SPECIFICATION AND CONTRACT

DOCUMENTS FOR

EAGLE VIEW WELL #1
DEVELOPMENT PROJECT

CITY OF MORGAN HILL

MORGAN HILL, CALIFORNIA
ENGINEERING DEPARTMENT

PREPARED BY
ENGINEERING DEPARTMENT

JULY 2025

LOCATION MAP

19201 Eagle View Drive, Morgan Hill, CA 95037

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NOTICE INVITING BIDS

1. **Bid Submission.** The City of Morgan Hill ("City"), will accept sealed bids for its Eagle View Well #1 Development ("Project"), by or before July 31, 2025, at 2:00 p.m., at its DEVELOPMENT SERVICES CENTER, located at 17575 PEAK AVENUE MORGAN HILL, California, at which time the bids will be publicly opened and read aloud.

2. **Project Information.**

   2.1 Location and Description. The Project is located at 19201 Eagle View Drive, Morgan Hill, CA 95037, and is described as follows: The work to be done includes the furnishing of all labor, material, transportation, tools, supplies, plant, equipment and appurtenances, and the performance of all work required for completing in a good workmanlike manner the drilling, testing and disinfection of one water production well in conformity with all applicable State, Santa Clara Valley Water District (Valley Water), and AWWA/ASCE standards. All equipment and related materials shall be adequate to drill the specified well as deep as three hundred and seventy (370) feet and install the specified well casing and screens.

   2.2 Time for Final Completion. The Project must be fully completed within 150 calendar days from the start date set forth in the Notice to Proceed. City anticipates that the Work will begin on or about mid to late August, but the anticipated start date is provided solely for convenience and is neither certain nor binding.

3. **License and Registration Requirements.**

   3.1 License. This Project requires a valid California contractor's license for the following classification(s): An A - General Engineering License is required for bidding. In addition, the prime contractor or subcontractor must also possess a C-57 Well Drilling License.

   3.2 DIR Registration. City will not accept a Bid Proposal from or enter into the Contract with a bidder, without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations ("DIR") to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

4. **Contract Documents.** The plans, specifications, bid forms and contract documents for the Project, and any addenda thereto ("Contract Documents") may be obtained from the City of Morgan Hill, at 17575 Peak Avenue, Morgan Hill, CA, (408) 778-6480. Electronic copies of the Contract Documents are available on USB thumb drive for twenty-five dollars ($25.00). If mailing by

USPS, a ten-dollar ($10.00) charge will be added. To download plans and specifications at no charge, register at www.publicpurchase.com.

5. Bid Proposal and Security.

5.1 Bid Proposal Form. Each Bid must be submitted using the Bid Proposal form provided with the Contract Documents.

5.2 Bid Security. The Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's or certified check made payable to City of Morgan Hill, or a bid bond executed by a surety licensed to do business in the State of California on the Bid Bond form included with the Contract Documents. The bid security must guarantee that within ten (10) days after City issues the Notice of Award, the successful bidder will execute the Contract and submit payment and performance bonds, insurance certificates and endorsements, valid Certificates of Reported Compliance as required under the California Air Resources Board's In-Use Off-Road Diesel-Fueled Fleets Regulation (13 CCR § 2449 et seq.) ("Off-Road Regulation"), if applicable, and any other submittals required by the Contract Documents and the Notice of Award.

6. Prevailing Wage Requirements.

6.1 General**.** Pursuant to California Labor Code Section 1720 *et seq*., this Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes.

6.2 Rates**.** The prevailing rates are available online at http://www.dir.ca.gov/DLSR. Each Contractor and Subcontractor must pay no less than the specified rates to all workers employed to work on the Project. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work must be at least time and one-half.

6.3 Compliance. The Contract will be subject to compliance monitoring and enforcement by the California Department of Industrial Relations, pursuant to Labor Code Section 1771.4.

7. Performance and Payment Bonds. The successful bidder will be required to provide performance and payment bonds each for one hundred percent of the Contract Price as further described in the Contract Documents.

8. Substitution of Securities. Substitution of appropriate securities in lieu of retention amounts from progress payments is permitted under Public Contract Code Section 22300.

9. **Subcontractor List.** Each Subcontractor must be registered with the DIR to perform work on public projects. Each bidder must submit a completed Subcontractor List form with its Bid Proposal, including the name, location of the place of business, California contractor license number and DIR registration number and percentage of the Work to be performed (based on the base bid price) for each Subcontractor who will perform Work or service or fabricate or install Work for the prime contractor in excess of one-half (1/2) of one percent (1%) of the bid price, using the Subcontractor List form included with the Contract Documents. For street or highway construction, this requirement applies to any subcontract of $10,000 or more.

10. **Instructions to Bidders.** All bidders should carefully review the Instructions to Bidders for more detailed information before submitting a Bid Proposal. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, as defined therein, including this Notice Inviting Bids.

11. **Estimated Cost.** The estimated construction cost is $839,000.

By: Michelle Bigelow Date: June 26, 2025

Publication Dates: 1) July 4, 2025 2) July 18, 2025

END OF NOTICE INVITING BIDS

INSTRUCTIONS TO BIDDERS

Each Bid Proposal submitted to the City of Morgan Hill ("City") for its Eagle View Well #1 Development ("Project") must be submitted in accordance with the following instructions and requirements:

1. Bid Submission.

1.1 General. Each Bid Proposal must be signed, sealed and submitted to City, using the form provided in the Contract Documents, by or before the date and time set forth in Section 1 of the Notice Inviting Bids, or as amended by subsequent addendum. Faxed or emailed Bid Proposals will not be accepted, unless otherwise specified. Late submissions will be returned unopened. City reserves the right to postpone the date or time for receiving or opening bids. Each bidder is solely responsible for all of its costs to prepare and submit its bid and by submitting a bid waives any right to recover those costs from City. The bid price(s) must include all costs to perform the Work as specified, including all labor, materials, supplies, and equipment and all other direct or indirect costs such as applicable federal, state and local taxes, insurance and overhead.

1.2 Bid Envelope. The envelope containing the sealed Bid Proposal and all required forms and attachments must be clearly labeled and addressed as follows:

BID PROPOSAL
Morgan Hill Development Services Center
Eagle View Well #1 Development
City of Morgan Hill
17575 Peak Avenue
Morgan Hill, CA 95037
Attention: Bid Opening
Bid Date:_____
Bid Time: _____

The envelope must also be clearly labeled, as follows, with the bidder's name, address, and its registration number with the California Department of Industrial Relations ("DIR") for bidding on public works contracts (Labor Code sections 1725.5 and 1771.1):

[Contractor company name]
[Street address]
[City, state, zip code]
DIR Registration No._____

1.3 DIR Registration. Subject to limited legal exceptions for joint venture bids and federally-funded projects, City will not accept a Bid Proposal from a bidder without proof that the bidder is registered with the DIR to perform public work under Labor Code Section 1725.5. If City is unable to confirm that the bidder is currently registered with the DIR, City may disqualify the bidder and return its bid unopened (Labor Code Section 1725.5 and 1771.1(a)).

2. Bid Proposal Form and Enclosures. Each Bid Proposal must be completed in ink using the Bid Proposal form included with the Contract Documents. The Bid Proposal form must be fully completed without interlineations, alterations, or erasures. Any necessary corrections must be clear and legible and must be initialed by the bidder's authorized representative. A Bid Proposal submitted with exceptions or terms such as "negotiable," "will negotiate," or similar, will be considered nonresponsive. Each Bid Proposal must be accompanied by bid security, as set forth in Section 4 below, and by a completed Subcontractor List and NonCollusion Declaration using the forms included with the Contract Documents, and any other required enclosures, as applicable.

3. Authorization and Execution. Each Bid Proposal must be signed by the bidder's authorized representative. A Bid Proposal submitted by a partnership must be signed in the partnership name by a general partner with authority to bind the partnership. A Bid Proposal submitted by a limited liability company (LLC) must be signed in the name of the LLC by a member or manager with authority to bind the LLC. A Bid Proposal submitted by a corporation must be signed with the legal name of the corporation, followed by the signature and title of an officer of the corporation with full authority to bind the corporation to the terms of the Bid Proposal.

4. Bid Security. Each Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's check or certified check, made payable to the City, or bid bond using the form included in the Contract Documents and executed by a surety licensed to do business in the State of California. The bid security must guarantee that, within ten days after issuance of the Notice of Award, the bidder will: execute and submit the enclosed Contract for the bid price; submit payment and performance bonds for 100% of the maximum Contract Price; submit the insurance certificates and endorsements; and submit valid Certificates of Reported Compliance as required by the Off-Road Regulation, if applicable, and any other submittals, if any, required by the Contract Documents or the Notice of Award.

4.1 Withdrawal of Bid Proposals. A Bid Proposal may not be withdrawn for a period of 90 days after the bid opening without forfeiture of

the bid security, except as authorized for material error under Public Contract Code Section 5100 *et seq*.

5. Requests for Information. Questions or requests for clarifications regarding the Project, the bid procedures, or any of the Contract Documents must be submitted in writing to David Gittleson, Project Engineer, at david.gittleson @morganhill.ca.gov. Oral responses are not authorized and are not binding on the City. Bidders should submit any such written inquiries at least five Working Days before the scheduled bid opening. Questions received any later might not be addressed before the bid deadline. An interpretation or clarification by City in response to a written inquiry will be issued in an addendum.

6. Pre-Bid Investigation.

6.1 General. Each bidder is solely responsible at its sole expense for diligent and thorough review of the Contract Documents, examination of the Project site, and reasonable and prudent inquiry concerning known and potential site and area conditions prior to submitting a Bid Proposal. Each bidder is responsible for knowledge of conditions and requirements which reasonable review and investigation would have disclosed. However, except for any areas that are open to the public at large, bidders may not enter property owned or leased by the City or the Project site without prior written authorization from City.

6.2 Document Review. Each bidder is responsible for review of the Contract Documents and any informational documents provided "For Reference Only," e.g., as-builts, technical reports, test data, and the like. A bidder is responsible for notifying City of any errors or omissions, inconsistencies, or conflicts it discovers in the Contract Documents prior to submitting a Bid Proposal, subject to the limitations of Public Contract Code Section 1104. Notification of any such errors, omissions, inconsistencies, or conflicts must be submitted in writing to the City no later than five Working Days before the scheduled bid opening. (See Section 5, above.) City expressly disclaims responsibility for assumptions a bidder might draw from the presence or absence of information provided by City.

6.3 Project Site. Questions regarding the availability of soil test data, water table elevations, and the like should be submitted to the City in writing, as specified in Section 5, above. Any subsurface exploration at the Project site must be done at the bidder's expense, but only with prior written authorization from City. All soil data and analyses available for inspection or provided in the Contract Documents apply only to the test hole locations. Any water table elevation indicated by a soil test report existed on the date the test hole was drilled. The bidder is responsible for determining and allowing for any differing soil or water table conditions during construction.

Because groundwater levels may fluctuate, difference(s) in elevation between ground water shown in soil boring logs and ground water actually encountered during Project construction will not be considered changed Project site conditions. Actual locations and depths must be determined by bidder's field investigation. The bidder may request access to underlying or background information on the Project site in City's possession that is necessary for the bidder to form its own conclusions, including, if available, record drawings or other documents indicating the location of subsurface lines, utilities, or other structures.

6.4 Utility Company Standards. The Project must be completed in a manner that satisfies the standards and requirements of any affected utility companies or agencies (collectively, "utility owners"). The successful bidder may be required by the third-party utility owners to provide detailed plans prepared by a California registered civil engineer showing the necessary temporary support of the utilities during coordinated construction work. Bidders are directed to contact the affected third-party utility owners about their requirements before submitting a Bid Proposal.

7. Bidders Interested in More Than One Bid. No person, firm, or corporation may submit or be a party to more than one Bid Proposal unless alternate bids are specifically called for. However, a person, firm, or corporation that has submitted a subcontract proposal or quote to a bidder may submit subcontract proposals or quotes to other bidders.

8. Addenda. Subject to the limitations of Public Contract Code section 4104.5, City reserves the right to issue addenda prior to bid time. Any addenda issued prior to the bid opening are part of the Contract Documents. Each bidder is solely responsible for ensuring it has received and reviewed all addenda prior to submitting its bid. Bidders should check City's website periodically for any addenda or updates on the Project at: http://www.publicpurchase.com.

9. Brand Designations and "Or Equal" Substitutions. Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate quality and type of item or service desired, and bidders may request use of any equal material, product, thing, or service. All data substantiating the proposed substitute as an "equal" item or service must be submitted with the written request for substitution. This provision does not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code Section 3400(c).

9.1 Pre-Bid Requests. Any request for submission made before the Contract is awarded must be submitted to the City Engineer at least ten (10)

days before the opening of bids so that all interested bidders may be notified of any approved alternative.

9.2 Post-Award Requests. After the Contract is awarded, Contractor may submit a substitution within fourteen (14) days after the date of award of the Contract, or as specified in the Special Conditions.

10. Bid Protest. Any bid protest against another bidder must be submitted in writing and received by City at the City Attorney's Office at 17575 Peak Avenue, Morgan Hill, CA, (Fax: (408) 779-1592 or Email to cityattorney@morganhill.ca.gov), before 5:00 p.m. no later than two Working Days following bid opening ("Bid Protest Deadline") and must comply with the following requirements:

10.1 General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. If required by City, the protesting bidder must submit a non-refundable fee in the amount specified by City, based upon City's reasonable costs to administer the bid protest. Any such fee must be submitted to City no later than the Bid Protest Deadline, unless otherwise specified. For purposes of this Section 10, a "Working Day" means a day that City is open for normal business, and excludes weekends and holidays observed by City. Pursuant to Public Contract Code Section 4104, inadvertent omission of a Subcontractor's DIR registration number on the Subcontractor List form is not grounds for a bid protest, provided it is corrected within 24 hours of the bid opening or as otherwise provided under Labor Code Section 1771.1(b).

10.2 Protest Contents. The bid protest must contain a complete statement of the basis for the protest and must include all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the protesting bidder and any person submitting the protest on behalf of or as an authorized representative of the protesting bidder.

10.3 Copy to Protested Bidder. Upon submission of its bid protest to City, the protesting bidder must also concurrently transmit the protest and all supporting documents to the protested bidder, and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest, by email or hand delivery to ensure delivery before the Bid Protest Deadline.

10.4 Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., within two Working Days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person responding on behalf of or representing the protested bidder if different from the protested bidder.

10.5 Copy to Protesting Bidder. Upon submission of its response to the bid protest to City, the protested bidder must also concurrently transmit by email or hand delivery, by or before the Response Deadline, a copy of its response and all supporting documents to the protesting bidder and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

10.6 Exclusive Remedy. The procedure and time limits set forth in this Section are mandatory and are the bidder's sole and exclusive remedy in the event of a bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

10.7 Right to Award. City reserves the right, acting in its sole discretion, to reject any bid protest that it determines lacks merit, to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a Notice to Proceed with the Work notwithstanding any pending or continuing challenge to its determination.

11. Reservation of Rights. City reserves the unfettered right, acting in its sole discretion, to waive or to decline to waive any immaterial bid irregularities; to accept or reject any or all bids; to cancel or reschedule the bid; to postpone or abandon the Project entirely; or to perform all or part of the Work with its own forces. The Contract will be awarded, if at all, within ninety days after opening of bids or as otherwise specified in the Special Conditions, to the responsible bidder that submitted the lowest responsive bid. Any planned start date for the Project represents the City's expectations at the time the Notice Inviting Bids was first issued. City is not bound to issue a Notice to Proceed by or before such planned start date, and it reserves the right to issue the Notice to Proceed when the City determines, in its sole discretion, the appropriate time for commencing the Work. The City expressly disclaims responsibility for any assumptions a bidder might draw from the presence or absence of information provided by the City in any form. Each bidder is solely responsible for its costs to prepare and submit a bid, including site investigation costs.

12. **Bonds.** Within ten calendar days following City's issuance of the Notice of Award to the apparent low bidder, the bidder must submit payment and performance bonds to City as specified in the Contract Documents using the bond forms included in the Contract Documents. All required bonds must be calculated on the maximum total Contract Price as awarded, including additive alternates, if applicable.

13. **License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work. The successful bidder must also obtain a City business license within ten days following City's issuance of the Notice of Award. Subcontractors must also obtain a City business license before performing any Work.

14. **Ineligible Subcontractor.** Any Subcontractor who is ineligible to perform work on a public works project under Labor Code Sections 1777.1 or 1777.7 is prohibited from performing work on this Project.

15. **In-Use Off-Road Diesel-Fueled Fleets.** If the Project involves the use of vehicles subject to the California Air Resources Board's In-Use Off-Road Diesel-Fueled Fleets Regulation (13 CCR § 2449 et seq.) ("Off-Road Regulation"), then within ten calendar days following City's issuance of the Notice of Potential Award to the successful bidder, the bidder must submit to City valid Certificates of Reported Compliance for its fleet and its listed Subcontractors, if applicable, in accordance with the Off-Road Regulation, unless exempt under the Off-Road Regulation.

16. **Subcontractor Work Limits.** The prime contractor must perform at least **[20%]** of the Work on the Project, calculated as a percentage of the base bid price, with its own forces, except for any Work identified as "Specialty Work" in the Contract Documents. The total bid amount for any such Specialty Work, as shown on the Bid Schedule, may be deducted from the base bid price before computing the **20%** self-performance requirement. The remaining Work may be performed by qualified Subcontractor(s).

17. **Bidder's Questionnaire.** A completed, signed Bidder's Questionnaire using the form provided with the Contract Documents and including all required attachments must be submitted within 48 hours following a request by City. A bid that does not fully comply with this requirement may be rejected as nonresponsive. A bidder who submits a Bidder's Questionnaire which is subsequently determined to contain false or misleading information, or material omissions, may be disqualified as non-responsible.

18. Bid Schedule. Each bidder must complete the Bid Schedule form with unit prices as indicated, and submit the completed Bid Schedule with its Bid Proposal.

18.1 Incorrect Totals. In the event a computational error for any bid item (base bid or alternate) results in an incorrect extended total for that item, the submitted base bid or bid alternate total will be adjusted to reflect the corrected amount as the product of the estimated quantity and the unit cost. In the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid, and the amount entered as the base bid on the Bid Proposal form, the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid will be deemed the base bid price. Likewise, in the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for any bid alternate, and the amount entered for the alternate on the Bid Proposal form, the actual total of the itemized prices shown on the Bid Schedule for that alternate will be deemed the alternate price. Nothing in this provision is intended to prevent a bidder from requesting to withdraw its bid for material error under Public Contract Code § 5100 et seq.

18.2 Estimated Quantities. The quantities shown on the Bid Schedule are estimated and the actual quantities required to perform the Work may be greater or less than the estimated amount. The Contract Price will be adjusted to reflect the actual quantities required for the Work based on the itemized or unit prices provided in the Bid Schedule, with no allowance for anticipated profit for quantities that are deleted or decreased, and no increase in the unit price, and without regard to the percentage increase or decrease of the estimated quantity and the actual quantity.

19. Safety Orders. If the Project includes construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet or deeper, each bid must include a bid item for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which comply with safety orders as required by Labor Code Section 6707.

20. For Reference Only. The following documents are provided “For Reference Only,” as defined in Section 3.4 of the General Conditions: Attachment A-Geotechnical Design Report 2025

END OF INSTRUCTIONS TO BIDDERS

BID PROPOSAL

Eagle View Well #1 Development

_____ ("Bidder") hereby submits this Bid Proposal to the City of Morgan Hill ("City") for the above-referenced project ("Project") in response to the Notice Inviting Bids and in accordance with the Contract Documents referenced therein.

1. **Base Bid.** Bidder proposes to perform and fully complete the Work for the Project as specified in the Contract Documents, within the time required for full completion of the Work, including all labor, materials, supplies, and equipment and all other direct or indirect costs including, but not limited to, taxes, insurance and all overhead for the following price ("Base Bid"):

$ _____.

2. **Addenda.** Bidder agrees that it has confirmed receipt of or access to, and reviewed, all addenda issued for this Bid. Bidder waives any claims it might have against the City based on its failure to receive, access, or review any addenda for any reason. Bidder specifically acknowledges receipt of the following addenda:

Addendum:	Date Received:	Addendum:	Date Received:
#01	_____	#05	_____
#02	_____	#06	_____
#03	_____	#07	_____
#04	_____	#08	_____

3. **Bidder's Certifications and Warranties.** By signing and submitting this Bid Proposal, Bidder certifies and warrants the following:

3.1 **Examination of Contract Documents.** Bidder has thoroughly examined the Contract Documents, and represents that, to the best of Bidder's knowledge there are no errors, omissions, or discrepancies in the Contract Documents subject to the limitations of Public Contract Code Section 1104.

3.2 **Examination of Worksite.** Bidder has had the opportunity to examine the Worksite and local conditions at the Project location.

3.3 **Bidder Responsibility.** Bidder is a responsible bidder, with the necessary ability, capacity, experience, skill, qualifications, workforce, equipment, and resources to perform or cause the Work to be performed in accordance with the Contract Documents and within the Contract Time.

3.4 Responsibility for Bid. Bidder has carefully reviewed this Bid Proposal and is solely responsible for any errors or omissions contained in its completed Bid. All statements and information provided in this Bid Proposal and enclosures are true and correct to the best of Bidder's knowledge.

3.5 Nondiscrimination. In preparing this Bid, the Bidder has not engaged in discrimination against any prospective or present employee or Subcontractor on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status.

3.6 Iran Contracting Act if the Contract Price Exceeds $1,000,000. Bidder certifies that it is not identified on a list created under the Iran Contracting Act, Public Contract Code Section 2200 *et seq.* (the "Act"), as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

4. Award of Contract. By signing and submitting this Bid Proposal, Bidder agrees that if Bidder is awarded the Contract for the Project, then within ten days following issuance of the Notice of Award to Bidder, Bidder will do all of the following:

4.1 Execute Contract. Enter into the Contract with City in accordance with the terms of this Bid Proposal, by signing and submitting to City the Contract prepared by City using the form included with the Contract Documents;

4.2 Submit Required Bonds. Submit to City a payment bond and a performance bond, each for one hundred percent (100%) of the Contract Price, using the bond forms provided and in accordance with the requirements of the Contract Documents;

4.3 Insurance Requirements. Submit to City the insurance certificate(s) and endorsement(s) as required by the Contract Documents; and

4.4 Certificates of Reported Compliance. Submit to City valid Certificates of Reported Compliance for its fleet and its listed Subcontractors, if applicable, if the Project involves the use of vehicles subject to the Off-Road Regulation. (See Section 16 of the Instructions to Bidders.)

5. Wage Theft Prevention. All Bidders are expected to have read and understand the "Wage Theft Prevention Policy" adopted by the City Council on July 26, 2017 as further described in Section 9.6 of the General Conditions.

The undersigned Bidder certifies that neither Bidder nor its principals have been found by a final court judgement or final administrative action of an investigatory agency to have violated federal, state or local wage and hour laws within the past five years from the date of the submitted bid. Bidder or its principals who are unable to so certify, must disclose wage and hour violations, and shall provide a copy of (i) the court order and judgment and/or final administrative decision; and (ii) documents demonstrating either that the order/judgment has been satisfied, or if the order/judgment has not been fully satisfied, a written and signed description of Bidder's efforts to date to satisfy the order/judgment. Signing this bid shall constitute signature of this Certification.

The City, at its sole discretion, may disqualify a bidder based on one or more disclosed judgments consistent with the criteria set forth in the Policy.

6. Bid Security. As a guarantee that if awarded the Contract, Bidder will perform its obligations under Section 4 above Bidder is enclosing bid security in the amount of ten percent (10%) of its maximum bid amount in one of the following forms (check one):

____ A cashier's check or certified check payable to City of Morgan Hill and issued by _____ Bank in the amount of $_____.

____ A bid bond, using the Bid Bond form included with the Contract Documents, payable to City of Morgan Hill and executed by a surety licensed to do business in the State of California.

This Bid Proposal is hereby submitted on _____, 20__:

s/ _____ _____
Name and Title [print]

_____ _____
Company Name License # and Classification

_____
DIR Registration #

_____ _____
Address Phone

_____ _____
City, State, Zip Fax

END OF BID PROPOSAL

BID SCHEDULE I – GENERAL

Eagle View Well #1 Development

This Bid Schedule must be completed in ink and included with the sealed Bid Proposal. Pricing must be provided for each Bid Item as indicated. Items marked "(SW)" are Specialty Work that must be performed by a qualified Subcontractor. The lump sum or unit cost for each item must be inclusive of all costs, whether direct or indirect, including profit and overhead. The sum of all amounts entered in the "Extended Total Amount" column must be identical to the Base Bid price entered in Section 1 of the Bid Proposal Form. Quantities shown are required for bid purposes and may or may not be final pay quantities. Actual quantities, if different, must be substantiated during the Project by the Contractor (either by field measurement, trucking tags, or other means acceptable to the Engineer).

AL = Allowance CF = Cubic Feet CY = Cubic Yard EA = Each LB = Pounds
LF = Linear Foot LS = Lump Sum SF = Square Feet TON = Ton (2000 lbs.)

Bid Item No.	Description of Bid Item	Estimated Quantity/Unit of Measure	Unit Price	Extended Total Amount
1	Mobilization, Demobilization, and General Conditions	Lump Sum	$	$
2	Sound Walls	260 LF	$	$
3	48-Inch Diameter Borehole Drilling	50 LF	$	$
4	36-Inch OD x 3/8-Inch Wall ASTM A-53 Grade B Steel Conductor Casing	50 LF	$	$
5	30-Inch Diameter Borehole Drilling	320 LF	$	$
6	16-Inch ID x 5/16-Inch Wall ASTM A-778 Type 304 Stainless Steel Blank Casing	272 LF	$	$
7	16-Inch ID x 5/16-Inch Wall ASTM A-778 Type 304 Stainless Steel 0.070-Inch Slot Size Louvered Well Screen	90 LF	$	$
8	Gravel Fill Tube and Sounding Tube	Lump Sum	$	$
9	Gravel Envelope and Seal	370 LF	$	$
10	Well Development	Lump Sum	$	$
11	Install/Remove Test Pump	Lump Sum	$	$
12	Well and Aquifer Testing	30 Hour	$	$
13	Plumbness and Alignment Testing	Lump Sum	$	$
14	Television Inspection	Lump Sum	$	$
15	Well Disinfection	Lump Sum	$	$
16	Drilling Fluid and Cuttings Disposal	Lump Sum	$	$

17	Santa Clara Valley Water District and State Water Resources Control Board Permitting	Lump Sum	$	$
18	Site Clean-up and Records	Lump Sum	$	$
19	Standby Time	1 Hour		
20	Supplemental	Lump Sum	$40,000	$40,000

Bid Schedule I Total	

*Final Pay Quantity

TOTAL BASE BID: Items 1 through _____ inclusive: $_____

***Note**: The amount entered as the "Total Base Bid" should be identical to the Base Bid amount entered in Section 1 of the Bid Proposal form.*

END OF BID SCHEDULE

SUBCONTRACTOR LIST

For each Subcontractor that will perform a portion of the Work in an amount in excess of one-half of 1% of the Bidder's total Base Bid,[1] the bidder must list a description of the Work, the name of the Subcontractor, its California contractor license number, the location of its place of business, its DIR registration number, and the portion of the Work that the Subcontractor is performing based on a percentage of the Base Bid price. **Bidders: Please print legibly. Illegible forms may be rejected.**

DESCRIPTION OF WORK	SUBCONTRACTOR NAME	CALIFORNIA CONTRACTOR LICENSE NUMBER	DIR REG. NO.	LOCATION OF BUSINESS	LOCAL VENDOR[2] YES/NO	PERCENT OF WORK

END OF SUBCONTRACTOR LIST

[1] For street or highway construction this requirement applies to any subcontract of $10,000 or more.
[2] A Subcontractor is considered local if its principal place of business is within the city limits of Morgan Hill.

NONCOLLUSION DECLARATION

(To be executed by bidder and submitted with bid)

State of California County of _____	)))	ss.

The undersigned declares:

I am the _____ [title] of _____ [business name], 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.

This declaration is intended to comply with California Public Contract Code § 7106 and Title 23 U.S.C. § 112.

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].

s/_____

_____

Name [print]

BID BOND

_____ ("Bidder") has submitted a bid, dated _____ __, 20_____ ("Bid"), to the City of Morgan Hill ("City") for work on the _____ ("Project"). Under this duly executed bid bond ("Bid Bond"), Bidder as Principal and _____, its surety ("Surety"), are bound to City as obligee in the penal sum of ten percent (10%) of the maximum amount of the Bid (the "Bond Sum"). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

1. **General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with City in accordance with the terms of the Bid.

2. **Submittals.** Within ten days following issuance of the Notice of Award to Bidder, Bidder must submit to City the following:

   2.1 Contract. The executed Contract, using the form provided by City in the Project contract documents ("Contract Documents");

   2.2 Payment Bond. A payment bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond form included with the Contract Documents;

   2.3 Performance Bond. A performance bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Performance Bond form included with the Contract Documents;

   2.4 Insurance. The insurance certificate(s) and endorsement(s) required by the Contract Documents; and

   2.5 Certificates of Reported Compliance. Valid Certificates of Reported Compliance for its fleet and its listed Subcontractors, if applicable, in accordance with the In-Use Off-Road Diesel-Fueled Fleets Regulation (13 CCR § 2449 et seq.) ("Off-Road Regulation"), if the Project involves the use of vehicles subject to the Off-Road Regulation; and any other documents required by the Instructions to Bidders or Notice of Award.

3. **Enforcement.** If Bidder fails to execute the Contract or to submit the bonds, insurance certificates and endorsements, and valid Certificates of Reported Compliance, as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to City. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____

City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

4. **Duration and Waiver.** If Bidder fulfills its obligations under Section 2, above, then this obligation will be null and void; otherwise it will remain in full force and effect for ninety days following the bid opening or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code Sections 2819 and 2845.

This Bid Bond is entered into and is effective on _____, 20_____.

SURETY:

_____

s/ _____

Name: _____

Title: _____

(Attach Acknowledgement, Notary Seal, and Attorney-In-Fact Certificate)

CONTRACTOR:

_____

s/ _____

Name: _____

Title: _____

APPROVED AS TO FORM:

By:_____
Donald A. Larkin, City Attorney

Date:_____

BIDDER'S QUESTIONNAIRE

Eagle View Well #1 Development

Within forty-eight (48) hours following a request by City, a bidder must submit to City a completed, signed Bidder's Questionnaire using this form and all required attachments, including clearly labeled additional sheets as needed. City may request the Questionnaire from one or more of the apparent low bidders following the bid opening, and may use the completed Questionnaire as part of its investigation to evaluate a bidder's qualifications for this Project. The Questionnaire must be filled out completely, accurately, and legibly. Any errors, omissions, or misrepresentations in completion of the Questionnaire may be grounds for rejection of the bid or termination of a Contract awarded pursuant to the bid.

Part 1: General Information

Bidder Business Name: _____ ("Bidder")

Check One: ☐ Corporation State of Incorporation _____
☐ Limited Liability Company/State of Formation _____
☐ Partnership
☐ Sole Proprietorship
☐ Joint Venture of: _____
☐ Other: _____

Main Office Address:

_____

_____

Phone: _____

Fax: _____

Local Office Address and Phone: _____

_____

Website address: _____

Owner of Business: _____

Contact Name and Title: _____

Contact phone and email: _____

Bidder's California Contractor's License Number(s): _____

Bidder's DIR Registration Number: _____

Part 2: Bidder Experience

1. How many years has Bidder been in business under its present business name? _____ years

2. Has Bidder completed projects similar in type and size to this Project as a general contractor? ☐ Yes ☐ No

3. Has Bidder ever been disqualified from a bid on grounds that it is not responsible, or otherwise disqualified or debarred from bidding under state or federal law?

☐ Yes ☐ No

If yes, provide additional information on a separate sheet regarding the disqualification or debarment, including the name and address of the agency or owner of the project, the type and size of the project, the reasons that Bidder was disqualified or debarred, and the month and year in which the disqualification or debarment occurred.

4. Has Bidder ever been terminated for cause, alleged default, or legal violation from a construction project, either as a general contractor or as a subcontractor?

☐ Yes ☐ No

If yes, provide additional information on a separate sheet regarding the termination, including the name and address of the agency or owner of the subject project, the type and size of the project, whether Bidder was under contract as a general contractor or a subcontractor, the reasons that Bidder was terminated, and the month and year in which the termination occurred.

5. Provide information about Bidder's past projects performed as general contractor as follows:

5.1 Six most recently completed public works projects within the last three years;

5.2 Three largest completed projects within the last three years; and

5.3 Any project which is similar to this Project including scope and character of the work.

6. Use separate sheets to provide all of the following information for each project identified in response to the above three categories:

6.1 Project name
6.2 Location
6.3 Owner
6.4 Owner contact (name, address, email, and phone number)
6.5 Prime contractor, if applicable (name, address, email, and phone number);
6.6 Architect or engineer name
6.7 Architect or engineer contact (name, email and phone number)
6.8 Project and/or construction manager (name and current phone number)
6.9 Description of project, scope of work performed
6.10 Initial contract value (at time of bid award)
6.11 Final cost of construction (including change orders)
6.12 Original scheduled completion date
6.13 Time extensions granted (number of days)
6.14 Actual date of completion
6.15 Number and amount of stop notices or mechanic's liens filed
6.16 Amount of liquidated damages assessed against Bidder
6.17 Nature and resolution of any project-related claim, lawsuit, mediation and/or arbitration involving Bidder.

Part 3: Safety

1. Provide Bidder's Experience Modification Rate (EMR) for the last three years:

Year	EMR

2. Complete the following, based on information provided in Bidder's CalOSHA Form 300 or Form 300A, Annual Summary of Work-Related Illnesses and Injuries, from the most recent past calendar year:

2.1 Number of lost workday cases: _____
2.2 Number of medical treatment cases: _____
2.3 Number of deaths: _____

3. Has Bidder ever been cited, fined, or prosecuted by any local, state, or federal agency, including OSHA, CalOSHA, or EPA, for violation of any law, regulation, or requirements pertaining to health and safety?

☐ Yes ☐ No

If yes, provide additional information on a separate sheet regarding each such citation, fine, or prosecution, including the name and address of the agency or owner of the project, the type and size of the project, the reasons for and nature of the citation, fine, or prosecution, and the month and year in which the incident giving rise to the citation, fine, or prosecution occurred.

4. Name, title, and email for person responsible for Bidder's safety program:

Name	Title	Email
Name	Title	Email

Part 4: Verification

In signing this document, I, the undersigned, declare that I am duly authorized to sign and submit this Bidder's Questionnaire on behalf of the named Bidder, and that all responses and information set forth in this Bidder's Questionnaire and accompanying attachments are, to the best of my knowledge, true, accurate and complete as of the date of submission. **I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.**

Signature: _____ Date:

By [name, title]: _____

END OF BIDDER'S QUESTIONNAIRE

CONTRACT

This public works contract ("Contract") is entered into by and between the City of Morgan Hill ("City") and _____a (State of formation)(type of entity) [CONTRACTOR NAME] ("Contractor") for work on the Eagle View Well #1 Development Project ("Project").

The parties agree as follows:

1. **Award of Contract**. In response to the Notice Inviting Bids, Contractor has submitted a Bid Proposal to perform the Work to construct on the Project. On _____, 2025, City authorized award of this Contract to Contractor for the amount set forth in Section 4, below.

2. **Contract Documents**. The Contract Documents incorporated into this Contract include and are comprised of all of the documents listed below. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, including this Contract.

   2.1 Notice Inviting Bids;
   2.2 Instructions to Bidders;
   2.3 Addenda, if any;
   2.4 Bid Proposal and attachments thereto;
   2.5 Contract;
   2.6 Payment and Performance Bonds;
   2.7 General Conditions;
   2.8 Special Conditions;
   2.9 Project Plans and Specifications;
   2.10 Change Orders, if any;
   2.11 Notice of Award;
   2.12 Notice to Proceed; and
   2.13 The following: none

3. **Contractor's Obligations.** Contractor will perform all of the Work required for the Project, as specified in the Contract Documents. Contractor must provide, furnish, and supply all things necessary and incidental for the timely performance and completion of the Work, including all necessary labor, materials, supplies, tools, equipment, transportation, onsite facilities, and utilities, unless otherwise specified in the Contract Documents. Contractor must use its best efforts to diligently prosecute and complete the Work in a professional and expeditious manner and to meet or exceed the performance standards required by the Contract Documents.

4. **Payment.** As full and complete compensation for Contractor's timely performance and completion of the Work in strict accordance with the terms and conditions of the Contract Documents, City will pay Contractor [CONTRACT VALUE TEXT] Dollars ($[$#,###,###]) (the "Contract Price"), for all of Contractor's direct and indirect costs to perform the Work, including all labor, materials, supplies, equipment, federal, state and local taxes, insurance, bonds, and all overhead costs, in accordance with the payment provisions in the General Conditions.

5. **Time for Completion.** Contractor will fully complete the Work for the Project, meeting all requirements for Final Completion, within 150 calendar days from the start date set forth in the Notice to Proceed ("Contract Time"). By signing below, Contractor expressly waives any claim for delayed early completion.

6. **Liquidated Damages.** As further specified in Section 5.4 of the General Conditions, if Contractor fails to complete the Work within the Contract Time, City will assess liquidated damages in the amount of One Thousand Dollars ($1,000) per day for each day of unexcused delay in achieving Final Completion, and such liquidated damages may be deducted from City's payments due or to become due to Contractor under this Contract. Contract Price will be reduced accordingly.

7. **Labor Code Compliance.**

   7.1 General. This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours and workers' compensation insurance, as further specified in Article 9 of the General Conditions.

   7.2 Prevailing Wages. This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available online at http://www.dir.ca.gov/DLSR.

   7.3 DIR Registration. City will not enter into the Contract with a bidder without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

8. **Workers' Compensation Certification.** Pursuant to Labor Code Section 1861, by signing this Contract, Contractor certifies as follows: "I am aware of the provisions of Labor Code Section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work on this Contract."

9. **Conflicts of Interest**. Contractor, its employees, Subcontractors and agents, may not have, maintain or acquire a conflict of interest in relation to this Contract in violation of any City ordinance or requirement, or in violation of any California law, including Government Code Section 1090 *et seq*., or the Political Reform Act, as set forth in Government Code Section 81000 *et seq*. and its accompanying regulations. Any violation of this Section constitutes a material breach of the Contract.

10. **Independent Contractor.** Contractor is an independent contractor under this Contract and will have control of the Work and the means and methods by which it is performed. Contractor and its Subcontractors are not employees of City and are not entitled to participate in any health, retirement, or any other employee benefits from City.

11. **Notice.** Any notice required by the Contract Documents must be made in writing, signed, dated, and sent to the other party by personal delivery, U.S. Mail, a reliable overnight delivery service, or by email as a PDF file. Notice is deemed effective upon delivery unless otherwise specified. Notice for each party must be given as follows:

    City:

    City of Morgan Hill
    17575 Peak Avenue
    Morgan Hill, CA 95037
    Phone: (408) 779-7259
    Attn: City Clerk
    Email: michelle.bigelow@morganhill.ca.gov
    Copy to: david.gittleson@morganhill.ca.gov

    Contractor:

    Name: _____
    Address: _____
    City/State/Zip: _____
    Phone: _____
    Attn: _____
    Email: _____
    Copy to: _____

12. General Provisions.

12.1 Assignment and Successors. Contractor may not assign its rights or obligations under this Contract, in part or in whole, without City's written consent. This Contract is binding on Contractor's and City's lawful heirs, successors and permitted assigns.

12.2 Third Party Beneficiaries. There are no intended third-party beneficiaries to this Contract.

12.3 Governing Law and Venue. This Contract will be governed by California law and venue will be in the Superior Court of Santa Clara County, and no other place. Contractor waives any right it may have pursuant to Code of Civil Procedure Section 394, to file a motion to transfer any action arising from or relating to this Contract to a venue outside of Santa Clara County, California.

12.4 Amendment. No amendment or modification of this Contract will be binding unless it is in a writing duly authorized and signed by the parties to this Contract.

12.5 Integration. This Contract and the Contract Documents incorporated herein, including authorized amendments or Change Orders thereto, constitute the final, complete, and exclusive terms of the agreement between City and Contractor.

12.6 Severability. If any provision of the Contract Documents, is determined to be illegal, invalid, or unenforceable, in whole or in part, the remaining provisions of the Contract Documents will remain in full force and effect.

12.7 Iran Contracting Act. If the Contract Price exceeds $1,000,000, Contractor certifies, by signing below, that it is not identified on a list created under the Iran Contracting Act, Public Contract Code Section 2200 *et seq*. (the "Act"), as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

12.8 Authorization. Each individual signing below warrants that he or she is authorized to do so by the party that he or she represents, and that this Contract is legally binding on that party. If Contractor is a corporation, signatures from two officers of the corporation are required pursuant to California Corporations Code Section 313. If Contractor is a partnership, signature by a general partner with authority to bind the partnership is required. If Contractor is a limited liability company (LLC), a signature by a member or manager with authority to bind the LLC is required.

12.9 Electronic Signatures. Unless otherwise prohibited by law or City policy, the Parties agree that an electronic copy of a signed contract, or an electronically signed contract, has the same force and legal effect as a contract executed with an original ink signature. The term "electronic copy of a signed contract" refers to a transmission by facsimile, electronic mail, or other electronic means of a copy of an original signed contract in a portable document format. The term "electronically signed contract" means a contract that is executed by applying an electronic signature using technology approved by the City.

12.10 Notice of Security and/or Privacy Incident. If Contractor, or its subcontractor, suspect, discover or are notified of a data security incident or potential breach of security and/or privacy relating to City PII, PHI and/or PCI, Contractor shall immediately, but in no event later than forty-eight (48) hours from suspicion, discovery or notification of the incident or potential breach, notify City of such incident or potential breach. Contractor shall, upon City's request, investigate such

incident or potential breach, inform the City of the results of any such investigation, and assist the City in maintaining the confidentiality of such information. In addition to the foregoing, Contractor shall provide City with any assistance necessary to comply with any state and/or federal laws requiring the provision of notice of any privacy incident or security breach with respect to any City PII, PHI and/or PCI to the affected or impacted individuals and/or organizations, in addition to any notification to applicable state and federal agencies. Contractor agrees that it shall reimburse City for all expenses, costs, attorneys' fees, and resulting fines, penalties, and damages associated with such incident, breach, investigation and/or notification.

[Signatures are on the following page.]

AS SET FORTH IN CA. CORP. CODE § 313, TWO SIGNATURES ARE REQUIRED FOR CALIFORNIA CORPORATIONS:
(1) CHAIRPERSON OF THE BOARD, PRESIDENT, OR VICE PRESIDENT; AND
2) SECRETARY, ASSISTANT SECRETARY, CHIEF FINANCIAL OFFICER OR ASSISTANT TREASURER.

The parties agree to this Contract as witnessed by the signatures below:

CITY OF MORGAN HILL:

_____
Christina J. Turner
City Manager

Date: _____

Attest:

_____
Michelle Bigelow
City Clerk

Date: _____

Approved as to Form:

_____
Donald A. Larkin
City Attorney

Date: _____

CONTRACTOR:
[CONTRACTOR NAME]

_____
Signature

_____
Name/Title [print]

Date: _____

Corporate entities must provide a second signature:

_____
Signature

_____
Name/Title [print]

Date: _____

_____
Contractor's License Number(s)

_____
Expiration Date(s)

Seal:

_____
Contractor's DIR Registration Number(s)

_____
Expiration Date

END OF CONTRACT

PAYMENT BOND

The City of Morgan Hill ("City") and [CONTRACTOR NAME] ("Contractor") have entered into a contract for work on the **Eagle View Well #1 Development Project** ("Project"). The Contract is incorporated by reference into this Payment Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to City as obligee in an amount not less than [CONTRACT VALUE TEXT] Dollars ($[$#,###,###]) ("Bond Sum"), under California Civil Code Section 9550, *et seq*., to ensure payment to authorized claimants. This Bond is binding on the respective successors, assigns, owners, heirs, or executors of Surety and Contractor

2. **Surety's Obligation.** If Contractor or any of its Subcontractors fails to pay a person authorized in California Civil Code Section 9100 to assert a claim against a payment bond, any amounts due under the Unemployment Insurance Code with respect to work or labor performed under the Contract, or any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor and its Subcontractors, under California Unemployment Insurance Code Section 13020, with respect to the work and labor, then Surety will pay the obligation.

3. **Beneficiaries.** This Bond inures to the benefit of any of the persons named in California Civil Code Section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon this Bond. Contractor must promptly provide a copy of this Bond upon request by any person with legal rights under this Bond.

4. **Duration.** If Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the Work required by the Contract, in conformance with the time requirements set forth in the Contract and as required by California law, Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.

5. **Waivers.** Surety waives any requirement to be notified of alterations to the Contract or extensions of time for performance of the Work under the Contract. Surety waives the provisions of Civil Code Sections 2819 and 2845. City waives the requirement of a new bond for any supplemental contract under Civil Code Section 9550. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Superior Court of Santa Clara County, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

7. **Effective Date; Execution.** This Bond is entered into and is effective on _____, 20__.

SURETY:	CONTRACTOR:
s/ _____	s/ _____
Name: _____	Name: _____
Title: _____	Title: _____
(Attach Acknowledgment with Notary Seal and Power of Attorney)	

APPROVED AS TO FORM:

By: _____
Donald A. Larkin, City Attorney

Date: _____

END OF PAYMENT BOND

PERFORMANCE BOND

The City of Morgan Hill ("City") and [CONTRACTOR NAME] ("Contractor") have entered into a contract for work on the **Eagle View Well #1 Development Project** ("Project"). The Contract is incorporated by reference into this Performance Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to City as obligee for an amount not less than [CONTRACT VALUE TEXT] Dollars ($[$#,###,###]) (the "Bond Sum") to ensure Contractor's faithful performance of its obligations under the Contract. By executing this Bond, Contractor and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, to the provisions of this Bond.

2. **Surety's Obligations.** Surety's obligations are co-extensive with Contractor's obligations under the Contract. If Contractor fully performs its obligations under the Contract, including its warranty obligations under the Contract, Surety's obligations under this Bond will become null and void. Otherwise, Surety's obligations under this bond will remain in full force and effect.

3. **Waiver.** Surety waives any requirement to be notified of and further consents to any alterations to the Contract made under the applicable provisions of the Contract Documents, including changes to the scope of Work or extensions of time for performance of Work under the Contract. Surety waives the provisions of Civil Code Sections 2819 and 2845.

4. **Application of Contract Balance.** Upon making a demand on this Bond for completion of the Work prior to acceptance of the Project, City will make the Contract Balance available to Surety for completion of the Work under the Contract. For purposes of this provision, the Contract Balance is defined as the total amount payable by City to Contractor as the Contract Price minus amounts already paid to Contractor, and minus any liquidated damages, credits, or backcharges to which City is entitled under the terms of the Contract.

5. **Contractor Default.** Upon written notification from City that Contractor is in default under Article 13 of the Contract General Conditions, time being of the essence, Surety must act within the time specified in Article 13 to remedy the default through one of the following courses of action:

   5.1 Arrange for completion of the Work under the Contract by Contractor, with City's consent, but only if Contractor is in default solely due to its financial inability to complete the Work;

5.2 Arrange for completion of the Work under the Contract by a qualified contractor acceptable to City, and secured by performance and payment bonds issued by an admitted surety as required by the Contract Documents, at Surety's expense, or

5.3 Waive its right to complete the Work under the Contract and reimburse City the amount of City's costs to have the remaining Work completed.

6. **Surety Default.** If Surety defaults on its obligations under the Bond, City will be entitled to recover all costs it incurs due to Surety's default, including legal, design professional, or delay costs.

7. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

8. **Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Superior Court of Santa Clara County, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

[Signatures are on the following page.]

9. Effective Date; Execution. This Bond is entered into and effective on _____, 20___.

SURETY:	CONTRACTOR:
s/ _____	s/ _____
Name: _____	Name: _____
Title: _____	Title: _____
(Attach Acknowledgment with Notary Seal and Power of Attorney)	

APPROVED AS TO FORM:

By: _____
Donald A. Larkin, City Attorney

Date: _____

END OF PERFORMANCE BOND

GENERAL CONDITIONS

Article 1 - Definitions

1.1 Definitions. The following definitions apply to all of the Contract Documents unless otherwise indicated, e.g., additional definitions that apply solely to the Specifications or other technical documents. Defined terms and titles of documents are capitalized in the Contract Documents, with the exception of the following (in any tense or form): “day,” “furnish,” “including,” “install,” “work day,” or “working day.”

Allowance means a specific amount that must be included in the Bid Proposal for Work that may or may not be included in the Project, depending on conditions that will not become known until after bids are opened. If the Contract Price includes an Allowance and the cost of performing the Work covered by that Allowance is greater or less than the Allowance, the Contract Price will be increased or decreased accordingly.

Article, as used in these General Conditions, means a numbered Article of the General Conditions, unless otherwise indicated by the context.

Change Order means a written document duly approved and executed by City, which changes the scope of Work, the Contract Price, or the Contract Time.

City means the City of Morgan Hill, acting through its City Council, officers, employees, City Engineer, and any other authorized representatives.

City Engineer means the City Engineer for City and his or her authorized delegee(s).

Claim means a separate demand by Contractor for a change in the Contract Time or Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected by City, in whole or in part; a written demand by Contractor disputing a unilateral Change Order or a portion thereof; or a written demand by Contractor objecting to the amount of Final Payment.

Contract means the signed agreement between City and Contractor for performing the Work required for the Project, and all documents expressly incorporated therein.

Contract Documents means, collectively, all of the documents listed as such in Section 2 of the Contract, including the Notice Inviting Bids; the Instructions to Bidders; addenda, if any; the Bid Proposal and attachments thereto; the Contract; the Notice of Award and Notice to Proceed; the payment and performance bonds; the General Conditions; the Special Conditions; the Project Plans and

Specifications; any Change Orders; and any other documents that are clearly and unambiguously made part of the Contract Documents. The Contract Documents do not include documents provided "For Reference Only," or documents that are intended solely to provide information regarding existing conditions.

Contract Price means the total compensation to be paid to Contractor for performance of the Work, as set forth in the Contract and as may be amended by Change Order or adjusted for an Allowance. The Contract Price is not subject to adjustment due to inflation or due to the increased cost of labor, material, supplies, or equipment following submission of the Bid Proposal. The Contract Price is deemed to include all applicable federal, state, and local taxes.

Contract Time means the number of days specified for complete performance of the Work, as set forth in the Contract and as may be amended by Change Order.

Contractor means the individual, partnership, corporation, or joint venture that has signed the Contract with City to perform the Work.

Day means a calendar day unless otherwise specified.

Design Professional means the licensed individual(s) or firm(s) retained by City to provide architectural, engineering, or other design professional services for the Project. If no Design Professional has been retained for this Project, any reference to Design Professional is deemed to refer to the Engineer.

DIR means the California Department of Industrial Relations.

Drawings has the same meaning as Plans.

Engineer means the City Engineer for the City of Morgan Hill and his or her authorized delegee(s).

Excusable Delay is defined in Section 5.3(B), Excusable Delay.

Extra Work means new or unforeseen work added to the Project, as determined by the Engineer in his or her sole discretion, including Work that was not part of or incidental to the scope of the Work when the Contractor's bid was submitted; Work that is substantially different from the Work as described in the Contract Documents at bid time; or Work that results from a substantially differing and unforeseeable condition.

Final Completion means Contractor has fully completed all of the Work required by the Contract Documents to the City's satisfaction, including all punch list items, and any required commissioning or training, and has provided the City with all required submittals, including the instructions and manuals, product warranties, and as-built drawings.

Final Payment means payment to Contractor of the unpaid Contract Price, including release of undisputed retention, less amounts withheld or deducted pursuant to the Contract Documents.

Furnish means to purchase and deliver for the Project.

Government Code Claim means a claim submitted pursuant to California Government Code § 900 et seq.

Hazardous Materials means any substance or material identified now or in the future as hazardous under any Laws, or any other substance or material that may be considered hazardous or otherwise subject to Laws governing handling, disposal, or cleanup.

Including, whether or not capitalized, means "including, but not limited to," unless the context clearly requires otherwise.

Inspector means the individual(s) or firm(s) retained or employed by City to inspect the workmanship, materials, and manner of construction of the Project and its components to ensure compliance with the Contract Documents and all Laws.

Install means to fix in place for materials, and to fix in place and connect for equipment.

Laws means all applicable local, state, and federal laws, regulations, rules, codes, ordinances, permits, orders, and the like enacted or imposed by or under the auspices of any governmental entity with jurisdiction over any of the Work or any performance of the Work, including health and safety requirements.

Non-Excusable Delay is defined in Section 5.3(D), Non-Excusable Delay.

Plans means the City-provided plans, drawings, details, or graphical depictions of the Project requirements, but does not include Shop Drawings.

Project means the public works project referenced in the Contract.

Project Manager means the individual designated by City to oversee and manage the Project on City's behalf and may include his or her authorized delegee(s) when the Project Manager is unavailable. If no Project Manager has been designated for this Project, any reference to Project Manager is deemed to refer to the Engineer.

Recoverable Costs is defined in Section 5.3(F), Recoverable Costs.

Request for Information or RFI means Contractor's written request for information about the Contract Documents, the Work or the Project, submitted to City in the manner and format specified by City.

Section, when capitalized in these General Conditions, means a numbered section or subsection of the General Conditions, unless the context clearly indicates otherwise.

Shop Drawings means drawings, plan details or other graphical depictions prepared by or on behalf of Contractor, and subject to City acceptance, which are intended to provide details for fabrication, installation, and the like, of items required by or shown in the Plans or Specifications.

Specialty Work means Work that must be performed by a specialized Subcontractor with the specified license or other special certification, and that the Contractor is not qualified to self-perform.

Specifications means the technical, text specifications describing the Project requirements, which are prepared for and incorporated into the Contract by or on behalf of City, and does not include the Contract, General Conditions or Special Conditions.

Subcontractor means an individual, partnership, corporation, or joint venture retained by Contractor directly or indirectly through a subcontract to perform a specific portion of the Work. The term Subcontractor includes subcontractors, suppliers, fabricators, and equipment lessors of all tiers, unless otherwise indicated by the context. A third party such as a utility performing related work on the Project is not a Subcontractor, even if Contractor must coordinate its Work with the third party.

Technical Specifications has the same meaning as Specifications.

Work means all of the construction and services necessary for or incidental to completing the Project in conformance with the requirements of the Contract Documents.

Work Day or Working Day, whether or not capitalized, means a weekday when the City is open for business, and does not include holidays observed by City.

Worksite means the place or places where the Work is performed, which includes, but may extend beyond the Project site, including separate locations for staging, storage, or fabrication.

Article 2 - Roles and Responsibilities

2.1 City.

(A) ***City Council.*** The City Council has final authority in all matters affecting the Project, except to the extent it has delegated authority to the Engineer.

(B) ***Engineer.*** The Engineer, acting within the authority conferred by the City Council, is responsible for administration of the Project on behalf of City, including authority to provide directions to the Design Professional and to Contractor to ensure proper and timely completion of the Project. The Engineer's decisions are final and conclusive within the scope of his or her authority, including interpretation of the Contract Documents.

(C) ***Project Manager.*** The Project Manager assigned to the Project will be the primary point of contact for the Contractor and will serve as City's representative, for daily administration of the Project on behalf of City. Unless otherwise specified, all of Contractor's communications to City (in any form) will go to or through the Project Manager. City reserves the right to reassign the Project Manager role at any time or to delegate duties to additional City representatives, without prior notice to or consent of Contractor.

(D) ***Design Professional.*** The Design Professional is responsible for the overall design of the Project, and to the extent authorized by City, may act on City's behalf to ensure performance of the Work in compliance with the Plans and Specifications, including any design changes authorized by Change Order. The Design Professional's duties may include review of Contractor's submittals, visits to any Worksite, inspecting the Work, evaluating test and inspection results, and participation in Project-related meetings, including any pre-construction conference, weekly meetings, and coordination meetings. The Design Professional's interpretation of the Plans or Specifications is final and conclusive.

2.2 Contractor.

(A) ***General.*** Contractor must provide all labor, materials, supplies, equipment, services, and incidentals necessary to perform and timely complete the Work in strict accordance with the Contract Documents, and in an economical and efficient manner in the best interests of City, and with minimal inconvenience to the public.

(B) ***Responsibility for the Work and Risk of Loss.*** Contractor is responsible for supervising and directing all aspects of the Work to facilitate the efficient and timely completion of the Work. Contractor is solely

responsible for, and required to exercise full control over the Work, including the construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination of all portions of the Work with that of all other contractors and Subcontractors, except to the extent that the Contract Documents provide other specific instructions. Contractor's responsibilities extend to any plan, method or sequence suggested, but not required by City or specified in the Contract Documents. From the date of commencement of the Work until either the date on which City formally accepts the Project or the effective date of termination of the Contract, whichever is later, Contractor bears all risks of injury or damage to the Work and the materials and equipment delivered to any Worksite, by any cause including fire, earthquake, wind, weather, vandalism or theft, subject to the limitations of Laws, including Public Contract Code section 7105.

