if any funds subject to the BAP are included in a project, the entire project must comply with the BAP for Covered Materials based on HUD’s and any other applicable

general waivers, regardless of when the project was originally funded. Grantees who are considering adding Covered CPD Program funds for construction, maintenance, alteration or repair of an infrastructure project that was not previously subject to BABA requirements, should contact the local CPD Field Office for technical assistance.

**5. How do I find the obligation date of my grant?**

The obligation date is, in most cases, the date the grant agreement was signed by the CPD Director. You can locate this date by looking at the original grant agreement or navigating to IDIS or DRGR. For grants managed in IDIS, navigate to the View Grant screen and locate the date in the Obligation Date field. For grants managed in DRGR, navigate to the View Grant screen and locate the Contract Effective Date.

## Appendix 2 - Optional Buy America Preference Applicability Checklist

This checklist is an optional tool that may be used or adapted to assist with determining if the Buy America Preference (BAP) applies to a public infrastructure project funded by a covered CPD program. This checklist follows the analysis steps as described in Section VII of Notice CPD-25-01 and may be retained for recordkeeping purposes.

### Project Information

<b>Grantee</b>	
<b>Grant Number</b>	
<b>Activity Name</b>	
<b>Activity Number (IDIS/DRGR)</b>	

**Step 1.** Determine if the project is a public infrastructure project as defined in Sections II and III of Notice CPD-25-01.

<input type="checkbox"/> Yes	Continue to Step 2.
<input type="checkbox"/> No	The BAP does not apply. The BAP only applies to public infrastructure projects. Stop here.

**Step 2.** Is the project funded using a Covered CPD Program?

Check the box below for each CPD program funding this project.

### Group A: Covered CPD Programs

<input type="checkbox"/>	CDBG	<input type="checkbox"/>	SHOP
<input type="checkbox"/>	Section 108	<input type="checkbox"/>	VHRMP
<input type="checkbox"/>	HOME	<input type="checkbox"/>	CPF/EDI
<input type="checkbox"/>	HTF	<input type="checkbox"/>	Section 4
<input type="checkbox"/>	RHP	<input type="checkbox"/>	Rural Capacity Building
<input type="checkbox"/>	ESG	<input type="checkbox"/>	PRO Housing
<input type="checkbox"/>	CoC	<input type="checkbox"/>	PRICE
<input type="checkbox"/>	HOPWA	<input type="checkbox"/>	FY23 PSH Funds

### Group B: CPD Programs Not Covered by the BAP

<input type="checkbox"/>	CDBG-DR	<input type="checkbox"/>	CDBG-CV
<input type="checkbox"/>	CDBG-MIT	<input type="checkbox"/>	HOPWA-CV
<input type="checkbox"/>	CDBG-NDR	<input type="checkbox"/>	ESG-CV
<input type="checkbox"/>	HOME-ARP		



If you selected **any** Group A programs (even if Group B programs are also selected), answer yes. If you selected **only** Group B programs, answer no.

<input type="checkbox"/> Yes	Continue to Step 3.
<input type="checkbox"/> No	The BAP does not apply to this project because it is not funded by a covered CPD program. Stop here.

**Step 3.** Will the project use Covered Materials?

*Each material should be classified into only one category: iron and steel, specifically listed construction materials, not listed construction materials, or manufactured products. This classification is necessary to apply HUD's Phased Implementation Waiver.*

Check the box below for each type of covered material incorporated into this infrastructure project.

<input type="checkbox"/>	Iron or steel
<input type="checkbox"/>	Specifically Listed Construction materials
<input type="checkbox"/>	Not Listed Construction materials
<input type="checkbox"/>	Manufactured products

If you checked any boxes above, answer yes.

<input type="checkbox"/> Yes	Continue to Step 4.
<input type="checkbox"/> No	The BAP does not apply to this project because it will not incorporate any Covered Materials. Stop here.

Analysis continues on next page.

**Step 4.** Based on the obligation date of the covered CPD program funds, does the BAP apply to the funding source and Covered Materials that will be used in the project?

*Use the phased implementation table to determine whether the BAP applies based on the obligation date for the covered CPD program funds and classification of materials. The BAP may only apply to some Covered Materials used in the project.*

*The obligation date is generally the date that HUD executed the grant agreement for covered CPD program funds to the grantee. This date may be found in the grant agreement. The obligation date is not the date when the grantee commits funds to a project under a subrecipient agreement.*

<b>BAP will apply to...</b>	<b>Iron and Steel</b>	<b>Specifically Listed Construction Materials</b>	<b>Not Listed Construction Materials</b>	<b>Manufactured Products</b>
<b>CDBG</b>	CDBG funds obligated on or after 11/15/22	Projects using FY24 CDBG funds	Projects using FY25 CDBG funds	Projects using FY25 funds.
<b>RHP</b>	RHP funds obligated on or after 8/23/23	RHP funds obligated on or after 8/23/24	RHP funds obligated on or after 8/23/24	RHP funds obligated on or after 8/23/24
<b>All other CPD programs except HOME and HTF</b>	Funds obligated on or after 2/22/24	Funds obligated on or after 8/23/24	Funds obligated on or after 8/23/24	Funds obligated on or after 8/23/24
<b>HOME and HTF</b>	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24

<input type="checkbox"/> Yes	<p>Indicate here which Covered Materials the BAP applies to and continue to Step 5:</p> <p><input type="checkbox"/> Iron and steel</p> <p><input type="checkbox"/> Specifically listed construction materials</p> <p><input type="checkbox"/> Not listed construction materials</p> <p><input type="checkbox"/> Manufactured products</p>
<input type="checkbox"/> No	<p>The BAP does not apply to this project because the funds were obligated before the effective date for the program/materials used in the project. Stop here.</p>

**Step 5.** HUD has issued several general waivers. Check the box next to any conditions that apply to the project.

*Public infrastructure projects that meet the conditions of a general waiver may be exempt in whole or in part from the BAP.*

<input type="checkbox"/>	The total cost of the project from all sources (Federal and non-Federal) is \$250,000 or less. If checked, the Small Grants Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	There is an urgent need to immediately complete the project because of a threat to life, safety, or property. If checked, the Exigent Circumstances Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	The project is in Guam, American Samoa, or the Northern Mariana Islands. If checked, the Pacific Island Territories Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	The project is being funded by a Tribal recipient. If checked, the Tribal Recipients Waiver applies, and the project is exempt from the BAP.

If you checked any of the boxes above, answer yes below.

<input type="checkbox"/> Yes	The HUD general waiver selected above is being applied to this project, so the BAP does not apply to the entire project. Attach documentation of the conditions of the waiver and then stop here.
<input type="checkbox"/> No	Proceed to Step 5a.

**Step 5a.** Calculate the *De Minimis* limit for the project:

*The total cost of all Covered Materials includes all iron and steel, construction materials, and manufactured products used in the project, regardless of whether the BAP currently applies under the Phased Implementation Waiver.*

Enter the total cost of all Covered Materials:	
Multiply that amount by 0.05 (5%):	
Enter the lower of the number calculated in the row above or \$1,000,000:	

The amount in the third row above is the *De Minimis* limit for this project. The BAP can be waived for Covered Materials from foreign or unknown sources at a cost not to exceed the *De Minimis* limit of 5% of the total cost of materials or \$1,000,000 (whichever is less). The BAP

will still apply to other Covered Materials used in the project. **Attach a list of Covered Materials and their associated costs to which the *De Minimis* limit has been applied.**

**Step 6.** Is there a need for a project-/product-specific waiver?

*If the BAP applies to a project and all general waiver flexibilities have been utilized, but there are remaining Covered Materials that can only be sourced from foreign or unknown sources, then a grantee may apply for a project-/product-specific waiver.*

<input type="checkbox"/> Yes	Refer to guidance in Section VII Step 6 of Notice CPD 25-01.
<input type="checkbox"/> No	Stop here and retain this analysis in project records.

\_\_\_\_\_  
Completed by

\_\_\_\_\_  
Date Completed

### Appendix 3 - Optional Buy America Preference Certification

#### Project Information

<b>Grantee</b>	
<b>Grant Number</b>	
<b>Activity Name</b>	
<b>Activity Number (IDIS/DRGR)</b>	

This “*Optional Buy America Preference Certification*” is used to certify that, as required by the Build America, Buy America (BABA) Act, all of the iron, steel, manufactured products, and construction materials incorporated into a public infrastructure project are produced in the United States, unless exempted by a HUD general waiver or a project-/product-specific waiver approved by HUD and the Made in America Office (MIAO) at the Office of Management and Budget (OMB).

For Covered Materials not otherwise exempted from the Buy America Preference (BAP), the undersigned certifies the following:

- All iron and steel used in the project are produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- All manufactured products used in the project are produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product; and
- All construction materials used in the project are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.

***Attach a list of all Covered Materials procured by the signatory and used in the project.***

I/We, the undersigned, certify under penalty of perjury that the information provided above is true and correct. WARNING: Anyone who knowingly submits a false claim or makes a false statement is subject to criminal and/or civil penalties, including confinement for up to 5 years, fines, and civil and administrative penalties. (18 U.S.C. §§ 287, 1001, 1010, 1012, 1014; 31 U.S.C. §§ 3729, 3802).

<b>Signature</b>	<b>Title/Organization</b>	<b>Date</b>

# **EXHIBIT N**

## **SECTION 3 COMPLIANCE REQUIREMENTS**

### **ECONOMIC OPPORTUNITY FOR LOW AND VERY LOW-INCOME PERSONS**

#### **NEW MOORPARK CITY LIBRARY PROJECT**

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## SECTION 3 PLAN

### I. Purpose

Section 3 of the Housing and Urban Development Act of 1968, as amended by the Housing and Community Development Act of 1992 (12 U.S.C. 1701u) (Section 3), contributes to the establishment of stronger, more sustainable communities by ensuring that employment and other economic opportunities generated by Federal financial assistance for housing and community development programs are, to the greatest extent feasible, directed toward low- and very low-income persons, particularly those who receive government assistance for housing.

Section 3 is the legal basis for providing jobs for residents and awarding contracts to businesses in areas where a project involving construction, demolition, or rehabilitation receives HUD financial assistance in excess of **\$200,000** (aggregate of all awards) in federal funding that requires compliance with Section 3. Section 3 requirements apply to an entire Section 3 Project, regardless of whether the project is fully or partially assisted under HUD programs that provide Federal Financial Assistance.

In the event that a Section 3 Project generates economic opportunities (training, employment or contracts), these opportunities **must** be directed toward Section 3 Workers **and/or** Section 3 Business Concerns, as defined below. The purpose of Section 3 preferences is to be results oriented by: 1) encouraging business concerns that are not major sources of employment for low-income persons to increase their employment of these persons when economic opportunities arise from HUD financed construction related projects; and 2) promoting the growth of "profit-making" enterprises owned by low-income persons that substantially employ low-income persons with Section 3 contract awards.

Title 24 CFR Part 75 - Economic Opportunities for Low- and Very Low-Income Persons ("Final Rule") establishes the requirements to be followed to ensure the objectives of Section 3 are met, and is what this Section 3 Plan is based upon. The full regulation may be found at [https://www.ecfr.gov/cgi-bin/text-idx?SID=8bad10ac17bc38fff3da0e4bd40211d2&mc=true&tpl=/ecfrbrowse/Title24/24cfr75\\_main\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?SID=8bad10ac17bc38fff3da0e4bd40211d2&mc=true&tpl=/ecfrbrowse/Title24/24cfr75_main_02.tpl)



## II. Definitions

**1937 Act** - the United States Housing Act of 1937, 42 U.S.C. 1437 et seq.

**Area Median Income (AMI)** – income limits set annually by the Department of Housing and Urban Development (HUD) to determine eligibility for HUD-funded programs, including Housing and Community Development Financial Assistance subject to this Plan.

**Contractor** - any entity entering into a contract with: (1) the City; (2) a Subrecipient for work in connection with a Section 3 Project.

**Employment Opportunities** - with respect to Section 3 covered Housing and Community Development Financial Assistance, this term means **all** employment opportunities arising in connection with the Section 3 Project **including** management and administrative jobs. Sample job categories and descriptions are listed in **Attachment I**.

**Full Time** - a position that is temporary, seasonal, or permanent that requires at least 1,750 hours of employment on an annual basis.

**Housing and Community Development Financial Assistance** – housing rehabilitation, housing construction, and other public construction projects assisted under HUD programs that provide financial assistance when the total amount of assistance to the project from all federal sources exceeds a threshold of \$200,000.

**Labor Hours** - the number of paid hours worked by persons on a Section 3 Project or by persons employed with funds that include Public Housing Financial Assistance.

**Low-Income** - families (including single persons) whose income does not exceed 80% of the (adjusted) median family income of the Primary Metropolitan Statistical Area. See **Attachment E**.

**Material Supply Contracts** - contracts for the purchase of products and materials, including, but not limited to, lumber, drywall, wiring, concrete, pipes, toilets, sinks, carpets, and office supplies.

**Primary Metropolitan Statistical Area (PMSA)** - As established by the Office of Management and Budget, the entire geographic area encompassed by the political boundaries of the County of Ventura has been defined as the PMSA for this Section 3 Plan.

**Professional Services** - non-construction services that require an advanced degree or professional licensing, including, but not limited to, contracts for legal services, financial consulting, accounting services, environmental assessment, architectural services, and civil engineering services.

**Section 3** - Section 3 of the Housing and Urban Development Act of 1968, as amended (12 U.S.C. 1701u).

**Section 3 Business Concern** - means:

(1) A business concern meeting at least one of the following criteria, documented within the last six-month period:

- (i) It is at least 51 percent owned and controlled by low- or very low-income persons;
- (ii) Over 75 percent of the labor hours performed for the business over the prior three-month period

are performed by Section 3 workers; or

(iii) It is a business at least 51 percent owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.

(2) The status of a Section 3 business concern shall not be negatively affected by a prior arrest or conviction of its owner(s) or employees.

(3) Nothing in this part shall be construed to require the contracting or subcontracting of a Section 3 Business Concern. Section 3 Business Concerns are not exempt from meeting the specifications of the contract.

**Section 3 Contract** - a contract or subcontract (including contracts for Professional Services) awarded by the City of Moorpark or a Contractor/Subcontractor for work generated by the expenditure of Housing and Community Development Financial Assistance, or for work arising in connection with a Section 3 Project. This definition does not include contracts for the purchase of supplies and materials. However, whenever a contract for materials includes the installation of the materials, that contract constitutes a Section 3 Contract.

**Section 3 Project** - a project, as defined in § 75.3(a)(2) of the Final Rule, consisting of housing rehabilitation, housing construction, or other public construction projects assisted under HUD programs that provide Housing and Community Development Financial Assistance when the total amount of assistance to the project exceeds a threshold of \$200,000.

**Section 3 Worker** - means:

(1) Any worker who currently fits or when hired within the past five years fit at least one of the following categories, as documented:

(i) The worker's income in the year in which they qualified as a Section 3 Worker is below the income limit established by HUD (80% AMI for CDBG and HOME-assisted projects).

(ii) The worker is employed by a Section 3 Business Concern.

(iii) The worker is a YouthBuild participant.

(2) The status of a Section 3 worker shall not be negatively affected by a prior arrest or conviction.

(3) Nothing in this part shall be construed to require the employment of someone who meets this definition of a Section 3 worker. Section 3 workers are not exempt from meeting the qualifications of the position to be filled.

**Service Area or the Neighborhood of the Project** - an area within one mile of the Section 3 Project or, if fewer than 5,000 people live within one mile of a Section 3 Project, within a circle centered on the Section 3 Project that is sufficient to encompass a population of 5,000 people according to the most recent U.S. Census.

**Subcontractor** - any entity that has a contract with a Contractor to undertake a portion of the Contractor's obligation to perform work in connection with a Section 3 Project.

**Targeted Section 3 Worker** has the meanings provided in §§ 75.11, 75.21, or 75.29 of the Final Rule, and does not exclude an individual that has a prior arrest or conviction. Targeted Section 3 Worker is a sub-category of a Section 3 Worker. References to Section 3 Workers within this Section 3 Plan are inclusive of Targeted Section 3 Workers unless it is specifically stated otherwise.

For Housing and Community Development Financial Assistance, means a Section 3 Worker who is:

1. A worker employed by a Section 3 Business Concern; or
2. A worker who currently fits or when hired fit at least one of the following categories, as documented within the last five years:
  - (i) Living within the Service Area of the Neighborhood of the Project; or
  - (ii) A YouthBuild participant.

**Very Low-Income** - families (including single persons) whose income does not exceed 50% of the area (adjusted) median family income. See **Attachment E**.

**YouthBuild Programs** - programs receiving assistance under the Workforce Innovation and Opportunity Act (29 U.S.C. 3226).

### **III. Section 3 Implementation**

Contractors/Subcontractors working on Section 3 Projects must "to the greatest extent feasible" ensure that employment and training opportunities and contracts for work awarded in connection with Section 3 Projects are provided to Section 3 Workers and Section 3 Business Concerns that provide economic opportunities to Section 3 Workers in the Service Area or Neighborhood of the Project.

Contractors will also be required to incorporate a Section 3 Economic Opportunity Plan and utilize the Section 3 Clause in all subcontracts.

#### **A. Section 3 Economic Opportunity Plan (EOP)**

All bidders for contracts on Section 3 Projects are required to complete the Section 3 Economic Opportunity Plan (EOP) (**Attachment A**) and return it with the project bid. The Section 3 EOP requires all bidders to complete a preliminary statement of their workforce needs for the Section 3 Project, broken out by trade for all skilled, semi-skilled, and unskilled labor and trainee categories. The statement should include the anticipated workforce needs of any subcontractors to be hired where this is known.

In order to assist with meeting the required benchmarks, Contractors/ Subcontractors may wish to consider using the employment/job development services of the agencies listed in Attachment J as well as other agencies and centers that serve the economically disadvantaged within the project area.

#### **B. Section 3 Clause**

The attached Section 3 clause (**Attachment B**) is inserted in all Section 3 Project contracts and subcontracts. This clause commits the Contractor/Subcontractor to provide, to the greatest extent feasible, training and employment opportunities to Section 3 Workers and Section 3 Business Concerns. Contractors/Subcontractors that are awarded a Section 3 Project contract are required to give notice to all labor organizations of their commitment to hiring Section 3 Workers and Section 3 Business Concerns. This notice should also be posted at the Contractor/Subcontractors place of business and at the job site. A sample notice of this type is provided for reference (**Attachment C**).

In connection with each bid for work under a Section 3 Project, S bidders are required to complete and return the following forms:

1. Compliance Bidder's Certification Form (**Attachment D**) stating that each bidder understands this Section 3 requirement. This form must be completed by each Contractor/Subcontractor, signed by an authorized representative of the company and returned with their bid for work on the

Section 3 Project; and

#### **IV. Section 3 Benchmarks**

Contractors and Subcontractors shall make every good faith effort to achieve the following benchmarks in association with the Section 3 Project:

1. Section 3 Workers will make up 25% of the total number of labor hours worked by all workers, exclusive of the labor hours worked by Targeted Section 3 Workers; and
2. Targeted Section 3 Workers will make up 5% of the total number of labor hours worked by all workers.

These benchmarks shall be updated every three years by the U.S. Department of Housing and Urban Development. The current benchmarks can be found on the HUD website; <https://www.hudexchange.info/programs/section-3/section-3-guidebook/section-3-in-action/safe-harbor-benchmarks/> however the City reserves the right to adjust these benchmarks as needed, consistent with direction from HUD.

#### **V. Required Documentation and Reporting**

For each bidder submitting a bid the following documentation must be provided to the City at the time of the bid:

1. Section 3 Compliance Bidder's Certification for selected Contractors/Subcontractors (Attachment D);

For each bidder awarded work all the following documentation must be provided to the City within 10 days of selection of Contractors/Subcontractors:

1. Section 3 Economic Opportunity Plan (Attachment A);
2. Certification signed by the Subrecipient that all contracts/subcontracts for work include the required Section 3 Clause and copies of each contract with the clause highlighted;
3. Notice(s) given by Contractors/Subcontractors to all labor organizations indicating their commitment to hire Section 3 Workers (Attachment C);
4. and
5. Certification of Business Concerns Seeking Section 3 Preference in Contracting and Demonstration of Capability (Attachment D), if applicable.

Reporting will be required at the request of the City based upon HUD-required reporting. Contractors must report the following data to the City for each Section 3 Project:

1. Total number of labor hours worked;
2. Total number of labor hours worked by Section 3 Workers (exclusive of hours worked by Targeted Section 3 Workers) with documentation as described in Section VII of this Plan; and
3. Total number of labor hours worked by Targeted Section 3 Workers with documentation as described in Section VII of this Plan.

Section 3 Workers' and Targeted Section 3 Workers' labor hours may be counted for five years from when their status as a Section 3 Worker or Targeted Section 3 Worker is established.

Labor hours worked by people in Professional Services may be counted in the above reporting of total labor hours worked and total labor hours worked by Section 3 Workers and Targeted Section 3 Workers.

If a Contractor or Subcontractor does not track labor hours, the City may request that the Contractor/Subcontractors "good faith assessment" of labor hours of full-time or part-time employees be accepted. The City will only accept "good faith assessment" on Section 3 Projects that have requested, and had their request approved by the City, to utilize this method.

The benchmarks for the minimum percentage of labor hours worked by Section 3 Workers and Targeted Section 3 Workers represent **minimum** targets for a Section 3 Project. The benchmarks are not set-asides and quotas but instead establish a "safe harbor" for City, Contractors and Subcontractors on the matter of compliance with Section 3. In the absence of evidence to the contrary, City, Contractor or Subcontractor that meets the minimum benchmarks for a Section 3 Worker/Targeted Section 3 Worker labor hours will be considered to have met Section 3 requirements under this Section 3 Plan.

If, at the conclusion of the contracting period for the Section 3 Project, the above priorities and benchmarks are not met, the City must demonstrate why it was not feasible to comply with this Section 3 Plan. The Contractor must provide detailed information on their efforts to comply with this Section 3 Plan, including the outcome of all efforts originally identified in the Subrecipient's Section 3 Strategy.

## **VI. Qualification of Section 3 Workers and Section 3 Business Concerns**

### **A. Section 3 Workers**

A Section 3 Worker shall certify or submit evidence demonstrating their eligibility as a Section 3 Worker to the Contractor or Subcontractor as appropriate. **Attachment E** (or a similar form) must be filled out by Section 3 Workers.

This self-certification will be one of the methods used by City, Contractors, and Subcontractors to confirm the percentage of labor hours worked by Section 3 Workers. Should said certification come into question or not be appropriate, City, and Contractors/Subcontractors may request other evidence of eligibility.

Please note that nothing in the Section 3 Plan shall be construed to require the employment of a Section 3 Worker who does not meet the background and qualifications of the position to be filled.

### **B. Section 3 Business Concerns**

Businesses seeking to qualify for a Section 3 contracting preference shall certify that the business is a Section 3 Business Concern and provide appropriate documentation with the certification. Should said certification come into question, City and Contractors/Subcontractors may request other evidence of eligibility for the Section 3 preference. Self-certifications from business owners may be accepted by the City at its sole discretion.

A Section 3 Business Concern seeking a contract or a subcontract must demonstrate to the satisfaction of the party awarding the contract or subcontract that the business concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract or subcontract. The ability to perform successfully under the terms and conditions of all proposed contracts and subcontracts is required of all Contractors and Subcontractors subject to Section 3 requirements.

## VII. Section 3 Contract Compliance

Minimum compliance with Section 3 is determined by documentation of all of the following:

1. Creation and implementation of an acceptable Section 3 Strategy for meeting Section 3 Priorities prepared by the City;
2. Demonstration of inclusion of the required Section 3 language in all subcontracts/contracts for work associated with the Section 3 Project; **and**
3. Demonstration that the Section 3 Benchmarks were met.

The written records of Section 3 Project Contractors and Subcontractors will be reviewed by the City as a means of establishing compliance or non-compliance with Section 3 requirements. Contractors and Subcontractors who receive Section 3 contracts found to be in non-compliance will be deemed to be **ineligible** for future Section 3 covered projects for a minimum period of **24** months from the date deemed to be in noncompliance. **Attachment F** shall be used by Contractors and Subcontractors to provide information and data regarding **actual** contracts/subcontracts awarded. **Attachment G** identifies a form that is required for **actual** labor hours worked in connection with assisted Section 3 Projects. Satisfactory submission of **Attachment E** and/or **F** with each request for payment is a **prerequisite** in order for City to authorize payment on a Section 3 covered project.

**Attachment H** identifies acceptable methods that, when documented, demonstrate compliance with Section 3. **Attachment C** identifies a sample notice for project area resident employment commitment. **Attachment I** provides a sample description of job categories connected with Section 3 covered projects.

The following records must be maintained:

- Worker's self-certification that their income is below the income limit from the prior calendar year.
- Worker's self-certification of participation in public housing or Section 8.
- Certification from a PHA or Section 8 program manager that a worker is a participant in their program.
- Employer's certification that the worker's income from that employer is below the income limit.
- Employer's certification that the worker is employed by a Section 3 Business Concern.
- Worker's certification that the worker is a YouthBuild Participant.

If the Section 3 Benchmarks are NOT met, documentation of compliance with the Section 3 Strategy evidencing the efforts made to meet these goals must be provided. Examples of documentation of efforts to comply will be based upon the Section 3 Strategy and may include:

- Copies of direct mail solicitation and e-mail/Internet outreach;
- Formal advertisements;
- Flyers/brochures advertising meetings;
- Sign-in lists from job fairs and other public meetings;
- Agendas and/or meeting notes from meetings with interested parties and Contractors.

The City of Moorpark and HUD reserve the right to inspect Contractor records related to this Section 3 Plan with 48 hours notice.

## **VIII. Complaint Procedure**

A complaint may be filed alleging a violation of Section 3 requirements. They may be filed by Section 3 Workers or Section 3 Business Concerns. Complaints are to be addressed to the City of Moorpark at the address below. If the complaint cannot be resolved by the City, grievances may be submitted to and investigated by HUD. Those grievances that are not resolved voluntarily can result in an administrative hearing.

A complaint must be written and include:

- Name and address of grievant
- Name and address of Contractor/Subcontractor
- Description of acts or omission
- Corrective action sought

Complaints should be filed with the City of Moorpark and, if warranted, may be appealed to the Area Office of HUD (LA Area) and HUD in Washington, D.C., at the addresses below.

1. Parks, Recreation and Community Services Department  
Attention Parks and Recreation Director  
323 Science Drive  
Moorpark, CA 93021
2. HUD LA Area Office, Region IX  
Director, Fair Housing and Equal Opportunity  
U.S. Dept. of Housing and Urban Development  
611 West Sixth St., Suite 1000-9DD  
L.A., Ca. 90017-3101
3. HUD Washington  
Assistant Secretary, Fair Housing and Equal Opportunity  
Office of Economic Opportunity  
Room 5100, Dept. of HUD  
451 Seventh St., S.W.  
Washington, D.C. 20410-2000 (202/708-1112)



**IX. Attachments and Required Actions**

<b>Attachment</b>	<b>Title</b>	<b>Required Action</b>
A	Section 3 Economic Opportunity Plan	Submit with Bid
B	Section 3 Clause	Must be included in every contract and subcontract.
C	Sample Notice for Project Area Resident Employment Commitment	Must be posted at the project site.
D	Section 3 Compliance Bidder's Certification	Submit with Bid.
E	Section 3 Eligibly Certification	
F	Actual Subcontracts and Suppliers for Section 3 Compliance (awarded for covered projects)	Must be submitted with requests for payment
G	Actual Labor Hours Worked for Contractor or Subcontractor Economic Opportunities for Low and Very Low Income Persons in Connection with Assisted Section 3 Projects	Must be submitted with requests for payment
H	Section 3 Compliance – Suggested Examples (of Efforts to offer Training and Employment Opportunities to Section 3 Residents	
I	Sample Description of Job Categories for Section 3 Plan	Information
J	Apprenticeship Program Information and Resources	Information

## Attachment A - Section 3 Economic Opportunity Plan

(SUBMIT AFTER BID AWARD)

**Project Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Project Address:** \_\_\_\_\_

**Project City/County:** \_\_\_\_\_

**Name of Bidder/Organization:** \_\_\_\_\_

**Contact Person and Title:** \_\_\_\_\_

**Telephone Number:** \_\_\_\_\_ **email:** \_\_\_\_\_

**Address of Bidder:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Description of Service Area or Neighborhood of the Section 3 Project, bordering streets, etc. (or attach map)

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Census Tract(s) and Block Group(s): \_\_\_\_\_

### A. Economic Opportunities for Section 3 Business Concerns

1. List of all subcontractors and construction related vendors you plan to use regardless of contract amount. You may use additional sheets to complete this section if necessary.

Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No
Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No
Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No

## Attachment A

(page 2)

[illegible]

**Attachment A**

(page 3)

3. Detailed description of: 1) all efforts planned to outreach to, identify and secure bids from Section 3 Business Concerns; 2) all Technical Assistance planned to help Section 3 Business Concerns understand and bid on the Section 3 Project; **and** 3) any assistance made available to Section 3 Business Concerns in bonding, guaranties, or other efforts to support viable bids.

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4. List of sources and methods of identifying and soliciting Section 3 Business Concerns for this project.

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## Attachment A

(page 4)

### B. Economic Opportunities for Section 3 Workers

1. List of Sources and Methods of Recruitment of Section 3 Workers.

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2. List State approved apprenticeship programs to be utilized, if any.

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3. List any Job Training Partnership Act (JTPA) programs to be utilized, if any.

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4. Detailed description of: 1) all efforts planned to outreach to and generate job applicants who qualify as Section 3 Workers; **and** 2) all planned Technical Assistance to help Section 3 Workers apply for jobs.

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5. List other methods utilized to provide economic opportunities and comply with Section 3 requirements (use additional sheets if necessary).

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## Attachment A

(page 5)

### C. Preliminary Statement of Workforce Needs

- Complete the following table for the project. Depending upon the magnitude of the project, you may wish to prepare a table for you and each subcontractor.

Occupations	Total Labor Hours Estimated to be Worked by all Workers	Total Labor Hours Estimated to be Worked by Section 3 Workers	Total Labor Hours Estimated to be Worked by Targeted Section 3 Workers	Vacancies to Fill
Skilled Trades				
Semi-skilled				
Unskilled Labor				
Trainees/ Apprentices				
Professional Services (architectural, engineering, etc.)				
Other:				
Other:				
Other:				
Totals				

<b>Total Goal for Section 3 Workers</b> (Total Labor Hours Estimated to be Worked by Section 3 Workers Divided by Total Labor Hours Estimated to be Worked by all Workers)	
<b>Total Goal for Targeted Section 3 Workers</b> (Total Labor Hours Estimated to be Worked by Targeted Section 3 Workers Divided by Total Labor Hours Estimated to be Worked by all Workers)	

Section 3 Benchmarks require that Subrecipients, Contractors and Subcontractors make every effort to meet the following benchmarks:

- Section 3 Workers will make up 25% of the total number of labor hours worked by all workers, exclusive of the labor hours worked by Targeted Section 3 Workers; and
- Targeted Section 3 Workers will make up 5% of the total number of labor hours worked by all workers.

**SUBMIT WITH BID  
AND PRIOR TO ANY SUBCONTRACTS WITH SECTION 3 BUSINESS CONCERNS**

**Attachment B - Section 3 Clause  
24 CFR 75**

(to be inserted into every contract/subcontract for work)

- A. The work to be performed under this contract is on a project assisted under a program providing direct federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule). Section 3 requires that to the greatest extent feasible, opportunities for training and employment be given to lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.
- B. The parties to this contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR 75 and all applicable rules and orders of the Department issued thereunder prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.
- C. The contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract or understanding, if any, a notice advising the said labor organization or worker's representative of his commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.
- D. The contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR 75. The contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR 75 and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.
- E. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR 75, and all applicable rules and orders of the Department issued thereunder prior to the execution of the contract, shall be a condition of the federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors, and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which federal assistance is provided, and to such sanctions as are specified by 24 CFR 75.

## **Attachment C - Sample Notice of Project Service Area or Neighborhood of Project Employment Commitments**

### INSTRUCTIONS

*The City of Moorpark's Section 3 Plan requires that a notice similar to this sample be sent by all firms awarded or contracting for work on a Section 3 Project funded by the City with federal funds to any labor organizations with which the firm has a collective bargaining agreement or other agreement or understanding. If awarded a contract, you will be required to submit a notice of this type and to post it in a prominent place available to your employees. This notice should be provided on your company's letterhead.*

### S A M P L E

#### TO WHOM IT MAY CONCERN:

The **(Insert Name of Company)** has entered into an agreement with the City of Moorpark for work to be performed at **(Insert Project Name and Location)**. This project is funded in part by the U.S. Department of Housing and Urban Development (HUD) and as such is subject to the terms of Section 3 of the Housing and Urban Development Act of 1968, 12 USC 1701 u, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule). As a contractor or subcontractor on this project, and pursuant to the provisions of Section 3, the **(Insert Name of Company)** is committed to utilizing Section 3 Workers/Targeted Section 3 Workers residing within the Service Area or Neighborhood of the Project as employees and trainees to the greatest extent feasible. In addition, the **(Insert Name of Company)** will utilize to the greatest extent feasible, Section 3 Business Concerns located in or owned in substantial part by residents of the Section 3 Service Area or Neighborhood of the Project.

The Service Area or Neighborhood of the Project is defined as follows:

***(insert description)***

It is the intention of the **(Insert Name of Company)** to fulfill its obligations under Section 3.

[Signature of Authorized Company Representative]



**Attachment D - Section 3 Compliance Bidder's Certification**

Name of Company: \_\_\_\_\_

Address: \_\_\_\_\_

Project Title & Address: \_\_\_\_\_

The undersigned does hereby certify that he/she has read and understood the City of Moorpark's Section 3 Plan and requirements that apply to the above cited project, said requirements being known as the Section 3 Clause found in 24 CFR 75, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule) and that neither the project nor the company are under any contractual restrictions or other disabilities which would prevent the company from complying with said requirements.

Signature of Company Officer: \_\_\_\_\_

Title of Officer: \_\_\_\_\_ Date: \_\_\_\_\_

### Attachment E - Section 3 Worker/Targeted Section 3 Worker Certification

Project Title and Address: \_\_\_\_\_

Service Area or Neighborhood of the Section 3 Project *(to be completed by the Subrecipient & detailed below or attached)*:

I, the undersigned, understand that the aforementioned project is subject to the City of Moorpark's Section 3 Plan which warrants that employment and other economic opportunities generated by certain U.S. Department of Housing and Urban Development (HUD) financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State, and local laws and regulations, be directed to low-and very-low income persons, particularly those who are recipients of assistance for housing.

In reliance of that said warranty, and in reliance upon the income schedules and project service area designation attached hereto and made part of this certification by this reference, I hereby certify that I qualify as a Section 3 Worker/Targeted Section 3 Worker by virtue of the statements I make by selecting any of the following as applicable to me:

Section 3 Worker (select as many as apply, one is required to qualify as a Section 3 Worker)

- ☐ The total household income for my family for the previous or annualized calendar year is below the income limit established by HUD for low-income households (80% AMI); or
- ☐ I am employed by a Section 3 Business Concern; or
- ☐ I am a Youthbuild participant.

Targeted Section 3 Worker

- ☐ The total household income for my family for the previous or annualized calendar year is below the income limit established by HUD for low-income households (80% AMI).
- ☐ I am employed by a Section 3 Business Concern; **and**

Check one:

- ☐ I live within the Service Area or Neighborhood of the Section 3 Project, as defined above; or
- ☐ I am a YouthBuild participant.

My permanent address is: \_\_\_\_\_  
\_\_\_\_\_

I have attached the following documentation as evidence:

- ☐ Copy of lease/mortgage statement or driver's license with my home address
- ☐ Copy of evidence of participation in a Youthbuild program
- ☐ Copy of evidence of employment with a Section 3 Business Concern
- ☐ Other evidence \_\_\_\_\_

I, the undersigned, swear that the foregoing statements are true and correct and I understand that false statements may initiate action under Federal or State laws concerning false statements.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_ Telephone: \_\_\_\_\_

**Attachment E**

(page 2 of 2)

**SECTION 3 RESIDENT FAMILY INCOME LIMITS**

Ventura County

2025 Median Family Income = \$131,300 (4-person household)

	HOUSEHOLD SIZE							
	1 person	2 persons	3 persons	4 persons	5 persons	6 persons	7 persons	8 persons
50% Median: (Very Low-Income)	\$52,400	\$59,900	\$67,400	\$74,850	\$80,850	\$86,850	\$92,850	\$98,850
80% Median: (Low-Income)	\$83,850	\$95,800	\$107,800	\$119,750	\$129,350	\$138,950	\$148,500	\$158,100

These figures are updated annually by HUD.

## Attachment F - Actual Subcontracts and Suppliers for Section 3 Compliance

(To be submitted with each payment request.)

**NAME OF PROJECT:**

**DATE:**

SUBCONTRACTOR'S NAME, ADDRESS, PHONE NUMBER, LICENSE NUMBER	TYPE OF WORK (TRADE)	CONTRACT AMOUNT	SECTION 3 BUSINESS CONCERN YES OR NO
SUPPLIER'S NAME, ADDRESS AND PHONE NUMBER (IF INSTALLATION INCLUDED IN CONTRACT)	TYPE OF SUPPLIES	CONTRACT AMOUNT	SECTION 3 BUSINESS CONCERN YES OR NO

### Attachment G - Actual Labor Hours Worked for Contractor or Subcontractor Economic Opportunities for Low- and Very Low-Income Persons in Connection with Assisted Section 3 Projects

Name of Project: \_\_\_\_\_ Project Location: \_\_\_\_\_

Contractor/subcontractor Name & Address: (Street, City, State, Zip)		License Number:		Dollar Amount of Contract:	
		Contact Person:		Phone: (Include Area Code)	
		Construction Reporting Period:		Date Report Submitted:	
<b>Part I: Employment and Training</b>					
A Job Category	B Number of Labor Hours Worked	C Number of Section 3 Labor Hours Worked	D % of Labor Hours Worked by Section 3 Workers (Column C/B)	E Number of Targeted Section 3 Labor Hours Worked	F % of Labor Hours Worked by Targeted Section 3 Workers (Column E/B)
Professionals					
Technicians					
Office/Clerical					
Construction by Trade (List)					
Trade:					
Trade:					
Trade:					
Trade:					
Trade:					
Other: (List)					
TOTAL					

### **Attachment H - Section 3 Compliance - Suggested Examples**

Following are acceptable methods that, ***when documented***, may help demonstrate compliance with Section 3:

1. Consulting with State and local agencies administering training programs funded through JTPA or JOBS, probation and parole agencies, unemployment compensation programs, community organizations and other officials or organizations to assist with recruiting Section 3 Workers for a contractor's or subcontractor's training and employment positions.
2. Advertising the jobs to be filled through the local media, mail and e-mail and posting in the Service Area or the Neighborhood of the Project.
3. Employing a job coordinator, or contracting with a business concern that is licensed in the field of job placement (preferably a Section 3 Business Concern) that will undertake efforts to match eligible and qualified Section 3 Workers with the training and employment positions that the contractor intends to fill.
4. Establishing training programs, which are consistent with the requirements of the Department of Labor, for public housing residents and other Section 3 Workers in the building trades.
5. Advertising the training and employment positions by distributing flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) to housing developments where there are Section 3 Workers.
6. Entering into "first source" hiring agreements with organizations representing Section 3 Workers.
7. Contacting resident councils, resident management corporations, or other resident organizations in the housing developments where there are Section 3 Workers, to request the assistance of those organizations in notifying residents of the training and employment positions to be filled.
8. Sponsoring a job informational meeting to be conducted at a location in the housing developments where there are Section 3 Workers or in the Service Area or Neighborhood of the Project.
9. Arranging assistance in conducting job interviews and completing job applications for residents of the housing developments where there are Section 3 Workers and in the Service Area or Neighborhood of the Project.
10. Arranging for a location in the housing developments where there are Section 3 Workers, or the neighborhood or service area of the project, where job applications may be delivered and collected or where job interviews can be conducted.
11. Where there are more qualified Section 3 Workers than there are positions to be filled, maintaining a file of eligible qualified Section 3 Workers for future employment positions.
12. Undertaking such continued job training efforts as may be necessary to ensure the continued employment of Section 3 Workers previously hired for employment opportunities.

## **Attachment H**

(page 2 of 2)

### Efforts to Award Contracts to Section 3 Business Concerns:

1. In determining responsibility of potential subcontractors, consider their record of Section 3 compliance as evidenced by past actions and their current plans for the pending subcontract.
2. Contacting business assistance agencies, minority contractors' associations and community organizations to inform them of contracting opportunities and request their assistance in identifying Section 3 Business Concerns which may solicit bids or proposals for contracts for work in connection with Section 3 Projects.
3. Providing written notice to all known Section 3 Business Concerns of the contracting opportunities. This notice should be in sufficient time to allow the Section 3 Business Concerns to respond to the bid invitations or request for proposals.
4. Following up with Section 3 Business Concerns that have expressed interest in the contracting opportunities by contacting them to provide additional information on the contracting opportunities.
5. Coordinating pre-bid meetings at which Section 3 Business Concerns could be informed of upcoming contracting and subcontracting opportunities.
6. Advising Section 3 Business Concerns as to where they may seek assistance to overcome limitations such as inability to obtain bonding, lines of credit, financing, or insurance.
7. Arranging solicitations, times for presentations of subcontract bids, quantities, specifications, and delivery schedules in ways to facilitate the participation of Section 3 Business Concerns.
8. Where appropriate, breaking out subcontract work items into economically feasible units to facilitate participation by Section 3 Business Concerns.
9. Advertising subcontracting opportunities through trade association papers and newsletters, and through other local media, such as newspapers of general circulation.
10. Developing a list of eligible Section 3 Business Concerns.

### Providing Other Economic Opportunities

Contractors and subcontractors are encouraged to undertake efforts to provide to low-income persons economic opportunities other than training, employment, and contract awards, in connection with Section 3 Projects.

Other Training and Employment Related Opportunities: These include, but need not be limited to, use of trainee positions to fill vacancies; and hiring Section 3 Workers in part-time positions.

Other Business Related Economic Opportunities include, but are not limited to, the formation of Section 3 joint ventures, financial support for affiliating with franchise development, use of labor only contracts for building trades, purchase of supplies and materials from Housing Authority resident-owned businesses or Public Housing Authority resident-owned businesses.

## Attachment I - Sample Description of Section 3 Job Categories

Officials/Managers - Occupations requiring administrative personnel who set broad policies, exercise overall responsibility for execution of these policies, and direct individual departments or special phases of a firm's operation. Includes: officials, executives, middle management, plant managers, superintendents, salaried forepersons.

Professionals - Occupations requiring either college graduation or experience of such kind that provides a comparable background. Includes: accountants, chemists, architects, engineers, personnel workers, registered nurses, teachers, lawyers, auditors, researchers, property managers.

Technicians (Para-professionals) - Workers of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work which can be obtained through about two years of post-high school education or through equivalent on-the-job training (e.g., computer programmers, draft persons, engineering aides, junior engineers, nurses, nurse's aides, assistants, surveyors, buyers).

Sales - Occupations engaging wholly or primarily in direct selling (e.g., advertising agents, brokers, sales clerks).

Office/Clerical - Includes all clerical-type work regardless of level of difficulty (e.g., bookkeepers, office clerks, typists, telephone operators, non-management).

Skilled Craft Workers - Manual workers of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work (e.g., auto attendants, laundry operators, truck drivers).

Operatives (Semi-skilled workers) - Workers who operate machines or processing equipment or perform other factory-type building trades, truck drivers).

Laborers (Unskilled workers) - Workers in manual occupations which generally require no special training (e.g., laborers, helpers, car washers, gardeners, elevator operators).

Apprentices/Trainees - Persons employed in a program including work training and related instruction to learn a trade or craft which is traditionally considered an apprenticeship, regardless of whether the program is registered with a Federal or State agency).

Service Workers - Workers in both protective and non-protective service occupations

ADP/computer	Guards	Police
Air conditioning repair	Handyworker	Porters
Appliance repair	Janitorial	Printers
Carpet Consultants	Landscaping	Suppliers
Catering	Lead Based Paint Remover	Transportation providers
Engineers	Manufacturing	Vendors
Firefighters	Marketing	Waiters/Waitresses
Florists	Photography	



## **Attachment I**

(page 2 of 2)

Construction Workers - Include but are not limited to the following categories:

Architecture  
Asbestos Removal  
Bricklaying  
Carpentry  
Cement/Masonry  
Communications & Systems  
Demolition  
Drywall  
Electrical  
Elevator Construction  
Fencing  
Glazing  
Heating  
Insulators  
Iron works  
Laborers  
Lathers  
Marble and Tile  
Machine Operators  
Painters  
Parking Lot Striping  
Plastering  
Plumbing  
Power Equipment Operators  
Refrigeration/Conditioning  
Roofing  
Sheet Metal  
Soft Floor Layer  
Sprinkler Fitter  
Stone Mason/Bricklayer  
Surveying  
Terrazzo  
Tile Setting  
Truck Driver

## **I. Attachment J - Apprenticeship Program Information and Resources**

Building California Construction Careers conducts outreach programs which are designed to educate the public about construction career opportunities and apprenticeship. Their website is full of information regarding various union apprenticeship programs throughout the central coast. Their website is <https://buildcalifornia.com/>.

**TRI COUNTIES BUILDING AND CONSTRUCTION TRADES COUNCIL**, AFL-CIO, represents Craft Unions in Ventura, Santa Barbara and San Luis Obispo Counties.

3994 East Main Street  
Ventura, CA 93006  
(805) 794-4274

In addition, the following labor unions may also be a source for potential employees and many have apprenticeship programs.

### **ASBESTOS WORKERS 5**

670 E. Foothill, suite 2  
Azusa, Ca. 91702  
Phone: 626-815-9794  
E-Mail: fredaw15@aol.com  
Website: [www.awlocal5.com](http://www.awlocal5.com)

### **BAC LOCAL 4 (Bricklayers)**

BAC 4 (Ventura Office)  
270 South Joanne Ave.  
Ventura, California 93003  
Phone: 805-658-4883  
Phone: 800-972-3338  
E-Mail: mcrespi@sbcglobal.net  
E-Mail: bac4ca@aol.com  
Website: [www.bac4ca.org](http://www.bac4ca.org)

### **BOILERMAKERS 92**

2260 Riverside Ave.  
Bloomington, California 92316  
Phone: 909-877-9382  
website: [www.boilermakerslocal92.com](http://www.boilermakerslocal92.com)

### **CEMENT MASONS 600**

2299 East Main Street, Suite 9  
Ventura, California 93001  
Phone: 805-653-5919

### **ELECTRICAL WORKERS LOCAL 952**

3994 E. Main St.  
Ventura, CA 93006  
(805) 642-2149

### **ELEVATOR CONSTRUCTORS LOCAL 18**

100 South Mentor Ave.  
Pasadena, California 91106  
Phone: 626-449-1869  
E-Mail: gazzat18@sbcglobal.net  
Website: [www.iueclocal18.otg](http://www.iueclocal18.otg)

**FLOORLAYERS 1247**

8051 Pioneer Blvd.  
Whitter, California 90606  
Phone: 562-695-7402

**GLAZIERS LOCAL 636**

2333 North Lake Avenue, Unit F  
Altadena, CA 91001  
(626) 448-1565  
E-Mail: lu636@dc36.org

**GOLD COAST OF D.C. OF CARPENTERS LOCAL 805**

412 Dawson Drive  
Camarillo, CA 93010  
(805) 482-1905

**HEAT AND FROST LOCAL 5**

3833 Ebony St  
Ontario, CA 91761  
909-390-7002

**IBEW 952**

3994 East Main Street  
Ventura, California 93006  
Business Manager: Shane Werner  
Business Agent: Jeff Bode  
Phone: 805-642-2149 Fax: 805-658-7507  
E-Mail: shane@ibew952.org  
Website: [www.ibewlu952.org](http://www.ibewlu952.org)

**IRONWORKERS LOCAL 416** (Reinforced)

PO Box 1166  
Norwalk, California 90651  
Phone: 562-868-1251  
E-Mail: hart@ironworkers416.org  
E-Mail: robert@ironworkers416.org  
Website: [www.reinforcingironworkerslocal416.org](http://www.reinforcingironworkerslocal416.org)

**IRONWORKERS LOCAL 433** (Structural)

17495 Hurley Street East  
City of Industry, CA 91744  
(626) 964-2500

**IRONWORKERS LOCAL 509** (Shopmen & Ornamental)

13830 San Antonio Dr.  
Norwalk, CA 90651  
(323) 262-9653

**LABORERS LOCAL 585**

21 South Dos Caminos Ave.  
Ventura, CA 93003  
Phone: 805-643-5487  
E-Mail: dvalenzuela@sbcglobal.net

**LABORERS 1184**

1074 East La Cadena Drive, Suite 4  
Riverside, California 92501  
Phone: 951-680-1292  
Website: [www.laborers1184.com](http://www.laborers1184.com)

**MILLWRIGHTS LOCAL 1607**

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**OPERATING ENGINEERS LOCAL 12**

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**PAINTERS DISTRICT COUNCIL 36**

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**PAINTERS & TAPERS LOCAL 52**

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**PILEDRIERS LOCAL 2375**

728 N. Lagoon Ave.  
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**PLUMBERS & PIPEFITTERS LOCAL 484**

1955 N. Ventura Ave.  
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**ROOFERS LOCAL 36**

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**SO CA D.C. OF LABORERS**

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**TEAMSTERS LOCAL 186**

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**TRI COUNTIES BUILDING & CONSTRUCTION TRADES COUNCIL**

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**UA DISTRICT COUNCIL 16**

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**U.A. LOCAL 345** (Plumbing & Pipefitting)

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**UA 669 (Sprinkler Fitters)**

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**U.A. LOCAL 709 (Fire Sprinkler Fitters)**

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## **Additional Resources**

HUD Section 3 Business Registry

<https://portalapps.hud.gov/Sec3BusReg/BRegistry/BRegistryHome>

County of Ventura Human Services Agency (HSA) Employment Assistance:

[America's Job Center \(multiple locations\)](#)

Cal Jobs

<https://www.caljobs.ca.gov/vosnet/Default.aspx>

State Employment Development Department (EDD)

<https://edd.ca.gov/>

Housing Authorities

[Area Housing Authority of Ventura County](#)

[Oxnard Housing Authority](#)

[Port Hueneme Housing Authority](#)

[Santa Paula Housing Authority](#)

[Housing Authority of the City of San Buenaventura](#)

[Small Business Development Center](#). The Small Business Development Center may be able to provide technical assistance to potential Section 3 Business Concerns.

[Women's Economic Ventures](#) Women's Economic Ventures is dedicated to creating an equitable and just society through the economic empowerment of women.

[Ventura County Economic Development Council](#) (VCEDA), the Economic Development Collaborative of Ventura County (EDC-VC), and Chambers of Commerce may be able to provide names of potential Section 3 Business Concerns.



PO Box 2540, Camarillo, California 93011  
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805-603-4900

October 12, 2019  
Project No. 050.001

CWA AIA  
320 Arden Avenue  
Glendale, California 91203

Attention: Mr. Steven Finney

Subject: Updated Summary of Interpreted Site Conditions, Proposed Moorpark Civic Center Project, Moorpark, California

Dear Mr. Finney:

Oakridge Geoscience, Inc. (OGI) is pleased to provide this updated summary of interpreted site conditions for the proposed Moorpark Civic Center project in Moorpark, California. The proposed project consists of design of a new Civic Center complex and associated facilities in Moorpark near the intersection of Moorpark Avenue and High Street.

At the request of the City of Moorpark and CWA AIA, OGI advanced five cone penetrometer tests (CPT's) at the Moorpark Civic Center site in September 2019 to evaluate the subsurface site conditions and provide site-specific data to evaluate seismic hazards and preliminary foundation design.

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

The purpose of this letter is to summarize the interpreted site conditions in the vicinity of the proposed Moorpark Civic Center project site based on the work performed by OGI and other geotechnical consultants.

In 2017 and 2018, OGI performed a preliminary geotechnical report for conceptual development of the library site and evaluated geohazards at several locations in the City of Moorpark. The purpose of those geotechnical studies was to evaluate if seismic related geohazards including liquefaction, dry seismic settlement and lateral spreading, and hydroconsolidation (collapse) potential are present at the sites and the need for ground improvement to mitigate potential settlements that may occur as a result of earthquake-induced ground shaking. The data from the studies by OGI as well as other nearby sites are summarized below to provide a setting for the Moorpark Civic Center project.



## **1.2 SUMMARY OF SITE CONDITIONS**

### **1.2.1 Basis of Interpretation**

Our interpretation of the geotechnical conditions at the Civic Center site is based on geotechnical data from the following projects in the site vicinity.

- Five cone penetration tests (CPT) were advanced on the Civic Center site by OGI in September 2019;
- Geohazard report for various City-owned properties in the downtown Moorpark area (OGI, 2018);
- Preliminary geotechnical study for the Moorpark Library project site (OGI, 2017);
- AHA site east of Walnut Canyon Road, about 500 feet east of the existing City Hall building (Geotechnologies, Inc., 2016);
- Moorpark Apartments site west of City Hall (Gorian and Associates, 2006 and 2013a); and
- Proposed library expansion/renovation and civic center for the proposed library site, the City Hall site to the north, and the vacant land west of the library site and south of the Moorpark Apartments site (Rybak Geotechnical, Inc. (2012).
- Preliminary Geotechnical Site Investigation, Casey Road Elementary School, Gorian and Associates (1999).

The approximate location of the proposed civic center site and previous geotechnical studies summarized above are shown on Plate 1. The following section summarizes site conditions reported by previous studies in the project vicinity.

### **1.2.2 Background**

As summarized in OGI (2019), previous studies performed near the Civic Center site identified the potential for seismically-induced settlement to occur in the alluvial soils and recommended mitigations to reduce settlement to meet code requirements. The amount of estimated total and differential settlements in the vicinity of the Moorpark Civic Center complex ranged from 12 to 36 inches and 6 to 18 inches, respectively. Also, estimated total and differential settlement ranged from 3 to 19 inches and 2 to 10 inches, respectively, at sites studied by OGI in the downtown Moorpark area. The variability in estimated settlement is likely related to several factors, including:

- Depths of exploration - Explorations by Rybak and Gorian were conducted to maximum depths of 50 feet, so potential settlement within alluvial sediments below those depths was not able to be considered in their evaluations. OGI's 2017 exploration of the project site extended to depths of about 75 feet; our evaluations indicate the potential for settlement to occur in the granular soils below the shallower (50-foot) depths evaluated by others in the project area. Geotechnologies advanced exploration to maximum depths of about 75 feet at the AHA site.
- Ground accelerations - Estimated peak ground accelerations (pga) in the project area (and Ventura County in general) have increased due to evolving geologic models – Rybak (2012) used a pga of 0.48g, Gorian (2013a) used a pga of 0.68g,

and OGI (2017) used a pga of 1.03. Higher ground accelerations typically result in increased settlement estimates.

- Depths of recommended ground improvement - Based on their respective evaluations: 1) Geotechnologies recommended ground improvement to depths of 30 feet at the AHA site, 2) OGI recommended ground improvement to a depth of about 50 feet at the proposed Library site, 3) Gorian recommended overexcavation and recompaction of soils to a depth of 13 to 22 feet at the Moorpark Apartments site to the west (however the estimated liquefaction related settlement below the mitigation depth ranges from 2 to 4 inches), and 4) Rybak recommended ground improvement for the Civic Center site, but did not provide a recommended depth.
- The depth of the alluvial sediments within Walnut Canyon thickens southward, downstream, toward the Arroyo; similarly, the thickness of potentially seismically induced settlement-prone granular sediments also appears to increase southward.
- Lateral spreading - The Walnut Canyon drainage slopes southward at about 3 percent. The ground surface in the vicinity of Downtown Moorpark near High Street slopes westward at about 0.7 percent. Historically, lateral spreading has occurred on slopes as flat as 0.1 percent, although data for sites less than 1 percent are limited. There is not a free-face condition in the vicinity of the Moorpark Civic Center. Estimated lateral movement associated with the design earthquake for the Moorpark Library area by OGI near High Street ranges from 72 to 300+ inches. Estimated lateral spreading for the proposed High Street Station project (southeastern corner of High Street and Moorpark Avenue is 15 to 55 inches (OGI, 2019). Other consultants indicated the potential for lateral spreading was low following ground improvement but did not provide analyses for lateral spreading.

## **2.0 FINDINGS**

### **2.1 2019 Civic Center Explorations**

At the request of the City of Moorpark and CWA AIA, OGI advanced five CPT's (CPT-101 through CPT-105) at the Moorpark Civic Center site in September 2019 to evaluate the subsurface site conditions and provide data to evaluate seismic hazards and preliminary foundation design. The CPT's were advanced to depths of about 75 feet near the locations shown on Plate 2. Additionally, seismic shear wave velocities were measured in CPT-103 to aide in our evaluation of the site conditions. The CPT data are provided in Appendix A.

### **2.2 Subsurface Characterization**

The interpreted subsurface conditions at the project site are summarized on Cross Sections A-A' on Plate 3. As depicted on Plate 3, the earth materials at the site are interpreted to consist of interbedded silty to clayey sand and sand with lesser amounts of fine-grained silt and sandy clay of alluvial origin to the depths explored (75 feet). The CPT profiles for CPT-101, CPT-102, and CPT-103 suggest the lithology in the northern portion of site is more granular while the CPT profiles for CPT-104 and CPT-105 in the southern portion of the site appear to have a higher percentage of finer-grained silty to clayey sand and clay layers. The CPT tip resistance in sands range from a low of about 50 tons per square foot (tsf) to a high of about 300 tsf. In general, granular soil materials require a normalized tip resistance of greater than about 200 tsf to resist liquefaction.

The shear wave velocities measured in CPT-103 range from a low of 835 feet per second (ft/sec) to a high of about 1,200 ft/sec, with an average shear wave velocity 1,005 ft/sec for the 75-foot-deep CPT. The average shear wave velocity of 1,005 ft/sec at the Civic Center site is consistent with a Type D soil profile per CBC (2016). For comparison, the measured shear wave velocities near the intersection of Moorpark Avenue and High Street near the proposed Library site ranged from about 610 to 1,524 ft/sec with an average value of 840 ft/sec (OGI, 2018).

Groundwater was measured at a depth of about 55 feet below the ground surface in several of the CPTs advanced for this study after the rods were removed from the hole and prior to backfilling. For reference, groundwater was encountered at a depth of about 37 feet in OGI's 2017 explorations at the Library site and Gorian (2001) reported groundwater at depth of 27 to 38 feet for the Moorpark Apartments site directly west of the Civic Center site. Historic high groundwater levels in the relatively level areas of Moorpark from High Street southward are about 15 feet below the ground surface (CGS, 2002). The Civic Center site is about 15 feet above the relatively level alluvial plain located between High Street and Los Angeles Avenue/Arroyo Simi. Based on our evaluation of the site conditions and other previous studies which utilized modified groundwater levels in their analyses, we believe a design groundwater depth of 30 feet is applicable to the Civic Center site.

Topographic mapping by the US Geologic Survey for the Moorpark Quadrangle indicates the ground surface in the Walnut Canyon/Moorpark Civic Center area slopes westward at about 3 percent. The ground slope is a component of the seismic hazard/lateral spreading evaluation for the site.

### **2.3 Seismic Hazard Evaluation**

Evaluation of the potential for seismic related hazards associated with liquefaction and dry seismic settlement are two key factors associated with the seismic design of structure foundations. Liquefaction is the sudden loss of shear strength in saturated, granular soils due to seismic ground shaking during an earthquake. Dry seismic settlement occurs in unsaturated granular soil above the groundwater in response to strong earth ground shaking. The estimated settlement related to liquefaction and dry seismic settlement is commonly referred to as seismic settlement. Lateral spreading is downslope movement of earth materials associated with reduced shear strength during liquefaction. American Society of Civil Engineers (ASCE) Standard 7-1, Chapter 12, Section 13 (Tables 12.13-2 and -3) provides guidance on acceptable settlement due to seismic events.

**2.3.1 Differential Settlement Thresholds**

Table 12.13-3 provides differential settlement thresholds for various types of structures and Structure Risk Categories (I, II, III, IV). The differential settlement thresholds are summarized in the following table.

**Table 1. Differential Settlement Thresholds  
(from ASCE Table 12.13-3)**

Structure Type	Risk Category		
	I or II	III	IV
Single-story structures with concrete or masonry wall systems	0.0075L	0.005L	0.002L
Other single-story structures	0.015L	0.010L	0.002L
Multistory structures with concrete or masonry wall systems	0.005L	0.003L	0.002L
Other multistory structures	0.010L	0.006L	0.002L

L = Differential settlement over a defined distance, for example wall or footing spacing.

**2.3.2 Upper Limit for Lateral Spreading Horizontal Ground Displacements**

Table 12.13-2 indicates the following upper limit on lateral spreading from horizontal ground displacements for shallow foundations. Displacements exceeding the upper limits require deep foundations.

**Table 2. Upper Limit for Lateral Spreading Horizontal Ground Displacements  
(from ASCE Table 12.13-2)**

Risk Category	I or II	III	IV
Limit Inches (millimeters)	18 (455)	12 (305)	4 (100)

We note that deep foundations also could include ground improvement to improve the existing onsite soils to reduce the estimated lateral seismic movement to less than the code values.

**2.4 Evaluation of Seismic Settlement and Lateral Spreading**

We utilized the engineering program GeoLogMiki to evaluate the CPT data and estimate the amount of seismic settlement and lateral spreading associated with the design earthquake event for the project site. The design earthquake has a magnitude of 7.0 and a peak ground acceleration of 1.03g per the 2016 CBC. The GeoLogMiki program utilizes the CPT data (tip resistance and sleeve friction) to evaluate the soil type, consistency/density, and potential to liquefy and settle during an earthquake. The estimated settlement is summarized by CPT location and category in Table 3. Based on an assumed groundwater depth of 30 feet, the dry seismic

settlement is estimated for the upper 30 feet of the CPT location and liquefaction related settlement is estimated below a depth of 30 feet to a maximum depth of 60 feet. Lateral spreading is estimated considering the liquefaction potential and slope angle (approximately 3 percent). The following table summarizes the estimated values based on evaluation of the CPT data.

**Table 3. Summary of Estimated Seismically Induced Settlement**

<b>CPT Number</b>	<b>Estimated Dry Seismic Settlement (inches)</b>	<b>Estimated Liquefaction Settlement (inches)</b>	<b>Total Seismic Settlement (inches)</b>	<b>Estimated Lateral Displacement (inches)</b>
CPT-101	4	6	10	50
CPT-102	7	7	14	30
CPT-103	5	7	12	30
CPT-104	10	4	14	12
CPT-105	8	2	10	3
Shear Wave Velocity (CPT-103)	1/2	1 1/2	2	45
Range of Values	1/2 to 10	1-1/2 to 7	2 to 14	3 to 50
<b>Average value</b>	<b>6</b>	<b>4 1/2</b>	<b>10</b>	<b>28</b>

The total seismic settlement estimated from CPT-101 to CPT-105 ranges from about 10 to 14 inches. CPT-101 to CPT-103 generally have a more granular profile and similar amounts of dry seismic settlement (above groundwater) and liquefaction settlement (below groundwater). CPT-104 and CPT-105 have higher amounts of estimated dry seismic settlement (8 to 10 inches in upper 30 feet of profile) versus liquefaction related settlement (2 to 4 inches) in the lower portion of the profile (30 to 60 feet). Review of the interpreted CPT profiles for CPT-104 and CPT-105 (Appendix A) indicates those CPTs tend to have a higher percentage of interbedded clay layers in the lower portion of the profile below 40 feet that reduces the amount of granular soil that can liquefy.

To utilize shallow foundations per the 2016 CBC, the estimated seismic settlement will need to be reduced to about 4 inches or less and the lateral spreading potential will need to be reduced to 18 inches or less. Based on our evaluation of the September 2019 CPT data, the controlling CPT profiles are CPT-101 through CPT-103 located in the northern portions of the site. Based on our evaluations of the data from those CPT's, the in-place densities of the granular soil layers on-site will need to be improved to a depth of about 40 feet to reduce the estimated vertical settlement and lateral spreading potential to allow for shallow foundations per the CBC. Several potential mitigation options are discussed in the following sections. The preliminary analyses indicate the lateral spreading potential will require improvement to a depth of about 50 feet to reduce the lateral spreading potential to below values allowed in the CBC.

### **3.0 CONCLUSIONS**

#### **3.1 Proposed Structures**

Based on discussions with the project team, the proposed Civic Center structures will consist of one- to two-story structures with CMU shear wall buildings with a risk category (RC) of II.

#### **3.2 Settlement Criteria**

Chapter 12, Section 13, Foundation Design, of ASCE 7-16 provides guidance on foundation design, including the amount of allowable lateral spreading for shallow foundations (ASCE Table 12.13-2; Table 2 above) and differential settlement threshold for single and multi-story masonry wall and wood frame structures based on structure RC (ASCE Table 12.13-3; Table 1 above). The project's structural engineer, Mr. Greg Orozco with John A. Martin & Associates, has indicated the preliminary structure RC for the proposed sites is II. Per Table 12.13-3, multi-story structures founded on shallow foundations with a RC of II are allowed to have a differential settlement threshold of  $0.005L$  where  $L$  is the distance between footings. For this preliminary evaluation we assumed a footing distance of 30 feet (360 inches) which produces a maximum differential settlement of 1.8 inches. Differential settlement is typically estimated as one-half of total settlement, so the estimated total seismic settlement would be about 3-1/2 to 4 inches. Per ASCE Table 12.13-2, the upper limit of lateral spreading horizontal ground displacement for shallow foundations for a RC of I or II is 18 inches.

#### **3.3 Preliminary Settlement Evaluation and Potential Mitigations**

Based on the recent CPT data collected for the Civic Center Site, the estimated total seismic settlement (liquefaction plus dry seismic settlement) ranges from about 10 to 14 inches (Table 3). The proposed structures can incorporate a differential settlement of approximately 2 inches (total estimated settlement of 4 inches). On that basis, the total estimated vertical seismic settlement will need to be reduced by about 6 to 10 inches to utilize shallow footings. That level of improvement likely will require mitigation using some type of ground improvement. Ground improvement to a depth of 50 feet likely will be required to reduce the lateral spreading potential to within the CBC limits of 18 inches for Type II structure. Deep pile foundations could potentially be used but the pile foundations would need to be designed to resist loading associated with lateral spreading which could add significant costs to the pile foundation system.

The mitigation plan would need to treat the soil to a depth of about 40 to 50 feet to reduce the vertical settlement to 4 inches or less and estimated lateral displacement to 18 inches or less in the northern portion of the site (CPT locations CPT-101 through CPT-103). Based on our interpretation of the inferred finer-grained lithology indicated on the CPT profiles for CPT-104 and CPT-105, a shallower treatment zone to a depth of about 30 to 40 feet may be possible in the southern portion of the site. It may be possible to combine two ground improvement methods to provide a cost-effective mitigation plan as summarized below.

### **3.3.1 Overexcavation and Recomposition**

Gorian recommended overexcavation and recompaction of the upper 15 to 22 feet of soil for the adjacent Moorpark Apartments site to the west of the Civic Center site (Gorian, 2013). Overexcavation and recompaction will reduce dry seismic settlement potential of the near surface soils but will not improve the liquefaction settlement and lateral spreading potential of the soils below the treatment depth of about 15 to 20 feet. The estimated liquefaction related settlement below the mitigation zone for the Moorpark Apartments site ranges from about 2 to 4 inches; however, the estimated seismic settlement below 15 to 20 feet at the Civic Center site is about 7 to 8 inches. The overexcavation and recompaction treatment mitigation does not address the potential for vertical liquefaction settlement and lateral spreading potential below the overexcavation and recompaction treatment zone. Our cursory evaluation of the data from Gorian (2013) suggests a potential for about 25 inches of lateral spreading associated with the liquefiable soils at depths of greater than 20 feet. We note the Moorpark Apartments site is currently undeveloped open ground that can be graded without disruption of existing improvements and infrastructure. However, a similar overexcavation for the Civic Center site would need to consider existing improvements, infrastructure, and temporary storage of material while grading is ongoing. The largest open area available appears be the adjacent Moorpark Apartments site directly west of the Civic Center.

### **3.3.2 Rammed Aggregate Piers (RAP) or Rapid Impact Compaction (RIC) – Shallow Ground Improvement**

RAP was utilized to improve the site conditions at the AHA site (east of the Civic Center site) to a depth of about 30 feet. The improved soil materials in the upper 30 feet reduced the seismic related settlement to an acceptable level that allowed shallow foundations on a mat type foundation. RAP could potentially be a mitigation option for the Civic Center structures if the shallow ground improvement procedure can reduce the vertical settlement and lateral spreading to acceptable levels (less than 4 inches total settlement and 18 inches of lateral movement per ASCE 7-16) for the Civic Center structures. As depicted on the settlement analyses plots (Appendix A), the estimated liquefaction related settlement extends to depths of 40 to about 55 feet below the ground surface.

RIC involves placing a vibratory compactor at the surface and inducing vibration into the granular soils to densify the soils to depths of about 15 to 20 feet. RIC is most effective in clean granular soils. Soils with soft clay beds and high fines contents reduce the effective treatment depth of RIC. The CPT data indicate the site has zones of both clay soils and silty to clayey sands with fines contents above 25 percent which would potentially reduce the effectiveness of RIC at the Civic Center site.

For RAP or RIC ground improvement to be an effective mitigation for both vertical liquefaction settlement as well as lateral spreading potential, it likely would need to be combined with an overexcavation component of 15 to 20 feet to reach an effective treatment depth that would reduce overall vertical settlements and lateral movements to within code values. A mat type slab would be a prudent mitigation measure to help reduce potential future differential settlements.

### **3.3.3 Deep Ground Improvement (Vibro Replacement or Deep Soil Mixing)**

Vibro Replacement (VR) or Deep Soil Mixing (DSM) can be effective mitigations to treat soils to depths of about 50 feet or more. We note VR is not as effective in soils with high fines content of about 25 percent or more such as clayey sand and clay soil layers at the Civic Center and Library sites. DSM could be used to improve both granular and fine-grained silt and clay soils to reduce settlement and control lateral spreading. The deeper ground improvement methods will likely have an increased cost versus the shallow ground improvement methods. Based on our preliminary analyses, the ground improvement likely would need to extend to a depth of at least 50 feet below the ground surface to reduce the lateral spreading potential to less than 18 inches.

## **4.0 RECOMMENDATIONS**

### **4.1 Approach**

As described above, subsurface exploration at the Civic Center site indicates the potential for seismic settlement and lateral spreading potential to impact the foundation design. The estimated amount of seismic settlement ranges from about 10 to 14 inches and includes zones from near the ground surface to a depth of about 55 to 60 feet. Several potential mitigation options are available to reduce the estimated seismic settlement for the site to allow for the proposed improvements to be founded on shallow foundations. If a temporary soil storage area can be obtained, a potential cost-effective treatment option could be an overexcavation of about 10+ feet, with ground improvement to a depth of 40 feet (50 feet below original grade) followed by replacement of the upper 10 feet of compacted fill. We suggest that a mat slab be incorporated into the structure design to help reduce the potential for damage associated with the estimated 4 inches of future vertical settlement.

### **4.2 Estimated Ground Improvement Cost**

At the request of CWA AIA, we have provided a summary of potential methods, attributes, and initial preliminary fee estimates for overexcavation and recompaction, vibro-replacement, and DSM.



**Table 4. Summary of Potential Ground Improvement Methods**

<b>Ground Improvement Method</b>	<b>Pros</b>	<b>Cons</b>	<b>General Cost Range</b>
Overexcavation and Recompaction	<ul style="list-style-type: none"> <li>Proven procedure with relatively low cost.</li> <li>Can potentially be used to reduce the depth of more expensive ground improvement methods such as VR or DSM</li> </ul>	<ul style="list-style-type: none"> <li>Limited depth of treatment</li> <li>Need space to store spoil generated during excavation process and prior to backfill.</li> <li>Potentially disruptive to ongoing operations and utilities.</li> <li>Improves dry seismic settlement but does not address liquefaction or lateral spreading.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$15,000 to 20,000 (depending on equipment).</li> <li>About \$10 per cubic yard for shallow excavations and temporary stock pile.</li> </ul>
Vibro Replacement (VR) / Stone Columns	<ul style="list-style-type: none"> <li>Established procedure, excepted by agencies</li> <li>Densifies granular soil between individual columns</li> <li>Provides conduit to dissipate buildup of water pressure during a seismic event</li> <li>multiple contractors perform procedure – multiple bids</li> <li>No spoil generated during installation</li> </ul>	<ul style="list-style-type: none"> <li>Treatment depth typically to 50 feet.</li> <li>Vibration could impact adjacent structures. Vibration monitoring recommended.</li> <li>Limited density improvement to fine-grained silt and clay soils.</li> <li>Treatment area usually extends out beyond building foundations by about 10 feet.</li> <li>Ground disturbance at surface requires upper several feet of site to be recompacted.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$60,000</li> <li>\$30/ft of column</li> <li>Column center to center spacing typically 6 to 9 feet, assume 7 feet due to high fines content and interlayered clay soils.</li> </ul>
Deep Soil Mixing (DSM)	<ul style="list-style-type: none"> <li>Established procedure excepted by agencies</li> <li>DSM columns can be extended to depths of 75 feet if required.</li> <li>Treatment area can be limited to building foundation footprint depending on site conditions</li> </ul>	<ul style="list-style-type: none"> <li>More expensive mobilization and per foot of column cost than vibro replacement.</li> <li>Does not densify soil between columns.</li> <li>Soil between columns can settle requiring a grade-beam type foundation to span across columns.</li> <li>Up to about 20 percent spoil generated during installation requiring disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Mob/Demob - \$100,000 to \$150,000</li> <li>\$50/ft of column</li> <li>Replacement ratio 10%</li> </ul>

The following preliminary ground improvement cost estimates are provided as requested by CWA AIA and the City of Moorpark. To prepare the estimates we assumed a new Civic Center building with a footprint of approximately 9,000 square feet and new Library with a footprint of approximately 18,000 square feet for a total building area of 27,000 square feet. The estimates summarized below are provided for initial planning purposes only. We recommend the project civil and structural engineers contact ground improvement contractors to obtain project and site-specific cost estimates based on the selected ground improvement method(s) developed by the ground improvement contractor. The preliminary estimates provided below do not include contingencies, design or construction management fees which we have assumed are included in the overall cost estimate. We note the estimated costs can vary depending on many factors and that these preliminary estimates need to be revised based on actual design parameters and include contractor input on selected method and cost.

**Table 5. Summary of Preliminary Cost Estimates for Planning Purposes**

Procedure	Assumptions	Estimated Ground Improvement Cost		
		Civic Center (9,000 sq. ft.)	Library (18,000 sq. ft.)	Estimated Total with Mobilization (27,000 sq. ft.)
Overexcavation and Recompaction	Depth of about 10 feet, volume = 13,200 cubic yards .	\$32,000	\$70,000	\$112,000
Vibro Replacement	Depth of 50 feet, 3-foot diameter columns, spacing of about 7 feet, treatment to about 10 feet beyond foundation footprint, approximately 800 columns, 40,000 feet of column, gravel load transfer platform.	\$460,000	\$810,000	\$1,330,000
Deep Soil Mixing	Depth of 50 feet, 4-foot diameter columns, replacement ratio of 12 percent, spacing 10 feet, approximately 320 columns, 16,000 feet of column, mat slab foundation.	\$275,000	\$525,000	\$950,000
Grade Beam System	Assume about 6,000 feet of grade beam for both structures, with 600 cubic yards of concrete in addition to standard 6-inch concrete floor slab.	\$80,000	\$120,000	\$200,000

CWA AIA  
Project No. 050.001

**OAKRIDGE GEOSCIENCE, INC.**

### 4.3 Ground Improvement Test Strip

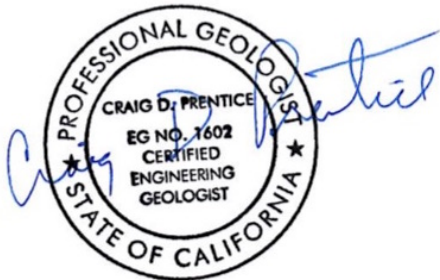
After the project team evaluates the available ground improvement options and selects a preferred option, we suggest a test strip be performed. The purpose of the test strip is to: 1) demonstrate the effectiveness of the method in a small area prior to mobilizing equipment for full scale production, and 2) provide prospective ground improvement contractors with data that can be used during the project bidding phase to help refine the estimated ground improvement cost since the method has been successfully demonstrated on-site in a field test.

### CLOSURE

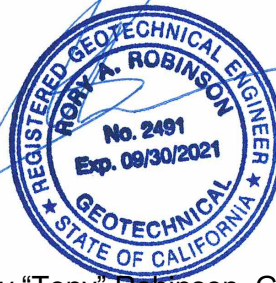
Thank you for the opportunity to provide geotechnical services to CWA AIA for this project. Please contact us if you have any questions on the information presented herein and the proposed next steps for the geotechnical services for the Civic Center project.

Sincerely,

OAKRIDGE GEOSCIENCE, INC.



Craig D. Prentice, CEG  
Principal Engineering Geologist



Rory "Tony" Robinson, GE  
Principal Geotechnical Engineer

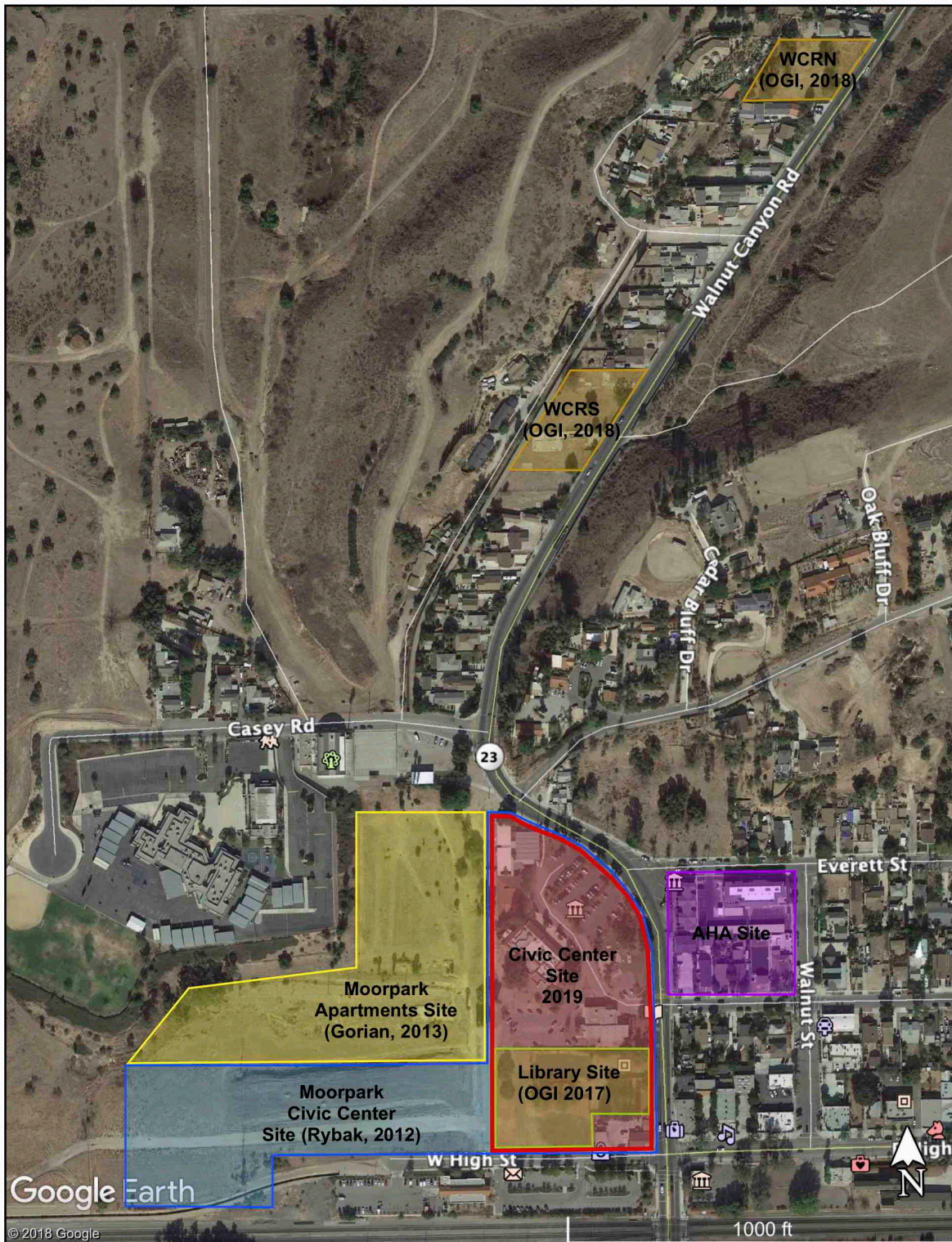
Copies Submitted: (1 electronic copy (pdf) via email)

## REFERENCES

- American Society of Civil Engineers (2016), ASCE Standard 7-16, Minimum Design Loads for Buildings and Other Structures.
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- Gorian and Associates, Inc. (2006), Geotechnical Investigation, Moorpark Apartments, Southwest Corner of Casey Road and Walnut Canyon Road, City of Moorpark, California, dated August 29.
- \_\_\_\_\_ (2013a), Updated Geotechnical Report and Grading Plan Review, Moorpark Apartments, Southwest Corner of Casey Road and Walnut Canyon Road, City of Moorpark, California, dated October 3.
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- Oakridge Geoscience (2017), Preliminary Geotechnical Report, Proposed Moorpark Library, Moorpark, California, dated June 17.
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- \_\_\_\_\_ (2019), Summary of Interpreted Site Conditions, Proposed Moorpark Civic Center Project, Moorpark, California, dated April 17.
- Rybak Geotechnical, Inc. (2012), Proposed Library Expansion/Renovation & Civic Center, 699 Moorpark Road, Moorpark, California, dated August 10.
- USGS (2017), <https://earthquake.usgs.gov/designmaps/us/application.php>

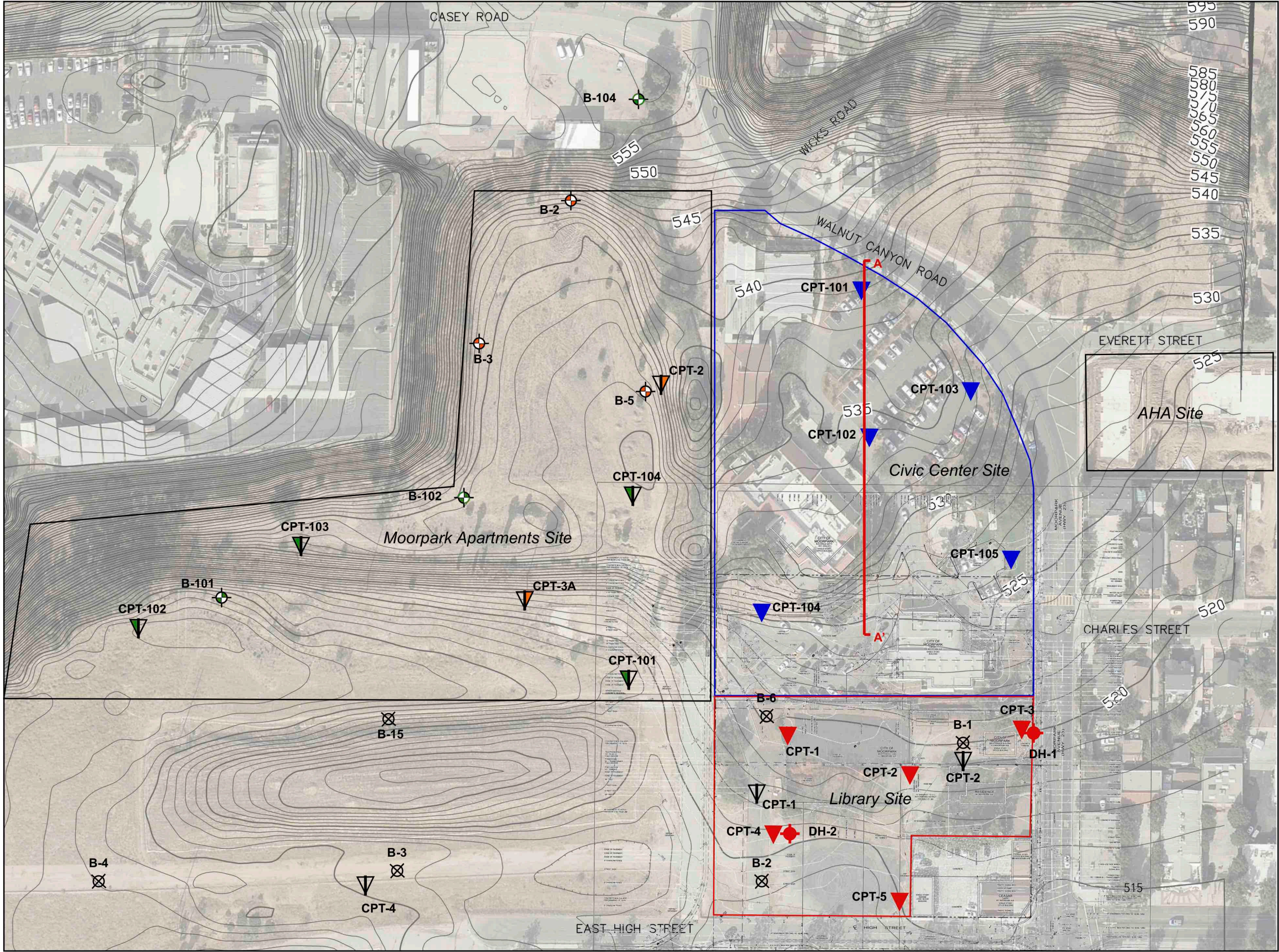
## **PLATES**



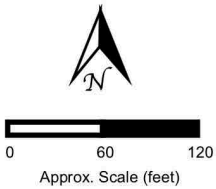


**LOCATION MAP**  
**Proposed Moorpark Civic Center Project**  
**Moorpark, California**



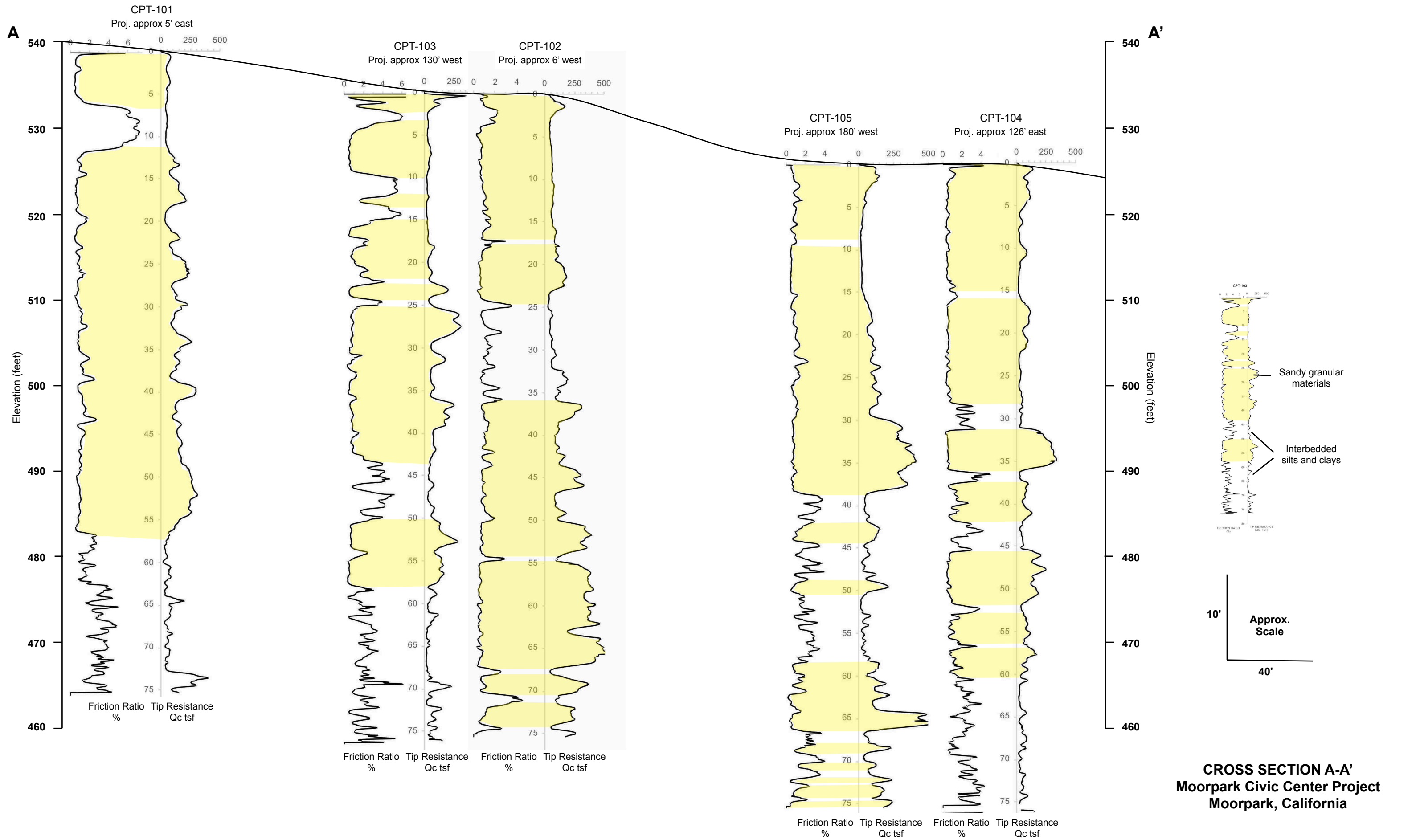


- CPT-101 Approximate location of CPT this study
- CPT-1 Approximate location of CPT OGI (2017)
- DH-1 Approximate location of Drill Hole OGI (2017)
- CPT-102 Approximate location of CPT Gorian and Assoc. (2006)
- B-102 Approximate location of boring Gorian and Assoc. (2006)
- CPT-3 Approximate location of CPT Gorian and Assoc. (2001)
- B-3 Approximate location of boring Gorian and Assoc. (2001)
- B-4 Approximate location of boring Rybak Geotechnical (2012)
- CPT-4 Approximate location of CPT Rybak Geotechnical (2012)
- Approximate location of Cross Section



EXPLORATION LOCATIONS  
Moorpark Civic Center Project  
Moorpark, California







## **APPENDIX A**

## LIQUEFACTION ANALYSIS REPORT

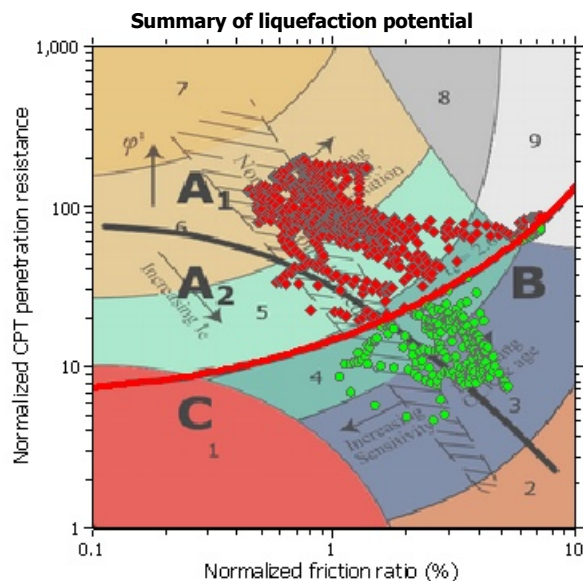
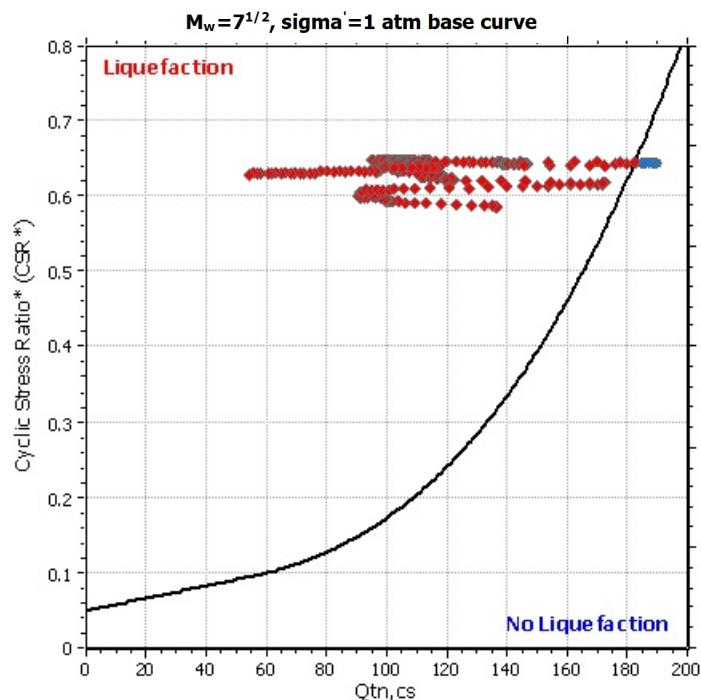
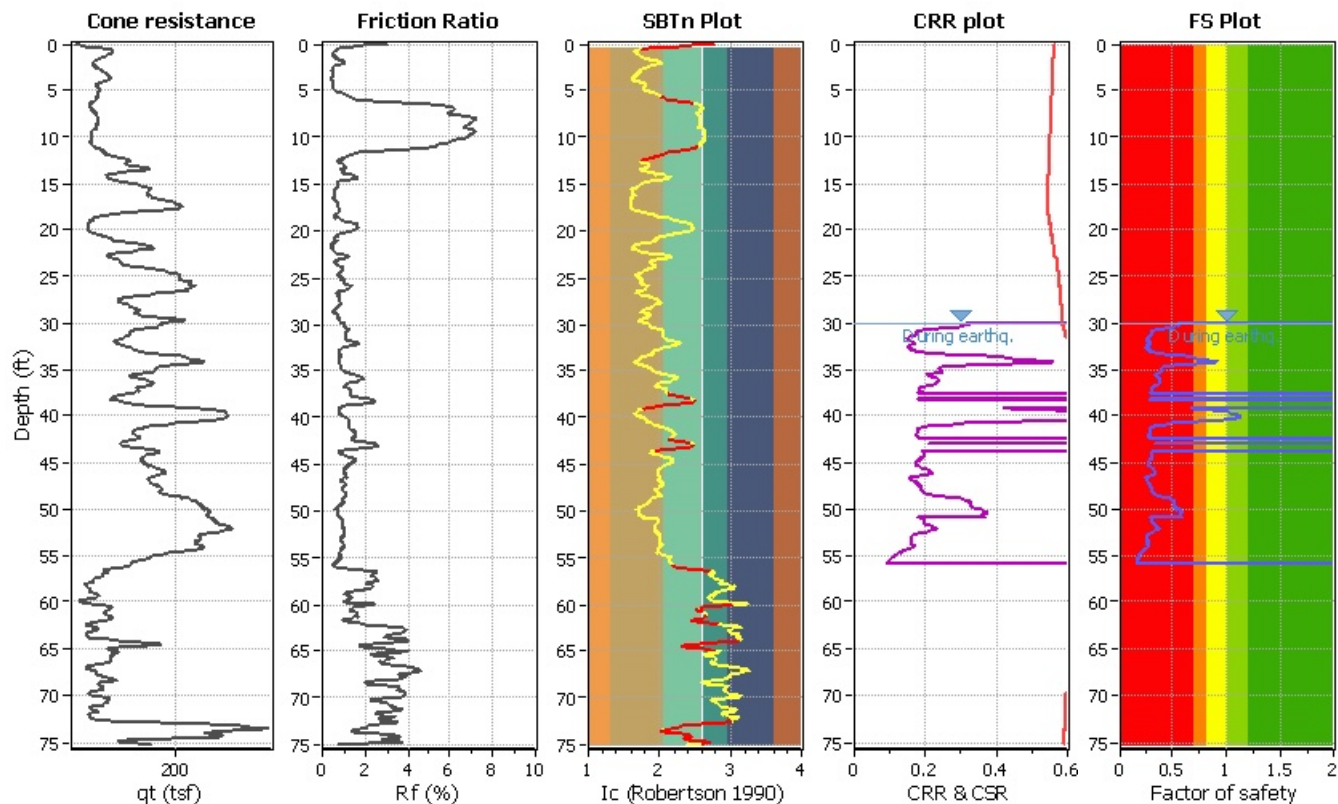
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

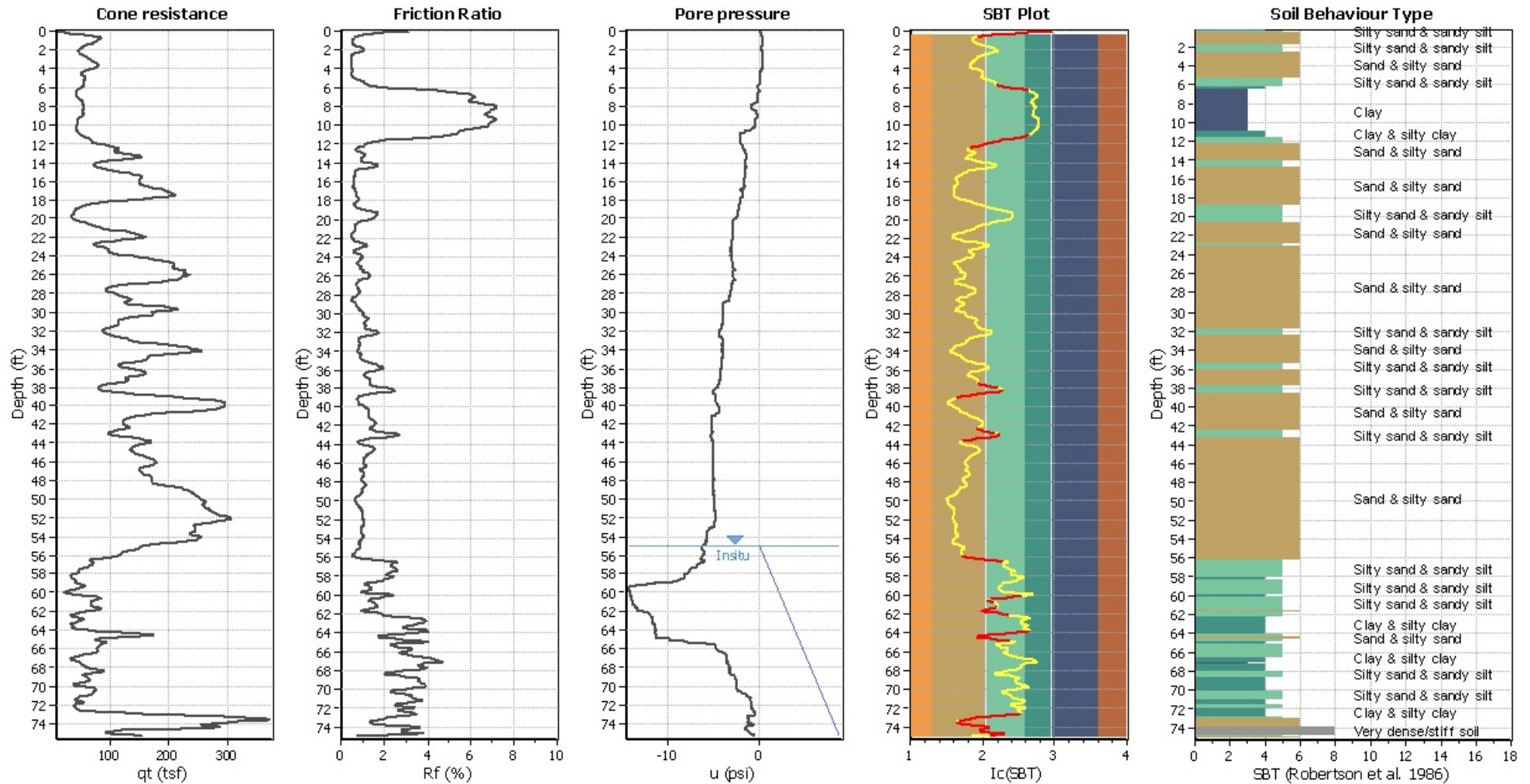
**CPT file : CPT-101-2019**

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Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

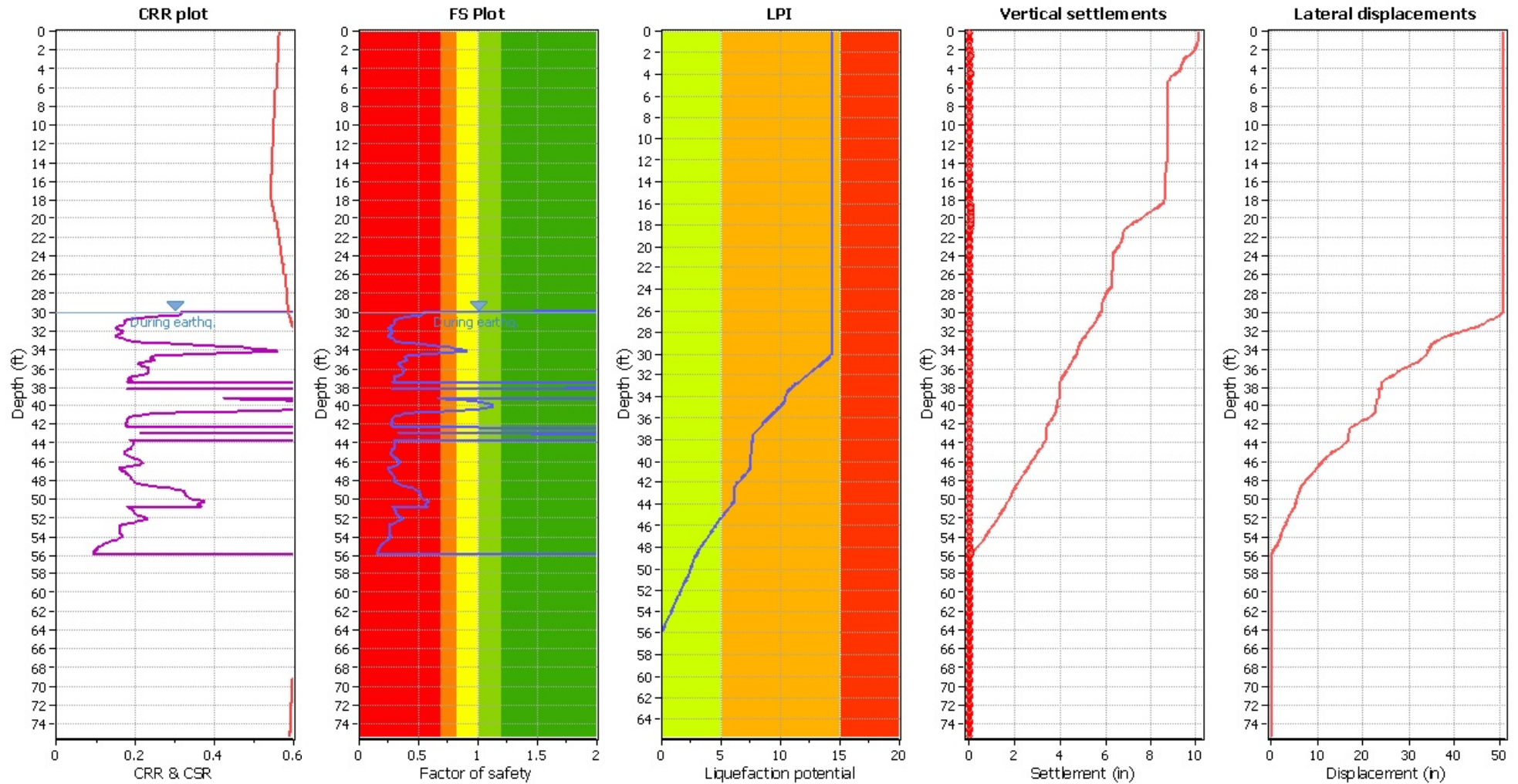
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

**SBT legend**

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



### Liquefaction analysis overall plot



#### Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

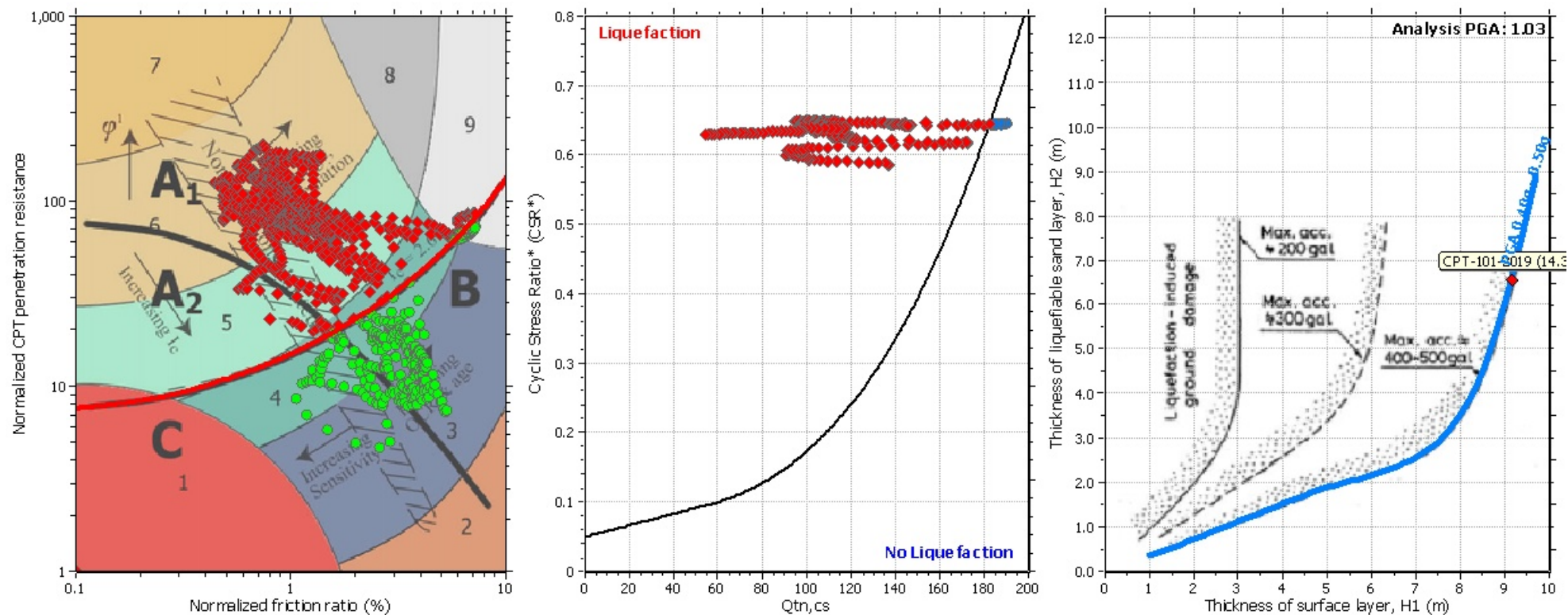
#### F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

#### LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



**LIQUEFACTION ANALYSIS REPORT**

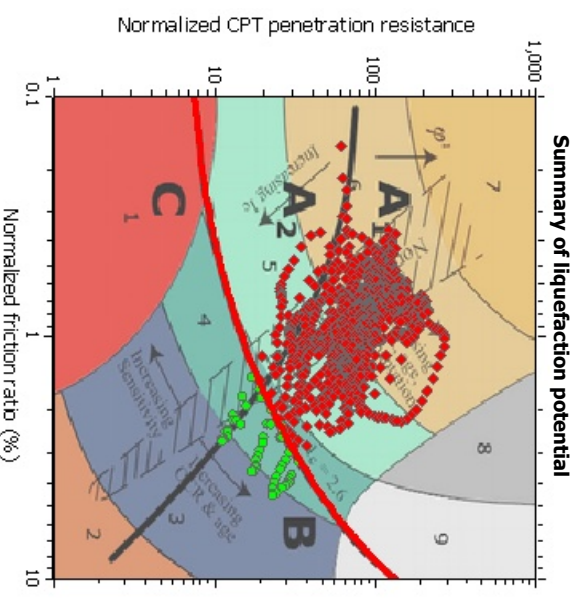
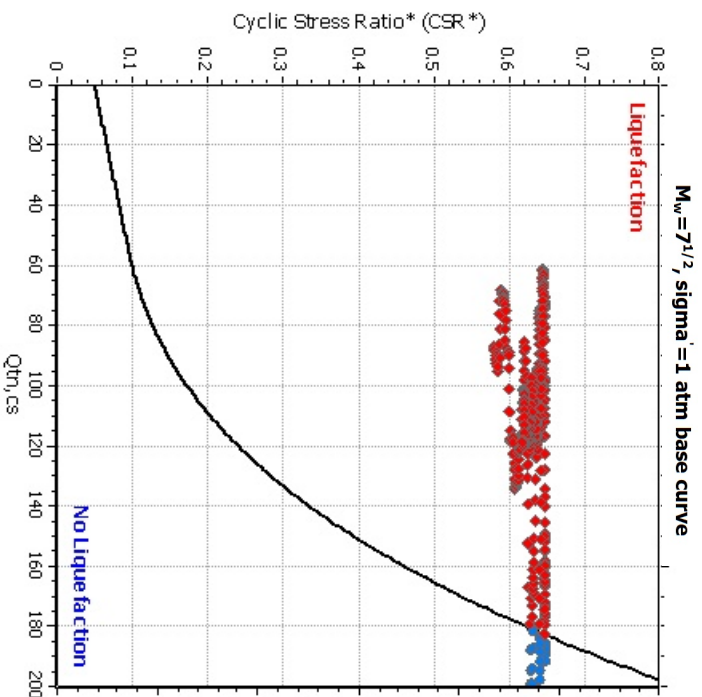
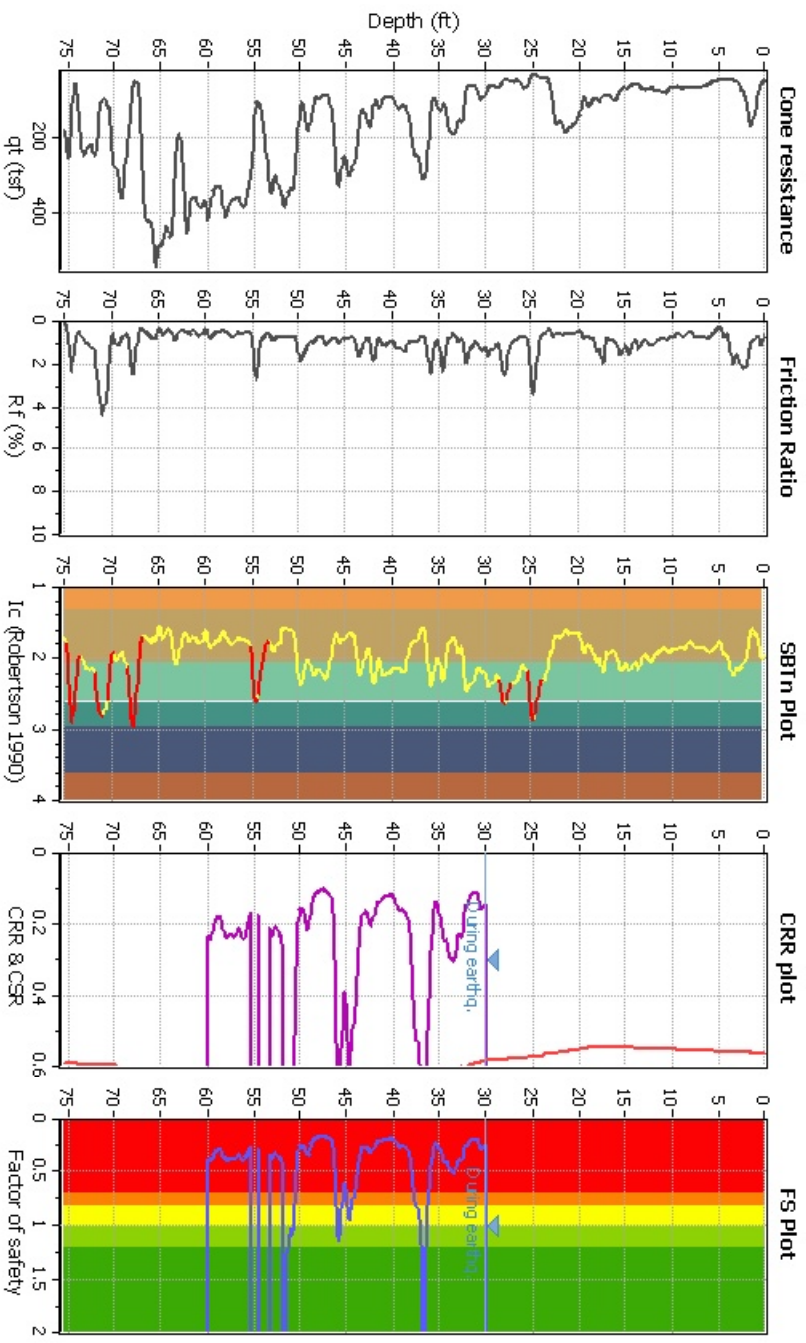
**Project title :** Moorpark Civic Center

**Location :** 799 Moorpark Avenue, Moorpark, California

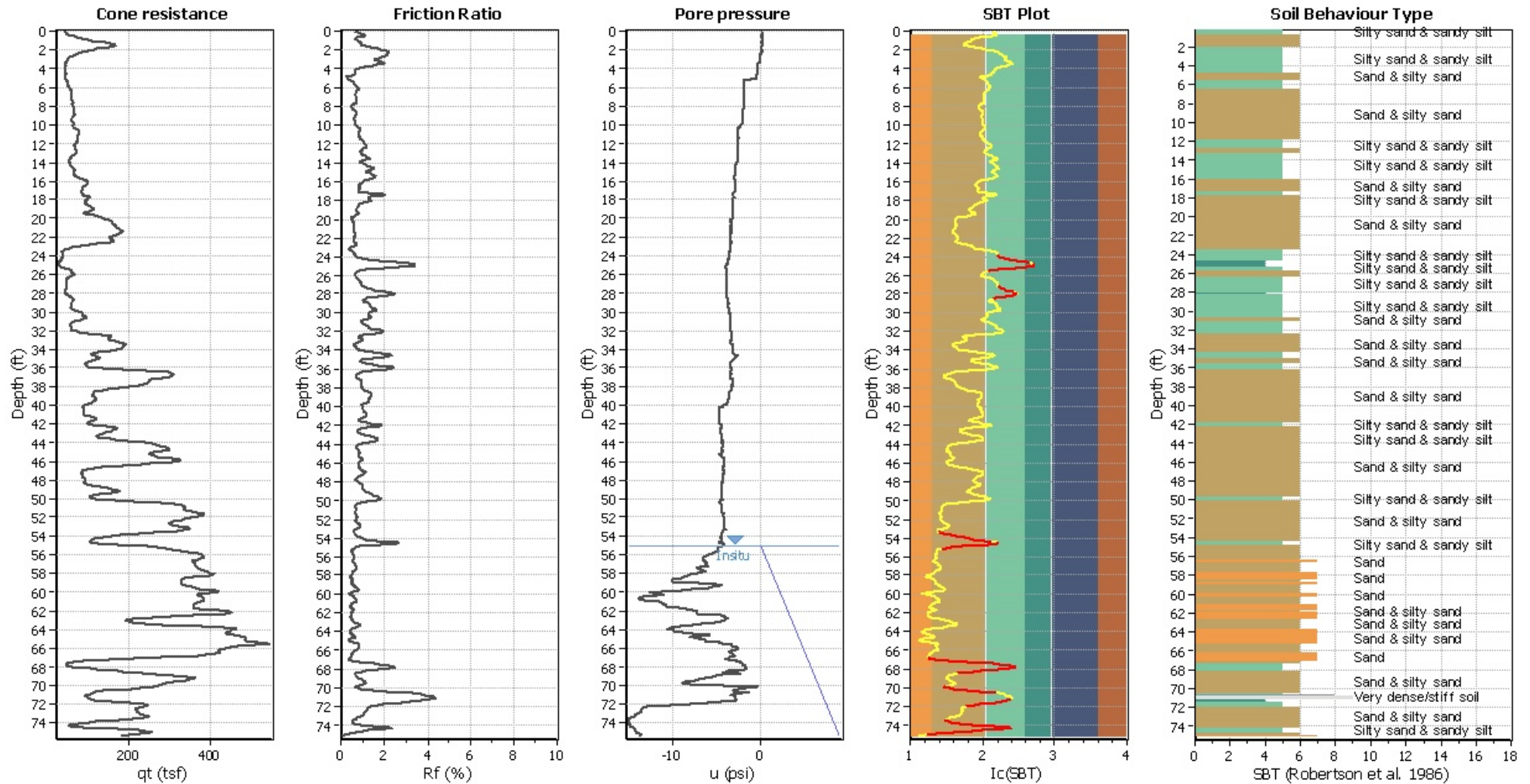
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Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth:	60.00 ft
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes		



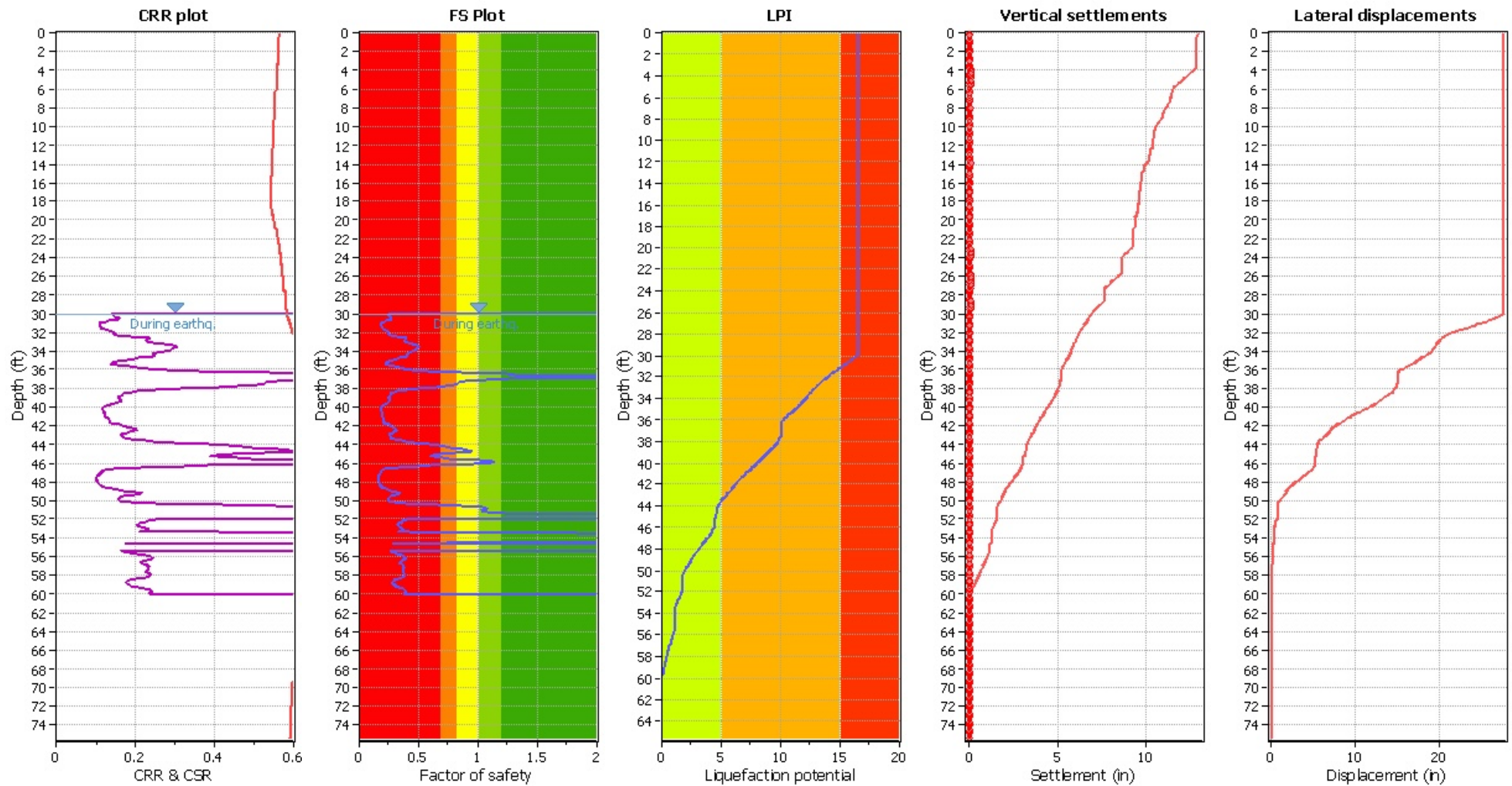
Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## F.S. color scheme

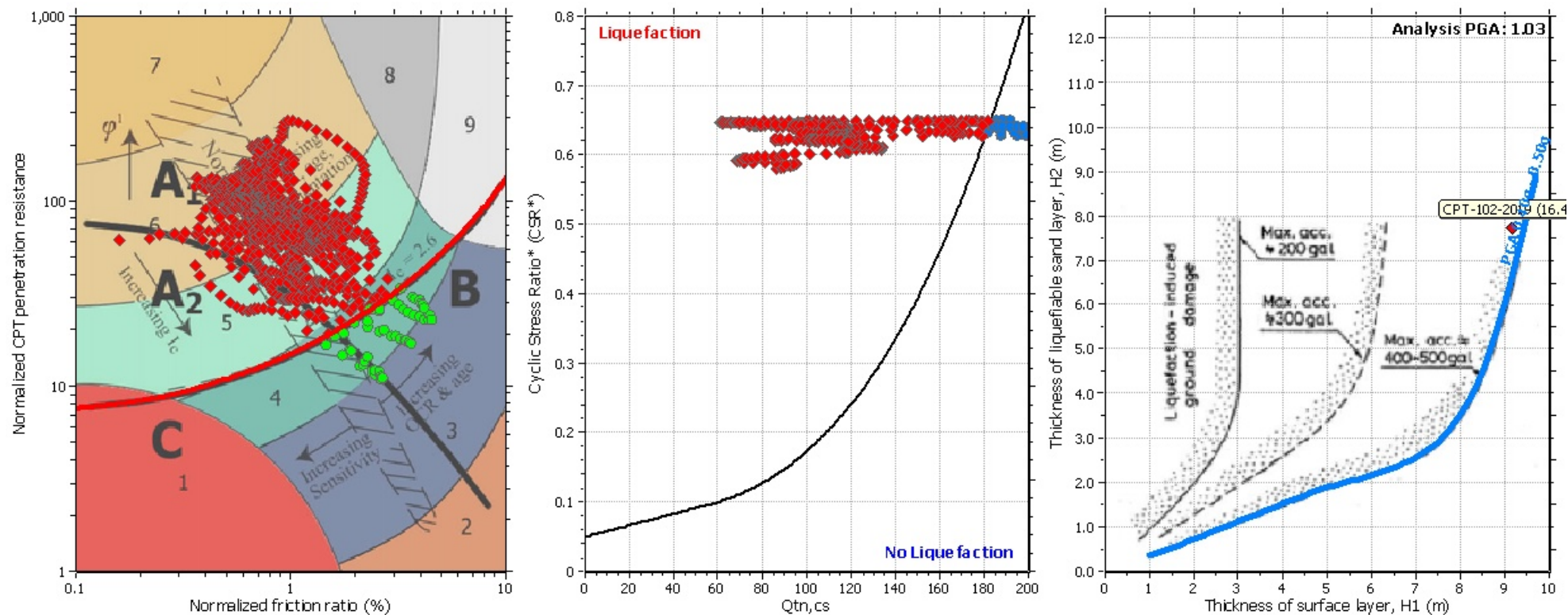
Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## LIQUEFACTION ANALYSIS REPORT

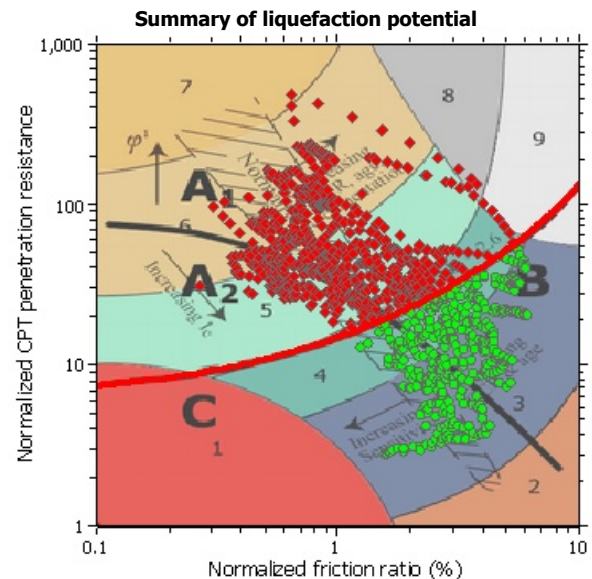
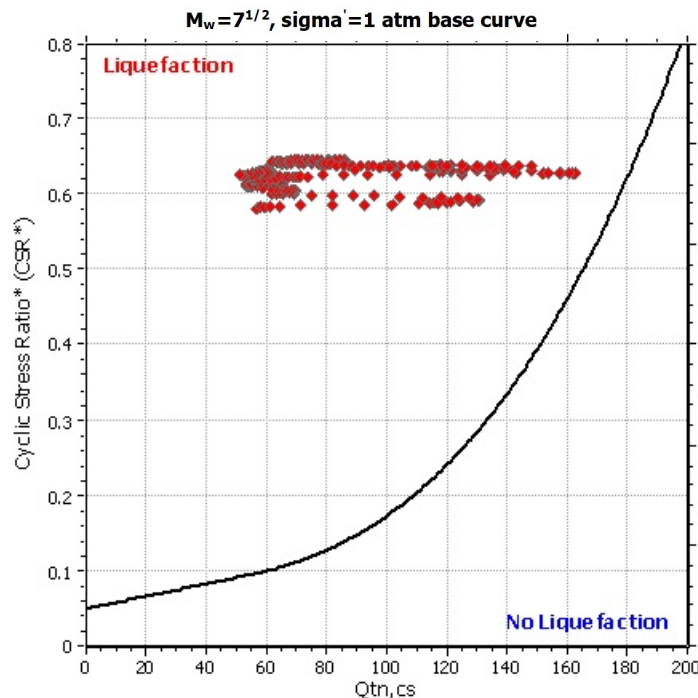
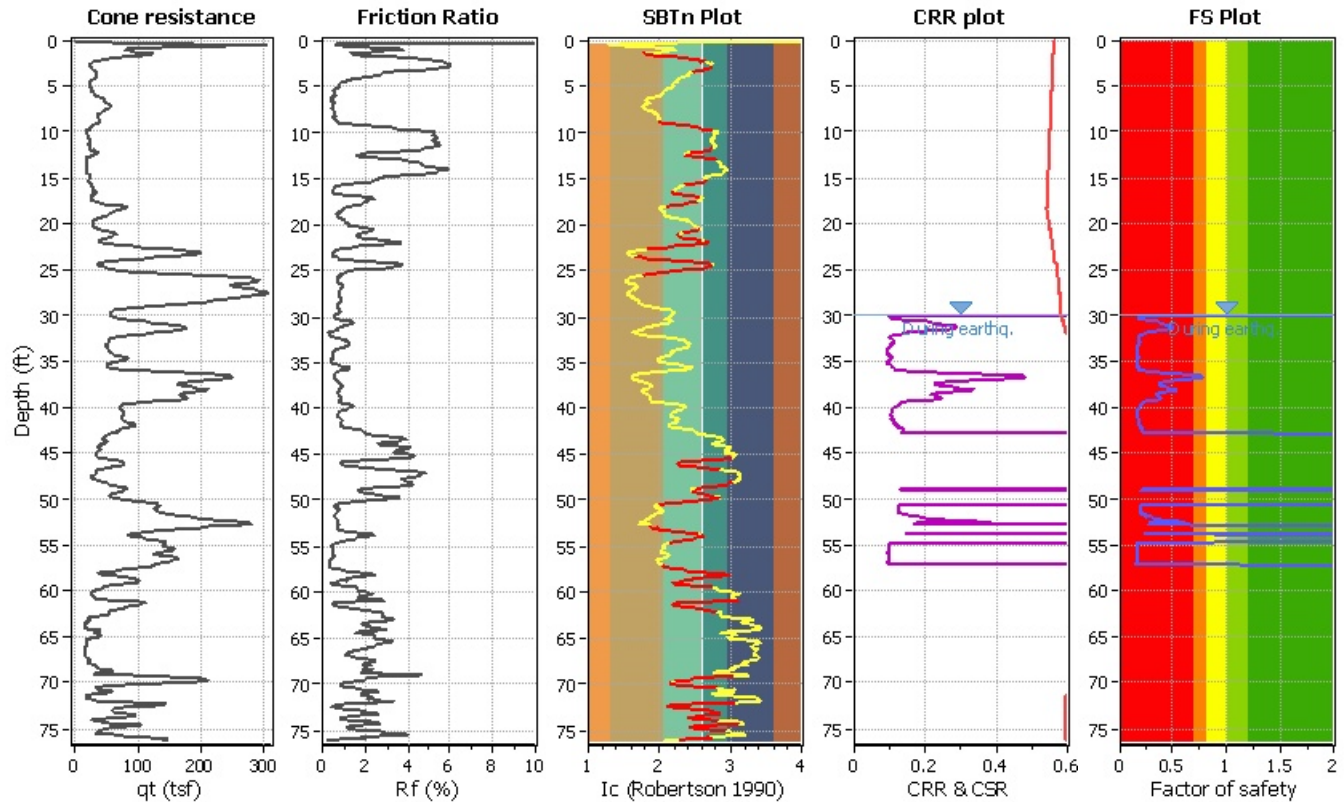
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**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-103-2019**

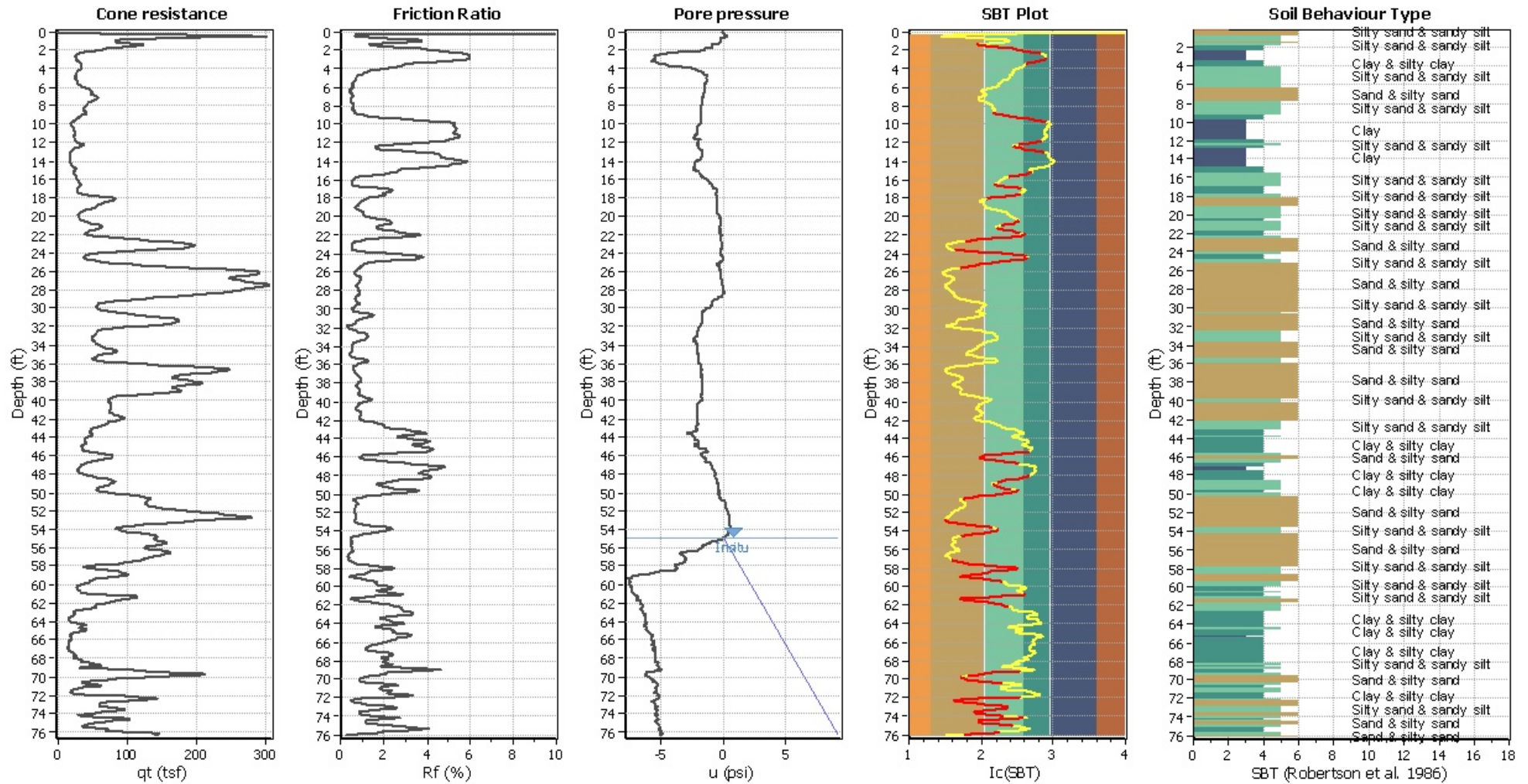
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Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
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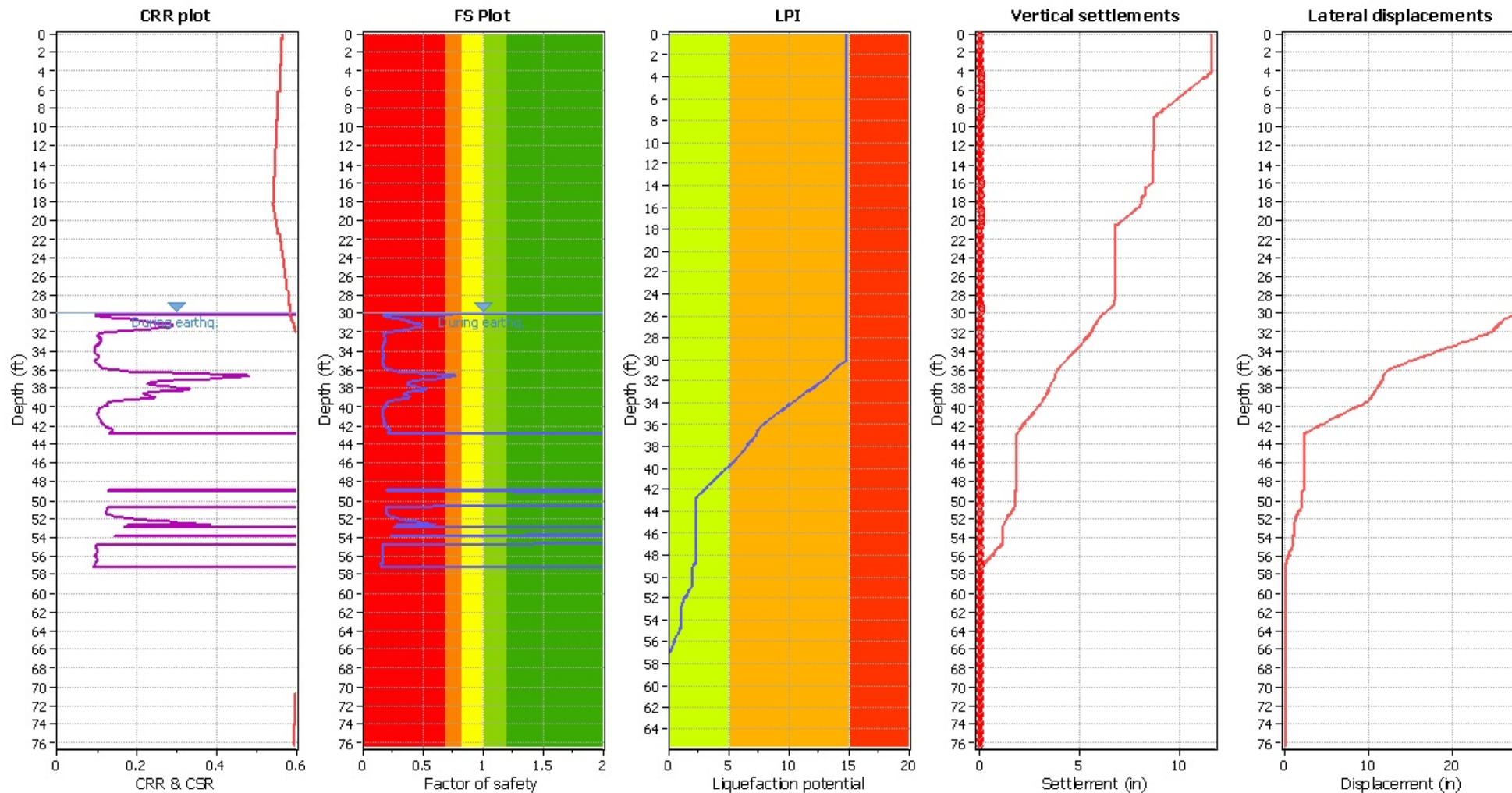
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Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

**SBT legend**

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2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
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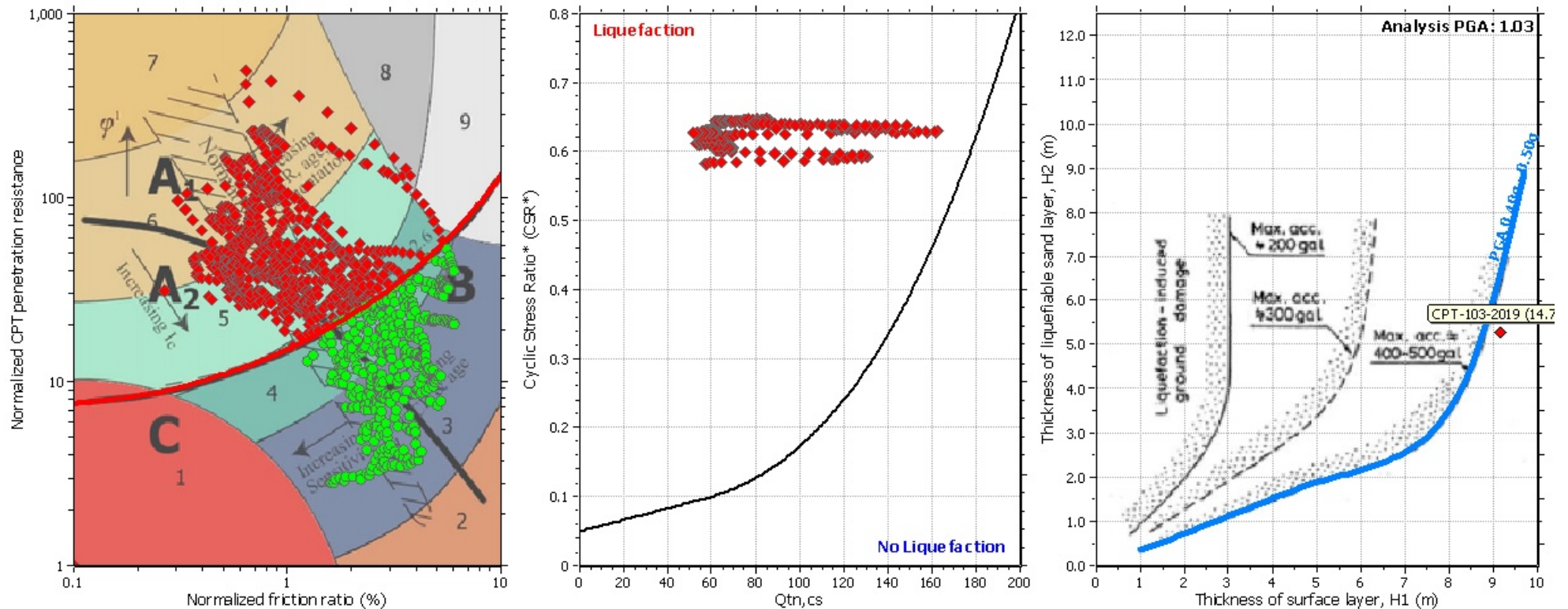
## F.S. color scheme

Red	Almost certain it will liquefy
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Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk

## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft



## LIQUEFACTION ANALYSIS REPORT

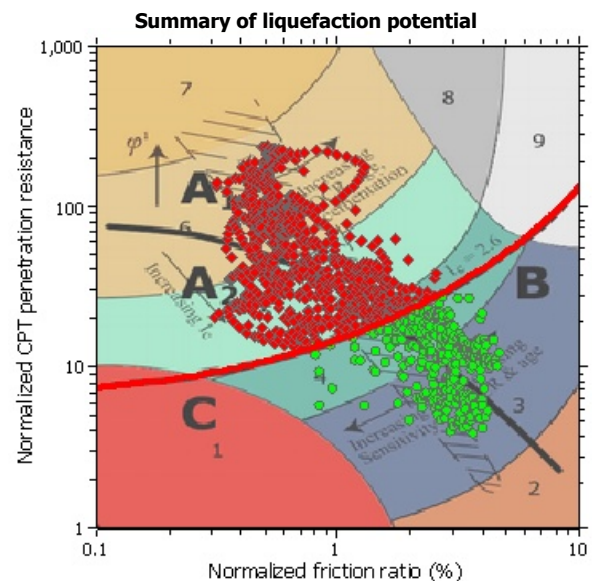
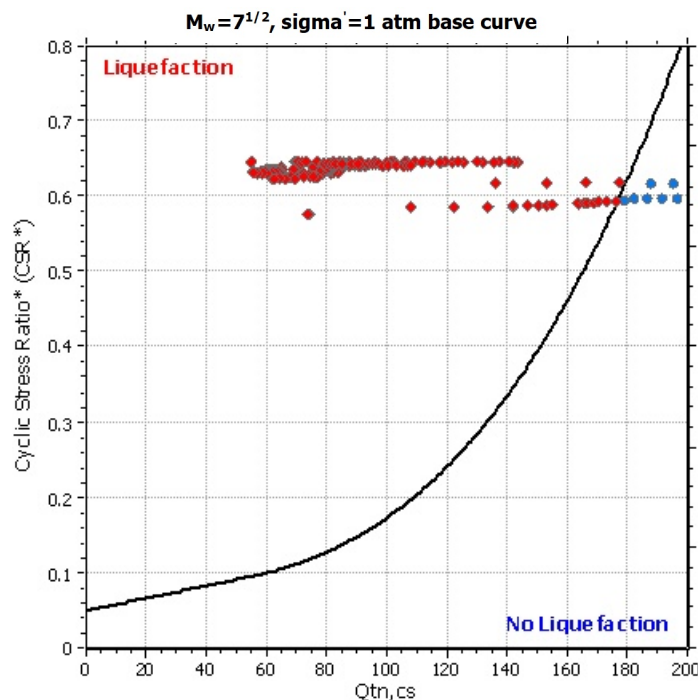
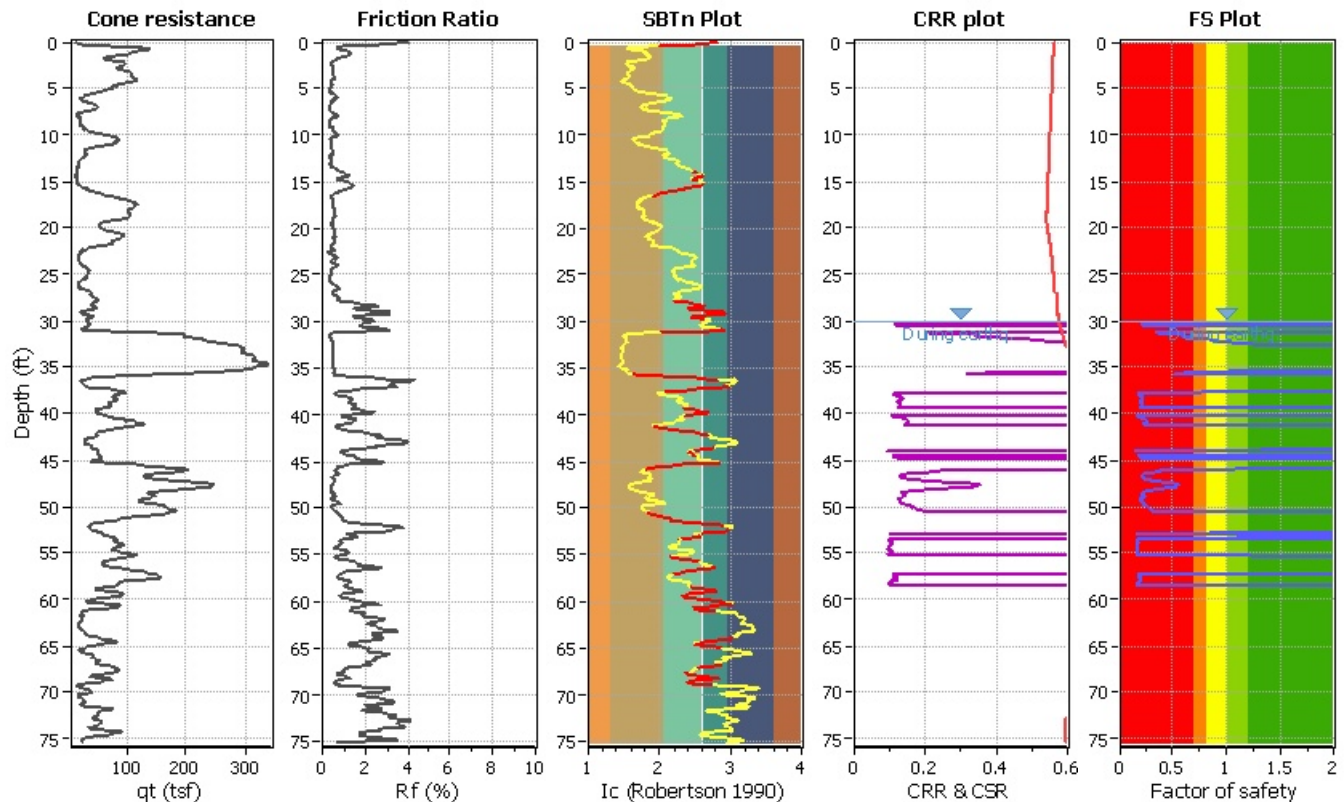
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**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-104-2019**

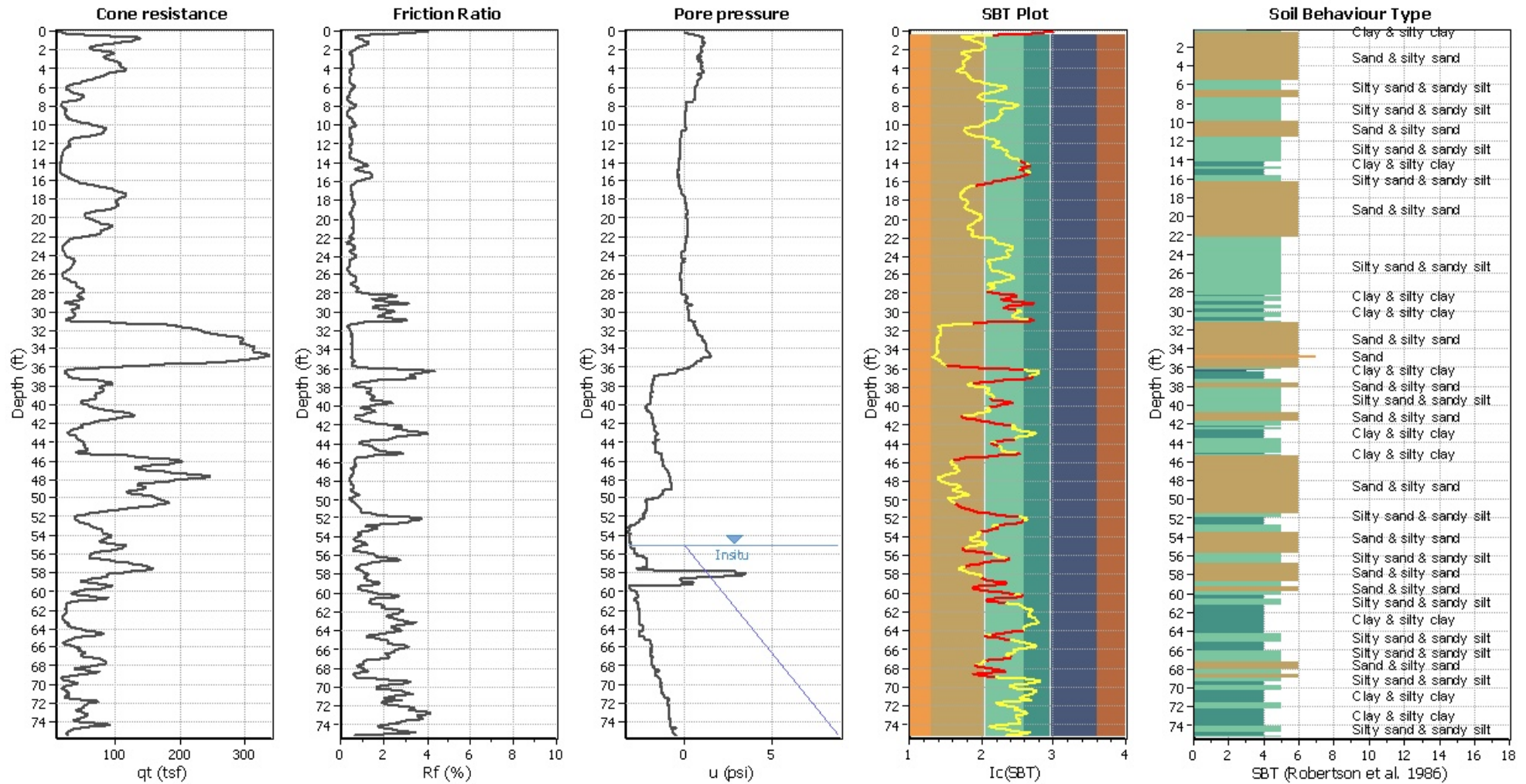
### Input parameters and analysis data

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Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
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Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

## CPT basic interpretation plo



## Input parameters and analysis data

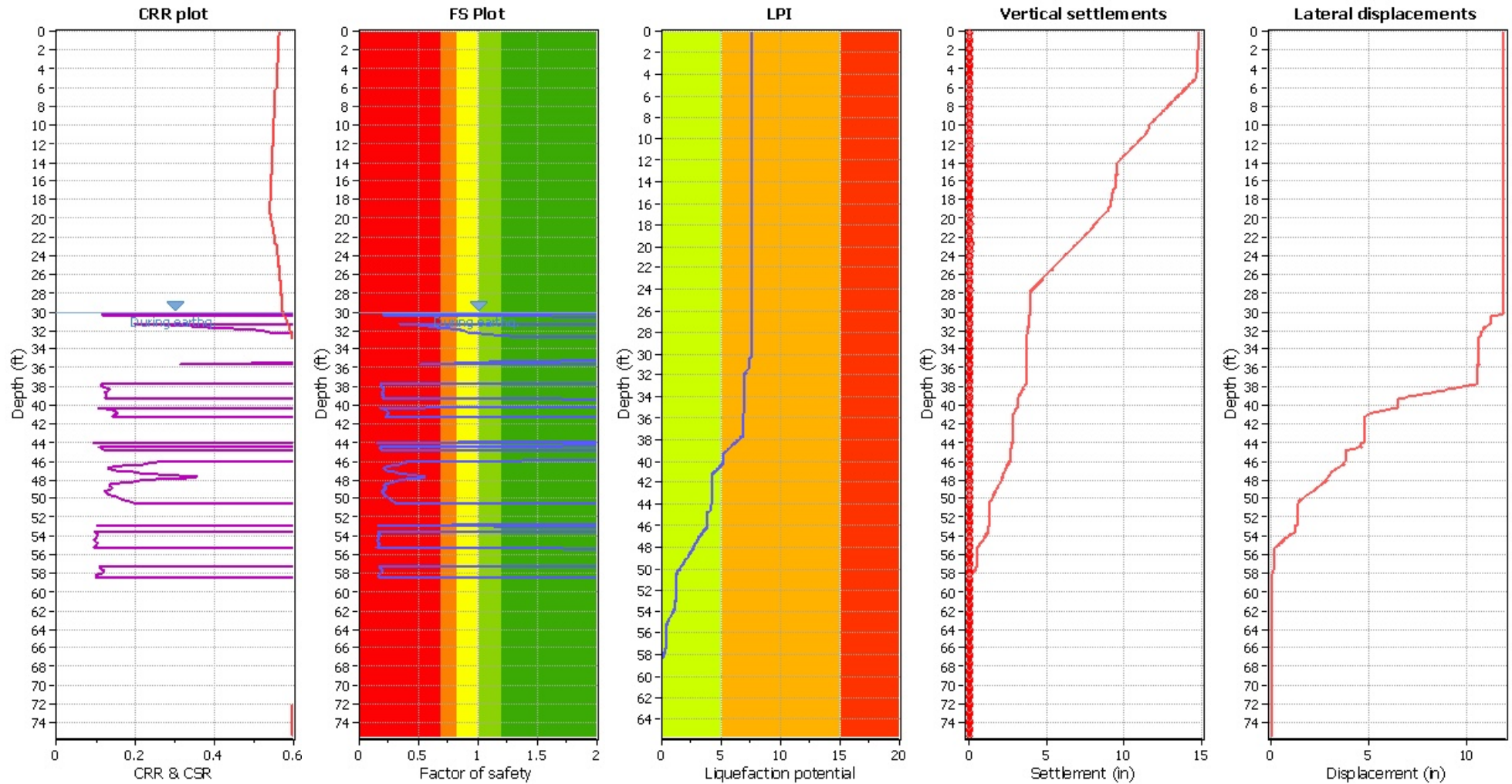
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## SBT legend

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



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_\sigma$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## F.S. color scheme

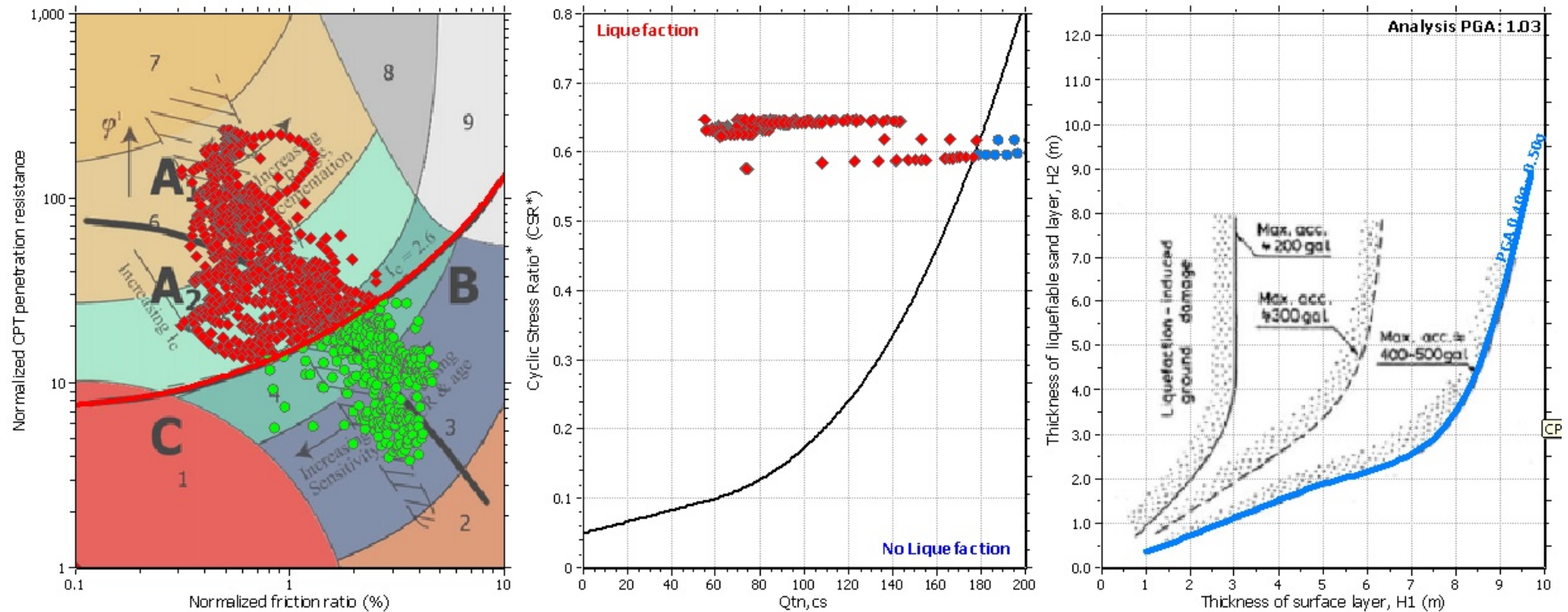
Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk



## Liquefaction analysis summary plo



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_0$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## LIQUEFACTION ANALYSIS REPORT