(C) ***Project Administration.*** Contractor must provide sufficient and competent administration, staff, and skilled workforce necessary to perform and timely complete the Work in accordance with the Contract Documents. Before starting the Work, Contractor must designate in writing and provide complete contact information, including telephone numbers and email address, for the officer or employee in Contractor's organization who is to serve as Contractor's primary representative for the Project, and who has authority to act on Contractor's behalf. A Subcontractor may not serve as Contractor's primary representative.

(D) ***On-Site Superintendent.*** Contractor must, at all times during performance of the Work, provide a qualified and competent full-time superintendent acceptable to City, and assistants, as necessary, who must be physically present at the Project site while any aspect of the Work is being performed. The superintendent must have full authority to act and communicate on behalf of Contractor, and Contractor will be bound by the superintendent's communications to City. City's approval of the superintendent is required before the Work commences. If City is not satisfied with the superintendent's performance, City may request a qualified replacement of the superintendent. Failure to comply may result in temporary suspension of the Work, at Contractor's sole expense and with no extension of Contract Time, until an approved superintendent is physically present to supervise the Work. Contractor must provide written notice to City, as soon as practicable, before replacing the superintendent.

(E) ***Standards.*** Contractor must, at all times, ensure that the Work is performed in an efficient, skillful manner following best practices and in full compliance with the Contract Documents, Laws, and applicable manufacturer's recommendations. Contractor has a material and ongoing obligation to provide true and complete information, to the best of its knowledge, with respect to all records, documents, or communications

pertaining to the Project, including oral or written reports, statements, certifications, Change Order requests, or Claims.

(F) ***Meetings.*** Contractor, its project manager, superintendent, and any primary Subcontractors requested by City, must attend a pre-construction conference, if requested by City, as well as weekly Project progress meetings scheduled with City. If applicable, Contractor may also be required to participate in coordination meetings with other parties relating to other work being performed on or near the Project site or in relation to the Project, including work or activities performed by City, other contractors, or other utility owners.

(G) ***Construction Records.*** Contractor will maintain up-to-date, thorough, legible, and dated daily job reports, which document all significant activity on the Project for each day that Work is performed on the Project. The daily report for each day must include the number of workers at the Project site; primary Work activities; major deliveries; problems encountered, including injuries, if any; weather and site conditions; and delays, if any. Contractor will take date and time-stamped photographs to document general progress of the Project, including site conditions prior to construction activities, before and after photographs at offset trench laterals, existing improvements and utilities, damage and restoration. Contractor will maintain copies of all subcontracts, Project-related correspondence with Subcontractors, and records of meetings with Subcontractors. Upon request by the City, Contractor will permit review of and/or provide copies of any of these construction records.

(H) ***Responsible Party.*** Contractor is solely responsible to City for the acts or omissions of any Subcontractors, or any other party or parties performing portions of the Work or providing equipment, materials, or services for or on behalf of Contractor or the Subcontractors. Upon City's written request, Contractor must promptly and permanently remove from the Project, at no cost to City, any employee, Subcontractor, or employee of a Subcontractor who the Engineer has determined to be incompetent, intemperate or disorderly, or who has failed or refused to perform the Work as required under the Contract Documents.

(I) ***Correction of Defects.*** Contractor must promptly correct, at Contractor's sole expense, any Work that is determined by City to be deficient or defective in any way, including workmanship, materials, parts, or equipment. Workmanship, materials, parts, or equipment that do not conform to the requirements under the Contract Documents, as determined by City, will be considered defective and subject to rejection. Contractor must also promptly correct, at Contractor's sole expense, any Work performed beyond the lines and grades shown on the Plans or established by City, and any Extra Work performed without City's prior written approval.

If Contractor fails to correct or to take reasonable steps toward correcting defective Work within five days following notice from City, or within the time specified in City's notice to correct, City may elect to have the defective Work corrected by its own forces or by a third party, in which case the cost of correction will be deducted from the Contract Price. If City elects to correct defective Work due to Contractor's failure or refusal to do so, City or its agents will have the right to take possession of and use any equipment, supplies, or materials available at the Project site or any Worksite on City property, in order to effectuate the correction, at no extra cost to City. Contractor's warranty obligations under Section 11.2, Warranty, will not be waived nor limited by City's actions to correct defective Work under these circumstances. Alternatively, City may elect to retain defective Work, and deduct the difference in value, as determined by the Engineer, from payments otherwise due to Contractor. This paragraph applies to any defective Work performed by Contractor during the one-year warranty period under Section 11.2.

(J) ***Contractor's Records.*** Contractor must maintain all of its records relating to the Project in any form, including paper documents, photos, videos, electronic records, approved samples, and the construction records required pursuant to paragraph (G), above. Project records subject to this provision include, complete Project cost records and records relating to preparation of Contractor's bid, including estimates, take-offs, and price quotes or bids.

(1) Contractor's cost records must include all supporting documentation, including original receipts, invoices, and payroll records, evidencing its direct costs to perform the Work, including, but not limited to, costs for labor, materials and equipment. Each cost record should include, at a minimum, a description of the expenditure with references to the applicable requirements of the Contract Documents, the amount actually paid, the date of payment, and whether the expenditure is part of the original Contract Price, related to an executed Change Order, or otherwise categorized by Contractor as Extra Work. Contractor's failure to comply with this provision as to any claimed cost operates as a waiver of any rights to recover the claimed cost.

(2) Contractor must continue to maintain its Project-related records in an organized manner for a period of five years after City's acceptance of the Project or following Contract termination, whichever occurs first. Subject to prior notice to Contractor, City is entitled to inspect or audit any of Contractor's records relating to the Project or to investigate Contractor's plant or equipment during Contractor's normal business hours. Contractor's records may also be subject to examination and audit by the California State Auditor, pursuant to

Government Code § 8546.7. The record-keeping requirements set forth in this subsection 2.2(J) will survive expiration or termination of the Contract.

(K) ***Copies of Project Documents.*** Contractor and its Subcontractors must keep copies, at the Project site, of all Work-related documents, including the Contract, permit(s), Plans, Specifications, addenda, Contract amendments, Change Orders, RFIs and RFI responses, Shop Drawings, as-built drawings, schedules, daily records, testing and inspection reports or results, and any related written interpretations. These documents must be available to City for reference at all times during construction of the Project.

2.3 Subcontractors.

(A) ***General.*** All Work which is not performed by Contractor with its own forces must be performed by Subcontractors, subject to the **[50%]** limitation set forth in the Instructions to Bidders. City reserves the right to approve or reject any and all Subcontractors proposed to perform the Work, for reasons including the Subcontractor's poor reputation, lack of relevant experience, financial instability, and lack of technical ability or adequately trained workforce. Each Subcontractor must obtain a City business license before performing any Work.

(B) ***Contractual Obligations.*** Contractor must require each Subcontractor to comply with the provisions of the Contract Documents as they apply to the Subcontractor's portion(s) of the Work, including the generally applicable terms of the Contract Documents, and to likewise bind their subcontractors. Contractor will provide that the rights that each Subcontractor may have against any manufacturer or supplier for breach of warranty or guarantee relating to items provided by the Subcontractor for the Project, will be assigned to City. Nothing in these Contract Documents creates a contractual relationship between a Subcontractor and City, but City is deemed to be a third-party beneficiary of the contract between Contractor and each Subcontractor. Copies of subcontracts must be available to the Engineer upon request. Before a Subcontractor commences Work on the Project, Contractor must provide the Engineer a written statement with the name of the Subcontractor, a description of each portion of the Work performed by the Subcontractor, and the percentage of the overall Work to be performed by the Subcontractor.

(C) ***Termination.*** If the Contract is terminated, each Subcontractor's agreement must be assigned by Contractor to City, subject to the prior rights of any surety, but only if and to the extent that City accepts, in writing, the assignment by written notification, and assumes all rights and obligations of Contractor pursuant to each such subcontract agreement.

(D) ***Substitution of Subcontractor.*** If Contractor requests substitution of a listed Subcontractor under Public Contract Code Section 4107, Contractor is solely responsible for all costs City incurs in responding to the request, including legal fees and costs to conduct a hearing, and any increased subcontract cost to perform the Work that was to be performed by the listed Subcontractor. If City determines that a Subcontractor is unacceptable to City based on the Subcontractor's failure to satisfactorily perform its Work, or for any of the grounds for substitution listed in Public Contract Code Section 4107(a), City may request removal of the Subcontractor from the Project. Upon receipt of a written request from City to remove a Subcontractor pursuant to this paragraph, Contractor will immediately remove the Subcontractor from the Project and, at no further cost to City, will either (1) self-perform the remaining Work to the extent that Contractor is duly licensed and qualified to do so, or (2) substitute a Subcontractor that is acceptable to City, in compliance with Public Contract Code Section 4107, as applicable.

2.4 Coordination of Work.

(A) ***Concurrent Work.*** City reserves the right to perform, have performed, or permit performance of other work on or adjacent to the Project site while the Work is being performed for the Project. Contractor is responsible for coordinating its Work with other work being performed on or adjacent to the Project site, including by any utility companies or agencies, and must avoid hindering, delaying, or interfering with the work of other contractors, individuals, or entities, and must ensure safe and reasonable site access and use as required or authorized by City. To the full extent permitted by law, Contractor must hold harmless and indemnify City against any and all claims arising from or related to Contractor's avoidable, negligent, or willful hindrance of, delay to, or interference with the work of any utility company or agency or another contractor or subcontractor.

(B) ***Coordination.*** If Contractor's Work will connect or interface with work performed by others, Contractor is responsible for independently measuring and visually inspecting such work to ensure a correct connection and interface. Contractor is responsible for any failure by Contractor or its Subcontractors to confirm measurements before proceeding with connecting Work. Before proceeding with any portion of the Work affected by the construction or operations of others, Contractor must give the Project Manager prompt written notification of any defects Contractor discovers which will prevent the proper execution of the Work. Failure to give notice of any known or reasonably discoverable defects will be deemed acknowledgement by Contractor that the work of others is not defective and will not prevent the proper execution of the Work. Contractor must also promptly notify City if work performed by others, including work or activities performed by City's own forces, is operating to hinder, delay, or interfere

with Contractor's timely performance of the Work. City reserves the right to backcharge Contractor for any additional costs incurred due to Contractor's failure to comply with the requirements in this Section 2.4.

2.5 Submittals. Unless otherwise specified, Contractor must submit to the Engineer for review and acceptance, all schedules, Shop Drawings, samples, product data and similar submittals required by the Contract Documents, or upon request by the Engineer. Unless otherwise specified, all submittals, including Requests for Information are subject to the general provisions of this Section, as well as specific submittal requirements that may be included elsewhere in the Contract Documents, including the Special Conditions or Specifications. The Engineer may require submission of a submittal schedule at or before a pre-construction conference, as may be specified in the Notice to Proceed.

(A) ***General.*** Contractor is responsible for ensuring that its submittals are accurate and conform to the Contract Documents.

(B) ***Time and Manner of Submission.*** Contractor must ensure that its submittals are prepared and delivered in a manner consistent with the current City-accepted schedule for the Work and within the applicable time specified in the Contract Documents, or if no time is specified, in such time and sequence so as not to delay the performance of the Work or completion of the Project.

(C) ***Required Contents.*** Each submittal must include the Project name and contract number, Contractor's name and address, the name and address of any Subcontractor or supplier involved with the submittal, the date, and references to applicable Specification section(s) and/or drawing and detail number(s).

(D) ***Required Corrections.*** If corrections are required, Contractor must promptly make and submit any required corrections as specified in full conformance with the requirements of this Section, or other requirements that apply to that submittal.

(E) ***Effect of Review and Acceptance.*** Review and acceptance of a submittal by City will not relieve Contractor from complying with the requirements of the Contract Documents. Contractor is responsible for any errors in any submittal, and review or acceptance of a submittal by City is not an assumption of risk or liability by City.

(F) ***Enforcement.*** Any Work performed or any material furnished, installed, fabricated, or used without City's prior acceptance of a required submittal is performed or provided at Contractor's risk, and Contractor may be required to bear the costs incident thereto, including the cost of removing

and replacing such Work or material, repairs to other affected portions of the Work or material, and the cost of additional time or services required of City, including costs for the Design Professional, Project Manager, or Inspector.

(G) **Excessive RFIs.** An RFI will be considered excessive or unnecessary if the City determines that the explanation or response to the RFI is clearly and unambiguously discernable from the Contract Documents. City's costs to review and respond to excessive or unnecessary RFIs may be deducted from payments otherwise due to Contractor.

2.6 Shop Drawings. When Shop Drawings are required by the Specifications or requested by the Engineer, they must be prepared according to best practices at Contractor's expense. The Shop Drawings must be of a size and scale to clearly show all necessary details. Unless otherwise specified by City, Shop Drawings must be provided to the Engineer for review and acceptance at least 30 days before the Work will be performed. If City requires changes, the corrected Shop Drawings must be resubmitted to the Engineer for review within the time specified by the Engineer. For all Project components requiring Shop Drawings, Contractor will not furnish materials or perform any Work until the Shop Drawings for those components are accepted by City. Contractor is responsible for any errors or omissions in the Shop Drawings, shop fits and field corrections; any deviations from the Contract Documents; and for the results obtained by the use of Shop Drawings. Acceptance of Shop Drawings by City does not relieve Contractor of Contractor's responsibility.

2.7 Access to Work. Contractor must afford prompt and safe access to any Worksite by City and its employees, agents, or consultants authorized by City; and upon request by City, Contractor must promptly arrange for City representatives to visit or inspect manufacturing sites or fabrication facilities for items to be incorporated into the Work.

2.8 Personnel. Contractor and its Subcontractors must employ only competent and skillful personnel to perform the Work. Contractor and its Subcontractor's supervisors, security or safety personnel, and employees who have unescorted access to the Project site must possess proficiency in English sufficient to read, understand, receive, and implement oral or written communications or instructions relating to their respective job functions, including safety and security requirements. Upon written notification from the Engineer, Contractor and its Subcontractors must immediately discharge any personnel who are incompetent, disorderly, disruptive, threatening, abusive, or profane, or otherwise refuse or fail to comply with the requirements of the Contract Documents or Laws, including Laws pertaining to health and safety. Any such discharged personnel may not be re-employed or permitted on the Project in any capacity without City's prior written consent.

Article 3 - Contract Documents

3.1 Interpretation of Contract Documents.

(A) ***Plans and Specifications.*** The Plans and Specifications included in the Contract Documents are complementary. If Work is shown on one but not on the other, Contractor must perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The Plans and Specifications are deemed to include and require everything necessary and reasonably incidental to completion of the Work, whether or not particularly mentioned or shown. Contractor must perform all Work and services and supply all things reasonably related to and inferable from the Contract Documents. In the event of a conflict between the Plans and Specifications, the Specifications will control, unless the Plan(s) at issue are dated later than the Specification(s) at issue. Detailed drawings take precedence over general drawings, and large-scale drawings take precedence over smaller scale drawings. Any arrangement or division of the Plans and Specifications into sections is for convenience and is not intended to limit the Work required by separate trades. A conclusion presented in the Plans or Specifications is only a recommendation. Actual locations and depths must be determined by Contractor's field investigation. Contractor may request access to underlying or background information in City's possession that is necessary for Contractor to form its own conclusions.

(B) ***Duty to Notify and Seek Direction.*** If Contractor becomes aware of a changed condition in the Project, or of any ambiguity, conflict, inconsistency, discrepancy, omission, or error in the Contract Documents, including the Plans or Specifications, Contractor must promptly submit a Request for Information to the Engineer and wait for a response from City before proceeding further with the related Work. The RFI must notify the City of the issue and request clarification, interpretation, or direction. The Engineer's clarification, interpretation, or direction will be final and binding on Contractor. If Contractor proceeds with the related Work before obtaining City's response, Contractor will be responsible for any resulting costs, including the cost of correcting any incorrect or defective Work that results. Timely submission of a clear and complete RFI is essential to avoiding delay. Delay resulting from Contractor's failure to submit a timely and complete RFI to the Engineer is Non-Excusable Delay. If Contractor believes that City's response to an RFI justifies a change to the Contract Price or Contract Time, Contractor must perform the Work as directed, but may submit a timely Change Order request in accordance with the Contract Documents. (See Articles 5 and 6.)

(C) ***Figures and Dimensions.*** Figures control over scaled dimensions.

(D) ***Technical or Trade Terms.*** Any terms that have well-known technical or trade meanings will be interpreted in accordance with those meanings, unless otherwise specifically defined in the Contract Documents.

(E) ***Measurements.*** Contractor must verify all relevant measurements in the Contract Documents and at the Project site before ordering any material or performing any Work, and will be responsible for the correctness of those measurements or for costs that could have been avoided by independently verifying measurements.

(F) ***Compliance with Laws.*** The Contract Documents are intended to comply with Laws and will be interpreted to comply with Laws.

3.2 Order of Precedence. Information included in one Contract Document but not in another will not be considered a conflict or inconsistency. Unless otherwise specified in the Special Conditions, in case of any conflict or inconsistency among the Contract Documents, the following order of precedence will apply, beginning from highest to lowest, with the most recent version taking precedent over an earlier version:

(A) Change Orders;
(B) Addenda;
(C) Contract;
(D) Notice to Proceed;
(E) Attachment B- Federal Contract Requirements (only if used);
(F) Special Conditions;
(G) General Conditions;
(H) Payment and Performance Bonds;
(I) Specifications;
(J) Plans;
(K) Notice of Award
(L) Notice Inviting Bids;
(M) Attachment A – Federal Bidding Requirements (only if used);
(N) Instructions to Bidders;
(O) Contractor's Bid Proposal and attachments;
(P) The City's standard specifications, as applicable; and
(Q) Any generic documents prepared by and on behalf of a third party, that were not prepared specifically for this Project, such as Caltrans Standard Specifications or Caltrans Special Provisions.

3.3 Caltrans Standard Specifications. Any reference to or incorporation of the Standard Specifications of the State of California, Department of Transportation ("Caltrans"), including "Standard Specifications," "Caltrans Specifications," "State

Specifications," or "CSS," means the most current edition of Caltrans' Standard Specifications, unless otherwise specified ("Caltrans Standard Specifications"), including the most current amendments as of the date that Contractor's bid was submitted for this Project. The following provisions apply to use of or reference to the Caltrans Standard Specifications or Special Provisions:

(A) ***Limitations.*** None of the "General Provisions" of the Caltrans Standard Specifications, i.e., sections 1 through 9, applies to these Contract Documents with the exception of any specific provisions, if any, which are expressly stated to apply to these Contract Documents.

(B) ***Conflicts or Inconsistencies.*** If there is a conflict or inconsistency between any provision in the Caltrans Standard Specifications or Special Provisions and a provision of these Contract Documents, as determined by City, the provision in the Contract Documents will govern.

(C) ***Meanings.*** Terms used in the Caltrans Standard Specifications or Special Provisions are to be interpreted as follows:

(1) Any reference to the "Engineer" is deemed to mean the City Engineer.

(2) Any reference to the "Special Provisions" is deemed to mean the Special Conditions, unless the Caltrans Special Provisions are expressly included in the Contract Documents listed in Section 2 of the Contract.

(3) Any reference to the "Department" or "State" is deemed to mean City.

3.4 For Reference Only. Contractor is responsible for the careful review of any document, study, or report provided by the City or appended to the Contract Documents solely for informational purposes and identified as "For Reference Only." Nothing in any document, study, or report so appended and identified is intended to supplement, alter, or void any provision of the Contract Documents. Contractor is advised that City or its representatives may be guided by information or recommendations included in such reference documents, particularly when making determinations as to the acceptability of proposed materials, methods, or changes in the Work. Any record drawings or similar final or accepted drawings or maps that are not part of the Contract Documents are deemed to be For Reference Only. The provisions of the Contract Documents are not modified by any perceived or actual conflict with provisions in any document that is provided For Reference Only.

3.5 Current Versions. Unless otherwise specified by City, any reference to standard specifications, technical specifications, or any City or state codes or

regulations means the latest specification, code or regulation in effect on the date the Contract is signed.

3.6 Conformed Copies. If City prepares a conformed set of the Contract Documents following award of the Contract, it will provide Contractor with two hard copy (paper) sets and one copy of the electronic file in PDF format. It is Contractor's responsibility to ensure that all Subcontractors, including fabricators, are provided with the conformed set of the Contract Documents at Contractor's sole expense.

3.7 Ownership. No portion of the Contract Documents may be used for any purpose other than construction of the Project, without prior written consent from City. Contractor is deemed to have conveyed the copyright in any designs, drawings, specifications, Shop Drawings, or other documents (in paper or electronic form) developed by Contractor for the Project, and City will retain all rights to such works, including the right to possession.

Article 4 - Bonds, Indemnity, and Insurance

4.1 Payment and Performance Bonds. Within ten days following issuance of the Notice of Award, Contractor is required to provide a payment bond and a performance bond, each in the penal sum of not less than 100 percent of the Contract Price, and each executed by Contractor and its surety using the bond forms included with the Contract Documents.

(A) ***Surety.*** Each bond must be issued and executed by a surety admitted in California. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City. If Contractor fails to substitute an acceptable surety within the specified time, City may, at its sole discretion, withhold payment from Contractor until the surety is replaced to City's satisfaction, or terminate the Contract for default.

(B) ***Supplemental Bonds for Increase in Contract Price.*** If the Contract Price increases during construction by five percent or more over the original Contract Price, Contractor must provide supplemental or replacement bonds within ten days of written notice from City pursuant to this Section, covering 100% of the increased Contract Price and using the bond forms included with the Contract Documents.

4.2 Indemnity. To the fullest extent permitted by law, Contractor must indemnify, defend, and hold harmless City, its Council, officers, officials, employees, agents, volunteers, and consultants, (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability, loss, damage, claims, causes of action, demands, charges, fines, costs, and expenses

(including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of or in connection with the acts or omissions of Contractor, its employees, Subcontractors, representatives, or agents, in bidding or performing the Work or in failing to comply with any obligation of Contractor under the Contract, except such Liability caused by the active negligence, sole negligence, or willful misconduct of an Indemnitee. This indemnity requirement applies to any Liability arising from alleged defects in the content or manner of submission of Contractor's bid for the Contract. Contractor's failure or refusal to timely accept a tender of defense pursuant to this Contract will be deemed a material breach of this Contract. City will timely notify Contractor upon receipt of any third-party claim relating to the Contract, as required by Public Contract Code Section 9201. Contractor waives any right to express or implied indemnity against any Indemnitee. Contractor's indemnity obligations under this Contract will survive the expiration or any early termination of the Contract.

4.3 Insurance. No later than ten days following issuance of the Notice of Award, Contractor must procure and provide proof of the insurance coverage required by this Section in the form of certificates and endorsements acceptable to City. The required insurance must cover the activities of Contractor and its Subcontractors relating to or arising from the performance of the Work, and must remain in full force and effect at all times during the period covered by the Contract through the date of City's acceptance of the Project. The coverages may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or "umbrella" policies, provided each such policy complies with the requirements set forth herein. If Contractor fails to provide any of the required coverage in full compliance with the requirements of the Contract Documents, City may, at its sole discretion, purchase such coverage at Contractor's expense and deduct the cost from payments due to Contractor, or terminate the Contract for default. Contractor further understands that City reserves the right to modify the insurance requirements set forth herein, with thirty (30) days' notice provided to Contractor, at any time as deemed necessary to protect the interests of City. The procurement of the required insurance will not be construed to limit Contractor's liability under this Contract or to fulfill Contractor's indemnification obligations under this Contract.

(A) **Deductibles and Self-Insured Retentions.** Any deductibles or self-insured retentions must be declared to and approved by City. If the City's Risk Manager determines that the deductibles and/or self-insured retentions are unacceptably high, at City's option, Contractor must either reduce or eliminate the deductibles and/or self-insured retentions as they apply to City and all required Additional Insured; or must provide a financial guarantee, to City's satisfaction, guaranteeing payment of losses and related investigation, claim administration, and legal expenses.

(B) **Policies and Limits.** The following insurance policies and limits are required for this Contract unless otherwise specified in the Special Conditions:

(1) **Commercial General Liability Insurance ("CGL").** Contractor shall maintain CGL and must include coverage for liability arising from Contractor's or its Subcontractor's acts or omissions in the performance of the Work against claims and liabilities for personal injury, death, or property damage providing protection in the minimum amount of: (i) two million dollars ($2,000,000.00) combined single limit each occurrence and either a general aggregate limit of four million dollars ($4,000,000.00) or a general aggregate limit of two million dollars ($2,000,000.00) as applied on a "per project" or "per location" basis, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

a. CGL policy may not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.

b. CGL policy must include contractor's protected coverage, blanket contractual, and completed operations.

(2) **Builder's Risk Insurance***:* The Builder's Risk Insurance policy must be issued on occurrence basis, for all-risk coverage (including Flood and Earthquake) on a one hundred percent (100%) completed value basis on the insurable portion of the Project for the benefit of City.

(3) **Workers' Compensation Insurance and Employer's Liability***:* Contractor shall maintain Workers Compensation coverage, as required by law. The policy must comply with the requirements of the California Workers' Compensation Insurance and Safety Act and provide protection in the minimum amount of: (i) One Million Dollars ($1,000,000.00) for any one accident or occurrence, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater. If Contractor is self-insured, Contractor must provide its Certificate of Permission to Self-Insure, duly authorized by the Department of Industrial Relations.

(4) **Automobile Liability**: Contractor shall maintain Automobile Liability covering all owned, non-owned and hired automobiles (if

Contractor does not own automobiles, then Contractor shall maintain Hired/Non-owned Automobile Liability) against claims and liabilities for personal injury, death, or property damage providing protection in the minimum amount of: (i) One Million Dollars ($1,000,000.00) combined single limit, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

(5) **Pollution (Environmental) Liability**: If the performance of Contractor's work or service under this Contract involves hazardous materials, contaminated soil disposal, and/or a risk of accidental release of fuel oil, chemicals or other toxic gases or hazardous materials, Contractor shall procure and maintain Pollution Liability covering Contractor's liability for bodily injury, property damage and environmental damage resulting from pollution and related cleanup costs arising out of the work or services to be performed under this Contract. Coverage shall be provided for both work performed on site, as well as during the transport of hazardous materials. Such coverage shall be in the minimum amount of: (i) One Million Dollars ($1,000,000.00) for any one accident or occurrence, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

(6) **Professional Liability**:

a. If the performance of Contractor's work or service under this Contract involves professional and/or technical services (examples include, but are not limited to, architects, engineers, land surveyors, legal services, and appraisers), Contractor shall procure and maintain either a claims made or occurrence Errors and Omission liability insurance in the minimum amount of: (i) One Million Dollars ($1,000,000.00) each claim, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater. Further, if Contractor maintains a claims-made policy, Contractor shall provide written evidence of such insurance to City for at least five (5) years after the completion of work performed under this Contract.

b. If the performance of Contractor's work or service under this Contract relates to Information Technology or related services

(examples include, but are not limited to computer programmers, hardware engineers, or other systems consultants), Contractor shall procure and maintain a claims made Errors and Omission liability insurance, including Cyber Liability and Data Breach, in the minimum amount of: (i) One Million Dollars ($1,000,000.00) each claim, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

(C) **Required Endorsements.** Contractor must provide proof of the following endorsements, listed for each policy for which endorsements are required, as outlined below:

(1) For all Policies except Builder's Risk and Professional Liability:

a. "Waiver of Subrogation" endorsements providing that the carrier agrees to waive any right of subrogation it may have against the City of Morgan Hill and the City's elected or appointed officials, boards, agencies, officers, agents, employees, and volunteers.

(2) General Liability, Automobile, and Pollution Liability:

a. "Additionally Insured" - The City of Morgan Hill, its elected or appointed officials, boards, agencies, officers, agents, employees, and volunteers are named as additional insureds on a form at least as broad as ISO Form CG 20 10 for ongoing operations and at least as broad as ISO Form CG 20 37 for completed operations.

b. "Primary and Non-Contributing" - Insurance shall be endorsed to be primary and non-contributory and will not seek contribution from the City's insurance or self-insurance and shall be at least as broad as ISO Form CG 20 01.

(3) General Liability:

a. "Separation of Insureds" endorsements stating that the inclusion of more than one insured will not operate to impair the rights of one insured against another, and the coverages afforded will apply as though separate policies have been issued to each insured.

(D) **Subcontractors.** Contractor must ensure that each Subcontractor is required to maintain the same insurance coverage required under this

Section 4.3, with respect to its performance of Work on the Project, including those requirements related to the additional insureds and waiver of subrogation. Contractor must confirm that each Subcontractor has complied with requirements as outlined herein. The insurance requirements for Subcontractors do not replace or limit the Contractor's insurance obligations.

(E) **Qualification of Insurers**. All insurance required pursuant to this Contract must be issued by a company licensed and admitted, or otherwise legally authorized to carry out insurance business in the State of California, and each insurer must have a current A.M. Best's financial strength rating of "A" or better and a financial size rating of "VIII" or better.

(F) **Certificates**. Contractor must furnish City with copies of all certificates as outlined herein, whether new or modified, promptly upon receipt. In the event of a claim or legal action, Contractor shall promptly furnish City of Morgan Hill with copies of all policies outlined herein. No policy subject to Contractor's Contract with City shall be reduced, canceled, allowed to expire, or materially changed except after thirty (30) days' notice by the insurer to City, unless due to non-payment of premiums, in which case ten (10) days written notice must be made to City. Certificates, including renewal certificates, may be mailed electronically to riskmgmt@morganhill.ca.gov or delivered to the Certificate Holder address as follows:

City of Morgan Hill
Attn: Risk Management
17575 Peak Avenue
Morgan Hill, CA 95037

(G) **Contractor's Responsibilities.** This Section 4.3 establishes the minimum requirements for Contractor's insurance coverage in relation to this Project, but is not intended to limit Contractor's ability to procure additional or greater coverage. Contractor is responsible for its own risk assessment and needs and is encouraged to consult its insurance provider to determine what coverage it may wish to carry beyond the minimum requirements of this Section. Contractor is solely responsible for the cost of its insurance coverage, including premium payments, deductibles, or self-insured retentions, and no Additional Insured will be responsible or liable for any of the cost of Contractor's insurance coverage.

Article 5 - Contract Time

5.1 Time is of the Essence. Time is of the essence in Contractor's performance and completion of the Work, and Contractor must diligently prosecute the Work and complete it within the Contract Time.

(A) ***General.*** Contractor must commence the Work on the date indicated in the Notice to Proceed, and must fully complete the Work in strict compliance with all requirements of the Contract Documents and within the Contract Time. Contractor may not begin performing the Work before the date specified in the Notice to Proceed.

(B) ***Authorization***. Contractor is not entitled to compensation or credit for any Work performed before the date specified in the Notice to Proceed, with the exception of any schedules, submittals, or other requirements, if any, that must be provided or performed before issuance of the Notice to Proceed

(C) ***Rate of Progress.*** Contractor and its Subcontractors must, at all times, provide workers, materials, and equipment sufficient to maintain the rate of progress necessary to ensure full completion of the Work within the Contract Time. If City determines that Contractor is failing to prosecute the Work at a sufficient rate of progress, City may, in its sole discretion, direct Contractor to provide additional workers, materials, or equipment, or to work additional hours or days without additional cost to City, in order to achieve a rate of progress satisfactory to City. If Contractor fails to comply with City's directive in this regard, City may, at Contractor's expense, separately contract for additional workers, materials, or equipment or use City's own forces to achieve the necessary rate of progress. Alternatively, City may terminate the Contract based on Contractor's default.

5.2 Schedule Requirements. Contractor must prepare all schedules using standard, commercial scheduling software acceptable to Engineer, and must provide the schedules in electronic and paper form as requested by the Engineer. In addition to the general scheduling requirements set forth below, Contractor must also comply with any scheduling requirements included in the Special Conditions or in the Technical Specifications.

(A) ***Baseline (As-Planned) Schedule.*** Within ten calendar days following City's issuance of the Notice to Proceed (or as otherwise specified in the Notice to Proceed), Contractor must submit to City for review and acceptance a baseline (as-planned) schedule using critical path methodology showing in detail how Contractor plans to perform and fully complete the Work within the Contract Time including labor, equipment, materials, and fabricated items. The baseline schedule must show the order of the major items of Work and the dates of start and completion of each

item, including when the materials and equipment will be procured. The schedule must also include the work of all trades reflecting anticipated labor or crew hours and equipment loading for the construction activities, and must be sufficiently comprehensive and detailed to enable progress to be monitored on a day-by-day basis. For each activity, the baseline schedule must be dated, provided in the format specified in the Contract Documents or as required by City, and must include, at a minimum, a description of the activity, the start and completion dates of the activity, and the duration of the activity.

(1) *Specialized Materials Ordering*. Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not readily available from material suppliers. Contractor must also retain documentation of the purchase order date(s).

(B) ***City's Review of Schedules.*** City will review and may note exceptions to the baseline schedule, and to the progress schedules submitted as required below, to assure completion of the Work within the Contract Time. Contractor is solely responsible for resolving any exceptions noted in a schedule and, within seven days, must correct the schedule to address the exceptions. City's review or acceptance of Contractor's schedules will not operate to waive or limit Contractor's duty to complete the Project within the Contract Time, nor to waive or limit City's right to assess liquidated damages for Contractor's unexcused failure to do so.

(C) ***Progress Schedules.*** After City accepts the final baseline schedule with no exceptions, Contractor must submit an updated progress schedule and three week look-ahead schedule, in the format specified by City, for review and acceptance with each application for a progress payment or when otherwise specified by City, until completion of the Work. The updated progress schedule must show: how the actual progress of the Work as constructed to date compares to the baseline schedule; reflect any proposed changes in the construction schedule or method of operations, including to achieve Project milestones within the Contract Time; and identify any actual or potential impacts to the critical path. Contractor must also submit periodic reports to City of any changes in the projected material or equipment delivery dates for the Project.

(1) *Float.* The progress schedule must show early and late completion dates for each task. The number of days between those dates will be designated as the "float." Any float belongs to the Project and may be allocated by the Engineer to best serve timely completion of the Project.

(2) *Failure to Submit Schedule.* Reliable, up-to-date schedules are essential to efficient and cost-effective administration of the Project and timely completion. If Contractor fails to submit a schedule within the time periods specified in this Section, or submits a schedule to which City has noted exceptions that are not corrected, City may withhold up to five percent from payment(s) otherwise due to Contractor until the exceptions are resolved, the schedule is corrected and resubmitted, and City has accepted the schedule. In addition, Contractor's failure to comply with the schedule requirements in this Section 5.2 will be deemed a material default and a waiver of any claims for Excusable Delay or loss of productivity arising during any period when Contractor is out of compliance, subject only to the limits of Public Contract Code Section 7102.

(D) ***Recovery Schedule.*** If City determines that the Work is more than one week behind schedule, within seven days following written notice of such determination, Contractor must submit a recovery schedule, showing how Contractor intends to perform and complete the Work within the Contract Time, based on actual progress to date.

(E) ***Effect of Acceptance.*** Contractor and its Subcontractors must perform the Work in accordance with the most current City-accepted schedule unless otherwise directed by City. City's acceptance of a schedule does not operate to extend the time for completion of the Work or any component of the Work, and will not affect City's right to assess liquidated damages for Contractor's unexcused delay in completing the Work within the Contract Time.

(F) ***Posting.*** Contractor must at all times prominently post a copy of the most current City-accepted progress or recovery schedule in its on-site office.

(G) ***Reservation of Rights.*** City reserves the right to direct the sequence in which the Work must be performed or to make changes in the sequence of the Work in order to facilitate the performance of work by City or others, or to facilitate City's use of its property. The Contract Time or Contract Price may be adjusted to the extent such changes in sequence actually increase or decrease Contractor's time or cost to perform the Work.

(H) ***Authorized Working Days and Times.*** Contractor is limited to working Monday through Friday, excluding City-observed holidays, during City's normal business hours, except as expressly provided in the Special Conditions, or as authorized in writing by City. City reserves the right to charge Contractor for additional costs incurred by City due to Work performed on days or during hours not expressly authorized in the Contract

Documents, including reimbursement of costs incurred for inspection, testing, and construction management services.

5.3 Delay and Extensions of Contract Time.

(A) ***Notice of Delay.*** If Contractor becomes aware of any actual or potential delay affecting the critical path, Contractor must promptly notify the Engineer in writing, regardless of the nature or cause of the delay, so that City has a reasonable opportunity to mitigate or avoid the delay.

(B) ***Excusable Delay.*** The Contract Time may be extended if Contractor encounters "Excusable Delay," which is an unavoidable delay in completing the Work within the Contract Time due to causes completely beyond Contractor's control, and which Contractor could not have avoided or mitigated through reasonable care, planning, foresight, or diligence, provided that Contractor is otherwise fully performing its obligations under the Contract Documents. Grounds for Excusable Delay may include fire, natural disasters, including earthquake or unusually severe weather, acts of terror or vandalism, epidemic, unforeseeable adverse government actions, unforeseeable actions of third parties, encountering unforeseeable hazardous materials, unforeseeable site conditions, or suspension for convenience under Article 13. The Contract Time will not be extended based on circumstances which will not unavoidably delay completing the Work within the Contract Time based on critical path analysis.

(C) ***Weather Delays.*** A "Weather Delay Day" is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than 40% of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Project site clean-up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule. Contractor will be entitled to a non-compensable extension of the Contract Time for each Weather Delay Day in excess of the normal Weather Delay Days within a given month as determined by reliable records, including monthly rainfall averages, for the preceding ten years (or as otherwise specified in the Special Conditions or Specifications).

(1) Contractor must fully comply with the applicable procedures in Articles 5 and 6 of the General Conditions regarding requests to modify the Contract Time.

(2) Contractor will not be entitled to an extension of time for a Weather Delay Day to the extent Contractor is responsible for concurrent delay on that day.

(3) Contractor must take reasonable steps to mitigate the consequences of Weather Delay Days, including prudent workforce management and protecting the Work, Project Site, materials, and equipment.

(D) ***Non-Excusable Delay***. Delay which Contractor could have avoided or mitigated through reasonable care, planning, foresight, or diligence is "Non-Excusable Delay." Contractor is not entitled to an extension of Contract Time or any compensation for Non-Excusable Delay, or for Excusable Delay that is concurrent with Non-Excusable Delay. Non-Excusable Delay includes delay caused by:

(1) weather conditions which are normal for the location of the Project, as determined by reliable records, including monthly rainfall averages, for the preceding ten years;

(2) Contractor's failure to order equipment and materials sufficiently in advance of the time needed for completion of the Work within the Contract Time;

(3) Contractor's failure to provide adequate notification to utility companies or agencies for connections or services necessary for completion of the Work within the Contract Time;

(4) foreseeable conditions which Contractor could have ascertained from reasonably diligent inspection of the Project site or review of the Contract Documents or other information provided or available to the Contractor;

(5) Contractor's failure, refusal, or financial inability to perform the Work within the Contract Time, including insufficient funds to pay its Subcontractors or suppliers;

(6) performance or non-performance by Contractor's Subcontractors or suppliers;

(7) the time required to respond to excessive RFIs (see Section 2.5(G));

(8) delayed submission of required submittals, or the time required for correction and resubmission of defective submittals;

(9) time required for repair of, re-testing, or re-inspection of defective Work;

(10) enforcement of Laws by City, or outside agencies with jurisdiction over the Work; or

(11) City's exercise or enforcement of any of its rights or Contractor's duties pursuant to the Contract Documents, including correction of defective Work, extra inspections or testing due to non-compliance with Contract requirements, safety compliance, environmental compliance, or rejection and return of defective or deficient submittals.

(E) ***Compensable Delay.*** Pursuant to Public Contract Code Section 7102, in addition to entitlement to an extension of Contract Time, Contractor is entitled to compensation for costs incurred due to delay caused solely by City, when that delay is unreasonable under the circumstances involved and not within the contemplation of the parties ("Compensable Delay"). Contractor is not entitled to an extension of Contract Time or recovery of costs for Compensable Delay that is concurrent with Non-Excusable Delay. Delay due to Weather Delay Days, in excess of normal for a given month, as set forth in Section5.3(C), is not Compensable Delay, and will only entitle Contractor to an extension of time commensurate with the time lost due to such delay.

(F) ***Recoverable Costs.*** Contractor is not entitled to compensation for Excusable Delay unless it is Compensable Delay, as defined above. Contractor is entitled to recover only the actual, direct, reasonable, and substantiated costs ("Recoverable Costs") for each working day that the Compensable Delay prevents Contractor from proceeding with more than 50% of the critical path Work scheduled for that day, based on the most recent progress schedule accepted by City. Recoverable Costs will not include home office overhead or lost profit.

(G) ***Request for Extension of Contract Time or Recoverable Costs.*** A request for an extension of Contract Time or any associated Recoverable Costs must be submitted in writing to City within 14 calendar days of the date the delay is first encountered, even if the duration of the delay is not yet known at that time, or any entitlement to the Contract Time extension or to the Recoverable Costs will be deemed waived. In addition to complying with the requirements of this Article 5, the request must be submitted in compliance with the Change Order request procedures in Article 6, below. Strict compliance with these requirements is necessary to ensure that any delay or consequences of delay may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project and timely performance of the Work. Any request for an extension of Contract Time or

Recoverable Costs that does not strictly comply with all of the requirements of Article 5 and Article 6 will be deemed waived.

(1) *Required Contents.* The request must include a detailed description of the cause(s) of the delay, and must also describe the measures that Contractor has taken to mitigate the delay and/or its effects, including efforts to mitigate the cost impact of the delay, such as by workforce management, or by a change in sequencing. If the delay is still ongoing at the time the request is submitted, the request should also include Contractor's plan for continued mitigation of the delay or its effects.

(2) *Delay Days and Costs.* The request must specify the number of days of Excusable Delay claimed, or provide a realistic estimate if the duration of the delay is not yet known. If the Contractor believes it is entitled to Recoverable Costs for Compensable Delay, the request must specify the amount of and basis for the Recoverable Costs that are claimed or provide a realistic estimate if the amount is not yet known. Any estimate of delay duration or cost must be updated in writing and submitted with all required supporting documentation as soon as the actual time and cost is known. The maximum extension of Contract Time will be the number of days, if any, by which an Excusable Delay or a Compensable Delay exceeds any concurrent Non-Excusable Delay. Contractor is entitled to an extension of Contract Time, or compensation for Recoverable Costs, only if, and only to the extent that, such delay will unavoidably delay Final Completion.

(3) *Supporting Documentation.* The request must also include any and all supporting documentation necessary to evidence the delay and its actual impacts, including scheduling and cost impacts, with a time impact analysis using critical path methodology, and demonstrating the unavoidable delay to Final Completion. The time impact analysis must be submitted in a form or format acceptable to City.

(4) *Burden of Proof.* Contractor has the burden of proving that the delay was an Excusable Delay or Compensable Delay, as defined above; Contractor has fully complied with its scheduling obligations in Section 5.2, Schedule Requirements; Contractor has made reasonable efforts to mitigate the delay and its schedule and cost impacts; the delay will unavoidably result in delaying Final Completion; and

any Recoverable Costs claimed by Contractor were actually incurred and were reasonable under the circumstances.

(5) *Legal Compliance.* Nothing in this Section 5.3 is intended to require the waiver, alteration, or limitation of the applicability of Public Contract Code Section 7102.

(6) *No Waiver.* Any grant of an extension of Contract Time or compensation for Recoverable Costs due to Compensable Delay will not operate as a waiver of City's right to assess liquidated damages for Non-Excusable Delay.

(7) *Dispute Resolution.* In the event of a dispute over entitlement to an extension of Contract Time or compensation for Recoverable Costs, Contractor may not stop Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work. Contractor's sole recourse for an unresolved dispute based on City's rejection of a Change Order request for an extension of Contract Time or compensation for Recoverable Costs is to comply with the dispute resolution provisions set forth in Article 12, below.

5.4 Liquidated Damages. It is expressly understood that if Final Completion is not achieved within the Contract Time, City will suffer damages from the delay that are difficult to determine and accurately specify. Pursuant to Public Contract Code section 7203, if Contractor fails to achieve Final Completion within the Contract Time Non-Excusable Delay, City will charge Contractor in the amount specified in the Contract for each calendar day that Final Completion is delayed beyond the Contract Time, as liquidated damages and not as a penalty. Any waiver of accrued liquidated damages, in whole or in part, is subject to approval of the City Council or its authorized delegee.

(A) ***Liquidated Damages.*** Liquidated damages will not be assessed for any Excusable Delay or Compensable Delay, as set forth above.

(B) ***Milestones.*** Liquidated damages may also be separately assessed for failure to meet milestones specified elsewhere in the Contract Documents.

(C) ***Setoff.*** City is entitled to deduct the amount of liquidated damages assessed against any payments otherwise due to Contractor, including progress payments, Final Payment, or unreleased retention. If there are insufficient Contract funds remaining to cover the full amount of liquidated

damages assessed, City is entitled to recover the balance from Contractor or its performance bond surety.

(D) ***Occupancy or Use.*** Occupancy or use of the Project in whole or in part prior to Final Completion does not constitute City's acceptance of the Project and will not operate as a waiver of City's right to assess liquidated damages for Contractor's Non-Excusable Delay in achieving Final Completion.

(E) ***Other Remedies.*** City's right to liquidated damages under this Section applies only to damages arising from Contractor's Non-Excusable Delay or failure to complete the Work within the Contract Time. City retains its right to pursue all other remedies under the Contract for other types of damage, including damage to property or persons, costs or diminution in value from defective materials or workmanship, costs to repair or complete the Work, or other liability caused by Contractor.

Article 6 - Contract Modification

6.1 Contract Modification. Subject to the limited exception set forth in subsection (D) below, any change in the Work or the Contract Documents, including the Contract Price or Contract Time, will not be a valid and binding change to the Contract unless it is formalized in a Change Order, including a "no-cost" Change Order or a unilateral Change Order. Changes in Work will not operate to release, limit, or abridge Contractor's warranty obligations pursuant to Article 11 or any obligations of Contractor's bond sureties.

(A) ***City-Directed Changes*****.** City may direct changes in the scope or sequence of Work or the requirements of the Contract Documents, without invalidating the Contract. Such changes may include Extra Work as set forth in subsection (C) below, or deletion or modification of portions of the Work. Contractor must promptly comply with City-directed changes in the Work in accordance with the intent of the original Contract Documents, even if Contractor and City have not yet reached agreement as to adjustments to the Contract Price or Contract Time for the change in the Work or for the Extra Work. Contractor is not entitled to extra compensation for cost savings resulting from "value engineering" pursuant to Public Contract Code Section 7101, except to the extent authorized in advance by City in writing, and subject to any applicable procedural requirements for submitting a proposal for value engineering cost savings.

(B) ***Disputes.*** In the event of a dispute over entitlement to or the amount of a change in Contract Time or a change in Contract Price related to City-directed change in the Work, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute,

but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute. Likewise, in the event that City and Contractor dispute whether a portion or portions of the Work are already required by the Contract Documents or constitute Extra Work, or otherwise dispute the interpretation of any portion(s) of the Contract Documents, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute, as directed by City. If Contractor refuses to perform the Work in dispute, City may, acting in its sole discretion, elect to delete the Work from the Contract and reduce the Contract Price accordingly, and self-perform the Work or direct that the Work be performed by others. Alternatively, City may elect to terminate the Contract for convenience or for cause. Contractor's sole recourse for an unresolved dispute related to changes in the Work or performance of any Extra Work is to comply with the dispute resolution provisions set forth in Article 12, below.

(C) ***Extra Work.*** City may direct Contractor to perform Extra Work related to the Project. Contractor must promptly perform any Extra Work as directed or authorized by City in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement on adjustments to the Contract Price or Contract Time for such Extra Work. If Contractor believes it is necessary to perform Extra Work due to changed conditions, Contractor must promptly notify the Engineer in writing, specifically identifying the Extra Work and the reason(s) the Contractor believes it is Extra Work. This notification requirement does not constitute a Change Order request pursuant to Section 6.2, below. Contractor must maintain detailed daily records that itemize the cost of each element of Extra Work, and sufficiently distinguish the direct cost of the Extra Work from the cost of other Work performed. For each day that Contractor performs Extra Work, or Work that Contractor contends is Extra Work, Contractor must submit no later than the following Working Day, a daily report of the Extra Work performed that day and the related costs, together with copies of certified payroll, invoices, and other documentation substantiating the costs ("Extra Work Report"). The Engineer will make any adjustments to Contractor's Extra Work Report(s) based on the Engineer's records of the Work. When an Extra Work Report(s) is agreed on and signed by both City and Contractor, the Extra Work Report(s) will become the basis for payment under a duly authorized and signed Change Order. Failure to submit the required documentation by close of business on the next Working Day is deemed a full and complete waiver for any change in the Contract Price or Contract Time for any Extra Work performed that day.

(D) ***Minor Changes and RFIs.*** Minor field changes, including RFI replies from City, that do not affect the Contract Price or Contract Time and that

are approved by the Engineer acting within his or her scope of authority, do not require a Change Order. By executing an RFI reply from City, Contractor agrees that it will perform the Work as clarified therein, with no change to the Contract Price or Contract Time.

(E) ***Remedy for Non-Compliance.*** Contactor's failure to promptly comply with a City-directed change is deemed a material breach of the Contract, and in addition to all other remedies available to it, City may, at its sole discretion, hire another contractor or use its own forces to complete the disputed Work at Contractor's sole expense, and may deduct the cost from the Contract Price.

6.2 Contractor Change Order Requests. Contractor must submit a request or proposal for a change in the Work, compensation for Extra Work, or a change in the Contract Price or Contract Time as a written Change Order request or proposal.

(A) ***Time for Submission.*** Any request for a change in the Contract Price or the Contract Time must be submitted in writing to the Engineer within 14 calendar days of the date that Contractor first encounters the circumstances, information or conditions giving rise to the Change Order request, even if the total amount of the requested change in the Contract Price or impact on the Contract Time is not yet known at that time. If City requests that Contractor propose the terms of a Change Order, unless otherwise specified in City's request, Contractor must provide the Engineer with a written proposal for the change in the Contract Price or Contract Time within five working days of receiving City's request, in a form satisfactory to the Engineer.

(B) ***Required Contents.*** Any Change Order request or proposal submitted by Contractor must include a complete breakdown of actual or estimated costs and credits, and must itemize labor, materials, equipment, taxes, insurance, subcontract amounts, and if applicable, Extra Work Reports. Any estimated cost must be updated in writing as soon as the actual amount is known.

(C) ***Required Documentation.*** All claimed costs must be fully documented, and any related request for an extension of time or delay-related costs must be included at that time and in compliance with the requirements of Article 5 of the General Conditions. Upon request, Contractor must permit City to inspect its original and unaltered bidding records, subcontract agreements, subcontract change orders, purchase orders, invoices, or receipts associated with the claimed costs.

(D) ***Required Form.*** Contractor must use City's form(s) for submitting all Change Order requests or proposals, unless otherwise specified by City.

(E) ***Certification.*** All Change Order requests must be signed by Contractor and must include the following certification:

> "The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Change Order request are true and correct. Contractor warrants that this Change Order request is comprehensive and complete as to the Work or changes referenced herein, and agrees that any known or foreseeable costs, expenses, or time extension requests not included herein, are deemed waived."

6.3 Adjustments to Contract Price. The amount of any increase or decrease in the Contract Price will be determined based on one of the following methods listed below, in the order listed with unit pricing taking precedence over the other methods. Markup applies only to City-authorized time and material Work, and does not apply to any other payments to Contractor. For Work items or components that are deleted in their entirety, Contractor will only be entitled to compensation only for those direct, actual, and documented costs (including restocking fees), reasonably incurred before Contractor was notified of the City's intent to delete the Work, with no markup for overhead, profit, or other indirect costs.

(A) ***Unit Pricing.*** Amounts previously provided by Contractor in the form of unit prices, either in a bid schedule or in a post-award schedule of values pursuant to Section 8.1 Schedule of Values, will apply to determine the price for the affected Work, to the extent applicable unit prices have previously been provided for that type of Work. No additional markup for overhead, profit, or other indirect costs will be added to the calculation.

(B) ***Lump Sum.*** A mutually agreed upon, all-inclusive lump sum price for the affected Work with no additional markup for overhead, profit, or other indirect costs;

(C) ***Time and Materials.*** On a time and materials basis, if and only to the extent compensation on a time and materials basis is expressly authorized by City in advance of Contractor's performance of the Work and subject to any not-to-exceed limit. Time and materials compensation for increased costs or Extra Work (but not decreased costs or deleted Work), will include allowed markup for overhead, profit, and other indirect costs, calculated as the total of the following sums, the cumulative total of which may not exceed the maximum markup rate of 15%:

> (1) All direct labor costs provided by the Contractor, excluding superintendence, project management, or administrative costs plus 15 percent markup;

(2) All direct material costs provided by the Contractor, including sales tax, plus 15 percent markup;

(3) All direct plant and equipment rental costs provided by the Contractor, plus 15 percent markup;

(4) All direct additional subcontract costs plus ten percent markup for Work performed by Subcontractors; and

(5) Increased bond or insurance premium costs computed at 1.5% percent of the total of the previous four sums.

6.4 Unilateral Change Order. If the parties dispute the terms of a proposed Change Order, including disputes over the amount of compensation or extension of time that Contractor has requested, the value of deleted or changed Work, what constitutes Extra Work, or quantities used, City may elect to issue a unilateral Change Order, directing performance of the Work, and authorizing a change in the Contract Price or Contract Time for the adjustment to compensation or time that the City believes is merited. Contractor's sole recourse to dispute the terms of a unilateral Change Order is to submit a timely Claim pursuant to Article 12, below.

6.5 Non-Compliance Deemed Waiver. Contractor waives its entitlement to any increase in the Contract Price or Contract Time if Contractor fails to fully comply with the provisions of this Article. Contractor will not be paid for unauthorized Extra Work.

Article 7 - General Construction Provisions

7.1 Permits, Fees, Business License, and Taxes.

(A) ***Permits, Fees, and City Business License.*** Contractor must obtain and pay for all permits, fees, and licenses required to perform the Work, including a City business license. Contractor must cooperate with and provide notifications to all government agencies with jurisdiction over the Project, as may be required. Contractor must provide City with copies of all records of permits and permit applications, payment of required fees, and any licenses required for the Work.

(B) ***Taxes.*** Contractor must pay for all taxes on labor, material, and equipment, except Federal Excise Tax to the extent that City is exempt from Federal Excise Tax.

7.2 Temporary Facilities. Contractor must provide, at Contractor's sole expense, any and all temporary facilities for the Project, including an onsite staging area for materials and equipment, a field office, sanitary facilities, utilities, storage, scaffolds, barricades, walkways, and any other temporary structure required to safely perform the Work along with any incidental utility services. The location of all temporary facilities must be approved by the City prior to installation. Temporary facilities must be safe and adequate for the intended use, and installed and maintained in accordance with Laws and the Contract Documents. Contractor must fence and screen the Project site and, if applicable, any separate Worksites, including the staging area, and its operation must minimize inconvenience to neighboring properties. Additional provisions pertaining to temporary facilities may be included in the Specifications or Special Conditions.

(A) ***Utilities****.* Contractor must install and maintain the power, water, sewer and all other utilities required for the Project site, including the piping, wiring, internet and Wi-Fi connections, and any related equipment necessary to maintain the temporary facilities.

(B) ***Removal and Repair.*** Contractor must promptly remove all such temporary facilities when they are no longer needed or upon completion of the Work, whichever comes first. Contractor must promptly repair any damage to City's property or to other property caused by the installation, use, or removal of the temporary facilities, and must promptly restore the property to its original or intended condition.

7.3 Noninterference and Site Management. Contractor must avoid interfering with City's use of its property at or adjacent to the Project site, including use of roadways, entrances, parking areas, walkways, and structures. Contractor must also minimize disruption of access to private property in the Project vicinity. Contractor must coordinate with affected property owners, tenants, and businesses, and maintain some vehicle and pedestrian access to their residences or properties at all times. Temporary access ramps, fencing or other measures must be provided as needed. Before blocking access to a private driveway or parking lot, Contractor must provide effective notice to the affected parties at least 48 hours in advance of the pending closure and allow them to remove vehicles. Private driveways, residences and parking lots must have access to a roadway during non-Work hours.

(A) ***Offsite Acquisition.*** Unless otherwise provided by City, Contractor must acquire, use and dispose of, at its sole expense, any Worksites, licenses, easements, and temporary facilities necessary to access and perform the Work.

(B) ***Offsite Staging Area and Field Office.*** If additional space beyond the Project site is needed, such as for the staging area or the field office, Contractor may need to make arrangements with the nearby property owner(s) to secure the space. Before using or occupying any property owned by a third party, Contractor must provide City with a copy of the necessary license agreement, easement, or other written authorization from the property owner, together with a written release from the property owner holding City harmless from any related liability, in a form acceptable to the City Attorney.

(C) ***Traffic Management.*** Contractor must provide traffic management and traffic controls as specified in the Contract Documents, as required by Laws, and as otherwise required to ensure public and worker safety, and to avoid interference with public or private operations or the normal flow of vehicular, bicycle, or pedestrian traffic.

7.4 Signs. No signs may be displayed on or about City's property, except signage which is required by Laws or by the Contract Documents, without City's prior written approval as to size, design, and location.

7.5 Project Site and Nearby Property Protections.

(A) ***General.*** Contractor is responsible at all times, on a 24-hour basis and at its sole cost for protecting the Work, the Project site, and the materials and equipment to be incorporated into the Work until the City has accepted the Project, excluding any exceptions to acceptance, if any. Except as specifically authorized by City, Contractor must confine its operations to the area of the Project site indicated in the Plans and Specifications. Contractor is liable for any damage caused by Contractor or its Subcontractors to the Work, City's property, the property of adjacent or nearby property owners and the work or personal property of other contractors working for City, including damage related to Contractor's failure to adequately secure the Work or any Worksite.

(1) Subject to City's approval, Contractor will provide and install safeguards to protect the Work; any Worksite, including the Project site; City's real or personal property and the real or personal property of adjacent or nearby property owners, including plant and tree protections.

(2) City wastewater systems may not be interrupted. If the Work disrupts existing sewer facilities, Contractor must immediately notify City and establish a plan, subject to City's approval, to convey the sewage in closed conduits back into the sanitary sewer system. Sewage must not be permitted to flow in trenches or be covered by backfill.

(3) Contractor must remove with due care, and store at City's request, any objects or material from the Project site that City will salvage or reuse at another location.

(4) If directed by Engineer, Contractor must promptly repair or replace any property damage, as specified by the Engineer. However, acting in its sole discretion, City may elect to have the property damage remedied otherwise, and may deduct the cost to repair or replace the damaged property from payment otherwise due to Contractor.

(5) Contractor will not permit any structure or infrastructure to be loaded in a manner that will damage or endanger the integrity of the structure or infrastructure.

(B) ***Securing Project Site.*** After completion of Work each day, Contractor must secure the Project site and, to the extent feasible, make the area reasonably accessible to the public unless City approves otherwise. All excess materials and equipment not protected by approved traffic control devices must be relocated to the staging area or demobilized. Trench spoils must be hauled off the Project site daily and open excavations must be protected with steel plates. Contractor and Subcontractor personnel may not occupy or use the Project site for any purpose during non-Work hours, except as may be provided in the Contract Documents or pursuant to prior written authorization from City.

(C) ***Unforeseen Conditions.*** If Contractor encounters facilities, utilities, or other unknown conditions not shown on or reasonably inferable from the Plans or apparent from inspection of the Project site, Contractor must immediately notify the City and promptly submit a Request for Information to obtain further directions from the Engineer. Contractor must avoid taking any action which could cause damage to the facilities or utilities pending further direction from Engineer. The Engineer's written response will be final and binding on Contractor. If Engineer's subsequent direction to Contractor affects Contractor's cost or time to perform the Work, Contractor may submit a Change Order request as set forth in Article 6 above.

(D) ***Support; Adjacent Properties.*** Contractor must provide, install, and maintain all shoring, bracing, and underpinning necessary to provide support to City's property and adjacent properties and improvements thereon. Contractor must provide notifications to adjacent property owners as may be required by Laws. See also Section 7.15 Trenching of Five Feet or More.

(E) ***Notification of Property Damage.*** Contractor must immediately notify the City of damage to any real or personal property resulting from Work on the Project. Contractor must immediately provide a written report to City of any such property damage in excess of $500 (based on estimated cost to repair or replace) within 24 hours of the occurrence. The written report must include: (1) the location and nature of the damage, and the owner of the property, if known; (2) the name and address of each employee of Contractor or any Subcontractor involved in the damage; (3) a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with another government agency, Contractor will provide a copy of the report to City.

7.6 Materials and Equipment.

(A) ***General.*** Unless otherwise specified, all materials and equipment required for the Work must be new, free from defects, and of the best grade for the intended purpose, and furnished in sufficient quantities to ensure the proper and expeditious performance of the Work. Contractor must employ measures to preserve the specified quality and fitness of the materials and equipment. Unless otherwise specified, all materials and equipment required for the Work are deemed to include all components required for complete installation and intended operation, and must be installed in accordance with the manufacturer's recommendations or instructions. Contractor is responsible for all shipping, handling, and storage costs associated with the materials and equipment required for the Work. Contractor is responsible for providing security and protecting the Work and all of the required materials, supplies, tools and equipment at Contractor's sole cost until City has formally accepted the Project as set forth in Section 11.1, Final Completion. Contractor will not assign, sell, mortgage, or hypothecate any materials or equipment for the Project, or remove any materials or equipment that have been installed or delivered.

(B) ***City-Provided.*** If the Work includes installation of materials or equipment to be provided by City, Contractor is solely responsible for the proper examination, handling, storage, and installation in accordance with the Contract Documents. Contractor must notify City of any defects discovered in City-provided materials or equipment sufficiently in advance of scheduled use or installation to afford adequate time to procure replacement materials or equipment as needed. Contractor is solely responsible for any loss of or damage to such items which occurs while the items are in Contractor's custody and control, the cost of which may be offset from the Contract Price and deducted from any payment(s) due to Contractor.

(C) ***Intellectual Property Rights.*** Contractor must, at its sole expense, obtain any authorization or license required for use of patented or copyright-protected materials, equipment, devices or processes that are incorporated into the Work. Contractor's indemnity obligations in Article 4 apply to any claimed violation of intellectual property rights.

7.7 Substitutions.

(A) ***"Or Equal."*** Any Specification designating a material, product, or thing (collectively "item") or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate the quality and type of item or service desired, and Contractor may request use of any equal item or service. Unless otherwise stated in the Specifications, any reference to a specific brand or trade name for an item or service that is used solely for the purpose of describing the type of item or service desired, will be deemed to be followed by the words "or equal." A substitution will only be approved if it is a true "equal" item or service in every aspect of design, function, and quality, as determined by City, including dimensions, weight, maintenance requirements, durability, fit with other elements, and schedule impacts.

(B) ***Request for Substitution.*** A post-award request for substitution of an item or service must be submitted in writing to the Engineer for approval in advance, within the applicable time period provided in the Contract Documents. If no time period is specified, the substitution request may be submitted any time within 35 days after the date of award of the Contract, or sufficiently in advance of the time needed to avoid delay of the Work, whichever is earlier.

(C) ***Substantiation.*** Any available data substantiating the proposed substitute as an equal item or service must be submitted with the written request for substitution. Contractor's failure to timely provide all necessary substantiation, including any required test results as soon as they are available, is grounds for rejection of the proposed substitution, without further review.

(D) ***Burden of Proving Equality.*** Contractor has the burden of proving, at Contractor's sole cost, the equality of the proposed substitution. City has sole discretion to determine whether a proposed substitution is equal, and City's determination is final.

(E) ***Approval or Rejection.*** If the proposed substitution is approved, Contractor is solely responsible for any additional costs or time associated with the substituted item or service. If the proposed substitution is rejected, Contractor must, without delay, install the item or use the service as specified by the City.

(F) ***Contractor's Obligations.*** City's approval of a proposed substitution will not relieve Contractor from any of its obligations under the Contract Documents. In the event Contractor makes an unauthorized substitution, Contractor will be solely responsible for all resulting cost impacts, including the cost of removal and replacement and the impact to other design elements.

7.8 Testing and Inspection.

(A) ***General.*** All materials, equipment, and workmanship used in the Work are subject to inspection and testing by City at all times and at all locations during construction and/or fabrication, including at any Worksite, shops, and yards. All manufacturers' application or installation instructions must be provided to the Inspector at least ten days prior to the first such application or installation. Contractor must, at all times, make the Work available for testing or inspection. Neither City's inspection or testing of Work, nor its failure to do so, operate to waive or limit Contractor's duty to complete the Work in accordance with the Contract Documents.

(B) ***Scheduling and Notification.*** Contractor must cooperate with City in coordinating the inspections and testing. Contractor must submit samples of materials, at Contractor's expense, and schedule all tests required by the Contract Documents in time to avoid any delay to the progress of the Work. Contractor must notify the Engineer no later than noon of the Working Day before any inspection or testing and must provide timely notice to the other necessary parties as specified in the Contract Documents. If Contractor schedules an inspection or test beyond regular Work hours, or on a Saturday, Sunday, or recognized City holiday, Contractor must notify the Engineer at least two Working Days in advance for approval. If approved, Contractor must reimburse City for the cost of the overtime inspection or testing. Such costs, including the City's hourly costs for required personnel, may be deducted from payments otherwise due to Contractor.

(C) ***Responsibility for Costs.*** City will bear the initial cost of inspection and testing to be performed by independent consultants retained by City, subject to the following exceptions:

(1) Contractor will be responsible for the costs of any subsequent inspections or tests which are required to substantiate compliance with the Contract Documents, and any associated remediation costs.

(2) Contractor will be responsible for inspection costs, at City's hourly rates, for inspection time lost because the Work is not ready, or Contractor fails to appear for a scheduled inspection.

(3) If any portion of the Work that is subject to inspection or testing is covered or concealed by Contractor prior to the inspection or testing, Contractor will bear the cost of making that portion of the Work available for the inspection or testing required by the Contract Documents, and any associated repair or remediation costs.

(4) Contractor is responsible for properly shoring all compaction test sites deeper than five feet below grade, as required under Section 7.15 below.

(5) Any Work or material that is defective or fails to comply with the requirements of the Contract Documents must be promptly repaired, removed, replaced, or corrected by Contractor, at Contractor's sole expense, even if that Work or material was previously inspected or included in a progress payment

(D) ***Contractor's Obligations.*** Contractor is solely responsible for any delay occasioned by remediation of defective or noncompliant Work or material. Inspection or testing of the Work does not in any way relieve Contractor of its obligations to perform the Work as specified. Any Work done without the inspection(s) or testing required by the Contract Documents will be subject to rejection by City.

(E) ***Distant Locations.*** If required off-site testing or inspection must be conducted at a location more than 100 miles from the Project site, Contractor is solely responsible for the additional travel costs required for testing and/or inspection at such locations.

(F) ***Final Inspection.*** The provisions of this Section 7.8 also apply to final inspection under Article 11, Completion and Warranty Provisions.

7.9 Project Site Conditions and Maintenance. Contractor must at all times, on a 24-hour basis and at its sole cost, maintain the Project site and staging and storage areas in clean, neat, and sanitary condition and in compliance with all Laws pertaining to safety, air quality, and dust control. Adequate toilets must be provided, and properly maintained and serviced for all workers on the Project site, located in a suitably secluded area, subject to City's prior approval. Contractor must also, on a daily basis and at its sole cost, remove and properly dispose of the debris and waste materials from the Project site.

(A) ***Air Emissions Control.*** Contractor must not discharge smoke or other air contaminants into the atmosphere in violation of any Laws. Contractor must comply with all Laws, including the California Air Resources Board's In-Use Off-Road Diesel-Fueled Fleets Regulation (13 CCR § 2449 et seq.).

(B) ***Dust and Debris.*** Contractor must minimize and confine dust and debris resulting from the Work. Contractor must abate dust nuisance by cleaning, sweeping, and immediately sprinkling with water excavated areas of dirt or other materials prone to cause dust, and within one hour after the Engineer notifies Contractor that an airborne nuisance exists. The Engineer may direct that Contractor provide an approved water-spraying truck for this purpose. If water is used for dust control, Contractor will only use the minimum necessary. Contractor must take all necessary steps to keep wastewater out of streets, gutters, or storm drains. See Section 7.19, Environmental Control. If City determines that the dust control is not adequate, City may have the work done by others and deduct the cost from the Contract Price. Contractor will immediately remove any excess excavated material from the Project site and any dirt deposited on public streets.

(C) ***Clean up.*** Before discontinuing Work in an area, Contractor must clean the area and remove all debris and waste along with the construction equipment, tools, machinery, waste, and surplus materials.

(1) Except as otherwise specified, all excess Project materials, and the materials removed from existing improvements on the Project site with no salvage value or intended reuse by City, will be Contractor's property.

(2) Hauling trucks and other vehicles leaving the Project site must be cleaned of exterior mud or dirt before traveling on City streets. Materials and loose debris must be delivered and loaded to prevent dropping materials or debris. Contractor must immediately remove spillage from hauling on any publicly traveled way. Streets affected by Work on the Project must be kept clean by street sweeping.

(D) ***Disposal.*** Contractor must dispose of all Project debris and waste materials in a safe and legal manner. Contractor may not burn or bury waste materials on the Project site. Contractor will not allow any dirt, refuse, excavated material, surplus concrete or mortar, or any associated washings, to be disposed of onto streets, into manholes or into the storm drain system.

(E) ***Completion.*** At the completion of the Work, Contractor must remove from the Project site all of its equipment, tools, surplus materials, waste materials and debris., presenting a clean and neat appearance. Before demobilizing from the Project site, Contractor must ensure that all surfaces are cleaned, sealed, waxed, or finished as applicable, and that all marks, stains, paint splatters, and the like have been properly removed from the completed Work and the surrounding areas. Contractor must ensure that all

parts of the construction are properly joined with the previously existing and adjacent improvements and conditions. Contractor must provide all cutting, fitting and patching needed to accomplish that requirement. Contractor must also repair or replace all existing improvements that are damaged or removed during the Work, both on and off the Project site, including curbs, sidewalks, driveways, fences, signs, landscaping, utilities, street surfaces and structures. Repairs and replacements must be at least equal to the previously existing improvements, and the condition, finish and dimensions must match the previously existing improvements. Contractor must restore to original condition all property or items that are not designated for alteration under the Contract Documents and leave each Worksite clean and ready for occupancy or use by City.

(F) ***Non-Compliance.*** If Contractor fails to comply with its maintenance and cleanup obligations or clean up order, City may, acting in its sole discretion, elect to suspend the Work until the condition(s) is corrected with no increase in the Contract Time or Contract Price, or undertake appropriate cleanup measures without further notice and deduct the cost from any amounts due or to become due to Contractor.

7.10 Instructions and Manuals. Contractor must provide to City three copies each of all instructions and manuals required by the Contract Documents, unless otherwise specified. These must be complete as to drawings, details, parts lists, performance data, and other information that may be required for City to easily maintain and service the materials and equipment installed for this Project.

(A) ***Submittal Requirements.*** The instructions and manuals, along with any required guarantees, must be delivered to City for review, prior to requesting final inspection pursuant to Section 11.1(A), unless otherwise specified.

(B) ***Training.*** Contractor or its Subcontractors must train City's personnel in the operation and maintenance of any complex equipment or systems as a condition precedent to Final Completion, if required in the Contract Documents.

7.11 As-built Drawings. Contractor and its Subcontractors must prepare and maintain at the Project site a detailed, complete, and accurate as-built set of the Plans which will be used solely for the purpose of recording changes made in any portion of the original Plans in order to create accurate record drawings at the end of the Project.

(A) ***Duty to Update.*** The as-built drawings must be updated as changes occur, on a daily basis if necessary. City may withhold the estimated cost for City to have the as-built drawings prepared from payments otherwise

due to the Contractor, until the as-built drawings are brought up to date to the satisfaction of City. Actual locations to scale must be identified on the as-built drawings for all runs of mechanical and electrical work, including all site utilities, installed underground, in walls, floors, or otherwise concealed. Deviations from the original Plans must be shown in detail. The exact location of all main runs, whether piping, conduit, ductwork, or drain lines, must be shown by dimension and elevation. The location of all buried pipelines, appurtenances, or other improvements must be represented by coordinates and by the horizontal distance from visible above-ground improvements.

(B) ***Final Completion.*** Contractor must verify that all changes in the Work are depicted in the as-built drawings and must deliver the complete set of as-built drawings to City for review and acceptance as a condition precedent to Final Completion and Final Payment.

7.12 Existing Utilities.

(A) General. The Work may be performed in developed, urban areas with existing utilities, both above and below ground, including utilities identified in the Contract Documents or in other informational documents or records. Contractor must take due care to locate identified or reasonably identifiable utilities before proceeding with trenching, excavation, or any other activity that could damage or disrupt existing utilities. This may include excavation with small equipment, potholing, or hand excavation, and, if practical, using white paint or other suitable markings to delineate the area to be excavated. Except as otherwise provided herein, Contractor will be responsible for costs resulting from damage to identified or reasonably identifiable utilities due to Contractor's negligence or failure to comply with the Contract Documents, including the requirements in this Article 7.

(B) ***Unidentified Utilities.*** Pursuant to Government Code Section 4215, if, during the performance of the Work, Contractor discovers utility facilities not identified by City in the Contract Documents, Contractor must immediately provide written notice to City and the utility. City assumes responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Project site, if those utilities are not identified in the Contract Documents. Contractor will be compensated in accordance with the provisions of the Contract Documents for the costs of locating, repairing damage not due to Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans or Specifications with reasonable accuracy, and for equipment on the Project necessarily idled during such work. Contractor will not be assessed liquidated damages for delay in completion of the Work, to the extent such delay was caused by City's failure to provide for removal or relocation of the utility facilities.

7.13 Notice of Excavation. Contractor must comply with all applicable requirements in Government Code Sections 4216 through 4216.5, which are incorporated by reference herein. Government Code Section 4216.2 requires that, except in an emergency, Contractor must contact the appropriate regional notification center, or Underground Services Alert, at least two working days, but not more than fourteen calendar days before starting any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations. Contractor may not begin excavation until it has obtained and submitted to Engineer an inquiry identification number from Underground Services Alert.

7.14 Trenching and Excavations of Four Feet or More. As required by Public Contract Code Section 7104, if the Work includes digging trenches or other excavations that extend deeper than four feet below the surface, the provisions in this Section apply to the Work and the Project.

(A) ***Duty to Notify.*** Contractor must promptly, and before the following conditions are disturbed, provide written notice to City if Contractor finds any of the following conditions:

(1) Material that Contractor believes may be a hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing Laws;

(2) Subsurface or latent physical conditions at the Project site differing from those indicated by information about the Project site made available to bidders prior to the deadline for submitting bids; or

(3) Unknown physical conditions at the Project site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in work of the character required by the Contract Documents.

(B) ***City Investigation.*** City will promptly investigate the conditions and if City finds that the conditions materially differ from those indicated, apparent, or reasonably inferred from information about the Project site made available to bidders, or involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, City will issue a Change Order.

(C) ***Disputes.*** In the event that a dispute arises between City and Contractor regarding any of the conditions specified in subsection (B) above, or the terms of a Change Order issued by the City, Contractor will

not be excused from completing the Work within the Contract Time, but must proceed with all Work to be performed under the Contract. Contractor will retain any and all rights provided either by the Contract or by Laws which pertain to the resolution of disputes between Contractor and City.

7.15 Trenching of Five Feet or More. As required by Labor Code Section 6705, if the Contract Price exceeds $25,000 and the Work includes the excavation of any trench or trenches of five feet or more in depth, a detailed plan must be submitted to City for acceptance in advance of the excavation. The detailed plan must show the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. If the plan varies from the shoring system standards, it must be prepared by a California registered civil or structural engineer. Use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders is prohibited.

7.16 New Utility Connections. Except as otherwise specified, City will pay connection charges and meter costs for new permanent utilities required by the Contract Documents, if any. Contractor must notify City sufficiently in advance of the time needed to request service from each utility provider so that connections and services are initiated in accordance with the Project schedule.

7.17 Lines and Grades. Contractor is required to use any benchmark provided by the Engineer. Unless otherwise specified in the Contract Documents, Contractor must provide all lines and grades required to execute the Work. Contractor must also provide, preserve, and replace if necessary, all construction stakes required for the Project. All stakes or marks must be set by a California licensed surveyor or a California registered civil engineer. Contractor must notify the Engineer of any discrepancies found between Contractor's staking and grading and information provided by the Contract Documents. Upon completion, all Work must conform to the lines, elevations, and grades shown in the Plans, including any changes directed by a Change Order.

7.18 Historic or Archeological Items.

(A) ***Contractor's Obligations.*** Contractor must ensure that all persons performing Work at the Project site are required to immediately notify the Project Manager, upon discovery of any potential historic or archeological items, including historic or prehistoric ruins, a burial ground, archaeological or vertebrate paleontological site, including fossilized footprints or other archeological, paleontological or historical feature on the Project site (collectively, "Historic or Archeological Items").

(B) ***Discovery; Cessation of Work.*** Upon discovery of any potential Historic or Archeological Items, Work must be stopped within an 85-foot radius of the find and may not resume until authorized in writing by City. If required by City, Contractor must assist in protecting or recovering the Historic or Archeological Items, with any such assistance to be compensated as Extra Work on a time and materials basis under Article 6, Contract Modification. At City's discretion, a suspension of Work required due to discovery of Historic or Archeological Items may be treated as Excusable Delay pursuant to Article 5 or as a suspension for convenience under Article 13.

7.19 Environmental Control. Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides, herbicides or other harmful materials. Contractor must prevent the release of any hazardous material or hazardous waste into the soil or groundwater, and prevent the unlawful discharge of pollutants into City's storm drain system and watercourses as required below. Contractor and its Subcontractors must at all times in the performance of the Work comply with all Laws concerning pollution of waterways.

(A) ***Stormwater Permit.*** Contractor must comply with all applicable conditions of the State Water Resources Control Board National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity ("Stormwater Permit").

(B) ***Contractor's Obligations.*** If required for the Work, a copy of the Stormwater Permit is on file in City's principal administrative offices, and Contractor must comply with the permit without adjustment of the Contract Price or the Contract Time. Contractor must timely and completely submit required reports and monitoring information required by the conditions of the Stormwater Permit. Contractor must also comply with all other Laws governing discharge of stormwater, including applicable municipal stormwater management programs.

7.20 Noise Control. Contractor must comply with all applicable noise control Laws. Noise control requirements apply to all equipment used for the Work or related to the Work, including trucks, transit mixers or transient equipment that may or may not be owned by Contractor.

7.21 Mined Materials. Pursuant to Public Contract Code § 20676, Contractor will not purchase any sand, gravel, or other minerals for the Work from an operation subject to the Surface Mining and Reclamation Act of 1975 (Public Resources Code Section 2710 *et seq*.), unless the Contractor certifies, under penalty of perjury, that the minerals are form a mining

operation included on the AB 3098 List, which may be accessed online at: https://www.conservation.ca.gov/smgb/Pages/AB-3098-List.aspx

Article 8 - Payment

8.1 Schedule of Values. Prior to submitting its first application for payment, Contractor must prepare and submit to the Project Manager a schedule of values apportioned to the various divisions and phases of the Work, including mobilization and demobilization. If a Bid Schedule was submitted with Contractor's bid, the amounts in the schedule of values must be consistent with the Bid Schedule. Each line item contained in the schedule of values must be assigned a value such that the total of all items equals the Contract Price. The items must be sufficiently detailed to enable accurate evaluation of the percentage of completion claimed in each application for payment, and the assigned value consistent with any itemized or unit pricing submitted with Contractor's bid.

(A) ***Measurements for Unit Price Work.*** Materials and items of Work to be paid for on the basis of unit pricing will be measured according to the methods specified in the Contract Documents.

(B) ***Deleted or Reduced Work.*** Contractor will not be compensated for Work that City has deleted or reduced in scope, except for any labor, material or equipment costs for such Work that Contractor reasonably incurred before Contractor learned that the Work could be deleted or reduced. Contractor will only be compensated for those actual, direct and documented costs incurred, and will not be entitled to any mark up for overhead or lost profits.

8.2 Progress Payments. Following the last day of each month, or as otherwise required by the Special Conditions or Specifications, Contractor will submit to Project Manager a monthly application for payment for Work performed during the preceding month based on the estimated value of the Work performed during that preceding month.

(A) ***Application for Payment.*** Each application for payment must be itemized to include labor, materials, and equipment incorporated into the Work, and materials and equipment delivered to the Project site, as well as authorized and approved Change Orders. Each payment application must be supported by the unit prices submitted with Contractor's Bid Schedule and/or schedule of values and any other substantiating data required by the Contract Documents. **Each application for payment shall be accompanied by completed "Contract Balance Form," a copy of which is provided at the end of Article 8.**

(B) ***Payment of Undisputed Amounts.*** City will pay the undisputed amount due within thirty days after Contractor has submitted a complete and accurate payment application, subject to Public Contract Code Section 20104.50. City will deduct a percentage from each progress payment as retention, as set forth in Section 8.5, below, and may deduct or withhold additional amounts as set forth in Section 8.3, below.

8.3 Adjustment of Payment Application. City may adjust or reject the amount requested in a payment application, including application for Final Payment, in whole or in part, if the amount requested is disputed or unsubstantiated. Contractor will be notified in writing of the basis for the modification to the amount requested. City may also deduct or withhold from payment otherwise due based upon any of the circumstances and amounts listed below. Sums withheld from payment otherwise due will be released when the basis for that withholding has been remedied and no longer exists.

(A) For Contractor's unexcused failure to perform the Work as required by the Contract Documents, including correction or completion of punch list items. City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(B) For loss or damage caused by Contractor or its Subcontractors arising out of or relating to performance of the Work, or any failure to protect the Project site, City may deduct an amount based on the estimated cost to repair or replace.

(C) For Contractor's failure to pay its Subcontractors and suppliers when payment is due. City may withhold an amount equal to the total of past due payments and may opt to pay that amount separately via joint check pursuant to Section 8.6(B), Joint Checks.

(D) For Contractor's failure to timely correct rejected, nonconforming, or defective Work. City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(E) For any unreleased stop notice, City may withhold 125% of the amount claimed.

(F) For Contractor's failure to submit any required schedule or schedule update in the manner specified or within the time specified in the Contract Documents, City may withhold an amount equal to five percent of the total amount requested until Contractor complies with its schedule submittal obligations.

(G) For Contractor's failure to maintain or submit as-built documents in the manner specified or within the time specified in the Contract Documents;

City may withhold or deduct an amount based on the City's cost to prepare the as-builts.

(H) For Work performed without City-accepted Shop Drawings, when accepted Shop Drawings are required before proceeding with the Work, City may deduct an amount based on the estimated cost to correct unsatisfactory Work or diminution in value.

(I) For fines, payments, or penalties assessed under the Labor Code, City may deduct from payments due to Contractor as required by Laws and as directed by the Division of Labor Standards Enforcement.

(J) For any other fines, payments, or penalties assessed against the City relating to Contractor's acts or omissions, including violations of Laws, City may withhold or deduct such amounts from payment otherwise due to Contractor.

(K) For any other costs or charges that may be withheld or deducted from payments to Contractor, as provided in the Contract Documents, including liquidated damages, City may withhold or deduct such amounts from payment otherwise due to Contractor.

8.4 Early Occupancy. Neither City's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

8.5 Retention. City will retain five percent of the full amount due on each progress payment (i.e., the amount due before any withholding or deductions pursuant to Section 8.3, Adjustment of Payment Application), or the percentage stated in the Notice Inviting Bids, whichever is greater, as retention to ensure full and satisfactory performance of the Work. Contractor is not entitled to any reduction in the rate of withholding at any time, nor to release of any retention before 35 days following City's recordation of the Notice of Completion, subject to the terms of Public Contract Code § 7107..

(A) ***Substitution of Securities.*** As provided by Public Contract Code Section 22300, Contractor may request in writing that it be allowed, at its sole expense, to substitute securities for the retention withheld by City. Any escrow agreement entered into pursuant to this provision must fully comply with Public Contract Code Section 22300, and will be subject to approval as to form by City's legal counsel. If City exercises its right to draw upon such securities in the event of default pursuant to section (7) of the statutory Escrow Agreement for Security Deposits in Lieu of Retention, pursuant to subdivision (g) of Public Contract Code Section 22300 ("Escrow Agreement"), and if Contractor disputes that it is in default, its sole remedy is to comply with the dispute resolution procedures in Article 12 and the

provisions therein. It is agreed that for purposes of this paragraph, an event of default includes City's rights pursuant to these Contract Documents to withhold or deduct sums from retention, including withholding or deduction for liquidated damages, incomplete or defective Work, stop payment notices, or backcharges. It is further agreed that if any individual authorized to give or receive written notice on behalf of a party pursuant to section (10) of the Escrow Agreement are unavailable to give or receive notice on behalf of that party due to separation from employment, retirement, death, or other circumstances, the successor or delegee of the named individual is deemed to be the individual authorized to give or receive notice pursuant to section (10) of the Escrow Agreement.

(B) ***Release of Undisputed Retention.*** All undisputed retention, less any amounts that may be assessed as liquidated damages, retained for stop notices, or otherwise withheld pursuant to Section 8.3 Adjustment of Payment Application will be released as Final Payment to Contractor no sooner than 35 days following recordation of the notice of completion, and no later than 60 days following acceptance of the Project by City's governing body or authorized designee pursuant to Section 11.1(C) Acceptance, or, if the Project has not been accepted, no later than 60 days after the Project is otherwise considered complete pursuant to Public Contract Code Section 7107(c).

8.6 Payment to Subcontractors and Suppliers. Each month, Contractor must promptly pay each Subcontractor and supplier the value of the portion of labor, materials, and equipment incorporated into the Work or delivered to the Project site by the Subcontractor or supplier during the preceding month. Such payments must be made in accordance with the requirements of Laws pertaining to such payments, and those of the Contract Documents and applicable subcontract or supplier contract.

(A) ***Withholding for Stop Notice.*** Pursuant to Civil Code Section 9358, City will withhold 125% of the amount claimed by an unreleased stop notice, a portion of which may be retained by City for the costs incurred in handling the stop notice claim, including attorneys' fees and costs, as authorized by law.

(B) ***Joint Checks.*** City reserves the right, acting in its sole discretion, to issue joint checks made payable to Contractor and a Subcontractor or supplier, if City determines this is necessary to ensure fair and timely payment to Subcontractor or supplier who has provided services or goods for the Project. As a condition to release of payment by a joint check, the joint check payees may be required to execute a joint check agreement in a form provided or approved by the City Attorney's Office. The joint check payees will be jointly and severally responsible for the allocation and disbursement of funds paid by joint check. Payment by joint check will not

be construed to create a contractual relationship between City and a Subcontractor or supplier of any tier beyond the scope of the joint check agreement.

8.7 Final Payment. Contractor's application for Final Payment must comply with the requirements for submitting an application for a progress payment as stated in Section 8.2, above. Corrections to previous progress payments, including adjustments to estimated quantities for unit priced items, may be included in the Final Payment. If Contractor fails to submit a timely application for Final Payment, City reserves the right to unilaterally process and issue Final Payment without an application from Contractor in order to close out the Project. For the purposes of determining the deadline for Claim submission pursuant to Article 12, the date of Final Payment is deemed to be the date that City acts to release undisputed retention as final payment to Contractor, or otherwise provides written notice to Contractor of Final Payment or that no undisputed funds remain available for Final Payment due to offsetting withholdings or deductions pursuant to Section 8.3, Adjustment of Payment Application. If the amount due from Contractor to City exceeds the amount of Final Payment, City retains the right to recover the balance from Contractor or its sureties.

8.8 Release of Claims. City may, at any time, require that payment of the undisputed portion of any progress payment or Final Payment be contingent upon Contractor furnishing City with a written waiver and release of all claims against City arising from or related to the portion of Work covered by those undisputed amounts, subject to the limitations of Public Contract Code Section 7100. Any disputed amounts may be specifically excluded from the release.

8.9 Warranty of Title. Contractor warrants that title to all work, materials, or equipment incorporated into the Work and included in a request for payment will pass over to City free of any claims, liens, or encumbrances upon payment to Contractor.

CONTRACT BALANCE FORM

Eagle View Well #1 Development

Note: A detailed invoice MUST be attached to this Contract Balance Form.

CONTRACTOR NAME: _____ DATE: _____

MAILING ADDRESS: _____ TELEPHONE NO.: _____

_____ FAX NO.: _____

_____ PROJECT NO.: _____

INVOICE NO.: _____

1. ORIGINAL CONTRACT AMOUNT:		$_____
2. APPROVED CHANGE ORDERS TOTAL:		$_____
3. REVISED CONTRACT AMOUNT:	(1+2)	$_____
4. PREVIOUS BALANCE PAID:		$_____
5. REMAINING BALANCE:	(3-4)	$_____
6. CURRENT PROGRESS PAYMENT DUE: *(before retention)*		$_____
7. 5% RETENTION FROM WORK DONE:	(-)	$_____
8. CURRENT BALANCE DUE:	(6-7)	$_____
9. REMAINING BALANCE OF REVISED *(including retention)*	(5-8)	$_____

Article 9 - Labor Provisions

9.1 Discrimination Prohibited. Discrimination against any prospective or present employee engaged in the Work on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status is strictly prohibited. Contractor and its Subcontractors are required to comply with all applicable Laws prohibiting discrimination, including the California Fair Employment and Housing Act (Government Code Section 12900 *et seq.*), Government Code Section 11135, and Labor Code Sections 1735, 1777.5, 1777.6, and 3077.5.

9.2 Labor Code Requirements.

(A) ***Eight Hour Day.*** Pursuant to Labor Code Section 1810, eight hours of labor constitute a legal day's work under this Contract.

(B) ***Penalty.*** Pursuant to Labor Code Section 1813, Contractor will forfeit to City as a penalty, the sum of $25.00 for each day during which a worker employed by Contractor or any Subcontractor is required or permitted to work more than eight hours in any one calendar day or more than 40 hours per calendar week, except if such workers are paid overtime under Labor Code Section 1815.

(C) ***Apprentices.*** Contractor is responsible for compliance with the requirements governing employment and payment of apprentices, as set forth in Labor Code Section 1777.5, which is fully incorporated by reference.

(D) ***Notices.*** Pursuant to Labor Code Section 1771.4, Contractor is required to post all job site notices prescribed by Laws.

9.3 Prevailing Wages. Each worker performing Work under this Contract that is covered under Labor Code Sections 1720, 1720.3, or 1720.9, including cleanup at the Project site, must be paid at a rate not less than the prevailing wage as defined in Sections 1771 and 1774 of the Labor Code. The prevailing wage rates are available online at http://www.dir.ca.gov/dlsr. Contractor must post a copy of the applicable prevailing rates at the Project site.

(A) ***Penalties.*** Pursuant to Labor Code Section 1775, Contractor and any Subcontractor will forfeit to City as a penalty up to $200.00 for each calendar day, or portion of a day, for each worker paid less than the applicable prevailing wage rate. Contractor must also pay each worker the difference between the applicable prevailing wage rate and the amount actually paid to that worker.

(B) ***Federal Requirements.*** If this Project is subject to federal prevailing wage requirements in addition to California prevailing wage requirements, Contractor and its Subcontractors are required to pay the higher of the currently applicable state or federal prevailing wage rates.

9.4 Payroll Records. Contractor must comply with the provisions of Labor Code Sections 1771.4, 1776, and 1812 and all implementing regulations, which are fully incorporated by this reference, including requirements for electronic submission of payroll records to the DIR.

(A) ***Contractor and Subcontractor Obligations***. Contractor and each Subcontractor must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed in connection with the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct; and

(2) Contractor or Subcontractor has complied with the requirements of Labor Code Sections 1771, 1811, and 1815 for any Work performed by its employees on the Project.

(B) ***Certified Record.*** A certified copy of an employee's payroll record must be made available for inspection or furnished to the employee or his or her authorized representative on request, to City, to the Division of Labor Standards Enforcement, to the Division of Apprenticeship Standards of the DIR, and as further required by the Labor Code.

(C) ***Enforcement.*** Upon notice of noncompliance with Labor Code Section 1776, Contractor or Subcontractor has ten days in which to comply with the requirements of this section. If Contractor or Subcontractor fails to do so within the ten-day period, Contractor or Subcontractor will forfeit a penalty of $100.00 per day, or portion of a day, for each worker for whom compliance is required, until strict compliance is achieved. Upon request by the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties will be withheld from payments then due to Contractor.

9.5 Labor Compliance. Pursuant to Labor Code Section 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the DIR.

9.6 Wage Theft Prevention. Compliance with Wage and Hour Laws: Contractor, and any subcontractor it employs to complete work under this Agreement, shall comply with all applicable federal, state and local wage and hour laws. Applicable laws may include, but are not limited to, the Federal Fair Labor Standards Act and the California Labor Code.

Final Judgments, Decisions, and Orders: For purposes of this Section, a "final judgment, decision, or order" refers to one for which all appeals have been exhausted or the time to appeal has expired. Relevant investigatory government agencies include: the federal Department of Labor, the California Division of Labor Standards Enforcement, or any other governmental entity or division tasked with the investigation and enforcement of wage and hour laws.

Prior Judgments against Contractor and/or its Subcontractors: BY SIGNING THIS AGREEMENT, CONTRACTOR AFFIRMS THAT IT HAS DISCLOSED ANY FINAL JUDGMENTS, DECISIONS OR ORDERS FROM A COURT OR INVESTIGATORY GOVERNMENT AGENCY FINDING – IN THE FIVE (5) YEARS PRIOR TO EXECUTING THIS AGREEMENT – THAT CONTRACTOR OR ITS SUBCONTRACTOR(S) HAS VIOLATED ANY APPLICABLE WAGE AND HOUR LAWS. CONTRACTOR FURTHER AFFIRMS THAT IT OR ITS SUBCONTRACTOR(S) HAS SATISFIED AND COMPLIED WITH – OR HAS REACHED AGREEMENT WITH THE CITY REGARDING THE MANNER IN WHICH IT WILL SATISFY – ANY SUCH JUDGMENTS, DECISIONS OR ORDERS.

Judgments or Decisions During Term of Contract: If at any time during the term of this Agreement, a court or investigatory government agency issues a final judgment, decision or order finding that Contractor or an subcontractor it employs to perform work under this Agreement has violated any applicable wage and hour law, or Contractor learns of such a judgment, decision, or order that was not previously disclosed, Contractor shall inform the City Attorney, no more than fifteen (15) days after the judgment, decision or order becomes final or of learning of the final judgment, decision or order. Contractor and its subcontractors shall promptly satisfy and comply with any such judgment, decision, or order, and shall provide the City Attorney with documentary evidence of compliance with the final judgment, decision or order within five (5) days of satisfying the final judgment, decision or order. The City reserves the right to require Contractor to enter into an agreement with the City regarding the manner in which any such final judgment, decision, or order will be satisfied.

City's Right to Withhold Payment: Where Contractor or any subcontractor it employs to perform work under this Agreement has been found in violation of any applicable wage and hour law by a final judgment, decision or order of a court or government agency, the City reserves the right to withhold

payment to Contractor until such judgment, decision or order has been satisfied in full.

Material Breach: Failure to comply with any part of this Section constitutes a material breach of this Agreement. Such breach may serve as a basis for immediate termination of this Agreement and/or any other remedies available under this Agreement and/or law.

Notice to City Related to Wage Theft Prevention: Notice provided to the City Attorney as required under this Section shall be addressed to: City Attorney, City of Morgan Hill, 17575 Peak Avenue, Morgan Hill, CA 95037. The Notice provisions of this Section are separate from any other notice provisions in this Agreement and, accordingly, only notice provided to the above address satisfies the notice requirements in this Section.

Article 10 - Safety Provisions

10.1 Safety Precautions and Programs. Contractor and its Subcontractors are fully responsible for safety precautions and programs, and for the safety of persons and property in the performance of the Work. Contractor and its Subcontractors must at all times comply with all applicable health and safety Laws and seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at any Worksite, materials and equipment stored on or off site, and property at or adjacent to any Worksite.

(A) ***Reporting Requirements.*** Contractor must immediately notify the City of any death, serious injury or illness resulting from Work on the Project. Contractor must immediately provide a written report to City of each recordable accident or injury occurring at any Worksite within 24 hours of the occurrence. The written report must include: (1) the name and address of the injured or deceased person; (2) the name and address of each employee of Contractor or of any Subcontractor involved in the incident; (3) a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with a government agency, Contractor will provide a copy of the report to City.

(B) ***Legal Compliance.*** Contractor's safety program must comply with the applicable legal and regulatory requirements. Contractor must provide City with copies of all notices required by Laws.

(C) ***Contractor's Obligations.*** Any damage or loss caused by Contractor arising from the Work which is not insured under property insurance must be promptly remedied by Contractor.

(D) ***Remedies.*** If City determines, in its sole discretion, that any part of the Work or Project site is unsafe, City may, without assuming responsibility for Contractor's safety program, require Contractor or its Subcontractor to cease performance of the Work or to take corrective measures to City's satisfaction. If Contractor fails to promptly take the required corrective measures, City may perform them and deduct the cost from the Contract Price. Contractor agrees it is not entitled to submit a Claim for damages, for an increase in Contract Price, or for a change in Contract Time based on Contractor's compliance with City's request for corrective measures pursuant to this provision.

10.2 Hazardous Materials. Unless otherwise specified in the Contract Documents, this Contract does not include the removal, handling, or disturbance of any asbestos or other Hazardous Materials. If Contractor encounters materials on the Project site that Contractor reasonably believes to be asbestos or other Hazardous Materials, and the asbestos or other Hazardous Materials have not been rendered harmless, Contractor may continue Work in unaffected areas reasonably believed to be safe, but must immediately cease work on the area affected and report the condition to City. No asbestos, asbestos-containing products or other Hazardous Materials may be used in performance of the Work.

10.3 Material Safety. Contractor is solely responsible for complying with Section 5194 of Title 8 of the California Code of Regulations, including by providing information to Contractor's employees about any hazardous chemicals to which they may be exposed in the course of the Work. A hazard communication program and other forms of warning and training about such exposure must be used. Contractor must also maintain Safety Data Sheets ("SDS") at the Project site, as required by Law, for materials or substances used or consumed in the performance of the Work. The SDS will be accessible and available to Contractor's employees, Subcontractors, and City.

(A) ***Contractor Obligations.*** Contractor is solely responsible for the proper delivery, handling, use, storage, removal, and disposal of all materials brought to the Project site and/or used in the performance of the Work. Contractor must notify the Engineer if a specified product or material cannot be used safely.

(B) ***Labeling.*** Contractor must ensure proper labeling on any material brought onto the Project site so that any persons working with or in the vicinity of the material may be informed as to the identity of the material,

any potential hazards, and requirements for proper handling, protections, and disposal.

10.4 Hazardous Condition. Contractor is solely responsible for determining whether a hazardous condition exists or is created during the course of the Work, involving a risk of bodily harm to any person or risk of damage to any property. If a hazardous condition exists or is created, Contractor must take all precautions necessary to address the condition and ensure that the Work progresses safely under the circumstances. Hazardous conditions may result from, but are not limited to, use of specified materials or equipment, the Work location, the Project site condition, the method of construction, or the way any Work must be performed.

10.5 Emergencies. In an emergency affecting the safety or protection of persons, Work, or property at or adjacent to any Worksite, Contractor must take reasonable and prompt actions to prevent damage, injury, or loss, without prior authorization from the City if, under the circumstances, there is inadequate time to seek prior authorization from the City.

Article 11 - Completion and Warranty Provisions

11.1 Final Completion.

(A) ***Final Inspection and Punch List.*** When the Work required by this Contract is fully performed, Contractor must provide written notification to City requesting final inspection. The Engineer will schedule the date and time for final inspection, which must include Contractor's primary representative for the Project and its superintendent. Based on that inspection, City will prepare a punch list of any items that are incomplete, missing, defective, incorrectly installed, or otherwise not compliant with the Contract Documents The punch list to Contractor will specify the time by which all of the punch list items must be completed or corrected. The punch list may include City's estimated cost to complete each punch list item if Contractor fails to do so within the specified time. The omission of any non-compliant item from a punch list will not relieve Contractor from fulfilling all requirements of the Contract Documents. Contractor's failure to complete any punch list item within the time specified in the punch list will not waive or abridge its warranty obligations for any such items that must be completed by the City or by a third party retained by the City due to Contractor's failure to timely complete any such outstanding item.

(B) ***Requirements for Final Completion.*** Final Completion will be achieved upon completion or correction of all punch list items, as verified by City's further inspection, and upon satisfaction of all other Contract requirements, including any commissioning required under the Contract Documents, and submission of all final submittals, including instructions

and manuals as required under Section 7.10, and complete, final as-built drawings as required under Section 7.11, all to City's satisfaction.

(C) ***Acceptance.*** The Project will be considered accepted upon City Council action during a public meeting to accept the Project, unless the Engineer is authorized to accept the Project, in which case the Project will be considered accepted upon the date of the Engineer's issuance of a written notice of acceptance. In order to avoid delay of Project close out, the City may elect, acting in its sole discretion, to accept the Project as complete subject to exceptions for punch list items that are not completed within the time specified in the punch list.

(D) ***Final Payment and Release of Retention.*** Final Payment and release of retention, less any sums withheld pursuant to the provisions of the Contract Documents, will not be made sooner than 35 days after recordation of the notice of completion. If Contractor fails to complete all of the punch list items within the specified time, City may withhold up to 150% of City's estimated cost to complete each of the remaining items from Final Payment and may use the withheld retention to pay for the costs to self-perform the outstanding items or to retain a third party to complete any such outstanding punch list item.

11.2 Warranty.

(A) ***General.*** Contractor warrants that all materials and equipment will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. Contractor warrants that materials or items incorporated into the Work comply with the requirements and standards in the Contract Documents, including compliance with Laws, and that any Hazardous Materials encountered or used were handled as required by Laws. At City's request, Contractor must furnish satisfactory evidence of the quality and type of materials and equipment furnished. Contractor's warranty does not extend to damage caused by normal wear and tear, or improper use or maintenance.

(B) ***Warranty Period.*** Contractor's warranty must guarantee its Work for a period of one year from the date of Project acceptance (the "Warranty Period"), except when a longer guarantee is provided by a supplier or manufacturer or is required by the Specifications or Special Conditions. Contractor must obtain from its Subcontractors, suppliers and manufacturers any special or extended warranties required by the Contract Documents.

(C) ***Warranty Documents.*** As a condition precedent to Final Completion, Contractor must supply City with all warranty and guarantee documents relevant to equipment and materials incorporated into the Work and guaranteed by their suppliers or manufacturers.

(D) ***Subcontractors.*** The warranty obligations in the Contract Documents apply to Work performed by Contractor and its Subcontractors, and Contractor expressly agrees to be co-guarantor of such Work.

(E) ***Contractor's Obligations.*** Upon written notice from City to Contractor of any defect in the Work discovered during the Warranty Period, Contractor or its responsible Subcontractor must promptly correct the defective Work at its own cost. Contractor's obligation to correct defects discovered during the Warranty Period will continue past the expiration of the Warranty Period as to any defects in Work for which Contractor was notified prior to expiration of the Warranty Period. Work performed during the Warranty Period ("Warranty Work") will be subject to the warranty provisions in this Section 11.2 for a one-year period that begins upon completion of such Warranty Work to City's satisfaction.

(F) ***City's Remedies.*** If Contractor or its responsible Subcontractor fails to correct defective Work within ten days following notice by City, or sooner, if required by the circumstances, City may correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor must reimburse City for its costs in accordance with subsection (H) below.

(G) ***Emergency Repairs.*** In cases of emergency where any delay in correcting defective Work could cause harm, loss or damage, City may immediately correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor or its surety must reimburse City for its costs in accordance with subsection (H), below.

(H) ***Reimbursement.*** Contractor must reimburse City for its costs to repair under subsections (F) or (G), above, within 30 days following City's submission of a demand for payment pursuant to this provision. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor and its surety are solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein in addition to any and all costs City incurs to correct the defective Work.

11.3 Use Prior to Final Completion. City reserves the right to occupy or make use of the Project, or any portions of the Project, prior to Final Completion if City has determined that the Project or portion of it is in a condition suitable for the proposed occupation or use, and that it is in its best interest to occupy or make use of the Project, or any portions of it, prior to Final Completion.

City will notify Contractor in writing of its intent to occupy or make use of the Project or any portions of the Project, pursuant to this provision.

(A) ***Non-Waiver.*** Occupation or use of the Project, in whole or in part, prior to Final Completion will not operate as acceptance of the Work or any portion of it, nor will it operate as a waiver of any of City's rights or Contractor's duties pursuant to these Contract Documents, and will not affect nor bear on the determination of the time of substantial completion with respect to any statute of repose pertaining to the time for filing an action for construction defect.

(B) ***City's Responsibility.*** City will be responsible for the cost of maintenance and repairs due to normal wear and tear with respect to those portions of the Project that are being occupied or used before Final Completion. The Contract Price or the Contract Time may be adjusted pursuant to the applicable provisions of these Contract Documents if, and only to the extent that, any occupation or use under this Section actually adds to Contractor's cost or time to complete the Work within the Contract Time.

11.4 Substantial Completion. For purposes of determining "substantial completion" with respect to any statute of repose pertaining to the time for filing an action for construction defect, "substantial completion" is deemed to mean the last date that Contractor or any Subcontractor performs Work on the Project prior to City acceptance of the Project, except for warranty work performed under this Article.

Article 12 - Dispute Resolution

12.1 Claims. This Article applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) ***Limitations.*** A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with Article 5 and Article 6, and subsequently rejected in whole or in part by City.

(B) ***Scope of Article.*** This Article is intended to provide the exclusive procedures for submission and resolution of Claims of any amount, and applies in addition to the provisions of Public Contract Code Section 9204

and Sections 20104 *et seq.*, which are incorporated herein by this reference.

(C) ***No Work Delay.*** Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of a Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to a Claim or other dispute.

(D) ***Informal Resolution.*** Contractor will make a good faith effort to informally resolve a dispute before initiating a Claim, preferably by face-to-face meeting between authorized representatives of Contractor and City.

12.2 Claims Submission. The following requirements apply to any Claim subject to this Article:

(A) ***Substantiation.*** The Claim must be submitted to City in writing by registered or certified mail with return receipt requested and clearly identified as a "Claim" submitted pursuant to this Article 12. The Claim must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City's written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all known or estimated labor, materials, taxes, insurance, and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each component of claimed cost. Any Claim for an extension of time or delay costs must be substantiated with a schedule analysis and narrative depicting and explaining claimed time impacts. Contractor understands that submission of a Claim which has no basis in fact or which Contractor knows to be false may violate the False Claims Act (Government Code Section 12650 et seq.).

(B) ***Claim Format and Content.*** A Claim must be submitted in the following format:

(1) Provide a cover letter, specifically identifying the submission as a "Claim" submitted under this Article 12 and specifying the requested remedy (e.g., amount of proposed change to Contract Price and/or change to Contract Time).

(2) Provide a summary of each Claim, including underlying facts and the basis for entitlement, and identify each specific demand at issue,

including the specific Change Order request (by number and submittal date), and the date of City's rejection of that demand, in whole or in part.

(3) Provide a detailed explanation of each issue in dispute. For multiple issues included within a single Claim or for multiple Claims submitted concurrently, separately number and identify each individual issue or Claim and include the following for each separate issue or Claim:

(a) A succinct statement of the matter in dispute, including Contractor's position and the basis for that position;

(b) Identify and attach all documents that substantiate the Claim, including relevant provisions of the Contract Documents, RFIs, calculations, and schedule analysis (see subsection (A), Substantiation above);

(c) A chronology of relevant events; and

(d) Analysis and basis for claimed changes to Contract Price, Contract Time, or any other remedy requested.

(4) Provide a summary of issues and corresponding claimed damages. If, by the time of the Claim submission deadline (below), the precise amount of the requested change in the Contract Price or Contract Time is not yet known, Contractor must provide a good faith estimate, including the basis for that estimate, and must identify the date by which it is anticipated that the Claim will be updated to provide final amounts.

(5) Include the following certification, executed by Contractor's authorized representative:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim submittal are true and correct. Contractor warrants that this Claim submittal is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay not included herein are deemed waived.

(C) ***Submission Deadlines.***

(1) A Claim disputing rejection of a request for a change in the Contract Time or Contract Price must be submitted within 21 days following the date that City notified Contractor in writing that a

request for a change in the Contract Time or Contract Price, duly submitted in compliance with Article 5 and Article 6, has been rejected in whole or in part. A Claim disputing the terms of a unilateral Change Order must be submitted within 21 days following the date of issuance of the unilateral Change Order. These Claim deadlines apply even if Contractor cannot yet quantify the total amount of any requested change in the Contract Time or Contract Price. If the Contractor cannot quantify those amounts, it must submit an estimate of the amounts claimed pending final determination of the requested remedy by Contractor.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment, or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 21 days of the effective date of Final Payment, under Section 8.7, Final Payment, above.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. Any Claim that is not submitted within the specified deadlines will be deemed waived by Contractor.

12.3 City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and Contractor or as otherwise allowed under Public Contract Code Section 9204. However, if City determines that the Claim is not adequately substantiated pursuant to Section 12.2(A), Substantiation, City may first request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim.

(A) ***Additional Information.*** If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor. If Contractor's Claim is based on estimated amounts, Contractor has a continuing duty to update its Claim as soon as possible with information on actual amounts in order to facilitate prompt and fair resolution of the Claim.

(B) ***Non-Waiver.*** Any failure by City to respond within the times specified above will not be construed as acceptance of the Claim in whole or in part, or as a waiver of any provision of these Contract Documents.

12.4 Meet and Confer. If Contractor disputes City's written response, or City fails to respond within the specified time, within 15 days of receipt of City's response, or within 15 days of City's failure to respond within the applicable 45-day time period under Section 12.3, respectively, Contractor may notify City of the dispute in writing sent by registered or certified mail, return receipt requested and demand an informal conference to meet and confer for settlement of the issues in dispute. If Contractor fails to notify of the dispute, and demand an informal conference to meet and confer City in writing within the specified time, Contractor's Claim will be deemed waived.

(A) ***Schedule Meet and Confer.*** Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) ***Location for Meet and Confer.*** The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) ***Written Statement After Meet and Confer.*** Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) ***Submission to Mediation.*** If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the Contractor may identify in writing disputed portion(s) of the Claim that will be submitted for mediation, as set forth below.

12.5 Mediation and Government Code Claims.

(A) ***Mediation.*** Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute**,** following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code Section 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. If there are multiple Claims in dispute, the parties may agree to schedule the mediation to address all outstanding Claims at the same time. The parties will share the costs of the mediator and mediation fees equally, but each party is otherwise solely and separately responsible for its own costs to prepare for and participate in the mediation, including costs for its legal counsel or any other consultants.

(B) ***Government Code Claims***.

(1) Timely presentation of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract. Compliance with the Claim submission requirements in this Article 12 is a condition precedent to filing a Government Code Claim.

(2) The time for filing a Government Code Claim will be tolled from the time Contractor submits its written Claim pursuant to Section 12.2, above, until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not fully resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

12.6 Tort Claims. This Article does not apply to tort claims and nothing in this Article is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.

12.7 Arbitration. It is expressly agreed, under Code of Civil Procedure Section 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.

12.8 Burden of Proof and Limitations. Contractor bears the burden of proving entitlement to and the amount of any claimed damages. Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. Contractor is not entitled to speculative, special, or consequential damages, including home office overhead or any form of overhead not directly incurred at the Project site or any other Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract. The Eichleay Formula or similar formula will not be used for any recovery under the Contract. The City will not be directly liable to any Subcontractor or supplier.

12.9 Legal Proceedings. In any legal proceeding that involves enforcement of any requirements of the Contract Documents, the finder of fact will receive detailed instructions on the meaning and operation of the Contract Documents, including conditions, limitations of liability, remedies, claim procedures, and other provisions bearing on the defenses and theories of liability. Detailed findings of fact will be requested to verify enforcement of the Contract Documents. All of the City's remedies under the Contract Documents will be construed as cumulative, and not exclusive, and the City

reserves all rights to all remedies available under law or equity as to any dispute arising from or relating to the Contract Documents or performance of the Work.

12.10 Other Disputes. The procedures in this Article 12 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, including disputes regarding suspension or early termination of the Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City. Nothing in this Article is intended to delay suspension or termination under Article 13.

Article 13 - Suspension and Termination

13.1 Suspension for Cause. In addition to all other remedies available to City, if Contractor fails to perform or correct Work in accordance with the Contract Documents, including non-compliance with applicable environmental or health and safety Laws, City may immediately order the Work, or any portion of it, suspended until the circumstances giving rise to the suspension have been eliminated to City's satisfaction.

(A) ***Notice of Suspension***. Upon receipt of City's written notice to suspend the Work, in whole or in part, except as otherwise specified in the notice of suspension, Contractor and its Subcontractors must promptly stop Work as specified in the notice of suspension; comply with directions for cleaning and securing the Worksite; and protect the completed and in-progress Work and materials. Contractor is solely responsible for any damages or loss resulting from its failure to adequately secure and protect the Project.

(B) ***Resumption of Work.*** Upon receipt of the City's written notice to resume the suspended Work, in whole or in part, except as otherwise specified in the notice to resume, Contractor and its Subcontractors must promptly re-mobilize and resume the Work as specified; and within ten days from the date of the notice to resume, Contractor must submit a recovery schedule, prepared in accordance with the Contract Documents, showing how Contractor will complete the Work within the Contract Time.

(C) ***Failure to Comply.*** Contractor will not be entitled to an increase in Contract Time or Contract Price for a suspension occasioned by Contractor's failure to comply with the Contract Documents.