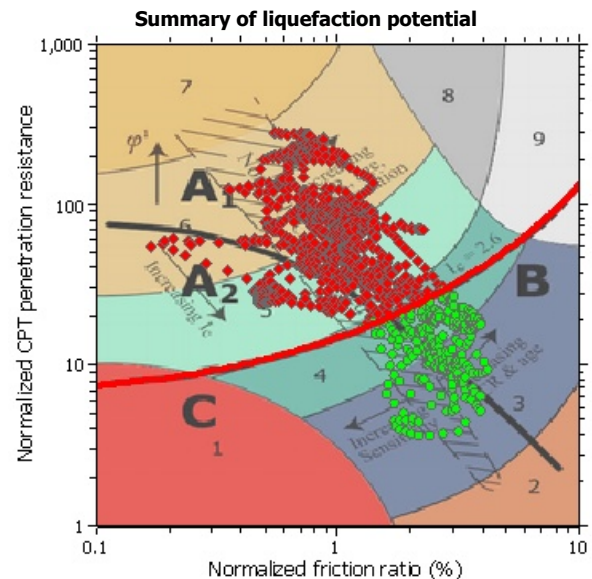
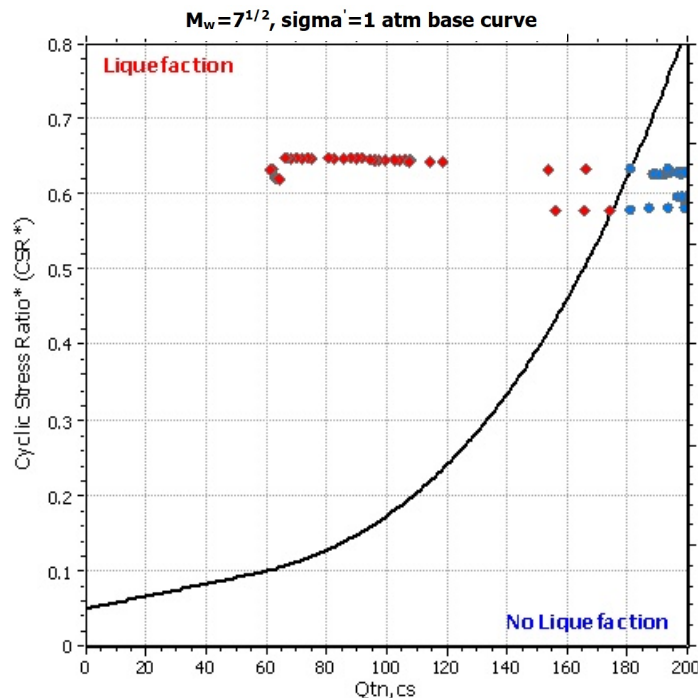
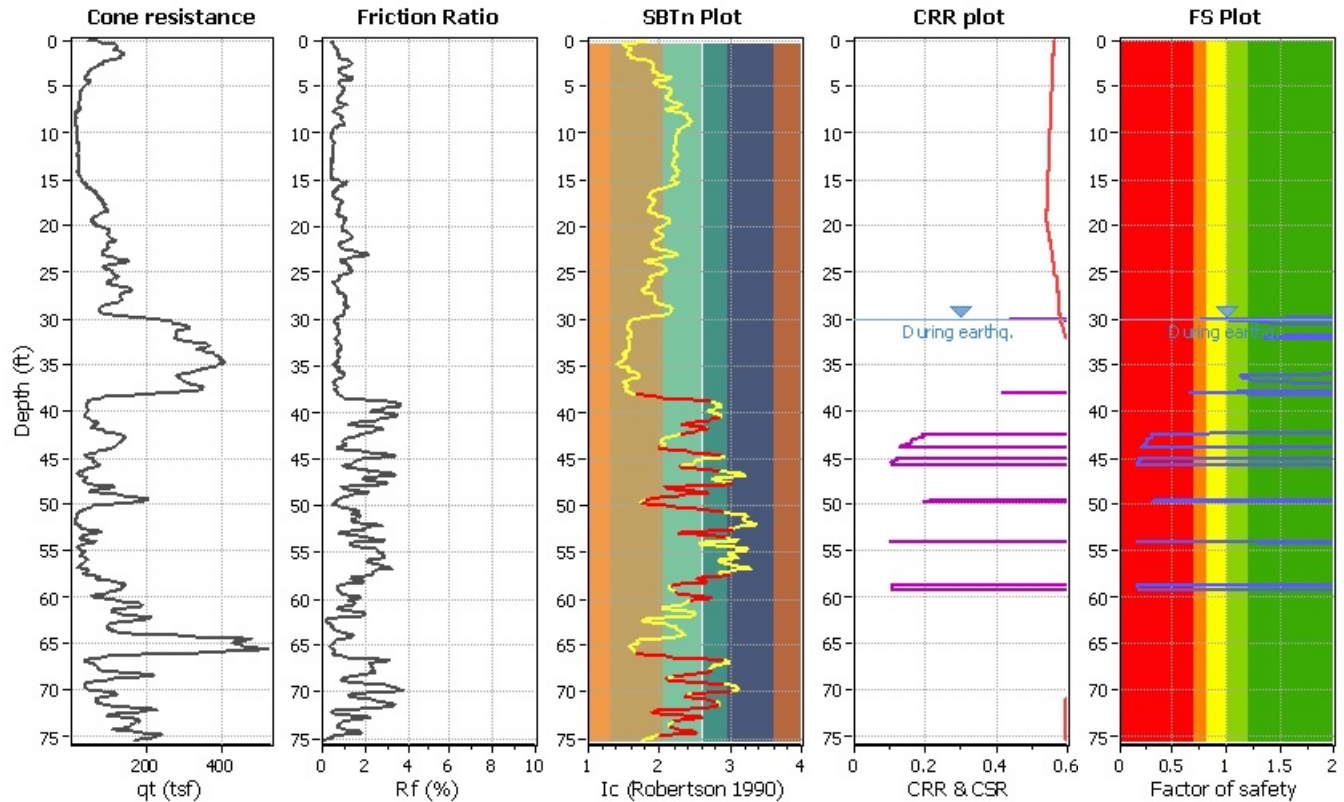
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

**CPT file : CPT-105-2019**

### Input parameters and analysis data

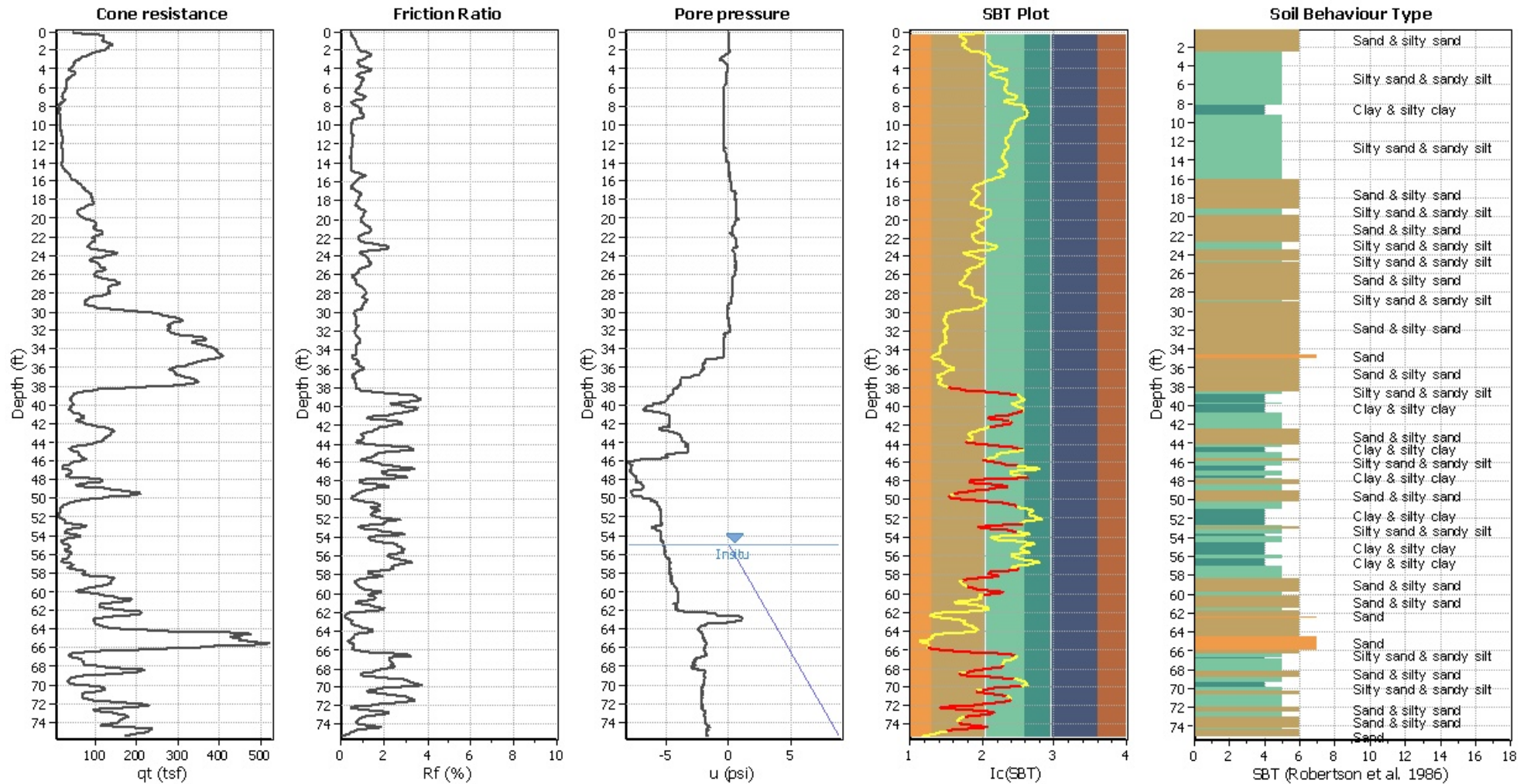
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



## CPT basic interpretation plo



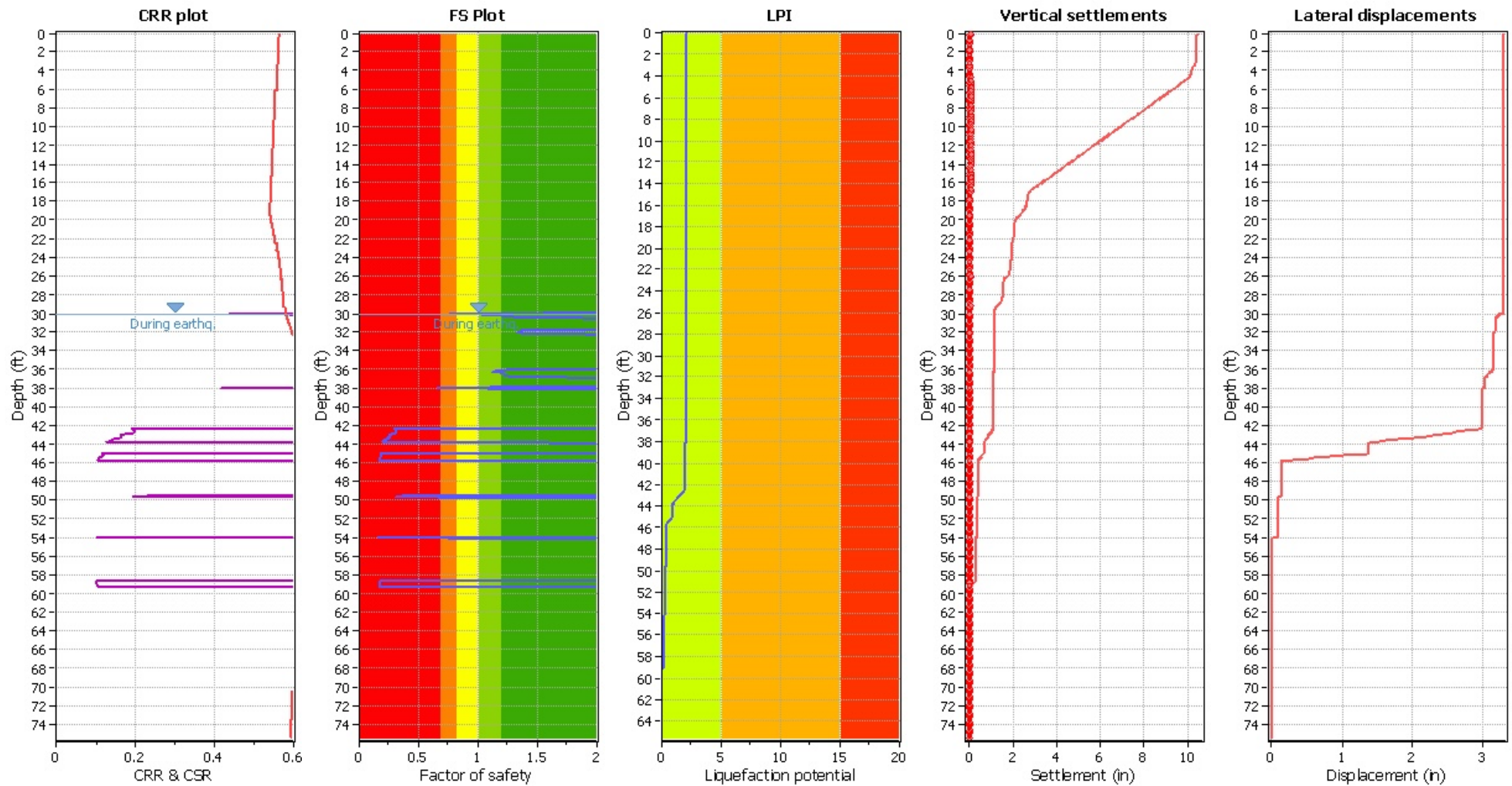
## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## SBT legend

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

## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

Red	Very high risk
Orange	High risk
Yellow	Low risk





## LIQUEFACTION ANALYSIS REPORT

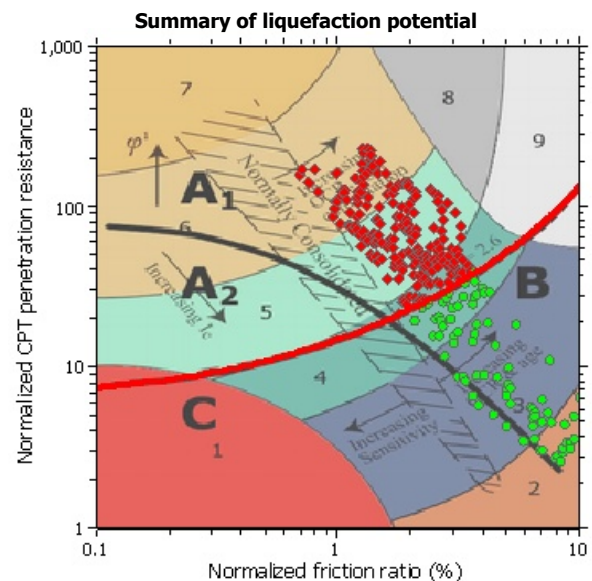
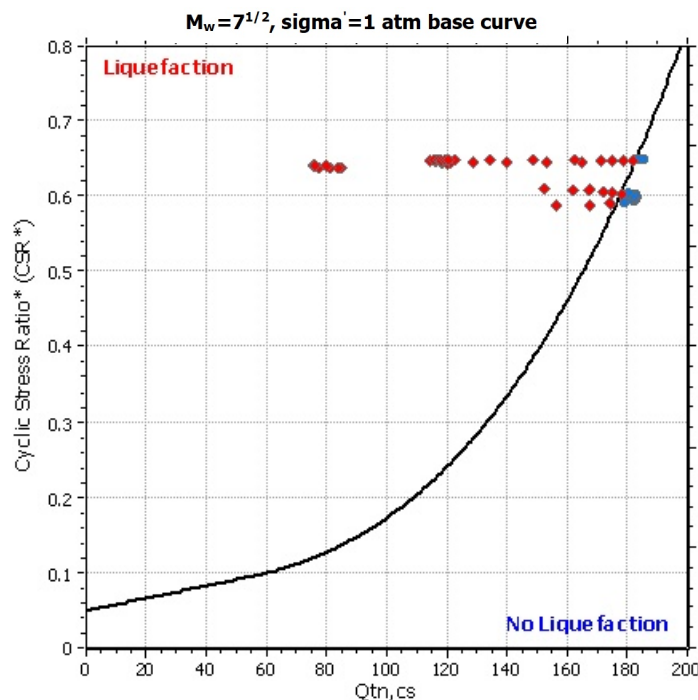
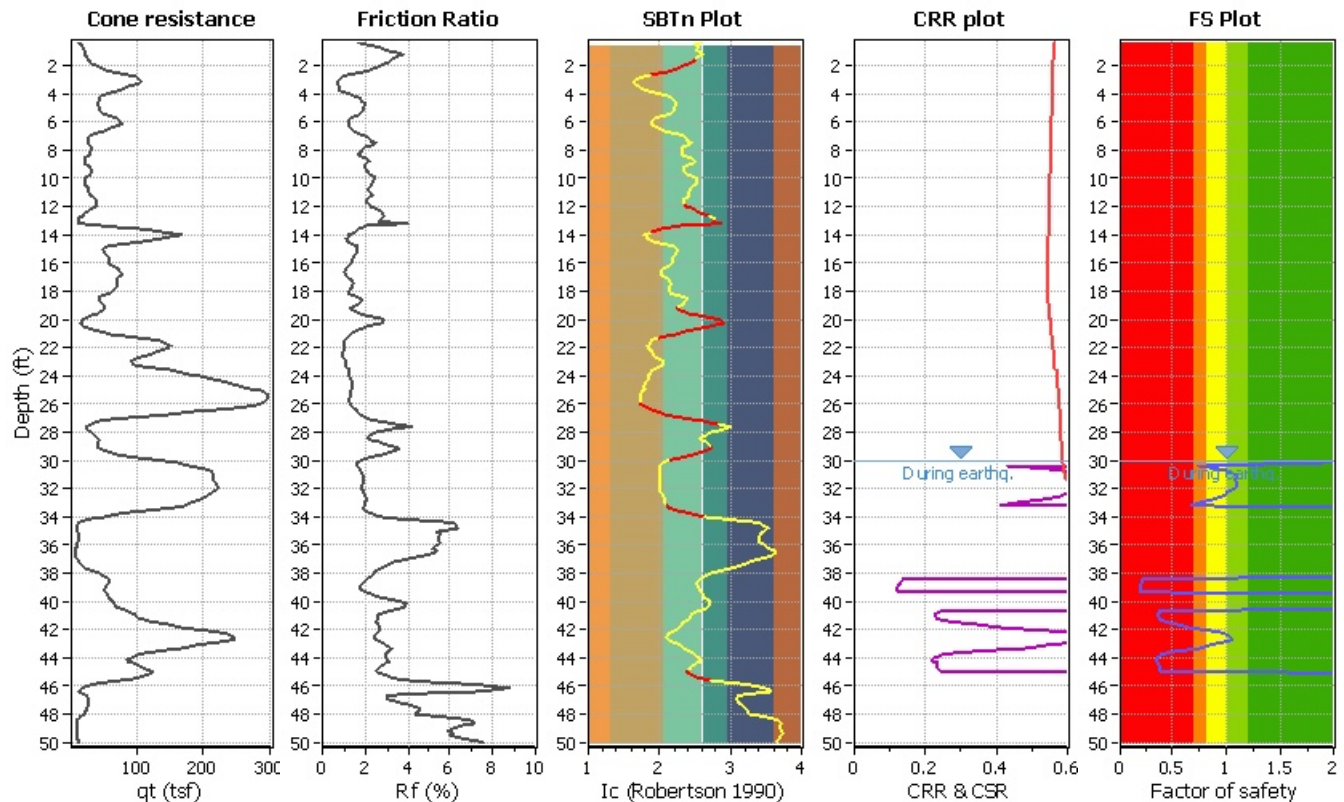
**Project title : Moorpark Civic Center**

**Location : 799 Moorpark Avenue, Moorpark, California**

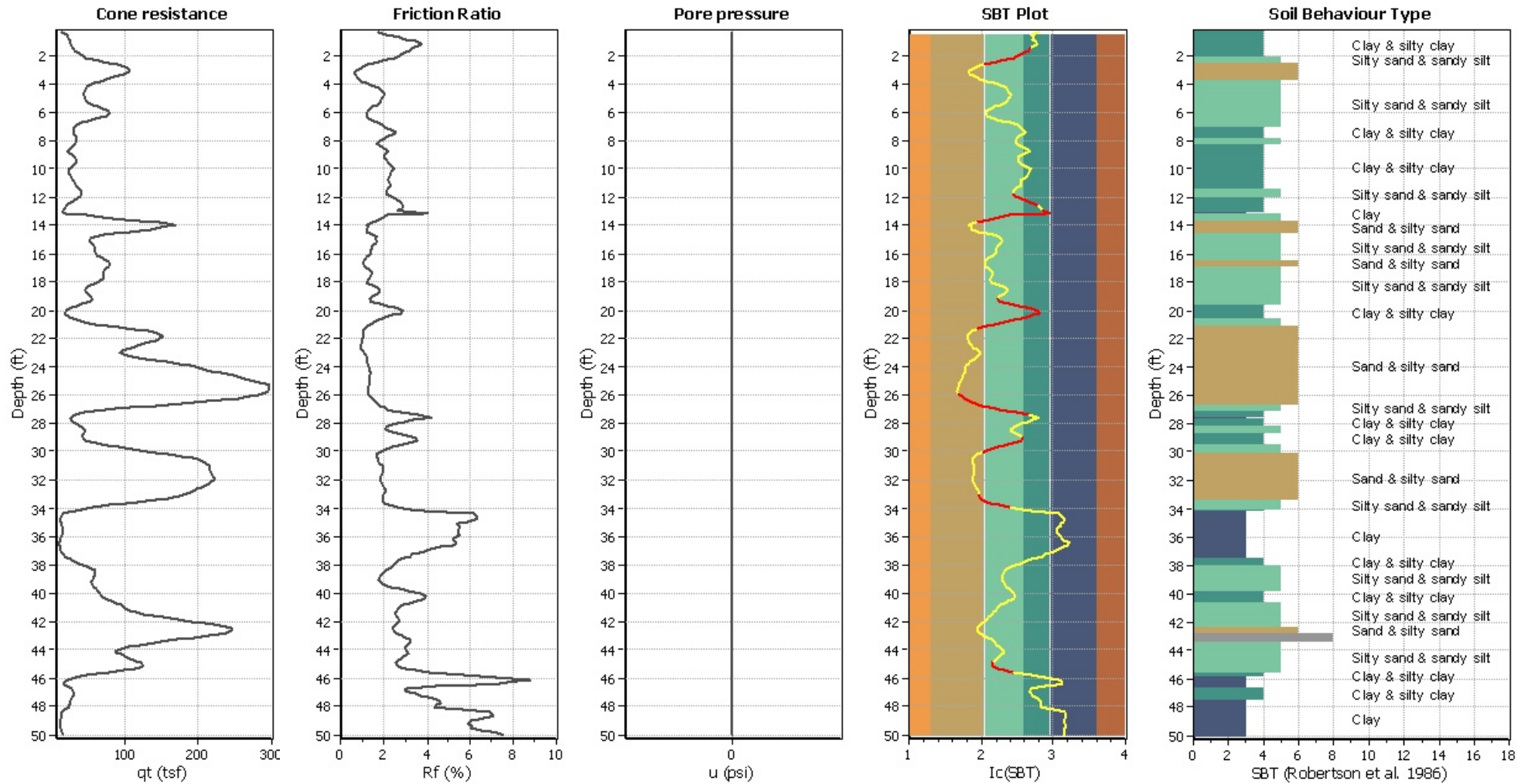
**CPT file : Gorian CPT-2**

### Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	55.00 ft	Use fill:	No	Clay like behavior	
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	applied:	Sands only
Points to test:	Based on Ic value	Average results interval:	5	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	1.03	Unit weight calculation:	Based on SBT	$K_0$ applied:	Yes	MSF method:	Method based



Zone A<sub>1</sub>: Cyclic liquefaction likely depending on size and duration of cyclic loading  
 Zone A<sub>2</sub>: Cyclic liquefaction and strength loss likely depending on loading and ground geometry  
 Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening  
 Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

**CPT basic interpretation plo****Input parameters and analysis data**

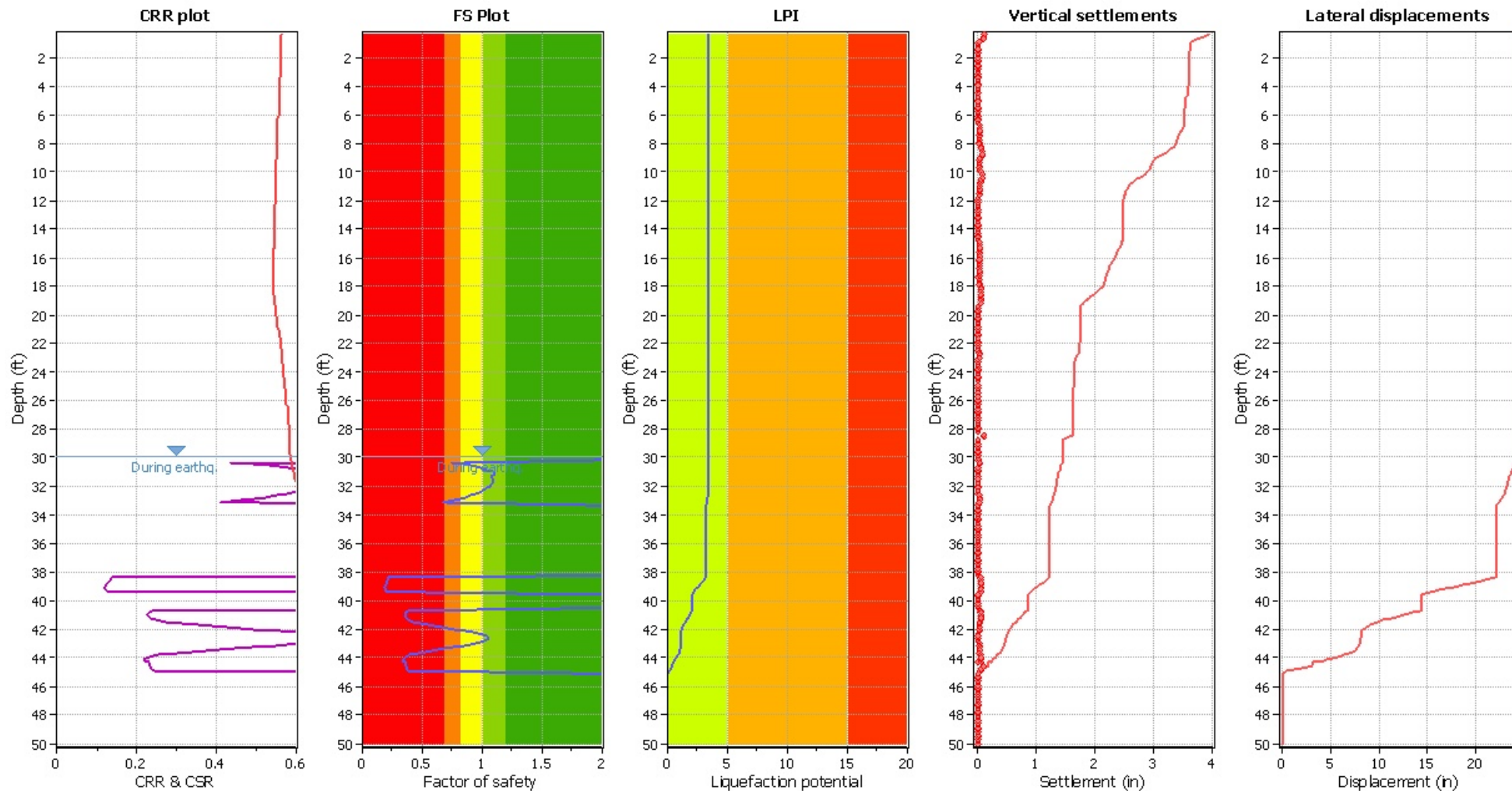
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K <sub>o</sub> applied:	Yes
Earthquake magnitude M <sub>w</sub> :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

**SBT legend**

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



## Liquefaction analysis overall plot



## Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	5	Transition detect. applied:	Yes
Points to test:	Based on $I_c$ value	$I_c$ cut-off value:	2.60	$K_o$ applied:	Yes
Earthquake magnitude $M_w$ :	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	1.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	55.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

## F.S. color scheme

Red	Almost certain it will liquefy
Orange	Very likely to liquefy
Yellow	Liquefaction and no liq. are equally likely
Light Green	Unlike to liquefy
Dark Green	Almost certain it will not liquefy

## LPI color scheme

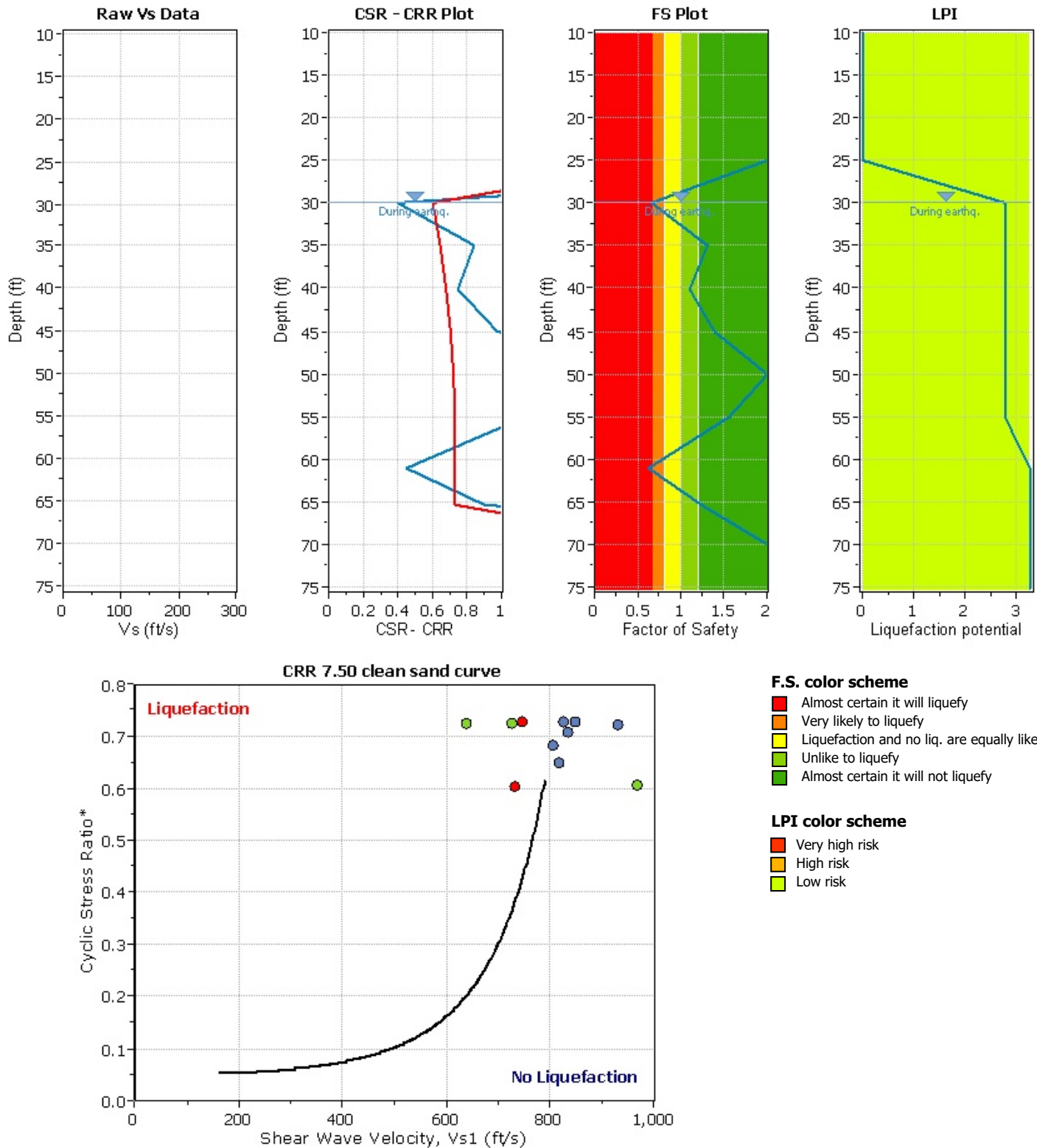
Red	Very high risk
Orange	High risk
Yellow	Low risk



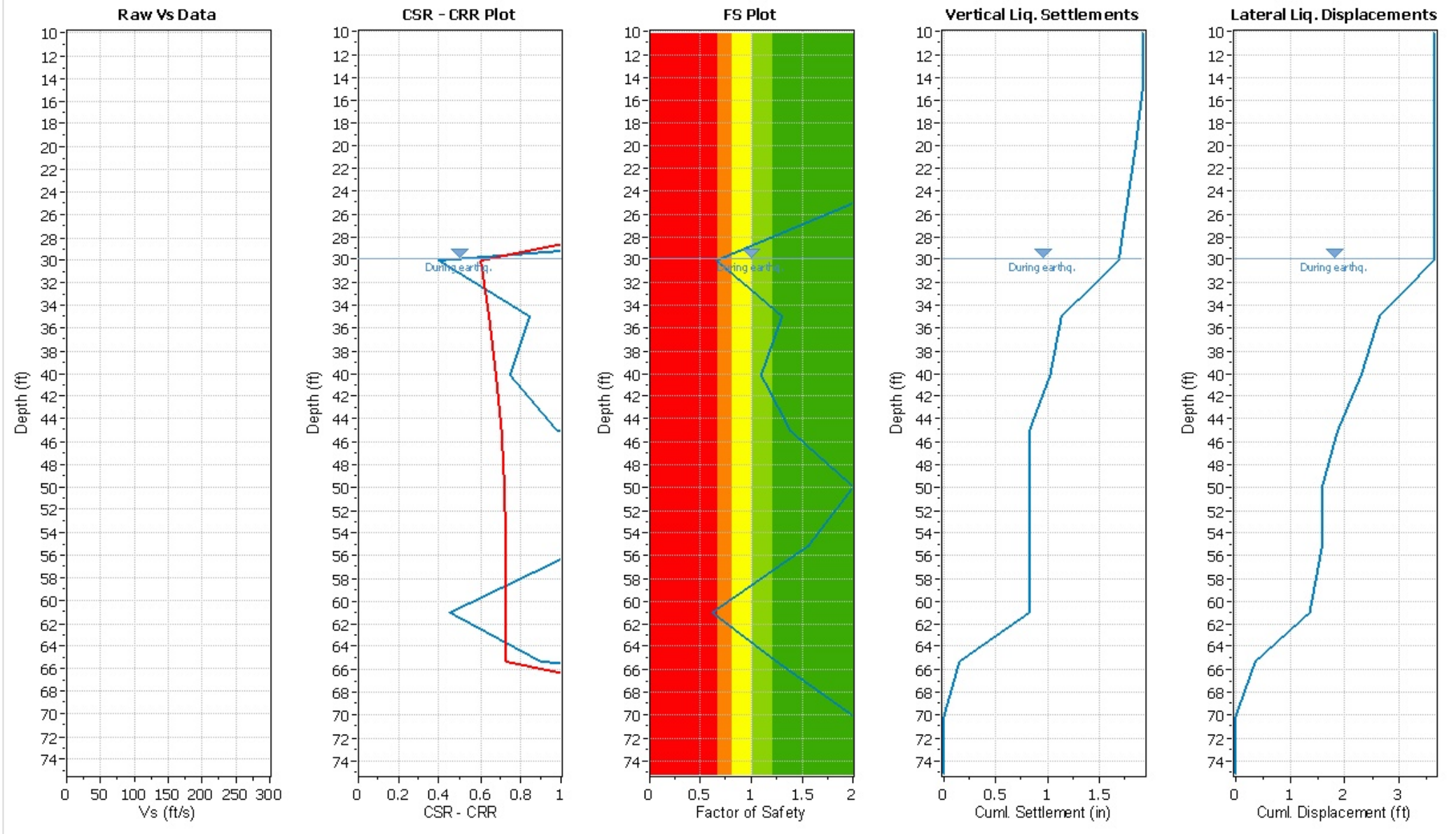
## V<sub>s</sub> BASED LIQUEFACTION ANALYSIS REPORT

**Project title : Moorpark Civic Center**
**V<sub>s</sub> Name: OGI CPT-103**
**Location : 799 Moorpark Avenue, Moorpark, California**
**:: Input parameters and analysis properties ::**

Analysis method: Kayen et al. 2013  
 G.W.T. (in-situ): 55.00 ft  
 G.W.T. (earthq.): 30.00 ft  
 Earthquake magnitude  $M_w$ : 7.00  
 Peak ground acceleration: 1.03 g  
 Eq. external load: 0.00 tsf



**:: Overall Liquefaction Assessment Analysis Plots ::**



:: Field input data ::					
Test Depth (ft)	V <sub>s</sub> Field Value (ft/s)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
10.07	907.03	60.00	120.00	5.00	No
15.06	1054.43	35.00	120.00	5.00	Yes
20.08	1000.60	35.00	120.00	5.00	Yes
25.07	1057.11	35.00	120.00	5.00	Yes
30.02	836.59	35.00	120.00	5.00	Yes
35.01	972.64	35.00	120.00	5.00	Yes
40.09	990.70	35.00	120.00	5.00	Yes
45.08	1055.98	35.00	120.00	5.00	Yes
50.00	1210.70	35.00	120.00	5.00	Yes
55.09	1130.26	35.00	120.00	5.00	Yes
61.06	1007.83	35.00	120.00	5.00	Yes
65.26	1122.41	35.00	120.00	5.00	Yes
70.05	876.89	50.00	120.00	5.00	No
75.12	1005.56	35.00	120.00	5.00	Yes

#### Abbreviations

Depth: Depth at which test was performed (ft)  
 Vs Field Value: Measured shear waves velocity (ft/s)  
 Fines Content: Fines content at test depth (%)  
 Unit Weight: Unit weight at test depth (pcf)  
 Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)  
 Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::								
Depth (ft)	V <sub>s</sub> Field Value (ft/s)	Unit Weight (pcf)	$\sigma_v$ (tsf)	$u_o$ (tsf)	$\sigma'_{vo}$ (tsf)	Norm. Factor	V <sub>s1</sub> (ft/s)	CRR <sub>7.5</sub>
10.07	907.03	120.00	0.60	0.00	0.60	1.15	1043.42	4.000
15.06	1054.43	120.00	0.90	0.00	0.90	1.04	1096.87	4.000
20.08	1000.60	120.00	1.20	0.00	1.20	0.97	968.64	4.000
25.07	1057.11	120.00	1.50	0.00	1.50	0.92	968.11	4.000
30.02	836.59	120.00	1.80	0.00	1.80	0.88	732.41	0.398
35.01	972.64	120.00	2.10	0.00	2.10	0.84	819.41	0.839
40.09	990.70	120.00	2.41	0.00	2.41	0.81	806.82	0.747
45.08	1055.98	120.00	2.70	0.00	2.70	0.79	835.13	0.976
50.00	1210.70	120.00	3.00	0.00	3.00	0.77	933.02	2.822
55.09	1130.26	120.00	3.31	0.00	3.30	0.75	850.35	1.136
61.06	1007.83	120.00	3.66	0.19	3.47	0.74	748.68	0.453
65.26	1122.41	120.00	3.92	0.32	3.60	0.74	826.69	0.900
70.05	876.89	120.00	4.20	0.47	3.73	0.73	639.81	4.000
75.12	1005.56	120.00	4.51	0.63	3.88	0.72	726.69	4.000

#### Abbreviations

$\sigma_v$ : Total stress during SPT test (tsf)  
 $u_o$ : Water pore pressure during SPT test (tsf)  
 $\sigma'_{vo}$ : Effective overburden pressure during SPT test (tsf)  
 Norm. Factor: overburden-stress correction factor  
 V<sub>s1</sub>: Overburden-stress corrected shear wave velocity  
 CRR<sub>7.5</sub>: Cyclic resistance ratio for M=7.5



### :: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	$r_d$	$\alpha$	CSR	MSF	$CSR_{eq,M=7.5}$	$K_{sigma}$	CSR*	FS	
10.07	120.00	0.60	0.00	0.60	1.00	1.00	0.669	1.10	0.607	1.00	0.607	2.000	●
15.06	120.00	0.90	0.00	0.90	1.00	1.00	0.668	1.10	0.607	1.00	0.607	2.000	●
20.08	120.00	1.20	0.00	1.20	1.00	1.00	0.667	1.10	0.606	1.00	0.606	2.000	●
25.07	120.00	1.50	0.00	1.50	0.99	1.00	0.666	1.10	0.604	1.00	0.604	2.000	●
30.02	120.00	1.80	0.00	1.80	0.99	1.00	0.663	1.10	0.602	1.00	0.602	0.662	●
35.01	120.00	2.10	0.16	1.94	0.98	1.00	0.712	1.10	0.646	1.00	0.646	1.299	●
40.09	120.00	2.41	0.31	2.09	0.97	1.00	0.750	1.10	0.681	1.00	0.681	1.097	●
45.08	120.00	2.70	0.47	2.23	0.96	1.00	0.777	1.10	0.706	1.00	0.706	1.384	●
50.00	120.00	3.00	0.62	2.38	0.94	1.00	0.794	1.10	0.721	1.00	0.721	2.000	●
55.09	120.00	3.31	0.78	2.52	0.91	1.00	0.801	1.10	0.727	1.00	0.727	1.561	●
61.06	120.00	3.66	0.97	2.69	0.88	1.00	0.801	1.10	0.727	1.00	0.727	0.622	●
65.26	120.00	3.92	1.10	2.82	0.86	1.00	0.799	1.10	0.725	1.00	0.725	1.241	●
70.05	120.00	4.20	1.25	2.95	0.84	1.00	0.796	1.10	0.723	1.00	0.723	2.000	●
75.12	120.00	4.51	1.41	3.10	0.82	1.00	0.796	1.10	0.723	1.00	0.723	2.000	●

### Abbreviations

$\sigma_{v,eq}$ :	Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$ :	Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$ :	Effective overburden pressure, during earthquake (tsf)
$r_d$ :	Nonlinear shear mass factor
$\alpha$ :	Improvement factor due to stone columns
CSR :	Cyclic Stress Ratio
MSF :	Magnitude Scaling Factor
$CSR_{eq,M=7.5}$ :	CSR adjusted for M=7.5
$K_{sigma}$ :	Effective overburden stress factor
CSR*:	CSR fully adjusted
FS:	Calculated factor of safety against soil liquefaction

### :: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	$I_L$
10.07	2.000	0.00	8.47	4.99	0.00
15.06	2.000	0.00	7.70	4.99	0.00
20.08	2.000	0.00	6.94	5.02	0.00
25.07	2.000	0.00	6.18	4.99	0.00
30.02	0.662	0.34	5.42	4.95	2.77
35.01	1.299	0.00	4.66	4.99	0.00
40.09	1.097	0.00	3.89	5.08	0.00
45.08	1.384	0.00	3.13	4.99	0.00
50.00	2.000	0.00	2.38	4.92	0.00
55.09	1.561	0.00	1.60	5.09	0.00
61.06	0.622	0.38	0.69	5.97	0.48
65.26	1.241	0.00	0.05	4.20	0.00
70.05	2.000	0.00	0.00	0.00	0.00
75.12	2.000	0.00	0.00	0.00	0.00

Overall potential  $I_L$  : 3.25

$I_L$  = 0.00 - No liquefaction  
 $I_L$  between 0.00 and 5 - Liquefaction not probable  
 $I_L$  between 5 and 15 - Liquefaction probable  
 $I_L$  > 15 - Liquefaction certain

**:: Vertical settlements estimation for dry sands ::**

Depth (ft)	$V_{s1,cs}$ (ft/s)	$(N_1)_{60,cs}$	$T_{av}$	$p$	$G_{max}$ (tsf)	$a$	$b$	$\gamma$	$\epsilon_{15}$	$N_c$	$\epsilon_{Nc}$ (%)	$\Delta h$ (ft)	$\Delta S$ (in)
10.07	1443.14	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.000
15.06	1591.54	50	0.60	0.61	1281.3	0.16	6801.34	0.00	0.00	10.85	0.06	5.00	0.069
20.08	1257.57	50	0.80	0.81	1479.5	0.17	5723.10	0.00	0.00	10.85	0.06	5.00	0.077
25.07	1256.34	50	1.00	1.01	1653.1	0.18	5009.53	0.00	0.00	10.85	0.07	5.00	0.085

**Cumulative settlements: 0.231****Abbreviations**

$V_{s1,cs}$ : Normalized shear wave velocity clean sand equivalent  
 $(N_1)_{60,cs}$ : Estimated normalized corrected clean sand SPT  
 $T_{av}$ : Average cyclic shear stress  
 $p$ : Average stress  
 $G_{max}$ : Maximum shear modulus (tsf)  
 $a, b$ : Shear strain formula variables  
 $\gamma$ : Average shear strain  
 $\epsilon_{15}$ : Volumetric strain after 15 cycles  
 $N_c$ : Number of cycles  
 $\epsilon_{Nc}$ : Volumetric strain for number of cycles  $N_c$  (%)  
 $\Delta h$ : Thickness of soil layer (in)  
 $\Delta S$ : Settlement of soil layer (in)

**:: Vertical settlements estimation for saturated sands ::**

Depth (ft)	$V_{s1,cs}$ (ft/s)	$q_{t1N,cs}$	$e_v$ (%)	$\Delta h$ (ft)	$s$ (in)
30.02	811.61	65644.53	0.92	5.00	0.551
35.01	954.12	132231.62	0.18	5.00	0.106
40.09	932.10	119519.72	0.35	5.00	0.211
45.08	982.35	150024.41	0.00	5.00	0.000
50.00	1177.49	328708.64	0.00	5.00	0.000
55.09	1010.46	169508.76	0.00	5.00	0.000
61.06	836.60	74855.21	1.11	5.00	0.667
65.26	967.10	140200.62	0.25	5.00	0.150
70.05	681.94	30897.60	0.00	5.00	0.000
75.12	802.99	62678.05	0.00	5.00	0.000

**Cumulative settlements: 1.685****Abbreviations**

$V_{s1,cs}$ : Normalized shear wave velocity clean sand equivalent  
 $q_{t1N,cs}$ : Estimated normalized corrected clean sand cone resistance  
 $e_v$ : Post liquefaction volumetric strain (%)  
 $\Delta h$ : Thickness of soil layer to be considered (ft)  
 $s$ : Estimated settlement (in)

**:: Lateral displacements estimation for saturated sands ::**

Depth (ft)	$V_{s1,cs}$ (ft/s)	$(N_1)_{60,cs}$	$D_r$ (%)	$\gamma_{max}$ (%)	$d_z$ (ft)	LDI	LD (ft)
10.07	1443.14	50	100.00	0.00	5.00	0.000	0.00
15.06	1591.54	50	100.00	0.00	5.00	0.000	0.00
20.08	1257.57	50	100.00	0.00	5.00	0.000	0.00
25.07	1256.34	50	100.00	0.00	5.00	0.000	0.00
30.02	811.61	50	100.00	6.20	5.00	0.310	0.99
35.01	954.12	50	100.00	2.03	5.00	0.102	0.33

:: Lateral displacements estimation for saturated sands ::							
Depth (ft)	V <sub>s1,cs</sub> (ft/s)	(N <sub>1</sub> ) <sub>60,cs</sub>	D <sub>r</sub> (%)	γ <sub>max</sub> (%)	d <sub>z</sub> (ft)	LDI	LD (ft)
40.09	932.10	50	100.00	2.76	5.00	0.138	0.44
45.08	982.35	50	100.00	1.82	5.00	0.091	0.29
50.00	1177.49	50	100.00	0.00	5.00	0.000	0.00
55.09	1010.46	50	100.00	1.46	5.00	0.073	0.23
61.06	836.60	50	100.00	6.20	5.00	0.310	0.99
65.26	967.10	50	100.00	2.21	5.00	0.111	0.35
70.05	681.94	50	100.00	0.00	5.00	0.000	0.00
75.12	802.99	50	100.00	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 3.63

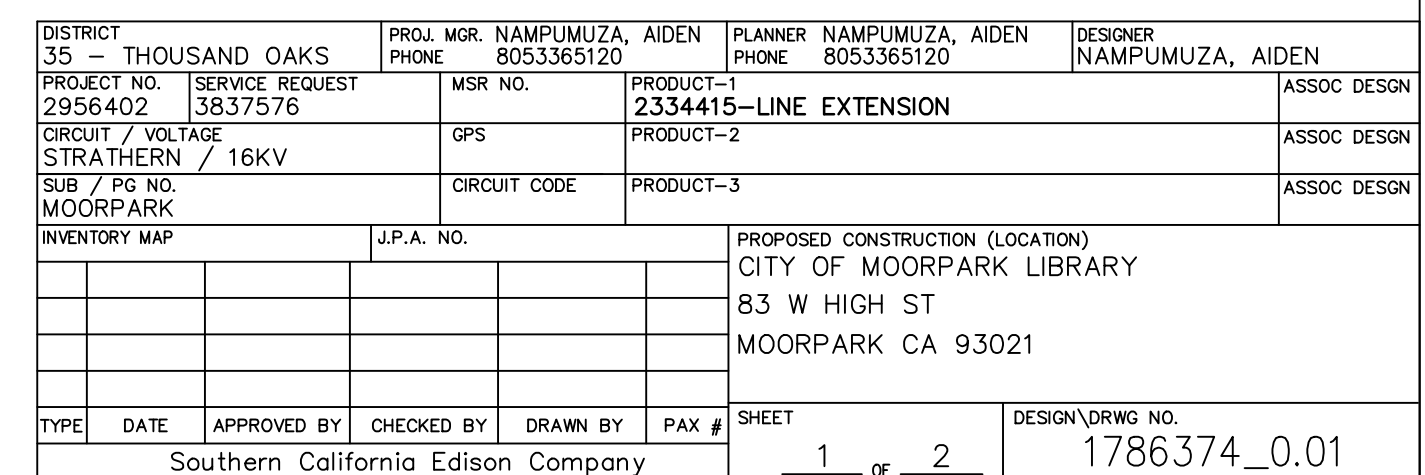
Abbreviations

- V<sub>s1,cs</sub>: Normalized shear wave velocity clean sand equivalent
- (N<sub>1</sub>)<sub>60,cs</sub>: Estimated normalized corrected clean sand SPT
- D<sub>r</sub>: Relative density (%)
- γ<sub>max</sub>: Maximum amplitude of cyclic shear strain (%)
- d<sub>z</sub>: Soil layer thickness (ft)
- LDI: Lateral displacement index (ft)
- LD: Actual estimated displacement (ft)



0124: 02/23/24

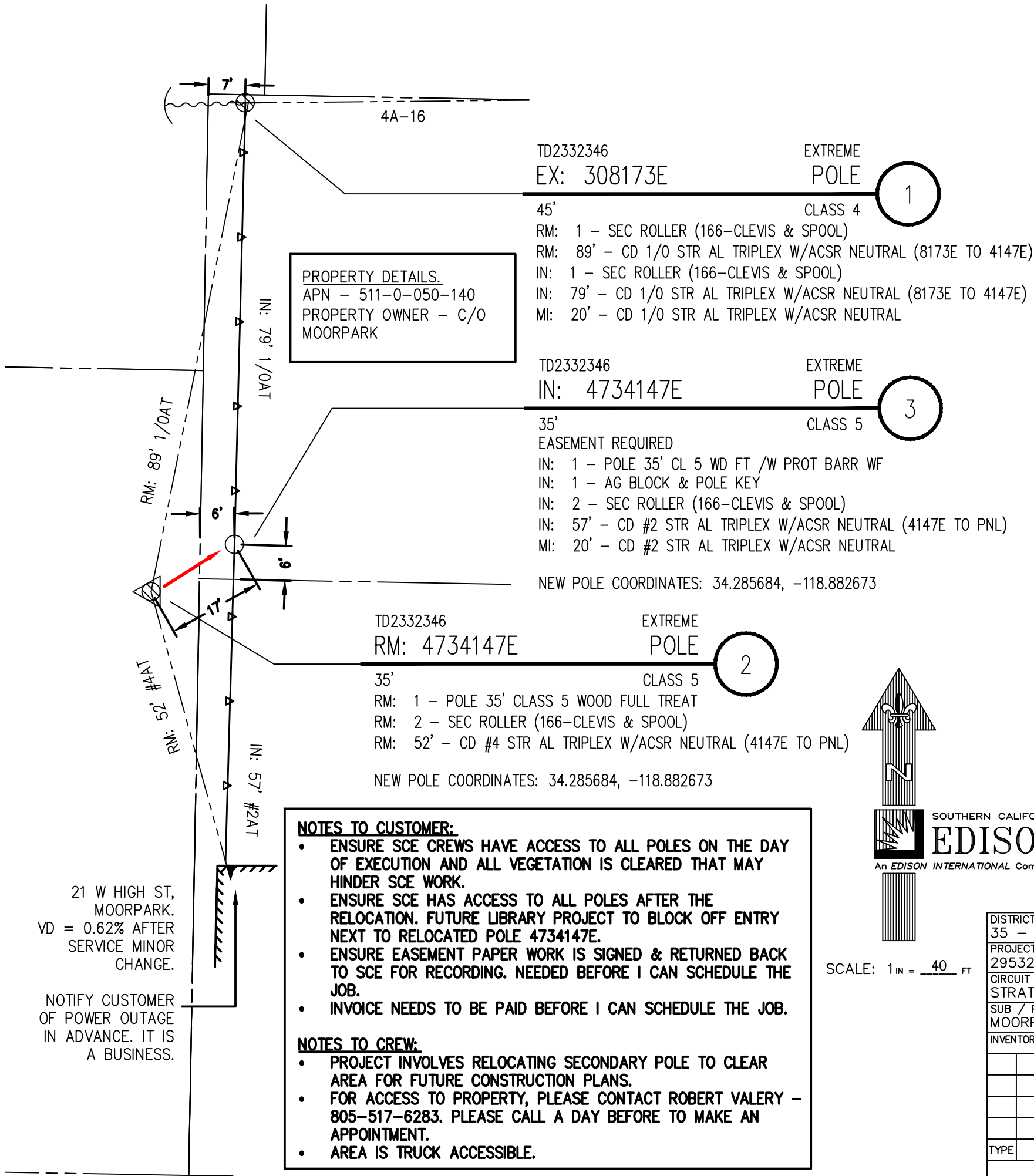
- For Underground Locating  
Two Working Days Before You Dig



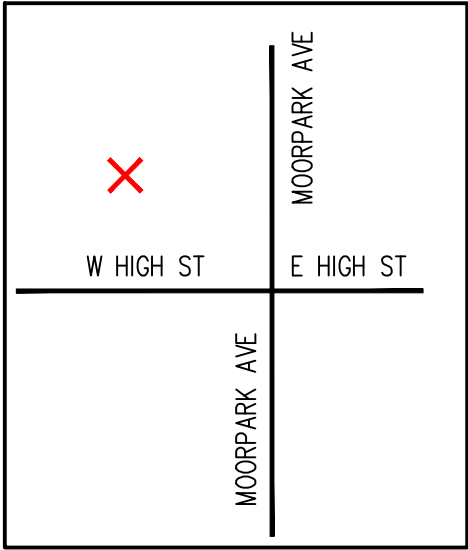
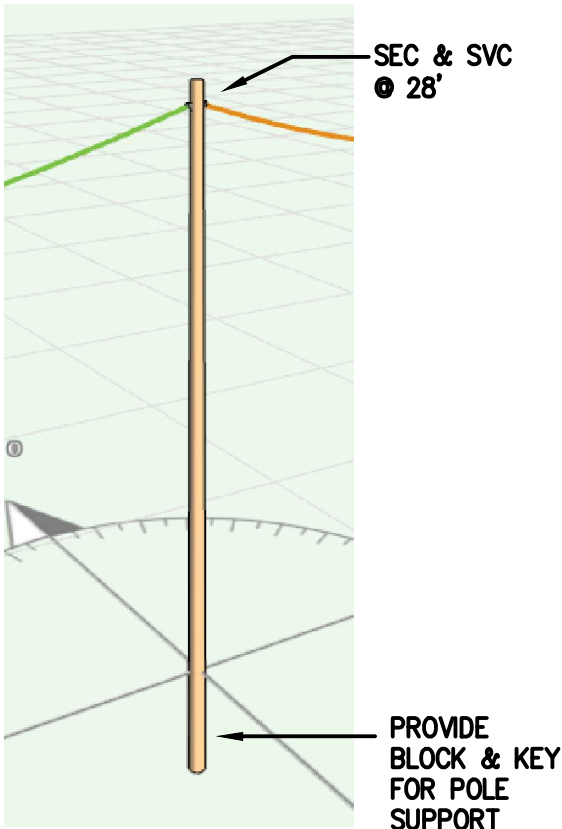




FILE NAME:1784787\_0.01.DWG SAVE DATE:11/21/2024 1:08 PM SAVED BY:NAMPUMU



POLE HEAD DIAGRAM – 4734147E



PROJECT REQUIREMENTS (Y/N)

EDISON EASEMENT REQUIRED

Y

PWRD 88 REQUIRED UG

N

CIVIL ONLY WORK ORDER

N

PERMIT REQUIRED

N

PERMIT TYPE: N/A

OUTAGE REQUIRED

N

OUTAGE DATE: TIME:

TRAFFIC CONTROL REQUIRED

N

PED. TRAFFIC CONTROL REQ'D

N

CONVEYANCE LETTER REQ'D

N

ENVIRONMENTAL REQUIREMENTS DOCUMENT (ERD) REQUIRED

Y

CSD 140 (TLM) REQ'D

N

CIRCUIT MAP CHANGE REQ'D (TD 203)

N

DIG ALERT APP

N

VERIFIED ACTIVE AND CONFIRMED USA TICKETS

N

UTILIQUEST NOTIFIED

N

FAA MARKING REQ'D

N

FAA TYPE: N/A

STANDARD ADHERENCE: 4 Q/ 2024 Y

D124: 02/23/24

- NOTES TO CUSTOMER:
- ENSURE SCE CREWS HAVE ACCESS TO ALL POLES ON THE DAY OF EXECUTION AND ALL VEGETATION IS CLEARED THAT MAY HINDER SCE WORK.