(D) ***No Duty to Suspend.*** City's right to suspend the Work will not give rise to a duty to suspend the Work, and City's failure to suspend the Work

will not constitute a defense to Contractor's failure to comply with the requirements of the Contract Documents.

13.2 Suspension for Convenience. City reserves the right to suspend, delay, or interrupt the performance of the Work in whole or in part, for a period of time determined to be appropriate for City's convenience. Upon notice by City pursuant to this provision, Contractor must immediately suspend, delay, or interrupt the Work and secure the Project site as directed by City, except for taking measures to protect completed or in progress Work as directed in the suspension notice, and subject to the provisions of Section 13.1(A) and (B), above. If Contractor submits a timely request for a Change Order in compliance with Articles 5 and 6, the Contract Price and the Contract Time will be equitably adjusted by Change Order pursuant to Articles 5 and 6 to reflect the cost and delay impact occasioned by such suspension for convenience except to the extent that any such impacts were caused by Contractor's failure to comply with the Contract Documents or the terms of the suspension notice or notice to resume. However, Contract Time will only be extended if the suspension causes or will cause unavoidable delay in Final Completion. If Contractor disputes the terms of a Change Order issued for such equitable adjustment due to suspension for convenience, its sole recourse is to comply with the Claim procedures in Article 12.

13.3 Termination for Default. City may declare that Contractor is in default of the Contract for a material breach of or inability to fully, promptly, or satisfactorily perform its obligations under the Contract.

(A) ***Default.*** Events giving rise to a declaration of default include Contractor's refusal or failure to supply sufficient skilled workers, proper materials, or equipment to perform the Work within the Contract Time; Contractor's refusal or failure to make prompt payment to its employees, Subcontractors, or suppliers or to correct defective Work or damage; Contractor's failure to comply with the Laws, or orders of any public agency with jurisdiction over the Project; evidence of Contractor's bankruptcy, insolvency, or lack of financial capacity to complete the Work as required within the Contract Time; suspension, revocation, or expiration and nonrenewal of Contractor's license or DIR registration; dissolution, liquidation, reorganization, or other major change in Contractor's organization, ownership, structure or existence as a business entity; unauthorized assignment of Contractor's rights or duties under the Contract; or any material breach of the Contract requirements.

(B) ***Notice of Default and Opportunity to Cure.*** Upon City's declaration that Contractor is in default, due to a material breach of the Contract Documents, if City determines that the default is curable, City will afford Contractor the opportunity to cure the default within ten days of City's notice

of default, or within a period of time reasonably necessary for such cure, including a shorter period of time if applicable.

(C) ***Termination.*** If Contractor fails to cure the default or fails to expediently take steps reasonably calculated to cure the default within the time period specified in the notice of default, City may issue written notice to Contractor and its performance bond surety of City's termination of the Contract for default.

(D) ***Waiver.*** Time being of the essence in the performance of the Work, if Contractor's surety fails to arrange for completion of the Work in accordance with the Performance Bond, within seven calendar days from the date of the notice of termination, pursuant to paragraph (C), City may immediately make arrangements for the completion of the Work through use of its own forces, by hiring a replacement contractor, or by any other means that City determines advisable under the circumstances. Contractor and its surety will be jointly and severally liable for any additional cost incurred by City to complete the Work following termination, where "additional cost" means all cost in excess of the cost City would have incurred if Contractor had timely completed Work without the default and termination. In addition, City will have the right to immediate possession and use of any materials, supplies, and equipment procured for the Project and located at the Project site or any Worksite on City property for the purposes of completing the remaining Work.

(E) ***Compensation.*** Within 30 days of receipt of updated as-builts, all warranties, manuals, instructions, or other required documents for Work installed to date, and delivery to City of all equipment and materials for the Project for which Contractor has already been compensated, Contractor will be compensated for the Work satisfactorily performed in compliance with the Contract Documents up to the effective date of the termination pursuant to the terms of Article 8, Payment, subject to City's rights to withhold or deduct sums from payment otherwise due pursuant to Section 8.3, and excluding any costs Contractor incurs as a result of the termination, including any cancellation or restocking charges or fees due to third parties. If Contractor disputes the amount of compensation determined by City, its sole recourse is to comply with the Claim Procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of the total compensation to be paid by City.

(F) ***Wrongful Termination.*** If Contractor disputes the termination, its sole recourse is to comply with the Claim procedures in Article 12. If a court of competent jurisdiction or an arbitrator later determines that the termination for default was wrongful, the termination will be deemed to be a termination for convenience, and Contractor's damages will be strictly limited to the compensation provided for termination for convenience, under

Section 13.4, below. Contractor waives any claim for any other damages for wrongful termination including special or consequential damages, lost opportunity costs or lost profits, and any award of damages is subject to Section 12.8, Burden of Proof and Limitations.

13.4 Termination for Convenience. City reserves the right, acting in its sole discretion, to terminate all or part of the Contract for convenience upon written notice to Contractor.

(A) ***Compensation to Contractor.*** In the event of City's termination for convenience, Contractor waives any claim for damages, including for loss of anticipated profits from the Project. The following will constitute full and fair compensation to Contractor, and Contractor will not be entitled to any additional claim or compensation.

(1) ***Completed Work.*** The value of its Work satisfactorily performed as of the date notice of termination is received, based on Contractor's schedule of values and unpaid costs for items delivered to the Project site that were fabricated for incorporation in the Work;

(2) ***Demobilization.*** Demobilization costs specified in the schedule of values, or if demobilization costs were not provided in a schedule of values pursuant to Section 8.1, then based on actual, reasonable, and fully documented demobilization costs; and

(3) ***Termination Markup.*** Five percent of the total value of the Work performed as of the date of notice of termination including reasonable, actual, and documented costs to comply with the direction in the notice of termination for convenience, and demobilization costs, which is deemed to cover all overhead and profit to date.

(B) ***Disputes.*** If Contractor disputes the amount of compensation determined by City pursuant to paragraph (A), above, its sole recourse is to comply with the Claim procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of total compensation to be paid by City.

13.5 Actions Upon Termination for Default or Convenience. The following provisions apply to any termination under this Article, whether for default or convenience, and whether in whole or in part.

(A) ***General.*** Upon termination, City may immediately enter upon and take possession of the Project and the Work and all tools, equipment, appliances, materials, and supplies procured or fabricated for the Project.

Contractor will transfer title to and deliver all completed Work and all Work in progress to City.

(B) ***Submittals.*** Unless otherwise specified in the notice of termination, Contractor must immediately submit to City all designs, drawings, as-built drawings, Project records, contracts with vendors and Subcontractors, manufacturer warranties, manuals, and other such submittals or Work-related documents required under the terms of the Contract Documents, including incomplete documents or drafts.

(C) ***Close Out Requirements.*** Except as otherwise specified in the notice of termination, Contractor must comply with all of the following:

(1) Immediately stop the Work, except for any Work that must be completed pursuant to the notice of termination and comply with City's instructions for cessation of labor and securing the Project and any other Worksite(s).

(2) Comply with City's instructions to protect the completed Work and materials, using best efforts to minimize further costs.

(3) Contractor must not place further orders or enter into new subcontracts for materials, equipment, services or facilities, except as may be necessary to complete any portion of the Work that is not terminated.

(4) As directed in the notice, Contractor must assign to City or cancel existing subcontracts that relate to performance of the terminated Work, subject to any prior rights, if any, of the surety for Contractor's performance bond, and settle all outstanding liabilities and claims, subject to City's approval.

(5) As directed in the notice, Contractor must use its best efforts to sell any materials, supplies, or equipment intended solely for the terminated Work in a manner and at market rate prices acceptable to City.

(D) ***Payment Upon Termination.*** Upon completion of all termination obligations, as specified herein and in the notice of termination, Contractor will submit its request for Final Payment, including any amounts due following termination pursuant to this Article 13. Payment will be made in accordance with the provisions of Article 8, based on the portion of the Work satisfactorily completed, including the close out requirements, and consistent with the previously submitted schedule of values and unit pricing, including demobilization costs. Adjustments to Final Payment may include deductions for the cost of materials, supplies, or equipment retained by

Contractor; payments received for sale of any such materials, supplies, or equipment, less re-stocking fees charged; and as otherwise specified in Section 8.3, Adjustment of Payment Application.

(E) ***Continuing Obligations.*** Regardless of any Contract termination, Contractor's obligations for portions of the Work already performed will continue and the provisions of the Contract Documents will remain in effect as to any claim, indemnity obligation, warranties, guarantees, submittals of as-built drawings, instructions, or manuals, record maintenance, or other such rights and obligations arising prior to the termination date.

Article 14 - Miscellaneous Provisions

14.1 Assignment of Unfair Business Practice Claims. Under Public Contract Code Section 7103.5, Contractor and its Subcontractors agree to assign to City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment will be effective at the time City tenders Final Payment to Contractor, without further acknowledgement by the parties.

14.2 Provisions Deemed Inserted. Every provision of law required to be inserted in the Contract Documents is deemed to be inserted, and the Contract Documents will be construed and enforced as though such provision has been included. If it is discovered that through mistake or otherwise that any required provision was not inserted, or not correctly inserted, the Contract Documents will be deemed amended accordingly.

14.3 Waiver. City's waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents will not be effective unless it is in writing and signed by City. City's waiver of any breach, failure, right, or remedy will not be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor will any waiver constitute a continuing waiver unless specified in writing by City.

14.4 Titles, Headings, and Groupings. The titles and headings used and the groupings of provisions in the Contract Documents are for convenience only and may not be used in the construction or interpretation of the Contract Documents or relied upon for any other purpose.

14.5 Statutory and Regulatory References. With respect to any amendments to any statutes or regulations referenced in these Contract Documents, the reference is deemed to be the version in effect on the date that bids were due.

14.6 Survival. The provisions that survive termination or expiration of this Contract include Contract Section 11, Notice, and subsections 12.1, 12.2, 12.3, 12.4, 12.5, and 12.6 of Section 12, General Provisions; and the following provisions in these General Conditions: Section 2.2(J), Contractor's Records, Section 2.3(C), Termination, Section 3.7, Ownership, Section 4.2, Indemnity, Article 12, Dispute Resolution, and Section 11.2, Warranty.

END OF GENERAL CONDITIONS

SPECIAL CONDITIONS

1.0 Shop Drawings. Whenever Shop Drawings are required by the Contract Documents or by the Engineer, Contractor must submit five (5) prints of each shop drawing to the Engineer.

(A) If three (3) prints of the drawing are returned to Contractor marked "NO EXCEPTIONS TAKEN," further revision of the drawings will not be required. If one (1) print of the drawing is returned to Contractor marked "REVISE AND RESUBMIT," Contractor must revise the drawing and resubmit five (5) copies of the revised drawing to the Engineer. City reserves the right to withhold payment due Contractor to cover additional costs of the Engineer's review beyond the second submission.

(B) Fabrication of an item may not commence before the Engineer has reviewed the pertinent shop drawings and returned copies to Contractor marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

(C) Revisions indicated on shop drawings are deemed necessary to meet the existing requirements of the Contract Documents and may not be taken as the basis of claims for extra Work. Contractor is not entitled to claim for damages or extension of time due to any delay resulting from making the required revisions to shop drawings. The Engineer's review of the shop drawings does not relieve Contractor of responsibility for any errors or omissions contained in the shop drawings nor will such review operate to waive or modify any provision contained in the Contract Documents.

2.0 ***Waste Water.*** City will provide water required for performance of the Work. Contractor is responsible for the appropriate disposal of waste water in coordination with City personnel. Contractor must provide a backflow preventer on all point of connections to City's Water System. All backflow preventers must be checked and approved by City's Public Works Water Division. Contractor must provide a deposit (refundable) and make necessary arrangements to pick up a hydrant meter at City's Public Works Office. At the completion of the Project, if the hydrant meter is not returned promptly or if it is damaged, Contractor shall forfeit its deposit.

3.0 ***Equipment.*** Contractor must provide and use equipment and plants suitable to produce the quality of Work and materials required by the Contract Documents. Contractor may be required to remove equipment which the Engineer deems unsuitable for the Work. Contractor must ensure that equipment is operated by trained, experienced operators, and at a speed or rate of production not to exceed that recommended by the manufacturer. Any vehicles used to haul materials over existing streets and highways must be equipped with pneumatic tires.

4.0 Lines and Grades. The Engineer will set the stakes or marks necessary to establish the lines and grades required for the completion of the Work in accordance with the Contract Documents. Contractor must give at least two (2) working days' notice to the Engineer of the need for setting any lines and grades.

(A) ***Measurements.*** Distances and measurements are given and will be made in a horizontal plane. Grades are given from the top of stakes or nail unless otherwise noted. Three (3) consecutive points shown on the same rate of slope must be used in common in order to detect any variation from a straight grade. Any variation from a straight grade, straight slope or line, must be reported to the Engineer. If such discrepancy is not reported to the Engineer, Contractor is responsible for any error in the finished work.

(B) ***Stakes.*** Contractor must preserve all stakes and points set for lines, grades or measurements of the Work in their proper places until authorized by the Engineer to remove them. All expense incurred by replacing stakes that have been removed without proper authority may be deducted from any payment due to Contractor.

5.0 Disposal of Materials Outside of Street Right-of-Way. Unless otherwise specified in the Specifications or Special Conditions, Contractor is solely responsible for disposing of materials outside the street right-of-way and for all associated costs. Before disposing materials outside the street right-of-way, Contractor must 1) obtain a written release from the property owner releasing City from any and all responsibility in connection with the disposal of material on that property; and 2) obtain permission from the Engineer to dispose of the material at the permitted location.

6.0 Emergency Contact. Prior to the commencement of Work on the Project, Contractor must provide contact information to the Engineer for the person designated by Contractor to respond to any emergency that arises on the Worksite during the course of the Project. That person will be responsible for responding to the Worksite within thirty (30) minutes following notification of an emergency by City's Police or Fire Department, regardless of the time of day.

7.0 Right-of-Way. City will provide the right-of-way for performance of the Work. Contractor is solely responsible for any additional area required outside of the designated the right-of-way, unless otherwise provided in the Contract Documents.

(A) ***Environmental Control.*** Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides, herbicides or other harmful materials. Contractor and its subcontractors shall at all times in the performance of the Work comply with all applicable

federal, state, and local laws and regulations concerning pollution of waterways.

8.0 Use of Explosives. When the use of explosives is necessary for the prosecution of the Work, Contractor must ensure that they are used with the utmost care to avoid endangering persons or property. All explosives must be used and stored in strict accordance with all applicable federal, state, and local laws and regulations.

9.0 Authorized Work Days and Hours.

(A) ***Authorized Work Days.*** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project on the following days of the week, excluding holidays observed by City:
(Monday through Friday)

(B) ***Authorized Work Hours.*** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project during the following hours: **(8am through 5pm)**

10.0 ***Pre-Construction Conference.*** City will designate a date and time for a pre-construction conference with Contractor following Contract execution. Project administration procedures and coordination between City and Contractor will be discussed, and Contractor must present City with the following information or documents at the meeting for City's review and acceptance before the Work commences:

10.1 Name, 24-hour contact information, and qualifications of the proposed on-site superintendent;

10.2 List of all key Project personnel and their complete contact information, including email addresses and telephone numbers during regular hours and after hours;

10.3 Staging plans that identify the sequence of the Work, including any phases and alternative sequences or phases, with the goal of minimizing the impacts on residents, businesses and other operations in the Project vicinity;

10.4 If required, traffic control plans associated with the staging plans that are signed and stamped by a licensed traffic engineer;

10.5 Draft baseline schedule for the Work as required under Section 5.2, of the General Conditions to be finalized within ten days after City issues the Notice to Proceed;

10.6 Breakdown of lump sum bid items, to be used for determining the value of Work completed for future progress payments to Contractor;

10.7 Schedule with list of Project submittals that require City review, and list of the proposed material suppliers;

10.8 Plan for coordination with affected utility owner(s) and compliance with any related permit requirements;

10.9 Videotape and photographs recording the conditions throughout the pre-construction Project site, showing the existing improvements and current condition of the curbs, gutters, sidewalks, signs, landscaping, streetlights, structures near the Project such as building faces, canopies, shades and fences, and any other features within the Project area limits;

10.10 If requested by City, Contractor's cash flow projections; and

10.11 Any other documents specified in the Special Conditions or Notice of Award.

11.0 Weather Delay Days. This provision is intended to supplement the requirements of General Conditions Section 5.2 on Schedule Requirements and Section 5.3 on Delays and Extensions of Contract Time.

(A) ***Weather Delay Day****.* A Weather Delay Day is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than forty percent (40%) of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Worksite clean-up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule.

(B) ***Normal Weather Delay Days.*** Based on historic records for the Project location, Contractor's schedule should assume the following number of normal Weather Delay Days for each month:

Month	# Normal Weather Delay Days
January	10
February	13
March	5
April	3
May	3

June	1
July	1
August	1
September	2
October	3
November	7
December	12

Weather Delay Days which do not occur during a given month based on the number of days allocated for that month (above) do not carry over to another month.

12.0 Close Out Requirements. Contractor's close out requirements include the following, if applicable:

12.1 Contractor must replace, with thermoplastic, any existing striping within and adjacent to the Project site that is damaged during the Work. Partially damaged striping must be replaced in its entirety.

12.2 Contractor must replace any survey monuments that are damaged or removed during the Work, with a Record of Survey filed by a licensed land surveyor as required by California law.

12.3 Before removing any traffic control or street signs on the Project site, Contractor must take photographs showing their original locations. Upon completion of each phase of construction, Contractor must temporarily reset the signs at those locations. Contractor must then replace the signs permanently upon completion of the Work and the cost of their removal and replacement must be included in the Bid Proposal.

12.4 Contractor must maintain any rural mail boxes on the Project site and relocate them to their permanent locations as soon as possible in the course of the Work, to the satisfaction of the affected property owners and the postal service.

13.0 Value Engineering. The Contractor may be entitled to additional compensation for cost reduction changes made pursuant to a value engineering proposal submitted by the Contractor, subject to the limitations of Public Contract Code Section 7101, and in strict compliance with this Section __. Contractor will not be entitled to any such additional compensation unless all of the following requirements have been met:

13.1 The Contractor must submit a written proposal for changes to the Plans or Specifications for the Project, in which it:

(A) Identifies the written proposal as a proposal for cost reduction changes with reference to this section;

(B) Clearly and specifically identifies the proposed cost reduction changes by describing in detail each of the changes proposed with specific references to each of the Specifications and Plans involved in the proposed changes, and providing proposed revised Specifications and Plans as applicable; and

(C) Estimates the net amount of the cost reduction and provides the basis for that estimate.

13.2 The proposed changes have been identified and developed solely by the Contractor, and not, in whole or in part, by the City.

13.3 The City accepts the proposed changes in whole or in part in a writing signed by the Engineer. The Contractor will only be entitled to additional compensation for those changes specifically accepted by the City. The Engineer will determine the net savings in construction costs from any such changes that are both accepted and implemented by the City. Contractor will not be entitled to more than 50% of the net savings as determined by the Engineer, acting in his or her sole discretion.

END OF SPECIAL CONDITIONS

Bid Item Descriptions

1.02 Bid Item Descriptions

A. The Bid Amounts for each Base Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments.

B. Each Lump Sum bid amount will undergo further breakdown as described later in this section. Unit prices for any unit price bid items will be the basis for monthly progress payment determinations and for any changes related to that Work item. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.

1. **Bid Item 1**: Mobilization, Demobilization, and General Conditions:

   This bid item is limited to 10% of the total Contract amount. 75% of this bid item will be allocated for mobilization (first progress payment) and 25% of this bid item will be allocated for demobilization (final progress payment).

   This item includes all mobilization and construction staging work to be performed by the Contractor. Furnish all labor, materials, and equipment necessary to complete this work item, in accordance with the Contract Documents. Work shall include but is not limited to, utility verification, project identification, and temporary signs and establishment of staging areas as necessary for the project work.

   Demobilization includes all demobilization necessary for all components of the project, including but not limited to removal of all equipment, utilities, and facilities, and acceptance of all record and warranty documents.

   Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

2. **Bid Item 2**: Sound Walls:

   This item includes all costs for labor, equipment, and materials for furnishing and installing temporary sound walls surrounding the project site to meet noise conditions as specified.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

3. **Bid Item 3**: 48-Inch Diameter Borehole Drilling:

   This item includes all costs for labor, materials, and equipment for drilling the 48-Inch diameter borehole for the installation of the conductor casing as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of

all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

4. **Bid Item 4**: 36-Inch OD x 3/8-Inch Wall ASTM A-53 Grade B Steel Conductor Casing:

   This item includes all costs for labor, materials, and equipment for furnishing and installing the 36-inch conductor casing and 10.3 sack sand/cement grout sanitary seal as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

5. **Bid Item 5:** 30-Inch Diameter Borehole Drilling:

   This item includes all costs for labor, materials, and equipment for logging and drilling the 30-Inch diameter borehole for the installation of the well production casing as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

6. **Bid Item 6**: 16-Inch ID x 5/16-Inch Wall ASTM A-778 Type 304 Stainless Steel Blank Casing:

   This item includes all costs for labor, materials, and equipment for furnishing and installing the 16-inch well production blank casings, collars, centralizers, end caps and other appurtenances as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

7. **Bid Item 7**: 16-Inch ID x 5/16-Inch Wall ASTM A-778 Type 304 Stainless Steel 0.070-Inch Slot Size Louvered Well Screen:

   This item includes all costs for labor, materials, and equipment for furnishing and installing the 16-inch well production louvered well screen as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

8. **Bid Item 8**: Gravel Fill Tube and Sounding Tube:

   This item includes all costs for labor, materials, and equipment for furnishing and installing the 3-inch gravel fill tube and the 2-inch sounding tube as indicated in the Drawings and Specifications.

Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

9. **Bid Item 9**: Gravel Envelope and Seal:

   This item includes all costs for labor, materials, and equipment for furnishing and installing the 6x12 gradation gravel envelope and the 10.3 sack sand/cement grout annular seal and surface seal as indicated in the Drawings and Specifications.

   Payment for this Bid Item shall be by lineal foot which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the lineal foot completed for this Bid Item.

10. **Bid Item 10**: Well Development:

    This item includes all costs for labor, materials, and equipment for cleaning, surging, swabbing and developing the well as indicated in the Drawings and Specifications. This bid item shall include all costs for labor, materials, and equipment to adhere to all State Water Resources Control Board and Santa Clara Valley Water District permit requirements during well development. See bid item 17 for acquiring State Water Resources Control Board and Santa Clara Valley Water District permits.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

11. **Bid Item 11**: Install/Remove Test Pump:

    This item includes all costs for labor, equipment, and materials for installation and removal of the test pump for testing the well as indicated in the Specifications.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

12. **Bid Item 12**: Well and Aquifer Testing:

    This item includes all costs for labor, materials, and equipment for testing the well and aquifer using the test pump as indicated in the Specifications. Work shall be considered part of this bid item for Contractor's operation of the test pump during which the test pump is energized, and data is being recorded for testing. This bid item shall include all costs for labor, materials, and equipment to adhere to all State Water Resources Control Board and Santa Clara Valley Water District permit requirements during pumping test(s).

    Payment for this Bid Item shall be by standard hour which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the hours elapsed for the work of this Bid Item.

13. **Bid Item 13**: Plumbness and Alignment Testing:

    This item includes all costs for labor, materials, and equipment for completing the testing of the plumbness and alignment of the well as indicated in the Specifications.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

14. **Bid Item 14**: Television Inspection:

    This item includes all costs for labor, materials, and equipment for completing the television inspection of the well as indicated in the Specifications.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

15. **Bid Item 15**: Well Disinfection:

    This item includes all costs for labor, materials, and equipment for completing the disinfection and dechlorination of the well as indicated in the Specifications.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

16. **Bid Item 16**: Drilling Fluid and Cuttings Disposal:

    This item includes all costs for labor, materials, and equipment for disposal of all drilling fluid, cuttings and tailings produced during construction of the well, as indicated in the Specifications and in accordance to the local and state regulations.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

17. **Bid Item 17**: Santa Clara Valley Water District and State Water Resources Control Board Permitting:

    This item includes all costs for labor, materials, and equipment for the Contractor to obtain a Well Construction Permit through the Santa Clara Valley Water District, and to obtain applicable permit(s) from the State Water Resources Control Board for discharges of any water from the well for development or testing, as indicated in the Specifications.

    Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

18. **Bid Item 18**: Site Clean-up and Records:

This item includes all costs for labor, materials, and equipment for the Contractor to remove all excess materials and dispose of all remaining debris resulting from the work, as indicated in the Specifications.

Payment for this Bid Item shall be by lump sum which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the total value of the work for this Bid Item.

19. **Bid Item 19**: Standby Time:

    This item includes all costs for labor, materials, and equipment for the Contractor to remain in readiness to begin or resume drilling operations during the time when the Contractor is ordered to be on Standby by the Owner. The standby time, ordered in writing, will be measured to the nearest one-quarter unit as the number of actual hours of idle time of drilling equipment and workforce ordered and approved by the Owner.

    Payment for this Bid Item shall be by standard hour which price named on the Bid Schedule under this Bid Item shall constitute full compensation for completion of all such Work as required per the Contract Documents. Payment will be made for the work completed in proportion to the hours elapsed for the work of this Bid Item.

20. **Bid Item 20**: Supplemental:

    Supplemental work shall include any new or unforeseen work not specified/included in the plans and specifications. The lump sum dollar amount listed in the bid schedule will be included in each bidder's proposal. Supplemental work shall be performed only upon direct written authorization from the Project Engineer. An agreed price may be used as an alternate method of payment, if directed by the Project Engineer.

****END OF SECTION****

Technical Specifications

City of Morgan Hill

Eagle View Well #1 Improvements Project
Phase I - Well Development
Project No.: WA6001

Technical Specifications

May 2025

Prepared for
City of Morgan Hill

Date: May 9, 2025

Prepared Under the Responsible Charge of
Jigar D. Shah, P.E.
Lic. No. C66080, Expires 06-30-26

Prepared By:
HydroScience Engineers, Inc.
10569 Old Placerville Road
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HydroScience

SECTION 02672
WATER PRODUCTION WELL

PART 1 - GENERAL

1.01 Summary

A. The work to be done includes the furnishing of all labor, material, transportation, tools, supplies, plant, equipment and appurtenances, and the performance of all work required for completing in a good workmanlike manner the drilling and testing of one water production well in conformity with all applicable State, Santa Clara Valley Water District (Valley Water), and AWWA/ASCE standards. All equipment and related material shall be adequate to drill the specified well as deep as three-hundred and seventy (370) feet and install the specified well casing and screens.

B. The well shall be located on the site as shown in the plans prepared by Hydroscience Engineers, Inc. and as directed by the Engineer or its duly appointed representative. The Contractor shall check and confirm the well location with the Owner, or its appointed representative, at least forty-eight (48) hours prior to setting up the drilling equipment and starting drilling operations.

1.02 References

A. City of Morgan Hill Code of Ordinances (Ord.)

1. Noise Ordinance: Title 8 Health and Safety, §8.28.040.

B. American Petroleum Institute (API)

1. API Standard 13-A: Drilling Fluid Materials

C. American Society for Testing and Materials (ASTM)

1. ASTM A-778: Standard Specification for Welded Austenitic Stainless Steel Tubing
2. ASTM A-53: Standard Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated, Welded and Seamless

D. American Water Works Association (AWWA)

1. AWWA A100: Standards for Water Wells

1.03 Description

A. The project consists of the drilling and testing of one gravel envelope water well in accordance with the specifications herein set forth.

B. The work shall include furnishing and setting up of all equipment and mud pit as necessary, the drilling of an uncased bore, running of an electronic log and caliper log of the uncased hole, completion of uncased bore into finished bore, setting and supporting of unperforated casing and well screen, placing of gravel pack to level as directed, setting and supporting a gravel tube, setting and supporting a sounding tube, tremie placement of surface seal, setting of gravel pack, performance of plumbness and alignment tests, developing and testing of well, disinfection of completed well, TV scan of completed well, and installation of a temporary pump with minimum capacity to 1,200 gpm, and clean-up and restoration of site to its original condition, all in conformance with accepted good practices and with these specifications. All setting depths, drilled depths, bore diameters, hole diameters, and pipe diameters are per the plans.

C. The Contractor shall use bucket auger and reverse rotary drilling methods as specified herein. Bits for drilling and reaming as applicable shall be of a form and size to prevent eccentricity during rotation and to assure a plumb and straight bore hole to permit free installation and removal, without binding, of a test pump and capable of delivering 1,200 gpm (vertical turbine or submersible pump with approximately 12” bowl OD maximum and 8” column pipe).

D. Contractor's Work shall include all incidental work and subsidiary obligations necessary or required for the completion of the work, including but not limited to securing of permits, filing of drilling reports, provision of adequate mud pit, conveyance of water to site as necessary, coordination with Owner's representatives on allowable discharge location(s) for disposal of water, coordination with Owner's representatives on disposal of tailings, taking of water samples, all safety and protective measures, and other work required for the drilling, testing, and developing of a completed well as herein specified. Conveyance of water and tailings to disposal locations is the responsibility of the Contractor.

1. The Contractor shall obtain a Valley Water well construction permit.

2. The Contractor shall apply for and obtain enrollment under the statewide general order for Waste Discharge Requirements from the State Water Resources Control Board Water Quality Order No. 2003-0003-DWQ.

E. Deviation from the specifications will not be permitted unless prior authorization in writing is obtained from the Engineer or Owner's representative for the project.

1.04 Submittals

A. The Contractor shall submit to the Engineer for approval copies of the following data or material prior to purchase and use on the project: Electronic submission is acceptable.

1. Product data for the following:

1) Conductor casing,

2) Well screen,

3) Well casing,

4) Noise suppression products,

5) Disinfectants,

6) Dechlorination chemicals,

7) Drilling fluid(s),

8) Well drilling equipment,

9) Test pump equipment,

10) Sealing material,

11) Any hazardous materials, and

12) Gravel envelope

2. Contractor shall submit all required permits, geophysical and E-logs, formation samples, plumbness and alignment test results, well and aquifer test results, water quality analysis results, well completion report and any other information requested by the Owner or Engineer.

3. Samples of at least one (1) quart size and a sieve analysis of the same material proposed to be furnished for gravel packing wells;

4. The name of the firm proposed to perform the geophysical logging (electric log), and a sample of the log data proposed to be furnished; and

5. The name of the laboratory proposed to perform water quality analysis services.

B. Notification to Owner's Representative: The Contractor shall be responsible for giving at least forty-eight (48) hours advance written notice to the Owner's representative prior to performance of specified operations as follows for the well:

1. Intending to start drilling operations at the well site;
2. Scheduling an anticipated date of the geophysical logging;
3. Scheduling the final reaming of the well bore, setting of casing, and placement of gravel pack and surface seal;
4. Scheduling development and testing of completed well;
5. Scheduling the plumbness and alignment test; and
6. Scheduling of the TV scan.

C. These minimum advance notification requirements are based on a normal sequencing and scheduling of work without unusual delays or interruptions. If delays or interruptions should occur, the Owner's representative shall be given as much advance notice as possible on the restart of work of the project.

1.05 Scheduling

A. The Contractor shall be responsible for scheduling work so that immediate and continuous installation of casing, gravel pack, and grout seal after final reaming and all other work of the project can proceed as specified. Such schedules shall be furnished to the Owner before each critical phase of the work.

1.06 Basic Depth and Capacity Data

A. The intention of these specifications is to provide one well capable of a minimum continuous yield of at least 800 gpm. The well depth and surface seal depth are shown on the plans.

B. Depending on data obtained from the drilling operations, the Engineer reserves the right to vary the extent or scope of work to be done, including terminating work if suitable strata are not encountered.

C. No changes in the specified depth of well, depth of surface seal, length of well screens, developing time, or other basic factors covered by the base bid will be approved except as authorized or directed by the Engineer in writing.

1.07 Special Requirements

A. Contractor shall construct a mud pit for temporary staging or storage of cuttings and return fluid from drilling operations and manage its capacity. Contractor shall supply a portable circulation pit or tank(s) in lieu of an excavated pit if there is inadequate space for a mud pit. Mud pits or circulation tanks shall be of size, capacity, and shape to remove cuttings from drilling operations and return fluid suitable for reverse rotary drilling. Mud pit shall be located in an area by the Contractor and approved by the Owner's Representative to avoid the footprint area of the future well building shown on the Drawings. Cuttings shall be removed from the mud pit or circulation tanks as necessary to maintain proper drilling fluid characteristics. After completion of the project, the mud pit shall be filled with materials removed in constructing the mud pit and compacted to 90% of the maximum density. Whenever workmen or a watchman is not present, a temporary cyclone fence to limit entry by animals or people shall enclose the site and mud pit. The fence shall be at least 6-foot tall with a lockable entry.

B. Contractor shall provide temporary sound walls or curtains suppress noise during operations and night hours. sound walls and/or sound curtains shall enclose the site and shall have a minimum height of 16 feet. The approximate location and quantities of the sound walls are depicted on the Drawings.

C. Unless allowed by the Owner, noise levels due to construction activity shall not exceed unreasonable levels as determined by the Owner per local ordinance (Ord. Title 8, §8.28.040).

D. Unless otherwise approved by the Owner, construction activities are prohibited other than between the hours of seven (7) a.m. and eight (8) p.m. Monday through Friday and between the hours of nine (9) a.m. and six (6) p.m. on Saturday. Construction activities are prohibited on Sundays or federal holidays.

E. Refer to the Geotechnical Report included as an attachment to the Contract Documents for existing soils, subsurface conditions and construction considerations.

F. Hazardous Materials

1. The Contractor shall comply with all laws, rules, and regulations concerning use, handling, and disposal of hazardous wastes.

2. The Contractor shall not deliver any hazardous materials to the job site without submitting Material Safety Data Sheets and receiving prior approval from the Owner and Engineer.

3. Hazardous materials produced or generated due to the project construction shall not be disposed of via sewer, storm drain, or trash container or dumpster(s).

4. The Contractor shall be considered the hazardous waste generator and will be responsible for legal transport and disposal of all hazardous wastes resulting from the project.

5. Violation of any hazardous materials transport and disposal requirements shall be sufficient cause for the Owner or Engineer to stop all work. In addition to the Contractor's costs for stoppage, any costs incurred by the Owner and Engineer caused by the work stoppage shall be borne by the Contractor, including any costs to return the job site and other effected areas to hazard-free conditions.

6. The Contractor shall be solely responsible for all costs, including fines and penalties, for the investigation and cleanup of any hazardous materials the Contractor transported, generated, handled, failed to dispose of legally, and any damage to property and/or injury to any person.

PART 2 - MATERIALS (NOT USED)

2.01 Conductor Casing

A. The conductor casing shall consist of ASTM A-53 Grade B Steel with quantities and dimensions shown on the Drawings.

B. Collars shall be of the same thickness and physical and chemical properties as the casing, 5 inches minimum in width, shall be rolled to fit the outside diameter of joining sections, and shall be circumferentially welded to the casing section.

C. All casing welds shall be ground flush to uniform surfaces. Inside edges of collars shall have all sharp edges, burrs, and welds removed.

D. All casing segments shall terminate with flat ends perpendicular to the casing axis and shall not vary more than 0.010 inches at any point from a true plane perpendicular to the casing.

E. The casing shall be round and not deviate more than one percent ellipticity from the specified inside and/or outside diameter(s) on the Drawings.

2.02 Cement Grout

A. Cement grout mixture shall be composed of not more than two (2) parts by weight of sand to one part of Portland Cement to about seven (7) gallons of clean water (10.3 sack mix).

B. The cement shall be Type I or II and shall conform to the California Department of Water Resources Well Standards, Bulletin 74-81, Supplement 74-90 and any local ordinances from the Valley Water for sanitary seal requirements.

2.03 Well Casing

A. The well casing shall consist of ASTM A-778 Type 304 austenitic stainless steel with quantities and dimensions shown on the Drawings.

B. Ends of casing sections shall be furnished with collars for field assembly. Collars shall be of the same thickness and physical and chemical properties as the casing, 5 inches minimum in width, shall be rolled to fit the outside diameter of joining sections, and shall be circumferentially welded to the casing section. Collars shall be furnished with three alignment holes to ensure proper alignment and overlap with the casing sections.

C. All casing welds shall be ground flush to uniform surfaces. Inside edges of collars shall have all sharp edges, burrs, and welds removed.

D. All casing segments shall terminate with flat ends perpendicular to the casing axis and shall not vary more than 0.010 inches at any point from a true plane perpendicular to the casing.

E. The casing shall be round and not deviate more than one percent ellipticity from the specified inside and/or outside diameter(s) on the Drawings.

2.04 Well Screen

A. The well screen shall be louvered 0.070-inch slot size and consist of ASTM A-778 Type 304 austenitic stainless steel with quantities and dimensions shown on the Drawings. Products shall be Roscoe Moss Ful Flo, Super Flo type louvered or shutter screens or equal.

B. Ends of casing sections shall be furnished with collars for field assembly. Collars shall be of the same thickness and physical and chemical properties as the casing, 5 inches minimum in width, shall be rolled to fit the outside diameter of joining sections, and shall be circumferentially welded to the casing section.

C. All casing welds shall be ground flush to uniform surfaces. Inside edges of collars shall have all sharp edges, burs, and welds removed.

D. All casing segments shall terminate with flat ends perpendicular to the casing axis and shall not vary more than 0.010 inches at any point from a true plane perpendicular to the casing.

E. The casing shall be round and not deviate more than one percent ellipticity from the specified inside and/or outside diameter(s) on the Drawings.

2.05 Centralizers

A. Centralizers shall be of the same material as the adjoining conductor casing, well casing, or screen section(s).

B. Centralizers shall be 2 inches in width, 30 inches in length, and shall be angled perpendicular to the casing

C. Each centralizer location shall contain a minimum of four (4) centralizers equally spaced circumferentially around the casing(s).

D. Each centralizer shall provide at least 2-feet length of bearing surface on the bore interface.

2.06 Bottom Cap

A. The bottom end piece of the well casing shall be secured by an SE-type head of the same material and thickness as the blank casing.

2.07 Top Caps

A. The caps of the stub up pipes for the well casing, gravel pipe, and sounding tube shall be furnished with lockable covers of the same or similar product materials to prevent tampering and entrance of foreign objects from vandalism.

2.08 Gravel Pipe

A. The gravel pipe shall be Schedule 40 ASTM A-53, Black Steel Pipe with quantities and dimensions shown on the Drawings.

B. The gravel fill pipe shall be furnished in 20-foot sections and butt welded in the field.

2.09 Sounding Tube

A. The sounding tube shall be Schedule 40 ASTM A-778 Type 304 austenitic stainless steel, with quantities and dimensions shown on the Drawings.

B. The sounding tube shall be furnished in 20-foot sections and butt welded in the field.

2.10 Gravel Envelope

A. shall use 6 x 12 clean and washed well-rounded sand as manufactured by Cemex or approved equal.

B. The Owner reserves the right to modify the pack grading for the well, based on sieve analysis data obtained in drilling the well. The gravel envelope shall contain no more than 5% carbonates and shall be kept free of any contaminants and foreign matter.

2.11 Disinfectant

A. Pellet hypochlorite disinfectant shall be added to the gravel at the rate of 1/2 pound per cubic yard of pack material, based on 70% chlorine content. If a lesser strength hypochlorite, or other chlorine product is used, the quantity shall be adjusted accordingly.

B. Liquid sodium hypochlorite shall be used for disinfecting the completed well. The disinfectant shall be of such volume and strength and shall be so applied that a concentration of at least fifty (50) ppm of chlorine shall be obtained in all parts of the well water, however, not less than twenty (20) pounds of 70% HTH, or its equivalent, shall be used. Liquid sodium hypochlorite shall not be stored for more than 60 days after its manufactured date prior to its use.

C. Disinfectants shall not be exposed to atmosphere or direct sunlight during storage.

D. Dechlorination chemicals shall be calcium thiosulfate based in such quantities to neutralize the chlorine to below 0.01 mg/L residual.

2.12 Sand Tester

A. A Rossum Sand Tester shall be used to measure sand content of pumped water. Sand testers shall meet the AWWA A 100 Appendix E for measuring sand content.

PART 3 - EXECUTION

3.01 Construction Inspection

A. The Contractor shall notify the Engineer, Owner, and appropriate regulatory agencies in advance of the start and completion of the well. It shall be the Contractor's responsibility to obtain and conform to the appropriate well drilling and discharge permits.

B. The Contractor shall be responsible to provide safe and proper access for Owner or regulatory agency inspections at all times throughout construction.

C. The Contractor shall be responsible for contacting and notifying the Engineer and/or Owner at least 24 hours in advance of required inspections at various stages of construction. The Contractor shall perform no work until such inspection(s) have been made by the Engineer or Owner.

D. The following list of required inspections shall be coordinated by the Contractor and completed and must receive approval by the Owner and/or Engineer.

Inspections	Items for Inspection
1. Mobilization	Drilling Equipment, site layout, stormwater prevention measures, sound walls and noise mitigation measures, sanitary facilities
2. Construction Materials	Drilling fluid additives, casing and screen sections, gravel Gravel pipe, sounding pipe, centralizers, end caps, cement for seal
3. Drilling	Drilling fluid properties, geophysical and caliper logs, formation samples, mud pit or circulation tanks
4. Construction	Conductor casing installation, blank casing and screen Installation, gravel pipe installation, sounding tube installation, gravel envelope installation, seal placement
5. Plumbness and Alignment	Equipment, testing
6. Well Development	Swabbing tool, pump equipment, discharge assembly, baker tanks, discharge location
7. Well Testing	Sand test, well and aquifer tests, discharge locations
8. Disinfection	Disinfectant, dechlorination chemicals, chlorine analyzer
9. Final	Casing and pipe stub ends, lockable caps, site clean up

3.02 Test Well Construction and Logging

A. A Driller's log of the bore, which carefully and accurately logs the materials encountered, shall be made for each well as the drilling proceeds. The logs show all changes in strata and other pertinent information, which might develop in the drilling of the boreholes. Two (2) one pint or larger samples of all strata changes shall be taken by the Contractor and placed in suitable containers and turned over to the Engineer. Strata samples shall be taken from the mud circulation discharge in a two (2) gallon or larger bucket, decanting the overlying water using care not to remove sand or silts, then taking representative strata samples from the decanted materials. One of the strata samples from each water bearing aquifer five (5) feet or more in thickness shall be dried and sieved by the Contractor for grain size distribution with selected sieves so that no more than 30% of the formation will be held on one sieve. The sieve analysis results shall be plotted and submitted to the Engineer. Formation samples not used for sieve analyses, as specified above, shall be turned over to the Owner's Representative. The viscosity of the drilling fluid shall be measured and recorded throughout the drilling operation.

3.03 Well Drilling Fluids

A. The Contractor shall submit a drilling fluid control program to the Engineer for approval prior to drilling operations. The Contractor shall not deviate from the approved fluid control program without approval from the Owner or Engineer.

B. The Contractor shall be responsible for drilling fluid and additive selection, maintaining drilling fluid quality and protection of water bearing and potential water bearing formations in boreholes, and the ability to obtain representative samples of formations and aquifer materials encountered during the drilling process. The Contractor shall use fresh, potable water from the Owner’s approved source to prepare the drilling fluid.

C. The Contractor shall submit to the Engineer for approval a list of all additives and fluids anticipated to be used during the drilling operations. Drilling fluid additives shall meet or exceed API Standard

13-A. All drilling fluid additives must comply with recognized industry standards and practices, and must be applied and used in accordance with manufacturer instructions. Toxic or dangerous substances shall not be added to the drilling fluid. Disallowance of any materials by the Owner prior to or during construction will not relieve the Contractor of the responsibility to complete the drilling process or construction of the well as defined in the Contract Documents.

3.04 Production Well Construction

A. Contractor shall install the well casings in accordance with the design in the plans.

B. Depth of the completed well shall be as directed by the Engineer. Upon completion of the initial borehole, the Contractor's lithology log and geophysical logging shall be provided to the Engineer. The Engineer will determine final depth, and the number and width of screened sections. Upon determination of the final depth, and the number and width of screened sections, the well bore shall be reamed to the full depth as selected by the Engineer using a reamer with the same diameter as the borehole. This final reaming is required regardless of the size of the initial bore.

C. The Contractor shall perform a caliper log immediately after reaming the bore to the full diameter. The log shall show the true diameter of the borehole plotted as a function of the depth of the borehole. After final reaming of the bore as specified above, work shall proceed continuously and without interruption until the casing has been set, the gravel pack fully installed, and the surface seal placed, all as hereinafter specified.

D. The well bore shall always be maintained full of the drilling fluid until the casing, gravel pack, and surface seal are set and placed. Minor receding of drilling fluid during non-work hours is acceptable provided it does not compromise the integrity of the well bore. Contractor shall be responsible for maintaining a free, uncollapsed borehole until the casing and screen are fully installed, the gravel pack placed, and the surface seal with graveling pipe completely placed. All drilling fluids and additives shall be NSF approved for potable water use and shall be accompanied with MSDS sheets.

E. After the final boring or reaming to the specified diameter and the Engineer's approval of the screen/casing placement, the Contractor shall proceed to set the well casing. The Contractor shall schedule his work so that the casing and gravel pack materials are on the site and are placed with the minimum possible delay after reaming the well bore to final size. The Contractor shall be responsible for ensuring that the well bore meet the minimum size per the plans so that a full and complete gravel envelope is achieved. Failure of the bore to take at least 80 percent of the calculated volume of gravel with allowance for normal losses and compaction shall be cause for rejection of the well by the Owner.

F. The well shall be cased to the depth as directed using a casing with diameter per the plans. The contractor shall submit product data for the well casing.

G. Centralizers shall be provided for the well to center the well casing in the borehole. Starting five (5) feet from the bottom, centralizers shall be placed at the bottom and top of each section of well screen and at intervals of not greater than forty (40) feet up to the ground level. At least four (4) centralizing strips, or one (1) centralizing unit, shall be placed at each location for centering the casing or screen to provide minimum interference with the sounding line and graveling.

H. The well screen and unperforated casings shall be furnished in 20 foot lengths to permit placing of well screen at selected water bearing strata, and the Contractor is hereby notified that odd lengths of unperforated casing may be involved in setting the well screen at the selected locations and in providing an unperforated bottom section (length per plan).

I. Louvered well screen:

1. The Contractor shall use a total of ninety (90) linear feet of louvered well screen and preliminary screen slot size of 0.070-inch for the well. Based on the conditions encountered in drilling the production well, the Owner shall select actual total length of the screen, and

the Contractor shall be compensated for changes from the base bid. Changes in screen slot size and use of various lengths of screen shall not be basis for change of proposal bid prices, provided screen and blank sections are 20 feet long.

2. The intent is that louvered screen and blank casing sections may be of mixed order in the well and of intermixed lengths to take maximum advantage of water bearing strata encountered in the well, and to minimize the chances of sanding or water quality problems. All pipes are mechanical and 20 feet long.

3. If field conditions of bore hole lithology differ from those indicated on the plans, the Contractor shall submit recommended screen opening size to be used and the gravel pack to be used for Engineer's approval after completion of the production well bore hole, but prior to casing installation. Engineer will confirm Contractor's recommended lengths and order of the unperforated casing and well screen for the well within seventy-two (72) hours of Contractor's submitted recommendation.

4. To minimize the chances of errors, the order in which the casing and well screen lengths are to enter the bore hole shall be marked clearly on the inside of the collared ends of the casing and screen lengths with a lead-free, non-toxic crayon or similar marker before any casing is placed in the well.

J. A gravel pipe and sounding tube shall be installed for adding gravel through the surface seal and for monitoring downhole water level as hereinafter specified. Refer to the Drawings and Part 2 of this specification for details and materials.

K. Support of well casing, screen, sounding tube, and gravel pipe: The Contractor shall be responsible for supporting and anchoring the well casing and graveling pipe in the well in such a way as to hold it in place until the surface seal as hereinafter specified has been placed and set for at least twenty-four (24) hours. Welding the gravel pipe to any supports in contact with the well casing or directly to the well casing shall not be allowed.

L. Graveling: After the well casing has been installed in place as specified and the drilling fluid adjusted to the proper consistency, the gravel pack with disinfectant shall be placed in the well using procedures to minimize segregation and bridging of the gravel, all as herein specified.

1. The annular space between the well casing and the bore of the well shall be filled to the level of the bottom of the intermediate seal with a clean, graded gravel pack as herein specified. Care shall be taken not to include extraneous soil or other foreign material in the gravel pack in the graveling operation. Contractor shall use a tremie pipe to install the gravel pack.

2. The Owner reserves the right to modify the pack grading for the well, based on sieve analysis data obtained in drilling the well. In no case shall gravel envelope contain no more than 5% carbonates. Contractor shall provide sample for Engineer's approval after receiving notice-to-proceed.

3. A sample of the gravel pack material proposed to be used, and the current sieve analysis of the material shall be submitted to the Owner's representative for approval, and approval obtained in writing before any pack material is delivered to the well site. As the pack is installed in the well, pellet hypochlorite disinfectant shall be added to the gravel at the rate of 1/2 pound per cubic yard of pack material, based on 70% chlorine content. If a lesser strength hypochlorite, or other chlorine product is used, the quantity shall be adjusted accordingly. The pack shall be placed from bottom to the top with suitable precautions to avoid the possibility of the pack bridging or clogging at any point. A sounding line shall be used continuously during the placement of the gravel pack to monitor the gravel layer and detect bridging of the pack. The packing of the well shall be properly coordinated with the surging and cleaning of the well.

4. Care shall be taken not to extend the gravel pack above the level selected for the bottom of the seal for the well. To ensure this end, the Contractor shall carefully monitor the pack level as the critical level is approached in the well and shall stop graveling at a slightly lower level and then carefully add gravel to achieve the correct level. The Contractor at their expense must remove any gravel placed above the selected level before proceeding to place the surface seal.

3.05 Surface Seal

A. A plumbness and alignment test, in accordance with Section 3.09, shall be performed prior to setting the surface seal.

B. A surface seal shall be provided between the casing and the well bore from the depth as directed by the Engineer to the ground level. For purposes of the Base Bid, the Contractor shall use a surface seal depth per the plans.

C. The sealant mixture for the well shall be placed in one continuous operation from the bottom to the top using a tremie pipe to form a continuous seal. The Contractor shall be responsible for providing for adequate grout to give a complete seal to the ground surface. The Contractor shall furnish grout pumps and all other equipment and material for effectively installing a continuous seal. The end of the tremie pipe shall be kept below the top level of the grout in the annulus as it is placed to avoid diluting and weakening the seal.

D. Neat cement or cement grout shall be entirely placed before the occurrence of an initial set. To meet this requirement, any batch of the sealant shall be fully placed in not more than 1-1/2 hours from the time of adding cement and water to mix. Sealant material not placed within this time shall be subject to rejection for use in sealing the well. Contractor shall be responsible for scheduling the batching or ordering and preparation of sealant to meet this requirement. Unless specifically approved by the Engineer based on the field conditions, no addition of water to mix will be allowed. Water addition, if authorized, shall be clean potable water.

E. The upper portion of the conductor casing shall be removed immediately prior to setting the last twenty (20) feet of the surface seal.

F. After the surface seal is placed, bailing or other operations which might damage the seal are prohibited for a minimum period of twenty-four (24) hours, or longer as required by local regulation

3.06 Cleaning and Surging

A. After the specified time has elapsed upon placing the surface seal for the well, the Contractor shall surge and airlift the well to set the gravel pack and remove the drilling fluid from the water bearing strata until the well is mostly free of drillers mud. If storage volume for development water is no longer available, Contractor shall coordinate alternate disposal of development water with Owner's representatives and then after that is made available shall continue cleaning the well until the well is mostly free of drillers mud.

B. A close-fitting swab or suitable bailer may be used to surge the well during and/or following the packing operation to pack the gravel pack and remove fines from the strata. Surging shall be in conformance with the following specifications:

1. The outside diameter of the bailer shall not be more than one-quarter (1/4) inch smaller than the inside diameter of the well casing. The Contractor may exercise their judgment on whether to start bailing to set the gravel as it is placed or to wait until the gravel pack is at a level above the top of the highest perforations in the well. The Contractor shall be responsible for operating the bailer to fully consolidate and seat the entire gravel pack. Care shall be taken not to cave the walls of the well bore or disturb the gradation of the gravel pack during the graveling and/or bailing operations. Drilling fluid shall be maintained to the

full depth of the well throughout the graveling and bailing operation. Drilling fluid properties shall be monitored and recorded.

2. After the gravel pack is installed and the pack has been set by bailing, the surface seal as hereinafter specified shall be tremied in place. Bailing to set the gravel shall not be continued after start of placing the surface seal to prevent damage to the seal.

C. In lieu of the above, Contractor may submit for Engineer review and approval an alternative mechanical method for cleaning and surging well.

3.07 Well Development

A. After notice-to-proceed, Contractor shall submit for Engineer's review the plan for surging and pumping the well at a rate of up to one thousand two hundred (1,200) gallons per minute.

B. Upon completion of surging and cleaning of the well, the Contractor shall install a temporary submersible pump with top of bowls set at a depth of up to two hundred and fifty (250) feet below the surface of the ground for developing at various flow rates up to one thousand two hundred (1,200) gallons per minute from said depth.

C. An airline of up to two hundred and fifty (250) feet in length with suitable gauge and air pump or other water level device shall be provided for measuring the water level in the well. Contractor may substitute alternate, acceptable level measurement device.

D. A sand content tester shall be installed in the discharge line from the test pump during the development of the well. Measurements shall be taken at frequent intervals to determine the changes in sand production as the well is developed and at the various rates of flow. Location of the sand content tester in the pump discharge line shall be as directed by the Engineer. Measurements shall be performed in accordance with the Manufacturer's recommendations.

E. Prior to starting the surging and airlift operation to set the gravel pack, the graveling pipe shall be filled with gravel as specified for the well gravel pack. Gravel shall be maintained at all times to within thirty (30) feet of the bottom of the tremie pipe during the surging and airlift operation. Care shall be taken not to include soil or other foreign material in the gravel pack material. The surge assembly shall be lowered into the well to the bottom of the lowest perforations and the strata cleaned and the gravel set by surging and airlifting the well. The approved surge and cleaning method shall induce vigorous motion while airlifting the developed water at any given zone undergoing development.

F. The surging and pumping operation shall be carried out opposite the total perforated lengths of casing by progressively raising the surge assembly. Surging and airlifting for a period of fifteen (15) hours, equivalent to 10 minutes per linear foot of well screen, shall be included in the base bid lump sum price for the well. The fifteen (15) hours is the net pumping time and excludes the time required to position the assembly.

G. The water discharged from the well shall be disposed of by the Contractor as directed by the Owner's representatives.

H. At the completion of the surging of the well, the well shall be sounded and if the sounded depth is less than the total depth of the well, the well shall be bailed to the bottom to remove mud, sand, and/or other material which has entered and settled in the well casing.

3.08 Well and Aquifer Testing

A. Testing of the well shall commence immediately after completion of development pumping.

B. The rate of recovery of the well water level shall be measured after shutting down from the maximum developing rate. The recovery test shall continue to be recorded in the same measurement intervals specified for pumping tests at least until the difference between the static water level and the recovered water level is within 10% of the difference between the static water level and the

maximum measured drawdown, not to exceed a period of twelve (12) hours. This recovery logging time shall be considered independent of the time allotted for development.

C. Sand production shall be monitored and recorded throughout the test pumping period at the time intervals specified herein. At no point shall the average sand content for any 5-minute period exceeds 5 parts per million. If the average sand content exceeds 5 parts per million for ay 5-minute period during well and aquifer testing, the Contractor at the Contractor's sole expense shall perform development work until the sand content is 5 parts per million or less over a 30-minute period after pump start up.

D. The Contractor shall measure and record static water level prior to each pumping test. Three consecutive measurements of ten minutes apart shall be provided each time.

E. The Contractor shall measure and record depth to water at the time intervals specified herein to the nearest 0.01 feet.

F. The Contractor shall measure discharge flow rates at the time intervals specified herein and shall maintain flow rates within 5 percent of the specified rates by means of actuating the discharge valve and throttling engine speed. Prior to the start of the first test, the pump shall be adjusted to each of the prescribed pumping rates to determine the appropriate engine speeds (rpm) and discharge valve positions to facilitate rapid adjustment of the pump at the commencement of testing. The Contractor shall furnish all measuring devices and incidentals necessary for the pump test. The water developed shall be measured by an orifice plate in the discharge line, or Pitot tube survey, or other approved means. Contractor will be required to substantiate accuracy of propeller, electronic, or other type meters used by an on-site Pitot tube check or other approved means.

G. The Contractor shall furnish all power needed, or connect to the Owner-provided power, to operate the pump at the above required capacity for the well and shall surge and develop the well. The Contractor shall include in the base bid thirty (30) hours for testing of the well (eight (8) hours step-drawdown test, ten (10) hours constant-rate test , and twelve (12) hours recovery test). However, the Owner reserves the right to terminate the development at any time or to extend the development based on the field conditions encountered. The well shall be attended at all times during development and shall be surged whenever the water clears.

H. Water from testing the well shall be disposed of by the Contractor on-site as directed by Owner's representatives.

I. After the development of the well, the amount pumped shall be so varied as to determine the draw-down curve for the well. The draw-down tests shall be made by backing down from the peak pumping rate. During the draw-down tests, water level measurements to the nearest 0.01 ft shall be measured at pumping rates of six hundred (600), eight hundred (800), one thousand (1,000), and one thousand two hundred (1,200) gallons per minute. A sufficient number of tests, but not less than four (4) 2-hour tests at each flow rate, shall be made for the well to accurately determine the draw-down curve over a range from six hundred (600) to one thousand two hundred (1,200) gallons per minute as directed by the Owner.

J. The following measurement intervals shall apply to flow rates, sand content, and water level measurements for all step drawdown, constant rate, and recovery tests:

1. Turn the pump on to approved test pumping capacity at time (t) = 0 minutes.
2. From Time t = 1 to t = 10 minutes: each 1 minute;
3. From Time t = 10 to t = 20 minutes: each 2 minutes;
4. From Time t = 20 to 50 minutes: each 5 minutes;
5. From Time t = 50 to 100 minutes: each 10 minutes;
6. From Time t = 100 to 300 minutes: at t = 120, t = 150, t = 180, t = 240, and t = 300;

7. From Time t = 300 onwards: each 100 minutes.

K. Data for the draw-down curve for the well shall be furnished to the Owner by the Contractor.

L. The Contractor shall perform a ten (10) hour run at a constant discharge rate at the design discharge of 800 gallons per minute.

M. After completion of developing and testing of the well, the Contractor shall sound the well to determine if the well has partially sanded during developing and any material in the well shall be removed by bailing, or other approved means. Contractor shall perform this work at no additional cost to the Owner.

N. The Contractor shall draw water quality samples in accordance with the procedures recommended by the Contractor's laboratory. The Contractor shall furnish the sample bottles and shall submit them to the laboratory.

O. After completion of testing, the record of water level measurements shall be delivered to the Engineer all test data. The test pump shall not be removed from the well until the Engineer has evaluated the data and authorized its removal.

3.09 Plumbness and Alignment Testing

A. The Contractor shall use every precaution to ensure a straight and plumb well without bend or offset. Plumbness and alignment of the well shall be tested by the Contractor after completing and developing of the well by lowering into the well casing to its full depth a section of pipe forty (40) feet long or a dummy of the same length. The outer diameter of the plumb shall not be more than one (1) inch smaller than the inside diameter of the well casing. The Contractor may check plumbness and alignment prior to test pumping.

B. If a dummy is used, it shall consist of a rigid spindle with three (3) rings, each ring being twelve (12) inches wide. The rings shall be truly cylindrical and shall be carefully centered on the central spindle. Rings shall be spaced one at each end of the dummy and one in the center thereof. The central spindle member of the dummy shall be rigid so that it will maintain the alignment of the axes of the rings. Outside diameter of the rings shall not be more than one (1) inch smaller than the inside diameter of the well casing.

C. Testing will be required to be in complete compliance with the above specifications. Deviation in the diameter or length of the test pipe or dummy as set forth will not be permitted.

D. Contractor shall provide a rig that will suspend test pipe or dummy from at least ten (10) feet and preferably twenty (20) feet or more, above the top of the well casing and shall carefully center the plumb in the well casing with the top of the plumb flush with the top of the well casing. Properly centered, the test pipe or dummy should be readily rotated by hand.

E. For the plumbness test, the plumb shall be lowered slowly into the well and the movement of the support line from the center position at the top of the well casing recorded both as to direction and amount. Such measurements shall be made at points of maximum deviation, changes in direction of deviation, and at intervals not to exceed forty (40) feet for the full depth of the well. The height of the support point above the top of the casing and the depth to the top of the plumb shall be recorded for each deviation measured. From these measurements the variation of the well casing from the vertical shall be calculated. A deviation from the vertical more than two-thirds the inside diameter of each well casing per one hundred (100) feet of depth shall be cause for rejection of the well by the Engineer.

F. The alignment test shall be made by lowering the test section to the full depth of the well. Failure of the test section to move freely throughout the length of the well casing shall be cause for rejection of the well by the Owner. A written report of the results of the plumbness and alignment test shall be made by the Contractor and furnished to the Owner. Procedures used shall be as set forth above and in conformance with the procedures set forth in the current version of AWWA A-100.

G. Failure to meet the plumbness and alignment limitations as above set forth is the responsibility of the Contractor and shall be subject to correction at the Contractor's sole expense.

H. Cost of the plumbness and alignment tests for the well shall be included in the Base Bid. These tests will not be allowed as part of the setting, developing, and testing time as put forth in Section 3.06 of these Specifications, and other miscellaneous requirements.

3.10 Capping Well

A. Except when drilling is in progress, the top of the well casing, the open borehole, and all entrance pipes, shall be kept securely covered or capped, both night and day, in such a manner as to effectively prevent either tampering with the well or entrance of foreign matter.

B. Upon completion of the well, the top of the casing and all entrance pipes shall be capped by means of a lockable cap or lockable steel plate of proper size securely fastened in place.

3.11 Logs and Samples

A. The Contractor shall furnish the Engineer with a daily record or log, which will give accurately the depth, thickness, and nature of the strata penetrated, as well as water level, and daily site activities.

B. As previously specified, the Contractor shall draw a water sample from the well and shall submit the sample to a State certified drinking water analysis laboratory for analysis. The sample shall be analyzed for Irrigation Water Quality and all primary (Inorganic Chemicals 40 CFR 141.62 b; Volatile Organic Chemical 40 CFR 141.61 a; Synthetic Organic Chemicals 40 CFR 141.61 c) and secondary MCL standards for drinking water constituents defined by Title 22 of the California Code of Regulations (Section 64449). The General Physical properties of the water shall also be analyzed. Laboratory methods and detection levels shall be in accordance with State of California drinking water standards. The laboratory reports shall be submitted to the Engineer.

3.12 Water and Tailings

A. The water for drilling shall be available from the City supply at no cost to the Contractor. The Contractor is responsible for supplying all necessary labor, equipment, and tools to furnish or convey water from the City supply to the site for all purposes of this contract. The Contractor shall also be responsible for obtaining a backflow device and water meter assembly from the City at no additional cost to the Contractor.

B. The Contractor shall be responsible for obtaining a discharge permit through the State Water Resources Control Board Water Quality Order No. 2003-0003-DWQ for Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality from water well drilling construction. Disposing of all development and test water shall be in conformance with all County, State, and Federal regulations.

C. For bidding purposes, the Contractor shall assume development water requires Baker Tanks or equivalent filtration treatment prior to discharge. Water, including mud, sand, and debris pumped from the well during developing and testing shall be treated, conveyed, and disposed of by the Contractor as a part of this contract in such a manner as to adhere to all applicable permits. The Contractor shall not damage or interfere with property of others and shall cooperate with the Owner.

D. The developing waters shall be discharged to an existing storm drainage system as determined by the Owner or the applicable County, State, and Federal regulatory authorities. The Contractor may propose alternative locations for disposal of the developing waters, subject to approval by the Engineer and by the regulatory authorities. The Contractor shall comply with the County and State requirements for such discharge. All existing facilities disturbed or removed by the Contractor shall be replaced to their original condition immediately upon completion of the specific work. The Contractor shall provide protective barriers and other safety protection as necessary to protect the public and workmen.

E. The Contractor shall remove and dispose of all drilling fluid, cuttings, and tailings in a lawful manner, and as approved by the Owner's representatives. The Contractor may temporarily stockpile tailings at a location designated by the Owner's representatives.

3.13 Disinfection

A. After the well has been completely constructed, it shall be thoroughly cleaned of all foreign substances, including tools, timbers, rope, debris of any kind, cement, oil, grease, joint dope, and scum. The well shall then be disinfected with a chlorine solution.

B. The chlorine solution used for disinfecting the well shall be of such volume and strength and shall be so applied that a concentration of at least fifty (50) ppm of chlorine shall be obtained in all parts of the well water, however, not less than twenty (20) pounds of 70% HTH, or its equivalent, shall be used. The chlorine solution shall remain in the well at least eight (8) hours.

C. The chlorine solution shall be applied after the well has been developed. It shall be added while the test pump is still in place and the well surged to help distribute the chlorine solution into the well and surrounding strata. Chlorinated development water shall be dechlorinated prior to discharge, in accordance with NPDES requirements. Dechlorination may be performed inside the well. If on-site capture of chlorinated water is necessary for dechlorination, Contractor to coordinate with Owner's representatives.

3.14 Standby Time

A. During the drilling and construction of the well, it may be necessary for the Owner or Engineer to perform work requiring the drilling workforce and equipment to stand idle. In such an event, the Owner shall request the Contractor in writing to cease operations and stand idle and shall state the anticipated extent or duration thereof.

B. If the Owner requests cessation of operations, an extension of time equal to the period of stoppage will be granted. The Contractor will be paid for standby time at the rate provided in the Bid Schedule.

3.15 Miscellaneous Requirements and Provisions

A. The Contractor shall employ only competent workmen for the execution of the work and all such work shall be performed under the direct supervision of an experienced well driller.

B. In the event the Contractor shall abandon a hole or holes because of loss of tools, or other causes, which are the responsibility of the Contractor, and prevent completion of the well as specified, the Contractor shall destruct the well in accordance with Santa Clara Valley Water District requirements at the Contractor's expense.

C. TV Scan: Contractor shall conduct a TV scan of the completed well and turn two (2) copies of the video film over to the Owner as an electronic video file on flash drive. Any damage discovered during the TV scan shall be corrected to the Owner's satisfaction at the Contractor's expense. The TV scan shall be repeated after any corrective work at no cost to the Owner.

D. Following completion of the work, the Contractor shall remove from the premises and work areas all excess materials, tools, and equipment used in the execution of the work, and shall dispose of all debris resulting from the work. The well site shall be left in a condition approximating site conditions prior to the work and to the satisfaction of the Owner.

E. Basis for payment: Payment shall be on the basis of the respective bid item bid price(s) with adjustments for additions or deductions to be approved on a case-by-case basis by the Owner. The bid price(s) shall include all incidental work of each item, and no claim will be considered for additional payment for incidental work necessary for any items of work without approval from the Owner.

**** END OF SECTION ****

ATTACHMENT A
City of Morgan Hill
Geotechnical Design Report

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HALEY ALDRICH

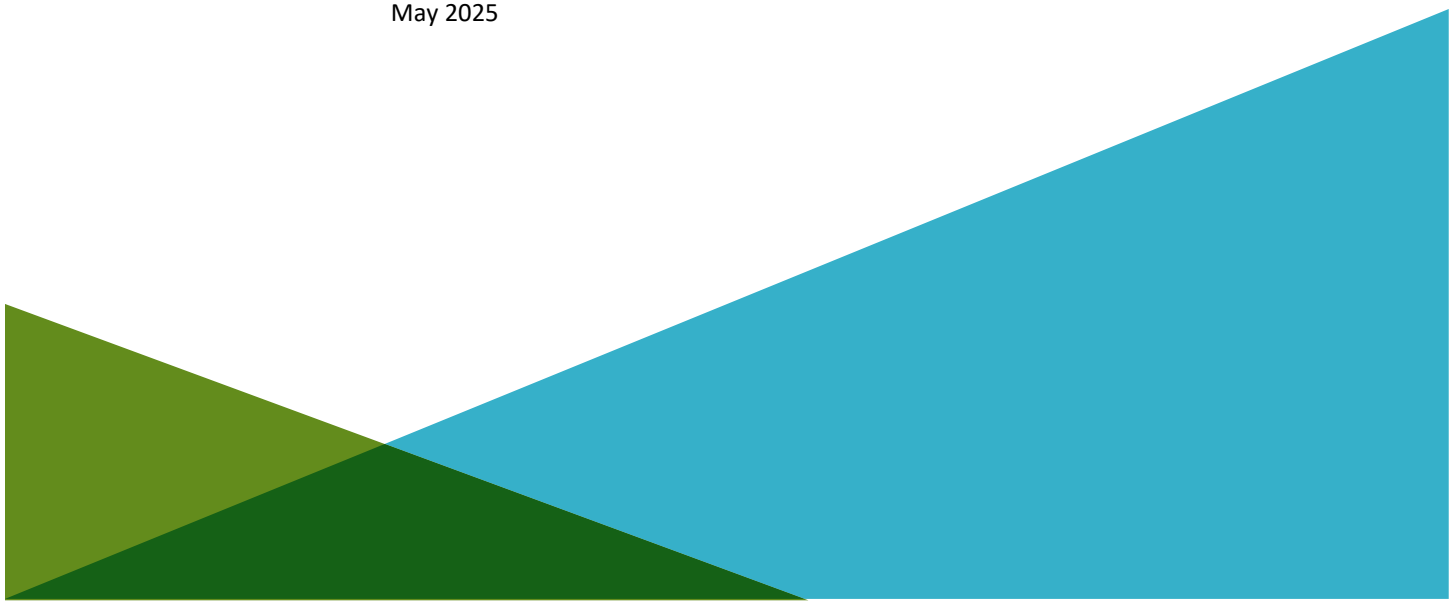
www.haleyaldrich.com

GEOTECHNICAL DESIGN REPORT
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

by
Haley & Aldrich, Inc.
Walnut Creek, California

for
HydroScience Engineers
Sacramento, California

File No. 0210949-000
May 2025



HALEY & ALDRICH, INC.
2033 N. Main St
Ste 309
Walnut Creek, CA 94596
925.949.1012

May 5, 2025
File No. 0210949-000

HydroScience Engineers
10569 Old Placerville Road
Sacramento, California 95827

Attention: Bill Slenter, P.E.

Subject: Geotechnical Design Report
Morgan Hill Well Facility Project
19201 Eagle View Drive
Morgan Hill, California

Ladies and Gentlemen:

Enclosed is our geotechnical report for the Morgan Hill Well Facility Project in Morgan Hill, California. As part of our scope of work, we have reviewed available information provided to us by the HydroScience Engineers (HydroScience) team. Our review of the available information has aided us in providing geotechnical recommendations for the proposed Well Facility. These recommendations, along with various geological and geotechnical aspects of the project site, are discussed in detail in this report.

Sincerely yours,
HALEY & ALDRICH, INC.

Khashayar Amini, PE
Senior Technical Specialist, Geotechnical

Dan Peluso, PE, GE
Senior Principal Engineer

Enclosures

https://haleyaldrich.sharepoint.com/sites/CityofMorganHill/Shared Documents/0210949.Morgan Hill Well Facility/Reports-Letters/2025 0505 HAI Morgan Hill Well Facility-Geotech Report_F.docx

HALEY & ALDRICH, INC.
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SIGNATURE PAGE FOR

GEOTECHNICAL DESIGN REPORT
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

PREPARED FOR
HYDROSCIENCE ENGINEERS
SACRAMENTO, CALIFORNIA

PREPARED BY:

Khashayar Amini, PE
Senior Technical Specialist, Geotechnical
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Dan Peluso, PE 49562, GE 2367
Senior Principal Engineer
Haley & Aldrich, Inc.

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1. Introduction

1.1 GENERAL

Haley & Aldrich, Inc. (Haley & Aldrich) is providing geotechnical engineering services to HydroScience for the Morgan Hill Well Facility Project, located at 19201 Eagle View Drive in Morgan Hill, California (the "site"). The site location is shown in Figure 1. Our scope of services includes project management, data review and site reconnaissance, and preparation of a geotechnical design report. This report presents geotechnical recommendations for design based on our review and evaluation of field and laboratory test results by others.

1.2 PROJECT DESCRIPTION

The project site is located on the southeast side of Eagle View Drive approximately 2,000 feet northeast of Highway 101. Based on our communications with the project team, it is our understanding that a new well is to be drilled and a new well facility is to be constructed at the site. The facility's building is planned to be built with a slab on grade floor and will include trenched yard piping. The structure is anticipated to be an approximately 800-square-foot one-story building with an asphalt paved driveway. The facility is anticipated to be surrounded by fencing.

1.3 PURPOSE AND SCOPE OF SERVICES

Our review of available information was undertaken to assess the existing surface and subsurface soil and groundwater conditions in the immediate vicinity of the Project Area and to develop geotechnical design recommendations for the proposed building design and construction.

The scope of work completed for the geotechnical investigation and report included:

- Consultation and coordination with HydroScience personnel;
- Review of existing subsurface and laboratory testing data provided to us by the project team and pertinent to the project area;
- Engineering analysis;
- Development of geotechnical design recommendations; and
- Preparation of this report.

1.4 AVAILABLE INFORMATION

The HydroScience team provided us with the following information to review which has aided us in providing geotechnical recommendations:

- Geotechnical Exploration Report, Lantana Wisteria, Morgan Hill, California, dated October 9, 2015, prepared by ENGEO Incorporated. This report was prepared to provide geotechnical design recommendations for the adjacent residential subdivision to the south and southeast;
- City of Morgan Hill – Eagle View Test Hole and Monitoring Well Installation Summary and Design Report, dated February 28, 2024, prepared by Luhdorff & Scalmanini, Consulting Engineers;
- A hand sketch of the conceptual design of the new well facility; and
- A Google Earth file containing the site survey limits.

2. Site Description

The project site is located approximately 2,000 feet northeast of Highway 101, to the east of Eagle View Drive, and is at the southwest corner of a vacant lot. To the south of the project site is a series of one or two-story residential buildings along White Moon Drive. Based on the Santa Clara County Assessor's website, the subject parcel has an area of 3,587 square feet and the site grade appears to be covered with seasonal grass and shrubs and is relatively flat. Historical air photographs of the site reveal the earthwork around the site started sometime in 2017 and prior to that, the site was used as agricultural land since at least 1939. Access to the site is provided through fenced gates, one to the east along Cochrane Road, and two along Eagle View Drive (one to the southwest of the site and another approximately 700 feet to the north of the site). The site plan is shown in Figure 2.

3. Geologic Setting

The San Francisco Bay is a major feature within the Coast Ranges geomorphic province of California, a region characterized by northwest-southeast trending mountain ranges and intervening valleys occupied by Santa Clara Valley. The right-lateral strike-slip San Andreas fault system controls the northwest-southeast structural grain of the Coast Ranges and the Bay Area. The San Andreas fault system includes the Hayward-Rodgers Creek, Calaveras, Concord-Green Valley, and Greenville faults. The San Francisco Bay is bounded on the east by the northwest-trending Diablo Range and to the west by the Santa Cruz Mountains that have been shedding erosional debris toward the Bay, recorded by relatively thick accumulations of alluvial sediment along the Bay and much of Santa Clara Valley. This thick apron of sediments has been and continues to be, incised by various stream systems that drain into south San Francisco Bay, resulting in numerous slough systems along the south bay perimeter.

3.1 SITE GEOLOGY

The geologic setting is shown on the Regional Geology Map (Figure 3). The project site lies within the City of Morgan Hill, which is situated in the Llagas subbasin of the southern Santa Clara Valley. The geology of the Santa Clara Valley has been extensively studied and mapped by the United States Geological Survey (USGS), California Geological Survey (CGS), and other investigators.

The general vicinity of the project site has been mapped several times, with geologic mapping having different emphases: Knudsen and others (2000), McLaughlin and others (2001), Graymer and others (2006), and Witter and others (2006). Knudsen and others (2000) mapped Quaternary geologic materials in detail for much of the San Francisco Bay Area. Much of Knudsen and others' mapping was incorporated or refined by Witter and others (2006). For this project, the Quaternary geologic mapping of Knudsen and others (2000), refined by Witter and others (2006), is the most detailed and pertinent. Based on mapping by Witter and others (2006), the project site is underlain by Holocene-aged alluvial fan deposits (fine facies), which are generally dominated by clay and silt and have interbedded lobes of sand and occasional gravel.

3.2 SEISMICITY

The project site is located within the greater San Francisco Bay Area, which is recognized as one of the more seismically active regions of California. The seismic activity in this region results from the complex movements along the transform boundary between the Pacific Plate and the North American Plate. Along this transform boundary, the Pacific Plate is slowly moving to the northwest relative to the more stable North American Plate at approximately 40 mm/yr. in the Bay Area (Page, 1992). The differential movements between the two crustal plates caused the formation of a series of active fault systems within the transform boundary. The transformed boundary between the two plates extends across a broad zone of the North American Plate within which right-lateral strike-slip faulting predominates. In this broad transform boundary, the San Andreas fault accommodates less than half of the average total relative plate motion. Much of the remainder of the motion in the South Bay Area is distributed across faults such as the San Gregorio, Monte Vista-Shannon, Sargent, Hayward, Calaveras, and Zayante-Vergeles fault zones.

Due to the site's location in the seismically active San Francisco Bay Area, it will likely experience strong ground shaking from a large (Moment Magnitude [Mw] 6.7) or greater earthquake along with one or more of the nearby active faults during the design lifetime of the project (WGCEP, 2003). It should be

noted that the third Uniform California Earthquake Rupture Forecast (UCERF3) time-independent model supports a magnitude-dependent methodology that accounts for historic open intervals on faults without a date of last event constraint. The exact factors influencing differences between UCERF2 and UCERF3 vary throughout the region and depend on the evaluation of specific seismogenic sources. For example, with the 30 yr M≥6.7 probabilities, the most significant changes from UCERF2 are a threefold increase on the Calaveras fault and a threefold decrease on the San Jacinto fault. The model also suggests that the average time between 6.7 Mw or larger events has increased. The UCERF3 model indicates that M≥6.7 probabilities may not be representative of other hazard or loss measures, and the applicability of UCERF3 should be evaluated on a case-by-case basis if required during site-specific ground motion analyses or at the behest of the regulatory agencies (WGCEP, 2014).

Some contributors to seismic risk for the project include the Monte Vista/Shannon, San Andreas, Hayward, Calaveras, Sargent, Zayante-Vergeles, Greenville, and San Gregorio-Hosgri faults. A large-magnitude earthquake on any of these fault systems has the potential to cause significant ground shaking in the vicinity of the planned dam replacement. The intensity of ground shaking that is likely to occur in the area is generally dependent upon the magnitude of the earthquake and the distance to the epicenter.

Relevant seismic sources in the San Francisco Bay area and their distances from the site are summarized in Table 3-1.

Table-3-1. Distances to Selected Major Active Fault Surface Traces

Fault Name	Distance and Direction from Site to Mapped Surface Fault Traces
Coyote Creek	<1.0 km north
Calaveras	3.8 km northeast
Monte Vista-Shannon	9.0 km west
Hayward	9.7 km north
Sargent	14 km southeast
San Andreas	18 km southwest
Greenville	20 km northeast
Zayante-Vergeles	23 km southwest
Ortigalita	35 km east
San Gregorio	54 km southwest

3.3 GEOHAZARD MAPPING

3.3.1 Active Faulting and Fault Rupture

According to CGS (2018), a Holocene-active fault is defined as a fault that has had surface displacement within Holocene time (the last 11,700 years), and a pre-Holocene fault is defined as a fault whose recency of past movement is older than 11,700 years. The Alquist-Priolo Earthquake Fault Zoning Act only addresses the hazard of surface fault rupture for Holocene-active faults, although pre-Holocene-active faults may also have the potential for future surface fault rupture (CGS, 2018). According to CGS (2006), the site is not mapped within an Alquist-Priolo Earthquake Fault Zone.

According to the United States Geological Survey's (USGS) Quaternary fault and fold database, there are no active faults mapped as crossing through the project site. A Fault Activity Map is provided as Figure 4.

Based on the Santa Clara County Geologic Hazard Zones map (2012), the project site is not located within a fault rupture hazard zone.

3.3.2 Liquefaction Hazards

Witter and others (2006) have generated a map showing liquefaction susceptibility for the San Francisco Bay Area with a five-class scale that includes very low (essentially bedrock areas), low, moderate, high, and very high liquefaction susceptibility classes. The soil underlying the site is mapped as having moderate liquefaction susceptibility (Figure 5).

The Seismic Hazard Zone Map for the Morgan Hill Quadrangle prepared by the California Geological Survey (2004) maps the site as one of required investigation for liquefaction.

Based on the Santa Clara County Geologic Hazard Zones map (2012), the project site is located within a liquefaction hazard zone.

3.3.3 Compressible Soils

According to the Santa Clara County Geologic Hazard Zones map (2012), the site is not located within a compressible soil hazard zone.

3.3.4 Landslide Hazards

Based on the Santa Clara County Geologic Hazard Zones map (2012), the project site is not located within a landslide hazard zone.

3.4 REGIONAL GROUNDWATER

The California Department of Water Resources identifies the site as lying within the Coyote Valley subbasin, which is one of several groundwater subbasins within the Santa Clara Valley groundwater basin.

According to the Valley Water historical high groundwater elevation data, the generalized depth to first groundwater in the site vicinity ranges from approximately 20 to 30 feet below ground surface (bgs).

4. Field Investigations by Others

4.1 SUBSURFACE EXPLORATIONS

4.1.1 Exploratory Borings

In 2015, ENGEO Incorporated (ENGEO) performed site investigations in an area bounded by Mission View Drive to the south, Eagle View Drive to the west, Cochrane Road to the east, and an extension of the northern boundary of the project site parallel with Mission View Drive. The site investigation program consisted of six soil borings, 2-B1, 2-B2, 2-B2A, 2-B3, 2-B4, and 2-B5. The site plan with the historical boring locations is shown in Figure 2. The purpose of the investigation was to supplement the previous investigations by ENGEO and by Lai & Associates, both of which were conducted in 2013. ENGEO reported that a depression of approximately 5,000 square feet existed in the northwest corner of the site which included stockpiles of undocumented fill, cobbles, and debris covering approximately 300 square feet and up to 4 feet in height. This reported depression is approximately located at the current project site.

The 2013 investigation by ENGEO consisted of five cone penetration test (CPT) soundings extending between 9 and 25 feet bgs as well as four infiltration tests. ENGEO reported that the CPTs were terminated shallower than the target depth of 50 feet due to cone refusals.

The 2013 investigation by Lai & Associates consisted of four soil borings to depths ranging from 7 to 46.5 feet.

The 2015 ENGEO borings were drilled on September 18, 2015. Boring 2-B2 was drilled using a truck-mounted drill rig employing mud rotary drilling method. This boring was stopped at a depth of 26.5 feet bgs due to reported gravel and cobbles creating adverse drilling conditions. The remaining five borings were drilled using a truck-mounted drill rig employing hollow stem drilling method. These borings advanced to a depth range of 16.5 to 41.5 feet bgs.

The ENGEO (2015) geotechnical report is included in Appendix A.

4.1.2 Logging and Sampling

In the 2015 ENGEO site investigation, soil sampling was conducted using a 140-pound automatic hammer falling 30 inches. Two types of soil samplers were used as part of that investigation:

- 3-inch outside diameter Modified California-type split-spoon sampler fitted with 6-inch-long brass liners; and
- 2-inch outside diameter standard penetration test (SPT) split-spoon sampler.

The samplers were driven 18 inches (three 6-inch increments) into the soil. ENGEO recorded the number of blows needed to drive the samplers for each sample. The blow counts for the last 1 foot of penetration for each sample are documented in their boring logs (SPT N value in blows per foot [bpf]).

We have reviewed the SPT N values from all the borings and plotted them against depth. This plot is shown in Figure 6. Based on this plot, frequent instances of sampler refusal were encountered during

the investigations. The blow counts are generally over 30, indicating the presence of compact and very compact soils.

4.1.3 Soil Conditions Encountered

Subsurface soil conditions encountered in Lai & Associates (2013) and ENGEO (2013, 2015) investigations were generally consistent with regional geologic mapping.

Based on our review of these borings and CPTs, the upper 2 feet of the tested area consists of granular fill (silty or clayey sand, gravel with trace of clay) and seasonal grasses. The fill layer is underlain by compact clayey gravel, clayey or silty sand, gravel, and sand mixtures. The presence of cobbles during drilling has frequently been noted in the boring logs.

A detailed description of the soils encountered during drilling is noted in the boring and CPT logs. The complete geotechnical report by ENGEO (2015) includes the boring and CPT logs and is included in Appendix A of this report.

The closest CPT sounding to the project site is the historical cone sounding 1-CPT1 which extended to 25 feet bgs. The soils encountered in this CPT are reported as mostly sandy silt and to a lesser degree, clayey silt and sand. The log of this CPT sounding indicates the soils at this location are very compact.

4.1.4 Groundwater Conditions Encountered

During borehole logging and sampling, groundwater was not encountered in any of the borings or CPTs. This indicates the groundwater may be expected to be deeper than the deepest soil boring (B-1 drilled by Lai & Associates in 2013) which was 46.5 feet deep.

ENGEO reports historic high groundwater at approximately 25 feet bgs in the northwest corner of their tested site which may be relevant to this report's site.

4.2 GEOTECHNICAL LABORATORY TESTING

4.2.1 General

ENGEO's testing was performed to obtain information concerning the qualitative and quantitative physical properties of the samples recovered during the subsurface exploration program. Tests were performed by ENGEO's laboratory, in general conformance with applicable ASTM International (ASTM) standards. The following tests were performed:

- Moisture Content and Dry Unit Weight (ASTM D2216, D7263)
- Atterberg Limits (ASTM D4318)
- Wash Over #200 Sieve (ASTM D1140)
- Sieve Analysis W/ #200 Wash (ASTM D422)
- Corrosion including:
  - Redox (ASTM D1498)
  - Resistivity (ASTM G57)
  - pH (ASTM D4972)

- Sulfide (ASTM D4658)
- Chloride and Sulfate (ASTM D4327))

The results of the laboratory testing program are included in Appendix A.

4.2.2 Corrosion

Corrosion testing was performed on two soil samples at shallow depths (1.5 to 3 feet from boring 2-B1 and 0 to 3 feet from boring 2-B4). Testing results are included in ENGEO's report provided in Appendix A.

Based on the results of the laboratory testing performed, ENGEO reported the soils to have moderately corrosive potential and that buried metal and steel should be protected against corrosion.

Corrosion results should be considered preliminary and are an indicator of potential soil corrosivity for the sample tested. Other soils found on-site may be more, less, or of a similar corrosive nature. Our scope of services does not include corrosion engineering; therefore, a detailed analysis of the corrosion tests is not included.

4.3 INFILTRATION TESTS

ENGEO (2015) performed four infiltration tests in 2014. These tests were named 1-P1 through 1-P4. The locations of these tests are shown in Figure 2. ENGEO reported that infiltration rates at their site ranged from 2.5 to 15.3 inches per hour at the southwest and northeast ends of the site at 3 feet bgs. The infiltration rates ranged from 4.1 to 4.3 inches per hour near the center of the site at depths between 6.5 and 8 bgs. ENGEO cites a letter they submitted on August 5, 2014, which details the infiltration testing. This letter was not provided to us and therefore we could not access the detailed test results during our data review process.

4.4 MONITORING WELL REPORT BY OTHERS

Based on our review of the monitoring well installation summary and design report by Luhdorff & Scalmanini, Consulting Engineers (LSCE 2024), LSCE concluded that the project site would be suitable for the construction of a community supply well with a design capacity of 800 gallons per minute (gpm). As part of their evaluations, they logged the drilling of the borehole to a depth of 400 feet bgs. The soil stratigraphy in the upper 50 feet encountered during the drilling process was similar to that encountered previously by Lai & Associates (2013) and ENGEO (2013, 2015). The soil stratigraphy and minor variations between clay, sand, and gravel remain consistent to the final depth of the boring. The LSCE (2024) report is provided in Appendix B.

5. Conclusions and Discussion

The new well, well facility, and associated structures are currently planned to be constructed in the approximate area shown in Figures 1 and 2. We understand the current design shown represents a conceptual design, and there may likely be significant changes to this design as the project progresses.

It is our professional opinion that the structures associated with the well facility should be designed to be supported on shallow foundations comprised of spread or strip footings or a mat foundation. The recommendations for the building to be founded on shallow foundations are due to the high SPT N values and our analysis results indicating that there is low potential for liquefaction-induced settlement at the project site. We believe that should the recommendations presented in this report be followed, construction of the well facility is possible.

Some important geotechnical factors to note during project design and construction that form the basis of our recommendations are:

1. Settlement;
2. Expansive soils;
3. Soil liquefaction; and
4. Wet weather construction.

5.1 SETTLEMENT

The exploratory borings did not encounter compressible clays and silts. The soils encountered in the historical boring and CPT soundings consistently revealed high stiffness which corresponds to low susceptibility to static settlement. The structure loads were not available to us at this time. Therefore, we made assumptions regarding the structural loading to evaluate static settlement. Our evaluation of static settlement (without seismic considerations) resulted in elastic settlement of less than 0.5 inches for the loading from an assumed one-story building column elements and building walls.

5.2 EXPANSIVE SOILS

The results of the ENGEO field investigation indicate the surficial soil layers at their site have low expansion potential. Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, perched groundwater, drought, or other factors. Changes in soil moisture may result in unacceptable settlement or heave of structures, concrete slabs-on-grade, or pavements supported on these materials. Since there is no available boring at the site location, our evaluation of the soil expansiveness is based on the historical borings nearby. For the proposed facility, we do not anticipate the presence of expansive soils.

5.3 LIQUEFACTION

5.3.1 Liquefaction and Densification Susceptibility

Liquefaction is a soil behavior phenomenon in which soil located below the groundwater table loses a substantial amount of strength due to high excess pore-water pressure generated and accumulated during strong earthquake ground shaking. During and immediately following an earthquake, ground

shaking-induced cyclic shear creates a tendency in most soils to change volume by rearranging the soil-particle structure. The potential for excess pore-water pressure generation and strength loss associated with this volume change tendency is highly dependent on the gradation and density of the soil, with greater potential in looser, generally cohesionless (sandy) soils. Recently deposited (i.e., geologically young) and relatively loose natural soils and uncompacted or poorly compacted artificial fills located below the groundwater table are potentially susceptible to liquefaction.

The granular soils below the site vicinity are considered to have moderate liquefaction susceptibility based on independent mapping and analysis by the USGS (Figure 5). Groundwater was not encountered in any of the boreholes or the CPTs. Based on a review of historic groundwater levels done by ENGEO, the highest groundwater level in the site vicinity is approximately 25 feet bgs.

Densification of unsaturated, loose granular soils due to strong vibrations such as that resulting from earthquake shaking may occur. Granular soils and loose fill above groundwater may be subject to such a phenomenon. Based on the subsurface materials encountered during the subsurface exploration completed as part of this investigation, we judge the potential for seismic densification to be low due to the absence of the groundwater table.

5.3.2 Probabilistic Ground Motions

The site ground motions used in our liquefaction assessment were evaluated based on geotechnical investigation guidelines in ASCE 7-16 (2016) and USGS seismic hazard deaggregation (2008). Using tools contained on the USGS website, we completed a probabilistic assessment of earthquake shaking hazards at the project site. Liquefaction analyses were performed on the SPT data using these ground motion parameters.

5.3.3 SPT Analysis Methodology

We performed an SPT-based liquefaction assessment using the commercial program LiqSVs software (v.2.3.2.9) by GeoLogismiki, according to the method explained by Boulanger and Idriss (2014), based on the seismic parameters outlined in this report. The SPT blow count values, fines content values from the historical boring logs, soil types, and laboratory test results were input into the software, along with the ground accelerations and historical high groundwater levels. Estimated settlements computed in the SPT-based analyses consider both the liquefaction settlements and the settlement contributions from the densification of unsaturated soils. The probability of densification of unsaturated soil was considered due to the deep groundwater table and the prevalent coarse-grained soil material. The liquefaction analysis results are included in Appendix C.

5.3.4 Earthquake Event for Liquefaction Evaluation

We evaluated the liquefaction potential resulting from an earthquake with a modified peak ground acceleration (PGA_m) of 0.841g, which matches the event shown on the seismic design parameters in Table 6-2. Using the seismic deaggregation tool on the USGS website, this event has about a 5 percent chance of exceedance in 50 years and is associated with the mean (overall sources) Magnitude 6.9 earthquake at an estimated radius of 9.3 km from the site.

5.3.5 Seismically Induced Settlement

Granular materials, including fine-grained loose sands that, when saturated, are potentially susceptible to liquefaction and densification from strong earthquake shaking. Granular materials were encountered in all of the exploratory borings by Lai & Associates (2013) and ENGEO (2015). The calculated liquefaction conditions were variable across the project site with a maximum anticipated seismically induced settlement from liquefaction with a design groundwater level of 25 feet bgs calculated to be generally less than ¼ inch. The outlier boring B-1 had two N values equal to 35 and 30 at depths of 30 and 40 feet respectively. Since the drilling method for this boring utilized hollow stem augers, we anticipate actual N values to be higher than those tested on-site.

The liquefaction analysis results are included in Appendix C.

Table 5-1 – Estimated Settlement Based on Liquefaction Analysis

SPT Boring	Estimated Liquefaction Settlement 5% Chance of Exceedance in 50 years (975 yr. RP) (inches)
B-1	0.6
B-2	<0.1
B-3	<0.1
B-4	<0.1
2B-1	<0.1
2B-2 & 2B-2A	0.2
2B-3	0.1
2B-4	<0.1
2B-5	0.1

5.3.6 Liquefaction Hazard Discussion

The principal consequence of liquefaction in the loose sandy and/or gravelly soil layers at the site is liquefaction-induced settlement. Based on our analyses, there is a low potential for significant settlement to occur in the soils underlying the project site with groundwater near historic and design levels.

In summary, based on subsurface information collected during investigations by Lai & Associates (2013) and ENGEO (2015), we judge the potential for liquefaction at this site to be low. In addition, the principal consequence of liquefaction will be liquefaction-induced settlement. The amount of anticipated liquefaction-induced settlement is judged to be minor. We, therefore, recommend that the proposed facility and appurtenant buildings be supported on shallow foundations designed in accordance with the recommendations presented herein.

5.4 WET WEATHER CONSTRUCTION

We anticipate that higher than optimum moisture contents should be expected during most of the winter and spring in the site soils. From our previous experience on sites in the vicinity with similar soil conditions, the site soils are likely moderately sensitive to moisture conditions and may become unstable during grading operations if they are significantly higher than the optimum moisture content. Avoiding grading operations during the wet season, along with limiting heavy equipment traffic, especially rubber-tired equipment, on the over-saturated soils is recommended.

6. Design and Construction Considerations

Detailed recommendations for the geotechnical aspects of the proposed improvements are presented in the subsequent sections of this report. Our evaluations and recommendations are based upon the previously discussed information that has been provided to us. The following recommendations may need to be modified if there are any changes in the proposed improvements, their layout or location, or the proposed grading.

6.1 DESIGN GROUNDWATER LEVEL

Groundwater was not encountered in any of the historical borings or CPTs. Groundwater may fluctuate depending on rainfall, groundwater pumping, and other factors not apparent at the time of our review. Groundwater is likely to be encountered during excavation for the installation of shallow foundations. For the design of the project components, a design groundwater level of approximately 25 feet below the existing grade is recommended. This is based on the historical high groundwater levels reported by ENGEO (2015).

6.2 EARTHWORK

6.2.1 Demolition and Clearing

Plans for demolition are expected to be limited, considering the current level of development at the site. Existing underground utilities that may be present in the areas of the planned improvements may require removal or relocation if encountered.

Site clearing should include the removal of deleterious materials, debris, and obstructions that are designated for removal. Depressions, voids, and holes that extend below the proposed finish grade should be cleaned and backfilled with engineered fill compacted according to the recommendations in this report.

6.2.2 Excavations

Excavations for this project will likely include trenching for underground utilities and excavations for foundation construction. Excavation may also be required for the removal of underground historical demolition waste and debris that is currently not known to exist at the project at the time of writing this report.

Excavations should be constructed in accordance with the current California Occupational Safety and Health Act (CAL-OSHA) safety standards and local jurisdiction. The stability and safety of excavations, braced or unbraced, are the responsibility of the contractor.

Trench excavations adjacent to existing or proposed foundations should be above an imaginary plane having an inclination of 1-½:1 (horizontal to vertical) extending down from the bottom edge of the foundations.

6.2.3 Subgrade Preparation

Soil surfaces to receive engineered fills, concrete slabs-on-grade, and pavements should be scarified to a depth of 12 inches, moisture conditioned, and compacted in accordance with the recommendations given in Section 6.2.5, "Engineered Fill Placement and Compaction." In proposed building areas, subgrade preparation should extend at least 5 feet beyond the limits of the proposed building slabs and any adjoining flatwork. In exterior concrete slab and pavement areas, subgrade preparation should extend at least 2 feet beyond the limits of these improvements.

Prepared soil subgrades should be non-yielding when proof-rolled by a fully loaded water truck or equipment of similar weight. Moisture conditioning of subgrade soils should consist of adding water if the soils are too dry and allowing the soils to dry if the soils are too wet. After the subgrades have been prepared, the areas may be raised to design grades by the placement of engineered fill.

If unstable, wet, or soft soil is encountered, the soil will require processing before compaction can be achieved. When the construction schedule does not allow for air-drying, other means, such as lime or cement treatment, over-excavation and replacement, geotextile fabrics, etc., may be considered to help stabilize the subgrade. The method to be used should be determined at the time of construction based on the actual site conditions. We recommend obtaining unit prices for subgrade stabilization during the construction bid process.

6.2.4 Material for Engineered Fill

In general, on-site soils with an organic content of less than 3 percent by weight, free of any hazardous or deleterious materials, and meeting the gradation requirements below may be used as general engineered fill to achieve project grades, except when special material (such as aggregate base or subbase material) is required.

In general, engineered fill material should not contain rocks or lumps larger than 3 inches in greatest dimension, should not contain more than 15 percent of the material larger than 1½ inches, and should contain at least 20 percent passing the No. 200 sieve. In addition to these requirements, import fill should have a low expansion potential as indicated by a Plasticity Index of 15 or less or an Expansion Index of less than 20.

All import fills must be approved by the project geotechnical engineer before delivery to the site by providing representative samples of proposed import fills to the engineer for evaluation.

6.2.5 Engineered Fill Placement and Compaction

Engineered fill should be placed on soil subgrades that are prepared as recommended in this report. Engineered fill should be placed in horizontal lifts, each not exceeding 8 inches in thickness, and mechanically compacted to the recommendations below at the recommended moisture content. Relative compaction or compaction is defined as the in-place dry density of the compacted soil divided by the laboratory maximum dry density as determined by ASTM Test Method D1557, latest edition, expressed as a percentage. Moisture conditioning of soils should consist of adding water to the soils if they are too dry and allowing the soils to dry if they are too wet.

Engineered fills consisting of on-site soils and imported soils should be compacted to a minimum of 90 percent relative compaction with moisture content between about 1 and 3 percent above the

laboratory optimum value. In pavement areas, the upper 12 inches of subgrade soil and the full section of the aggregate base should be compacted to a minimum of 95 percent relative compaction with moisture content slightly above the optimum value. Aggregate base in vehicle pavement areas should be compacted at slightly above the optimum moisture content to a minimum of 95 percent relative compaction.

6.2.6 Utility Trench Excavation and Backfill

Utility trenches less than 5 feet in depth in the near-surface soil materials should be able to stand near vertical with minimal bracing. Sandy soils, where encountered, may need bracing to prevent the caving of the granular soils. We estimate that excavations should be able to be accomplished with conventional excavating equipment, such as backhoes and excavators. Excavations should be constructed in accordance with the current CAL-OSHA safety standards and local jurisdiction. The stability and safety of excavations, braced or unbraced, are the responsibility of the contractor.

Pipe zone backfill, extending from the bottom of the trench to about 1 foot above the top of the pipe, should consist of free-draining sand (at least 90 percent passing a No. 4 sieve, and less than 5 percent passing a No. 200 sieve) compacted to a minimum of 90 percent relative compaction unless concrete or cement slurry is specified.

Above the pipe zone, underground utility trenches may be backfilled with free-draining sand, on-site soil, or imported soil that is free of deleterious and hazardous material. The trench backfill should be compacted to the requirements given in Section 6.2.5, “Engineered Fill Placement and Compaction.” Trench backfill should be capped with at least 12 inches of compacted, on-site soil similar to that of the adjoining subgrade. The upper 12 inches of trench backfill in areas to be paved should be compacted to a minimum of 95 percent relative compaction. Compaction should be performed by mechanical means only. Water jetting or flooding to attain compaction of backfill shall not be permitted.

Trench excavations that extend below an imaginary plane inclined at 1½:1 (h:v) below the bottom edge of foundations should be properly shored to maintain the support of the existing facilities. Trenches that run parallel to the proposed foundations should not be excavated within the imaginary plane inclined at 1½:1 (h:v) below the bottom of the footing.

6.2.7 Wet Weather Construction

If site grading and construction are to be performed during the winter rainy months, the owner and contractors should be fully aware of the potential impact of wet weather. Rainstorms can cause delays to construction and damage to previously completed work by saturating compacted pads or subgrades or flooding excavations.

Earthwork during rainy months will require extra effort and caution by the contractors. The grading contractor should be responsible for protecting his work to avoid damage by rainwater. Standing pools of water should be pumped out immediately. Construction during wet weather conditions should be addressed in the project construction bid documents and specifications. We recommend the grading contractor submit a wet weather construction plan outlining procedures they will employ to protect their work and to minimize damage to their work by rainstorms.

6.3 LATERAL EARTH PRESSURES

The table below summarizes the lateral earth pressures recommended for use in the design of pressures acting against retaining structures and foundation elements. We note that passive pressure should be ignored for a depth of 12 inches and may be utilized to resist overturning and sliding. Where structures will be located below groundwater, hydrostatic pressures are already considered in the passive lateral earth pressure values shown in the table below.

Table 6-1. Lateral Earth Pressures

Pressure Type	Above Groundwater Level (Equiv. Fluid Pressure)	Below Groundwater Level (Equiv. Fluid Pressure + Hydrostatic)
Active	31 pcf	77 pcf
At-Rest	49 pcf	85 pcf
Passive	400 pcf	245 pcf

***Note**:*
pcf - pounds per cubic foot

Walls whose tops are not free to deflect (restrained) should be designed for an at-rest condition, while an active case (unrestrained) can be applied for walls that are free to deflect at the top.

As a result of earthquake shaking, the soil behind retaining walls will exert an additional horizontal force on the walls. To simulate seismic conditions, a horizontal seismic line force of $12H^2$ pounds per lineal foot (where H is the height of the wall from the wall base to the ground surface above) should be added to the active or at-rest lateral soil pressure. The resultant of the lateral soil pressure (active or at-rest) and the resultant of the seismic line force should be applied at H/3 above the wall base. A reduced factor of safety for overturning and sliding may be used in seismic design.

In addition to static and dynamic earth pressures, the structural engineer should consider surcharge loads due to construction and any anticipated specialized loading conditions. A surcharge pressure of 250 pounds per square foot (psf; acting vertically on the ground surface above the wall) should be considered for the ground surface behind retaining walls. For lateral considerations of the surcharge load, we recommend a rectangular distribution over the entire depth of the wall with a pressure equal to two-thirds of the surcharge load. For the above condition with a vertical surcharge pressure of 250 psf, we recommend using a horizontal uniform pressure on the wall of 160 psf.

Should the project structural engineer prefer not to include hydrostatic pressures in consideration of retaining structures, walls greater than 3 feet should be well-drained to reduce the potential for hydrostatic pressure. A typical drainage system consists of a 1- to 2-foot-wide zone of Caltrans Class 2 Permeable material immediately adjacent to the structure with a perforated pipe at the base of the structure discharging to a storm drain or other discharge facility. As an alternative, a prefabricated drainage board may be used in lieu of the Class 2 Permeable material. Where conditions allow for the use of weep holes, they may be used in lieu of the perforated pipe. The holes should be a minimum of 3 inches in diameter, at a spacing of 8 feet or less, center to center. Filter fabric or wire mesh should be placed over the holes at the backside of the wall to inhibit the permeable material, if used, from washing through the holes.

6.4 CODE-BASED SEISMIC DESIGN VALUES

Due to the proximity of the site to the numerous active fault systems that traverse the greater San Francisco Bay Area, the project site will likely be subjected to the effects of a major earthquake during

the design life of the proposed improvements. The effects are likely to consist of significant ground accelerations. These ground movements may cause damage to the proposed improvements. We, therefore, recommend that, at a minimum, the structural systems for the proposed improvements be designed following the requirements of Chapter 16 of the 2022 California Building Code and ASCE 7-16 for Site Class D type soils. The 2022 California Building Code seismic design parameters for the site are included in Table 6-2. A site-specific ground motion analysis was not included in our evaluation and may be required depending on the configuration of the final structures planned for the site, specifically if the planned structures are seismically isolated or are designed with damping systems.

Table 6-2 – Seismic Design Parameters

Item	Design Value
Site Soil Class Definition	D
Ss – 0.2 Second Spectral Response Acceleration	1.83
S_1 – 1.0 Second Spectral Response Acceleration	0.67
Fa – Values of Site Coefficient	1.0
Fv – Value of Site Coefficient	1.7*
S_{DS} – Designed Spectral Response Acceleration for Short Periods	1.22
S_{D1} – Designed Spectral Response Acceleration for 1-Sec Periods	1.14
S_{MS} – MCE_R Spectral Response Acceleration Parameter (g)	1.83
S_{M1} – MCE_R Spectral Response Acceleration Parameter (g)	1.71**
PGA	0.764
PGA_M	0.841

Notes:

1. *The above parameters assume the structure is not seismically isolated and does not incorporate a damping system. If this is not the case, a ground motion hazard analysis may be required. Reference: https://asce7hazardtool.online/ and https://hazards.atcouncil.org/#/*
2. *MCER = Risk-targeted maximum considered earthquake*
3. *g = acceleration of gravity*
4. ** - This value shall only be used for calculation of T_s and the parameters S_{M1} and S_{D1} before they are increased by 50%.*
5. *** - In accordance with the EXCEPTION to ASCE 7-16*

6.5 FOUNDATIONS

The planned foundations for the project should satisfy one criterion with respect to foundation soils: the vertical movements of the foundation due to liquefaction-induced settlement of the foundation soils should be within tolerable limits of the structure. Based on the liquefaction-related settlement calculated in our analysis, we recommend that the proposed structure and appurtenances be supported on a shallow foundation system.

6.6 SHALLOW FOUNDATIONS

We anticipate that all structures for this project may be supported on conventional shallow foundations. Continuous and isolated footings may be designed to impose a maximum allowable bearing pressure not exceeding 4,000 psf for dead loads plus sustained live loads.

Allowable foundation soil pressures may be increased by one-third when considering short-term wind or seismic loading. We recommend that spread footings have a minimum width of 18 inches and be embedded a minimum of 24 inches below the lowest adjacent finished grade.

Soil resistance to lateral loads will be provided by a combination of frictional resistance between the bottom of the footings and underlying soils and by passive pressures acting against the embedded sides of the footings, as described above. An allowable friction factor of 0.35 is considered appropriate between the undersurface of the concrete and the supporting subgrade. An allowable passive earth pressure equivalent to that exerted by a fluid weighing 400 pcf is recommended. These values may be used in combination without reduction. The passive pressure can be assumed to act starting at the top of the lowest adjacent grade in paved areas. In unpaved areas, the passive pressure can be assumed to act starting at a depth of 1 foot below grade.

Concrete should be placed only in excavations that are clean and free of loose soils or debris. Foundation excavations should be maintained in a moist condition before the placement of concrete. The geotechnical engineer should observe foundation excavations to verify that adequate foundation-bearing soils have been reached. The project structural engineer should determine the foundation reinforcement.

Settlements are expected to be primarily elastic with most of the settlement occurring immediately upon application of load. Long-term settlement of the foundation system following the completion of construction is anticipated to be less than 1 inch. The differential settlements are anticipated to be on the order of 1/2 inch or less over a distance of 25 feet.

We request the opportunity to review the foundation plans and to provide supplemental recommendations, as necessary.

6.7 CONCRETE SLABS-ON-GRADE

Concrete slabs-on-grade will include building slabs and exterior flatwork. Exterior flatwork should be underlain by at least 12 inches of “non-expansive” engineered fill and properly moisture-conditioned soil subgrade. Preparation of subgrade soil and placement and compaction of engineered fill should be as outlined in the “Earthwork” section of this report. Slab subgrade should not be allowed to dry out prior to placing “non-expansive” fill and concrete.

6.7.1 Building Floor Slabs

The floor slabs can be supported on grade prepared in accordance with the subgrade preparation recommendations provided above. There should be a minimum of 6 inches of capillary break below the concrete slab. The thickness of the slab should be determined by the structural engineer based on applicable loading.

Interior concrete slabs subject to vehicle loading, including maintenance vehicles, should be supported on at least 6 inches of Class 2 Aggregate Base or a mixture of baserock and asphalt, provided that they meet the gradation requirements for Caltrans Class 2 Aggregate Base. Thickness and reinforcing of the slab should be designed by the project Structural Engineer, but we suggest a minimum thickness of 5 inches of concrete be used. Special care should be taken to ensure that reinforcement is placed at the slab mid-height. The slabs should be structurally separated from the footings and walls. If this is not possible from a structural standpoint, it is recommended that the slab connection to footings be reinforced such that there will be resistance to potential differential movement.

For slabs-on-grade that have moisture-sensitive surfacing, we recommend that an impermeable membrane (10 mils or thicker) be placed over 6 inches of crushed rock to reduce the migration of

moisture through the concrete slab. Typically, the membrane and the slab are separated by 2 inches of sand, but this should be determined by the structural engineer and architect. The sand should be moisture-conditioned slightly prior to placing concrete.

6.7.2 Exterior Flatwork

Where concrete flatwork is to be exposed to vehicle traffic, the upper 6 inches of imported, non-expansive fill layer should consist of Class 2 aggregate baserock. We recommend that, as a minimum, exterior concrete slabs and pedestrian walkways be designed using 4 inches of concrete. Typically, construction joints are spaced at horizontal distances no greater than 30 times the concrete slab thickness. If there is a conflict between the civil and geotechnical design recommendations for contraction joint spacing, Haley & Aldrich defers to the civil engineer's recommendations. Recommendations for subgrade preparation and aggregate base compaction for concrete slabs and walkways are the same as those we have described in the "Engineered Fill Placement and Compaction" section.

6.8 PAVEMENTS

Laboratory R-Value testing was not previously conducted by others. ENGEO (2015) reported a minimum R-value of 5 based on their experience with the site area.

6.8.1 Flexible Pavements

Flexible pavement sections have been developed given these assumptions and are presented in Table 6-3. Based on the nearby existing subsurface data, we estimate the site surficial soils have a minimum R-Value of 15 for the near-surface soils. The actual pavement section for the proposed driveways shall be determined by the project Civil Engineer based on an appropriate traffic index.

Table 6-3: Flexible Pavement Section Design for R-Value = 15 (based on 20-Year Design Life)

Traffic Index	Asphalt Concrete Thickness (inches)	Class 2 Aggregate Base Thickness (inches)	Total Pavement Thickness (inches)
4.0	2.5	6.0	8.5
4.5	2.5	7.5	10.0
5.0	2.5	9.0	11.5
5.5	3.0	10.0	13.0
6.0	3.0	11.5	14.5
6.5	3.5	12.5	16.0
7.0	4.0	13.0	17.0

Pavement sections shall be placed on soil surfaces that have been prepared as outlined in the Earthwork section of this report. The full section of the aggregate base should be compacted to a minimum of 95 percent relative compaction (ASTM D1557, latest edition). The Class 2 aggregate base material should conform to Section 26 of the Caltrans Standard Specifications. Asphalt concrete should meet the requirements for 1/2- or 3/4-inch maximum, medium Type A Hot Mix Asphalt (asphalt concrete), Section 39, Caltrans Standard Specifications, latest edition.

6.8.2 Rigid Pavements

If concrete slabs are used for pavements (rigid pavement section) for Traffic Indices less than 9, we recommend the concrete pavement consist of a minimum of 6 inches of concrete and be underlain by a minimum of 12 inches of Class 2 aggregate base compacted to a minimum of 95 percent relative compaction. As a minimum, the concrete pavement should include steel reinforcement comprised of No. 5 bars spaced 18 inches on-center each way, placed in the slab mid-depth.

Pavement sections shall be placed on soil surfaces that have been prepared as outlined in the Earthwork section of this report. The full section of the aggregate base should be compacted to a minimum of 95 percent relative compaction (ASTM D1557, latest edition). The Class 2 aggregate base material should conform to Section 26 of the Caltrans Standard Specifications.

6.9 SURFACE DRAINAGE

The areas adjacent to the proposed improvements should be positively sloped away from the building and associated improvements to provide for rapid removal of surface water runoff. Ponding of water adjacent to the structure or seepage toward foundation systems at any time during or after construction should be prevented. To reduce the potential for ponding of water adjacent to the foundation, we recommend that stormwater from roof downspouts be collected in a solid pipe drain system and discharged into an appropriate discharge facility.

6.10 TECHNICAL REVIEW AND CONSTRUCTION OBSERVATION

Before construction, the geotechnical engineer should review the project plans and specifications for conformance with the intent of the recommendations presented in this report. The geotechnical engineer should be contacted a minimum of 48 hours in advance of excavation operations to observe the subsurface conditions.