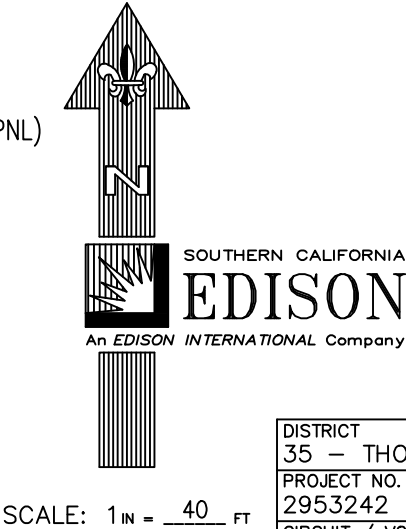
• ENSURE SCE HAS ACCESS TO ALL POLES AFTER THE RELOCATION. FUTURE LIBRARY PROJECT TO BLOCK OFF ENTRY NEXT TO RELOCATED POLE 4734147E.

• ENSURE EASEMENT PAPER WORK IS SIGNED & RETURNED BACK TO SCE FOR RECORDING. NEEDED BEFORE I CAN SCHEDULE THE JOB.

• INVOICE NEEDS TO BE PAID BEFORE I CAN SCHEDULE THE JOB.
- NOTES TO CREW:
- PROJECT INVOLVES RELOCATING SECONDARY POLE TO CLEAR AREA FOR FUTURE CONSTRUCTION PLANS.

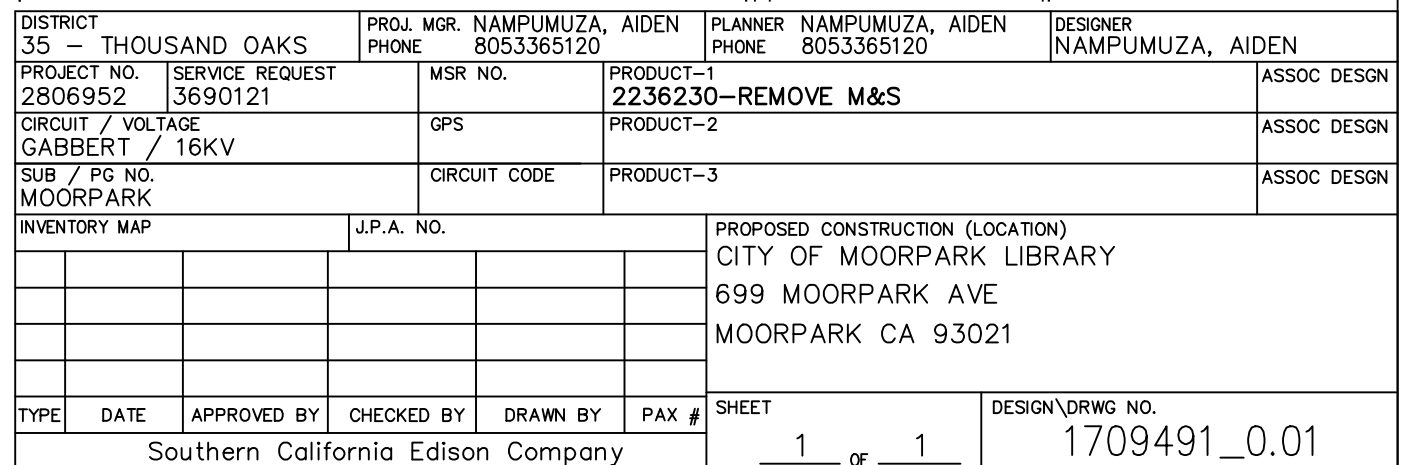
• FOR ACCESS TO PROPERTY, PLEASE CONTACT ROBERT VALERY – 805-517-6283. PLEASE CALL A DAY BEFORE TO MAKE AN APPOINTMENT.

• AREA IS TRUCK ACCESSIBLE.



DISTRICT 35 – THOUSAND OAKS			PROJ. MGR. NAMPUMUZA, AIDEN PHONE 8053365120			PLANNER NAMPUMUZA, AIDEN PHONE 8053365120			DESIGNER NAMPUMUZA, AIDEN		
PROJECT NO. 2953242		SERVICE REQUEST 3834477		MSR NO.		PRODUCT-1 2332346-RELOCATE FACILITIES				ASSOC DESGN	
CIRCUIT / VOLTAGE STRATHERN / 16KV				GPS		PRODUCT-2				ASSOC DESGN	
SUB / PG NO. MOORPARK				CIRCUIT CODE		PRODUCT-3				ASSOC DESGN	
INVENTORY MAP			J.P.A. NO.			PROPOSED CONSTRUCTION (LOCATION) CITY OF MOORPARK 83 W HIGH ST MOORPARK CA 93021					
TYPE	DATE	APPROVED BY	CHECKED BY	DRAWN BY	PAX #	SHEET 1 OF 1			DESIGN\DRWG NO. 1784787_0.01		
Southern California Edison Company											

PRELIMINARY  
NOT FOR CONSTRUCTION





RESOLUTION NO. PC-2024-706

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, CERTIFYING A FINAL ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT INCLUDING A MITIGATION MONITORING AND REPORTING PROGRAM, APPROVAL OF CONDITIONAL USE PERMIT NO. CD-CUP-2023-0013 TO DEVELOP A 17,272 SQUARE FOOT PUBLIC LIBRARY, LOCATED AT 83 HIGH STREET, AND DEMOLITION OF AN EXISTING 7,900 SQUARE FOOT PUBLIC LIBRARY, IN CONNECTION THEREWITH, ON THE APPLICATION OF JESSICA SANDIFER ON BEHALF OF THE CITY OF MOORPARK.

WHEREAS, on February 8, 2023, an application was filed by Jessica Sandifer, Deputy Parks and Recreation Director ("Applicant"), on behalf of the City of Moorpark for a Conditional Use Permit ("CUP") CD-CUP-2023-0013 to develop a 17,272 square foot public library located at 83 E. High Street, and demolish an existing 7,900 square foot public library located at 699 Moorpark Avenue ("Project"); and

WHEREAS, at a duly noticed public hearing on February 27, 2024, the Planning Commission considered CUP CD-CUP-2023-0013, including the agenda report and any supplements thereto and written public comments; opened the public hearing and took and considered public testimony both for and against the proposal; and

WHEREAS, on May 9, 2022, the City of Moorpark Community Development Department published pursuant to California Environmental Quality Act ("CEQA") an Initial Study and Notice of Preparation ("NOP") of an Environmental Impact Report ("EIR") related to the Civic Center Master Plan ("Civic Center") to receive input from interested public and private parties on issues to be addressed in the EIR between May 9, 2022, and June 8, 2022. In addition, a public scoping meeting was held on May 23, 2022, to provide information on the Project and receive additional comments on issues to be addressed in the EIR; and

WHEREAS, on May 22, 2023, the City of Moorpark Community Development Department published pursuant to CEQA a Notice of Availability and the Draft EIR for the Moorpark Civic Center Master Plan (State Clearinghouse Number 2022050175) analyzing the Project's potential impacts on the environment and accepted public comments in accordance with CEQA Guidelines Section 15105 for a period of 45 days between May 22, 2023 and July 6, 2023; and

WHEREAS, the City prepared written responses to all comments received on the Draft EIR and those responses to comments are incorporated into the Final EIR. The Responses to Comments were distributed with the Final EIR to all public agencies that submitted comments on the Draft EIR at least 10 days prior to certification of the Final EIR; and

WHEREAS, the Final EIR is comprised of the Draft EIR dated May 2023 and all appendices thereto, the Comments and Responses to Comments on the Draft EIR, the clarifications, revisions, and corrections to the Draft EIR, and the Mitigation Monitoring and Reporting Program, and the July 2023 Final EIR.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The findings made in this Resolution are based upon the information and evidence set forth in the Final EIR (attached hereto as Exhibit B) and upon other substantial evidence that has been presented at the hearings and in the record of the proceedings. The Final EIR, agenda reports, technical studies, appendices, plans, specifications, and other documents and materials that constitute the record of proceedings on which this Resolution is based are on file for public examination during normal business hours at the City of Moorpark Community Development Department, 799 Moorpark Avenue, Moorpark, CA 93021. Each of these documents is incorporated herein by reference.

SECTION 2. The Planning Commission finds that agencies and interested members of the public have been afforded ample notice and opportunity to comment on the Final EIR and Project.

SECTION 3. Prior to taking action, the Planning Commission has heard, been presented with, reviewed and considered the information and data in the record, including oral and written testimony presented for and during public hearings. The City's independent environmental consultants, City staff, and the Project Applicant's environmental consultants reviewed and analyzed the comments received on the Project's environmental review. No comments or any additional information submitted to the City have produced any substantial new information requiring additional environmental review or re-circulation of the EIR pursuant to CEQA because no new significant environmental impacts were identified, nor was any substantial increase in the severity of any previously disclosed environmental impacts identified.

SECTION 4. The Planning Commission, pursuant to CEQA Guidelines Section 15090, certifies that the Final EIR: 1) reflects the Planning Commission's independent judgment and analysis; 2) was presented to, and reviewed and considered by, the Planning Commission; and 3) has been completed in compliance with CEQA.

SECTION 5. Pursuant to Public Resources Code section 21081.6, the Planning Commission adopts the Mitigation Monitoring and Reporting Program included herewith in Exhibit B and incorporated herein by reference, and adopt each mitigation measure set forth therein, and impose each mitigation measure as a condition of the Project's approval.

SECTION 8. FINDING OF GENERAL PLAN CONSISTENCY: The Planning Commission hereby finds the Project and all associated actions to be consistent with the

General Plan based upon the information set forth in the staff report(s), accompanying studies, the Project Final EIR and appendices, and oral and written public testimony, including but not limited to the General Plan Consistency Analysis provided in Section 4.10 (Land Use and Planning) of the Draft EIR incorporated by reference.

SECTION 2. CONDITIONAL USE PERMIT FINDINGS: Based upon the information set forth in the staff report(s), accompanying studies, and oral and written public testimony, the Planning Commission makes the following findings in accordance with City of Moorpark, Municipal Code Section 17.44.040(C):

- A. The proposed use is consistent with the provisions of the General Plan, zoning ordinance, and all applicable regulations in that the proposed use would be permitted within Mixed-Use Medium (MUM) zone and the Downtown Specific Plan area. The proposed use is also consistent, with General Plan Land Use Element Goal No. 3.8: Public services and facilities: Support a diversity of uses and services supporting Moorpark's residents such as facilities for governance and administration, public safety, seniors and youth, community gatherings, and comparable activities and General Plan Land Use Element Goal No. 9.18: Library and lifelong learning: Provide and promote a state-of-the-art library that offers resources and engaging programs to meet the varied educational, cultural, civic, and general business needs of all residents and support opportunities for lifelong learning and enrichment. Additionally, the proposed use is consistent with General Plan Land Use Element Goal No. 17.1: Services supporting Moorpark's residents: Provide public facilities and services that are cost effective, and contribute to the health, safety, welfare, and personal development of all residents and General Plan Land Use Element Goal No. 19.1: Core community district: Support the continued development of the area along High Street as a distinct place identified as the symbolic and functional downtown of Moorpark. The proposed use is also consistent with Downtown Specific Plan Land Use Goal No. 3.3.3 f): Continue to maintain a civic presence in downtown through the expansion of the Civic Center area to provide for an enlarged City Hall and Library.
- B. The proposed use is compatible with both existing and permitted land uses in the surrounding area. The proposed Project would replace the existing City library located to the north east, located on the City's Civic Center site. Surrounding uses include commercial stores and services, residences, post office, and City Hall.
- C. The proposed use is compatible with the scale, visual character, and design of surrounding properties. The proposed structure has undergone significant public review by the public, City Council, and Planning Commission to find the agrarian architectural style desirable in the downtown core. The architectural style, scale, features, and design are consistent with design guidelines set forth in the Downtown Specific Plan and applicable design standards in the MUM zone.
- D. The proposed use would not be obnoxious or harmful or impair the utility of neighboring property or uses. The proposed Project would operate with similar



programing, hours of operation, and staff as the existing library which it will replace, which has been beneficial to the surrounding community.

- E. The proposed use would not be detrimental to the public health, safety, convenience, or welfare in that Conditions of Approval (Exhibit B) have been included to ensure the Project would not generate negative impacts on the surrounding area and the proposed library is planned to operate similarly as the existing library which has not demonstrated negative impacts to public health, safety, convenience, or welfare.

SECTION 3. PLANNING COMMISSION APPROVAL: The Planning Commission hereby approves CUP CD-CUP-2023-0013 subject to the Conditions of Approval found in Exhibit A attached.

SECTION 4. FILING OF THE RESOLUTION: The Community Development Director shall cause a certified resolution to be filed in the book of original resolutions.

The action of the foregoing direction was approved by the following vote:

AYES: Commissioner Alva, Di Cecco, Hamalainen, Landis and Chair Barrett

NOES:

ABSENT:

ABSTAIN:

PASSED, AND ADOPTED this 27<sup>th</sup> day of February 2024.

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Christopher Barrett, Chair

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Carlene Saxton  
Community Development Director

Exhibit A – Conditions of Approval

Exhibit B – Final Environmental Impact Report dated July 2023, including Mitigation Monitoring and Reporting Program

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NOES:

ABSENT:

ABSTAIN:

PASSED, AND ADOPTED this 27<sup>th</sup> day of February 2024.



Christopher Barrett, Chair



Carlene Saxton  
Community Development Director

Exhibit A – Conditions of Approval

Exhibit B – Final Environmental Impact Report dated July 2023, including Mitigation Monitoring and Reporting Program

## EXHIBIT A

### CITY OF MOORPARK CONDITIONS OF APPROVAL

**Project Approval Date:**

**Expiration Date:**

**Location:** 83 High Street, Moorpark

**Entitlements:** Conditional Use Permit No. CD-CUP-2023-0013

**Project Description:** Allow the development and operation of a new 17,272 square foot City library and associated site improvements located at 83 High Street ("Project Site"), and demolition of the existing 7,900 square foot public library structure located at 699 Moorpark Avenue ("Project"), on an application of Jessica Sandifer on behalf of the City of Moorpark ("Applicant").

**The applicant/permittee is responsible for the fulfillment of all conditions and standard development requirements, unless specifically stated otherwise.**

#### **General Conditions**

In addition to complying with all applicable City, County, State and Federal Statutes, Codes, Ordinances, Resolutions and Regulations, Development Agreements, Permittee expressly accepts and agrees to comply with the following Conditions of Approval and Standard Development Requirements of this Permit:

1. The Conditions of Approval of this entitlement and all provisions of the Subdivision Map Act, City of Moorpark Municipal Code and adopted City policies at the time of the entitlement approval, supersede all conflicting notations, specifications, dimensions, typical sections and the like which may be shown on said plans or on the entitlement application. This language shall be added as a notation to the to the final plans for the entitlement. [CDD]
2. Conditions of this entitlement may not be interpreted as permitting or requiring any violation of law or any unlawful rules or regulations or orders of an authorized governmental agency. [CDD]
3. Should continued compliance with these Conditions of Approval not be met, the Community Development Director may modify the conditions in accordance with Municipal Code Section 17.44.100 and sections amendatory or supplementary thereto, declare the project to be out of compliance, or the Director may declare, for some other just cause, the project to be a public nuisance. The applicant shall be liable to the City

for any and all costs and expenses to the City involved in thereafter abating the nuisance and in obtaining compliance with the Conditions of Approval or applicable codes. If the applicant fails to pay all City costs related to this action, the City may enact special assessment proceedings against the parcel of land upon which the nuisance existed (Municipal Code Section 1.12.170). [CDD]

4. If any of the conditions or limitations of this approval are held to be invalid, that holding does not invalidate any of the remaining conditions or limitations set forth. [CDD]
5. All facilities and uses, other than those specifically requested in the application and approval and those accessory uses allowed by the Municipal Code, are prohibited unless otherwise permitted through application for Modification consistent with the requirements of the zone and any other adopted ordinances, specific plans, landscape guidelines, or design guidelines. [CDD]
6. Condition Compliance: Prior to the issuance of any zoning clearance, building permit, grading permit, or advanced grading permit, the applicant shall submit to the Community Development Department the Condition Compliance review deposit and a matrix indicating how each condition has been complied with. [CDD]
7. Any expansion, alteration, or change in architectural elements requires prior approval of the Community Development Director. Those changes in architectural elements that the Director determines may only be allowed, if, in the judgment of the Community Development Director such change is compatible with the surrounding area. Any approval granted by the Director must be consistent with the approved Design Guidelines (if any) for the planned development and applicable Zoning Code requirements. A Permit Modification application may be required as determined by the Community Development Director. [CDD]
8. If any hazardous waste or material is encountered during the construction of this project, all work must be immediately stopped and the Ventura County Environmental Health Department, the Ventura County Fire Protection District, the Moorpark Police Department, and the Moorpark City Engineer and Public Works Director must be notified immediately. Work may not proceed until clearance has been issued by all of these agencies. [CDD, VCFPD, MPD, VCEHD, & PW]
9. Mechanical equipment for the operation of the building should be ground mounted and screened to the satisfaction of the Community Development Director, except as otherwise permitted by this CUP to allow screened roof mounted equipment within a roof parapet. The Community Development Director may approve other roof-mounted equipment, in which case, all parts of the roof mounted equipment (such as vents, stacks, blowers, air conditioning equipment, etc.) should be screened below the lowest parapet on the roof; and should be painted the same color as the roofing material. No piping, roof ladders, vents, exterior drains and scuppers or any other exposed equipment may be visible on the roof, except as required by Building Code. [CDD]

10. Any outdoor ground level equipment, facilities or storage areas including, but not limited to loading docks, trash enclosures, cooling towers, generators, must be architecturally screened from public view with masonry wall and/or landscaping as determined by the Community Development Director. [CDD]
11. Prior to the issuance of a grading permit for each project phase, the applicant shall demonstrate adequate sight distance at all street intersections, in a manner meeting the approval of the City's Public Works Department. [CDD & PW]
12. Prior to the issuance of any grading permits, the applicant shall demonstrate that applicable improvements for that phase from the Project's Traffic Study have been incorporated into Project design, in a manner meeting the approval of the City's Public Works Department. [CDD & PW]
13. The building plans must be in substantial conformance to the plans approved under this entitlement and must specifically include the following:
  - a. Transformers, backflow prevention devices, fire department apparatus, and cross connection water control devices (subject to approval by Ventura County Waterworks District No. 1), screened from street view with a masonry wall and/or landscaping as determined by the Community Development Director.
  - b. Bicycle racks or storage facilities, shall be provided in quantities as required by the Municipal Code.
  - c. If drains from the loading area are connected to the sewer system, they are subject to the approval of Ventura County Waterworks District No. 1.
  - d. Final exterior building materials and paint colors consistent with the approved plans under this permit. Any changes to the building materials and paint colors are subject to the review and approval of the Community Development Director.
  - e. Identification of coating or rust-inhibitive paint for all exterior metal building surfaces to prevent corrosion and release of metal contaminants into the storm drain system.
  - f. Trash disposal and recycling areas in locations which will not interfere with circulation, parking, or access to the building. Exterior trash areas and recycling bins must use impermeable pavement and be designed to have a cover and so that no other area drains into it. The trash areas and recycling bins must be depicted on the final construction plans, the size of which must be approved by the Community Development Director, City Engineer and Public Works Director and the City's Solid Waste Management staff. When deemed appropriate, drains from the disposal and recycling areas must be connected to the sewer system and subject to the approval of Ventura County Waterworks District

No. 1. Review and approval shall be accomplished prior to the issuance of a zoning clearance for building permit. [CDD & BS]

14. A final landscape plan shall be prepared to align with the library site plan and to address all requirements of the City's Landscape Design Standards and Guidelines and the Ventura County Fire Department standards for landscape in the High Fire Severity Zone or applicable fire zone at the time of approval. The final landscape plan shall be approved by the Ventura County Fire Department and the Community Development Director prior to installation. [CDD & VCFPD]
15. All landscaping must be maintained in a healthy and thriving condition, free of weeds, litter and debris. All paved surfaces: including, but not limited to, the parking area and aisles, drive-through lanes, on-site walkways must be maintained free of litter, debris and dirt. Walkways, parking areas and aisles and drive-through lanes must be swept, washed, or vacuumed regularly. When swept or washed, litter, debris and dirt must be trapped and collected to prevent entry to the storm drain system in accordance with NPDES requirements. [CDD & PW]
16. Prior to issuance of a building permit, the Applicant shall pay all required fees for applicable Development Impact Fees required of the Project by outside agencies. [CDD & BS]
17. Tree Survey and Landscaping Plan. Prior to the issuance of a grading permit, a tree survey must be prepared to determine the valuation of the mature trees to be removed. Thereafter, a landscaping plan shall be prepared which incorporates replacement tree plantings consistent with the City's Tree Ordinance, which would be submitted to the City's Community Development Director for review and approval. [CDD & PRCS]
18. A 15-mile per hour speed limit must be observed with all construction areas. This condition shall be noted on all grading or building permits plans prior to permit issuance. [CDD & PW]
19. The Project's grading, construction, and demolition activities shall comply with Section 15.26 of the City's Municipal Code, which requires contractors to not engage in or conduct any noise-generating outdoor construction work, except between the hours of 7:00 AM and 7:00 PM, Monday through Saturday, unless a permit for different hours has been issued. [CDD, BS, & PW]
20. The Project shall comply with Chapters 9.28, 10.04, 12.24 and 17.53 of the Moorpark Municipal Code and any provision amendatory or supplementary thereto, as a standard requirement for construction noise reduction. [CDD & BS]
21. Beginning in 2030, prior to issuance of a grading permit, the Project's Construction Manager shall demonstrate to the City's Community Development Department that construction documents require the construction contractors to implement the following



measures: a. All off-road diesel-powered construction equipment greater than 50 horsepower (hp) used during phases 3 and 4 shall, at a minimum, meet Tier 3 off-road emissions standards. b. A copy of each unit's certified offroad engine Tier specification shall be provided to the City at the time of mobilization of each applicable unit of equipment. [CDD & APCD]

22. As applicable, during construction of the Project, the Applicant and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) Rule 62.7, Asbestos-Demolition and Renovation, which imposes notification, emission control, training and licensing, warning signage, containment area, and record keeping requirements on projects involving the demolition and renovation operations and the associated disturbance of asbestos-containing material (ACM). [CDD, BS, & APCD]
23. Nesting Bird Survey. If construction and/or vegetation removal must be initiated during the peak nesting season (i.e., February 1 to August 31), a preconstruction nesting bird survey shall be conducted by a qualified Biologist within 14 days prior to the beginning of Project-related activities (including but not limited to clearing, grubbing, vegetation removal, grading, and building demolition). If project-related construction activities lapse for greater than 14 days during the peak nesting season, an additional nest survey shall be conducted before work can be reinitiated. If the Biologist finds an active nest within or adjacent to the construction area (within 200 feet for all birds protected under California Fish and Game Code and the Migratory Bird Treaty Act and within 500 feet for raptors), the Biologist shall identify an appropriate protective buffer zone around the nest depending on the sensitivity of the species, the nature of the construction activity, and the amount of existing disturbance in the vicinity. In general, the Biologist should designate a buffer of 10 to 200 feet for common nesting birds and 200 to 500 feet for special status nesting birds and nesting raptors. Construction activities within the buffer shall only proceed after a qualified biologist determines the nest is no longer active due to natural causes (e.g., young have fledged, predation, or other non-human causes of nest failure) to maintain compliance with California Fish and Game Code and the Migratory Bird Treaty Act. [CDD]
24. Jurisdictional Drainage Avoidance and Regulatory Permitting. Impacts to jurisdictional waters within the Project Site will be avoided to the extent feasible. If such impacts are unavoidable, then permits/ certifications/ agreements from the United States Army Corp of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) are required. A pre-application meeting with these agencies is recommended prior to submittal of permit applications to discuss existing conditions; confirm the agencies' jurisdiction over water resources on the study area; discuss impacts to these resources that would result from the Project; discuss proposed avoidance, minimization, and mitigation measures to offset these impacts; and to discuss the regulatory permitting process. Following the preapplication meeting, the Project Applicant would prepare and process the appropriate permits (e.g., a Section 404 Permit from the USACE in the form of a Nationwide Permit or Individual Permit, a Section 401 Water Quality Certification from the RWQCB, and/or a CDFW Section 1602



Notification of Lake or Streambed Alteration). Additional permit conditions may be required by the resource agencies regarding impacts to areas under their respective jurisdictions. Standard construction Best Management Practices (BMPs) shall be implemented to prevent toxins, chemicals, or petroleum products from entering the culverts and degrading water quality. [CDD]

25. Greenhouse Gas Emissions - The Project is required to comply with the applicable requirements established under the Green Building Standards Code Title 24 development standards. [CDD & BS]
26. Hazardous Materials - Applicant/operator shall store, manifest, transport, and dispose of all on-site generated waste that meets hazardous waste criteria in accordance with California Code of Regulations Title 22 and in a manner to the satisfaction of the Manager, HCA/Hazardous Materials Program. Applicant shall keep storage, transportation, and disposal records on site and open for inspection to any government agency upon request. [CDD & BS]
27. Transport of Hazardous Materials - Transport of materials deemed as hazardous must comply with the requirements of Title 22, Division 4.5 of the California Code of Regulations, the U.S. Department of Transportation regulations in the Code of Federal Regulations (specifically, Title 49, Hazardous Materials Transportation Act and Title 40, Part 263, Subtitle C of Resource Conservation and Recovery Act), California Department of Transportation (Caltrans) standards, and Occupational Safety and Health Administration (OSHA) standards. [CDD & BS]
28. Prior to issuance of a demolition permit for any buildings or facilities, building materials shall be assessed by a qualified Environmental Professional as defined in Section 312.10 of 40 CFR Part 312 for the presence of lead-based paints (LBPs), asbestos-containing materials (ACM), and other common hazardous building materials (e.g., polychlorinated biphenyl [PCB]- containing lighting ballasts and mercury-containing light tubes and switches). If determined to be present, the Applicant shall prepare an abatement plan for their removal and safe transport in compliance with State and federal regulations, including Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (specifically Title 29, Part 1926) and South Coast Air Quality Management District (SCAQMD) Rule 1403. The abatement plan shall meet the satisfaction of the County Environmental Health Division. [CDD & BS]
29. As applicable, any future tenant or operator that may handle store, or transport hazardous materials, or generate hazardous waste at or above the reportable thresholds shall be reported to the Ventura County Environmental Health Division's Certified Unified Program Agency (CUPA). [CDD & VCEHD]
30. Prior to issuance of a building permit for each new building within the Project Site, the applicant is required to obtain a will-serve letter or equivalent from dry utility providers demonstrating their capacity to serve the Project for electricity, natural gas, and

telecommunications, if needed. The will-serve letters must be submitted to the Community Development Department for review prior to issuance of a building permit. [CDD & BS]

31. Prior to issuance of a building or demolition permit for each new building or building to be demolished within the Project Site, the applicant shall submit a Construction and Demolition Materials Management Plan Estimate for the review and approval of the City's Solid Waste Management staff and Building and Safety Division for recycling of waste materials consistent with applicable City and State requirements. The Plan must include estimated quantities for each type of material to be diverted or landfilled. [CDD & BS]
32. Prior to issuance of Certificate of Occupancy for new structures within the Project Site, the applicant must submit a Final Report Construction and Demolition Waste Letter of Documentation (including premium gate tickets) to the Building and Safety Division, demonstrating compliance with the Construction and Demolition Materials Management Plan Estimate and indicating the total amount of construction and demolition waste diverted. [CDD & BS]

### **Mitigation Monitoring and Reporting Program**

33. All mitigation measures required as part of an approved Mitigation Monitoring Report and Program (MMRP) for this entitlement are hereby adopted and included as requirements of this entitlement. Where conflict or duplication between the MMRP and the Conditions of Approval occurs the Community Development Director shall determine compliance so long as it does not conflict with the California Environmental Quality Act and the more restrictive measure or condition shall apply. Applicable mitigation measures have been reproduced below for reference. Mitigation measures that are applicable to future phases of the Project have not been shown in the Conditions of Approval for Phase 1 for construction of a new library and demolition of the existing library. The complete text of the MMRP is included in Exhibit B, starting on page 4-1, attached to Resolution No. PC-2024-706. [CDD]
34. MMRP BIO-2 - The Applicant shall retain a qualified biologist to conduct a pre-construction survey for the burrowing owl between 14 and 30 days prior to the initial ground disturbance on the western portion of the Project Site. The preconstruction survey shall include the area of proposed disturbance plus a 500-foot buffer (if access is available and habitat is present). If an active burrow is observed outside the breeding season (September 1 to January 31) and it cannot be avoided, the burrowing owl shall be passively excluded from the burrow following methods described in California Department of Fish and Wildlife ("CDFW") 2012. Prior to any burrowing owl exclusion efforts, an exclusion plan will be prepared and submitted to CDFW for review and approval. The plan will include all details on passive relocation including that one-way doors shall be used to exclude owls from the burrows; doors shall be left in place for at least 48 hours. Once the burrow is determined to be unoccupied, the burrow shall be closed by a qualified Biologist who shall excavate the burrow using hand tools. Prior to excluding an owl from an active

burrow, a receptor burrow survey shall be conducted to confirm that at least two potentially suitable unoccupied burrows are within approximately 688 feet prior to installation of the one-way door. If two natural receptor burrows are not located, one artificial burrow shall be created for every burrow that would be closed. If an active burrow is observed outside the breeding season (September 1 to January 31) and it can be avoided, the Biologist shall determine an appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 160 feet to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an environmentally sensitive area (ESA) on construction plans. If an active burrow is observed during the breeding season (February 1 to August 31), the active burrow shall be protected until nesting activity has ended (i.e., all young have fledged from the burrow). The Biologist shall determine the appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 650 to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an ESA on construction plans. Construction shall be allowed to proceed when the qualified Biologist has determined that all fledglings have left the nest. [CDD]

35. MMRP CUL-1- Prior to the start of Project phases that involve work within 75 feet of the Tanner Building, protection measures shall be developed in a formal plan for the adjacent Tanner Corner Building at 601 Moorpark Avenue. Protection measures shall include at a minimum: (1) clear denotation in the project construction plans that the project is located directly adjacent to an historical resource, marking the location of the Tanner Corner Building; (2) a protocol for informing all construction workers of the presence of the historical resource and making them aware of the protocol to avoid and protect it; (3) a list of approved construction equipment/distances in consideration of any identified groundborne vibration impacts; (4) recommendations for specific protective fencing and signage to be implemented during construction; and (5) if determined appropriate based on the results of the groundborne vibration analysis, recommendations for construction monitoring (pre-, post-, and during construction). The protection plan shall be prepared by a qualified architectural historian/historic preservation professional, clearly identify all responsible parties with their contact information, and be appended to the final set of construction plans. (Also see MMRP NOI-2, Noise, which relates to vibration monitoring requirements). [CDD, BS, & PW]
36. MMRP GEO-1- Prior to approval of grading plans, the Applicant shall demonstrate, to the satisfaction of the City's Planning Division that the recommendations in the project's geotechnical reports and in any future geotechnical reports have been fully and appropriately incorporated (OGI 2017a and 2017b). [CDD & PW]
37. MMRP NOI-1- Prior to the start of grading of each Project phase, the Project applicant shall provide evidence acceptable to the City's Community Development Department, that: a. All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. b. Stationary equipment, such as generators and air compressors, would be located as far from local residences and Walnut Canyon

Elementary School, as feasible. c. Equipment maintenance and staging areas would be located as far away from local residences and Walnut Canyon Elementary School, as feasible. d. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings and Walnut Canyon Elementary School. [CDD, BS, & PW]

38. MMRP NOI-2- During construction activities, the Project Applicant will ensure that ongoing vibration monitoring is conducted for Project activities within 75 feet of the Tanner Corner Building as specified below.

- Whenever vibratory replacement activities occur within 75 feet of the Tanner Corner Building.
- Whenever Deep Soil Mixing activities occur within 50 feet of the Tanner Corner Building.
- Whenever general construction equipment is utilized within 25 feet of the Tanner Corner Building.

If vibration levels at the Tanner Corner Building reach or exceed 0.25 ppv, there is a potential for building damage and an immediate stop work order will be issued. Alternative construction methods or vibration reduction measures will then be determined that keep vibration exposure levels below 0.25 ppv. [CDD, BS, & PW]

### **Ground Disturbances**

39. Archeological Training: Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training conducted by a qualified archaeologist. Issues that shall be included in the basic training will be geared toward training the applicable construction crews in the identification of archaeological deposits, further described below. Training will include written notification of the restrictions regarding disturbance and/or removal of any portion of archaeological, paleontological, or historical deposits and the procedures to follow should a resource be identified. The construction contractor, or its designee, shall be responsible for implementation of this measure. A tribal monitor shall be provided an opportunity to attend the pre-construction briefing if requested. Staff from the Community Development Department shall be made aware of the training and have the opportunity to attend the training. [CDD]

40. Historical Resource Training: Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training regarding the historical resource located adjacent to the Project Site, identified as Tanner Corner. As part of the archeological training identified in Condition No. 52, or as part of a separate training, all construction personnel shall be made aware of the sensitivity of the historic resource and protocols identified in MMRP CUL-1. Staff from the Community Development Department shall be made aware of the training and have the opportunity to attend the training. [CDD]

41. If any archeological, paleontological, or historical finds are uncovered during grading or excavation operations, all grading or excavation shall immediately cease in the immediate

area and the find must be left untouched. The applicant, in consultation with the project paleontologist or archeologist, shall assure the preservation of the site and immediately contact the Community Development Director by phone, in writing by email or hand delivered correspondence informing the Director of the find. In the absence of the Director, the applicant shall so inform the City Manager and Planning Manager. The applicant shall be required to obtain the services of a qualified paleontologist or archeologist, whichever is appropriate to recommend disposition of the site. The paleontologist or archeologist selected must be approved in writing by the Community Development Director. The applicant shall pay for all costs associated with the investigation and disposition of the find. [CDD]

42. Inadvertent Discovery of Human Remains. In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or are believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, the disposition of the human remains. [CDD]

43. Paleontological Plan. If paleontological remains are discovered, a paleontological mitigation plan outlining procedures for paleontological data recovery must be prepared and submitted to the Community Development Director for review and approval. The development and implementation of this Plan must include consultations with the Applicant's engineering geologist as well as a requirement that the curation of all specimens recovered under any scenario will be through the Los Angeles County Museum of Natural History (LACMNH). All specimens become the property of the City of Moorpark unless the City chooses otherwise. If the City accepts ownership, the curation location may be revised. The monitoring and data recovery should include periodic inspections of excavations to recover exposed fossil materials. The cost of this data recovery is limited to the discovery of a reasonable sample of available material. The interpretation of reasonableness rests with the Community Development Director. [CDD]

#### **Permit Specific Conditions – Conditional Use Permit**

44. This CUP is granted or approved with the City's designated approving body retaining and reserving the right and jurisdiction to review and to modify the permit-including the conditions of approval-based on changed circumstances. Changed circumstances include, but are not limited to, major modification of the use; a change in scope, emphasis,



size, or nature of the use; the expansion, alteration, reconfiguration, or change of use; or the fact that the use is negatively impacting surrounding uses by virtue of impacts not identified at the time of application for the conditional use permit or impacts that are much greater than anticipated or disclosed at the time of application for the CUP. The reservation of right to review any permit granted or approved under this chapter by the City's designated approving body is in addition to, and not in lieu of, the right of the City, its Planning Commission, City Council, and designated approving body to review and revoke or modify any permit granted or approved under this chapter for any violations of the conditions imposed on such permit.

45. Parking areas must be developed and maintained in accordance with the requirements of the Moorpark Municipal Code. All parking space and loading bay striping must be maintained so that it remains clearly visible during the life of the development. [CDD]
46. Project Site shall provide a minimum of 65 parking spaces onsite, as stipulated by this CUP. The Project includes 70 parking spaces. Minor revisions to the parking space count, layout, or design may be authorized by the Community Development Director. [CDD]
47. Outdoor live entertainment, amplified music, or sound shall not begin before 7 a.m. nor conclude after 10 p.m., except for hours being expanded for special events or temporary use permits with express consent of the Community Development Director or their designee. [CDD]
48. The applicant shall comply with "Chapter 8.32 Prohibiting Smoking In Public Places" at all times and shall provide signs consistent with Section 8.32.040 of the Moorpark Municipal Code to the satisfaction of the Community Development Director, prior to initiation of the uses allowed by this permit. [CDD]
49. All necessary building permits must be obtained from the Building and Safety Department and the Public Works Department prior to start of construction activities. [CDD, BS, & PW]
50. No hazardous materials shall be used, stored, or generated on site that are subject to regulation under any federal or state or local laws from time to time in effect concerning hazardous, toxic or radioactive materials. The foregoing restriction shall not extend to hazardous substances typically found or used in establishments within first class enclosed regional Shopping Centers and are maintained only in such quantities as are reasonably necessary for Applicant's operations in the premises. [CDD]

### **Department and Agency Requirements**

#### **Public Works and Engineering Department (PW)**

##### **ENGINEERING DIVISION**

51. Prior to construction, applicant shall submit a construction traffic control plan for the review and acceptance by the City Engineer and Public Works Director. Traffic control

plan shall include construction advisory speed limits, speed limit posting locations, and enforcement measures if needed. [PW]

52. Prior to any work being conducted within any State, County, or City right-of-way, the applicant shall obtain all necessary encroachment permits from the appropriate agencies and provide copies of these approved permits and the plans associated with the permits to the City Engineer and Public Works Director. [PW]
53. Reactive organic compounds, Nitrogen oxides (ozone/smog precursor), and particulate matter (aerosols/dust) generated during construction operations must be minimized in accordance with the City of Moorpark standards and the standards of the Ventura County Air Pollution Control District (APCD). When an air pollution Health Advisory has been issued, construction equipment operations (including but not limited to grading, excavating, earthmoving, trenching, material hauling, and roadway construction) and related activities must cease in order to minimize associated air pollutant emissions. [PW & VCAPCD]
54. The applicant shall utilize all prudent and reasonable measures (including installation of a 6-foot-high chain link fence around the construction site(s) and/or provision of a full-time licensed security guard) to prevent unauthorized persons from entering the work site at any time and to protect the public from accidents and injury. [PW, CDD, & BS]
55. Prior to construction, the applicant shall post, in a conspicuous location, the construction hour limitations and make each construction trade aware of the construction hour limitations to the satisfaction of the City. [CDD & PW]
56. Prior to the issuance of a grading permit, whichever comes first, the applicant shall post sufficient surety with the City, in a form acceptable to the City Engineer and Public Works Director, guaranteeing completion of all onsite and offsite improvements required by these Conditions of Approval and/or the Municipal Code including, but not limited to grading, street improvements, storm drain improvements, temporary and permanent Best Management Practice (BMP) for the control of non-point water discharges, landscaping, fencing, and bridges. Grading and improvements must be designed, bonded, and constructed as a single project. [PW]
57. Prior to the issuance of a grading permit, whichever occurs first, the applicant shall provide written proof to the City Engineer and Public Works Director that any and all wells that may exist or have existed within the project have been properly sealed, destroyed or abandoned per Ventura County Ordinance No. 2372 or Ordinance No. 3991 and per California Department of Conservation, Division of Oil, Gas, and Geothermal Resources requirements. [PW]
58. During grading, the project geotechnical engineer shall observe and approve all keyway excavations, removal of fill and landslide materials down to stable bedrock or in-place material, and installation of all sub-drains including their connections. All fill slope construction must be observed and tested by the project geotechnical engineer, and the



density test results and reports submitted to the City Engineer and Public Works Director to be kept on file. Cuts and slopes must be observed and mapped by the project geotechnical and civil engineers who will provide any required slope modification recommendations based on the actual geologic conditions encountered during grading. Written approval from the City Engineer and Public Works Director must be obtained prior to any modification. [PW]

59. Written weekly progress reports and a grading completion report must be submitted to the City Engineer and Public Works Director by the project geotechnical engineers. These reports must include the results and locations of all compaction tests, as-built plans of all landslide repairs and fill removal, including geologic mapping of the exposed geology of all excavations showing cut cross-sections and sub-drain depths and locations. The lists of excavations approved by the engineering geologist must also be submitted. Building permits will not be issued without documentation that the grading and other pertinent work has been performed in accordance with the geotechnical report criteria and applicable Grading Ordinance provisions. [PW]
60. During grading, colluvial soils and landslide deposits within developed portions of the properties must be re-graded to effectively remove the potential for seismically-induced landslides in these materials. Additional buttressing, keying and installation of debris benches must be provided in transition areas between non-graded areas and development as recommended in the final geotechnical reports by the project geotechnical engineer. [PW]
61. Temporary irrigation, hydroseeding and erosion control measures, approved by the Community Development Director, City Engineer and Public Works Director, must be implemented on all temporary grading. Temporary grading is defined to be any grading partially completed and any disturbance of existing natural conditions due to construction activity. These measures will apply to a temporary or permanent grading activity that remains or is anticipated to remain unfinished or undisturbed in its altered condition for a period of time greater than thirty (30) calendar days except that during the rainy season (October 1 to April 15), these measures will be implemented immediately. [CDD & PW]
62. Grading may occur during the rainy season from October 1 to April 15, subject to timely installation of erosion control facilities when approved in writing by the City Engineer, Public Works Director and the Community Development Director and when erosion control measures are in place. In order to start or continue grading operations between October 1 and April 15, project-specific erosion control plans that provide detailed Best Management Practices for erosion control during the rainy season must be submitted to the City Engineer and Public Works Director no later than September 1 of each year that grading is in progress. During site preparation and construction, the contractor shall minimize disturbance of natural groundcover on the project site until such activity is required for grading and construction purposes. During the rainy season, October 1 through April 15, all graded slopes must be covered with a woven artificial covering immediately after completion of each graded slope. Grading operations must cease if the applicant fails to place effective best management measures on graded slopes

immediately after construction. No slopes may be graded or otherwise created when the National Weather Service local three-day forecast for rain is twenty percent (20%), or greater, unless the applicant is prepared to cover the permanent and temporary slopes before the rain event. The artificial covering and planting will be to the satisfaction of the Community Development Director, City Engineer, and Public Works Director. [CDD & PW]

63. Prior to construction, the applicant shall comply with the City of Moorpark standard requirements for dust control, including, but not be limited to, minimization of ground disturbance, application of water/chemicals, temporary/permanent ground cover/seeding, street sweeping, and covering loads of dirt for the review and approval of the City Engineer and Public Works Director. All clearing, grading, earth moving, excavation, soil import and/or soil export operations must cease during periods of high winds (greater than 15 mph averaged over one hour). [PW]
64. At least one (1) week prior to commencement of grading or construction, the applicant shall prepare a notice that grading or construction work will commence. This notice shall be posted at the site and mailed to all owners and occupants of property within five-hundred feet (500') of the exterior boundary of the project site, as shown on the latest equalized assessment roll. The notice must include current contact information for the applicant, including all persons with authority to indicate and implement corrective action in their area of responsibility, including the name of the contact responsible for maintaining the list. The names of individuals responsible for noise and litter control, tree protection, construction traffic and vehicles, erosion control, and the twenty-four (24) hour emergency number, must be expressly identified in the notice. The notice must be re-issued with each phase of major grading and construction activity. A copy of all notices must be concurrently transmitted to the Community Development Department. The notice record for the City must be accompanied by a list of the names and addresses of the property owners notified and a map identifying the notification area. [CDD & PW]
65. Applicant has full right to exercise the service of a new engineer in charge at any time during a project. When there is a change in engineer, the applicant/owner shall notify the City Engineer and Public Works Director in writing within 48 hours of such change. Said letter shall specify successor California Registered Civil Engineer and shall be stamped and signed and dated by said engineer in responsible charge and shall accept responsibility of project. The letter will be kept on file at the City. [PW]

#### PUBLIC AND PRIVATE STREETS AND RELATED IMPROVEMENTS

66. Prior to construction of any public improvement, the applicant shall submit to the City Engineer and Public Works Director, for review and acceptance, street improvement plans prepared by a California Registered Civil Engineer, and enter into an agreement with the City of Moorpark to complete public improvements, with sufficient surety posted to guarantee the complete construction of all improvements, except as specifically noted in these Standard Conditions or Special Conditions of Approval. [PW]

67. Prior to issuance of the first building permit, all existing and proposed utilities, including electrical transmission lines less than 67Kv, must be under-grounded consistent with plans approved by the City Engineer, Public Works Director and Community Development Director. [CDD & PW]
68. Prior to final inspection of improvements, the project Registered Civil Engineer shall submit certified original "record drawing" plans and the appropriate plan revision review fees to the City Engineer and Public Works Director along with electronic files in a format satisfactory to the City Engineer and Public Works Director. These "record drawing" plans must incorporate all plan revisions and all construction deviations from the approved plans and revisions thereto. The plans must be "record drawings" on 24" X 36" Mylar® sheets (made with proper overlaps) with a City title block on each sheet. In addition, the applicant shall provide an electronic file update of the City's Master Base Map electronic file, incorporating all streets, sidewalks, streetlights, traffic control facilities, street striping, signage and delineation, storm drainage facilities, water and sewer mains, lines and appurtenances and any other utility facility installed for this project. [PW]
69. Prior to reduction of improvement bonds, the applicant must submit reproducible centerline tie sheets on 3-mil polyester film to the City Engineer and Public Works Director. [PW]

#### DRAINAGE AND HYDROLOGY

70. Prior to final review of a grading plan, the applicant shall submit a drainage plan with calculations that analyze conditions before and after development, as well as potential development proposed, approved, or shown in the General Plan for the review and approval of the City Engineer and Public Works Director. Quantities of water, water flow rates, major watercourses, drainage areas and patterns, diversions, collection systems, flood hazard areas, sumps, sump locations, detention and NPDES facilities and drainage courses must be addressed. [PW]
71. Hydrology calculations must be per current Ventura County Watershed Protection Agency Standards and to the satisfaction of the City Engineer and Public Works Director. Development projects within a 100-year flood zone may require a Conditional Letter of Map Revisions (CLOMR) and Letter of Map Revision (LOMR) as determined by the City Engineer and Public Works Director. [PW]
72. Prior to final review and acceptance of grading plan, a drainage plan showing all proposed storm drainage facilities must be designed to the standards of the Ventura County Watershed Protection District Design Hydrology Manual. This includes, but not limited to, hydrologic modeling, design storm modeling, and development mitigation criteria. The development mitigation criteria must address how to mitigate 100-yr developed condition peak back to the 10-yr developed condition peak. [PW]

73. The project shall attenuate the 100-year developed peak flow condition to the 10-year developed condition. This includes no increase in peak flow for the 10-year, 25-year, 50-year, and 100-year design storms. [PW]

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

74. Prior to the start of grading or any ground disturbance, the applicant shall identify a responsible person experienced in NPDES compliance who is acceptable to the City Engineer and Public Works Director. The designated NPDES person (superintendent) shall be present, on the project site Monday through Friday and on all other days when the probability of rain is forty percent (40%) or greater and prior to the start of and during all grading or clearing operations until the release of grading bonds. The superintendent shall have full authority to rent equipment and purchase materials to the extent needed to effectuate Best Management Practices (BMPs). The superintendent shall be required to assume NPDES compliance during the construction of streets, storm drainage systems, all utilities, buildings, and final landscaping of the site. [PW]
75. Prior to the start of grading and any ground disturbance, all storm water quality requirements shall conform to the latest NPDES and MS4 permit requirements. Post-Construction Storm Water Quality BMPs shall conform to the most current Ventura County Technical Guidance Manual for Stormwater Quality Control Measures. [PW]
76. Prior to construction, a Storm Water Quality Report with a post-construction maintenance covenant shall be submitted to the City for review and acceptance by the City Engineer. [PW]
77. Prior to the issuance of any construction/grading permits, the applicant shall demonstrate compliance under California's General Permit for Stormwater Discharges associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing in a manner meeting the satisfaction of the Community Development Department and/or Public Works Department. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the Project Site and be available for review on request. [PW]
78. As part of the project storm drain maintenance covenant, the applicant and/or property owner shall provide verification to the City Engineer and Public Works Director that all on-site storm drains have been cleaned at least twice a year, once immediately prior to October 1st (the rainy season) and once in January. Additional cleaning may be required by the City Engineer and Public Works Director depending upon site and weather conditions. [PW]
79. Prior to Certificate of Occupancy, a Final Storm Water Quality Report and Operations & Maintenance Manual shall be reviewed by the City Engineer for acceptance. [PW]

80. Prior to Certificate of Occupancy, a Storm Water Maintenance Covenant shall be reviewed by the City Engineer for acceptance and recorded with the Ventura County Recorder's Office. [PW]

SITE SPECIFIC ENGINEERING CONDITIONS

81. Prior to construction of the bus turnout, proposed design must meet Ventura County Road Standards Plate D-13, "Bus turnout". Any deviations from the design standards shall be reviewed by the City Engineer and Public Works Director. [PW]
82. Prior to submittal of construction plans, applicant must ensure that all onsite improvements are designed within the legal parcel boundary. [PW]
83. Applicant shall prepare and submit separate, off-site street improvement plans to the City Engineer for review and acceptance. [PW]
84. Applicant shall ensure that all offsite improvements along High Street include a vehicular lane, and a bicycle lane in both the east and west direction. The vehicular and bicycle lane design must accommodate road alignment plans for the future Hitch Ranch project. [PW]
85. Angled parking design along High Street must conform with the City's and/or the American Association of State Highway and Transportation Officials (AASHTO) design standards. [PW]
86. Project building and site planning shall consider the following:
- Future 60' public right-of-way for construction; and
  - Ultimate 80' right-of-way for design. (PW)
87. Prior to final review and acceptance of engineering plans, the applicant shall record a Lot Merger for the parcels identified as Assessor Parcel Numbers ("APNs") 511-0-050-175, 511-0-050-090, and 511-0-050-080, recorded with the Ventura County Recorder's Office. [CDD & PW]
88. Prior to Certificate of Occupancy, applicant shall set all property and centerline monuments.
89. Prior to the issuance of a grading permit for each Project phase, a geotechnical report will be prepared and submitted to the City for review and approval. The geotechnical report shall be prepared by a registered Civil Engineer or certified Engineering Geologist and shall contain site-specific evaluations of the seismic and geologic hazards affecting the project and shall identify recommendations for earthwork and construction. All recommendations from forthcoming site-specific geotechnical studies shall be included in the site preparation and building design specifications. Compliance with this requirement shall be verified by the City as part of the plan approval process. [PW]



90. Prior to the issuance of any grading or building permits, the applicant shall submit for review and approval by the Community Development Department, a Water Quality Management Plan (WQMP) that must include the following minimum contents:
  - Address Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, and conserving natural areas;
  - Incorporate applicable Routine Source Control BMPs; and
  - Include an Operation and Maintenance (O&M) Plan that identifies the mechanism(s) by which long-term O&M of all structural BMPs will be provided. [PW]
91. Prior to the issuance of a certificate of use and occupancy, the applicant shall demonstrate compliance with the WQMP in a manner meeting the satisfaction of the Community Development Department, including:
  - Demonstrate that all structural Best Management Practices (BMPs) described in the project's WQMP have been implemented, constructed and installed in conformance with approved plans and specifications;
  - Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP; • Submit for review and approval an Operations and Maintenance (O&M) Plan for all structural BMPs for attachment to the WQMP; and
  - Demonstrate that copies of the project's approved WQMP (with attached O&M Plan) are available for each of the incoming occupants. [PW]

**Ventura County Waterworks District No. 1 (VCWD1)**

92. Prior to issuance of a grading permit, the Applicant shall prepare for Ventura County Waterworks District No. 1 (VCWD1) review and acceptance, a water and sewer improvement plans. Plans shall be prepared by a California registered Civil Engineer in accordance with VCWD1 rules and regulations, standards, guidelines, and requirements. [VCWD1]
93. No hardscaping, other than asphalt, shall be constructed above the VCWD1 sewer main. [VCWD1]
94. Any proposed work needs to remain clear of the VCWD1's right of way as indicated by existing easements. [VCWD1]
95. All planned trees shall remain clear of the VCWD1's easements at full maturity, as indicated in related easements. [VCWD1]
96. Prior to issuance of a grading permit, provide an assessment of 300 feet of existing sewer main extending from manhole in High Street and extending North 300 feet by a registered Civil Engineer to determine condition of sewer main and any remediation or relocation necessary to ensure the continued service to the citizens of Moorpark. [VCWD1]
97. Applicant shall apply for a will serve letter and construction permit for a watered meter service to serve the proposed library, prior to issuance of a building permit. Applicant shall

provide a plan and complete application package indicating water demand and proposed meter location. VCWD1 shall determine fees to be paid for the proposed service [VCWD1].