7. Limitations

The conclusions and recommendations presented in this report are based on the information provided regarding the planned construction and the results of subsurface exploration and laboratory testing by others, combined with extrapolation of the subsurface conditions obtained from the boring locations. Site conditions described in the text of this report are those existing at the time of our last field reconnaissance and are not necessarily representative of the site conditions at other times or locations. This information notwithstanding, the nature and extent of subsurface variations between borings may not become evident until construction. If variations are encountered during construction, Haley & Aldrich should be notified promptly so that conditions can be reviewed and recommendations reconsidered, as appropriate.

It is the Owner's/Client's responsibility to ensure that the recommendations contained in this report are carried out during the construction phases of the project. This report was prepared based on preliminary design information provided, which is subject to change during the design process.

The findings of this report should be considered valid for three years unless the conditions of the site change. After three years, Haley & Aldrich should be contacted to review the site conditions and prepare a letter regarding the applicability of this report.

This report presents the results of a geotechnical and geologic investigation only and should not be construed as an environmental audit or study.

The conclusions and recommendations contained in this report are valid only for the project described in this report. We have employed accepted geotechnical engineering procedures, and our professional opinions and conclusions are made in accordance with generally accepted geotechnical engineering principles and practices. This standard is in lieu of all other warranties, either expressed or implied.

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FIGURES

HALEY ALDRICH

HYDROSCIENCE ENGINEERS
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

SITE LOCATION MAP

MAP SOURCE: ESRI
SITE COORDINATES: 37°9'43"N, 121°39'11"W

APPROXIMATE SCALE: 1 IN = 0.25 MILE
MAY 2025

FIGURE 1

GIS: \\haleyaldrich.com\share\CF\Projects\0210949\GIS\ArcGIS\0210949-000-MORGAN-HILL.aprx - kdrozynska - 11/1/2024 12:30 PM

LEGEND

PROJECT SITE

PROPERTY LINES

SUBSURFACE EXPLORATIONS:

- BORING BY ENGEO, 2015
- CPT BY ENGEO, 2013
- BORING BY LAI & ASSOCIATES, 2013
- INFILTRATION TEST BY ENGEO, 2014

NOTES

1. THE LOCATIONS OF HISTORICAL BORINGS, CPTS, AND INFILTRATION TESTS SHOWN ARE APPROXIMATE.

2. PROPERTY LINES FROM COUNTY OF SANTA CLARA OPEN DATA PORTAL; ACCESSED ONLINE ON 9/7/2022.

3. ORTHOIMAGERY FROM SANTA CLARA COUNTY, 2022; ACCESSED THROUGH ESRI BASEMAP SERVICE.

N

0 200 400
Feet

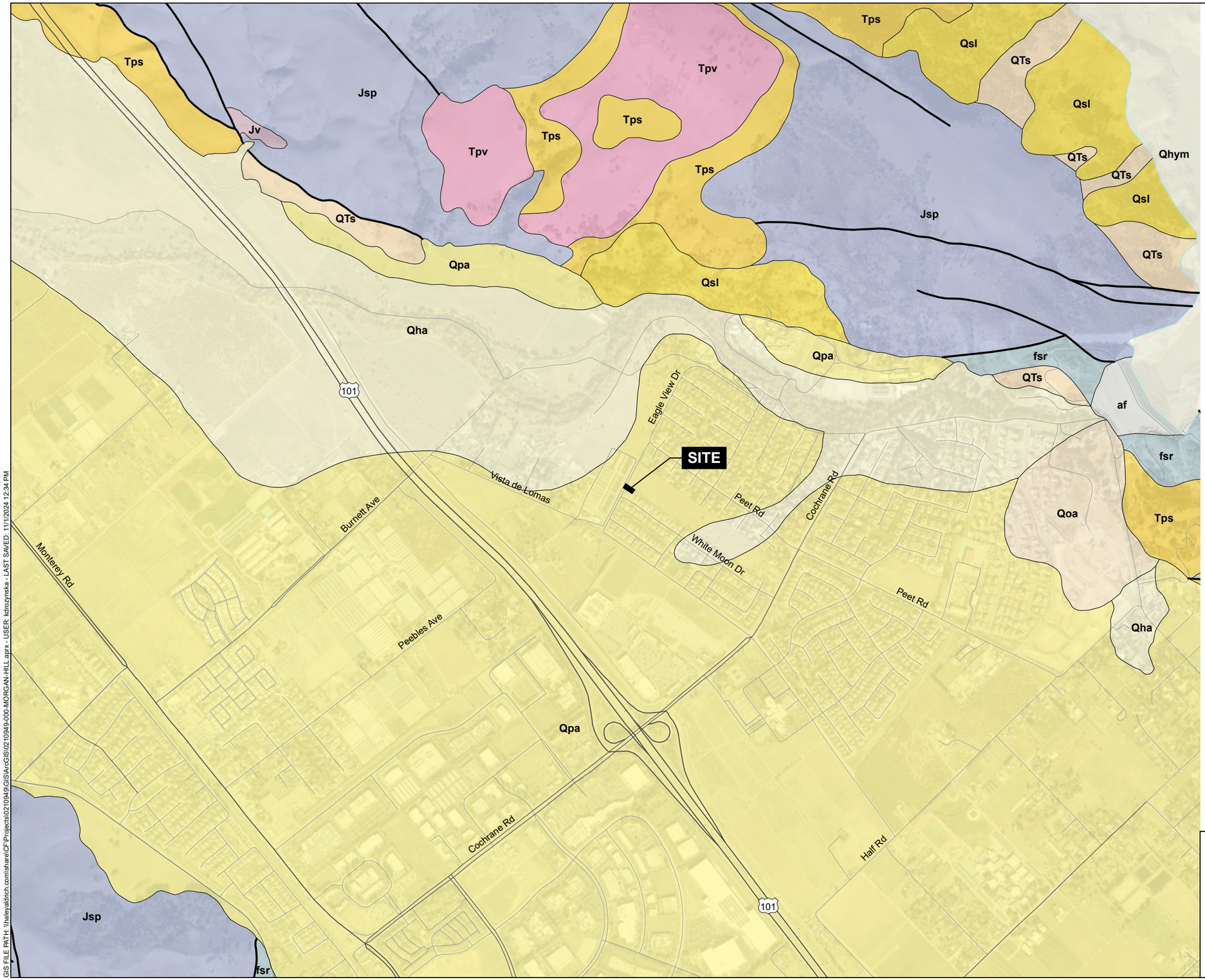
HALEY ALDRICH

HYDROSCIENCE ENGINEERS
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

SITE PLAN

MAY 2025

FIGURE 2



LEGEND

af	ARTIFICIAL FILL
Qhym	MUD DEPOSITS (LATE HOLOCENE)
Qha	ALLUVIUM (HOLOCENE)
Qsl	HILLSLOPE DEPOSITS (QUATERNARY)
Qpa	ALLUVIUM (PLEISTOCENE)
Qoa	ALLUVIUM (EARLY PLEISTOCENE)
QTs	SEDIMENTS (EARLY PLEISTOCENE AND (OR) PLIOCENE)
Tps	SEDIMENTARY ROCKS (PLIOCENE)
Tpv	VOLCANIC ROCKS (PLIOCENE)
fsr	FRANCISCAN COMPLEX MÉLANGE (EOCENE, PALEOCENE, AND (OR) LATE CRETACEOUS)
Jv	GREAT VALLEY COMPLEX VOLCANIC ROCKS (JURASSIC)
Jsp	GREAT VALLEY COMPLEX SERPENTINITE (JURASSIC)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. REGIONAL GEOLOGY FROM GRAYMER, 2006.

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HALEY ALDRICH

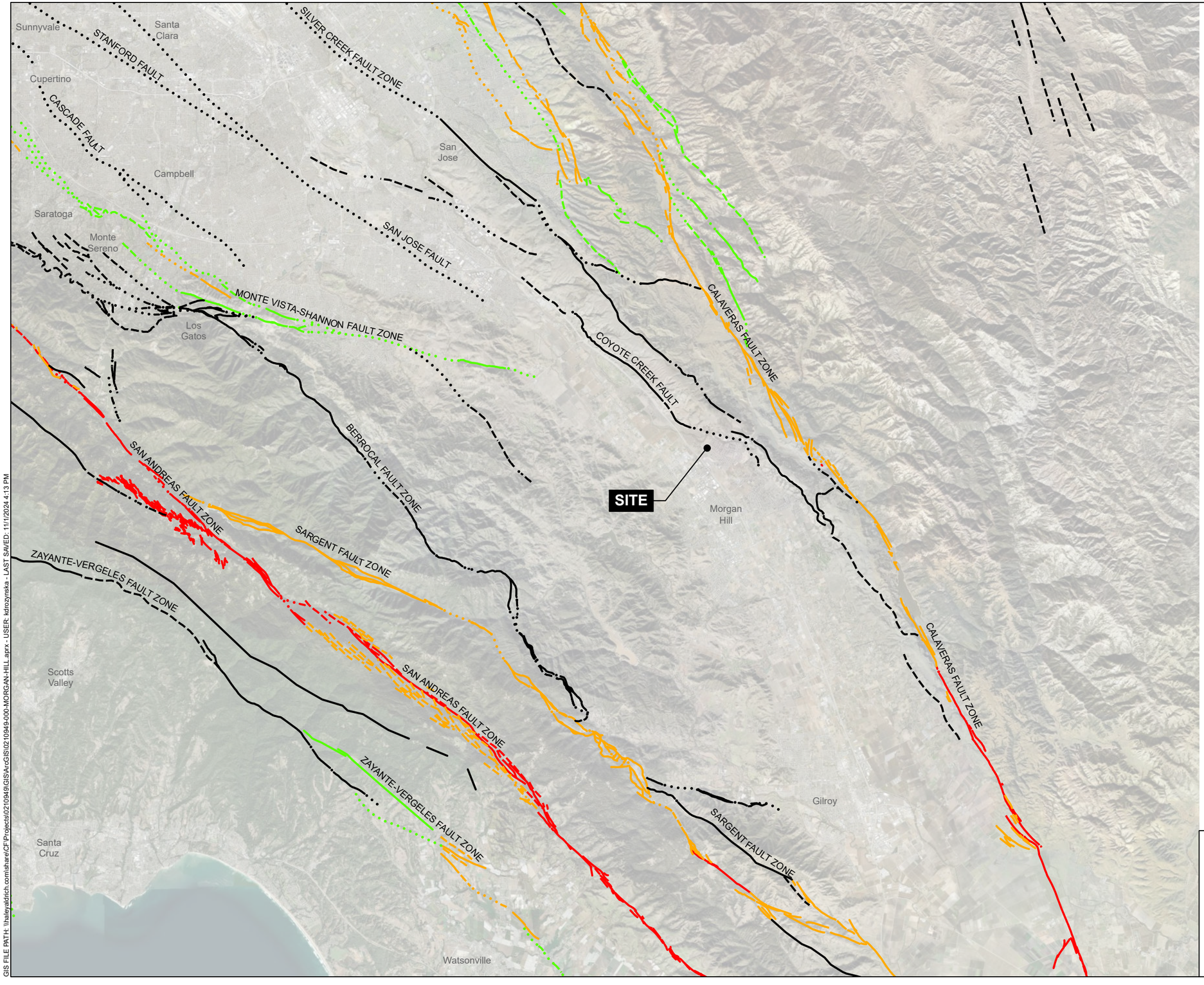
HYDROSCIENCE ENGINEERS
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

REGIONAL GEOLOGY MAP

MAY 2025

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0210949\GIS\ArcGIS\0210949-000-MORGAN-HILL.aprx - USER: kdroszynska - LAST SAVED: 11/1/2024 12:34 PM



LEGEND

QUATERNARY FAULTS BASED ON TIME OF MOST RECENT SURFACE DEFORMATION:

- HISTORICAL (<150 YEARS), WELL CONSTRAINED LOCATION
- HISTORICAL (<150 YEARS), MODERATELY CONSTRAINED LOCATION
- HISTORICAL (<150 YEARS), INFERRED LOCATION
- LATEST QUATERNARY (<15,000 YEARS), WELL CONSTRAINED LOCATION
- LATEST QUATERNARY (<15,000 YEARS), MODERATELY CONSTRAINED LOCATION
- LATEST QUATERNARY (<15,000 YEARS), INFERRED LOCATION
- LATE QUATERNARY (<130,000 YEARS), WELL CONSTRAINED LOCATION
- LATE QUATERNARY (<130,000 YEARS), MODERATELY CONSTRAINED LOCATION
- LATE QUATERNARY (<130,000 YEARS), INFERRED LOCATION
- UNDIFFERENTIATED QUATERNARY(<1.6 MILLION YEARS), WELL CONSTRAINED LOCATION
- UNDIFFERENTIATED QUATERNARY(<1.6 MILLION YEARS), MODERATELY CONSTRAINED LOCATION
- UNDIFFERENTIATED QUATERNARY(<1.6 MILLION YEARS), INFERRED LOCATION

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. FAULT LOCATIONS FROM US GEOLOGICAL SURVEY QUATERNARY FAULTS AND FOLDS DATABASE, ACCESSED ONLINE ON 30 JULY 2021.

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Miles

HALEY ALDRICH

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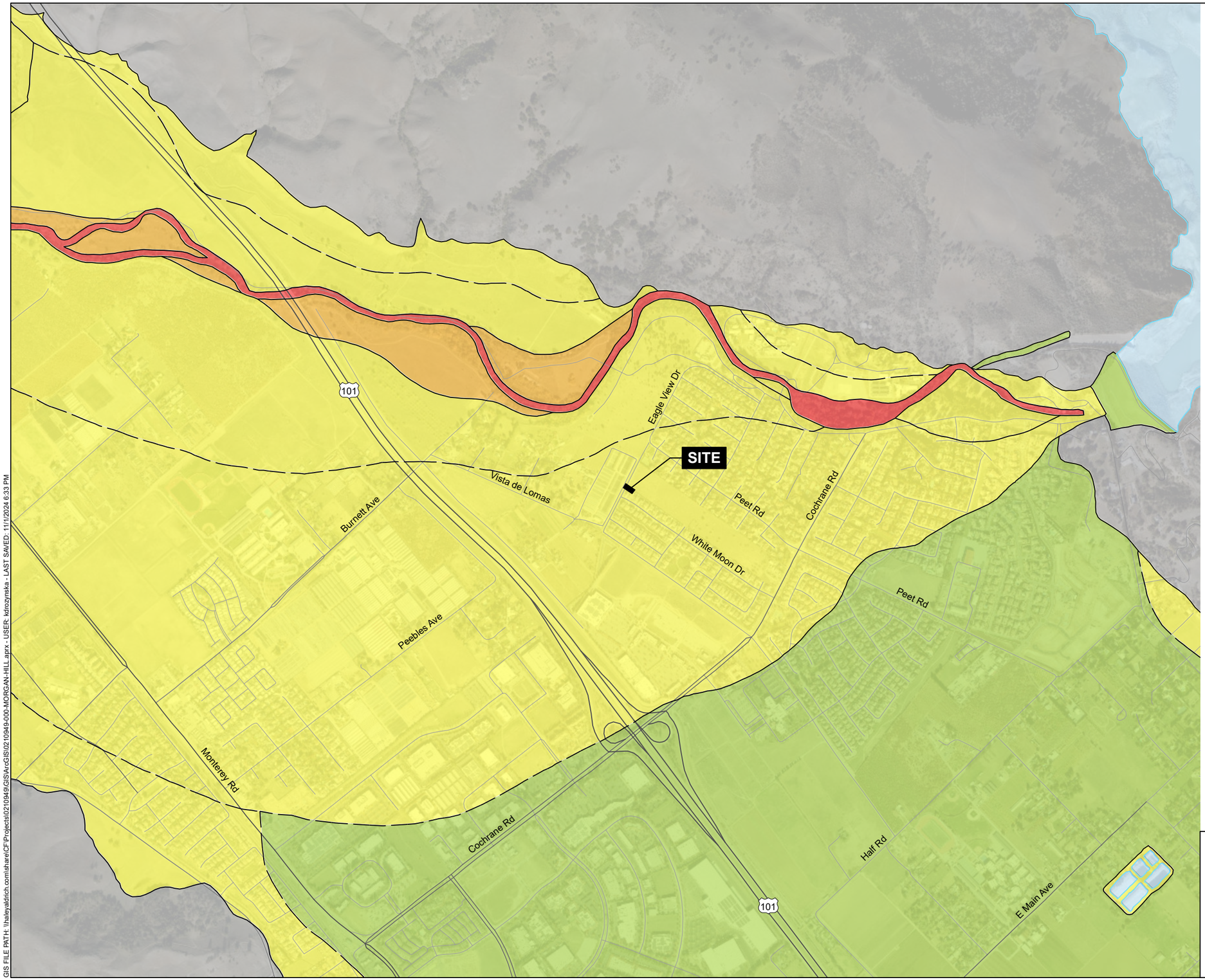
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

FAULT ACTIVITY MAP

MAY 2025

FIGURE 4



LEGEND

LIQUEFACTION SUSCEPTIBILITY:

- VERY HIGH
- HIGH
- MODERATE
- LOW
- VERY LOW
- WATER
- NOT MAPPED

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. LIQUEFACTION SUSCEPTIBILITY FROM WITTER, 2006.

N

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Miles

HALEY ALDRICH

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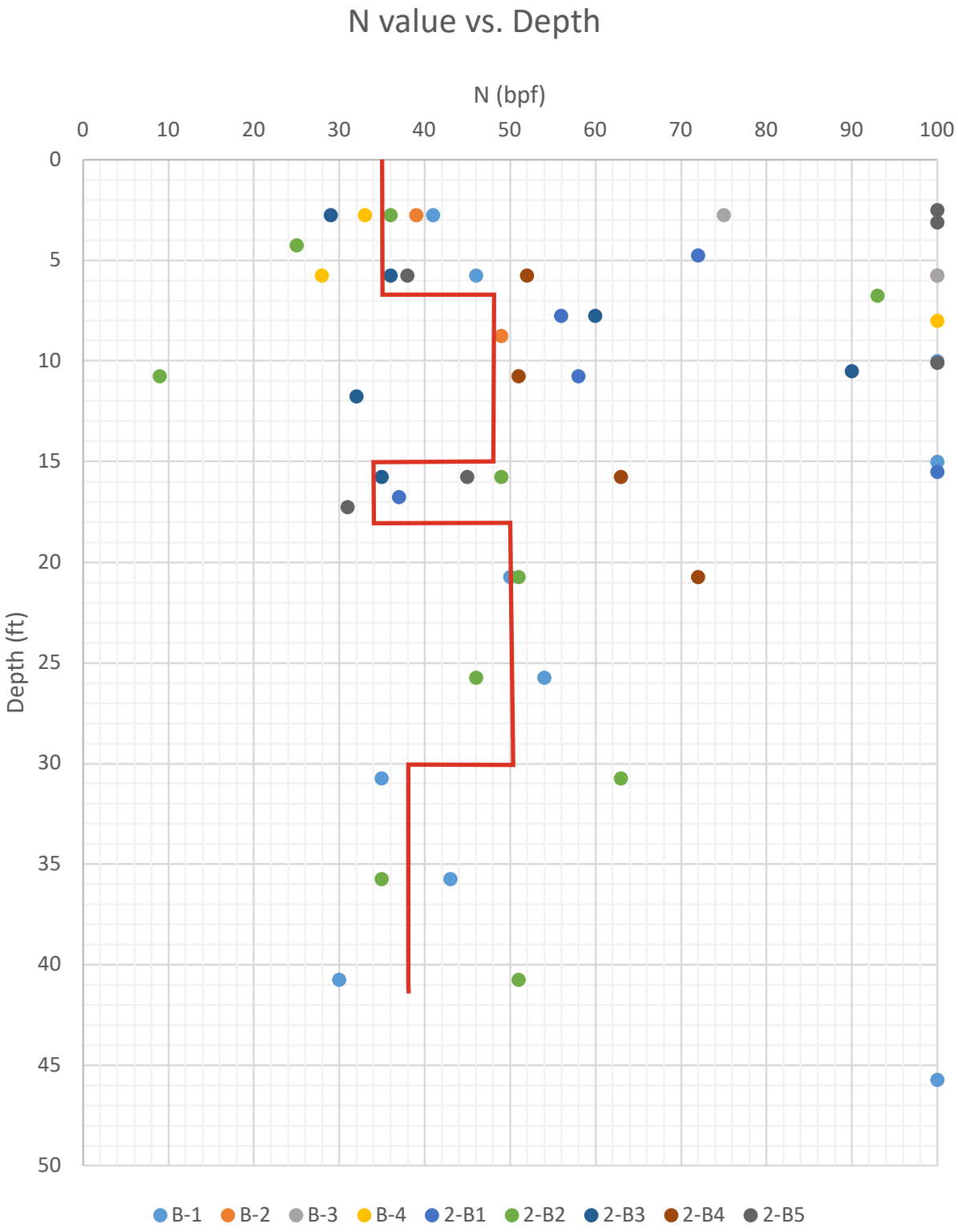
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

LIQUEFACTION SUSCEPTIBILITY MAP

MAY 2025

FIGURE 5



NOTES

1. BORINGS B-1 THROUGH B-4 WERE LOGGED BY LAI & ASSOCIATES (2013). THE SPT HAMMER TYPES WERE UNKNOWN.

2. BORINGS 2-B1 THROUGH 2-B5 WERE LOGGED BY ENGEO (2015). THE SPT HAMMER TYPES WERE AUTOMATIC.

3. SPT N VALUES SHOWN ARE UNCORRECTED.

HALEY ALDRICH

HYDROSCIENCE ENGINEERS
MORGAN HILL WELL FACILITY
MORGAN HILL, CALIFORNIA

HISTORICAL BORINGS
N VALUE VARIATION WITH DEPTH

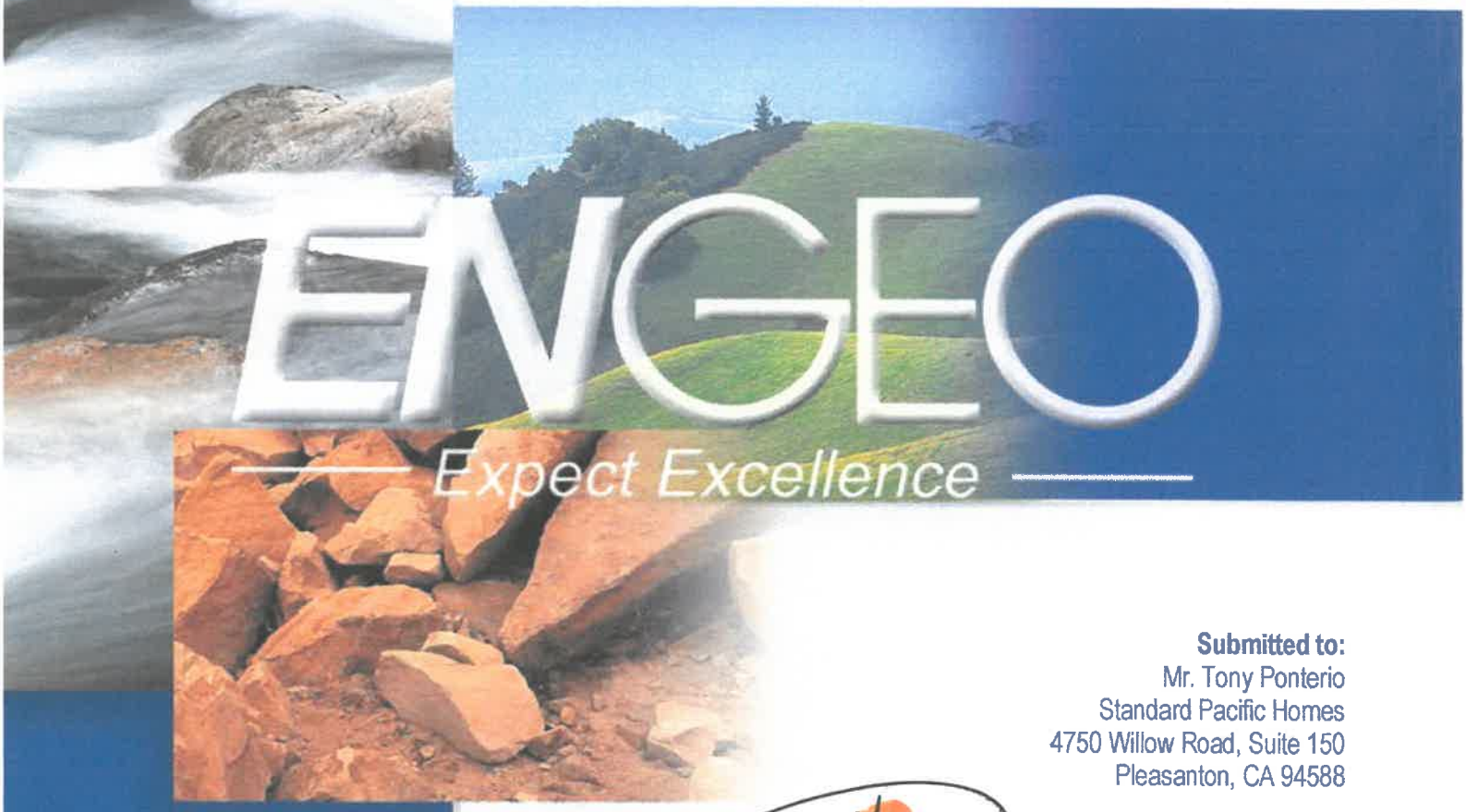
MAY 2025

FIGURE 6

APPENDIX A
Geotechnical Report by ENGEO (2015)

GEOTECHNICAL EXPLORATION

LANTANA WISTERIA
MORGAN HILL, CALIFORNIA



Submitted to:
Mr. Tony Ponterio
Standard Pacific Homes
4750 Willow Road, Suite 150
Pleasanton, CA 94588

Prepared by:
ENGEO Incorporated

October 9, 2015

Project No.
10451.000.000

ALL OK

Reviewed by Robert W. Williamson (Harris & Assoc.)
on Nov. 12, 2015

ENGEO
Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
10451.001.000

October 9, 2015

Mr. Tony Ponterio
Standard Pacific Homes
4750 Willow Road, Suite 150
Pleasanton, CA 94588

Subject: Lantana Wisteria
Morgan Hill, California

GEOTECHNICAL EXPLORATION

Dear Mr. Ponterio:

With your authorization, we completed this geotechnical exploration report for the proposed Lantana Wisteria project located in Morgan Hill, California. The accompanying geotechnical exploration report presents our field exploration and laboratory testing together with our conclusions and recommendations regarding residential development at the site.

Our findings indicate that the study area is suitable for the proposed residential development provided the recommendations of this report are incorporated into project design and implemented during construction. We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Sincerely

ENGEO Incorporated

PROFESSIONAL GEOLOGIST
GREGORY CUBBON
No. 8928
STATE OF CALIFORNIA

Greg Cubbon, PG

REGISTERED PROFESSIONAL ENGINEER
PAUL C. GUERIN
No. 2099
GEOTECHNICAL
STATE OF CALIFORNIA

Paul C. Guerin, GE

Mathew Clark, EIT

TABLE OF CONTENTS

Letter of Transmittal

Page

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this geotechnical report, as described in our proposal dated September 14, 2015, is to provide design-level geotechnical recommendations associated with the proposed residential development of the site.

We performed the following services:

- Review of available literature, previous reports and geologic maps for the study area.
- Subsurface exploration consisting of six soil borings to supplement data from previous geotechnical feasibility assessments and infiltration testing at the subject site (ENGEO, 2013 and 2014 and Lai & Associates, 2013).
- Laboratory testing of materials sampled during the field exploration.
- Geotechnical data analyses.
- Report preparation summarizing our conclusions and recommendations for the proposed development.

Our services are based on the following plan set:

> Improvement Plans for Lantana - Wisteria, Tract 10332, City of Morgan Hill, California, prepared by Ruggeri-Jensen-Azar (RJA), 1st Submittal dated September 29, 2015.

We prepared this report exclusively for Standard Pacific Homes and their design team consultants. ENGEO should review any changes made in the character, design or layout of the development to modify the conclusions and recommendations contained in this report, as necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without the express written consent of ENGEO.

1.2 SITE LOCATION AND DESCRIPTION

The property consists of two parcels identified as APN 728-36-013 and 728-36-014, totaling approximately 40 acres, in Morgan Hill, California. As shown on Figures 1 and 2, the site is generally bounded by Cochrane Road to the southeast, open fallow land on the northeast and southwest and agricultural use to the northwest. The project site slopes gently down to the northwest and site elevations vary from El. 378 feet to 394 feet above mean sea level. The site is currently vacant and covered with seasonal grass and shrubs, with the exception of the southern portion of the site, which contains vines associated with a former vineyard. A depression of approximately 5000 square feet in the northwest corner of the site includes stockpiles of undocumented fill, cobbles and debris covering approximately 300 square feet up to 4 feet in height.

1.3 PROPOSED DEVELOPMENT

Based on the referenced plans prepared by RJA, it is our understanding that the site will be developed into a residential subdivision consisting of 121 single-family detached units and 14 single-family attached units with associated streets, underground utilities, bioretention facilities, and landscaping.

1.4 AERIAL PHOTOGRAPH REVIEW

We reviewed individual aerial photographs of the site dated 1939, 1956, 1968, 1974, 1982, 1998, 1999, 2005, 2006, 2009, 2010 and 2012 provided by Environmental Data Resources (EDR).

Review of the photographs indicates that the property was used as agricultural land containing orchards and open pasture since at least 1939. The vineyard located on the southern portion of the property is first visible in the photograph dated 1998. Little about the site appears to change throughout the remaining photographs reviewed.

1.5 PREVIOUS STUDIES

ENGEO performed a Geotechnical Feasibility Assessment in August 2013, which included five cone penetration test (CPT) probes extending between 9 and 25 feet below ground surface (bgs) distributed throughout the site. The CPT logs are included in Appendix B. ENGEO also performed four infiltration tests for the subject property in August 2014 and a Modified Phase I Environmental Site Assessment (ESA) in August 2013 that was updated in March 2015.

In addition to previous in-house studies, we were provided with a preliminary geotechnical report previously prepared by Lai & Associates (2013) for our review. In June 2013, Lai & Associates conducted a field exploration consisting of four exploratory borings to depths ranging from 7 to 46.5 feet. Figure 2 depicts the approximate locations of the previous borings. The borelogs and laboratory test results by others are included in Appendix C. We incorporated geotechnical information from the report by Lai & Associates into our analyses for this study, as deemed appropriate.

2.0 GEOLOGY AND SEISMICITY

2.1 SITE SOILS AND GEOLOGY

Regional geologic mapping by Wentworth et al (1999, Figure 3) indicates the majority of the site is underlain by Upper Pleistocene alluvial deposits (Qpf) with a portion of the center of the site mapped as Holocene-age levee deposits (Qhl).

Similarly, regional geologic mapping by Dibblee (2005) indicates that the site is underlain by undifferentiated Quaternary-age alluvium (Qa) consisting of gravel, sand and clay of the valleys.

2.2 SITE SEISMICITY

The site is not located within a State of California Earthquake Fault Zone (Morgan Hill Quadrangle, 1982), and no known active faults cross the site. The nearest known active[1] fault surface trace is the Calaveras fault mapped approximately 3.1 miles northeast of the site. Other nearby active faults include the Monte-Vista Shannon fault mapped approximately 11 miles northwest of the site; the San Andreas fault mapped approximately 11.6 miles southwest of the site; and the Zayante Vergeles fault mapped approximately 15.1 miles southwest of the site.

Potentially active quaternary faults mapped by USGS near the site include the Coyote Creek fault, located approximately 0.6 miles northeast of the site, and the Silver Creek fault, approximately 1.3 miles northeast of the site.

The region is considered seismically active because of the presence of nearby active faults. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. Figure 4 shows the approximate locations of these faults and significant historic earthquakes recorded within the Greater Bay Area Region.

3.0 FIELD EXPLORATION

The field exploration for this study was conducted on September 18, 2015, and consisted of drilling six exploratory borings within the property. Figure 2 presents the approximate locations of the exploratory borings as well as the locations of previous explorations carried out by ENGEO and others. Locations were obtained by taping or pacing from existing features; therefore, they should be considered accurately located only to the degree implied by the method used.

One test boring, 2-B2, was drilled using a truck-mounted drill rig equipped with a 6-inch-diameter mud rotary drill. This boring reached a maximum depth of 26½ feet below the ground surface and was terminated due to gravel and cobbles creating adverse drilling conditions. The remainder of the borings were drilled using a truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. These borings were advanced to depths ranging between 16½ feet and 41½ feet. ENGEO engineers logged the borings in the field and collected soil samples using either a 3-inch outside diameter (O.D.) Modified California-type split-spoon sampler fitted with 6-inch-long brass liners or a 2-inch outside diameter (O.D.) Standard Penetration Test split-spoon sampler. The samplers were driven with a 140-pound safety hammer falling a distance of 30 inches employing an automatic trip system.

We recorded the penetration of the samplers into the native materials as the number of blows needed to drive the sampler 18 inches in 6-inch increments. The boring logs record blow count results as the actual number of blows required for the last one foot of penetration; no conversion

[1] The State Mining and Geology Board define an active fault as one that has had surface displacement within Holocene time (about the last 11,000 years). The State of California has prepared maps designating zones for special studies that contain these active earthquake faults.

factors have been applied. We used the field logs to develop the report boring logs, which are presented in Appendix A.

The logs depict subsurface conditions within the borings at the time of exploration. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in altered subsurface conditions. In addition, stratification lines represent the approximate boundaries between soil types and transitions may be gradual.

3.1 LABORATORY TESTING

We performed the following tests on select samples recovered during drilling to determine soil characteristics:

TABLE 3.1-1

Soil Characteristic	Testing Method	Location of Results
Natural Unit Weight and Moisture Content	ASTM D-2216, D-7263	Appendix A
Atterberg Limits	ASTM D-4318	Appendix D
Grain Size Distribution	ASTM D-422, D-1140	Appendix D
Corrosivity Testing (Redox, pH, Resistivity, Sulfide, Chloride, Sulfate)	ASTM D-1498, D-4972, G57, D-4658M, D-4327	Appendix D

The laboratory test results are shown on the borelogs (Appendix A), with individual test results presented in Appendix D.

3.2 SUBSURFACE CONDITIONS

In general, the subsurface conditions predominantly consist of dense to very dense sands and gravels with varying clay content. Our previous CPT probes and soil borings by others indicated similar soil conditions when compared to the borings advanced as part of our current study. It should be noted that our previous CPT probes were all terminated before reaching the target depth of 50 feet below the ground surface (bgs) due to refusal at shallower depths.

3.3 GROUNDWATER

Groundwater was not encountered at our current boring locations or at prior exploration locations from previous studies. Review of the State of California Seismic Hazard Report for the Morgan Hill 7.5 Minute Quadrangle (2004) indicates that historic groundwater highs range approximately 25 feet below the existing ground surface at the northwest portion of the site to 50 feet below existing ground surface at the southeast portion of the site. It should be recognized that fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice and other factors not evident at the time measurements were made.

4.0 DISCUSSION AND CONCLUSIONS

The site was evaluated with respect to known geologic hazards common to the greater San Francisco Bay Region. The primary hazards and the risks associated with these hazards with respect to the planned development are discussed in the following sections of this report.

4.1 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, soil liquefaction, lateral spreading and landsliding. The following sections present a discussion of these hazards as they apply to the site.

Based on topographic and lithological data, risk from earthquake-induced regional subsidence/uplift, ground lurching, tsunamis and seiches is considered low at the site.

4.1.1 Ground Rupture

The site is not located within a State of California Earthquake Fault Hazard Zone (Morgan Hill Quadrangle, 1982) and no known active faults cross the site. Therefore, we conclude that the risk of surface fault rupture within the planned residential lots at the site is low.

4.1.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the 2013 California Building Code (CBC) requirements, as a minimum. Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead-and-live loads. The code-prescribed lateral forces are generally considered substantially smaller than the comparable forces that would be associated with a major earthquake. Therefore, structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage.

Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse or cause loss of life in a major earthquake (SEAOC, 1996).

4.1.3 Liquefaction Potential

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary loss of shear strength because of pore pressure buildup under the cyclic shear stresses associated with earthquakes. Review of regional geologic mapping by Wentworth et al. (1999, Figure 3) indicates that the majority of the site is underlain by Pleistocene-age alluvial deposits, which typically have a low to very low liquefaction potential. However, the northwestern half of the site is mapped within a State of California zone of potential liquefaction (Figure 5) while the southeastern portion is not. As previously discussed, historic groundwater highs are approximately 25 to 50 feet below the existing ground surface.

A liquefaction analysis was performed to evaluate liquefaction hazard at the subject property using data obtained from ENGEO borings 2-B2 and 2-B2A as well as boring B-1 by Lai & Associates. Our analyses considered a peak ground acceleration (PGA) of 0.65g, a Mw of 7.9, and a conservatively assumed groundwater level of 25 feet bgs across the site. Based on methodologies by Youd et al. (2001) and Idriss and Boulanger (2008), soils encountered below the design groundwater depth of 25 feet bgs are too dense to liquefy. However, based on analysis methodology by Seed et al. (2003), gravelly deposits between 30 and 40 feet bgs and with a cumulative thickness of approximately 10 feet are potentially liquefiable. The results of our liquefaction analyses are included in Appendix E of this report.

4.1.4 Lateral Spreading

Lateral spreading is a failure within a nearly horizontal soil zone, possibly due to liquefaction, that causes the overlying soil mass to move toward a free face or down a gentle slope.

The potentially liquefiable deposits are situated at a depth of 30 feet or deeper. Due to the lack of free slope faces at this elevation in the vicinity of the site, it is our opinion the potential for lateral spreading is low.

4.1.5 Seismic-Induced Ground Settlement

Results of the liquefaction analysis using methodologies prescribed by Seed (2003) indicated that a 10-foot-thick dense gravelly layer encountered at approximately 35 feet bgs is potentially liquefiable. We evaluated the soils for potential settlement amounts in the event of a large earthquake by Tokimatsu & Seed (1987) and Ishihara & Yoshimine (1992) methodologies. Based on the methodologies described above, we conservatively estimate liquefaction-induced vertical settlement is in the range of 1 inch or less.

4.2 FLOODING

The project Civil Engineer should be consulted on the potential for localized flooding at the subject site. The review should also include a determination of whether the site falls below the 100-year flood plain elevation.

4.3 EXISTING FILLS

Undocumented fills were not observed in the ENGEO exploratory borings; however, the Phase I Environmental Site Assessment report indicates that stockpiles measuring 3 to 5 feet high extend across a few thousand square feet within a natural depression located in the north corner of the site. In addition, undocumented fill associated with previously demolished structures and buried utilities may be present.

Common mitigation techniques for non-engineered fills, if within or at the margin of the grading limits, include removal and replacement as engineered fill, provided the material is deemed suitable for reuse by the Geotechnical Engineer at the time of grading.

4.4 EXPANSIVE SOILS

Two samples of near surface site materials were tested for Plasticity Index (PI) and yielded values of 8 and 9. It is our opinion that near surface materials are expected to have a low expansion potential.

4.5 CORROSIVITY CONSIDERATIONS

An evaluation of possible corrosion impacts to site improvements has been conducted on the site soils. Two representative samples of the site soils were submitted under chain of custody to CERCO Analytical for full corrosivity testing. The samples were tested for redox potential, pH, resistivity, soluble sulfate and chloride ion concentrations. These tests provide an indication of the corrosion potential of the soil environment on buried concrete structures and metal pipes. The results are summarized below with the laboratory test results prepared by CERCO Analytical, Inc. contained in Appendix D.

TABLE 4.5-1
Corrosivity Test Results

Sample ID	Redox Potential (mV)	pH	Resistivity (ohms-cm)	Chloride Ion* (mg/kg)	Soluble Sulfate* (mg/kg)	Sulfide** (mg/kg)
2-B1 @ 1.5-3'	470	7.14	6300	ND	ND	ND
2-B4 @ 0-3'	460	6.80	7400	ND	ND	ND

* ND = not detected above the reporting limit of 15 mg/kg.
** ND = not detected above the reporting limit of 50 mg/kg.

The above corrosivity test results should be considered when designing underground vaults, critical buried pipelines and related site improvements. A corrosion specialist should be consulted for corrosivity design and protection. As indicated in the CERCO laboratory letter (Appendix D), because of the resistivity measurements indicating a "moderately corrosive" potential, buried metal and steel should be protected against corrosion.

The sulfate tests yielded non-detectable test results. The primary purpose for sulfate corrosion testing is to determine if sulfate-resistant concrete is needed for foundation construction. The CBC references the American Concrete Institute Manual, ACI 318 (Chapter 4) for concrete requirements. ACI tables provide the following sulfate exposure categories and classes and concrete requirements in contact with soil based upon the exposure risk.

TABLE 4.5-2
Sulfate Exposure Categories and Classes

Sulfate Exposure Category S	Exposure Class	Water- Soluble Sulfate in Soil % by Weight	Dissolved Sulfate in Water mg/kg (ppm)
Not Applicable	S0	$SO_4 < 0.10$	$SO_4 < 150$
Moderate	S1	$0.10 \leq SO_4 < 0.20$	$150 \leq SO_4 \leq 1,500$ seawater
Severe	S2	$0.20 \leq SO_4 \leq 2.00$	$1,500 \leq SO_4 \leq 10,000$
Very Severe	S3	$SO_4 > 2.00$	$SO_4 > 10,000$

TABLE 4.5-3
Requirements for Concrete by Exposure Class

Exposure Class	Max w/cm	Min f'c (psi)	Cement Type			Calcium Chloride Admixture
			ASTM C150	ASTM C595	ASTM C1157	
S0	N/A	2500	No Type restriction	No Type restriction	No Type restriction	No restriction
S1	0.5	4000	II†‡	IP(MS), IS(<70), (MS)	MS	No restriction
S2	0.45	4500	V‡	IP(HS), IS(<70), (HS)	HS	Not permitted
S3	0.45	4500	V + pozzolan or slag§	IP(HS) + pozzolan or slag or IS(<70) (HS) + pozzolan or slag§	HS + pozzolan or slag§	Not permitted

Notes:
† For seawater exposure, other types of portland cements with tricalcium aluminate (C_3A) contents up to 10 percent are permitted if the w/cm does not exceed 0.40.
‡ Other available types of cement such as Type III or Type I are permitted in Exposure Classes S1 or S2 if the C_3A contents are less than 8 or 5 percent, respectively.
§ The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record to improve sulfate resistance when used in concrete containing Type V cement. Alternatively, the amount of the specific source of the pozzolan or slag to be used shall not be less than the amount tested in accordance with ASTM C1012 and meeting the criteria in ACI 4.5.1.

According to the test results, the onsite soils have a non-detectable sulfate ion concentration. Therefore, based on the test results, the near-surface soils are classified as Sulfate Exposure Class S0. Cement type and water-cement ratio are not specified by the CBC for this range but the minimum concrete strength is specified to be 2,500 psi. As minimum requirements, we

recommend that Type II cement and a concrete mix design that incorporates a maximum water-cement ratio of 0.5 and a minimum compressive strength of 3,000 psi be used in foundation concrete for structures at the project site. It should be noted; however, that the structural engineering design requirements for concrete may result in more stringent concrete specifications.

Testing was not completed for all depths of potential embedment or across the entire site. If requested, we can provide additional testing and/or guidance regarding the exposure risk for sulfates. It is recommended that additional chemical tests be conducted on the subgrade soils after grading of the pads is completed, but prior to building and utility construction.

4.6 SEISMIC DESIGN CRITERIA

We provide the 2013 CBC seismic parameters in Table 4.6-1 for your use.

TABLE 4.6-1
2013 CBC Seismic Design Parameters

Parameter	Current Design Value 2013 CBC
Site Class	D
Mapped MCE_R spectral response accelerations for short periods, S_S (g)	1.71
Mapped MCE_R spectral response accelerations for 1-second periods, S_1 (g)	0.63
Site Coefficient, F_A	1.00
Site Coefficient, F_V	1.50
MCE spectral response accelerations for short periods, S_{MS} (g)	1.71
MCE spectral response accelerations for 1-second periods, S_{M1} (g)	0.94
Design spectral response acceleration at short periods, S_{DS} (g)	1.14
Design spectral response acceleration at 1-second periods, S_{D1} (g)	0.63
Mapped MCE Geometric Mean Peak Ground Acceleration (g)	0.65
Site Coefficient, F_{PGA}	1.00
MCE Geometric Mean Peak Ground Acceleration, PGA_M (g)	0.65
Long period transition-period, T_L	12 seconds

Latitude: 37.1594; Longitude: -121.6502

The seismic design parameters presented in the 2013 CBC seismic parameters are based upon the 2012 International Building Code and the ASCE standard "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-10) published in 2010. We used the USGS Seismic Design Map online tool to develop ASCE 7-10 seismic design parameters.

4.7 CONCLUSIONS

It is our opinion, based on this exploration and laboratory test results and previous explorations at the site, that the proposed residential development is feasible from a geotechnical standpoint provided the site is prepared in accordance with the recommendations contained herein. The recommendations included in this report, along with other sound engineering practices, should be incorporated in the design and construction of the project.

5.0 RECOMMENDATIONS

5.1 GRADING

We anticipate that grading will consist of minor cuts and fills within the site to achieve finished grades. Grading operations should meet the requirements of the Supplemental Recommendations (Appendix F) and should be observed and tested by ENGEO's field representative. ENGEO should be notified a minimum of three days prior to grading in order to coordinate its schedule with the grading contractor.

5.1.1 Demolition and Stripping

Site demolition includes the removal of structures, foundations, and buried structures, including abandoned utilities and septic tanks and their leach fields, if any exist. Debris and soft compressible soils should be also removed from any location to be graded, from areas to receive fill or structures, or those areas to serve as borrow. The depth of removal of such materials should be determined by the Geotechnical Engineer in the field at the time of grading.

Existing vegetation should be removed from areas to receive fill or improvements, or those areas to serve for borrow. Tree roots, if any are found, should be removed down to a depth of at least 3 feet below existing grade. Any topsoil that will be retained for future use in landscape areas should be stockpiled in areas where it will not interfere with grading operations.

No loose or uncontrolled backfilling of depressions resulting from demolition and stripping or other soil removal should be permitted. Depressions and subexcavations should have their locations and depths as-built prior to backfilling. A representative of our office should be present during stripping to observe the potential presence of undocumented fills, subsurface structures and unsuitable materials.

All excavations from demolition and stripping below design grades should be cleaned to a firm undisturbed soil surface determined by the Geotechnical Engineer. This surface should then be scarified, moisture conditioned, and backfilled with compacted engineered fill. All backfill materials should be placed and compacted as engineered fill according to the recommendations in a subsequent section.

5.1.2 Selection of Materials

With the exception of construction debris (wood, brick, asphalt, concrete, metal, etc.), trees, and organically contaminated materials (soil which contains more than 3 percent organic content by weight), we anticipate the site soils are suitable for use as engineered fill. Other materials and debris, including trees with their root balls, should be removed from the project site. Subject to approval by the Landscape Architect, organically contaminated soil may be stockpiled in approved areas located outside of the grading limits for future placement within landscape areas, infiltration/bioretention basins, or any open space within the site.

Alluvial cobbles and boulders with a maximum dimension of greater than 6 inches may be present in deep cuts. If encountered, oversized materials should not be placed within the upper two feet of fill within building pads. Below two feet from finished pad grade, the cobble or boulder size placed in the engineered fill should not exceed 12 inches in any dimension. Larger sizes should be broken mechanically by heavy bulldozers rolling on them or by a pneumatic hammer mounted on a backhoe. If this is not desirable, larger cobbles and boulders can be placed in non-structural fills, used for landscaping or removed from site. Cobbles and boulders should be spread and mixed with finer soil and should not be allowed to nest. Engineered fills consisting of large fragments only are not allowed. The cobbles/boulders should be mixed with fines at a ratio of 1 to 10, or one load of cobbles/boulders to 10 loads of fines.

The Geotechnical Engineer should be informed when import materials are planned for the site. Import materials should be submitted to, and approved by, the Geotechnical Engineer prior to delivery at the site and should conform to the requirements provided in the Supplemental Recommendations (Appendix F).

5.2 EXISTING FILLS

Existing fills encountered during grading should be removed to expose non-yielding native materials. In general, existing fills can be reused as engineered fill if deemed suitable and placed in accordance with the Fill Placement section of this report and under the observation and testing of a representative from ENGEO. Debris and other deleterious materials within the existing fill, if present, should be removed to the satisfaction of the Geotechnical Engineer or their field representative. No loose or uncontrolled backfilling of depressions resulting from removal of undocumented fill material should be permitted.

5.3 GRADED SLOPES

We recommend graded fill slopes less than 10 feet in vertical height be no steeper than 2:1. In addition, cut slopes should be rebuilt as engineered fill. Cut-fill transition slopes should also be overexcavated and reconstructed as fill slopes. All fill slopes should be adequately keyed into firm natural materials unaffected by shrinkage cracks.

Steeper and higher graded slopes can be constructed based on results of slope stability analysis and may require geogrid reinforcement or the use of select fill. ENGEO should review the grading plans and provide supplemental remedial grading recommendations as necessary.

5.4 SURFICIAL PAD TREATMENT

We recommend that all lots be underlain with a minimum of two feet of engineered fill beneath proposed pad grades. This recommendation will provide a relatively uniform, moisture conditioned state for the foundation subgrade soils. Moisture and compaction recommendations are provided in a subsequent section of this report.

At lots that are located within cut or cut-to-fill transitions, the upper two feet below proposed pad grade should be subexcavated and replaced with engineered fill. Lots located in fill areas should also contain a minimum of two feet of engineered fill beneath the proposed pad grades, which may require over-excavation following stripping of the near surface soils, depending on the depth of stripping.

5.5 DIFFERENTIAL FILL THICKNESS

Depending upon the depths of excavations required for removal of undocumented fill or for any other reason, a differential fill condition may arise that could adversely impact the performance of the residential foundations.

For grading activities that create a differential fill thickness across a building footprint, mitigation to reduce sharp transitions in fill thickness across the pad is beneficial for the performance of a shallow foundation system. We recommend that a differential fill thickness of up to 10 feet is acceptable across a building footprint. Pads with a differential fill thickness that exceeds 10 feet across a building footprint should be subexcavated such that the differential is reduced to 10 feet. The excavation limits should extend at least 5 feet beyond the proposed building perimeter. The excavation should be backfilled with engineered fill.

5.6 FILL PLACEMENT

Once a suitable firm base is achieved for general fill areas, the exposed non-yielding surface should be scarified to a depth of 10 inches, moisture conditioned, and recompacted to provide adequate bonding with the initial lift of fill. All fills should be placed in thin lifts, with the lift thickness not to exceed 10 inches or the depth of penetration of the compaction equipment used, whichever is less.

We recommend the following compaction control requirements for site soils and low expansion import.

General fill areas:

Required Moisture Content:	Not less than 2 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 92 percent

Pavement Subgrade:

Required Moisture Content:	Not less than 2 percentage points above optimum moisture content.
Minimum Relative Compaction:	Not less than 95 percent

Relative compaction refers to in-place dry density of the fill material expressed as a percentage of the maximum dry density based on ASTM D-1557. Optimum moisture is the moisture content corresponding to the maximum dry density. Specific compaction recommendations of imported fill material may be provided upon approval of the import source.

5.7 MONITORING AND TESTING

It is important that all site preparations for site grading be done under the observation of the Geotechnical Engineer's field representative. The Geotechnical Engineer's field representative should observe all graded area preparation, including demolition and stripping, following the recommendations contained in the Supplemental Recommendations in Appendix F. The final grading plans should be submitted to the Geotechnical Engineer for review.

5.8 SURFACE DRAINAGE

The lots must be positively graded at all times to provide for rapid removal of surface water runoff away from the foundation systems, and to prevent ponding of water under foundations or seepage toward the foundation systems at any time during or after construction. Ponded water may cause undesirable soil swell and loss of strength. As a minimum requirement, finished grades should have slopes of at least 5 percent within 10 feet from the exterior walls and at right angles to allow surface water to drain positively away from the structures. For paved areas, the slope gradient can be reduced to 2 percent.

All surface water should be collected and discharged into outlets approved by the Civil Engineer. Landscape mounds must not interfere with this requirement. In addition, each lot should drain individually by providing positive drainage or sufficient area drains around the building to remove excessive surface water.

All roof storm water should be collected and directed to downspouts. Storm water from roof downspouts should not be allowed to discharge directly onto the ground surface. Rather, storm water from roof downspouts should be directed to a solid pipe that discharges into the street or to an outlet approved by the Civil Engineer. If this is not acceptable, we recommend downspouts discharge at least 5 feet away from foundations.

The occurrence of surface water infiltrating, ponding, and saturating the foundation soils can cause loss of soil strength of the foundation soils. If at any time adequate drainage away from the foundation cannot be achieved, then additional measures to hinder saturation of foundation soils must be provided. This may be accomplished by installing a perimeter subdrain system or

additional area drains. If utilized, subdrain facilities and surface water collections systems should not be connected together.

5.9 STORMWATER INFILTRATION DESIGN

5.9.1 Detention Basin Design

Bioretention areas are currently planned along the centerline of the site, with the largest areas located near the center of the property. A "Stormchamber" underground detention system is proposed beneath the largest bioretention area and should be installed per the manufacturer's instructions. The side slopes of any basins should be designed in accordance with the "Graded Slope" section of this report.

Infiltration rates of site soils within the subject property were previously measured and reported by ENGEO in a letter dated August 5, 2014. The measured infiltration rate at 3 feet bgs at 1-P1 and 1-P4, at the southwest and northeast ends of the site respectively, ranged from 2.5 to 15.3 inches per hour. At 1-P2 and 1-P3, located near the center of the site, the infiltration rate was measured to be 4.1 to 4.3 inches per hour between 6.5 and 8 feet bgs.

5.9.2 Bioretention Areas and Flow-Through Planters Design

We recommend that bioretention and filtration features be planned a minimum of 5 feet away from structural site improvements, such as: buildings, streets, retaining walls, or sidewalks/driveways where practical. When this is not practical, bioretention areas located within 5 feet of structural site improvements can be either: A) constructed with structural side walls capable of withstanding the loads from the adjacent improvements or B) the filter material should be compacted to between 85 and 90 percent relative compaction (ASTM D1557, latest edition) and that the design incorporate a moisture retarder or water proofing membrane for the bioretention excavation. The choice of moisture retarder or water proofing membrane will be dependent on the type of improvements adjacent to the bioretention and filtration features.

Site improvements located adjacent to bioretention areas that are underlain by base rock, sand, or other granular materials should be designed with a deepened edge that extends below the bottom of the granular material.

Given the nature of bioretention systems and possible proximity to improvements, we recommend ENGEO be retained to review design plans and provide testing and observation services during the installation of linings, compaction of the filter material, and connection of designed drains.

It should be noted that the contractor is responsible for conducting all excavating and shoring in a manner that does not cause damage to adjacent improvements during construction and future maintenance of the bioretention areas. As with any excavation adjacent to improvements, the contractor should minimize the exposure time such that the improvements are not detrimentally impacted.

5.10 REQUIREMENTS FOR LANDSCAPING IRRIGATION

It is important to avoid adverse drainage or irrigation conditions near building foundations. We recommend planted areas adjacent to a structure utilize plants that require little moisture. Moreover, sprinkler systems should not be installed where they may cause ponding or saturation of foundation soils within 3 feet from walls. Such ponding or saturation could result in undesirable loss of soil strength and consequent foundation and slab movements. Irrigation of landscaped areas should be strictly limited to that necessary to sustain vegetation. The Landscape Architect and prospective owners should be informed of the surface drainage and irrigation requirements included in this report.

5.11 FOUNDATION RECOMMENDATIONS

Provided that the site is prepared in accordance with the recommendations provided herein, it is our opinion that post tensioned structural mat foundations and shallow footings would be suitable for supporting the residential and auxiliary structures, respectively.

5.11.1 Post-tensioned Mat Foundation

Post-tensioned mat foundations are suitable for supporting the proposed residential structures. Based upon the existing soil conditions and using the 2007 addendum (Third Edition) Post-Tensioning Institute, "Design of Post-Tensioned Slabs-On-Ground" manual, we recommend the following soil criteria for post-tensioned mat design.

Center Lift Condition:

Edge Moisture Variation Distance, e_m = 9.0 feet
Differential Soil Movement, y_m = 0.2 inches

Edge Lift Condition:

Edge Moisture Variation Distance, e_m = 5.5 feet
Differential Soil Movement, y_m = 0.4 inches

We recommend an allowable bearing pressure of 1,500 psf for dead plus long term live loads. This value may be increased by one-third when considering total loads including wind or seismic. The post-tensioned mat foundation should be designed to accommodate up to 1 inch of total settlement and ½ inch of differential settlement over a distance of 40 feet as a result of potential liquefaction.

5.11.2 Foundation Subgrade Treatment

The subgrade material under post-tensioned mat foundations should be uniform and consist of at least 2 feet of engineered fill. The pad subgrade should be moisture conditioned to a moisture content of at least 2 percentage points above optimum prior to foundation construction. The subgrade should be thoroughly soaked and approved by the Geotechnical Engineer prior to

placing the reinforcement or tendons. The subgrade should not be allowed to dry prior to concrete placement.

5.11.3 Moisture Vapor Reduction

A tough, water vapor retarding membrane should be installed below the mat foundations to reduce moisture condensation under floor coverings. The vapor retarder should meet ASTM E 1745 – 11 Class A requirements for water vapor permeance, tensile strength, and puncture resistance. Vapor transmission through the mat foundations can also be reduced by using high strength concrete with a low water-cement ratio.

5.12 AUXILIARY STRUCTURE FOUNDATIONS

We anticipate auxiliary structures such as entry monuments, isolated light poles and shade trellis structures may be planned within the Lantana Wisteria development. Auxiliary structures are generally lightly loaded and can be supported on shallow footings. The geotechnical design criteria to be used in footing sizing for areas founded on native soils or compacted engineered fill are as follows:

Minimum depth of footing embedment:	18 inches below lowest adjacent grade.
Minimum width of footing:	12 inches.
Maximum allowable footing pressure:	2,500 pounds per square foot (psf) for dead loads plus live-loads. This value may be increased by 1/3 for total loads.

Passive pressures acting on spread footing foundations may be assumed equal to an equivalent fluid weighing 350 pounds per cubic foot (pcf). The upper 1 foot of soil should be excluded from passive pressure computations unless it is confined by pavement or a concrete slab. The above passive pressures assume that the area in front of the footing is level for a distance of at least 10 feet or three times the depth of foundation, whichever is greater. A coefficient of friction of 0.4 can be used between concrete and the subgrade.

5.13 SECONDARY SLABS-ON-GRADE

This section provides guidelines for secondary slab designs such as exterior walkways, driveways and steps that are not part of the structural building foundations. Secondary slabs-on-grade should be constructed structurally independent of the foundation systems. This allows slab movement to occur with a reduced potential for foundation distress. An expansion joint material should be provided between architectural/structural elements constructed on adjacent secondary and foundation slabs to allow for each element to move independently with little potential for distress to the adjacent element. Where secondary slab-on-grade construction is anticipated, care must be exercised in attaining a moist condition of the subgrade soil before concrete placement.

We recommend that secondary slabs-on-grade have a minimum thickness of 4 inches and be underlain by at least a 4-inch-thick layer of clean, crushed rock or gravel. More critical and/or heavily loaded slabs-on-grade (such as driveways and patios) should be reinforced for control of cracking. Such reinforcement should be designed by the Structural Engineer. For less critical and/or lightly loaded slabs-on-grade (such as exterior walkways, including sidewalks), omission of the reinforcement may be considered with additional risk of cracking. In our experience, welded wire mesh may not be sufficient to control slab cracking.

5.14 RETAINING WALLS

The following retaining wall recommendations are provided for retaining walls planned within the residential development area.

Unrestrained drained retaining walls constructed on level ground up to 6 feet in height may be designed using the following active equivalent fluid weights in pounds per cubic foot (pcf). We anticipate retaining wall backfill will consist of native soils or low plasticity imported fill.

TABLE 5.14-1
Active Equivalent Fluid Pressures

Backfill Slope Condition (horizontal:vertical)	Active Pressure (pounds per cubic foot)
Level	40
3:1	50
2:1	60

Appropriate surcharge loads from buildings, hardscape and vehicles should be incorporated when the surcharge loading is situated above a 1:1 (horizontal:vertical) line of projection extending up the rear base edge of the footing. For design purposes, vertical surcharge loads may be applied as uniform, horizontal surcharge loading equal to 50 percent of the vertical surcharge load acting over the upper 10 feet of the wall.

In addition to static lateral earth pressures, retaining walls over 6 feet in height should be designed to resist an additional equivalent fluid pressure of 18 pcf from a seismic event.

Wall foundations can be designed using the criteria in Section 5.12.

All walls retaining more than two feet of soil should be provided with drainage facilities to prevent the build-up of hydrostatic pressures behind the walls. Wall drainage may be provided using a 4-inch-diameter perforated pipe embedded in either free-draining gravel surrounded by synthetic filter fabric (minimum 6-ounce) or Class 2 permeable material (Part 2 of Supplemental Recommendations, Section 2.05B). The width of the drain blanket should be at least 12 inches, and the drain blanket should extend to about 1 foot below the finished grades. The upper 1 foot of wall backfill should consist of compacted site soils. Drainage should be collected into solid

pipes and directed to an outlet approved by the Civil Engineer. Synthetic filter fabric should meet the minimum requirement listed in the Supplemental Recommendations and be preapproved by the Geotechnical Engineer prior to delivery.

All backfill should be placed in accordance with the recommendations provided above for engineered fill. Light equipment should be used during backfill compaction to reduce possible overstressing of the walls. The foundation details and structural calculations for retaining walls should be submitted for review.

5.15 PAVEMENT DESIGN

5.15.1 Flexible Pavements

Based on previous experience within the area, we estimate that site soil will have a minimum Resistance Value (R-value) of 5. The following preliminary pavement sections have been determined based on an assumed R-value of 5 according to the method contained in Topic 633 of Highway Design Manual by Caltrans. The sections provided below should be reviewed and revised, if applicable, based on R-value tests performed on samples of actual subgrade materials recovered at the time of grading.

TABLE 5.15.1-1
Flexible Pavement Cross Sections

Traffic Index	R-value	A.C. (inches)	A.B. (inches)
4.0	5	2.5	8.0
5.0	5	3.0	10.0
6.0	5	3.5	13.0
7.0	5	4.0	16.0
8.0	5	5.0	18.0

Notes: AC is asphaltic concrete
AB is aggregate base Class 2 Material with minimum R = 78

The Traffic Index should be determined by the Civil Engineer or appropriate public agency. These sections are for estimating purposes only.

5.15.2 Pavement Subgrade Preparation

Pavement construction and all materials should comply with the requirements of the Standard Specifications of the State of California Division of Highways, City of Morgan Hill requirements and the following minimum requirements.

- All pavement subgrades should be scarified to a depth of 12 inches below finished subgrade elevation, moisture conditioned to at least 2 percentage points above optimum moisture content, and compacted to at least 95 percent relative compaction and in accordance with City of Morgan Hill requirements.

- Subgrade soils should be in a stable, non-pumping condition at the time aggregate baserock materials are placed and compacted. Proof-rolling with a heavy wheel-loaded piece of construction equipment should be implemented. Yielding materials should be appropriately mitigated, with suitable mitigation measures developed in coordination with the client, contractor and Geotechnical Engineer.

- Aggregate baserock materials should meet current Caltrans specifications for Class 2 aggregate baserock and should be compacted to at least 95 percent of maximum dry density at a moisture content of at least optimum. Proof-rolling with a heavy wheel-loaded piece of construction equipment should be implemented after placement and compaction of the aggregate base. Yielding materials should be appropriately mitigated, with suitable mitigation measures developed in coordination with the client, contractor and Geotechnical Engineer.

- Asphaltic concrete paving materials should meet current Caltrans specifications.

- Adequate provisions must be made such that the subgrade soils and aggregate baserock materials are not allowed to become saturated.

- All concrete curbs separating pavement and irrigated landscaped areas should extend into the subgrade and below the bottom of adjacent aggregate baserock materials. An undercurb drain could also be considered to help collect and transport subsurface seepage.

5.16 UTILITIES

It is recommended that utility trench backfilling be done under the observation of a Geotechnical Engineer. Ideally, pipe zone backfill (i.e. material beneath and immediately surrounding the pipe) should consist of native material less than ¾ inch in maximum dimension compacted in accordance with recommendations provided above for engineered fill. Trench zone backfill (i.e. material placed between the pipe zone backfill and the ground surface) should also consist of native soil compacted in accordance with recommendations for engineered fill. Controlled density fill is also suitable for pipe zone and trench zone backfill.

If required by local agencies, where import material is used for pipe zone backfill, we recommend it consist of quarry fines, fine- to medium-grained sand, or a well-graded mixture of sand and gravel and that this material not be used within 2 feet of finish subgrades. This material should be compacted to at least 90 percent relative compaction at a moisture content of not less than optimum.

In general, uniformly graded gravel should not be used for pipe or trench zone backfill due to the potential for migration of soil into the relatively large void spaces present in this type of material and for movement of water along trenches backfilled with this type of material. If uniformly graded gravel is used, we recommend that it be encapsulated in 6-ounce filter fabric. Providing outlet locations into manholes or catch basins for water collected in granular trench backfill should also be considered.

All utility trenches entering building or paved areas should be provided with a plug/seal where the trenches pass under or through the building perimeter or curb lines. For this project, the plug should consist of compacted clayey soils and should extend at least 3 feet into and 3 feet beyond the crossing and should be placed below, around, and above the utility pipe such that it is entirely in contact with the trench walls and pipe. This is to prevent surface water percolation into the import sand or gravel pipe zone backfill under foundations and pavements where such water would remain trapped in a perched condition.

Care should be exercised where utility trenches are located beside foundation areas. Utility trenches constructed parallel to foundations should be located entirely above a plane extending down from the lower edge of the footing at an angle of 45 degrees. Utility companies and Landscape Architects should be made aware of this information.

Utility trenches in areas to be paved should be constructed in accordance with the City of Morgan Hill requirements or approved alternatives. Compaction of backfill by jetting should not be allowed at this site. If there appears to be a conflict between the City or other Agency requirements and the recommendations contained in this report, this should be brought to the Owner's attention for resolution prior to submitting bids.

5.17 EXCAVATIONS AND TEMPORARY SHORING SYSTEMS

Excavations, including utility trenches, should be properly excavated and shored, as applicable, to create a stable and safe condition. It is the responsibility of the Contractor to provide such stable, safe trench and construction slope conditions and to follow OSHA safety requirements. Since excavation procedures may be very dangerous, it is also the responsibility of the Contractor to provide a trained "competent person" as defined by OSHA to supervise all excavation operations, ensure that all personnel are working in safe conditions and have thorough knowledge of OSHA excavation safety requirements.

It should be noted that cohesionless soil including sands and gravels are present within the project site. Trench walls may slough and become unstable. While not anticipated at this time, recommendations for shoring design can be provided upon request. The contractor should be responsible for the design and construction of all shoring and underpinning systems and the safety of all workers within excavations.

6.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this report are solely professional opinions.

The professional staff of ENGEO Incorporated strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of

earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

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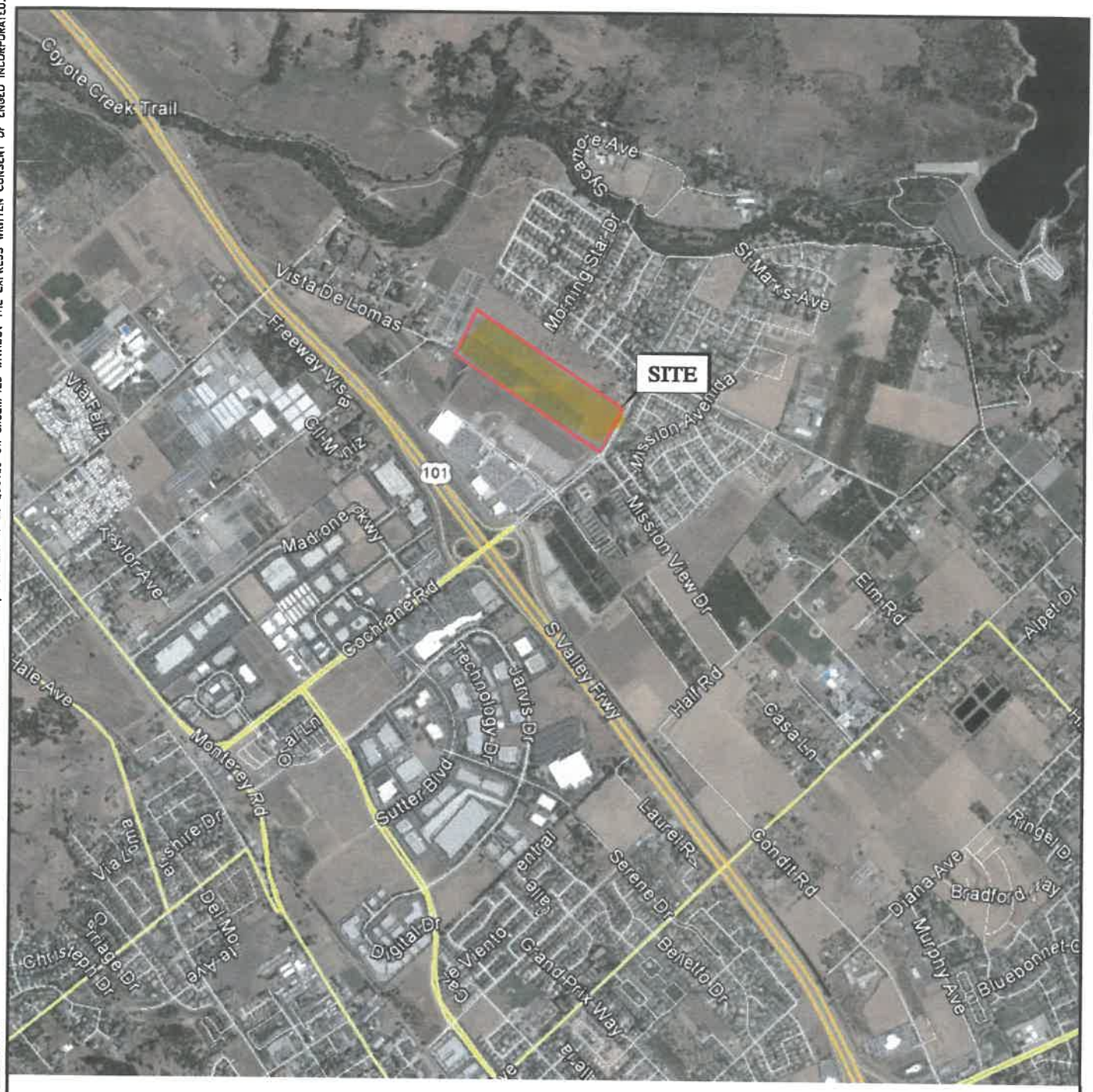
FIGURES

LIST OF FIGURES



BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO Expect Excellence

VICINITY MAP

LANTANA WISTERIA

MORGAN HILL, CALIFORNIA

PROJECT NO.: 10451.001.000		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: GC	

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ORIGINAL FIGURE PRINTED IN COLOR

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

2-B5 / B-4 — BORING (ENGEO, 2015) / BORING (LAI & ASSOCIATES, 2013)

1-CPT5 — CPT (ENGEO, 2013)

1-P4 — INFILTRATION TEST (ENGEO, 2014)

N

0 FEET 400

0 METERS 200

BASE MAP SOURCE: GOOGLE EARTH PRO

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SITE PLAN

LANTANA WISTERIA

MORGAN HILL, CALIFORNIA

PROJECT NO.:	10451.001.000
SCALE:	AS SHOWN
DRAWN BY:	SRP
CHECKED BY:	GC

FIGURE NO. 2

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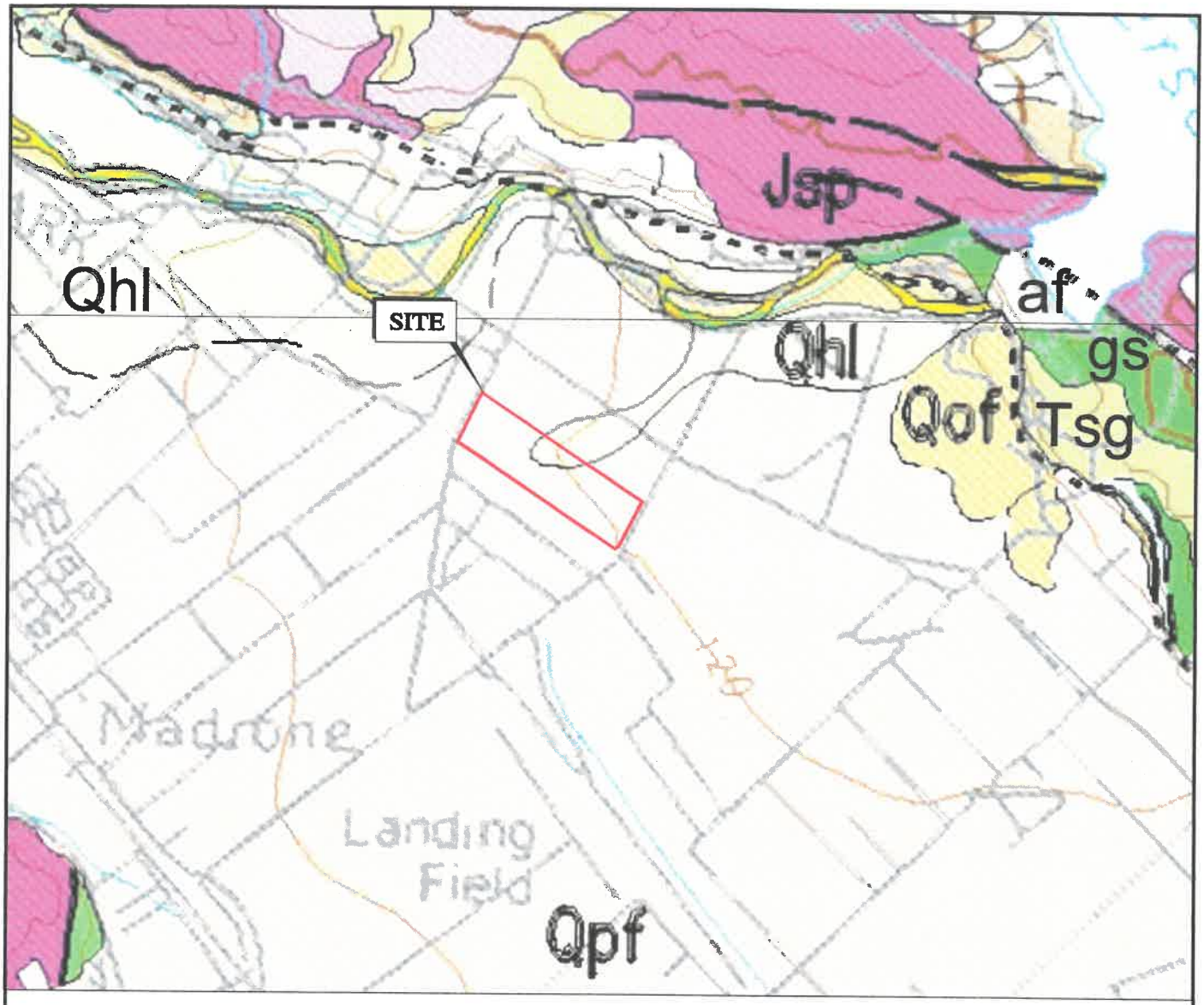
ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

GEOLOGIC CONTACT-DASHED WHERE GRADATIONAL OR APPROXIMATELY LOCATED

FAULT-DASHED WHERE INFERRED, DOTTED WHERE CONCEALED, QUERIED WHERE EXISTENCE IS DOUBTFUL.

Qpf	ALLUVIAL FAN DEPOSITS
Qhl	LEVEE DEPOSITS
Qof	OLDER ALLUVIAL FAN DEPOSITS
Jsp	SEPENTINIZED HARZBURGITE AND DUNITE
Tsg	SILVER CREEK GRAVELS (PLIOCENE)
gs	GREENSTONE
af	ARTIFICIAL FILL

N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: WENTWORTH, 1999

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REGIONAL GEOLOGIC MAP

LANTANA WISTERIA

MORGAN HILL, CALIFORNIA

PROJECT NO.: 10451.001.000		FIGURE NO. 3
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: GC	

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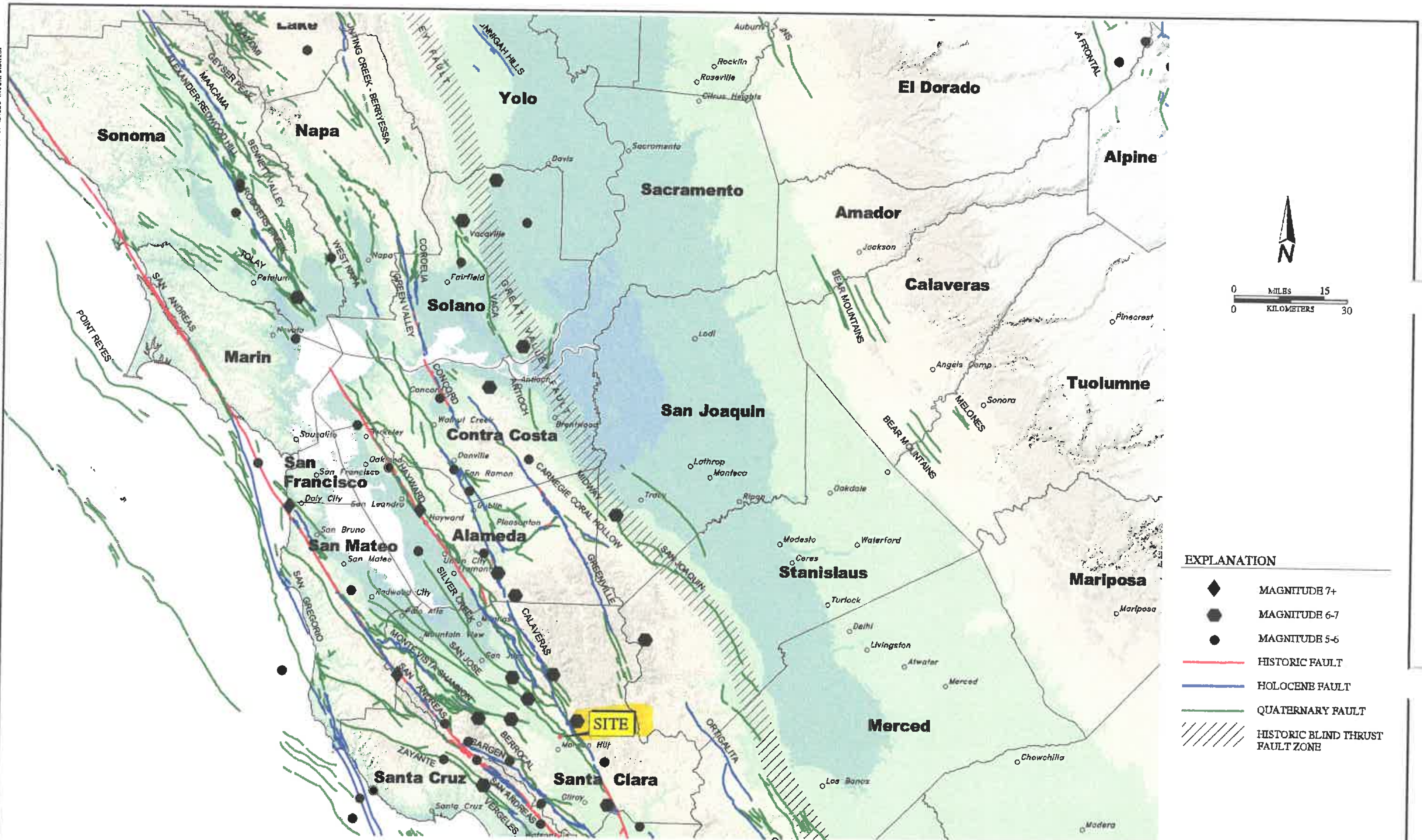

BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800-2000)

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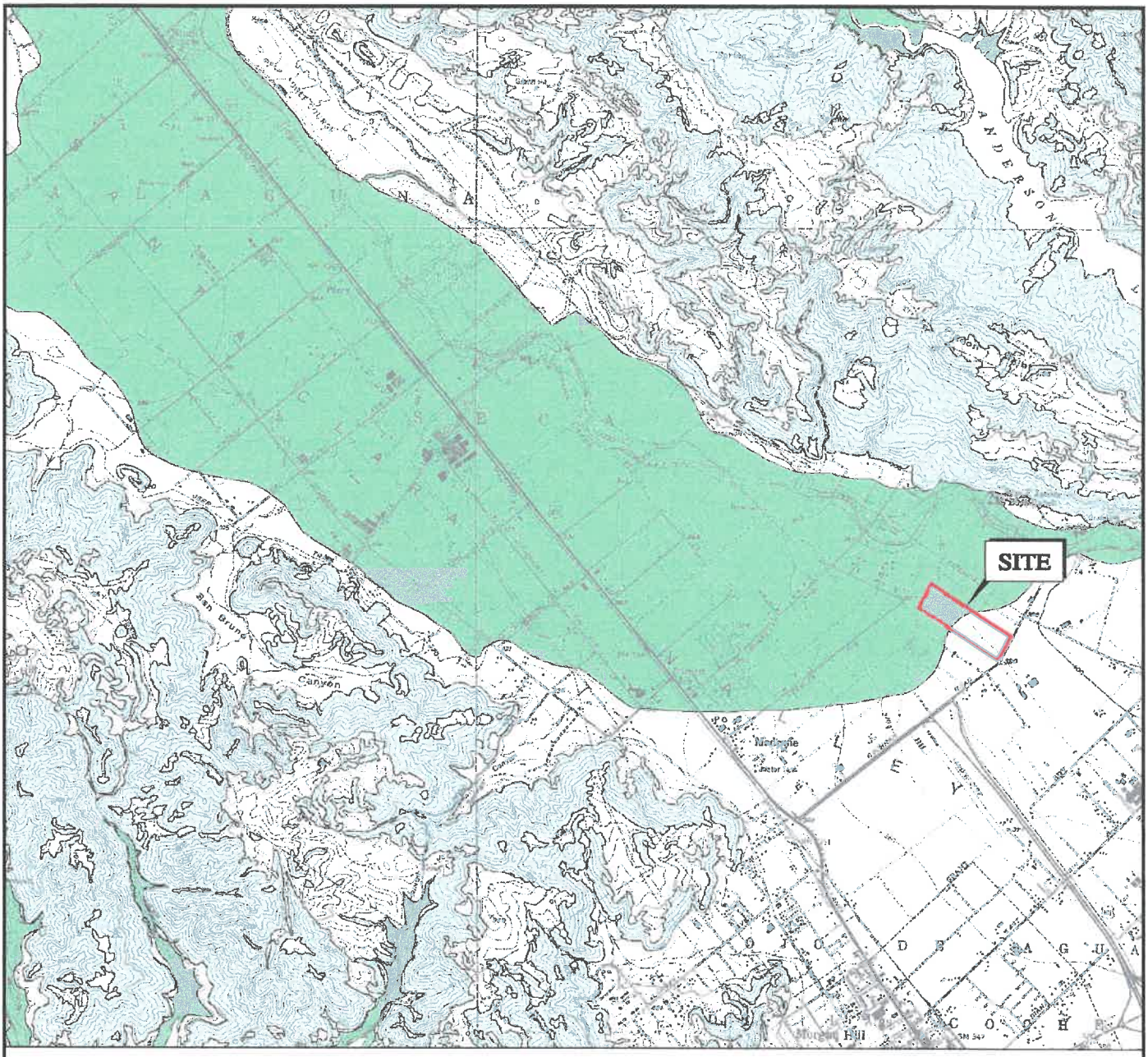
REGIONAL FAULTING AND SEISMICITY
LANTANA WISTERIA
MORGAN HILL, CALIFORNIA

PROJECT NO.: 10451.001.000	FIGURE NO. 4
SCALE: AS SHOWN	
DRAWN BY: SRP	CHECKED BY: GC

ORIGINAL FIGURE PRINTED IN COLOR



N

0 FEET 4000

0 METERS 2000

EXPLANATION

LIQUEFACTION

AREAS WHERE HISTORIC OCCURRENCE OF LIQUEFACTION, OR LOCAL GEOLOGICAL, GEOTECHNICAL AND GROUNDWATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

EARTHQUAKE-INDUCED LANDSLIDES

AREAS WHERE PREVIOUS OCCURRENCE OF LANDSLIDE MOVEMENT, OR LOCAL TOPOGRAPHIC, GEOLOGICAL, GEOTECHNICAL AND SUBSURFACE WATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

BASE MAP SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY, 2006

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SEISMIC HAZARD ZONES MAP

LANTANA WISTERIA

MORGAN HILL, CALIFORNIA

PROJECT NO.: 10451.001.000		FIGURE NO. 5
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: GC	

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APPENDIX A

Boring Logs
ENGEO, 2015

APPENDIX A

KEY TO BORING LOGS

MAJOR TYPES			DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW - Well graded gravels or gravel-sand mixtures GP - Poorly graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES	GM - Silty gravels, gravel-sand and silt mixtures GC - Clayey gravels, gravel-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW - Well graded sands, or gravelly sand mixtures SP - Poorly graded sands or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES	SM - Silty sand, sand-silt mixtures SC - Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity CL - Inorganic clay with low to medium plasticity OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		MH - Elastic silt with high plasticity CH - Fat clay with high plasticity OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to the group name.

For fine-grained soil with >30% retained on the #200 sieve, the words "sandy" or "gravelly" (whichever is predominant) are added to the group name.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE SIZE					CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4 "	3"	12"		
SILTS AND CLAYS	SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE			

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-2
VERY STIFF	2-4
HARD	OVER 4

SAMPLER SYMBOLS

- Modified California (3" O.D.) sampler
- California (2.5" O.D.) sampler
- S.P.T. - Split spoon sampler
- Shelby Tube
- Continuous Core
- Bag Samples
- Grab Samples
- NR No Recovery

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

LINE TYPES

———— Solid - Layer Break

– – – – – – Dashed - Gradational or approximate layer break

GROUND-WATER SYMBOLS

- Groundwater level during drilling
- Stabilized groundwater level

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer

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LOG OF BORING 2-B1

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 18 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 382 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Old vineyard with low, dry seasonal grasses										
	380												
			POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), reddish brown, very dense, slightly moist			72				9	4.3	109.4	
5													
	375		CLAYEY GRAVEL (GC), reddish brown, very dense, moist, 5 to 10% sand			56					5	120	
10			CLAYEY GRAVEL (GC), reddish brown mottled with orange, very dense, moist, 5 to 10% sand			58					6.9	120.6	
	370		Increased gravel content noted by driller at approximately 13 ft.										
15			Poor recovery, cobble in shoe			38/50 for 2"							
	365		CLAYEY GRAVEL (GC), reddish brown, dense, moist			37					8.6		
			Total depth approximately 18 below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B2

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 26.5 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (): Approx. 385 ft.

LOGGED / REVIEWED BY: M. Downing / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Open pasture with 3-6 ft. tall shrubs										
			POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), dark olive brown, dense, slightly moist			36	25	17	8	11	5.2	125.6	
			POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), dark olive brown, medium dense, slightly moist			25					7.1	103.6	
5	380												
			CLAYEY GRAVEL (GC), dark brown mottled with red, very dense, slightly moist Mud rotary advancement very difficult starting at 6 ft.			93				16	10	128.1	
10	375		Poor recovery, sampled material appears to be slough.			9							
15	370		CLAYEY GRAVEL (GC), dark brown with gray, dense, slightly moist			49							
20	365		CLAYEY GRAVEL (GC), very dark gray with brown, very dense, slightly moist			51							
25	360												

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B2

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 26.5 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (): Approx. 385 ft.

LOGGED / REVIEWED BY: M. Downing / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			CLAYEY GRAVEL (GC), dark gray with brown, dense, slightly moist			45				13	11.9		
			Total depth approximately 26.5' below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B2A

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 41.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 385 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Open pasture with 3-6 ft. tall shrubs Note: Borehole 2-B2 mud rotary drilling stopped at 26.5 ft. due to adverse drilling conditions (cobbles) 2-B2A located approximately 15 ft. NE of 2-B2										
5	380												
10	375												
15	370												
20	365		Water added to borehole to cool drill bit										
25	360												

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B2A

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 41.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 385 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Driller notes extra cobbles at 27-28 ft.										
30	355		CLAYEY GRAVEL (GC), reddish brown mottled with black, very dense, moist			63					10.7		
35	350		CLAYEY GRAVEL (GC), reddish brown mottled with yellowish brown, dense, moist			35				16	11.9		
40	345		CLAYEY GRAVEL (GC), reddish brown, very dense, moist			51							
			Total depth approximately 41.5' below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B3

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 16.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 386 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
	385		Dirt access road in old vineyard with low, dry seasonal grasses										
			SILTY SAND WITH GRAVEL (SM), reddish brown, medium dense, slightly moist			29	26	17	9				
5	380		POORLY GRADED GRAVEL WITH SAND (GP), reddish brown, dense, slightly moist			36					5.5	103.5	
			POORLY GRADED GRAVEL WITH SAND (GP), reddish brown, very dense, slightly moist			60							
10	375		WELL GRADED SAND (SW), yellowish brown, very dense, slightly moist, 5 to 10% gravel, weak cementation poor recovery due to cobble in shoe			90							
			WELL GRADED SAND (SW), reddish brown, dense, moist, 5 to 10% gravel			32					5.4		
			Driller noted beginning of cobbles at approximately 13-13.5 ft.										
15	370		CLAYEY GRAVEL (GC), reddish brown, dense, moist, 5 to 10% sand			35				11	8.5	117.9	
			Total depth approximately 16.5' below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B4

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 21.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 390 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Open pasture with low, dry seasonal grasses Significant near-surface rodent activity (burrows)										
5	385		WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC), reddish brown, very dense, moist			52				7	6.5	118.5	
10	380		WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC), reddish brown, very dense, moist			51					7.5	108.5	
15	375		WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC), reddish brown mottled with orange, very dense, moist			63					7.3	124.7	
20	370		WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC), reddish brown mottled with orange, very dense, moist			72				9	7.9		
			Total depth approximately 21.5' below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

ENGEO INCORPORATED

LOG OF BORING 2-B5

Geotechnical Exploration
Lantana Wisteria
Morgan Hill, CA
10451.001.000

DATE DRILLED: 9/18/2015
HOLE DEPTH: 18 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (): Approx. 387 ft.

LOGGED / REVIEWED BY: M. Clark / GC
DRILLING CONTRACTOR: Pitcher Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: 140 lb. Auto Trip

Depth in Feet	Elevation in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits: Liquid Limit	Atterberg Limits: Plastic Limit	Atterberg Limits: Plasticity Index	Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
			Old vineyard with low, dry seasonal grasses										
	385		POORLY GRADED GRAVEL WITH SAND (GP), reddish brown, slightly moist, 5 to 10% silt			50 for 3"							
			Poor recovery due to cobbles in shoe			50 for 4"							
5			POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC), reddish brown, dense, moist			38				8	5.9	115	
	380												
10			No recovery due to cobbles			50 for 5"							
	375												
15			POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), reddish brown mottled with orange, dense, moist			45					8.6	115.5	
	370		POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC), reddish brown mottled with orange, dense, moist			31							
			Total depth approximately 18.0' below existing grade Groundwater not encountered Backfilled with grout										

LOG - GEOTECHNICAL W/ELEV. 10451001000.GPJ ENGEO INC.GDT 10/6/15

APPENDIX B

Previous CPT Exploration Logs by ENGEO

ENGEO, 2013

APPENDIX B

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD. **CPT NO.:** 1-CPT1A

LOCATION: Morgan Hill CA **DATE:** 08-06-2013

PROJ. NO.: 10451.000.000(EGO-228) **TIME:** 10:24:00

Terminated at 25.0 feet Groundwater not encountered

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.57	187.4	299.84	3.50	1.9	47	75	0.07	>44	---	SAND to Silty SAND	130-140
1.04	279.1	446.56	6.05	2.2	56	89	0.13	>47	---	SAND	"
1.54	305.8	489.28	5.85	1.9	61	98	0.20	>47	---	"	"
2.01	322.6	516.16	6.13	1.9	65	103	0.26	>47	---	"	"
2.55	216.9	347.04	4.56	2.1	54	87	0.33	>45	---	SAND to Silty SAND	"
3.04	231.8	370.88	4.45	1.9	46	74	0.40	>46	---	SAND	"
3.56	254.8	407.68	8.41	3.3	127	204	0.47	>46	---	SAND to Clayey SAND *	>140
4.01	325.5	520.80	6.40	2.0	65	104	0.53	>48	---	SAND	130-140
4.50	265.1	424.16	9.48	3.6	133	212	0.60	>46	---	SAND to Clayey SAND *	>140
5.03	139.9	223.84	3.00	2.1	47	75	0.67	>43	---	Silty SAND to Sandy SILT	130-140
5.52	99.9	159.84	1.66	1.7	33	53	0.74	>41	---	"	"
6.04	58.4	92.86	1.74	3.0	23	37	0.81	---	7.73	Sandy SILT to Clayey SILT	"
6.52	200.4	305.52	3.33	1.7	40	61	0.88	>44	---	SAND	"
7.06	113.8	165.18	3.37	3.0	46	66	0.95	---	15.11	Sandy SILT to Clayey SILT	"
7.54	133.0	185.35	3.41	2.6	44	62	1.01	>42	---	Silty SAND to Sandy SILT	"
8.02	151.1	205.44	3.79	2.5	50	68	1.08	>42	---	"	"
8.51	151.1	200.19	3.02	2.0	50	67	1.14	>42	---	"	"
9.03	112.8	145.34	3.01	2.7	38	48	1.21	>40	---	"	"
9.50	77.2	97.00	3.31	4.3	39	48	1.28	---	10.21	Clayey SILT to Silty CLAY	"
10.00	223.6	273.73	5.25	2.4	75	91	1.35	>44	---	Silty SAND to Sandy SILT	"
10.55	222.4	264.41	6.12	2.8	74	88	1.42	>44	---	"	"
11.06	92.7	107.12	4.00	4.3	93	107	1.49	---	12.26	Very Stiff Fine Grained *	"
11.54	76.3	86.29	3.37	4.4	38	43	1.55	---	10.07	Clayey SILT to Silty CLAY	"
12.00	170.6	189.10	4.53	2.7	57	63	1.62	>42	---	Silty SAND to Sandy SILT	"
12.57	150.5	162.66	4.60	3.1	50	54	1.69	>41	---	"	"
13.01	182.9	193.79	5.03	2.8	61	65	1.75	>42	---	"	"
13.54	132.7	138.35	2.94	2.2	44	46	1.82	>40	---	"	"
14.04	155.6	159.70	3.96	2.5	52	53	1.89	>41	---	"	"
14.55	232.4	234.71	5.84	2.5	77	78	1.96	>43	---	"	"
15.04	345.6	345.41	12.22	3.5	173	173	2.03	>45	---	SAND to Clayey SAND *	>140
15.54	281.1	280.56	3.96	1.4	56	56	2.10	>44	---	SAND	130-140
16.03	308.1	307.11	6.50	2.1	62	61	2.16	>44	---	"	"
16.53	100.5	100.04	2.10	2.1	34	33	2.23	>38	---	Silty SAND to Sandy SILT	"
17.02	185.2	184.11	4.61	2.5	62	61	2.30	>42	---	"	"
17.53	203.2	201.72	6.31	3.1	102	101	2.36	>42	---	SAND to Clayey SAND *	"
18.06	130.8	129.66	3.63	2.8	44	43	2.44	>39	---	Silty SAND to Sandy SILT	"
18.53	115.0	113.85	4.00	3.5	46	46	2.50	---	15.17	Sandy SILT to Clayey SILT	"
19.06	192.6	186.21	5.83	3.0	64	62	2.57	>42	---	Silty SAND to Sandy SILT	"
19.52	140.8	133.11	5.90	4.2	141	133	2.64	---	18.60	Very Stiff Fine Grained *	>140
20.02	204.3	188.57	3.68	1.8	51	47	2.70	>42	---	SAND to Silty SAND	130-140
20.55	273.1	245.62	3.78	1.4	55	49	2.77	>43	---	SAND	"
21.02	192.0	168.65	3.84	2.0	48	42	2.84	>41	---	SAND to Silty SAND	"
21.50	239.9	205.61	5.46	2.3	80	69	2.90	>42	---	Silty SAND to Sandy SILT	"
22.05	172.6	143.70	5.61	3.3	69	57	2.98	---	22.81	Sandy SILT to Clayey SILT	"
22.51	190.9	156.65	6.17	3.2	95	78	3.04	>41	---	SAND to Clayey SAND *	"
23.04	150.3	122.09	4.65	3.1	60	49	3.11	---	19.83	Sandy SILT to Clayey SILT	"
23.57	203.3	163.49	5.61	2.8	68	54	3.18	>41	---	Silty SAND to Sandy SILT	"
24.02	268.5	214.01	6.63	2.5	90	71	3.24	>42	---	"	"
24.52	345.8	272.94	8.12	2.4	69	55	3.31	>44	---	SAND	"
25.09	411.2	320.80	11.84	2.9	206	160	3.39	>45	---	SAND to Clayey SAND *	>140

DEPTH = Sampling interval (~0.1 feet)

Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs

SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden

EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*

Su = Undrained Soil Strength* (see classification chart)

References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)
Terminated at 13.5 feet

CPT NO.: 1-CPT2B
DATE: 08-06-2013
TIME: 11:46:00
Groundwater not encountered

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.52	140.3	224.48	4.37	3.1	56	90	0.06	----	18.70	Sandy SILT to Clayey SILT	130-140
1.05	91.1	145.76	4.59	5.0	91	146	0.13	----	12.14	Very Stiff Fine Grained *	"
1.57	166.8	266.88	4.51	2.7	56	89	0.20	>44	----	Silty SAND to Sandy SILT	"
2.04	227.5	364.00	6.57	2.9	76	121	0.27	>45	----	"	"
2.52	213.9	342.24	6.20	2.9	71	114	0.33	>45	----	"	"
3.07	202.1	323.36	7.59	3.8	101	162	0.41	>45	----	SAND to Clayey SAND *	>140
3.54	168.5	269.60	5.20	3.1	56	90	0.47	>44	----	Silty SAND to Sandy SILT	130-140
4.04	159.9	255.84	4.47	2.8	53	85	0.54	>43	----	"	"
4.58	170.7	273.12	5.55	3.3	68	109	0.61	----	22.72	Sandy SILT to Clayey SILT	"
5.04	217.5	348.00	4.80	2.2	73	116	0.67	>45	----	Silty SAND to Sandy SILT	"
5.51	196.5	314.40	4.76	2.4	66	105	0.74	>45	----	"	"
6.05	193.9	307.85	9.92	5.1	194	308	0.81	----	25.80	Very Stiff Fine Grained *	>140
6.52	222.0	337.98	9.29	4.2	222	338	0.88	----	29.54	"	"
7.03	162.2	235.75	4.62	2.9	54	79	0.95	>43	----	Silty SAND to Sandy SILT	130-140
7.51	216.0	300.79	6.82	3.2	108	150	1.01	>44	----	SAND to Clayey SAND *	>140
8.00	335.7	455.97	7.37	2.2	67	91	1.08	>47	----	SAND	130-140
8.56	244.1	321.53	9.20	3.8	122	161	1.16	>45	----	SAND to Clayey SAND *	>140
9.04	94.0	120.55	5.37	5.7	94	121	1.23	----	12.45	Very Stiff Fine Grained *	"
9.51	238.2	298.09	4.25	1.8	48	60	1.29	>44	----	SAND	130-140
10.01	199.9	243.61	3.04	1.5	40	49	1.36	>43	----	"	"
10.08	190.9	231.76	2.47	1.3	38	46	1.37	>43	----	"	"
10.56	216.3	256.36	2.38	1.1	43	51	1.43	>43	----	"	120-130
11.05	150.6	173.73	3.61	2.4	50	58	1.49	>41	----	Silty SAND to Sandy SILT	130-140
11.55	154.4	174.20	2.58	1.7	39	44	1.56	>41	----	SAND to Silty SAND	"
12.03	146.3	161.66	2.50	1.7	37	40	1.62	>41	----	"	"
12.09	154.2	169.94	2.49	1.6	39	43	1.63	>41	----	"	"
12.56	256.6	276.98	3.89	1.5	51	55	1.70	>44	----	SAND	"
13.03	309.0	326.79	5.29	1.7	62	65	1.76	>45	----	"	"
13.51	577.0	601.33	8.26	1.4	115	120	1.82	>48	----	"	"

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD. **CPT NO.:** 1-CPT3A
LOCATION: Morgan Hill CA **DATE:** 08-06-2013
PROJ. NO.: 10451.000.000(EGO-228) **TIME:** 11:14:00
Terminated at 10.7 feet Groundwater not encountered

ENGEO, INC.

cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.55	191.1	305.76	5.19	2.7	64	102	0.06	>44	---	Silty SAND to Sandy SILT	130-140
1.03	122.3	195.68	4.42	3.6	49	78	0.13	---	16.30	Sandy SILT to Clayey SILT	"
1.51	28.8	46.08	1.43	5.0	29	46	0.19	---	3.83	CLAY	"
2.01	146.4	234.24	3.45	2.4	49	78	0.26	>43	---	Silty SAND to Sandy SILT	"
2.52	236.6	378.56	7.11	3.0	118	189	0.33	>46	---	SAND to Clayey SAND *	"
3.05	259.6	415.36	7.83	3.0	130	208	0.40	>46	---	"	>140
3.50	212.8	340.48	8.45	4.0	106	170	0.47	>45	---	"	"
4.02	111.1	177.76	2.88	2.6	37	59	0.54	>41	---	Silty SAND to Sandy SILT	130-140
4.52	183.9	294.24	3.29	1.8	46	74	0.61	>44	---	SAND to Silty SAND	"
5.03	109.4	175.04	1.72	1.6	27	44	0.67	>41	---	"	"
5.50	87.7	140.32	3.24	3.7	44	70	0.74	---	11.64	Clayey SILT to Silty CLAY	"
6.04	85.5	135.88	2.20	2.6	34	54	0.81	---	11.35	Sandy SILT to Clayey SILT	"
6.50	151.1	230.78	5.07	3.4	60	92	0.87	---	20.09	"	"
7.02	458.7	668.31	9.41	2.1	92	134	0.94	>48	---	SAND	"
7.55	179.1	249.13	7.05	3.9	90	125	1.02	>43	---	SAND to Clayey SAND *	>140
8.08	182.5	246.88	11.75	6.4	183	247	1.09	---	24.26	Very Stiff Fine Grained *	"
8.52	226.6	299.51	6.88	3.0	113	150	1.15	>44	---	SAND to Clayey SAND *	130-140
8.59	213.7	281.41	8.21	3.8	107	141	1.16	>44	---	"	>140
9.01	164.6	211.67	6.67	4.1	165	212	1.22	---	21.87	Very Stiff Fine Grained *	"
9.50	184.6	231.29	3.13	1.7	46	58	1.29	>43	---	SAND to Silty SAND	130-140
10.06	198.6	241.43	8.11	4.1	99	121	1.36	>43	---	SAND to Clayey SAND *	>140
10.52	135.4	160.40	6.94	5.1	136	161	1.43	---	17.96	Very Stiff Fine Grained *	"
11.02	312.9	360.21	11.71	3.7	156	180	1.50	>45	---	SAND to Clayey SAND *	"
11.10	300.3	344.36	10.73	3.6	150	172	1.51	>45	---	"	"
11.51	399.9	450.21	14.57	3.6	200	225	1.57	>47	---	"	"
11.60	560.0	628.17	17.02	3.0	280	314	1.58	>48	---	"	"
12.03	286.7	315.60	7.94	2.8	143	158	1.64	>45	---	"	130-140
12.51	84.1	90.51	7.69	9.1	84	91	1.70	---	11.10	Very Stiff Fine Grained *	>140
12.59	78.7	84.38	7.63	9.7	79	84	1.72	---	10.38	"	"
13.01	148.5	156.61	3.46	2.3	50	52	1.77	>41	---	Silty SAND to Sandy SILT	130-140
13.09	144.9	152.42	3.48	2.4	48	51	1.78	>40	---	"	"
13.52	71.4	74.13	1.71	2.4	29	30	1.84	---	9.40	Sandy SILT to Clayey SILT	"
14.02	117.5	120.07	1.93	1.6	29	30	1.91	>39	---	SAND to Silty SAND	"
14.56	176.8	177.58	4.16	2.4	59	59	1.98	>41	---	Silty SAND to Sandy SILT	"
15.02	185.8	185.64	4.36	2.4	62	62	2.04	>42	---	"	"
15.53	412.4	411.45	10.93	2.7	206	206	2.12	>46	---	SAND to Clayey SAND *	>140
16.01	257.8	256.86	14.83	5.8	258	257	2.18	---	34.23	Very Stiff Fine Grained *	"
16.53	196.4	195.40	6.50	3.3	98	98	2.25	>42	---	SAND to Clayey SAND *	"
17.01	250.3	248.70	6.58	2.6	83	83	2.32	>43	---	Silty SAND to Sandy SILT	130-140
17.09	207.3	205.93	6.88	3.3	104	103	2.33	>42	---	SAND to Clayey SAND *	>140
17.57	173.4	172.02	5.98	3.5	87	86	2.40	>41	---	"	"
18.01	149.8	148.43	4.85	3.2	60	59	2.46	---	19.81	Sandy SILT to Clayey SILT	130-140
18.54	188.9	185.19	4.91	2.6	63	62	2.53	>42	---	Silty SAND to Sandy SILT	"
19.01	186.6	179.07	4.52	2.4	62	60	2.59	>41	---	"	"
19.52	159.3	149.08	6.80	4.3	159	149	2.66	---	21.06	Very Stiff Fine Grained *	>140
20.02	235.3	214.93	6.89	2.9	118	107	2.73	>42	---	SAND to Clayey SAND *	130-140
20.52	340.7	303.36	11.72	3.4	170	152	2.80	>44	---	"	>140

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD. **CPT NO.:** 1-CPT4B
LOCATION: Morgan Hill CA **DATE:** 08-06-2013
PROJ. NO.: 10451.000.000(EGO-228) **TIME:** 10:48:00
Terminated at 20.4 feet Groundwater not encountered

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.53	170.0	272.00	7.70	4.5	170	272	0.06	----	22.66	Very Stiff Fine Grained *	>140
1.03	87.8	140.48	3.98	4.5	88	140	0.13	----	11.70	"	130-140
1.55	97.2	155.52	2.77	2.9	39	62	0.20	----	12.95	Sandy SILT to Clayey SILT	"
2.02	182.3	291.68	6.34	3.5	91	146	0.26	>44	----	SAND to Clayey SAND *	>140
2.52	131.1	209.76	2.71	2.1	44	70	0.33	>42	----	Silty SAND to Sandy SILT	130-140
3.03	137.2	219.52	3.94	2.9	46	73	0.40	>43	----	"	"
3.52	218.5	349.60	5.37	2.5	73	117	0.47	>45	----	"	"
4.01	293.0	468.80	5.15	1.8	59	94	0.53	>47	----	SAND	"
4.53	367.0	587.20	10.03	2.7	183	294	0.61	>48	----	SAND to Clayey SAND *	>140
5.03	207.4	331.84	7.97	3.8	104	166	0.68	>45	----	"	"
5.51	190.0	304.00	6.58	3.5	95	152	0.74	>44	----	"	"
5.59	212.7	340.32	6.75	3.2	106	170	0.76	>45	----	"	"
6.02	188.8	299.62	5.71	3.0	63	100	0.81	>44	----	Silty SAND to Sandy SILT	130-140
6.53	134.8	204.64	3.27	2.4	45	68	0.88	>42	----	"	"
7.02	85.2	123.71	1.75	2.1	28	41	0.95	>39	----	"	"
7.54	94.6	131.57	3.68	3.9	47	66	1.02	----	12.55	Clayey SILT to Silty CLAY	"
8.05	180.3	244.06	6.36	3.5	90	122	1.09	>43	----	SAND to Clayey SAND *	>140
8.51	155.3	205.19	4.69	3.0	52	68	1.15	>42	----	Silty SAND to Sandy SILT	130-140
9.02	113.9	146.41	4.28	3.8	46	59	1.22	----	15.11	Sandy SILT to Clayey SILT	"
9.50	270.9	339.35	7.48	2.8	135	170	1.29	>45	----	SAND to Clayey SAND *	"
10.01	202.7	247.33	5.61	2.8	68	82	1.35	>43	----	Silty SAND to Sandy SILT	"
10.10	282.8	343.36	6.43	2.3	71	86	1.37	>45	----	SAND to Silty SAND	"
10.52	216.0	256.38	5.66	2.6	72	85	1.42	>43	----	Silty SAND to Sandy SILT	"
11.07	497.9	573.35	8.68	1.7	100	115	1.50	>48	----	SAND	"
11.52	192.7	217.39	10.10	5.2	193	217	1.56	----	25.59	Very Stiff Fine Grained *	>140
12.02	272.0	300.23	7.54	2.8	136	150	1.63	>44	----	SAND to Clayey SAND *	130-140
12.55	140.4	151.26	6.08	4.3	140	151	1.70	----	18.61	Very Stiff Fine Grained *	>140
13.02	193.8	204.68	5.65	2.9	65	68	1.77	>42	----	Silty SAND to Sandy SILT	130-140
13.57	135.8	140.93	5.48	4.0	136	141	1.84	----	17.98	Very Stiff Fine Grained *	>140
14.03	136.4	139.53	4.76	3.5	55	56	1.90	----	18.06	Sandy SILT to Clayey SILT	130-140
14.54	130.0	130.84	4.46	3.4	52	52	1.97	----	17.20	"	"
15.07	151.6	151.46	3.70	2.4	51	50	2.04	>40	----	Silty SAND to Sandy SILT	"
15.54	153.0	152.67	4.75	3.1	61	61	2.11	----	20.26	Sandy SILT to Clayey SILT	"
16.03	219.1	218.32	6.87	3.1	110	109	2.18	>43	----	SAND to Clayey SAND *	>140
16.56	168.5	167.66	5.18	3.1	56	56	2.25	>41	----	Silty SAND to Sandy SILT	130-140
17.05	197.5	196.25	5.60	2.8	66	65	2.32	>42	----	"	"
17.52	184.8	183.39	6.49	3.5	92	92	2.38	>41	----	SAND to Clayey SAND *	>140
18.03	94.0	93.16	4.53	4.8	94	93	2.45	----	12.37	Very Stiff Fine Grained *	130-140
18.51	192.4	189.39	9.94	5.2	192	189	2.52	----	25.49	"	>140
19.07	62.7	60.17	4.24	6.8	63	60	2.59	----	8.19	"	130-140
19.52	83.5	78.45	3.16	3.8	42	39	2.65	----	10.96	Clayey SILT to Silty CLAY	"
20.05	10.2	9.36	1.17	11.5	10	9	2.72	----	1.47	Organic Material	120-130

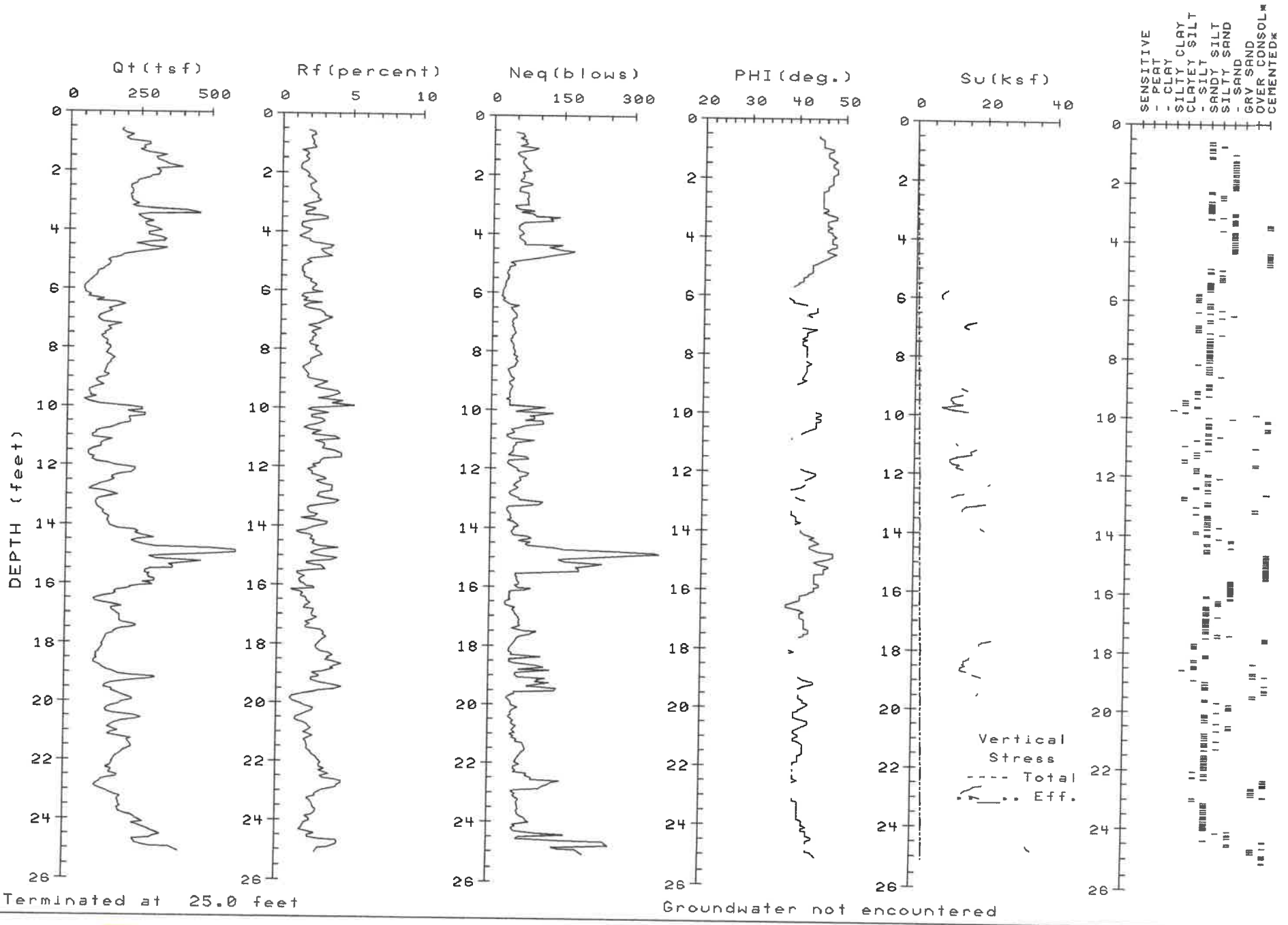
DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD. **CPT NO.:** 1-CPT5B
LOCATION: Morgan Hill CA **DATE:** 08-06-2013
PROJ. NO.: 10451.000.000(EGO-228) **TIME:** 10:11:00
Terminated at 8.8 feet Groundwater not encountered