98. Prior to issuance of a grading or building permit, provide copies of the latest, including any changes to, of the grading, street, landscape, and storm drain plans. Plans may be provided in digital format. [VCWD1]
99. Prior to issuance of a grading or building permit, provide a plan denoting the location of fire hydrants and copy of approvals by the Ventura County Fire Protection District for fire hydrant locations. [VCWD1]
100. Prior to issuance of a grading or building permit, provide cost estimates for water and sewer improvements. [VCWD1]
101. Prior to issuance of grading or building permit, pay all applicable plan check deposits, construction inspection deposits, capital improvement charges, sewer connection fees, and meter charges per phase of the project as calculated by the VCWD1. [VCWD1]
102. Prior to issuance of a will serve letter, all recorded easements dedicated to the District for water and sewer facility improvements as shown on the recorded final map or other recorded document. Dedicated easements shall be over and across all streets and parking lots for access to maintain and repair of the District's substructures and facilities. Separate deeds of conveyance for easements and/or lands in fee if these are not conveyed on the final map. [VCWD1]
103. Prior to issuance of a will serve letter, all easements shall be approved by VCWD1 and be designed to provide sufficient clearances to perform operation and maintenance activities. No permanent improvements such as buildings, block walls, monuments, fences, curbs and gutters, parking stalls, large trees and shrubs, and related appurtenances shall be placed over the easement. [VCWD1]
104. The VCWD1 will provide "Will Serve Letters" upon completed review and acceptance of the water and sewer improvement plans and payment of applicable fees and charges. [VCWD1]
105. Following the acceptance of the above items, the Applicant shall enter into an Agreement to Install improvements and provide a Surety Bond. Template copies of the Agreement to Install and Surety Bond are available upon request. [VCWD1]
106. The applicant shall at all times comply with all applicable provisions of the Rules and Regulations of the VCWD1. [VCWD1]
107. Prior to issuance of a grading or building permit, the sewer lateral will not tie into Trunk Line that runs westerly in High Street. It should tie into the new proposed 10" Line to the west of the library. [VCWD1]



108. Prior to issuance of a grading or building permit, the sewer line terminal cleanout should be installed north of the existing sewer later to remain at 601 Moorpark Road. [VCWD1]
109. Prior to issuance of a grading or building permit, the rear parking lot fire hydrant should be routed behind fire flow backflow. [VCWD1]

**Parks, Recreation, and Community Services Department (PRCS)**

110. Prior to issuance of a building permit, the Applicant shall design trash enclosure(s) for trash, recycling, organic bins or carts equivalent to: 1 - 3 cubic yards trash, 1 - 3 cubic yards recycle, and a minimum 96-gallon cart for organics/food waste, as outlined on the "Aerial Waste Enclosure Design Examples". The Applicant shall show a detail on building plans to ensure that doors have cane bolts and that the trash enclosure is ADA accessible with appropriate path of travel. Applicant shall refer to "Aerial Waste Enclosure Design Examples" provided by Waste Management for specific design criteria. [PRCS]

**Finance and Administrative Services Department (FAS)**

111. Prior to issuance of a building permit, the Applicant shall provide two, two-inch conduits for future fiberoptic cables in the following two locations, as shown on the Building Plans:
  - One between the Telecommunications Room and the High Street right-of-way for tie-in to future fiber-optic conduit within the High Street right-of-way; and
  - The second between the Telecommunications Room and the existing audio-video room in the Moorpark Active Adult Center's Apricot Room. [FAS]

**Moorpark Police Department (MPD)**

112. Prior to issuance of a building permit, the Applicant shall provide the MPD with a security plan for review and approval prior to occupancy. The plan should include details such as door/window sensors, glass break sensors, motion sensors, panic alarms, camera type/locations, and theft prevention steps. [MPD]
113. Prior to installation of bike racks and/or bike lockers, the Applicant shall provide details to the MPD regarding the type of bike racks and how the bike lockers will be issued and secured. [MPD]
114. Prior to installation of landscaping, ensure a landscape maintenance plan is implemented, to include maintaining tree canopies to a height of no lower than 6' and all shrubbery no higher than 2'. [MPD]
115. Prior to issuance of a building permit, ensure all exterior doors have, at minimum, a viewport so patrons and staff can exit safely. [MPD]
116. Applicant should consider placing convex mirrors that allow staff and patrons to see down each aisle of bookshelves. This adds to staff and patron safety, as they can see if someone is in an aisle prior to entering the aisle. [MPD]

**Ventura County Air Pollution Control District (VCAPCD)**

117. Prior to issuance of a grading permit, and to ensure that fugitive dust and particulate matter that may result from site preparation, construction and/or grading activities are reduced, the applicant shall comply with the provisions of applicable VCAPCD Rules and Regulations, which include, but are not limited to, Rule 50 (Opacity), Rule 51 (Nuisance), and Rule 55 (Fugitive Dust), and the Air Quality Assessment Guidelines. Applicant shall comply with Rule 51 that the construction site installs temporary signage with the APCD 24-hour Complaints Hotline phone number (805) 303-3700 near the fence entrance/exits. This can be as simple as a plastic-laminated sign attached to the fence with font large enough for the public to view and in an easily accessible location. [VCAPCD]
118. Prior to issuance of a grading permit, and to ensure that ozone precursor and particulate emissions from diesel-powered mobile construction equipment are reduced to the greatest amount feasible, the applicant shall comply with the provisions of all applicable California State Laws and APCD Rules and Regulations, and the Air Quality Assessment Guidelines regarding portable construction equipment and construction vehicles. [VCAPCD]
119. Prior to issuance of a demolition permit, the applicant shall submit Form AB3205 for the review and approval of VCAPCD. In addition, the contractor shall notify VCAPCD 10 business days prior to the abatement commencement, if applicable, by submitting a Notification of Demolition or Renovation Form. Demolition and/or renovation activities shall be conducted in compliance with APCD Rule 62.7, Asbestos – Demolition and Renovation. Enforcement of notification requirements for both forms and compliance with the VCAPCD Asbestos Rule will be enforced by APCD Asbestos Inspectors or on a complaint-basis. See <http://vcapcd.org/Rulebook/RuleIndex.htm> for more information on VCAPCD Rule 62.7- Asbestos Demolition and Renovation. [VCAPCD]
120. Prior to issuance of a zoning clearance for building permit, a Ventura County Air Pollution Control District (APCD) “Authority to Construct” must be obtained for all equipment or operations subject to an APCD Permit, pursuant to APCD Rule 10, Permits Required. Final Certificate of Occupancy will not be granted until compliance with all applicable APCD Rules & Regulations has been satisfactorily demonstrated. See <http://vcapcd.org/Rulebook/RuleIndex.htm> for more information on APCD Rule 10-Permits Required. The condition may apply if the facility proposed to install a diesel-powered emergency backup generator with a HP rating of 50 or over, or any other combustion equipment subject to air permits, such as a natural-gas heater or boiler rated at 1,000,00 BTUs/Hour or greater. [VCAPCD]

**Ventura County Watershed Protection District (VCWPD)**

121. To comply with the Ventura County Watershed Protection District Ordinance WP-2, as amended. Requirements: The proposed development shall incorporate mitigation measures to address cumulative impacts due to the proposed increase in

imperviousness. The project shall either reduce the developed condition peaks to the pre-project condition peaks for the 10-, 25-, 50-, and 100-year storms, or apply the city standard; whichever is more restrictive. Documentation: The applicant shall submit a drainage study evaluating the existing and proposed conditions and presenting the design of a drainage system that will mitigate any increases in peak runoff to the above requirements. Acceptance of the drainage study will be completed as part of the City's standard plan-check process. Timing: The drainage study shall be reviewed and accepted as meeting the applicable requirements prior to obtaining a Building permit, grading permit, or prior to project start date if no grading or building permits are required. Monitoring and Reporting: Prior to issuance of the first certificate of occupancy, County staff shall inspect the improvements to assure that construction was completed in accordance with the approved plans. [VCWPD]

122. The Permittee shall obtain a Watercourse/Encroachment Permit. The permit application shall include the following: a. Construction plans prepared, signed, and stamped by a California licensed civil engineer including but not limited to, a site plan depicting general drainage trends, existing and proposed topography with elevations, proposed improvements in both plan and profile, and construction details that meet the standards of the City of Moorpark and the VCWPD. b. Site specific hydrology for existing and proposed conditions that conforms to the WP's Hydrology Manual. c. Hydraulics using a methodology and/or computer model applicable to the proposed improvements and acceptable to the VCWPD. The final model shall confirm there are no adverse impacts to Walnut Canyon, including no loss of storage volume and no increase in water surface elevation for the 1-percent chance flood peak discharge on adjacent parcels. d. Any other information or studies required by the Permit Section to administer the requirements of watershed Ordinance WP-2. Documentation: A VCWPD Permit application package shall be prepared and signed by the Permittee or a duly authorized agent and submitted to and logged by the VCWPD Permit Section. Timing: The applicant shall obtain an encroachment permit prior to obtaining a Building permit or grading permit or prior to project start date if no grading or Building permits are required. Monitoring and Reporting: Prior to permit closure, VCWPD staff shall inspect the improvements to assure that construction was completed, in accordance with the approved plans and the Permit. [VCWPD]

### **Ventura County Fire Protection District (VCFPD)**

123. Fire Department Clearance (Submit prior to Building & Safety approval) – Applicant shall obtain VCFD Form #610 "Fire Permit Application" and Form #625 "Fire Flow Verification" prior to obtaining a Building permit for any new structures or additions to existing structures. [VCFPD]
124. Building Plan Review (Submit prior to Building & Safety approval) - Building plans of all A occupancies shall be submitted, with payment for plan check, to the Fire District for review and approval prior to obtaining a Building permit. [VCFPD]

125. Water System Plans (Submit prior to Building & Safety approval) - Plans for water systems supplying fire hydrants and / or fire sprinkler systems and not located within a water purveyor's easement, shall be submitted to the Fire District for review and approval prior to issuance of grading and/or Building permits or signing of Mylar plans, whichever is first. Plans shall reflect only dedicated private fire service lines and associated appurtenances. Plan shall be design and submitted with the appropriate fees in accordance with VCFPD Standard 14.7.2. [VCFPD]
126. Access Road Width, Private Roads/Driveways - Private roads shall comply with Public Road Standards. The access road width of 24 feet shall be required with no on-street parking permitted, or per Public Road Standards whichever is stricter. [VCFPD]
127. Building Location on Property - Buildings housing Group A occupancies shall front directly on or discharge to a public street not less than 20 feet in width. The exit discharge to the public street shall be a minimum 20-foot wide right of way, unobstructed and maintained only as exit discharge to the public street. The main entrance to the building shall be located on a public street or on the exit discharge. Reference California Building Code Requirements. NOTE: Fire District requires minimum 25-foot access roads. [VCFPD]
128. Fire Hydrant(s) Required - Fire hydrant(s) shall be provided in accordance with current adopted edition of the International Fire Code, Appendix C and adopted amendments. Onsite fire hydrants may be required as determined by the Fire District. [VCFPD]
129. Fire Flow Verification - Prior to issuance of a Building permit, the applicant shall provide to the Fire District, verification from the water purveyor that the purveyor can provide the required fire flow of 2,250 gallons per minute at 20 psi for a minimum (2) hour duration. [VCFPD]
130. Fire Sprinklers - All structures shall be provided with an automatic fire sprinkler system in accordance with current VCFPD Ordinance at time of Building permit application. [VCFPD]
131. Fire Alarm System - A fire alarm system shall be installed in all buildings in accordance with California Building and Fire Code requirements. [VCFPD]
132. Fire Protection Plan (Submit prior to building permit). A fire protection plan shall be submitted to the Fire Code Official for this project as part of the building permit application. The Fire Protection Plan (FPP) shall be prepared to determine the acceptability of fire protection and life safety measures designed to mitigate wildfire hazards presented for the property under consideration and reducing the impact on the community's fire protection delivery system. The FPP shall address all requirements of the State Minimum Fire Safe Regulations (Title 14 CCR), and VCFD Ordinance and Standards, whichever are more restrictive. The FPP shall also include a wildfire behavior modeling report. The FPP shall be prepared by a registered design professional, qualified landscape architect, qualified fire safety specialist or similar specialist acceptable to the fire code official and shall analyze the wildfire risk of the building, project, premises, or region to recommend

necessary changes. See VCFD Ordinance 32 Section 4903.1 for more information.  
[VCFPD]

133. The Developer shall comply with all applicable codes, ordinances, and regulations, including the most current edition of the California Fire Code and the City of Moorpark Municipal Code, regarding fire prevention and suppression measures; fire hydrants; fire access; water availability; and other, similar requirements. Prior to issuance of building permits, the City of Moorpark Community Development Department and the Ventura County Fire Department shall verify compliance with applicable codes and that appropriate fire safety measures are included in the Project design. All such codes and measures shall be implemented prior to occupancy. [VCFPD]

[END]

## RESOLUTION NO. PC-2025-711

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MOORPARK, CALIFORNIA, APPROVING MODIFICATION NO. 1 to CONDITIONAL USE PERMIT No. CD-CUP-2023-0013, MODIFYING SPECIFIC CONDITIONS OF APPROVAL IN PLANNING COMMISSION RESOLUTION NO PC-2024-706 FOR THE DEVELOPMENT OF A 17,272 SQUARE-FOOT PUBLIC LIBRARY, LOCATED AT 83 HIGH STREET, AND MAKING A DETERMINATION THAT THIS ACTION IS CONSISTENT WITH A PREVIOUSLY-CERTIFIED ENVIRONMENTAL IMPACT REPORT PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, ON THE APPLICATION OF JESSICA SANDIFER DEPUTY PARKS AND RECREATION DIRECTOR ON BEHALF OF THE CITY OF MOORPARK.

WHEREAS, at a duly noticed public hearing on February 27, 2024, the Planning Commission adopted Resolution No. PC-2024-706, certifying a Final Environmental Impact Report (EIR / State Clearinghouse No. 2022050175) pursuant to the California Environmental Quality Act (CEQA) and approving Conditional Use Permit No. CD-CUP-2023-0013 (CUP) for development of a 17,272 square-foot public library located at 83 High Street, on the application of Jessica Sandifer, Deputy Parks and Recreation Director, on behalf of the City of Moorpark; and

WHEREAS, on March 20, 2025, an application was submitted for Modification No. 1 to the CUP to make changes to specific conditions of approval associated with Resolution No. PC-2024-706; and

WHEREAS, at a duly noticed public hearing on March 25, 2025, the Planning Commission considered Modification No. 1 to the CUP, including the agenda report and any supplements thereto and written public comments; opened the public hearing, and took and considered public testimony regarding the proposal; and

WHEREAS, the Community Development Director has determined that Modification No. 1 is consistent with the previously-certified EIR because the proposed amendments to certain conditions of approval do not alter the project's consistency with the EIR. Therefore, no further environmental review is required pursuant to CEQA.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MOORPARK DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. ENVIRONMENTAL DETERMINATION: The Planning Commission, based on its own independent analysis and judgment, concurs with the Community Development Director's determination that the project is consistent with the previously certified EIR, including the agenda reports, technical studies, appendices, plans, specifications, and other documents and materials that constitute the record of proceedings on which this certification was based. These documents are on file for public examination during normal business hours at the City of Moorpark Community

Development Department, 323 Science Drive, Moorpark, CA 93021. Each of these documents is incorporated herein by reference. The modifications to certain conditions of approval do not alter the project's consistency with the EIR. Therefore, no further environmental review is required pursuant to CEQA.

SECTION 2. CONDITIONAL USE PERMIT FINDINGS: Based upon the information set forth in the staff report(s), accompanying studies, and oral and written public testimony, the Planning Commission makes the following findings in accordance with City of Moorpark, Municipal Code Section 17.44.040(C):

- A. The proposed use is consistent with the provisions of the General Plan, zoning ordinance, and all applicable regulations in that the proposed use would be permitted within Mixed-Use Medium (MUM) zone and the Downtown Specific Plan area. The proposed use is also consistent, with General Plan Land Use Element Goal No. 3.8: Public services and facilities: Support a diversity of uses and services supporting Moorpark's residents such as facilities for governance and administration, public safety, seniors and youth, community gatherings, and comparable activities and General Plan Land Use Element Goal No. 9.18: Library and lifelong learning: Provide and promote a state-of-the-art library that offers resources and engaging programs to meet the varied educational, cultural, civic, and general business needs of all residents and support opportunities for lifelong learning and enrichment. Additionally, the proposed use is consistent with General Plan Land Use Element Goal No. 17.1: Services supporting Moorpark's residents: Provide public facilities and services that are cost effective, and contribute to the health, safety, welfare, and personal development of all residents and General Plan Land Use Element Goal No. 19.1: Core community district: Support the continued development of the area along High Street as a distinct place identified as the symbolic and functional downtown of Moorpark. The proposed use is also consistent with Downtown Specific Plan Land Use Goal No. 3.3.3 f): Continue to maintain a civic presence in downtown through the expansion of the Civic Center area to provide for an enlarged City Hall and Library.
- B. The proposed use is compatible with both existing and permitted land uses in the surrounding area. The proposed Project would replace the existing City library located to the northeast, located on the City's Civic Center site. Surrounding uses include commercial stores and services, residences, post office, and City Hall.
- C. The proposed use is compatible with the scale, visual character, and design of surrounding properties. The proposed structure has undergone significant public review by the public, City Council, and Planning Commission to find the agrarian architectural style desirable in the downtown core. The architectural style, scale, features, and design are consistent with design guidelines set forth in the Downtown Specific Plan and applicable design standards in the MUM zone.



- D. The proposed use would not be obnoxious or harmful or impair the utility of neighboring property or uses. The proposed Project would operate with similar programming, hours of operation, and staff as the existing library which it will replace, which has been beneficial to the surrounding community.
- E. The proposed use would not be detrimental to the public health, safety, convenience, or welfare in that Conditions of Approval have been included to ensure the Project would not generate negative impacts on the surrounding area and the proposed library is planned to operate similarly as the existing library which has not demonstrated negative impacts to public health, safety, convenience, or welfare.

SECTION 3. PLANNING COMMISSION APPROVAL: The Planning Commission hereby approves Modification No. 1 to CUP CD-CUP-2023-0013 and modifies the following Conditions of Approval of Planning Commission Resolution No. PC-2024-706, where underlined indicates added text and strikethrough indicates removed text. Except for the items noted below, all other condition of approval of Resolution No. PC-2024-706 will remain in full force and effect, as applicable:

72. Prior to final review and acceptance of grading plan, a drainage plan showing all proposed storm drainage facilities must be designed to the standards of the Ventura County Watershed Protection District Design Hydrology Manual. This includes, but not limited to, hydrologic modeling, design storm modeling, and development mitigation criteria. If the entire site discharges directly into County Watershed facilities, the proposed development shall conform to the mitigation criteria set forth by the County and obtain the applicable permit, i.e. County Watershed Encroachment, County Storm Drain Connection, or County Watercourse Permit. County Acceptance of the site development discharge and connection to County facility shall be obtained prior to final acceptance of the grading and drainage plan. Otherwise, the development mitigation criteria must address how to mitigate 100-yr developed condition peak back to the 10-yr developed condition peak. [PW]

73. The project shall attenuate the 100-year developed peak flow condition to the 10-year developed condition. This includes no increase in peak flow for the 10-year, 25-year, 50- year, and 100-year design storms. If the entire site discharges directly into County Watershed facilities, the proposed development shall conform to the mitigation criteria set forth by the County and obtain the applicable permit, i.e. County Watershed Encroachment, County Storm Drain Connection, or County Watercourse Permit. County Acceptance of the site development discharge and connection to County facility shall be obtained prior to final acceptance of the grading and drainage plan. [PW]

~~81. Prior to construction of the bus turnout, proposed design must meet Ventura County Road Standards Plate D-13, "Bus turnout". Any deviations from the design standards shall be reviewed by the City Engineer and Public Works Director. [PW]~~

~~84. Applicant shall ensure that all offsite improvements along High Street include a vehicular lane, and a bicycle lane in both the east and west direction. The vehicular and bicycle lane design must accommodate road alignment plans for the future Hitch Ranch project. [PW]~~

SECTION 4. FILING OF THE RESOLUTION: The Community Development Director shall cause a certified resolution to be filed in the book of original resolutions.

The action of the foregoing direction was approved by the following vote:

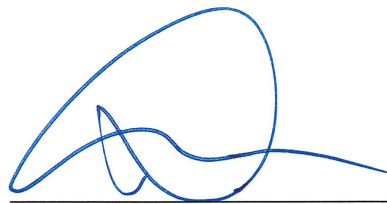
AYES: Commissioner Di Cecco, Hamalainen, Winters, and Chair Landis

NOES:

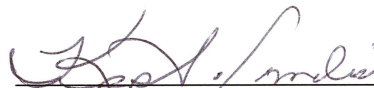
ABSENT: Commissioner Alva

ABSTAIN:

PASSED, AND ADOPTED this 25<sup>th</sup> day of March 2025.



Doug Spondello, AICP  
Community Development Director

  
Kipp Landis  
Chair

## **4.0 MITIGATION MONITORING AND REPORTING PROGRAM**

Section 21082.3 of CEQA and Section 15097 of the State CEQA Guidelines require a public agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) to ensure the implementation of required mitigation measures to reduce or avoid significant environmental effects that are identified in the EIR. Also, the specific reporting and/or monitoring requirements that will be enforced during Project implementation shall also be adopted simultaneously with final Project approval by the responsible decision-making body.

The MMRP for this Project is provided as Table 4-1, beginning on the next page. The MMRP consists of mitigation measures (MMs) identified in the EIR that are required for Project implementation. The MM identifier is provided in the first column. The text of each MM is provided in the second column. The timing of each MM's implementation is provided in the third column. The agency or party responsible for monitoring implementation of each MM is provided in the fourth column.

TABLE 4-1  
MITIGATION MONITORING AND REPORTING PROGRAM

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Aesthetics									
COA AES-1	Tree Removal Permits	As required by Section 12.12.070 of the City's Municipal Code, <b>Tree Removal Permits</b> – Requirements, no native oak tree, historic tree or other mature tree, where that tree is on public or private property, except as provided for in subsection B of this section, or is associated with a proposal for urban development, shall be removed, cut down, or otherwise destroyed, unless a tree removal permit has been issued by the city. The Parks, Recreation, and Community Services Department Director shall establish the format and information required for a tree removal permit consistent with this chapter. In no event shall a permit be denied if to do so would cause interference with the economic use and enjoyment of the property.	Prior to construction	City of Moorpark Parks, Recreation, and Community Services Department Director.	Contractor				
Air Quality									

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA AQ-1	<b>Rule 55, Fugitive Dust</b>	During construction of the Project, the City and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) <b>Rule 55, Fugitive Dust</b> , which requires, among other provisions, that "No person shall cause or allow the emissions of fugitive dust from any applicable source such that the dust remains visible beyond the midpoint (width) of a public street or road adjacent to the property line of the emission source or beyond 50 feet from the property line if there is not an adjacent public street or road" (VCAPCD 2008).	During Project Construction	Ventura County Air Pollution Control District (VCAPCD)	Contractor				
COA AQ-2	<b>15-mile per hour speed limit</b>	A <b>15-mile per hour speed limit</b> must be observed within all construction areas	During Project Construction	Contractor	Contractor				
COA AQ-3	<b>particulate matter (aerosols/dust)</b>	Reactive organic compounds, nitrogen oxides (ozone/smog precursor), and <b>particulate matter (aerosols/dust)</b> generated during construction operations must be minimized in accordance with City of Moorpark standards and the standards of the Ventura County Air Pollution Control District. When an air pollution Health Advisory has been issued, construction equipment operations (including but not limited to grading, excavating, earthmoving, trenching, material hauling, and roadway construction) and related activities must cease in order to minimize associated air pollutant emissions. Additionally, all paints used during phase 3	During Project Construction	Contractor/VCAPCD	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		of the Project shall have a maximum VOC content of 30g/L to minimize VOC emissions.							
COA AQ-4	soil import and/or soil export operations	During clearing, grading, earth moving, excavation, <b>soil import and/or soil export operations</b> , the applicant shall comply with the City of Moorpark standard requirements for dust control, including, but not limited to, minimization of ground disturbance, application of water/chemicals, temporary/permanent ground cover/seeding, street sweeping, and covering loads of dirt. All clearing, earth moving, excavation, soil import, and/or soil export operations must cease during periods of high winds (greater than 15 miles per hour [mph] averaged over one hour)	During Project Construction	Contractor	Contractor				
COA AQ-5	issuance of a grading permit	Beginning in 2030, prior to <b>issuance of a grading permit</b> , the Project's Construction Manager shall demonstrate to the City's Community Development Department that construction documents require the construction contractors to implement the following measures: a. All off-road diesel-powered construction equipment greater than 50 horsepower (hp) used during phases 3 and 4 shall, at a minimum, meet Tier 3 off-road emissions standards. b. A copy of each unit's certified offroad engine Tier specification shall be provided to the City at the time of mobilization of each applicable unit of equipment.	Prior to Issuance of a grading permit	Project Construction Manager/ City's Community Development Department	Project Construction Manager				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA AQ-6	Rule 62.7, Asbestos-Demolition and Renovation	As applicable, during construction of the Project, the City and its' contractors shall be required to comply with Ventura County Air Pollution Control District (VCAPCD) Rule 62.7, Asbestos- Demolition and Renovation, which imposes notification, emission control, training and licensing, warning signage, containment area, and record keeping requirements on projects involving the demolition and renovation operations and the associated disturbance of asbestos-containing material (ACM).	Prior to Issuance of a grading permit	Project Construction Manager/ City's Community Development Department/VCAPCD	Contractor				
Biological Resources									
COA BIO-1	Nesting Bird Survey	Nesting Bird Survey. If construction and/or vegetation removal must be initiated during the peak nesting season (i.e., February 1 to August 31), a pre- construction nesting bird survey shall be conducted by a qualified Biologist within 14 days prior to the beginning of Project-related activities (including but not limited to clearing, grubbing, vegetation removal, grading, and building demolition). If project-related construction activities lapse for greater than 14 days during the peak nesting season, an additional nest survey shall be conducted before work can be reinitiated. If the Biologist finds an active nest within or adjacent to the construction area (within 200 feet for all birds protected under California Fish and Game Code and the Migratory Bird Treaty	Prior to construction, during construction (if active nests are identified)	Qualified Biologist	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		Act and within 500 feet for raptors), the Biologist shall identify an appropriate protective buffer zone around the nest depending on the sensitivity of the species, the nature of the construction activity, and the amount of existing disturbance in the vicinity. In general, the Biologist should designate a buffer of 10 to 200 feet for common nesting birds and 200 to 500 feet for special status nesting birds and nesting raptors. Construction activities within the buffer shall only proceed after a qualified biologist determines the nest is no longer active due to natural causes (e.g., young have fledged, predation, or other non-human causes of nest failure) to maintain compliance with California Fish and Game Code and the Migratory Bird Treaty Act.							
COA BIO-2	Drainage Avoidance and Regulatory Permitting	Jurisdictional <b>Drainage Avoidance and Regulatory Permitting.</b> Impacts to jurisdictional waters within the Project Site will be avoided to the extent feasible. If such impacts are unavoidable, then permits/certifications/ agreements from the United States Army Corp of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) are required. A pre-application meeting with these agencies is recommended prior to submittal of permit applications to discuss existing conditions; confirm the agencies’ jurisdiction	Prior to construction	USACE, RWQCB, CDFW	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		over water resources on the study area; discuss impacts to these resources that would result from the Project; discuss proposed avoidance, minimization, and mitigation measures to offset these impacts; and to discuss the regulatory permitting process. Following the pre- application meeting, the Project Applicant would prepare and process the appropriate permits (e.g., a Section 404 Permit from the USACE in the form of a Nationwide Permit or Individual Permit, a Section 401 Water Quality Certification from the RWQCB, and/or a CDFW Section 1602 Notification of Lake or Streambed Alteration). Additional permit conditions may be required by the resource agencies regarding impacts to areas under their respective jurisdictions. Standard construction best management practices (BMPs) shall be implemented to prevent toxins, chemicals, or petroleum products from entering the culverts and degrading water quality.							
COA BIO-3	Tree Survey and Landscaping Plan	<b>Tree Survey and Landscaping Plan.</b> Prior to the issuance of a grading permit for each Project phase, a tree survey must be prepared to determine the valuation of the mature trees to be removed. Thereafter, a landscaping plan shall be prepared which incorporates replacement tree plantings consistent with the City’s Tree Ordinance, which would be submitted to the City’s	Prior to the issuance of a grading permit.	City of Moorpark Community Development Director	Architect/Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		Community Development Director for review and approval.							
MM BIO-1	Botanical surveys	<p>Prior to ground disturbance on the western portion of the Project Site associated with Phase 2 of the Project, the applicant shall retain a qualified Biologist (one with experience conducting <b>botanical surveys</b>) to conduct a focused <b>survey for special status plant species</b>. The survey shall be performed during the target species' peak blooming period in accordance with the most current protocols approved by the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS). If focused plant surveys determine that no special status plant species are present in the project impact area, then no future measures are necessary.</p> <p>If any <b>plant species listed as threatened or endangered</b> by the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA) is determined to be present and take of individuals cannot be avoided, then the applicant shall obtain take authorization from the listing agencies before impacting the species (FESA Consultation with the United States Fish and Wildlife Service (USFWS) and CESA Section 2080 from the CDFW). Consultation with the listing agencies shall determine the appropriate conservation measure(s) to mitigate for impacts on the</p>	<p>Prior to ground disturbance.</p>	City/Qualified Biologist/California Department of Fish and Wildlife (CDFW)	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		<p>species. The mitigation may include collecting seed from individuals in the impact area and planting them within a mitigation site with the appropriate microhabitat for this species and/or paying a fee to a mitigation bank and/or a qualified Plant Science Program to conduct germination or other research studies on the species. The applicant shall retain a qualified Biologist to prepare a detailed Special Status Plant Species Conservation Plan for approval by the USFWS and/or the CDFW. The conservation plan shall include the following topics: (1) responsibilities and qualifications of the personnel to implement and supervise the plan; (2) mitigation site selection criteria; (3) site preparation and planting implementation; (4) implementation schedule; (5) maintenance plan/guidelines; (6) monitoring plan; (7) long-term preservation. The applicant shall implement the Plan as approved.</p> <p>If focused surveys determine that CNPS List 1 or List 2 species are present and the necessary take of individuals would be greater than ten percent of</p>							

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		species' population within a one-mile radius of the Project Site, then compensatory mitigation shall be required. Mitigation may include collection of seed from individuals in the impact area and planting them within a mitigation site with the appropriate microhabitat for this species. If project timing requires that ground disturbance of potentially suitable habitat be performed prior to the species' peak blooming period and focused surveys cannot be performed, then the species shall be presumed present in the impact area. The applicant shall retain a qualified Biologist to prepare a detailed Special Status Plant Species Conservation Plan for approval by CDFW. The conservation plan shall include the following topics: (1) responsibilities and qualifications of the personnel to implement and supervise the plan, (2) mitigation site selection criteria, (3) site preparation and planting implementation, (4) implementation schedule, (5) maintenance plan/guidelines, (6) monitoring plan, (7) long-term preservation. The applicant shall implement the Plan as approved.							

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM BIO-2	Burrowing Owl breeding season	<p>Per the Staff Report on Burrowing Owl Mitigation (CDFW 2012), the applicant shall retain a qualified Biologist to conduct a pre-construction survey for the burrowing owl between 14 and 30 days prior to the initial ground disturbance on the western portion of the Project Site. The pre-construction survey shall include the area of proposed disturbance plus a 500-foot buffer (if access is available and habitat is present).</p> <p>If an active burrow is observed outside the <b>breeding season (September 1 to January 31)</b> and it cannot be avoided, the <b>burrowing owl</b> shall be passively excluded from the burrow following methods described in California Department of Fish and Wildlife (CDFW) 2012. Prior to any burrowing owl exclusion efforts, an exclusion plan will be prepared and submitted to CDFW for review and approval. The plan will include all details on passive relocation including that one-way doors shall be used to exclude owls from the burrows; doors shall be left in place for at least 48 hours. Once the burrow is determined to be unoccupied, the burrow shall be closed by a qualified Biologist who shall excavate the burrow using hand tools. Prior to excluding an owl from an active burrow, a receptor burrow survey shall be conducted to confirm that at least two potentially suitable unoccupied burrows are within approximately</p>	Prior to initial ground disturbance/During Construction if Necessary	Qualified Biologist	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		688 feet prior to installation of the one-way door. If two natural receptor burrows are not located, one artificial burrow shall be created for every burrow that would be closed.If an active burrow is observed outside the breeding season (September 1 to January 31) and it can be avoided, the Biologist shall determine an appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 160 feet to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an environmentally sensitive area (ESA) on construction plans.If an active burrow is observed during the breeding season (February 1 to August 31), the active burrow shall be protected until nesting activity has ended (i.e., all young have fledged from the burrow). The Biologist shall determine the appropriate protective buffer for the burrow based on CDFW guidelines. The buffer shall range from 650 to 1,640 feet depending on the level of impact and the time of year. The designated buffer will be clearly marked in the field and will be mapped as an ESA on construction plans. Construction shall be allowed to proceed when the qualified Biologist has determined that all fledglings have left the nest.							
Cultural Resources									



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-1	archaeological, paleontological, or historical finds	If any <b>archaeological, paleontological, or historical finds</b> are uncovered during grading or excavation operations, all grading or excavation shall immediately cease in the immediate area and the find must be left untouched. The applicant, in consultation with the project paleontologist or archeologist, shall assure the preservation of the site and immediately contact the Community Development Director by phone, in writing by email or hand delivered correspondence informing the Director of the find. In the absence of the Director, the applicant shall so inform the City Manager and Planning Manager. The applicant shall be required to obtain the services of a qualified paleontologist or archeologist, whichever is appropriate to recommend disposition of the site. The paleontologist or archeologist selected must be approved in writing by the Community Development Director. The applicant shall pay for all costs associated with the investigation and disposition of the find.	During Grading/Excavation n (if significant discovery is identified)	Project Paleontologist or Archeologist/City of Moorpark Community Development Director	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-2	human remains are found	In accordance with Section 7050.5 of the California Health and Safety Code, if <b>human remains are found</b> , the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are or are believed to be Native American, s/he shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, the disposition of the human remains.	During construction (if significant discovery is identified)	County Coroner	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA CUL-3	human remains are found	Prior to any ground disturbing activity, construction personnel associated with earth moving equipment, drilling, grading, and excavating, shall be provided with basic training conducted by a qualified archaeologist. Issues that shall be included in the basic training will be geared toward training the applicable construction crews in the identification of <b>archaeological deposits</b> , further described below. Training will include written notification of the restrictions regarding disturbance and/or removal of any portion of archaeological, paleontological, or historical deposits and the procedures to follow should a resource be identified. The construction contractor, or its designee, shall be responsible for implementation of this measure. A tribal monitor shall be provided an opportunity to attend the pre-construction briefing if requested.	Prior to any ground disturbing activities.	Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM CUL-1	75 feet of the Tanner Building	Prior to the start of Project phases that involve work within <b>75 feet of the Tanner Building</b> , protection measures shall be developed in a formal plan for the adjacent Tanner Corner Building at 601 Moorpark Avenue. Protection measures shall include at a minimum: (1) clear denotation in the project construction plans that the project is located directly adjacent to an historical resource, marking the location of the Tanner Corner Building; (2) a protocol for informing all construction workers of the presence of the historical resource and making them aware of the protocol to avoid and protect it; (3) a list of approved construction equipment/distances in consideration of any identified groundborne vibration impacts; (4) recommendations for specific protective fencing and signage to be implemented during construction; and(5) if determined appropriate based on the results of the groundborne vibration analysis, recommendations for construction monitoring (pre-, post-, and during construction). The protection plan shall be prepared by a qualified architectural historian/historic preservation professional, clearly identify all responsible parties with their contact information, and be appended to the final set of construction plans. (Also see MM NOI-2 in Section 4.11, Noise, which relates to vibration monitoring requirements).	Prior to the start of Project phases that involve work within 75 feet of the Tanner Building	Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Geology and Soils									
COA GEO-1	geotechnical report	Prior to the issuance of a grading permit for each Project phase, a <b>geotechnical report</b> will be prepared and submitted to the City for review and approval. The geotechnical report shall be prepared by a registered Civil Engineer or certified Engineering Geologist and shall contain site-specific evaluations of the seismic and geologic hazards affecting the project and shall identify recommendations for earthwork and construction. All recommendations from forthcoming site-specific geotechnical studies shall be included in the site preparation and building design specifications. Compliance with this requirement shall be verified by the City as part of the plan approval process.	Prior to the Issuance of a grading permit.	Geologist Engineer.	Contractor				
COA CUL-1	geotechnical report	See COA CUL-1 above.	Prior to See COA CUL-1 above.	See COA CUL-1 above.					
COA CUL-3	geotechnical report	See COA CUL-3 above.	See COA CUL-3 above.	See COA CUL-3 above.					
MM GEO-1	project's geotechnical reports	Prior to approval grading plans, the Applicant shall demonstrate, to the satisfaction of the City's Planning Division that the recommendations in the <b>project's geotechnical reports</b> and in any future geotechnical reports have been fully and appropriately incorporated (OGI 2017a and 2017b).	Prior to approval of grading plans.	City of Moorpark Planning Division.	Applicant				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
Greenhouse Gas Emissions									
COA GHG-1	Title 24 development standards	The Project is required to comply with the requirements established under the <b>Title 24 development standards.</b>	During Project Construction and Operations	Project Applicant/Operator	Contractor				
Hazards and Hazardous Materials									
COA HAZ-1	manifest, transport, and dispose	Applicant/operator shall store, <b>manifest, transport, and dispose</b> of all on-site generated waste that meets hazardous waste criteria in accordance with California Code of Regulations Title 22 and in a manner to the satisfaction of the Manager, HCA/Hazardous Materials Program. Applicant shall keep storage, transportation, and disposal records on site and open for inspection to any government agency upon request.	During Project Construction and Operations	Project Applicant/Operator	Contractor				
COA HAZ-2	Transport of materials deemed as hazardous	<b>Transport of materials deemed as hazardous</b> must comply with the requirements of Title 22, Division 4.5 of the California Code of Regulations, the U.S. Department of Transportation regulations in the Code of Federal Regulations (specifically, Title 49, Hazardous Materials Transportation Act and Title 40, Part 263, Subtitle C of Resource Conservation and Recovery Act), California Department of Transportation (Caltrans) standards, and Occupational Safety and Health Administration (OSHA) standards.	During Project construction and Operations	Project Applicant/Operator	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HAZ-3	<b>demolition permit</b>	Prior to issuance of a <b>demolition permit</b> for any buildings or facilities, building materials shall be assessed by a qualified Environmental Professional as defined in Section 312.10 of 40 CFR Part 312 for the presence of lead-based paints (LBPs), asbestos-containing materials (ACM), and other common hazardous building materials (e.g., polychlorinated biphenyl [PCB]-containing lighting ballasts and mercury-containing light tubes and switches). If determined to be present, the Applicant shall prepare an abatement plan for their removal and safe transport in compliance with State and federal regulations, including Occupational Safety and Health Administration (OSHA) regulations in the Code of Federal Regulations (specifically Title 29, Part 1926) and South Coast Air Quality Management District (SCAQMD) Rule 1403. The abatement plan shall meet the satisfaction of the County Environmental Health Division..	Prior to issuance of a demolition permit	City /South Coast Air Quality Management District (SCAQMD)/Contractor	Contractor				
COA HAZ-4	<b>food facilities</b>	As applicable, future land uses involving any <b>food facilities</b> shall submit plans to the Ventura County Environmental Health Division, Community Services Section to obtain plan approval prior to beginning any construction of any food facility. A permit to Operate form the Division shall also be required prior to beginning any retail food operations.	Prior to issuance of a demolition permit	City of Moorpark Community Development Department	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HAZ-5	transport hazardous materials	Any future tenant that may handle store, or <b>transport hazardous materials</b> , or generate hazardous waste at or above the reportable thresholds shall be reported to the Ventura County Environmental Health Division's Certified Unified Program Agency (CUPA).	Prior to issuance of a demolition permit	City of Moorpark Community Development Department	Contractor				
Hydrology and Water Quality									
COA HWQ-1	Permit for Stormwater Discharges Associated	Prior to the issuance of any grading or building permit for each project phase, the applicant shall demonstrate compliance under California's <b>General Permit for Stormwater Discharges Associated</b> with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing in a manner meeting the satisfaction of the Community Development Department. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the Project Site and be available for County review on request.	Prior to Issuance of any grading or building permit	City of Moorpark Community Development Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA HWQ-2	grading or building permits	Prior to the issuance of any <b>grading or building permits</b> , the applicant shall submit for review and approval by the Community Development Department, a Water Quality Management Plan (WQMP) that must include the following minimum contents: <ul style="list-style-type: none"> <li>· Address Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, and conserving natural areas;</li> <li>· Incorporate applicable Routine Source Control BMPs; and</li> <li>· Include an Operation and Maintenance (O&amp;M) Plan that identifies the mechanism(s) by which long-term O&amp;M of all structural BMPs will be provided.</li> </ul>	Prior to Issuance of any grading or building permits	City of Moorpark Community Development Department	Contractor				
COA HWQ-3	certificate of use and occupancy	Prior to the issuance of a <b>certificate of use and occupancy</b> , the applicant shall demonstrate compliance with the WQMP in a manner meeting the satisfaction of the Community Development Department, including: <ul style="list-style-type: none"> <li>· Demonstrate that all structural Best Management Practices (BMPs) described in the project's WQMP have been implemented, constructed and installed in conformance with approved plans and specifications;</li> <li>· Demonstrate that the applicant has complied with all non-structural BMPs described in the project's WQMP;</li> </ul>	Prior to Issuance of a certificate of use and occupancy	City of Moorpark Community Development Department	certificate of use and occupancy				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
		<ul style="list-style-type: none"> <li>Submit for review and approval an Operations and Maintenance (O&amp;M) Plan for all structural BMPs for attachment to the WQMP; and</li> <li>Demonstrate that copies of the project's approved WQMP (with attached O&amp;M Plan) are available for each of the incoming occupants.</li> </ul>							
<b>Land Use</b>									
COA AES-1		See COA AES-1 above.	See COA AES-1 above.	See COA AES-1 above.					
<b>Noise</b>									
COA NOI-1	noise-generating	The Project shall comply with Section 15.26 of the City's Municipal Code, which requires contractors to not engage in or conduct any <b>noise-generating outdoor construction work</b> , except between the hours of <b>7:00 AM and 7:00 PM, Monday through Saturday</b> , unless a permit for different hours has been issued.	During Construction	Contractor	Contractor				
COA NOI-2	construction noise reduction	The Project shall comply with Chapters 9.28, 10.04, 12.24 and 17.53 of the Moorpark Municipal Code and any provision amendatory or supplementary thereto, as a standard requirement for <b>construction noise reduction</b> .	During Construction	Contractor	Contractor				
COA NOI-3	construction hour limitations	The Project shall include the posting, in a conspicuous location, of the construction hour limitations and make each construction trade aware of the construction hour limitations.	During Construction	Project Applicant/Contractor	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM NOI-1	start of grading	Prior to the <b>start of grading of each Project phase</b> , the Project applicant shall provide evidence acceptable to the City's Community Development Department, that: a. All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. b. Stationary equipment, such as generators and air compressors, would be located as far from local residences and Walnut Canyon Elementary School, as feasible. c. Equipment maintenance and staging areas would be located as far away from local residences and Walnut Canyon Elementary School, as feasible. d. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings and Walnut Canyon Elementary School.	Prior to grading activities	City/City of Moorpark Community Development Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
MM NOI-2	Ongoing vibration monitoring	During construction activities, the Project applicant will ensure that ongoing vibration monitoring is conducted for Project activities within 75 feet of the Tanner Corner Building as specified below.· Whenever vibratory replacement activities occur within 75 feet of the Tanner Corner Building.· Whenever Deep Soil Mixing activities occur within 50 feet of the Tanner Corner Building.· Whenever general construction equipment is utilized within 25 feet of the Tanner Corner Building.If vibration levels at the Tanner Corner Building reach or exceed 0.25 ppv, there is a potential for building damage and an immediate stop work order will be issued. Alternative construction methods or vibration reduction measures will then be determined that keep vibration exposure levels below0.25 ppv. (Also see MM CUL-1 in Section 4.3, Cultural Resources, which includes requirements for the development of a construction monitoring plan for work in proximity to the Tanner Corner Building).	During Project Construction	City/Contractor	Contractor				
Public Services									

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA PUB-1	prevention and suppression measures;	The Developer shall comply with all applicable codes, ordinances, and regulations, including the most current edition of the California Fire Code and the City of Moorpark Municipal Code, regarding fire <b>prevention and suppression measures</b> ; fire hydrants; fire access; water availability; and other, similar requirements. Prior to issuance of building permits, the City of Moorpark Community Development Department and the Ventura County Fire Department shall verify compliance with applicable codes and that appropriate fire safety measures are included in the Project design. All such codes and measures shall be implemented prior to occupancy.	Prior to Issue of Building Permits	Project Developer/City of Moorpark Community Development Department/Ventura County Fire Department	Project Developer				
COA PUB-2	prevention and suppression measures;	The Developer shall pay all applicable <b>Development Impact Fees (DIFs)</b> prior to the issuance of building permits, for parkland dedication, parkland improvements, public safety facilities, other governmental facilities, and outside agency fees including school district fees.	Prior to the issuance of building permits.	City/Developer	City/Developer				
Transportation									
COA TRA-1	Grading permit	<b>Prior to the issuance of a grading permit</b> for each project phase, the applicant shall demonstrate adequate sight distance at all street intersections, in a manner meeting the approval of the City's Public Works Department.	Prior to the issuance of a grading permit	City of Moorpark Public Works Department	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA TRA-2	Grading permits	Prior to the issuance of any grading permits, the applicant shall demonstrate that applicable improvements for that phase from the Project's Traffic Study have been incorporated into Project design, in a manner meeting the approval of the City's Public Works Department.	Prior to the Issuance of any Grading Permits	City of Moorpark Public Works Department	Contractor				
COA TRA-3	Project phase	Prior to beginning each project phase, the applicant shall submit a construction traffic control plan for the review and approval of the City Engineer and Public Works Director. Traffic control plan shall include construction advisory speed limits, speed limit posting locations, and enforcement measures if needed.	Prior to the beginning of each Project phase	City Engineer/Public Works Director	Contractor				
<b>Tribal Cultural Resources</b>									
COA CUL-1	grading permits	See COA CUL-1 above.	See COA CUL-1 above.	See COA CUL-1 above.	Contractor				
COA CUL-2	Grading permits	See COA CUL-2 above.	See COA CUL-2 above.	See COA CUL-2 above.	Contractor				
COA CUL-3	Project phase	See COA CUL-3 above.	See COA CUL-3 above.	See COA CUL-3 above.	Contractor				
<b>Utilities</b>									
COA HWQ-2	grading or building permits	See COA HWQ-2 above.	See COA HWQ-2 above.	See COA HWQ-2 above.	Contractor				
COA HWQ-3	certificate of use and occupancy	See COA HWQ-3 above.	See COA HWQ-3 above.	See COA HWQ-3 above.	Contractor				



Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA UTL-1	Building permit	Prior to issuance of a <b>building permit for each new building</b> within the Project Site, the applicant would be required to obtain a <b>will-serve letter</b> or equivalent from Ventura County Waterworks District No. 1 (VCWWD No. 1) demonstrating their capacity to serve the Project for water and wastewater services. The will-serve letter must be submitted to the Community Development Department for review prior to issuance of a building permit.	Prior to issuance of a building permit for each new building within the Project Site	Ventura County Waterworks/ City of Moorpark Community Development Department	Contractor				
COA UTL-2	Building permit	Prior to issuance of a <b>building permit</b> for each new building within the Project Site, the applicant would be required to obtain a will-serve letter or equivalent from dry utility providers demonstrating their capacity to serve the Project for electricity, natural gas, and telecommunications if needed. The will-serve letters must be submitted to the Community Development Department for review prior to issuance of a building permit.	Prior to issuance of a building permit for each new building within the Project Site	City of Moorpark Community Development Department	Contractor				
COA UTL-3	Building permit	Prior to issuance of a <b>building permit</b> for each new building within the Project Site, the applicant shall submit a Construction and Demolition Materials Management Plan Estimate for the review and approval of the City's Solid Waste Management staff and Building and Safety Division for recycling of waste materials consistent with applicable City and State requirements. The Plan must include estimated quantities for each type of material to be diverted or landfilled.	Prior to issuance of a building permit for each new building within the Project Site	City's Solid Waste Management staff and Building and Safety Division	Contractor				

Mitigation Measure or Condition of Approval Number		Mitigation Measure/Condition of Approval	Timing of Implementation	Monitoring or Reporting Agency	Responsible Party	Completed	Initials	Date	Notes/Comments
COA UTL-4	certificate of occupancy	Prior to issuance of <b>certificate of occupancy</b> for new structures within the Project Site, the applicant must submit a Final Report Construction and Demolition Waste Letter of Documentation (including premium gate tickets) to the Building and Safety Division, demonstrating compliance with the Construction and Demolition Materials Management Plan Estimate and indicating the total amount of construction and demolition waste diverted.	Prior to issuance of certificate of occupancy for new structures within the Project Site	City Building and Safety Division	Contractor				

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## **5.0 REFERENCES**

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Moorpark, City of 2023d (May). Draft Environmental Impact Report for the Civic Center Master Plan Project. <https://ceqanet.opr.ca.gov/2022050175/2>

———.2023c. (May 22). Notice of Availability (NOA). <https://ceqanet.opr.ca.gov/2022050175/2>

## EXHIBIT M



OFFICE OF COMMUNITY PLANNING  
AND DEVELOPMENT

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
WASHINGTON, DC 20410-7000

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Special Attention of:  
All CPD Division Directors  
HUD Field Offices  
HUD Regional Offices  
All CDBG Grantees  
All CoC Grantees  
All HOME Participating Jurisdictions  
All HTF Grantees  
All ESG Grantees  
All HOPWA Grantees

NOTICE: **CPD-25-01**

Issued: **January 13, 2025**

Supersedes: CPD-2023-12

Expires: This Notice remains in effect until  
amended, superseded, or rescinded.

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Cross Reference:

Sections 70901-52 of Pub. L. No. 117-58

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Subject: CPD Implementation Guidance for the Build America, Buy America Act's Buy America Preference.

### **Overview**

This updated Community Planning and Development (CPD) Notice supersedes CPD Notice 2023-12 to provide clarified implementation guidance for the "Buy America Preference" (BAP) imposed by the Build America, Buy America Act (BABA) enacted under Division G, Title IX of the Infrastructure Investment and Jobs Act (IIJA, Pub. L. No. 117-58) signed into law on November 15, 2021. It describes how grantees can use covered CPD program funds for public infrastructure projects to bolster America's industrial base, protect national security, and support high-paying jobs.

The refreshing of this Notice is intended to provide greater clarity to grantees implementing BABA. Specifically, the Notice clarifies how the BAP applies to public infrastructure for housing projects. Projects with one- to four-units should be classified as private and not subject to BABA. Housing projects with five or more units should be considered as public infrastructure subject to BABA unless another BABA waiver or exemption applies. In addition, the Notice includes a reclassification of HOME-ARP to CPD programs not covered by the BAP, clarification on determining a project scope, BAP applicability to program income, additional recordkeeping considerations, guidance on using HUD's online project-specific waiver application website, and new resources to assist with compliance and determining when a project-specific waiver is appropriate.

This Notice also highlights issues that grantees will want to consider when preparing for

HUD’s full implementation of the BAP in FY2025, as described in “Public Interest Phased Implementation Waiver for FY 2022 and 2023 of Build America, Buy America Provisions as Applied to Recipients of HUD Federal Financial Assistance” (88 Fed. Reg. 17001, effective March 15, 2023 (“Phased Implementation Waiver”), which establishes BAP implementation points according to a schedule across HUD programs.

More in-depth technical assistance related to both BABA compliance and best practices is available on the HUD Exchange and hud.gov websites. HUD also encourages grantees to contact their assigned local field offices to discuss issues and concerns within the regulatory framework. This Notice uses the term “grantee” generically to also include HOME participating jurisdictions. The guidance provided in this Notice is subject to change if the Office of Management and Budget (OMB) updates guidance on the application of BABA for Federal financial assistance (FFA) programs for infrastructure.

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## **I. The Build America, Buy America Act (BABA)**

The Build America, Buy America Act (BABA) was signed into law by President Biden on November 15, 2021, as part of the Infrastructure Investment and Jobs Act (IIJA) as Sections 70901-52 of Pub. L. No. 117-58. In addition to providing funding for roads, bridges, rails, and high-speed internet access, it created an incentive to increase domestic manufacturing across the country through the inclusion of BABA's "Buy America Preference" (BAP). In general, the BAP requires that all iron, steel, manufactured products, and construction materials used in public infrastructure projects funded with Federal financial assistance (FFA), as outlined in Section 70914(a) of BABA, must be produced in the United States. The intent of the BAP is to stimulate private-sector investments in domestic manufacturing, bolster critical supply chains, and support the creation of well-paying jobs for people in the United States. The preference is also intended to bolster American firms' ability to compete and lead globally for years to come by requiring entities that receive Federal infrastructure funds to use American materials and products.

The BAP applies to all spending on public infrastructure projects by Federal agencies, including HUD. In BABA, and for purposes of this Notice, the Federal infrastructure spending with a BAP is referred to as "Federal financial assistance" or "FFA." Under Section 70912(7), FFA for public infrastructure "projects" includes the "construction, alteration, maintenance, or repair of infrastructure in the United States". Under Section 70914(a), the use of American iron and steel, construction materials, and manufactured products generally applies to funding from CPD programs for public infrastructure projects. However, the BAP does not apply to "pre and post disaster or emergency response expenditures" under Section 70912(4)(B). A list of CPD disaster or emergency funding meeting these criteria can be found in Section IV.

Effective May 14, 2022, the BAP applies to infrastructure spending unless an agency issues a waiver in three limited situations: 1) when applying the domestic content procurement preference would be inconsistent with the public interest, 2) when types of iron, steel, manufactured products or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality, or 3) where the inclusion of those products and materials will increase the cost of the overall project by more than 25 percent. Before issuing a waiver, HUD, must make a detailed written explanation for the proposed determination to issue the waiver publicly available and provide a period of not less than 15 days for public comment on the proposed waiver. Additional details on waivers can be found in Sections VIII and IX of this Notice.

### **A. Federal Government-wide Guidance on BABA**

As a part of the Federal government's support of domestic production and manufacturing through infrastructure investments, OMB and HUD have taken several steps to implement the BAP by providing guidance and issuing HUD general waivers.

On August 23, 2023, OMB issued final rules for 2 CFR Parts 184 and 200 and provided further guidance on implementing the statutory requirements and improving FFA management and transparency (88 Fed. Reg. 57750, effective October 23, 2023). These government-wide regulations apply to HUD programs and provide direction on implementing a BAP waiver process. The new and revised regulations also provide additional guidance on construction material standards, the cost



components of manufactured products, and their definitions.

On October 25, 2023, OMB issued guidance to all Federal agencies on how to implement BABA consistently across the government. The [“Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure” \(M-24-02\)](#) (OMB Guidance) directs Federal agencies, including HUD, on how to apply the BAP and provides an overview of the BAP waiver requirements. OMB may also issue additional or updated guidance in the future, and HUD will update its guidance as necessary.

## **B. HUD Actions and Guidance on BABA**

BABA is a new and complex statute that became effective in 2022. As such, establishing governmentwide guidance on these new statutory requirements has been an iterative process. Since the passage of BABA, HUD has worked diligently to implement the BAP for all HUD programs. Before the law became effective on May 14, 2022, HUD established a Department-wide BABA leadership committee. On June 1, 2022, HUD issued a Request for Information (RFI) to collect public comments on potential BABA implications for HUD grantees (87 FR 33193). To ease the transition in complying with the BAP, HUD proposed and received several general applicability waivers for covered FFA, which includes CPD programs. These waivers and other BABA information are available on HUD’s website at <https://www.hud.gov/baba>. Further details on these waivers and their application to CPD programs are provided in Section V of this Notice.

CPD has taken several actions to notify and communicate with stakeholders and grantees on BABA requirements and their impact on CPD programs. Since Fiscal Year (FY) 2022, all grant transmittal letters and notices of funding opportunities (NOFOs) have included a reference to the BAP under BABA. For the FY2023 and FY2024 funding allocations, all CPD grant agreements with covered FFA included a clause to require that the grantee must comply with BABA, as applicable, which will remain in place for future allocations. Throughout 2023 and 2024, CPD has held BABA information sessions for CPD grantees and operates a dedicated email box at [CPDBABA@hud.gov](mailto:CPDBABA@hud.gov) to answer questions from individual grantees and stakeholders. In October 2023, CPD established a HUD Exchange page ([hudexchange.info/programs/baba/](https://hudexchange.info/programs/baba/)) as a central resource for grantees. CPD has developed technical assistance products, including quick guides, webinars, and frequently asked questions (FAQs), that are available to CPD grantees on this site.

## **II. Definitions**

CPD has aligned its definitions regarding policy interpretations of BABA with regulations at 2 CFR part 184 and Appendix 1 of OMB guidance M-24-02 as stated below.

1. Build America, Buy America Act is defined in 2 CFR § 184.3 and means division G, title IX, subtitle A, parts I–II, sections 70901 through 70927 of the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58).
2. Buy America Preference is defined in 2 CFR § 184.3 and means the “domestic content procurement preference” set forth in section 70914 of BABA, which requires the head of each Federal agency to ensure that none of the funds made available for a Federal award for

an infrastructure project may be obligated unless all of the iron, steel, manufactured products, and construction materials incorporated into the project are produced in the United States.

3. Categorization of Articles. The term “categorization of articles” refers to the requirement that articles, materials, and supplies should only be classified into one of the following categories:
  - i. Iron or steel products;
  - ii. Manufactured products;
  - iii. Construction materials; or
  - iv. Section 70917(c) materials.

Each article, material, or supply should be classified in only one of the categories listed above. In some cases, an article, material, or supply may not fall under any of the categories listed in this paragraph. The classification of an article, material, or supply as falling into one of the categories listed in this paragraph must be made based on its status at the time it is brought to the work site for incorporation into an infrastructure project. In general, the work site is the location of the infrastructure project at which the iron, steel, manufactured products, and construction materials will be incorporated.

4. Component is defined in 2 CFR § 184.3 and means an article, material, or supply, whether manufactured or unmanufactured, incorporated directly into: a manufactured product; or, where applicable, an iron or steel product.
5. Construction Materials is defined in 2 CFR § 184.3 and means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.
  - (1) The listed items are:
    - i. Non-ferrous metals;
    - ii. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
    - iii. Glass (including optic glass);
    - iv. Fiber optic cable (including drop cable);
    - v. Optical fiber;
    - vi. Lumber;
    - vii. Engineered wood, and
    - viii. Drywall.
  - (2) Minor additions of articles, materials, supplies or binding agents to a construction material do not change the categorization of the construction material.
6. Covered Materials includes the following when used in connection with an Infrastructure Project:
  - (A) all iron and steel;

- (B) all Manufactured Products; and
- (C) all Construction Materials.

7. Covered CPD Programs. The term “covered CPD programs” means any Federal financial assistance administered by CPD that is used for public infrastructure projects, excepting expenditures related to pre and post disaster or emergency response.
8. Grantee. The term “grantee,” as defined at 24 CFR 5.100, means the person or legal entity to which a grant is awarded and that is accountable for the use of the funds provided.
9. Federal Financial Assistance (FFA) has the meaning given to the term in 2 CFR 200.1 (or successor regulations) and includes all expenditures by a Federal agency to a Non-Federal Entity for an Infrastructure Project, except that it does not include:
  - (A) expenditures for assistance authorized under section 402, 403, 404, 406, 408, or 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170a, 5170b, 5170c, 5172, 5174, or 5192) relating to a major disaster or emergency declared by the President under section 401 or 501, respectively, of such Act (42 U.S.C. 5170, 5191); or
  - (B) pre and post disaster or emergency response expenditures.
10. Infrastructure as described in 2 CFR 184.4(c), encompasses public infrastructure projects in the United States, which includes, at a minimum: the structures, facilities, and equipment for roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property; and structures, facilities, and equipment that generate, transport, and distribute energy including electric vehicle (EV) charging. See also 2 CFR 184.4(d).
11. Infrastructure Project The term “infrastructure project” is defined in 2 CFR 184.3 and means any activity related to the construction, alteration, maintenance, or repair of public infrastructure in the United States regardless of whether infrastructure is the primary purpose of the project. See also 2 CFR 184.4(c) and (d).
12. Iron and Steel Products The term “iron and steel products” is defined in 2 CFR 184.3 and means articles, materials, or supplies that consists wholly or predominantly of iron or steel, or a combination of both.
13. Predominantly of iron or steel or a combination of both is defined in 2 CFR 184.3 and means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components.

14. Made in America Office. The term “Made in America Office” or “MIAO” means the office at the Office of Management and Budget, established by section 70923 of BABA, that is charged with implementing the BAP and establishing the procedures to review waiver requests.
15. Manufactured Products is defined in 2 CFR 184.3 and means:
- (1) Articles, materials, or supplies that have been:
    - (i) Processed into a specific form and shape; or
    - (ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
  - (2) If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under 2 CFR 184.4(e) and the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 2 CFR 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials.
16. Manufacturer is defined in 2 CFR 184.3 and means the entity that performs the final manufacturing process that produces a manufactured product.
17. Non-Federal Entity means a State, local government, Indian tribe, Institution of Higher Education (IHE), or nonprofit organization that carries out a Federal award as a recipient or subrecipient., as provided in 2 CFR 200.1.
18. Not Listed Construction Materials The term “not listed construction materials” refers to the category of construction materials that are subject to the BAP, but not included in HUD’s specifically listed construction materials, as defined in the Phased Implementation Waiver. This includes:
- i. plastic and polymer-based products other than composite building materials or plastic and polymer-based pipe or tube;
  - ii. glass (including optic glass); and
  - iii. drywall.
19. Obligate means an action taken by HUD that creates a legal liability of the government for the payment of goods and services ordered or received or that administratively recognizes a legal duty on the part of the Agency that could mature into a legal liability by virtue of actions outside of HUD’s control. The milestone in the federal assistance award process that establishes the obligation date varies for each program, but for many CPD programs the obligation date occurs upon HUD’s execution of the grant agreement.
20. OMB Guidance. The term “OMB guidance” refers to 2 CFR Part 184, the "[Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure](#)” (M-24-02), issued October 25, 2023, by the Office of Management and Budget, and any subsequent guidance to rescind or replace M-24-02. This

guidance is applicable to the heads of all Federal agencies for the implementation of BABA's Buy America Preference.

21. Pre and Post Disaster or Emergency Response Expenditures. The term "pre and post disaster or emergency response expenditures" means Federal funding authorized under section 402, 403, 404, 406, 408, or 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) relating to a major disaster or emergency declared by the President under section 401 or 501, respectively. The BAP does not apply to pre- and post-disaster or emergency response expenditures authorized by statutes other than the Stafford Act and made in anticipation of or in response to an event that qualifies as an emergency or major disaster within the meaning of the Stafford Act.
22. Produced in the United States is defined in 2 CFR 184.3 and means:
- i. In the case of iron or steel products, all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
  - ii. In the case of manufactured products:
    - 1. The product was manufactured in the United States; and
    - 2. The cost of components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product. See 2 CFR 184.2(a). The costs of components of a manufactured product are determined according to 2 CFR 184.5.
  - iii. In the case of construction materials, all manufacturing processes for the construction material occurred in the United States. See 2 CFR 184.6 for more information on the meaning of "all manufacturing processes" for specific construction materials.
23. Section 70917(c) Materials. The term "section 70917(c) materials" is defined in 2 CFR 184.3 and means cement and cementitious materials; aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

The Federal Register Notice implementing new BABA regulations at 2 CFR 184 (88 FR 57787) clarifies that all categorizations of Covered Materials should be made based on the status of the material when it arrives at the work site. Section 70917(c) materials that are used at the work site, such as wet concrete or hot asphalt, are not subject to the BAP. However, Section 70917(c) materials may be components of manufactured products if, for example, they are used to produce precast concrete products before being transported to the work site.

24. Specifically listed construction materials. The term "specifically listed construction materials" for HUD programs includes:

- a. non-ferrous metals;
- b. lumber;
- c. composite building materials; and
- d. plastic and polymer-based pipe and tube.

### **III. Applicability of the BAP to CPD Programs and Projects**

The BAP applies to the purchase of iron, steel, manufactured products, and construction materials for Covered CPD Programs when funds are used for the construction, alteration, maintenance, or repair of public infrastructure, as defined by BABA. This list of Covered CPD Programs is subject to change if there are any changes to the eligible uses of funds or the establishment of new programs that fund public infrastructure projects and are covered by BABA. Covered CPD Programs currently include:

- Community Development Block Grant Formula Programs (CDBG)
- Section 108 Loan Guarantee
- HOME Investment Partnerships Program (HOME)
- Housing Trust Fund (HTF)
- Recovery Housing Program (RHP)
- Emergency Solutions Grants (ESG)
- Continuum of Care (CoC)
- Housing Opportunities for Persons With AIDS (HOPWA)
- Self-Help Homeownership Opportunity Program (SHOP)
- Special NOFA for unsheltered and rural homeless
- Veterans Housing Rehabilitation and Modification Program (VHRMP)
- Community Project Funding (CPF)/Economic Development Initiatives (EDI)
- Section 4 Capacity Building
- Rural Capacity Building
- Pathways to Removing Obstacles to Housing (PRO Housing)
- Preservation and Reinvestment Initiative for Community Enhancement (PRICE)
- Continuum of Care Builds Notice of Funding Opportunity (CoCBuilds NOFO)

BABA applies to any project that involves the construction, alteration, maintenance, or repair of public infrastructure, regardless of whether infrastructure is the primary purpose of the project. Since the term “infrastructure” includes the structures, facilities, and equipment for “buildings and real property”, the BAP generally applies to Covered CPD Program funds provided for housing projects. OMB acknowledged at 2 CFR 184.4(d) that some projects may be “private” in nature and are not considered public infrastructure subject to BABA. An example OMB provided in M-24-02 is a project consisting solely of the purchase, construction, or improvement of a private single-family home for personal use.

Through this notice, CPD provides further clarification on when grantees should apply BABA’s requirements to housing projects as described in M-24-02.

1. Housing projects with one to four units are considered “private,” consistent with HUD’s definition of single-family housing. Housing projects with one to four units, including

onsite utilities and related activities are therefore not considered public infrastructure and are not subject to the BAP.

2. Housing projects with five or more units are considered public infrastructure. Housing projects with five or more units are therefore subject to the BAP unless another BABA waiver or exemption applies.

Covered Materials incorporated into the public infrastructure project are subject to the BAP, regardless of the specific project costs for which Covered CPD Program funds are expended. To determine the scope of an individual public infrastructure project for BABA purposes, grantees should use the definition of a project as determined by the Covered CPD Program in question. For example, 24 CFR 92.2 defines a HOME project as “a site or sites together with any building (including a manufactured housing unit) or buildings located on the site(s) that are under common ownership, management, and financing and are to be assisted with HOME funds as a single undertaking under this part. The project includes all the activities associated with the site and building.”<sup>1</sup>

Where no program-specific definition of a project exists, grantees should use the definition of a “project” at 24 CFR 58 to assist with determining project scope: “an activity or group of integrally related activities designed by the recipient to accomplish, in whole or in part, a specific objective.” Grantees cannot split an infrastructure project to avoid application of the BAP to the project, such as by dividing procurements, subgrants, cooperative agreements, etc., into separate and smaller awards or contracts, particularly where the procurements, subgrants, cooperative agreements, etc., are integrally and proximately related to the whole.

#### **IV. CPD Programs and Funding Not Covered by the BAP**

The BAP does not apply to Federal funds for “pre and post disaster or emergency response.” The following list of CPD funds are administered for disaster or emergency-related purposes and therefore the BAP does not apply to them.

- Community Development Block Grant – Disaster Recovery Funds (CDBG-DR)
- Community Development Block Grant – Mitigation (CDBG-MIT)
- Community Development Block Grant – National Disaster Resilience Competition (CDBG-NDR)
- Community Development Block Grant CARES Act (CDBG-CV)
- HOME Investment Partnerships American Rescue Plan Program (HOME-ARP)
- Housing Opportunities for Persons With AIDS CARES Act (HOPWA-CV)
- Emergency Solutions Grants CARES Act (ESG-CV)
- Rapid Unsheltered Survivor Housing (RUSH)

In addition to the funding sources listed above, the BAP does not apply to projects funded solely with program income generated through any Covered CPD Program. Program income is not considered FFA.

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<sup>1</sup> See also 24 CFR 93.2 for HTF, 24 CFR 578.3 for CoC, etc.



BABA does not apply to projects that do not include any construction, alteration, maintenance, or repair of public infrastructure. Equipment, tools, and supplies that are brought to a construction site and removed upon completion of the project or furnishings used within the finished project that are not permanently affixed to the public infrastructure project are not covered by the BAP.

## V. HUD’s General Waivers Applicable to Covered CPD Programs

BABA requirements may be waived by HUD and OMB when applying the BAP would be inconsistent with the public interest, when Covered Materials are not reasonably available in sufficient quantities or quality, or if the inclusion of Covered Materials produced in the United States will increase the overall project by more than 25 percent. The term “general applicability waiver” refers to waivers that have broad applicability across multiple HUD programs. The general applicability waivers for HUD FFA that are currently in effect for all Covered CPD Programs as of publication of this Notice are listed below.

General public interest waivers may be applied to all or a portion of a project without prior approval from HUD when a project meets the conditions established by the waiver. Grantees should maintain documentation demonstrating that the project meets the conditions of each general waiver applied to the project. HUD is responsible for processing and reviewing all waivers, which may only apply prospectively to future expenditures incurred after the effective date of the final waiver. The table below is current as of the publication of this Notice. Details of all proposed and approved waivers can be found at HUD’s website at <https://www.hud.gov/baba>.

General Waiver Type	Purpose	Effective Dates
<b>Public Interest Phased Implementation</b>	HUD issued a public interest waiver, <a href="#"><i>“Public Interest Phased Implementation Waiver for FY 2022 and 2023 of Build America, Buy America Provisions as Applied to Recipients of HUD Federal Financial Assistance”</i></a> to allow for orderly implementation of the BAP across HUD programs. The Phased Implementation Waiver establishes a schedule for the phased implementation of the BAP across CPD programs and infrastructure materials.	The public interest waiver was issued in March 2023 and established a phased implementation schedule for the application of the BAP to HUD programs through FY2025. The BAP has been in effect since November 15, 2022, for the use of iron and steel for infrastructure projects funded with newly obligated FFA through the CDBG program.
<b>Exigent Circumstances</b>	HUD issued a public interest waiver for exigent circumstances, <a href="#"><i>“Public Interest Waiver of Build America, Buy America Provisions for Exigent Circumstances as Applied to Certain Recipients of HUD Federal Financial Assistance”</i></a> . This waiver applies when there is an urgent need by a CPD grantee to immediately	The public interest waiver for exigent circumstances is effective from November 23, 2022, until November 23, 2027, or such shorter time as HUD may announce via Notice.

General Waiver Type	Purpose	Effective Dates
	complete an infrastructure project because of a threat to life, safety, or property of residents and the community.	
<b>De Minimis and Small Grants</b>	<p>HUD issued a public interest titled “<a href="#"><u>Public Interest De Minimis and Small Grants Waiver of Build America, Buy America Provisions as Applied to Certain Recipients of HUD Federal Financial Assistance</u></a>”. This waives the BAP for all infrastructure projects whose total cost (from all funding sources) is equal to or less than the simplified acquisition threshold at 2 CFR 200.1, which is currently \$250,000.</p> <p>This Notice also waives the application of the BAP for a <i>de minimis</i> portion of an infrastructure project, meaning a cumulative total of no more than five percent of the total cost of the iron, steel, manufactured products, and construction materials used in and incorporated into the infrastructure project, up to a maximum of \$1 million.</p>	The public interest <i>de minimis</i> , and small grants waiver is effective from November 23, 2022, until on November 23, 2027, or such shorter time as HUD may announce via Notice.
<b>Tribal Recipients Waiver</b>	HUD issued a public interest waiver, “ <a href="#"><u>Extension of Public Interest, General Applicability Waiver of Build America, Buy America Provisions as Applied to Tribal Recipients of HUD Federal Financial Assistance</u></a> ” for the BAP as it applies to Tribal recipients.	The waiver of the BAP as it applies to Tribal recipients was effective for FFA obligated by HUD from May 23, 2023, until September 30, 2024.
<b>Pacific Island Territory Waiver</b>	HUD issued a “ <a href="#"><u>Public Interest, General Applicability Waiver of Build America, Buy America Provisions as Applied to Pacific Island Territory Recipients of HUD Federal Financial Assistance: Final Notice</u></a> ” which waives the BAP for any FFA used for infrastructure projects in the Commonwealth of the Northern Mariana Islands, Guam, and American Samoa.	The waiver is effective from November 15, 2023, until February 15, 2025.

## **VI. Understanding HUD’s Public Interest Phased Implementation General Waiver**

Under Section 70914(a), the BAP was required to be in effect for all FFA for public infrastructure projects no later than 180 days after it was signed into law. Thus, starting May 14, 2022, all new awards of covered FFA for infrastructure projects obligated by HUD would have been required to comply with the BAP. Due to the short implementation period of 180 days, and to allow for the domestic industry and FFA recipients to have the time and notice necessary to implement BABA efficiently and effectively, HUD issued a Phased Implementation Waiver. This waiver enabled HUD to implement the BAP in an incremental process, resulting in full compliance with the BAP for all HUD obligations in FY 2025.

Covered CPD Programs began applying the BAP to public infrastructure projects beginning with CDBG funds obligated by HUD on and after November 15, 2022. The table below outlines the timeline for applicability of the BAP to each classification of Covered Materials incorporated into public infrastructure projects undertaken with Covered CPD Program funds. The columns identify categories of Covered Materials subject to the BAP and the rows identify covered HUD FFA, some of which are Covered CPD Programs and some of which are FFA from other HUD offices that may contribute funding to CPD-funded projects. Note that HUD’s Phased Implementation Waiver divides the statutorily defined category of construction materials into two separate buckets for purposes of applying the BAP. See definitions of specifically listed and not listed construction materials in Section II.

To use the table, find the program(s) that funds the project under consideration, then identify which Covered Materials will be used in the project. The cell in the table where the applicable row and column intersect indicates the date on which the BAP will begin applying to each classification of Covered Materials used in the project. It is important to note that the date of obligation is typically the date on which HUD executed the legal instrument creating the relationship between HUD and the grantee for an award of FFA, commonly the date the grant agreement is signed by HUD. The date on which the grantee commits funds to a project or awards funds to a subrecipient does not impact applicability of the BAP.

For example, a grantee uses FY24 CDBG funding to build a new senior center and the HUD grant agreement was signed by the CPD Director on September 15, 2024. The grantee would use the phased implementation table to determine that:

- Since the funds were from FY24 appropriations and HUD executed the grant agreement after November 15, 2022, the BAP applies to all iron or steel materials and any specifically listed construction materials incorporated into the public infrastructure project; and
- Any not listed construction materials and manufactured products incorporated into the project are not subject to the BAP.
- However, if the grantee were to add funds from an FY25 CDBG grant in the future, then the BAP would apply to all Covered Materials used in the public infrastructure project.

A public infrastructure project may use funding from multiple Covered CPD Programs that impose the BAP to Covered Materials at different points in time. In that case, the procurement of Covered Materials for the project must comply with the program that applies the BAP most broadly.

For example, a public infrastructure project uses FY23 CDBG funding and FY24 HOME funding in the construction of a new multifamily housing development with 12 total units. HUD executed the CDBG grant agreement on September 15, 2023, and HUD executed the HOME grant agreement on September 12, 2024. The phased implementation table is used to determine that:

- HUD executed the CDBG grant agreement after November 15, 2022, but prior to FY24 appropriations. The BAP would apply to iron and steel products incorporated in the public infrastructure project.
- HUD executed the HOME grant agreement after August 23, 2024. The BAP would apply to iron and steel products, construction materials, and manufactured products (all Covered Materials) incorporated into the public infrastructure project.
- In this case, the HOME requirements are broader. Therefore, the procurement of all iron and steel products, construction materials, and manufactured products incorporated in the public infrastructure project must comply with the BAP.

Grantees who are considering adding Covered CPD Program funds for construction, maintenance, alteration, or repair of an infrastructure project that was not previously subject to BABA should contact their local CPD Field Office for technical assistance.

<b>BAP will apply to...</b>	<b>Iron and Steel</b>	<b>Construction Materials – Specifically Listed</b>	<b>Construction Materials – Not Listed</b>	<b>Manufactured Products</b>
<b>CDBG Formula Grants</b>	All funds obligated on or after November 15, 2022	As of the date HUD obligates new FFA from Fiscal Year 2024 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations
<b>Choice Neighborhood, Lead Hazard Reduction, and Healthy Homes Production Grants</b>	New FFA obligated by HUD on or after February 22, 2023	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024
<b>Recovery Housing Program (RHP) Grants</b>	New FFA obligated by HUD on or after August 23, 2023	As of the date HUD obligates new FFA from Fiscal Year 2024 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations	As of the date HUD obligates new FFA from Fiscal Year 2025 appropriations
<b>All other HUD FFA except HOME, Housing Trust Fund, and Public Housing FFA used for maintenance projects</b>	New FFA obligated by HUD on or after February 22, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024
<b>HOME, Housing Trust Fund, and Public Housing FFA used for maintenance projects</b>	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024	New FFA obligated by HUD on or after August 23, 2024

## **VII. Applying the BAP and HUD General Waivers to Covered CPD Programs**

Grantees should assess each project undertaken with Covered CPD Program funds to determine which Covered Materials incorporated into the project are subject to the BAP based on the effective dates in the Phased Implementation Waiver described above. This section describes the process grantees should follow to determine whether a project is subject to the BAP and if the project may be exempted in whole or in part by one of HUD’s general waivers.

As a part of its record-keeping, a CPD grantee should document its process to analyze if the

BAP applies to a public infrastructure project using the approach described below. An optional “Buy America Preference Applicability Checklist” is included in Appendix 2 of this Notice. Grantees may choose to use or adapt the tool to serve as a record of the analysis completed for each project.

### **Step 1: Type of project/activity**

Determine if the project is a public infrastructure project as defined in Sections II and III of this Notice. If the project is a public infrastructure project, the analysis continues to step 2.

### **Step 2: Funding sources**

Identify the source(s) of the project funding, including Covered CPD Programs, other HUD funds, or other Federal agency funding. If the project includes funding from a Covered CPD Program listed in this Notice, the analysis continues to Step 3.

### **Step 3: Covered Materials**

Identify and classify all the materials that will be incorporated into the project. Each material should be classified into only one category: iron and steel, specifically listed construction materials, not listed construction materials, or manufactured products. It is important to classify all Covered Materials used in the project to accurately determine BAP applicability because the BAP may only apply to some Covered Materials used in the project under the Phased Implementation Waiver.

The classification must be made based on the material’s status at the time it is brought to the location for incorporation into a public infrastructure project. If the project contains any Covered Materials, continue to Step 4.

### **Step 4: Date of obligation**

Use the phased implementation table provided in Section VI of this Notice to determine when the BAP applies to each classification of Covered Materials, based on the obligation date for the Covered CPD Program funds. If the project uses any Covered CPD Program funds subject to the BAP based on the HUD obligation date, identify which Covered Materials must be produced in the United States. The obligation date is generally the date that HUD makes a legal commitment for Covered CPD Program funds to the grantee. The date on which a grantee commits funds to a specific project does not impact the applicability of the BAP.

The obligation date is typically when HUD executes the grant agreement, but this may vary by program. For example, the obligation date for CDBG funds can be found in the CDBG grant agreement. Refer to Appendix 1 or contact your local CPD Field Office for assistance regarding the obligation date. If the project needs a waiver of the BAP for any Covered Materials, continue the analysis to Step 5.

## **Step 5: General waivers**

Analyze each available HUD general waiver, based upon the specific requirements of that waiver. Public infrastructure projects that meet the conditions of a general waiver may be exempt in whole or in part from the BAP. Most HUD general waivers provide exemptions for an entire public infrastructure project that meets the waiver's conditions. Grantees that apply a general waiver to an entire project should maintain documentation in their project records.

The *De Minimis and Small Grants Waiver* is uniquely useful for public infrastructure projects that are not covered in their entirety by the other general waivers. The *De Minimis and Small Grants Waiver* offers flexibility to incorporate Covered Materials of foreign or unknown origin up to 5% of the total cost of Covered Materials used in the project or \$1 million, whichever is less. The total cost of Covered Materials includes all classifications of materials, regardless of whether they are subject to the BAP based on HUD's Phased Implementation Waiver. This waiver advances compliance with the BAP by reducing the administrative burden to grantees where the costs of compliance with the BAP could distract from the focus on higher value BAP-compliant items. When using the *De Minimis* waiver, the grantee should document which Covered Materials the waiver was applied to in the project records.

For example, if the total cost of Covered Materials in a project is \$100,000, then the grantee should calculate 5% of that total, which equals \$5,000. The grantee may use the *De Minimis* waiver to use Covered Materials from foreign or unknown sources up to \$5,000. This flexibility can be used towards a specific high-value item or multiple items with lesser values, up to a total of \$5,000.

Grantees should calculate this limit for all public infrastructure projects and maximize this flexibility before seeking project-/product-specific waivers. For projects where general waivers do not provide relief for Covered Materials that cannot be procured from domestic sources, a project-/product-specific waiver may be appropriate. Continue the analysis in Step 6.

## **Step 6: Project-/Product-Specific Waivers**

If the BAP applies to a project and all general waiver flexibilities have been utilized, but there are remaining Covered Materials that can only be sourced from foreign or unknown sources, then a grantee may apply for a project-/product-specific waiver. Prior to submitting a project-/product-specific waiver, the grantee must conduct market research to demonstrate its efforts to procure domestic products. One optional resource for conducting market research is the National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP) center in the grantee's state. Grantees are encouraged to collaborate with relevant members of the project team to identify Covered Materials that cannot be obtained from domestic sources as early as possible in the project life cycle. [NIST MEP's free supplier scouting resources](#) can attempt to identify a domestic manufacturer that can supply the necessary materials or conduct the necessary market research to support the need for a project-/product-specific waiver.

As a part of its record-keeping, a grantee should document its process to analyze how the



BAP applies to a public infrastructure project using the approach described in this section and in Appendix 2. Grantees may also consult their local CPD Field Office for assistance in confirming the analysis completed for a specific project before applying for a project-/product-specific waiver.

### **VIII. Federal Government-wide Guidance on Project-/Product-Specific Waivers**

Once a grantee has completed the analysis described in Section VII and determined that a project-/product-specific waiver is required, the grantee should consider which type of project/product-specific waiver is appropriate, as described below.

The three types of project-/product-specific waivers for which a grantee may apply are described below.

1. A **nonavailability waiver** may be requested if the types of iron, steel, manufactured products, or construction materials required for the project are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality
2. An **unreasonable cost waiver** may be requested when the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.
3. A **public interest waiver** may be requested if the use of American made products would be inconsistent with the public interest. Grantees should explain how waiving the BABA requirement for this project or covered material will serve the public interest and demonstrate definite impacts on the community if specific items, products, or materials are not utilized in an infrastructure project to support this waiver type.

#### **A. Waivers for Infrastructure Projects Funded by Multiple Federal Agencies**

If a waiver is required for a public infrastructure project funded by multiple Federal agencies, the Federal agency contributing the greatest amount of Federal funds for the project may be considered the Cognizant Agency for Made in America (“Cognizant Agency”) and may take responsibility for coordinating with the other Federal awarding agencies. Each Federal agency waiving the BAP must make its own waiver determination. A Cognizant Agency cannot independently issue a waiver that applies to other agencies. Grantees that fund public infrastructure projects with other Federal agencies should contact the local CPD office as early as possible to coordinate review with other Federal agencies in the event a project-/product-specific waiver is needed.

OMB guidance outlined the waiver review process for agencies to follow before issuing a waiver. Based on this guidance, HUD has developed a Department-wide project-/product-specific waiver submission process, described in Section IX.

## IX. Applying for a HUD Specific Waiver

This section describes the process a grantee should follow to request a project-/product-specific waiver. Only the direct HUD recipient should submit a waiver request. Subrecipients and/or subcontractors may not submit a waiver request. The direct recipient should work with project partners to obtain necessary information. Project-/product-specific waivers cannot be approved retroactively for items that have already been purchased or incorporated into a project, so grantees should determine if a project-/product-specific waiver is needed as early as possible in the planning process.

1. Complete the BAP analysis described in Section VII of this Notice to confirm that the project is subject to the BAP and that the grantee has maximized the flexibility provided by HUD general waivers. Grantees may use the optional recordkeeping tool in Appendix 2 and contact the local CPD Field Office if technical assistance is needed.
  - a) This step should always include calculating the *De Minimis* limit allowed by HUD's *De Minimis* waiver and applying that flexibility to the products used in the project that cannot be procured from domestic manufacturers, as described in Section VII, Step 5.
2. Complete the necessary market research to support the need for a waiver. Market research may be completed by the grantee or the subrecipient/contractor who has been awarded funds and is purchasing the materials that will be incorporated into the infrastructure project. Acceptable market research strategies may include one or more of the following:
  - b) Document the report showing results of supplier scouting services provided by the NIST MEP, or similar supplier scouting service. For more information about the supplier scouting process, contact the [local MEP center](#).
  - c) Document that the purchaser has made a good faith effort to contact a minimum of three (3) manufacturers or suppliers to determine if a BABA-compliant material is available in sufficient quantity and satisfactory quality. Documentation may include PDF files or screenshots of Internet searches or email communications, or documentation of phone conversations that notes the date and time of the call, the contact person with whom the purchaser spoke, and a summary of the information received.
3. Collect the required information to complete a waiver application using HUD's [BABA Waiver Submission Site \(https://babawaiver.hud.gov/s/\)](https://babawaiver.hud.gov/s/). Access the [PDF version](#) of the application form to see questions ahead of time to assist with preparation. Once started, the application cannot be saved, so make sure all information has been collected in advance.
4. Submit a BABA waiver application through the BABA Waiver Submission Site. For help with completing the application, access the [Grantee User Manual](#) or view the [BABA Waiver System Training video](#). For additional technical assistance navigating the waiver system, please email [BuildAmericaBuyAmerica@hud.gov](mailto:BuildAmericaBuyAmerica@hud.gov).
5. HUD may contact the grantee for additional information as part of a review of the waiver application to validate the need for a waiver.

6. If an application is approved, HUD will post the proposed waiver in the Federal Register for a minimum 15-day public comment period and submit the request to the Made In America Office (MIAO). The MIAO will then review the proposed waiver and public comments for final approval, and communicate a final decision to HUD, which will communicate it to the grantee.

## **X. Documentation of Compliance with the BAP**

This section describes documentation that grantees should maintain to demonstrate compliance with the BAP for Covered Materials, including required terms and conditions of subawards. Project records should describe the public infrastructure project, identify the Covered Materials subject to the BAP, and include documentation that all iron and steel, manufactured products, and construction materials were produced in the United States or evidence of how a waiver was applicable.

Grantees are encouraged to coordinate with relevant members of the public infrastructure project team to ensure that the Covered Materials delivered to the project site are accompanied by documentation that demonstrates compliance with the BAP. Early and frequent coordination, such as pre-bid meetings to identify any Covered Materials that may be a challenge to source domestically, are recommended.

Grantees must maintain documentation of compliance with the BAP in hard copy or electronic formats, or in grant management software and must make it available to HUD upon request for monitoring purposes. Records should be consistent with existing records retention requirements for each of the Covered CPD programs. If there are no CPD program-specific records requirements, the CPD grantee may follow “retention requirements for records,” under 2 CFR § 200.334 as applicable to Federal grants. The compliance documentation must support the following:

- Documentation of the determination of BAP applicability to the Covered Materials used in the public infrastructure project. Even if the project is determined to be exempt, documentation of that determination should be retained in the grant files to support the determination. See Section VII and the optional BAP Applicability Checklist in Appendix 2.
- If a project is subject to the BAP, documentation that all Covered Materials subject to the BAP were procured from BABA-compliant sources, as determined by HUD’s Phased Implementation Waiver.
- If a general waiver was applied to the project, documentation that supports that the project meets the conditions of the waiver.
- If a project-/product-specific waiver was obtained for the project, a copy of the approved waiver and market research supporting the need for the waiver.

CPD grantees are required to identify whether an activity is an infrastructure project, as defined by BABA, in the Integrated Disbursement and Information System (IDIS) or the Disaster Recovery Grant Reporting System (DRGR), depending on the covered CPD program. Grantees will be prompted to answer a question regarding BAP applicability when creating a new activity or adding new funds to an existing activity. Grantees should answer the question based on the analysis in Section VII.

If the project is subject to the BAP requirements, the following are examples of information and documentation that the grantee may retain to demonstrate compliance. This is not an exhaustive or mandatory list and simply provides examples of documentation that can be maintained to support the conditions outlined above.

- A. Project budget specifying the total project cost and the cost of Covered Materials.
- B. Procurement list(s) of Covered Materials purchased for the public infrastructure project, either by the grantee, subrecipient, or contractor. This list(s) should reflect, for example:
  - a. Type of covered material, (iron, steel, manufactured product, or construction material);
  - b. Product or Material;
  - c. FFA Source(s);
  - d. FFA Obligation Date(s);
  - e. Costs per unit;
  - f. Total cost of product purchase or contract;
  - g. Manufacturer or Vendor;
  - h. Actual purchaser (grantee, sub-recipient, contractor);
  - i. Special Quality Standards, if applicable; and
  - j. U.S. Made verification, if available (Made in the USA label, product specifications, vendor or contractor certification, etc.).
- C. Documentation supporting the Covered Materials incorporated into the public infrastructure were made in the United States, for example:
  - a. A copy of the label indicating the product was made in the United States;
  - b. A copy of the product description or technical specifications that provides sufficient detail to conclude that the Covered Materials comply with BABA;
  - c. A certificate or other documentation from the manufacturer demonstrating that the Covered Materials comply with BABA;
  - d. A signed certification from the contractor of a project certifying compliance with BABA. (See Appendix 3 for an example.);
  - e. A signed certification from the manufacturer of the Covered Materials certifying compliance with BABA.
- D. Results of market research and product sourcing to include, for example, the following:
  - a. Results of a supplier scouting search conducted by NIST MEP or another supplier scouting service;
  - b. Copies of web searches used (e.g., PDF/JPEG copies of web pages showing search terms and results including sources considered, eliminated, and chosen for further research);
  - c. Copies of email, fax, or mail correspondence with Covered Materials manufacturers or suppliers; and

- d. Records of phone communications with Covered Materials manufacturers or suppliers, including:
  - i. Dates and times of phone calls,
  - ii. Phone numbers used,
  - iii. Whether the phone communication was successful in making it possible to reach a staff person manufacturer or supplier able to respond to questions about BABA compliance, or whether the attempt at communication was 14 unsuccessful (e.g., left a message, phone line was busy, or phone line was disconnected),
  - iv. If the phone communication resulted in reaching someone, the name of the person contacted,
  - v. Notes describing the substance of the conversation (e.g., manufactured product is assembled in U.S., but the manufacturer is uncertain whether 55% of the value of the materials/components are sourced in the United States).

## **XI. Subrecipient Compliance with BABA Requirements**

The terms and conditions of Federal awards attach to the FFA and flow down to subrecipients at all tiers. This means that all subgrantees, contractors, developers, etc., who receive Covered CPD Program funds through a CPD grantee must comply with BABA requirements. Language notifying subrecipients that the procurement of materials for public infrastructure projects must comply with the BAP must be included in all subawards, contracts, purchase orders, requests for proposals, and all other relevant procurement and bid documents. Sample language that grantees may use for this purpose is included below.

“Pursuant to the Build America, Buy America Act (BABA), enacted as part of the Infrastructure Investment and Jobs Act (IIJA). Pub. L. 117-58, 41 U.S.C. § 8301 note, the Federal Financial Assistance used to fund this infrastructure project is required to apply a domestic content procurement preference (the “Buy America Preference” or “BAP”) for all construction, alteration, maintenance, or repair of infrastructure, including buildings and real property, unless application of the BAP has been waived by HUD. Additional details on fulfilling the BABA requirements can be found at <https://www.hud.gov/baba>.

## **XII. Contact Information**

Grantees that have questions on this Notice should contact their assigned CPD Field Office Representative or request technical assistance from CPD staff at CPDBABA@hud.gov.

## **Appendix 1 - Frequently Asked Questions**

This Notice includes CPD-specific frequently asked questions (FAQs). For additional FAQs, please view the BABA HUDEXchange site, [hudexchange.info/programs/baba](http://hudexchange.info/programs/baba).

### **1. What projects or activities does the BAP apply to?**

The BAP applies to the Covered Materials used in construction, alteration, maintenance, or repair of public infrastructure projects funded by Covered CPD Programs. The term “infrastructure” includes the structures, facilities, and equipment for projects traditionally considered infrastructure, and buildings and real property. For CPD programs, this may include, but is not limited to, certain funding for:

- road and sidewalk improvement projects;
- water, sewer, and other utility projects;
- broadband infrastructure;
- affordable housing construction and rehabilitation of buildings with five or more units;
- community facility construction and rehabilitation;
- homeless shelter construction and rehabilitation; and
- other activities that are defined as public infrastructure according to BABA.

### **2. What projects or activities are not subject to the BAP?**

The BAP does not apply to projects undertaken with Covered CPD Program funds that do not involve any construction, alteration, maintenance, or repair of public infrastructure. Examples of CPD-funded projects to which the BAP does not apply include planning, capacity building, program administration, public services, training, counseling, short-term rental assistance, land acquisition and demolition projects where there are no articles, materials or supplies that are consumed in, incorporated into, or affixed to infrastructure. The BAP does not apply to affordable housing development projects with one to four units.

### **3. How can I find products that are Made in the USA?**

The Federal Trade Commission requires that products advertised or labeled as “Made in the USA” are generally assembled with parts and materials made of U.S. origin. Some manufacturers provide certification letters available on their website or upon request. HUD encourages grantees to coordinate with their local NIST [Manufacturing Extension Partnership \(MEP\)](#) center or similar supplier scouting service to find potential domestic manufacturers of items that cannot readily be sourced domestically.

### **4. If a project is already underway with funds not subject to the BAP and new funding is added that is subject to the BAP, does the entire project need to comply with the BAP?**

Yes, if any funds subject to the BAP are included in a project, the entire project must comply with the BAP for Covered Materials based on HUD’s and any other applicable

general waivers, regardless of when the project was originally funded. Grantees who are considering adding Covered CPD Program funds for construction, maintenance, alteration or repair of an infrastructure project that was not previously subject to BABA requirements, should contact the local CPD Field Office for technical assistance.

**5. How do I find the obligation date of my grant?**

The obligation date is, in most cases, the date the grant agreement was signed by the CPD Director. You can locate this date by looking at the original grant agreement or navigating to IDIS or DRGR. For grants managed in IDIS, navigate to the View Grant screen and locate the date in the Obligation Date field. For grants managed in DRGR, navigate to the View Grant screen and locate the Contract Effective Date.



## Appendix 2 - Optional Buy America Preference Applicability Checklist

This checklist is an optional tool that may be used or adapted to assist with determining if the Buy America Preference (BAP) applies to a public infrastructure project funded by a covered CPD program. This checklist follows the analysis steps as described in Section VII of Notice CPD-25-01 and may be retained for recordkeeping purposes.

### Project Information

<b>Grantee</b>	
<b>Grant Number</b>	
<b>Activity Name</b>	
<b>Activity Number (IDIS/DRGR)</b>	

**Step 1.** Determine if the project is a public infrastructure project as defined in Sections II and III of Notice CPD-25-01.

<input type="checkbox"/> Yes	Continue to Step 2.
<input type="checkbox"/> No	The BAP does not apply. The BAP only applies to public infrastructure projects. Stop here.

**Step 2.** Is the project funded using a Covered CPD Program?

Check the box below for each CPD program funding this project.

### Group A: Covered CPD Programs

<input type="checkbox"/>	CDBG	<input type="checkbox"/>	SHOP
<input type="checkbox"/>	Section 108	<input type="checkbox"/>	VHRMP
<input type="checkbox"/>	HOME	<input type="checkbox"/>	CPF/EDI
<input type="checkbox"/>	HTF	<input type="checkbox"/>	Section 4
<input type="checkbox"/>	RHP	<input type="checkbox"/>	Rural Capacity Building
<input type="checkbox"/>	ESG	<input type="checkbox"/>	PRO Housing
<input type="checkbox"/>	CoC	<input type="checkbox"/>	PRICE
<input type="checkbox"/>	HOPWA	<input type="checkbox"/>	FY23 PSH Funds

### Group B: CPD Programs Not Covered by the BAP

<input type="checkbox"/>	CDBG-DR	<input type="checkbox"/>	CDBG-CV
<input type="checkbox"/>	CDBG-MIT	<input type="checkbox"/>	HOPWA-CV
<input type="checkbox"/>	CDBG-NDR	<input type="checkbox"/>	ESG-CV
<input type="checkbox"/>	HOME-ARP		

If you selected **any** Group A programs (even if Group B programs are also selected), answer yes. If you selected **only** Group B programs, answer no.

<input type="checkbox"/> Yes	Continue to Step 3.
<input type="checkbox"/> No	The BAP does not apply to this project because it is not funded by a covered CPD program. Stop here.

**Step 3.** Will the project use Covered Materials?

*Each material should be classified into only one category: iron and steel, specifically listed construction materials, not listed construction materials, or manufactured products. This classification is necessary to apply HUD's Phased Implementation Waiver.*

Check the box below for each type of covered material incorporated into this infrastructure project.

<input type="checkbox"/>	Iron or steel
<input type="checkbox"/>	Specifically Listed Construction materials
<input type="checkbox"/>	Not Listed Construction materials
<input type="checkbox"/>	Manufactured products

If you checked any boxes above, answer yes.

<input type="checkbox"/> Yes	Continue to Step 4.
<input type="checkbox"/> No	The BAP does not apply to this project because it will not incorporate any Covered Materials. Stop here.

Analysis continues on next page.

**Step 4.** Based on the obligation date of the covered CPD program funds, does the BAP apply to the funding source and Covered Materials that will be used in the project?

*Use the phased implementation table to determine whether the BAP applies based on the obligation date for the covered CPD program funds and classification of materials. The BAP may only apply to some Covered Materials used in the project.*

*The obligation date is generally the date that HUD executed the grant agreement for covered CPD program funds to the grantee. This date may be found in the grant agreement. The obligation date is not the date when the grantee commits funds to a project under a subrecipient agreement.*

<b>BAP will apply to...</b>	<b>Iron and Steel</b>	<b>Specifically Listed Construction Materials</b>	<b>Not Listed Construction Materials</b>	<b>Manufactured Products</b>
<b>CDBG</b>	CDBG funds obligated on or after 11/15/22	Projects using FY24 CDBG funds	Projects using FY25 CDBG funds	Projects using FY25 funds.
<b>RHP</b>	RHP funds obligated on or after 8/23/23	RHP funds obligated on or after 8/23/24	RHP funds obligated on or after 8/23/24	RHP funds obligated on or after 8/23/24
<b>All other CPD programs except HOME and HTF</b>	Funds obligated on or after 2/22/24	Funds obligated on or after 8/23/24	Funds obligated on or after 8/23/24	Funds obligated on or after 8/23/24
<b>HOME and HTF</b>	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24	HOME or HTF funds obligated on or after 8/23/24

<input type="checkbox"/> Yes	Indicate here which Covered Materials the BAP applies to and continue to Step 5: <input type="checkbox"/> Iron and steel <input type="checkbox"/> Specifically listed construction materials <input type="checkbox"/> Not listed construction materials <input type="checkbox"/> Manufactured products
<input type="checkbox"/> No	The BAP does not apply to this project because the funds were obligated before the effective date for the program/materials used in the project. Stop here.

**Step 5.** HUD has issued several general waivers. Check the box next to any conditions that apply to the project.

*Public infrastructure projects that meet the conditions of a general waiver may be exempt in whole or in part from the BAP.*

<input type="checkbox"/>	The total cost of the project from all sources (Federal and non-Federal) is \$250,000 or less. If checked, the Small Grants Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	There is an urgent need to immediately complete the project because of a threat to life, safety, or property. If checked, the Exigent Circumstances Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	The project is in Guam, American Samoa, or the Northern Mariana Islands. If checked, the Pacific Island Territories Waiver applies, and the project is exempt from the BAP.
<input type="checkbox"/>	The project is being funded by a Tribal recipient. If checked, the Tribal Recipients Waiver applies, and the project is exempt from the BAP.

If you checked any of the boxes above, answer yes below.

<input type="checkbox"/> Yes	The HUD general waiver selected above is being applied to this project, so the BAP does not apply to the entire project. Attach documentation of the conditions of the waiver and then stop here.
<input type="checkbox"/> No	Proceed to Step 5a.

**Step 5a.** Calculate the *De Minimis* limit for the project:

*The total cost of all Covered Materials includes all iron and steel, construction materials, and manufactured products used in the project, regardless of whether the BAP currently applies under the Phased Implementation Waiver.*

Enter the total cost of all Covered Materials:	
Multiply that amount by 0.05 (5%):	
Enter the lower of the number calculated in the row above or \$1,000,000:	

The amount in the third row above is the *De Minimis* limit for this project. The BAP can be waived for Covered Materials from foreign or unknown sources at a cost not to exceed the *De Minimis* limit of 5% of the total cost of materials or \$1,000,000 (whichever is less). The BAP

will still apply to other Covered Materials used in the project. **Attach a list of Covered Materials and their associated costs to which the *De Minimis* limit has been applied.**

**Step 6.** Is there a need for a project-/product-specific waiver?

*If the BAP applies to a project and all general waiver flexibilities have been utilized, but there are remaining Covered Materials that can only be sourced from foreign or unknown sources, then a grantee may apply for a project-/product-specific waiver.*

<input type="checkbox"/> Yes	Refer to guidance in Section VII Step 6 of Notice CPD 25-01.
<input type="checkbox"/> No	Stop here and retain this analysis in project records.

\_\_\_\_\_  
Completed by

\_\_\_\_\_  
Date Completed

### Appendix 3 - Optional Buy America Preference Certification

#### Project Information

<b>Grantee</b>	
<b>Grant Number</b>	
<b>Activity Name</b>	
<b>Activity Number (IDIS/DRGR)</b>	

This “*Optional Buy America Preference Certification*” is used to certify that, as required by the Build America, Buy America (BABA) Act, all of the iron, steel, manufactured products, and construction materials incorporated into a public infrastructure project are produced in the United States, unless exempted by a HUD general waiver or a project-/product-specific waiver approved by HUD and the Made in America Office (MIAO) at the Office of Management and Budget (OMB).

For Covered Materials not otherwise exempted from the Buy America Preference (BAP), the undersigned certifies the following:

- All iron and steel used in the project are produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- All manufactured products used in the project are produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product; and
- All construction materials used in the project are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.

***Attach a list of all Covered Materials procured by the signatory and used in the project.***

I/We, the undersigned, certify under penalty of perjury that the information provided above is true and correct. WARNING: Anyone who knowingly submits a false claim or makes a false statement is subject to criminal and/or civil penalties, including confinement for up to 5 years, fines, and civil and administrative penalties. (18 U.S.C. §§ 287, 1001, 1010, 1012, 1014; 31 U.S.C. §§ 3729, 3802).

<b>Signature</b>	<b>Title/Organization</b>	<b>Date</b>

# **EXHIBIT N**

## **SECTION 3 COMPLIANCE REQUIREMENTS**

### **ECONOMIC OPPORTUNITY FOR LOW AND VERY LOW-INCOME PERSONS**

#### **NEW MOORPARK CITY LIBRARY PROJECT**



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## SECTION 3 PLAN

### I. Purpose

Section 3 of the Housing and Urban Development Act of 1968, as amended by the Housing and Community Development Act of 1992 (12 U.S.C. 1701u) (Section 3), contributes to the establishment of stronger, more sustainable communities by ensuring that employment and other economic opportunities generated by Federal financial assistance for housing and community development programs are, to the greatest extent feasible, directed toward low- and very low-income persons, particularly those who receive government assistance for housing.

Section 3 is the legal basis for providing jobs for residents and awarding contracts to businesses in areas where a project involving construction, demolition, or rehabilitation receives HUD financial assistance in excess of **\$200,000** (aggregate of all awards) in federal funding that requires compliance with Section 3. Section 3 requirements apply to an entire Section 3 Project, regardless of whether the project is fully or partially assisted under HUD programs that provide Federal Financial Assistance.

In the event that a Section 3 Project generates economic opportunities (training, employment or contracts), these opportunities **must** be directed toward Section 3 Workers **and/or** Section 3 Business Concerns, as defined below. The purpose of Section 3 preferences is to be results oriented by: 1) encouraging business concerns that are not major sources of employment for low-income persons to increase their employment of these persons when economic opportunities arise from HUD financed construction related projects; and 2) promoting the growth of "profit-making" enterprises owned by low-income persons that substantially employ low-income persons with Section 3 contract awards.

Title 24 CFR Part 75 - Economic Opportunities for Low- and Very Low-Income Persons ("Final Rule") establishes the requirements to be followed to ensure the objectives of Section 3 are met, and is what this Section 3 Plan is based upon. The full regulation may be found at [https://www.ecfr.gov/cgi-bin/text-idx?SID=8bad10ac17bc38fff3da0e4bd40211d2&mc=true&tpl=/ecfrbrowse/Title24/24cfr75\\_main\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?SID=8bad10ac17bc38fff3da0e4bd40211d2&mc=true&tpl=/ecfrbrowse/Title24/24cfr75_main_02.tpl)

## II. Definitions

**1937 Act** - the United States Housing Act of 1937, 42 U.S.C. 1437 et seq.

**Area Median Income (AMI)** – income limits set annually by the Department of Housing and Urban Development (HUD) to determine eligibility for HUD-funded programs, including Housing and Community Development Financial Assistance subject to this Plan.

**Contractor** - any entity entering into a contract with: (1) the City; (2) a Subrecipient for work in connection with a Section 3 Project.

**Employment Opportunities** - with respect to Section 3 covered Housing and Community Development Financial Assistance, this term means **all** employment opportunities arising in connection with the Section 3 Project **including** management and administrative jobs. Sample job categories and descriptions are listed in **Attachment I**.

**Full Time** - a position that is temporary, seasonal, or permanent that requires at least 1,750 hours of employment on an annual basis.

**Housing and Community Development Financial Assistance** – housing rehabilitation, housing construction, and other public construction projects assisted under HUD programs that provide financial assistance when the total amount of assistance to the project from all federal sources exceeds a threshold of \$200,000.

**Labor Hours** - the number of paid hours worked by persons on a Section 3 Project or by persons employed with funds that include Public Housing Financial Assistance.

**Low-Income** - families (including single persons) whose income does not exceed 80% of the (adjusted) median family income of the Primary Metropolitan Statistical Area. See **Attachment E**.

**Material Supply Contracts** - contracts for the purchase of products and materials, including, but not limited to, lumber, drywall, wiring, concrete, pipes, toilets, sinks, carpets, and office supplies.

**Primary Metropolitan Statistical Area (PMSA)** - As established by the Office of Management and Budget, the entire geographic area encompassed by the political boundaries of the County of Ventura has been defined as the PMSA for this Section 3 Plan.

**Professional Services** - non-construction services that require an advanced degree or professional licensing, including, but not limited to, contracts for legal services, financial consulting, accounting services, environmental assessment, architectural services, and civil engineering services.

**Section 3** - Section 3 of the Housing and Urban Development Act of 1968, as amended (12 U.S.C. 1701u).

**Section 3 Business Concern** - means:

(1) A business concern meeting at least one of the following criteria, documented within the last six-month period:

- (i) It is at least 51 percent owned and controlled by low- or very low-income persons;
- (ii) Over 75 percent of the labor hours performed for the business over the prior three-month period

are performed by Section 3 workers; or

(iii) It is a business at least 51 percent owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.

(2) The status of a Section 3 business concern shall not be negatively affected by a prior arrest or conviction of its owner(s) or employees.

(3) Nothing in this part shall be construed to require the contracting or subcontracting of a Section 3 Business Concern. Section 3 Business Concerns are not exempt from meeting the specifications of the contract.

**Section 3 Contract** - a contract or subcontract (including contracts for Professional Services) awarded by the City of Moorpark or a Contractor/Subcontractor for work generated by the expenditure of Housing and Community Development Financial Assistance, or for work arising in connection with a Section 3 Project. This definition does not include contracts for the purchase of supplies and materials. However, whenever a contract for materials includes the installation of the materials, that contract constitutes a Section 3 Contract.

**Section 3 Project** - a project, as defined in § 75.3(a)(2) of the Final Rule, consisting of housing rehabilitation, housing construction, or other public construction projects assisted under HUD programs that provide Housing and Community Development Financial Assistance when the total amount of assistance to the project exceeds a threshold of \$200,000.

**Section 3 Worker** - means:

(1) Any worker who currently fits or when hired within the past five years fit at least one of the following categories, as documented:

(i) The worker's income in the year in which they qualified as a Section 3 Worker is below the income limit established by HUD (80% AMI for CDBG and HOME-assisted projects).

(ii) The worker is employed by a Section 3 Business Concern.

(iii) The worker is a YouthBuild participant.

(2) The status of a Section 3 worker shall not be negatively affected by a prior arrest or conviction.

(3) Nothing in this part shall be construed to require the employment of someone who meets this definition of a Section 3 worker. Section 3 workers are not exempt from meeting the qualifications of the position to be filled.

**Service Area or the Neighborhood of the Project** - an area within one mile of the Section 3 Project or, if fewer than 5,000 people live within one mile of a Section 3 Project, within a circle centered on the Section 3 Project that is sufficient to encompass a population of 5,000 people according to the most recent U.S. Census.

**Subcontractor** - any entity that has a contract with a Contractor to undertake a portion of the Contractor's obligation to perform work in connection with a Section 3 Project.

**Targeted Section 3 Worker** has the meanings provided in §§ 75.11, 75.21, or 75.29 of the Final Rule, and does not exclude an individual that has a prior arrest or conviction. Targeted Section 3 Worker is a sub-category of a Section 3 Worker. References to Section 3 Workers within this Section 3 Plan are inclusive of Targeted Section 3 Workers unless it is specifically stated otherwise.

For Housing and Community Development Financial Assistance, means a Section 3 Worker who is:

1. A worker employed by a Section 3 Business Concern; or
2. A worker who currently fits or when hired fit at least one of the following categories, as documented within the last five years:
  - (i) Living within the Service Area of the Neighborhood of the Project; or
  - (ii) A YouthBuild participant.

**Very Low-Income** - families (including single persons) whose income does not exceed 50% of the area (adjusted) median family income. See **Attachment E**.

**YouthBuild Programs** - programs receiving assistance under the Workforce Innovation and Opportunity Act (29 U.S.C. 3226).

### III. Section 3 Implementation

Contractors/Subcontractors working on Section 3 Projects must "to the greatest extent feasible" ensure that employment and training opportunities and contracts for work awarded in connection with Section 3 Projects are provided to Section 3 Workers and Section 3 Business Concerns that provide economic opportunities to Section 3 Workers in the Service Area or Neighborhood of the Project.

Contractors will also be required to incorporate a Section 3 Economic Opportunity Plan and utilize the Section 3 Clause in all subcontracts.

#### A. Section 3 Economic Opportunity Plan (EOP)

All bidders for contracts on Section 3 Projects are required to complete the Section 3 Economic Opportunity Plan (EOP) (**Attachment A**) and return it with the project bid. The Section 3 EOP requires all bidders to complete a preliminary statement of their workforce needs for the Section 3 Project, broken out by trade for all skilled, semi-skilled, and unskilled labor and trainee categories. The statement should include the anticipated workforce needs of any subcontractors to be hired where this is known.

In order to assist with meeting the required benchmarks, Contractors/ Subcontractors may wish to consider using the employment/job development services of the agencies listed in Attachment J as well as other agencies and centers that serve the economically disadvantaged within the project area.

#### B. Section 3 Clause

The attached Section 3 clause (**Attachment B**) is inserted in all Section 3 Project contracts and subcontracts. This clause commits the Contractor/Subcontractor to provide, to the greatest extent feasible, training and employment opportunities to Section 3 Workers and Section 3 Business Concerns. Contractors/Subcontractors that are awarded a Section 3 Project contract are required to give notice to all labor organizations of their commitment to hiring Section 3 Workers and Section 3 Business Concerns. This notice should also be posted at the Contractor/Subcontractors place of business and at the job site. A sample notice of this type is provided for reference (**Attachment C**).

In connection with each bid for work under a Section 3 Project, S bidders are required to complete and return the following forms:

1. Compliance Bidder's Certification Form (**Attachment D**) stating that each bidder understands this Section 3 requirement. This form must be completed by each Contractor/Subcontractor, signed by an authorized representative of the company and returned with their bid for work on the

Section 3 Project; and

#### **IV. Section 3 Benchmarks**

Contractors and Subcontractors shall make every good faith effort to achieve the following benchmarks in association with the Section 3 Project:

1. Section 3 Workers will make up 25% of the total number of labor hours worked by all workers, exclusive of the labor hours worked by Targeted Section 3 Workers; and
2. Targeted Section 3 Workers will make up 5% of the total number of labor hours worked by all workers.

These benchmarks shall be updated every three years by the U.S. Department of Housing and Urban Development. The current benchmarks can be found on the HUD website; <https://www.hudexchange.info/programs/section-3/section-3-guidebook/section-3-in-action/safe-harbor-benchmarks/> however the City reserves the right to adjust these benchmarks as needed, consistent with direction from HUD.

#### **V. Required Documentation and Reporting**

For each bidder submitting a bid the following documentation must be provided to the City at the time of the bid:

1. Section 3 Compliance Bidder's Certification for selected Contractors/Subcontractors (Attachment D);

For each bidder awarded work all the following documentation must be provided to the City within 10 days of selection of Contractors/Subcontractors:

1. Section 3 Economic Opportunity Plan (Attachment A);
2. Certification signed by the Subrecipient that all contracts/subcontracts for work include the required Section 3 Clause and copies of each contract with the clause highlighted;
3. Notice(s) given by Contractors/Subcontractors to all labor organizations indicating their commitment to hire Section 3 Workers (Attachment C);
4. and
5. Certification of Business Concerns Seeking Section 3 Preference in Contracting and Demonstration of Capability (Attachment D), if applicable.

Reporting will be required at the request of the City based upon HUD-required reporting. Contractors must report the following data to the City for each Section 3 Project:

1. Total number of labor hours worked;
2. Total number of labor hours worked by Section 3 Workers (exclusive of hours worked by Targeted Section 3 Workers) with documentation as described in Section VII of this Plan; and
3. Total number of labor hours worked by Targeted Section 3 Workers with documentation as described in Section VII of this Plan.

Section 3 Workers' and Targeted Section 3 Workers' labor hours may be counted for five years from when their status as a Section 3 Worker or Targeted Section 3 Worker is established.

Labor hours worked by people in Professional Services may be counted in the above reporting of total labor hours worked and total labor hours worked by Section 3 Workers and Targeted Section 3 Workers.

If a Contractor or Subcontractor does not track labor hours, the City may request that the Contractor/Subcontractors "good faith assessment" of labor hours of full-time or part-time employees be accepted. The City will only accept "good faith assessment" on Section 3 Projects that have requested, and had their request approved by the City, to utilize this method.

The benchmarks for the minimum percentage of labor hours worked by Section 3 Workers and Targeted Section 3 Workers represent **minimum** targets for a Section 3 Project. The benchmarks are not set-asides and quotas but instead establish a "safe harbor" for City, Contractors and Subcontractors on the matter of compliance with Section 3. In the absence of evidence to the contrary, City, Contractor or Subcontractor that meets the minimum benchmarks for a Section 3 Worker/Targeted Section 3 Worker labor hours will be considered to have met Section 3 requirements under this Section 3 Plan.

If, at the conclusion of the contracting period for the Section 3 Project, the above priorities and benchmarks are not met, the City must demonstrate why it was not feasible to comply with this Section 3 Plan. The Contractor must provide detailed information on their efforts to comply with this Section 3 Plan, including the outcome of all efforts originally identified in the Subrecipient's Section 3 Strategy.

## **VI. Qualification of Section 3 Workers and Section 3 Business Concerns**

### **A. Section 3 Workers**

A Section 3 Worker shall certify or submit evidence demonstrating their eligibility as a Section 3 Worker to the Contractor or Subcontractor as appropriate. **Attachment E** (or a similar form) must be filled out by Section 3 Workers.

This self-certification will be one of the methods used by City, Contractors, and Subcontractors to confirm the percentage of labor hours worked by Section 3 Workers. Should said certification come into question or not be appropriate, City, and Contractors/Subcontractors may request other evidence of eligibility.

Please note that nothing in the Section 3 Plan shall be construed to require the employment of a Section 3 Worker who does not meet the background and qualifications of the position to be filled.

### **B. Section 3 Business Concerns**

Businesses seeking to qualify for a Section 3 contracting preference shall certify that the business is a Section 3 Business Concern and provide appropriate documentation with the certification. Should said certification come into question, City and Contractors/Subcontractors may request other evidence of eligibility for the Section 3 preference. Self- certifications from business owners may be accepted by the City at its sole discretion.



A Section 3 Business Concern seeking a contract or a subcontract must demonstrate to the satisfaction of the party awarding the contract or subcontract that the business concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract or subcontract. The ability to perform successfully under the terms and conditions of all proposed contracts and subcontracts is required of all Contractors and Subcontractors subject to Section 3 requirements.

## VII. Section 3 Contract Compliance

Minimum compliance with Section 3 is determined by documentation of all of the following:

1. Creation and implementation of an acceptable Section 3 Strategy for meeting Section 3 Priorities prepared by the City;
2. Demonstration of inclusion of the required Section 3 language in all subcontracts/contracts for work associated with the Section 3 Project; **and**
3. Demonstration that the Section 3 Benchmarks were met.

The written records of Section 3 Project Contractors and Subcontractors will be reviewed by the City as a means of establishing compliance or non-compliance with Section 3 requirements. Contractors and Subcontractors who receive Section 3 contracts found to be in non-compliance will be deemed to be **ineligible** for future Section 3 covered projects for a minimum period of **24** months from the date deemed to be in noncompliance. **Attachment F** shall be used by Contractors and Subcontractors to provide information and data regarding **actual** contracts/subcontracts awarded. **Attachment G** identifies a form that is required for **actual** labor hours worked in connection with assisted Section 3 Projects. Satisfactory submission of **Attachment E** and/or **F** with each request for payment is a **prerequisite** in order for City to authorize payment on a Section 3 covered project.

**Attachment H** identifies acceptable methods that, when documented, demonstrate compliance with Section 3. **Attachment C** identifies a sample notice for project area resident employment commitment. **Attachment I** provides a sample description of job categories connected with Section 3 covered projects.

The following records must be maintained:

- Worker's self-certification that their income is below the income limit from the prior calendar year.
- Worker's self-certification of participation in public housing or Section 8.
- Certification from a PHA or Section 8 program manager that a worker is a participant in their program.
- Employer's certification that the worker's income from that employer is below the income limit.
- Employer's certification that the worker is employed by a Section 3 Business Concern.
- Worker's certification that the worker is a YouthBuild Participant.

If the Section 3 Benchmarks are NOT met, documentation of compliance with the Section 3 Strategy evidencing the efforts made to meet these goals must be provided. Examples of documentation of efforts to comply will be based upon the Section 3 Strategy and may include:

- Copies of direct mail solicitation and e-mail/Internet outreach;
- Formal advertisements;
- Flyers/brochures advertising meetings;
- Sign-in lists from job fairs and other public meetings;
- Agendas and/or meeting notes from meetings with interested parties and Contractors.

The City of Moorpark and HUD reserve the right to inspect Contractor records related to this Section 3 Plan with 48 hours notice.

## **VIII. Complaint Procedure**

A complaint may be filed alleging a violation of Section 3 requirements. They may be filed by Section 3 Workers or Section 3 Business Concerns. Complaints are to be addressed to the City of Moorpark at the address below. If the complaint cannot be resolved by the City, grievances may be submitted to and investigated by HUD. Those grievances that are not resolved voluntarily can result in an administrative hearing.

A complaint must be written and include:

- Name and address of grievant
- Name and address of Contractor/Subcontractor
- Description of acts or omission
- Corrective action sought

Complaints should be filed with the City of Moorpark and, if warranted, may be appealed to the Area Office of HUD (LA Area) and HUD in Washington, D.C., at the addresses below.

1. Parks, Recreation and Community Services Department  
Attention Parks and Recreation Director  
323 Science Drive  
Moorpark, CA 93021
2. HUD LA Area Office, Region IX  
Director, Fair Housing and Equal Opportunity  
U.S. Dept. of Housing and Urban Development  
611 West Sixth St., Suite 1000-9DD  
L.A., Ca. 90017-3101
3. HUD Washington  
Assistant Secretary, Fair Housing and Equal Opportunity  
Office of Economic Opportunity  
Room 5100, Dept. of HUD  
451 Seventh St., S.W.  
Washington, D.C. 20410-2000 (202/708-1112)

**IX. Attachments and Required Actions**

<b>Attachment</b>	<b>Title</b>	<b>Required Action</b>
A	Section 3 Economic Opportunity Plan	Submit with Bid
B	Section 3 Clause	Must be included in every contract and subcontract.
C	Sample Notice for Project Area Resident Employment Commitment	Must be posted at the project site.
D	Section 3 Compliance Bidder's Certification	Submit with Bid.
E	Section 3 Eligibly Certification	
F	Actual Subcontracts and Suppliers for Section 3 Compliance (awarded for covered projects)	Must be submitted with requests for payment
G	Actual Labor Hours Worked for Contractor or Subcontractor Economic Opportunities for Low and Very Low Income Persons in Connection with Assisted Section 3 Projects	Must be submitted with requests for payment
H	Section 3 Compliance – Suggested Examples (of Efforts to offer Training and Employment Opportunities to Section 3 Residents	
I	Sample Description of Job Categories for Section 3 Plan	Information
J	Apprenticeship Program Information and Resources	Information

## Attachment A - Section 3 Economic Opportunity Plan

(SUBMIT AFTER BID AWARD)

**Project Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Project Address:** \_\_\_\_\_

**Project City/County:** \_\_\_\_\_

**Name of Bidder/Organization:** \_\_\_\_\_

**Contact Person and Title:** \_\_\_\_\_

**Telephone Number:** \_\_\_\_\_ **email:** \_\_\_\_\_

**Address of Bidder:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Description of Service Area or Neighborhood of the Section 3 Project, bordering streets, etc. (or attach map)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Census Tract(s) and Block Group(s): \_\_\_\_\_

### A. Economic Opportunities for Section 3 Business Concerns

1. List of all subcontractors and construction related vendors you plan to use regardless of contract amount. You may use additional sheets to complete this section if necessary.

Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No
Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No
Name: Address:	Amount: Contact: Phone Number: License Number: Section 3 Business Concern: Yes or No

## Attachment A

(page 2)

[illegible]

## Attachment A

(page 3)

3. Detailed description of: 1) all efforts planned to outreach to, identify and secure bids from Section 3 Business Concerns; 2) all Technical Assistance planned to help Section 3 Business Concerns understand and bid on the Section 3 Project; **and** 3) any assistance made available to Section 3 Business Concerns in bonding, guaranties, or other efforts to support viable bids.

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4. List of sources and methods of identifying and soliciting Section 3 Business Concerns for this project.

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## Attachment A

(page 4)

### B. Economic Opportunities for Section 3 Workers

1. List of Sources and Methods of Recruitment of Section 3 Workers.

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2. List State approved apprenticeship programs to be utilized, if any.

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3. List any Job Training Partnership Act (JTPA) programs to be utilized, if any.

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4. Detailed description of: 1) all efforts planned to outreach to and generate job applicants who qualify as Section 3 Workers; **and** 2) all planned Technical Assistance to help Section 3 Workers apply for jobs.

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5. List other methods utilized to provide economic opportunities and comply with Section 3 requirements (use additional sheets if necessary).

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**Attachment A**

(page 5)

**C. Preliminary Statement of Workforce Needs**

1. Complete the following table for the project. Depending upon the magnitude of the project, you may wish to prepare a table for you and each subcontractor.

<b>Occupations</b>	<b>Total Labor Hours Estimated to be Worked by all Workers</b>	<b>Total Labor Hours Estimated to be Worked by Section 3 Workers</b>	<b>Total Labor Hours Estimated to be Worked by Targeted Section 3 Workers</b>	<b>Vacancies to Fill</b>
Skilled Trades				
Semi-skilled				
Unskilled Labor				
Trainees/ Apprentices				
Professional Services (architectural, engineering, etc.)				
Other:				
Other:				
Other:				
Totals				

<b>Total Goal for Section 3 Workers</b> (Total Labor Hours Estimated to be Worked by Section 3 Workers Divided by Total Labor Hours Estimated to be Worked by all Workers)	
<b>Total Goal for Targeted Section 3 Workers</b> (Total Labor Hours Estimated to be Worked by Targeted Section 3 Workers Divided by Total Labor Hours Estimated to be Worked by all Workers)	

Section 3 Benchmarks require that Subrecipients, Contractors and Subcontractors make every effort to meet the following benchmarks:

- Section 3 Workers will make up 25% of the total number of labor hours worked by all workers, exclusive of the labor hours worked by Targeted Section 3 Workers; and
- Targeted Section 3 Workers will make up 5% of the total number of labor hours worked by all workers.

**SUBMIT WITH BID  
AND PRIOR TO ANY SUBCONTRACTS WITH SECTION 3 BUSINESS CONCERNS**

**Attachment B - Section 3 Clause  
24 CFR 75**

(to be inserted into every contract/subcontract for work)

- A. The work to be performed under this contract is on a project assisted under a program providing direct federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule). Section 3 requires that to the greatest extent feasible, opportunities for training and employment be given to lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.
- B. The parties to this contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR 75 and all applicable rules and orders of the Department issued thereunder prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.
- C. The contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract or understanding, if any, a notice advising the said labor organization or worker's representative of his commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.
- D. The contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR 75. The contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR 75 and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.
- E. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR 75, and all applicable rules and orders of the Department issued thereunder prior to the execution of the contract, shall be a condition of the federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors, and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which federal assistance is provided, and to such sanctions as are specified by 24 CFR 75.

**Attachment C - Sample Notice of Project Service Area or Neighborhood of Project  
Employment Commitments**

INSTRUCTIONS

*The City of Moorpark's Section 3 Plan requires that a notice similar to this sample be sent by all firms awarded or contracting for work on a Section 3 Project funded by the City with federal funds to any labor organizations with which the firm has a collective bargaining agreement or other agreement or understanding. If awarded a contract, you will be required to submit a notice of this type and to post it in a prominent place available to your employees. This notice should be provided on your company's letterhead.*

S A M P L E

TO WHOM IT MAY CONCERN:

The **(Insert Name of Company)** has entered into an agreement with the City of Moorpark for work to be performed at **(Insert Project Name and Location)**. This project is funded in part by the U.S. Department of Housing and Urban Development (HUD) and as such is subject to the terms of Section 3 of the Housing and Urban Development Act of 1968, 12 USC 1701 u, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule). As a contractor or subcontractor on this project, and pursuant to the provisions of Section 3, the **(Insert Name of Company)** is committed to utilizing Section 3 Workers/Targeted Section 3 Workers residing within the Service Area or Neighborhood of the Project as employees and trainees to the greatest extent feasible. In addition, the **(Insert Name of Company)** will utilize to the greatest extent feasible, Section 3 Business Concerns located in or owned in substantial part by residents of the Section 3 Service Area or Neighborhood of the Project.

The Service Area or Neighborhood of the Project is defined as follows:

***(insert description)***

It is the intention of the **(Insert Name of Company)** to fulfill its obligations under Section 3.

[Signature of Authorized Company Representative]

**Attachment D - Section 3 Compliance Bidder's Certification**

Name of Company: \_\_\_\_\_

Address: \_\_\_\_\_

Project Title & Address: \_\_\_\_\_

The undersigned does hereby certify that he/she has read and understood the City of Moorpark's Section 3 Plan and requirements that apply to the above cited project, said requirements being known as the Section 3 Clause found in 24 CFR 75, as amended in the Section 3 Final Rule on September 29, 2020 (the Final Rule) and that neither the project nor the company are under any contractual restrictions or other disabilities which would prevent the company from complying with said requirements.

Signature of Company Officer: \_\_\_\_\_

Title of Officer: \_\_\_\_\_ Date: \_\_\_\_\_

### Attachment E - Section 3 Worker/Targeted Section 3 Worker Certification

Project Title and Address: \_\_\_\_\_

Service Area or Neighborhood of the Section 3 Project *(to be completed by the Subrecipient & detailed below or attached)*:

I, the undersigned, understand that the aforementioned project is subject to the City of Moorpark's Section 3 Plan which warrants that employment and other economic opportunities generated by certain U.S. Department of Housing and Urban Development (HUD) financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State, and local laws and regulations, be directed to low-and very-low income persons, particularly those who are recipients of assistance for housing.

In reliance of that said warranty, and in reliance upon the income schedules and project service area designation attached hereto and made part of this certification by this reference, I hereby certify that I qualify as a Section 3 Worker/Targeted Section 3 Worker by virtue of the statements I make by selecting any of the following as applicable to me:

Section 3 Worker (select as many as apply, one is required to qualify as a Section 3 Worker)

- ☐ The total household income for my family for the previous or annualized calendar year is below the income limit established by HUD for low-income households (80% AMI); or
- ☐ I am employed by a Section 3 Business Concern; or
- ☐ I am a Youthbuild participant.

Targeted Section 3 Worker

- ☐ The total household income for my family for the previous or annualized calendar year is below the income limit established by HUD for low-income households (80% AMI).
- ☐ I am employed by a Section 3 Business Concern; **and**

Check one:

- ☐ I live within the Service Area or Neighborhood of the Section 3 Project, as defined above; or
- ☐ I am a YouthBuild participant.

My permanent address is: \_\_\_\_\_  
\_\_\_\_\_

I have attached the following documentation as evidence:

- ☐ Copy of lease/mortgage statement or driver's license with my home address
- ☐ Copy of evidence of participation in a Youthbuild program
- ☐ Copy of evidence of employment with a Section 3 Business Concern
- ☐ Other evidence \_\_\_\_\_

I, the undersigned, swear that the foregoing statements are true and correct and I understand that false statements may initiate action under Federal or State laws concerning false statements.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_ Telephone: \_\_\_\_\_

**Attachment E**

(page 2 of 2)

**SECTION 3 RESIDENT FAMILY INCOME LIMITS**

Ventura County

2025 Median Family Income = \$131,300 (4-person household)

	HOUSEHOLD SIZE							
	1 person	2 persons	3 persons	4 persons	5 persons	6 persons	7 persons	8 persons
50% Median: (Very Low-Income)	\$52,400	\$59,900	\$67,400	\$74,850	\$80,850	\$86,850	\$92,850	\$98,850
80% Median: (Low-Income)	\$83,850	\$95,800	\$107,800	\$119,750	\$129,350	\$138,950	\$148,500	\$158,100

These figures are updated annually by HUD.



## Attachment F - Actual Subcontracts and Suppliers for Section 3 Compliance

(To be submitted with each payment request.)

**NAME OF PROJECT:**

**DATE:**

SUBCONTRACTOR'S NAME, ADDRESS, PHONE NUMBER, LICENSE NUMBER	TYPE OF WORK (TRADE)	CONTRACT AMOUNT	SECTION 3 BUSINESS CONCERN YES OR NO
SUPPLIER'S NAME, ADDRESS AND PHONE NUMBER (IF INSTALLATION INCLUDED IN CONTRACT)	TYPE OF SUPPLIES	CONTRACT AMOUNT	SECTION 3 BUSINESS CONCERN YES OR NO

### Attachment G - Actual Labor Hours Worked for Contractor or Subcontractor Economic Opportunities for Low- and Very Low-Income Persons in Connection with Assisted Section 3 Projects

Name of Project: \_\_\_\_\_ Project Location: \_\_\_\_\_

Contractor/subcontractor Name & Address: (Street, City, State, Zip)		License Number:		Dollar Amount of Contract:	
		Contact Person:		Phone: (Include Area Code)	
		Construction Reporting Period:		Date Report Submitted:	
<b>Part I: Employment and Training</b>					
A Job Category	B Number of Labor Hours Worked	C Number of Section 3 Labor Hours Worked	D % of Labor Hours Worked by Section 3 Workers (Column C/B)	E Number of Targeted Section 3 Labor Hours Worked	F % of Labor Hours Worked by Targeted Section 3 Workers (Column E/B)
Professionals					
Technicians					
Office/Clerical					
Construction by Trade (List)					
Trade:					
Trade:					
Trade:					
Trade:					
Trade:					
Other: (List)					
TOTAL					

### **Attachment H - Section 3 Compliance - Suggested Examples**

Following are acceptable methods that, ***when documented***, may help demonstrate compliance with Section 3:

1. Consulting with State and local agencies administering training programs funded through JTPA or JOBS, probation and parole agencies, unemployment compensation programs, community organizations and other officials or organizations to assist with recruiting Section 3 Workers for a contractor's or subcontractor's training and employment positions.
2. Advertising the jobs to be filled through the local media, mail and e-mail and posting in the Service Area or the Neighborhood of the Project.
3. Employing a job coordinator, or contracting with a business concern that is licensed in the field of job placement (preferably a Section 3 Business Concern) that will undertake efforts to match eligible and qualified Section 3 Workers with the training and employment positions that the contractor intends to fill.
4. Establishing training programs, which are consistent with the requirements of the Department of Labor, for public housing residents and other Section 3 Workers in the building trades.
5. Advertising the training and employment positions by distributing flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) to housing developments where there are Section 3 Workers.
6. Entering into "first source" hiring agreements with organizations representing Section 3 Workers.
7. Contacting resident councils, resident management corporations, or other resident organizations in the housing developments where there are Section 3 Workers, to request the assistance of those organizations in notifying residents of the training and employment positions to be filled.
8. Sponsoring a job informational meeting to be conducted at a location in the housing developments where there are Section 3 Workers or in the Service Area or Neighborhood of the Project.
9. Arranging assistance in conducting job interviews and completing job applications for residents of the housing developments where there are Section 3 Workers and in the Service Area or Neighborhood of the Project.
10. Arranging for a location in the housing developments where there are Section 3 Workers, or the neighborhood or service area of the project, where job applications may be delivered and collected or where job interviews can be conducted.
11. Where there are more qualified Section 3 Workers than there are positions to be filled, maintaining a file of eligible qualified Section 3 Workers for future employment positions.
12. Undertaking such continued job training efforts as may be necessary to ensure the continued employment of Section 3 Workers previously hired for employment opportunities.

## **Attachment H**

(page 2 of 2)

### **Efforts to Award Contracts to Section 3 Business Concerns:**

1. In determining responsibility of potential subcontractors, consider their record of Section 3 compliance as evidenced by past actions and their current plans for the pending subcontract.
2. Contacting business assistance agencies, minority contractors' associations and community organizations to inform them of contracting opportunities and request their assistance in identifying Section 3 Business Concerns which may solicit bids or proposals for contracts for work in connection with Section 3 Projects.
3. Providing written notice to all known Section 3 Business Concerns of the contracting opportunities. This notice should be in sufficient time to allow the Section 3 Business Concerns to respond to the bid invitations or request for proposals.
4. Following up with Section 3 Business Concerns that have expressed interest in the contracting opportunities by contacting them to provide additional information on the contracting opportunities.
5. Coordinating pre-bid meetings at which Section 3 Business Concerns could be informed of upcoming contracting and subcontracting opportunities.
6. Advising Section 3 Business Concerns as to where they may seek assistance to overcome limitations such as inability to obtain bonding, lines of credit, financing, or insurance.
7. Arranging solicitations, times for presentations of subcontract bids, quantities, specifications, and delivery schedules in ways to facilitate the participation of Section 3 Business Concerns.
8. Where appropriate, breaking out subcontract work items into economically feasible units to facilitate participation by Section 3 Business Concerns.
9. Advertising subcontracting opportunities through trade association papers and newsletters, and through other local media, such as newspapers of general circulation.
10. Developing a list of eligible Section 3 Business Concerns.

### **Providing Other Economic Opportunities**

Contractors and subcontractors are encouraged to undertake efforts to provide to low-income persons economic opportunities other than training, employment, and contract awards, in connection with Section 3 Projects.

Other Training and Employment Related Opportunities: These include, but need not be limited to, use of trainee positions to fill vacancies; and hiring Section 3 Workers in part-time positions.

Other Business Related Economic Opportunities include, but are not limited to, the formation of Section 3 joint ventures, financial support for affiliating with franchise development, use of labor only contracts for building trades, purchase of supplies and materials from Housing Authority resident-owned businesses or Public Housing Authority resident-owned businesses.

## Attachment I - Sample Description of Section 3 Job Categories

Officials/Managers - Occupations requiring administrative personnel who set broad policies, exercise overall responsibility for execution of these policies, and direct individual departments or special phases of a firm's operation. Includes: officials, executives, middle management, plant managers, superintendents, salaried forepersons.

Professionals - Occupations requiring either college graduation or experience of such kind that provides a comparable background. Includes: accountants, chemists, architects, engineers, personnel workers, registered nurses, teachers, lawyers, auditors, researchers, property managers.

Technicians (Para-professionals) - Workers of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work which can be obtained through about two years of post-high school education or through equivalent on-the-job training (e.g., computer programmers, draft persons, engineering aides, junior engineers, nurses, nurse's aides, assistants, surveyors, buyers).

Sales - Occupations engaging wholly or primarily in direct selling (e.g., advertising agents, brokers, sales clerks).

Office/Clerical - Includes all clerical-type work regardless of level of difficulty (e.g., bookkeepers, office clerks, typists, telephone operators, non-management).

Skilled Craft Workers - Manual workers of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work (e.g., auto attendants, laundry operators, truck drivers).

Operatives (Semi-skilled workers) - Workers who operate machines or processing equipment or perform other factory-type building trades, truck drivers).

Laborers (Unskilled workers) - Workers in manual occupations which generally require no special training (e.g., laborers, helpers, car washers, gardeners, elevator operators).

Apprentices/Trainees - Persons employed in a program including work training and related instruction to learn a trade or craft which is traditionally considered an apprenticeship, regardless of whether the program is registered with a Federal or State agency).

Service Workers - Workers in both protective and non-protective service occupations

ADP/computer	Guards	Police
Air conditioning repair	Handyworker	Porters
Appliance repair	Janitorial	Printers
Carpet Consultants	Landscaping	Suppliers
Catering	Lead Based Paint Remover	Transportation providers
Engineers	Manufacturing	Vendors
Firefighters	Marketing	Waiters/Waitresses
Florists	Photography	

## **Attachment I**

(page 2 of 2)

Construction Workers - Include but are not limited to the following categories:

Architecture  
Asbestos Removal  
Bricklaying  
Carpentry  
Cement/Masonry  
Communications & Systems  
Demolition  
Drywall  
Electrical  
Elevator Construction  
Fencing  
Glazing  
Heating  
Insulators  
Iron works  
Laborers  
Lathers  
Marble and Tile  
Machine Operators  
Painters  
Parking Lot Striping  
Plastering  
Plumbing  
Power Equipment Operators  
Refrigeration/Conditioning  
Roofing  
Sheet Metal  
Soft Floor Layer  
Sprinkler Fitter  
Stone Mason/Bricklayer  
Surveying  
Terrazzo  
Tile Setting  
Truck Driver

Updated June 2021

## **I. Attachment J - Apprenticeship Program Information and Resources**

Building California Construction Careers conducts outreach programs which are designed to educate the public about construction career opportunities and apprenticeship. Their website is full of information regarding various union apprenticeship programs throughout the central coast. Their website is <https://buildcalifornia.com/>.

**TRI COUNTIES BUILDING AND CONSTRUCTION TRADES COUNCIL**, AFL-CIO, represents Craft Unions in Ventura, Santa Barbara and San Luis Obispo Counties.

3994 East Main Street  
Ventura, CA 93006  
(805) 794-4274

In addition, the following labor unions may also be a source for potential employees and many have apprenticeship programs.

### **ASBESTOS WORKERS 5**

670 E. Foothill, suite 2  
Azusa, Ca. 91702  
Phone: 626-815-9794  
E-Mail: fredaw15@aol.com  
Website: [www.awlocal5.com](http://www.awlocal5.com)

### **BAC LOCAL 4 (Bricklayers)**

BAC 4 (Ventura Office)  
270 South Joanne Ave.  
Ventura, California 93003  
Phone: 805-658-4883  
Phone: 800-972-3338  
E-Mail: mcrespi@sbcglobal.net  
E-Mail: bac4ca@aol.com  
Website: [www.bac4ca.org](http://www.bac4ca.org)

### **BOILERMAKERS 92**

2260 Riverside Ave.  
Bloomington, California 92316  
Phone: 909-877-9382  
website: [www.boilermakerslocal92.com](http://www.boilermakerslocal92.com)

### **CEMENT MASONS 600**

2299 East Main Street, Suite 9  
Ventura, California 93001  
Phone: 805-653-5919

### **ELECTRICAL WORKERS LOCAL 952**

3994 E. Main St.  
Ventura, CA 93006  
(805) 642-2149

### **ELEVATOR CONSTRUCTORS LOCAL 18**

100 South Mentor Ave.  
Pasadena, California 91106  
Phone: 626-449-1869  
E-Mail: gazzat18@sbcglobal.net  
Website: [www.iueclocal18.otg](http://www.iueclocal18.otg)

**FLOORLAYERS 1247**

8051 Pioneer Blvd.  
Whitter, California 90606  
Phone: 562-695-7402

**GLAZIERS LOCAL 636**

2333 North Lake Avenue, Unit F  
Altadena, CA 91001  
(626) 448-1565  
E-Mail: lu636@dc36.org

**GOLD COAST OF D.C. OF CARPENTERS LOCAL 805**

412 Dawson Drive  
Camarillo, CA 93010  
(805) 482-1905

**HEAT AND FROST LOCAL 5**

3833 Ebony St  
Ontario, CA 91761  
909-390-7002

**IBEW 952**

3994 East Main Street  
Ventura, California 93006  
Business Manager: Shane Werner  
Business Agent: Jeff Bode  
Phone: 805-642-2149 Fax: 805-658-7507  
E-Mail: shane@ibew952.org  
Website: [www.ibewlu952.org](http://www.ibewlu952.org)

**IRONWORKERS LOCAL 416** (Reinforced)

PO Box 1166  
Norwalk, California 90651  
Phone: 562-868-1251  
E-Mail: hart@ironworkers416.org  
E-Mail: robert@ironworkers416.org  
Website: [www.reinforcingironworkerslocal416.org](http://www.reinforcingironworkerslocal416.org)

**IRONWORKERS LOCAL 433** (Structural)

17495 Hurley Street East  
City of Industry, CA 91744  
(626) 964-2500

**IRONWORKERS LOCAL 509** (Shopmen & Ornamental)

13830 San Antonio Dr.  
Norwalk, CA 90651  
(323) 262-9653

**LABORERS LOCAL 585**

21 South Dos Caminos Ave.  
Ventura, CA 93003  
Phone: 805-643-5487  
E-Mail: dvalenzuela@sbcglobal.net



**LABORERS 1184**

1074 East La Cadena Drive, Suite 4  
Riverside, California 92501  
Phone: 951-680-1292  
Website: [www.laborers1184.com](http://www.laborers1184.com)

**MILLWRIGHTS LOCAL 1607**

932 S. Gerhart Ave., #200  
Los Angeles, CA 90022  
(323) 724-0178

**OPERATING ENGINEERS LOCAL 12**

1094 E. Main St.  
Ventura, CA 93001  
(805) 643-8740

**PAINTERS DISTRICT COUNCIL 36**

2333 North Lake Ave., Unit "H"  
Altadena, California 91001  
Phone: 626-584-9925  
E-Mail: [mike.gutierrez@dc36.org](mailto:mike.gutierrez@dc36.org)  
Website: [www.dc36.org](http://www.dc36.org)

**PAINTERS & TAPERS LOCAL 52**

26 Bernard Street, Room 20  
Bakersfield, CA 93305  
(805) 325-1825  
E-Mail: [lu52@sbcglobal.net](mailto:lu52@sbcglobal.net)

**PLASTERERS 200**

1610 West Holt Ave.  
Pomona, California 91768  
Phone: 909-865-2240  
E-Mail: [bobp.local200@verizon.net](mailto:bobp.local200@verizon.net)  
Website: [www.plastererslocal200.org](http://www.plastererslocal200.org)

**PILEDRIERS LOCAL 2375**

728 N. Lagoon Ave.  
Wilmington, CA 90744  
(310) 830-5300

**PLUMBERS & PIPEFITTERS LOCAL 484**

1955 N. Ventura Ave.  
Ventura, CA 93001  
(805) 643-6345

**ROOFERS LOCAL 36**

5380 Poplar Blvd.  
Los Angeles, CA 90032  
Phone: 323-222-0251  
E-Mail: [oj36@sbcglobal.net](mailto:oj36@sbcglobal.net)

**SHEET METAL WORKERS LOCAL 273**

1794 Goodyear  
Ventura, CA 93003  
(805) 658-0053  
E-Mail: [smwlocal273@aol.com](mailto:smwlocal273@aol.com)  
E-Mail: [smworkerslocal273@yahoo.com](mailto:smworkerslocal273@yahoo.com)

**SO CA D.C. OF LABORERS**

4399 Santa Anita Avenue  
Suite 204  
El Monte, CA 91731  
(626) 350-6900

**TEAMSTERS LOCAL 186**

1534 Eastman Avenue, Suite B  
Ventura, CA 93003  
(805) 644-0070

**TEAMSTERS 381**

115 West Bunny Ave.  
Santa Maria, California 93454  
Phone: 805-922-7876  
E-Mail: [lswenson@teamsters381.org](mailto:lswenson@teamsters381.org)  
Website: [www.teamsters381.org](http://www.teamsters381.org)

**TILE, MARBLE & TERRAZZO LOCAL 18**

9732 E. Garvey Avenue  
South El Monte, CA 91733  
(626) 329-0369  
E-Mail: [chad@tileunion.org](mailto:chad@tileunion.org)  
E-Mail: [pete@tileunion.org](mailto:pete@tileunion.org)  
Website: [www.tileunion.org](http://www.tileunion.org)

**TRI COUNTIES BUILDING & CONSTRUCTION TRADES COUNCIL**

3994 East Main Street  
Ventura, California 93006  
Phone: (805) 794-4274  
Website: <http://buildingtradescouncil.org/>

**UA DISTRICT COUNCIL 16**

501 Shatto Place, Suite 400  
Los Angeles, California 90020  
Phone: 213-487-4262  
Website: [www.dc16.org](http://www.dc16.org)

**U.A. LOCAL 250** (Refrigeration/Steamfitters)

18355 S. Figueroa St.  
Los Angeles, CA 90248  
(310) 660-0035  
Website: [www.ua250.org](http://www.ua250.org)

**U.A. LOCAL 345** (Plumbing & Pipefitting)

1430 Huntington Drive  
Duarte, CA 91010  
Phone: 626-301-0531  
E-Mail: [kauhi49@aol.com](mailto:kauhi49@aol.com)

**UA 484**

1955 North Ventura Ave.  
Ventura, California 93001  
Phone: 805-643-6345  
E-Mail: [local484@sbcglobal.net](mailto:local484@sbcglobal.net)

**UA 669 (Sprinkler Fitters)**

PO Box 1894  
Oakhurst, California 93644  
Phone: 559-642-2224  
E-Mail: kwatsonba27@sti.net  
Website: [www.sprinklerfitters669.org](http://www.sprinklerfitters669.org)

**U.A. LOCAL 709 (Fire Sprinkler Fitters)**

12140 Rivera Road  
Whittier, CA 90606  
Phone: 562-698-9909  
E-Mail: michaelh@sprinklerfitters709.org  
Website: [www.sprinklerfitters709.org](http://www.sprinklerfitters709.org)

## **Additional Resources**

HUD Section 3 Business Registry

<https://portalapps.hud.gov/Sec3BusReg/BRegistry/BRegistryHome>

County of Ventura Human Services Agency (HSA) Employment Assistance:

[America's Job Center \(multiple locations\)](#)

Cal Jobs

<https://www.caljobs.ca.gov/vosnet/Default.aspx>

State Employment Development Department (EDD)

<https://edd.ca.gov/>

Housing Authorities

[Area Housing Authority of Ventura County](#)

[Oxnard Housing Authority](#)

[Port Hueneme Housing Authority](#)

[Santa Paula Housing Authority](#)

[Housing Authority of the City of San Buenaventura](#)

[Small Business Development Center](#). The Small Business Development Center may be able to provide technical assistance to potential Section 3 Business Concerns.

[Women's Economic Ventures](#) Women's Economic Ventures is dedicated to creating an equitable and just society through the economic empowerment of women.

[Ventura County Economic Development Council](#) (VCEDA), the Economic Development Collaborative of Ventura County (EDC-VC), and Chambers of Commerce may be able to provide names of potential Section 3 Business Concerns.

<b><u>SPECIFICATIONS GROUP</u></b>	
<b><u>General Requirements Subgroup</u></b>	
<b>DIVISION 01 – GENERAL REQUIREMENTS</b>	
01 10 00	SUMMARY
01 13 00	DELEGATED DESIGN REQUIREMENTS
01 20 00	PRICE AND PAYMENT PROCEDURES
	ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (AIA FORM G710)
	WORK CHANGES PROPOSAL REQUEST (AIA FORM G709)
	CHANGE ORDER PROPOSAL REQUEST (CSI FORM 13.6A)
	CHANGE ORDER (AIA FORM G701)
	CONSTRUCTION CHANGE DIRECTIVE (AIA FORM G714)
01 25 00	SUBSTITUTION PROCEDURES
	PROPOSED SUBSTITUTION REQUEST FORM - DURING BIDDING (CSI FORM 1.5C)
	PROPOSED SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION (CSI FORM 13.1 A)
01 26 13	REQUESTS FOR INTERPRETATION
	RFI FORM (CSI FORM 13.2A)
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 40 00	QUALITY REQUIREMENTS
01 42 00	REFERENCES
01 43 39	MOCKUPS AND FIELD SAMPLES
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 60 00	PRODUCT REQUIREMENTS
01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS
01 74 19	CONSTRUCTION WASTE MANAGEMENT
01 81 13.14	SUSTAINABLE DESIGN REQUIREMENTS
	ATTACHMENT-LEED CHECKLIST 90CD
	ATTACHMENT-LEED PRODUCT DATA SUBMITTAL COVER SHEET
01 91 15	BUILDING ENCLOSURE COMMISSIONING
<b><u>Facility Construction Subgroup</u></b>	
<b>DIVISION 02 – EXISTING CONDITIONS (NOT INCLUDED)</b>	
<b>DIVISION 03 – CONCRETE</b>	
03 10 00	CONCRETE FORMING AND ACCESSORIES
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE
03 35 10	CONCRETE FLATWORK FINISHING AND CURING
03 35 40	POLISHED CONCRETE FINISHING
03 54 16	HYDRAULIC CEMENT UNDERLAYMENT
<b>DIVISION 04 – MASONRY</b>	
04 20 00	UNIT MASONRY
04 43 13	ANCHORED STONE VENEER
04 74 14	ADHERED MANUFACTURED STONE VENEER
<b>DIVISION 05 – METALS</b>	
05 05 14	SHOP-APPLIED STEEL PRIMER
05 05 23	METAL FASTENINGS
05 12 00	STRUCTURAL STEEL FRAMING
05 31 00	STEEL DECKING

<b>SPECIFICATIONS GROUP</b>	
<b>General Requirements Subgroup</b>	
05 40 00	COLD-FORMED METAL FRAMING
05 50 00	METAL FABRICATIONS
05 52 13	PIPE AND TUBE RAILINGS
05 51 34	LADDERS
<b>DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES</b>	
06 10 00	ROUGH CARPENTRY
06 10 53	MISCELLANEOUS ROUGH CARPENTRY
06 15 00	WOOD DECKING
06 18 00	GLUED-LAMINATED CONSTRUCTION
06 16 43	GMF GYPSUM SHEATHING
06 40 16	INTERIOR ARCHITECTURAL WOODWORK
06 41 00	ARCHITECTURAL WOOD CASEWORK
<b>DIVISION 07 – THERMAL AND MOISTURE PROTECTION</b>	
07 21 50	BUILDING ENCLOSURE INSULATION
07 25 13	SHEET WEATHER-RESISTIVE BARRIERS
07 25 23	FLUID-APPLIED WEATHER-RESISTIVE BARRIERS
07 26 13	BELOW-GRADE VAPOR RETARDERS
07 41 13	METAL ROOF PANELS
07 46 23	WOOD SIDING
07 54 23	TPO ROOFING
07 62 00	SHEET METAL FLASHING AND TRIM
07 65 26	SASM FLASHING
07 72 33	ROOF HATCHES
07 84 00	FIRESTOPPING
07 92 00	JOINT SEALANTS
<b>DIVISION 08 – OPENINGS</b>	
08 12 13	STANDARD HOLLOW METAL FRAMES
08 12 16	ALUMINUM FRAMES
08 13 13	STANDARD HOLLOW METAL DOORS
08 14 16	FLUSH WOOD DOORS
08 17 00	INTEGRATED DOOR ASSEMBLIES
08 31 16	ACCESS PANELS
08 41 13	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
08 42 14	INTERIOR ALUMINUM-FRAMED ENTRANCES
08 43 33	SLIDING STOREFRONTS
08 43 36	FOLDING STOREFRONTS
08 44 13	STANDARD ALUMINUM-FRAMED CURTAIN WALLS
08 81 00	GLASS GLAZING
<b>DIVISION 09 – FINISHES</b>	
09 05 16	PREPARATION OF CONCRETE SUBSTRATES FOR FINISH FLOORING
09 22 26	METAL SUSPENSION SYSTEMS
09 22 39	VENEER PLASTER BASE
09 25 14	ACRYLIC PLASTER FINISH
09 28 15	GMF GYPSUM TILE BACKING BOARD
09 29 00	GYPSUM BOARD
09 30 00	TILING

<b><u>SPECIFICATIONS GROUP</u></b>	
<b><u>General Requirements Subgroup</u></b>	
09 51 13	ACOUSTICAL PANEL CEILINGS
09 51 15	ACOUSTICAL CLOUD CEILING ASSEMBLIES
09 62 62	METAL FLOORING TRANSITIONS
09 65 13	RESILIENT BASE AND ACCESSORIES
09 65 19	RESILIENT TILE FLOORING
09 65 23	RESILIENT PLANK FLOORING
09 65 36	STATIC CONTROL RESILIENT FLOORING
09 68 13	TILE CARPETING
09 72 10	CONTRACT WALL COVERINGS
09 81 33	ACOUSTICAL INSULATION, SEALANTS, AND ACCESSORIES
09 84 15	ACOUSTICAL CEILING BAFFLES
09 84 33	SOUND-ABSORBING WALL UNITS
09 91 00	PAINTING
09 96 20	PAINT PRODUCTS SCHEDULE PERMANENT NON-SACRIFICIAL ANTI-GRAFFITI COATING
09 97 13	HIGH-PERFORMANCE STEEL COATINGS
09 97 23	PENETRATING CONCRETE FLOOR SEALER
<b>DIVISION 10 – SPECIALTIES</b>	
10 11 16	MARKERBOARDS
10 11 23	TACK BOARDS
10 14 13	REGULATORY SIGNAGE
10 14 19	DIMENSIONAL LETTER SIGNAGE
10 21 13	TOILET COMPARTMENTS
10 26 13	CORNER GUARDS
10 28 13	COMMERCIAL TOILET ACCESSORIES
10 44 00	FIRE PROTECTION SPECIALTIES
10 75 00	FLAGPOLES
10 99 00	BUILDING SPECIALTIES
<b>DIVISION 11 – EQUIPMENT</b>	
11 31 10	KITCHENETTE APPLIANCES
11 51 00	LIBRARY EQUIPMENT
11 68 00	PLAY FIELD EQUIPMENT AND STRUCTURES
<b>DIVISION 12 – FURNISHINGS</b>	
12 05 16	UPHOLSTERY
12 24 13	ROLLER WINDOWS SHADES
12 36 63	SOLID SURFACE MATERIAL COUNTERTOPS
12 36 64	QUARTZ AGGLOMERATE COUNTERTOPS
12 48 13	ENTRANCE FLOOR MATS AND FRAMES
<b>DIVISION 13 – SPECIAL CONSTRUCTION (NOT INCLUDED)</b>	
<b>DIVISION 14 – CONVEYING EQUIPMENT (NOT INCLUDED)</b>	
<b><u>Facility Services Subgroup</u></b>	
<b>DIVISION 21 – FIRE SUPPRESSION</b>	
21 05 00	COMMON WORK RESULTS FOR FIRE SUPPRESSION
21 13 00	FIRE-SUPPRESSION SPRINKLER SYSTEMS

<b>SPECIFICATIONS GROUP</b>	
<b>General Requirements Subgroup</b>	
22 01 30	COMMON WORK RESULTS FOR PLUMBING
22 05 16	EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING
22 05 17	SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
22 05 23	GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 05 29	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 48	VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 19	PLUMBING PIPING INSULATION
22 10 05	PLUMBING PIPING
22 10 06	PLUMBING PIPING SPECIALTIES
22 30 00	PLUMBING EQUIPMENT
22 40 00	PLUMBING FIXTURES
<b>DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING</b>	
23 05 00	COMMON WORK RESULTS FOR HVAC
23 05 29	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 05 48	VIBRATION AND SEISMIC CONTROLS FOR HVAC
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 07 13	HVAC DUCT INSULATION
23 07 19	HVAC PIPING INSULATION
23 09 13	INSTRUMENTATION AND CONTROL DEVICES FOR HVAC
23 09 23	DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC
23 23 00	REFRIGERANT PIPING
23 31 00	HVAC DUCTS AND CASINGS
23 33 00	AIR DUCT ACCESSORIES
23 33 19	DUCT SILENCERS
23 34 23	HVAC POWER VENTILATORS
23 36 00	AIR TERMINAL UNITS
23 37 00	AIR OUTLETS AND INLETS
23 40 00	HVAC AIR CLEANING DEVICES
23 74 16	PACKAGED STANDARD OUTDOOR AIR-CONDITIONING UNITS
23 81 26	SPLIT-SYSTEM AIR CONDITIONERS
<b>DIVISION 25 – INTEGRATED AUTOMATION (NOT INCLUDED)</b>	
<b>DIVISION 26 – ELECTRICAL</b>	
26 05 05	SELECTIVE DEMOLITION FOR ELECTRICAL
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
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