ENGEO, INC.
cpts by John Sarmiento & Associates

DEPTH (feet)	Qc (tsf)	Qc' (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT' (N')	EffVtStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.52	94.8	151.68	5.72	6.0	95	152	0.06	----	12.64	Very Stiff Fine Grained *	>140
1.00	69.3	110.88	1.81	2.6	28	44	0.13	----	9.23	Sandy SILT to Clayey SILT	130-140
1.53	179.2	286.72	6.06	3.4	90	143	0.20	>44	----	SAND to Clayey SAND *	>140
2.07	353.9	566.24	14.90	4.2	177	283	0.27	>48	----	"	"
2.54	329.3	526.88	14.61	4.4	329	527	0.34	----	43.88	Very Stiff Fine Grained *	"
3.03	215.7	345.12	8.41	3.9	108	173	0.41	>45	---	SAND to Clayey SAND *	"
3.51	160.1	256.16	3.95	2.5	53	85	0.47	>43	---	Silty SAND to Sandy SILT	130-140
3.59	164.0	262.40	4.18	2.6	55	87	0.49	>44	----	"	"
4.01	201.5	322.40	4.83	2.4	67	107	0.54	>45	----	"	"
4.53	348.8	558.08	5.92	1.7	70	112	0.61	>48	----	SAND	"
5.01	519.5	831.20	15.37	3.0	260	416	0.68	>48	----	SAND to Clayey SAND *	>140
5.10	412.4	659.84	14.57	3.5	206	330	0.69	>48	----	"	"
5.53	219.5	351.20	8.39	3.8	110	176	0.75	>45	----	"	"
6.00	237.3	375.98	6.75	2.8	79	125	0.82	>46	---	Silty SAND to Sandy SILT	130-140
6.53	147.7	223.48	4.97	3.4	59	89	0.89	---	19.63	Sandy SILT to Clayey SILT	"
7.04	153.2	221.36	3.79	2.5	51	74	0.96	>43	---	Silty SAND to Sandy SILT	"
7.52	327.1	454.38	6.07	1.9	65	91	1.02	>47	----	SAND	"
8.00	511.8	693.01	15.27	3.0	256	347	1.09	>48	----	SAND to Clayey SAND *	>140
8.07	618.0	833.96	15.68	2.5	309	417	1.10	>48	----	"	"

DEPTH = Sampling interval (~0.1 feet)
Qc = Tip bearing uncorrected Qt = Tip bearing corrected Fs = Sleeve friction resistance Rf = Qt / Fs
SPT = Equivalent Standard Penetration Test Qt' and SPT' = Qt and SPT corrected for overburden
EffVtStr = Effective Vertical Stress using est. density** Phi = Soil friction angle*
Su = Undrained Soil Strength* (see classification chart)
References: * Robertson and Campanella, 1988 **Olsen, 1989 *** Durgunoglu & Mitchell, 1975

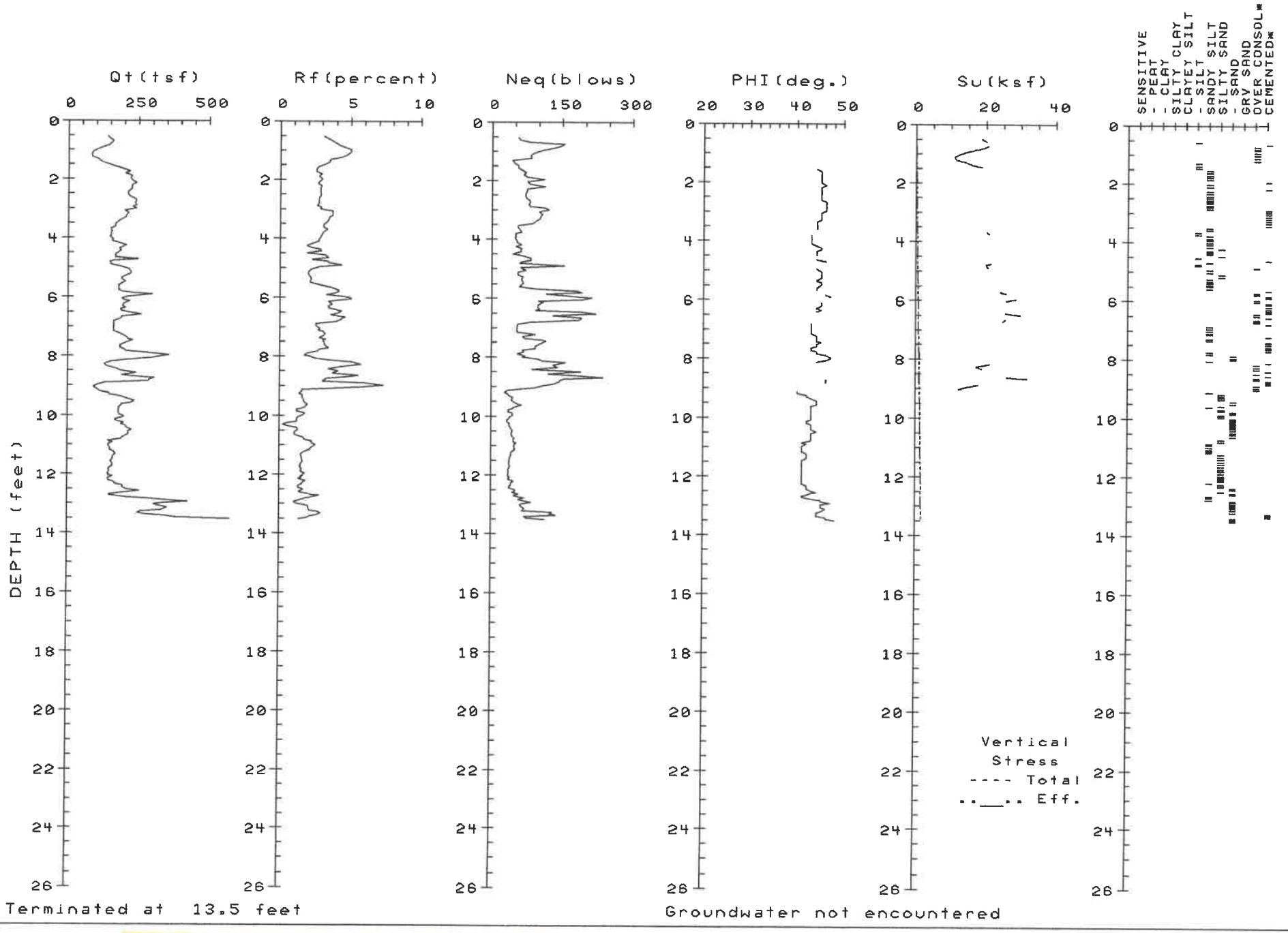


PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT1A
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

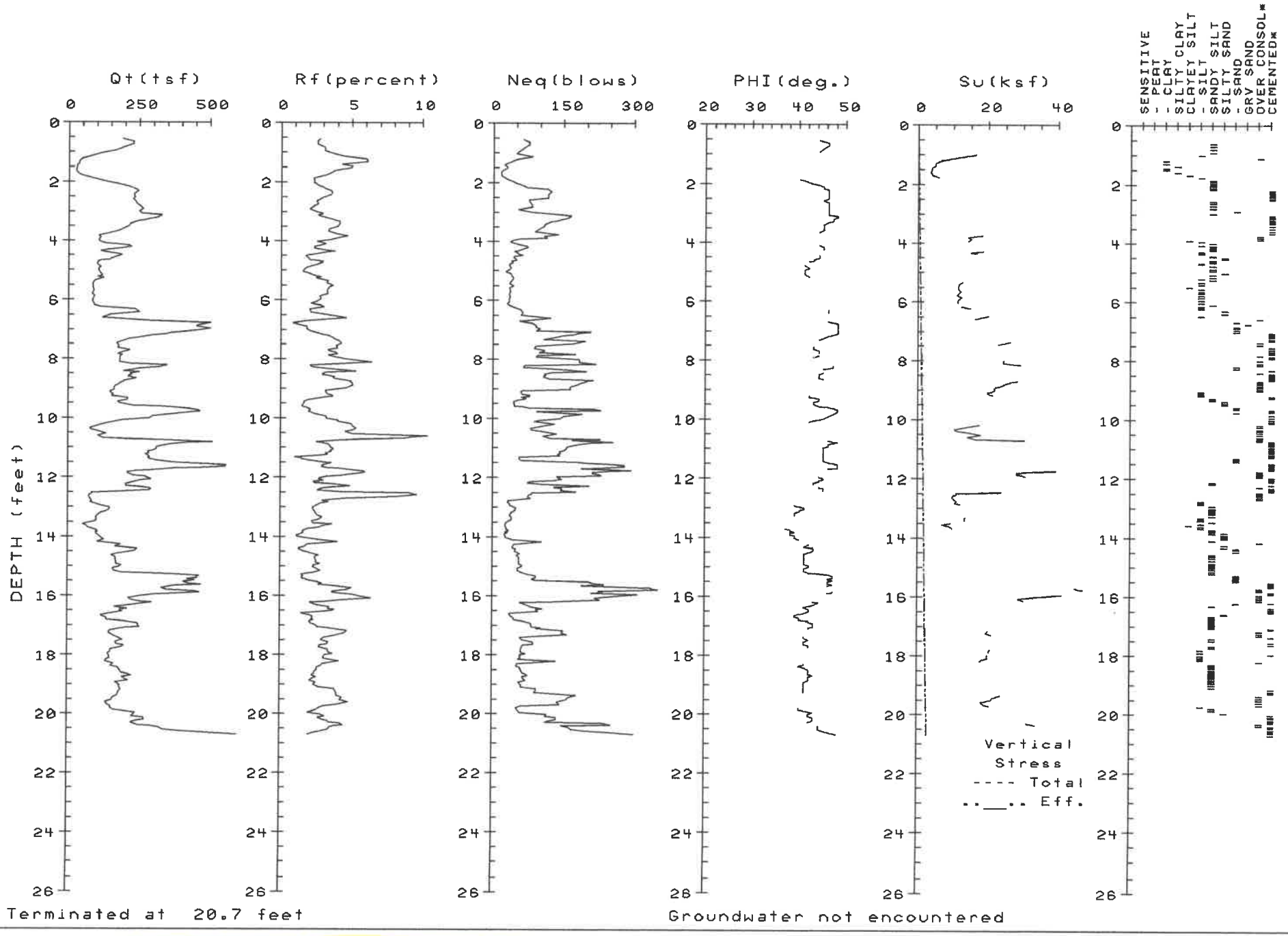


PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT2B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 20.7 feet

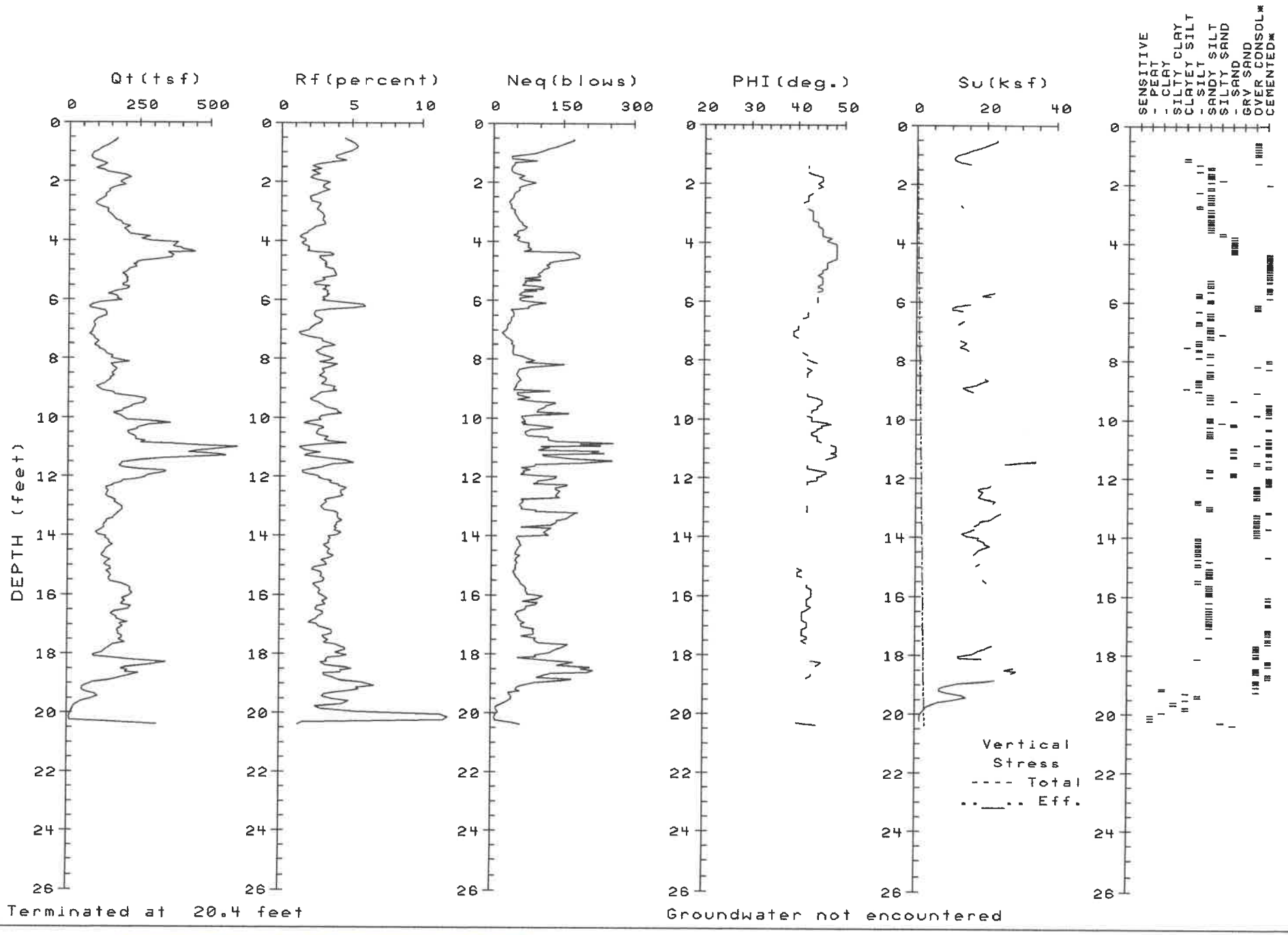
Groundwater not encountered

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT3A
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

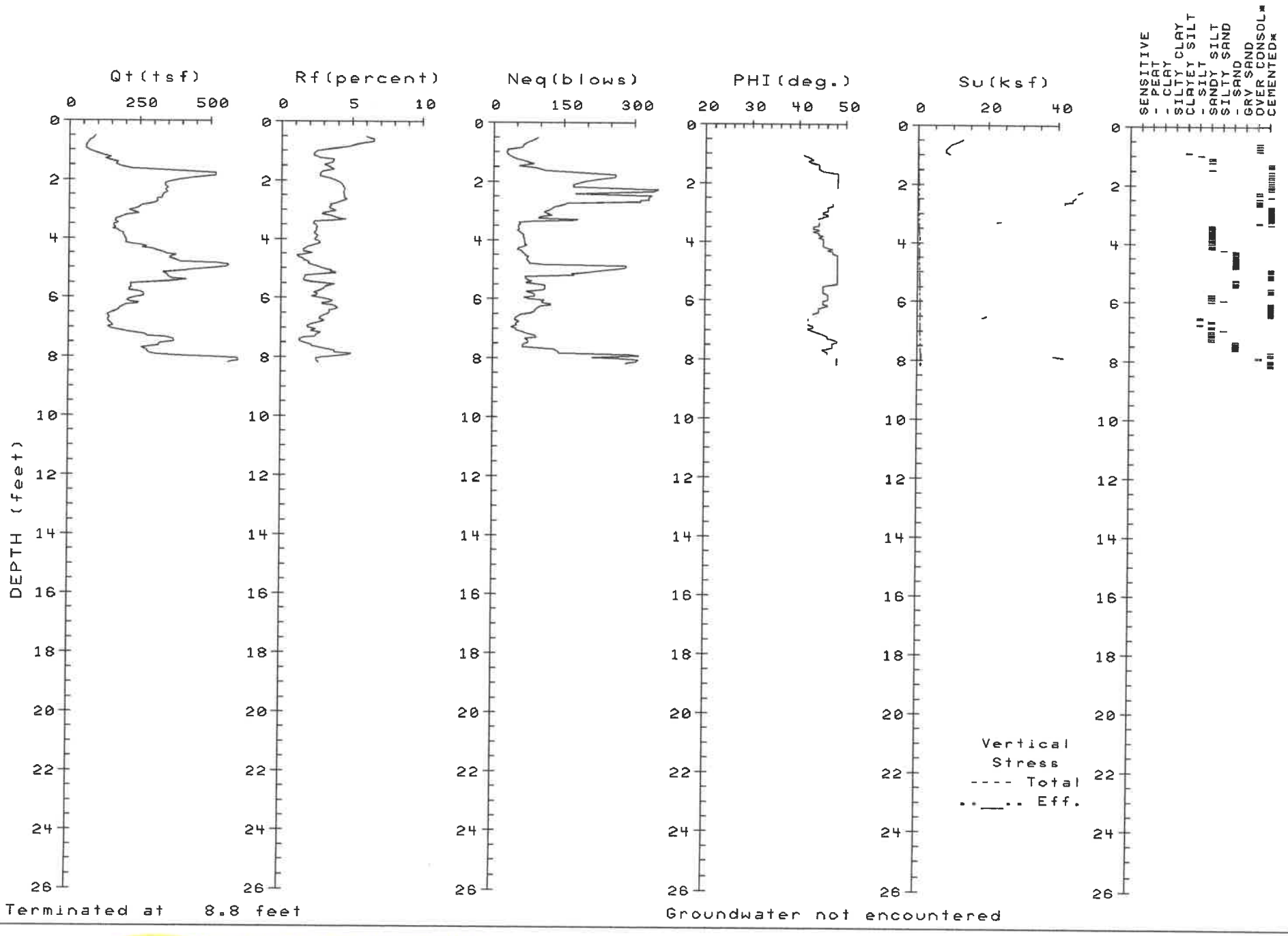


PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT4B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 8.8 feet

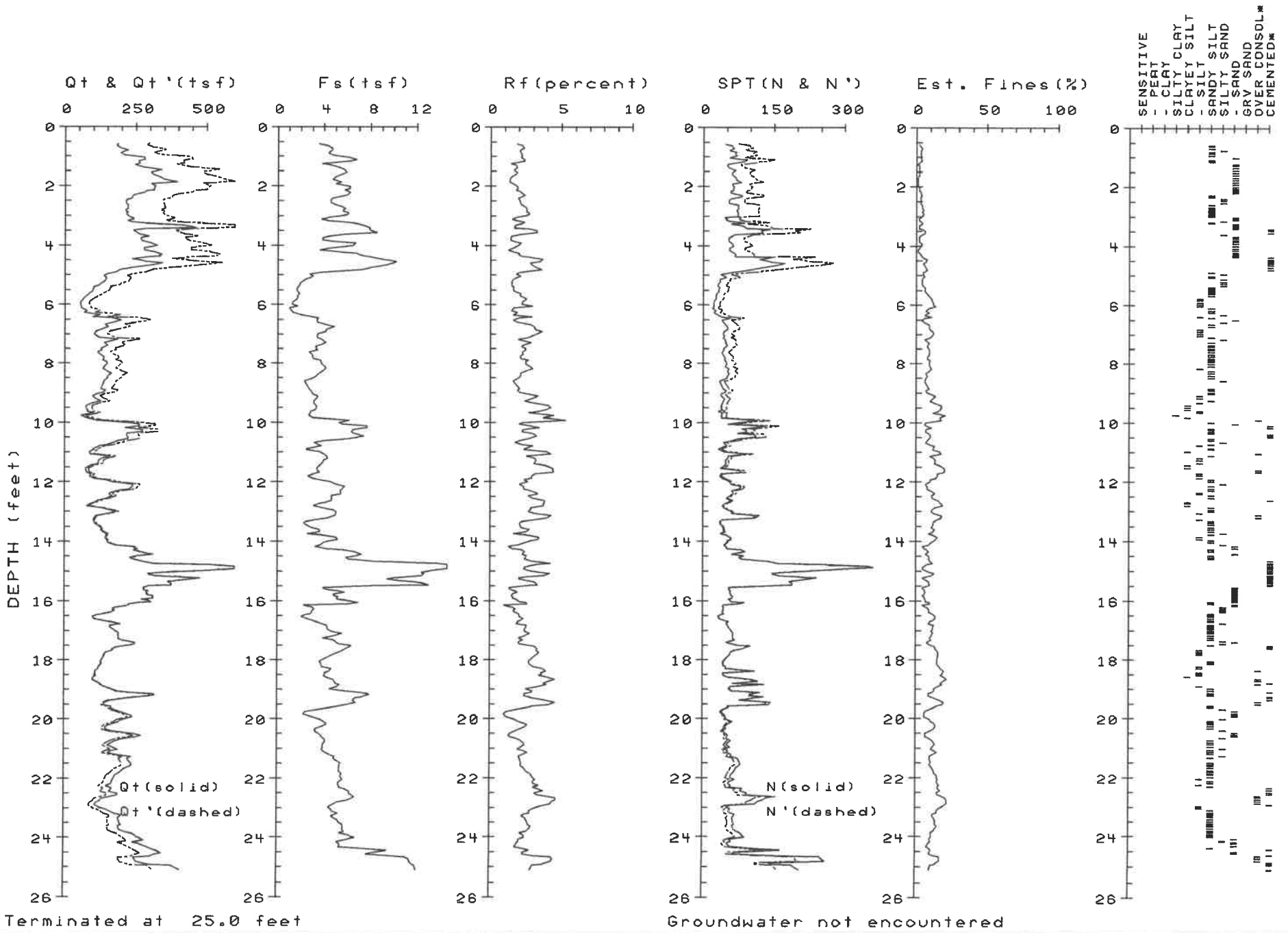
Groundwater not encountered

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT5B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 25.0 feet

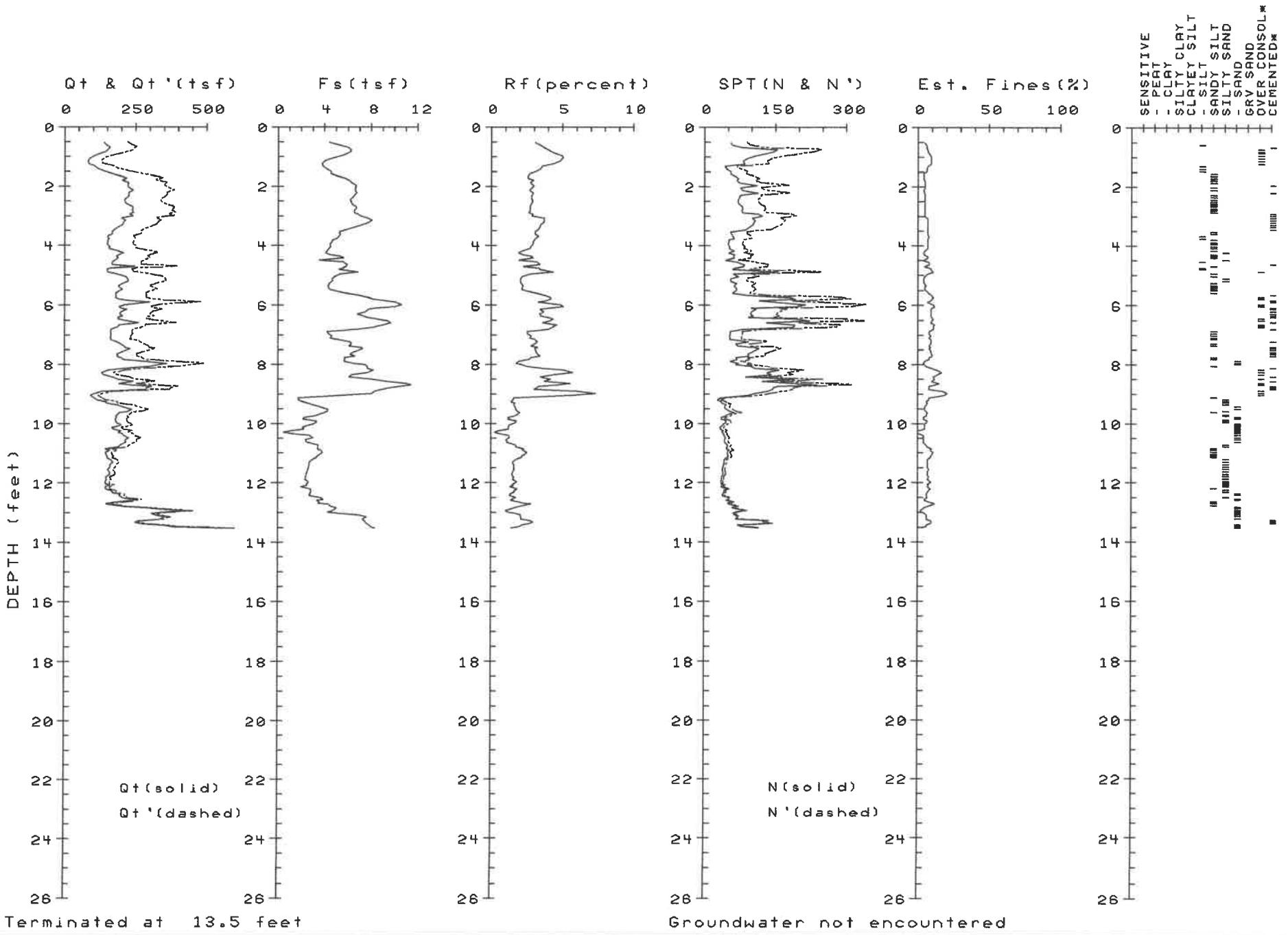
Groundwater not encountered

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT1A
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 13.5 feet

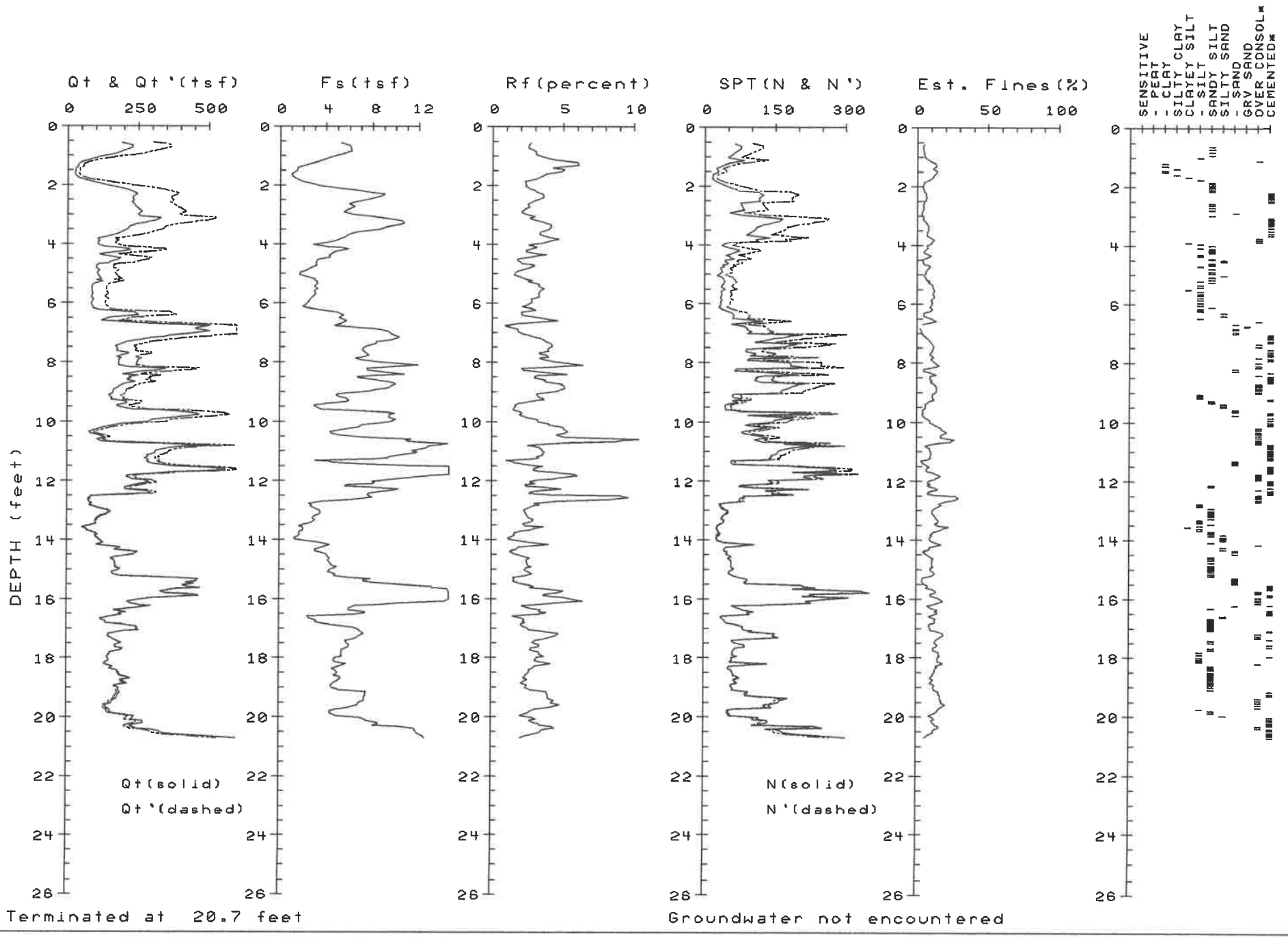
Groundwater not encountered

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT2B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

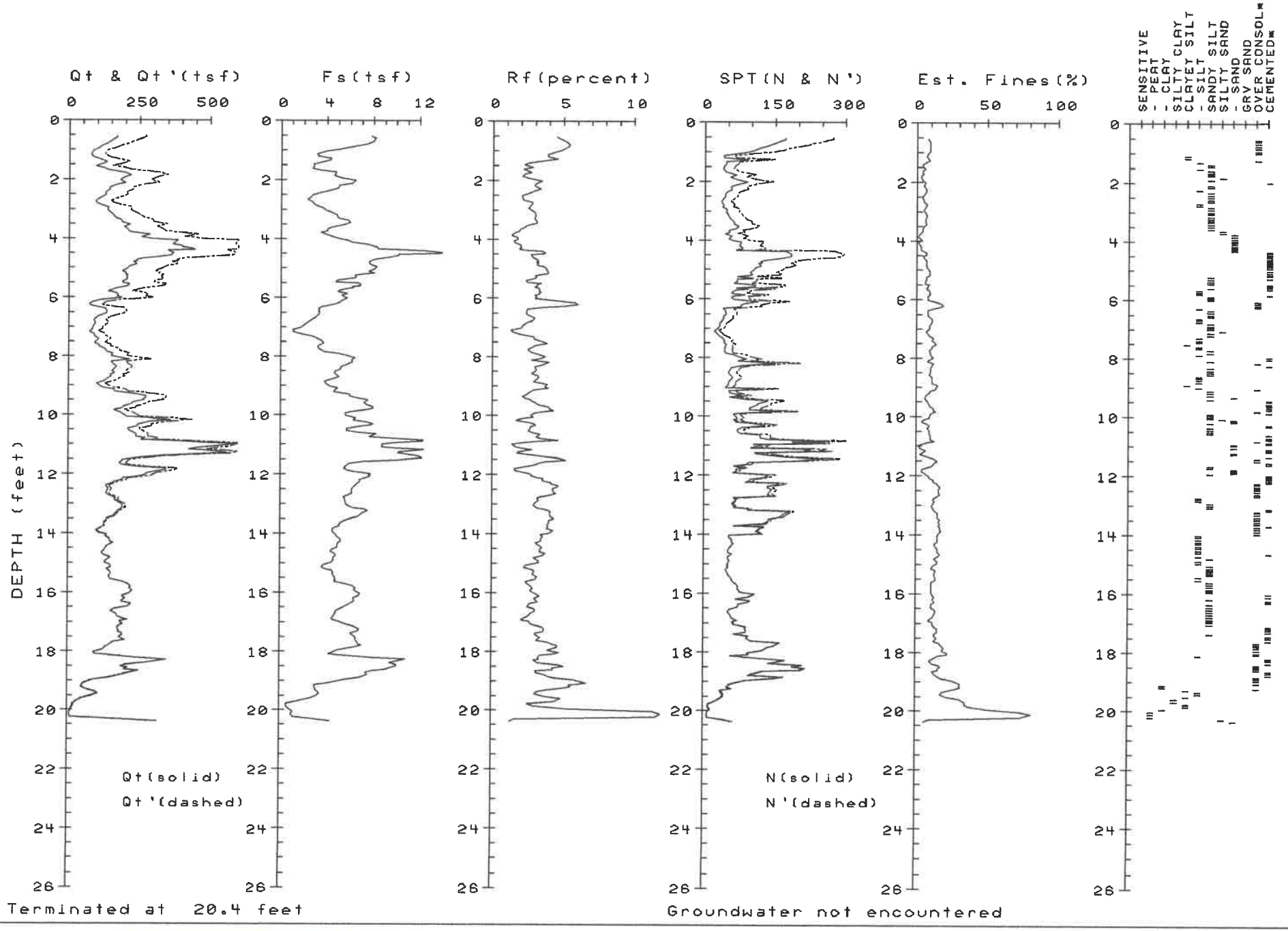


PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT3A
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

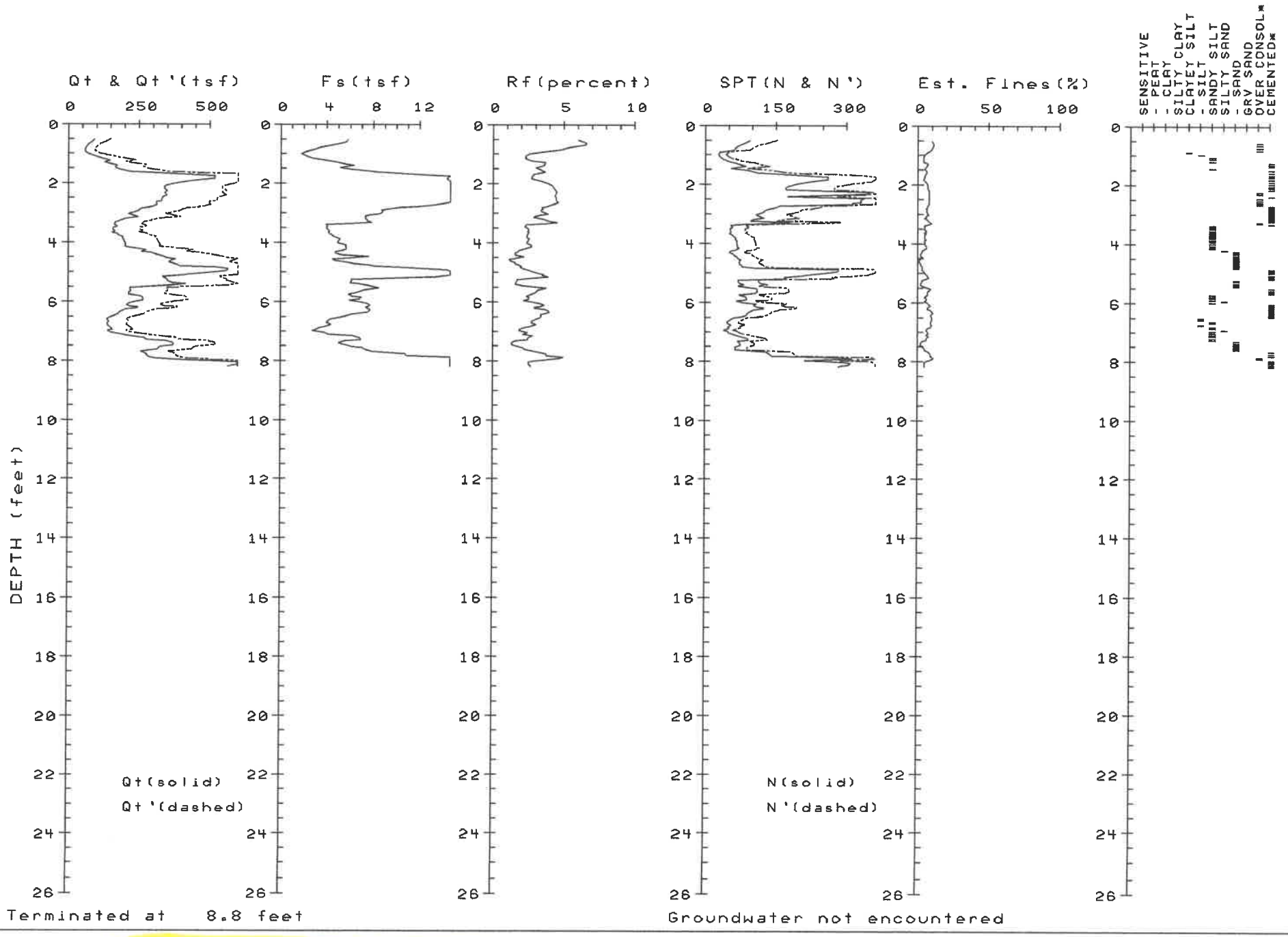


PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT4B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates



Terminated at 8.8 feet

Groundwater not encountered

PROJECT: BARBARA PROPERTY-1365 COCHRANE RD.
LOCATION: Morgan Hill CA
PROJ. NO.: 10451.000.000(EGO-228)

CPT NO.: 1-CPT5B
DATE : 08-06-2013

ENGEO, INC.

cpts by John Sarmiento & Associates

APPENDIX C

Exploratory Logs, Field Test Results and Laboratory Test Results by Others

Lai & Associates, 2013

APPENDIX C

Lai & Associates

LOG OF BORING B-1

Project No.: 188.100	**Client:** UCP, LLC	**Date Drilled:** 6-10-13
Project Name: Roland Property	**Drilling Method:** Hollow-stem Auger	**Elevation:** N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
						SURFACE CONDITIONS: Vineyard
			0		SM	SILTY SAND, light brown, dry to moist, loose to medium dense, fine-grained, trace clay and gravel
-	-	41			GP	SANDY GRAVEL, brown, moist, dense to very dense, fine-grained sand
-	-	46	5			
						between 8 and 10 feet, cobbles
-	-	50/5"	10			
						between 11 and 13 feet, cobbles
-	-	50/3"	15			
-	-	50	20			

PLATE 3

Lai & Associates

LOG OF BORING B-1

Project No.: 188.100	**Client:** UCP, LLC	**Date Drilled:** 6-10-13
Project Name: Roland Property	**Drilling Method:** Hollow-stem Auger	**Elevation:** N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
					GP	SANDY GRAVEL, brown, moist, dense to very dense, fine-grained sand
-	-	50	20			
-	-	54	25			
-	-	35	30			
-	-	43	35			
-	-	30	40		SC	CLAYEY SAND, yellowish-brown, moist, medium dense to dense, fine-grained

PLATE 4

Lai & Associates

LOG OF BORING B-1

Project No.: 188.100	Client: UCP, LLC	Date Drilled: 6-10-13
Project Name: Roland Property	Drilling Method: Hollow-stem Auger	Elevation: N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
-	-	30	40		GP	SANDY GRAVEL, brown, moist, dense to very dense, fine-grained sand
					SC	CLAYEY SAND, yellowish-brown, moist, medium dense to dense, fine-grained
-	-	50/6"	45		GP	SANDY GRAVEL, brown, moist, very dense, fine-grained sand, some clay
			50			Boring terminated at 46-1/2 feet No groundwater encountered
			55			
			60			

PLATE 5

Lai & Associates

LOG OF BORING B-2

Project No.: 188.100	**Client:** UCP, LLC	**Date Drilled:** 6-10-13
Project Name: Roland Property	**Drilling Method:** Hollow-stem Auger	**Elevation:** N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
						SURFACE CONDITIONS: Vineyard
			0		SM	SILTY SAND, light brown, dry to moist, loose to medium dense, fine-grained, trace gravel
-	-	39			GP	SANDY GRAVEL, brown, moist, dense, fine-grained sand
-	-	82/11"	5			
-	-	49				
			10			Boring terminated at 9-1/2 feet No groundwater encountered
			15			
			20			

PLATE 6

Lai & Associates

LOG OF BORING B-3

Project No.: 188.100	Client: UCP, LLC	Date Drilled: 6-10-13
Project Name: Roland Property	Drilling Method: Hollow-stem Auger	Elevation: N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
						SURFACE CONDITIONS: Vineyard
			0		SM	SILTY SAND, light brown, dry to moist, loose to medium dense, fine-grained, trace gravel
-	-	75	-		GP	SANDY GRAVEL, brown, moist, dense, fine-grained sand
-	-	50/6"	5			
			-			Boring terminated at 7 feet No groundwater encountered
			10			
			15			
			20			

PLATE 7

Lai & Associates

LOG OF BORING B-4

Project No.: 188.100	Client: UCP, LLC	Date Drilled: 6-10-13
Project Name: Roland Property	Drilling Method: Hollow-stem Auger	Elevation: N/A

SAMPLER TYPE:	DRIVE WEIGHT (LBS.)	HEIGHT OF FALL (IN.)
☒ Standard Penetration Test	140	30

Moisture Content (%)	Dry Unit Weight (PCF)	Penetration Resistance (blows/foot)	Depth (feet)	Sample Symbol	USCS Classification	MATERIAL DESCRIPTION AND REMARKS
			0			**SURFACE CONDITIONS:** Vineyard
					SM	SILTY SAND, light brown, dry to moist, loose to medium dense, fine-grained, trace gravel
-	-	33				
					GP	SANDY GRAVEL, brown, moist, dense, fine-grained sand
-	-	28	5			
-	-	50/5"				
			10			Boring terminated at 8-1/2 feet No groundwater encountered
			15			
			20			

PLATE 8

Lai & Associates

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			CLASSIFICATION SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF OF THE MATERIAL IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE TO NO FINES	GW	WELL GRADED GRAVELS, GRAVEL/SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL/SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL/SAND/SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL/SAND/CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE TO NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND/SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND/CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF OF THE MATERIAL IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SILTS

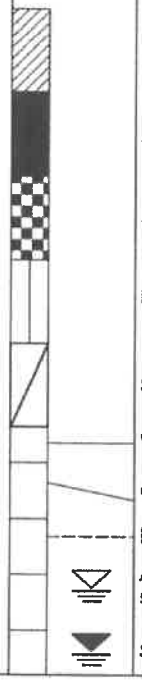
DATE: 6-12-13

KEY TO BORING LOG SYMBOLS

JOB NUMBER: 188.100

Depth in Feet	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per foot	Unified Soil Classification System

Note: Soils described as dry, moist, and wet are estimated to be dry of optimum, near optimum, and more wet than optimum moisture content, respectively. Saturated soils are estimated to be within areas of free groundwater.



- Bulk Sample
- 2.5-inch I.D. Split Barrel Sample
- 2.8-inch I.D. Shelby Tube Sample
- No Sample recovered
- Standard Penetration Test interval
- Well-defined stratum change
- Gradual stratum change
- Interpreted stratum change
- Apparent ground water level measured at date noted; seasonal weather conditions, site topography, etc., may cause fluctuations in water level indicated on boring logs
- Stabilized ground water level measured at date noted

PLATE 9

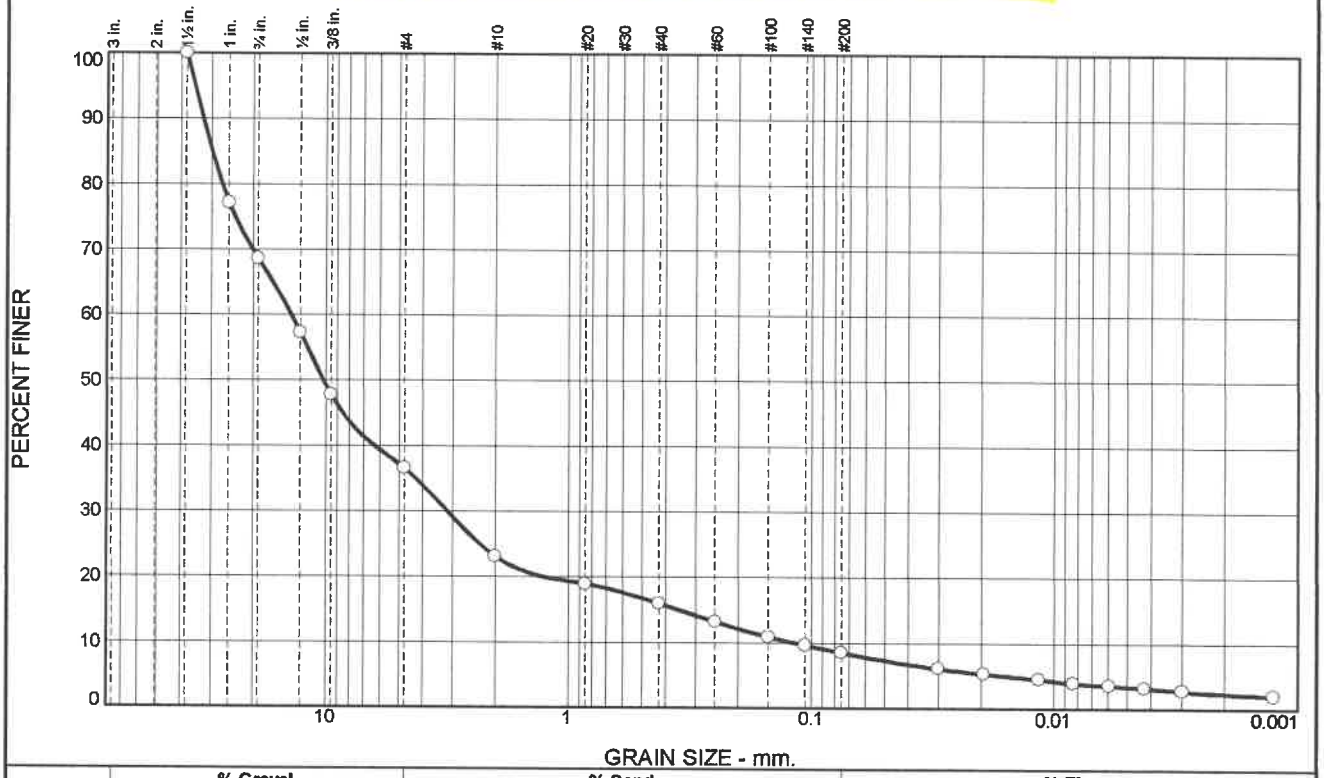
APPENDIX D

Laboratory Test Results

ENGEO, 2015

APPENDIX D

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	31.4	32.1	13.4	7.1	7.5	5.1	3.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2	100.0		
1	77.1		
3/4	68.6		
1/2	57.2		
3/8	47.8		
#4	36.5		
#10	23.1		
#20	18.9		
#40	16.0		
#60	13.2		
#100	10.9		
#140	9.6		
#200	8.5		
0.0301 mm.	6.1		
0.0195 mm.	5.3		
0.0116 mm.	4.5		
0.0083 mm.	3.9		
0.0060 mm.	3.6		
0.0042 mm.	3.2		
0.0030 mm.	2.8		
0.0013 mm.	2.0		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 32.5131 D_{85}= 29.8430 D_{60}= 13.8658
D_{50}= 10.2483 D_{30}= 3.1623 D_{15}= 0.3539
D_{10}= 0.1178 C_u= 117.71 C_c= 6.12

Classification

USCS= AASHTO=

Remarks

ASTM D422

Sample Number: 2-B1 @ 4.5-5 **Depth:** 4.5-5.0 feet

Date: 09/29/15

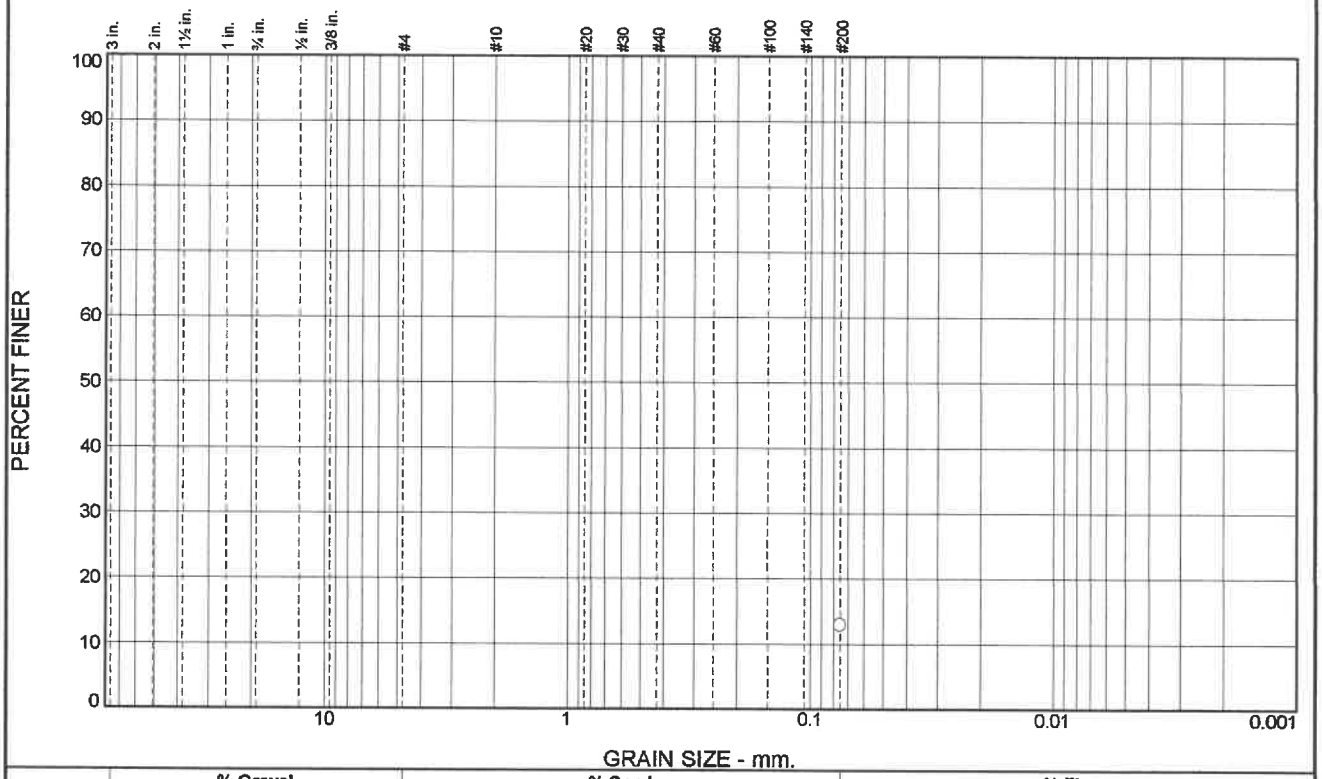
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: G. Criste **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						12.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	12.9		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B2 @ 25-26.5 **Depth:** 25.0-26.5 feet

Date: 09/29/15

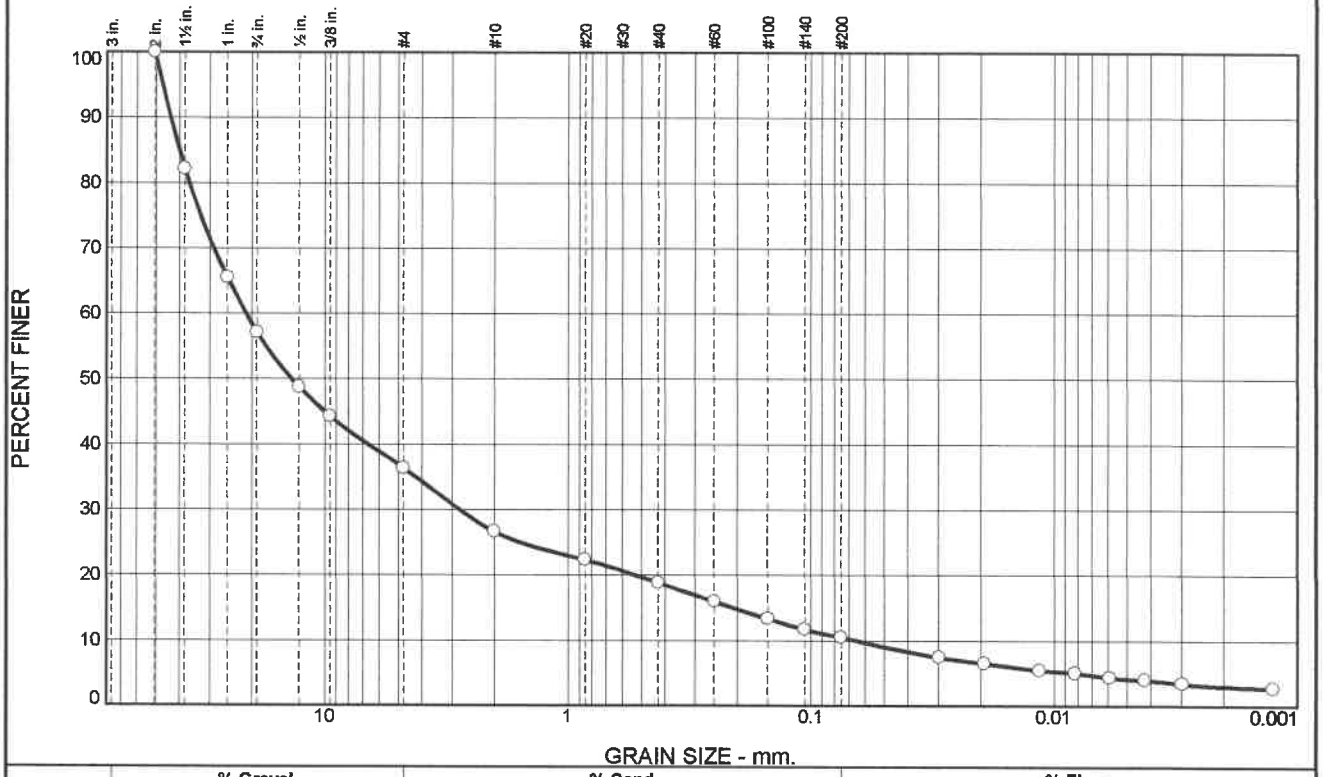
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: J. Lawton **Checked By:** D. Seibold

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	42.9	20.8	9.7	7.8	8.3	6.3	4.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1-1/2	82.1		
1	65.5		
3/4	57.1		
1/2	48.7		
3/8	44.2		
#4	36.3		
#10	26.6		
#20	22.3		
#40	18.8		
#60	15.9		
#100	13.3		
#140	11.7		
#200	10.5		
0.0298 mm.	7.4		
0.0193 mm.	6.5		
0.0115 mm.	5.5		
0.0082 mm.	5.0		
0.0059 mm.	4.4		
0.0042 mm.	4.0		
0.0030 mm.	3.4		
0.0013 mm.	2.7		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= 17 LL= 25 PI= 8

Coefficients

D_{90}= 43.5565 D_{85}= 40.0976 D_{60}= 21.2191
D_{50}= 13.6717 D_{30}= 2.7965 D_{15}= 0.2090
D_{10}= 0.0658 C_u= 322.51 C_c= 5.60

Classification

USCS= GP-GC AASHTO= A-2-4(0)

Remarks

GS: ASTM D422
PI: ASTM D4318, Wet method
USCS: ASTM D2487

Sample Number: 2-B2 @ 3-3.5 **Depth:** 3.0-3.5 feet

Date: 09/29/15

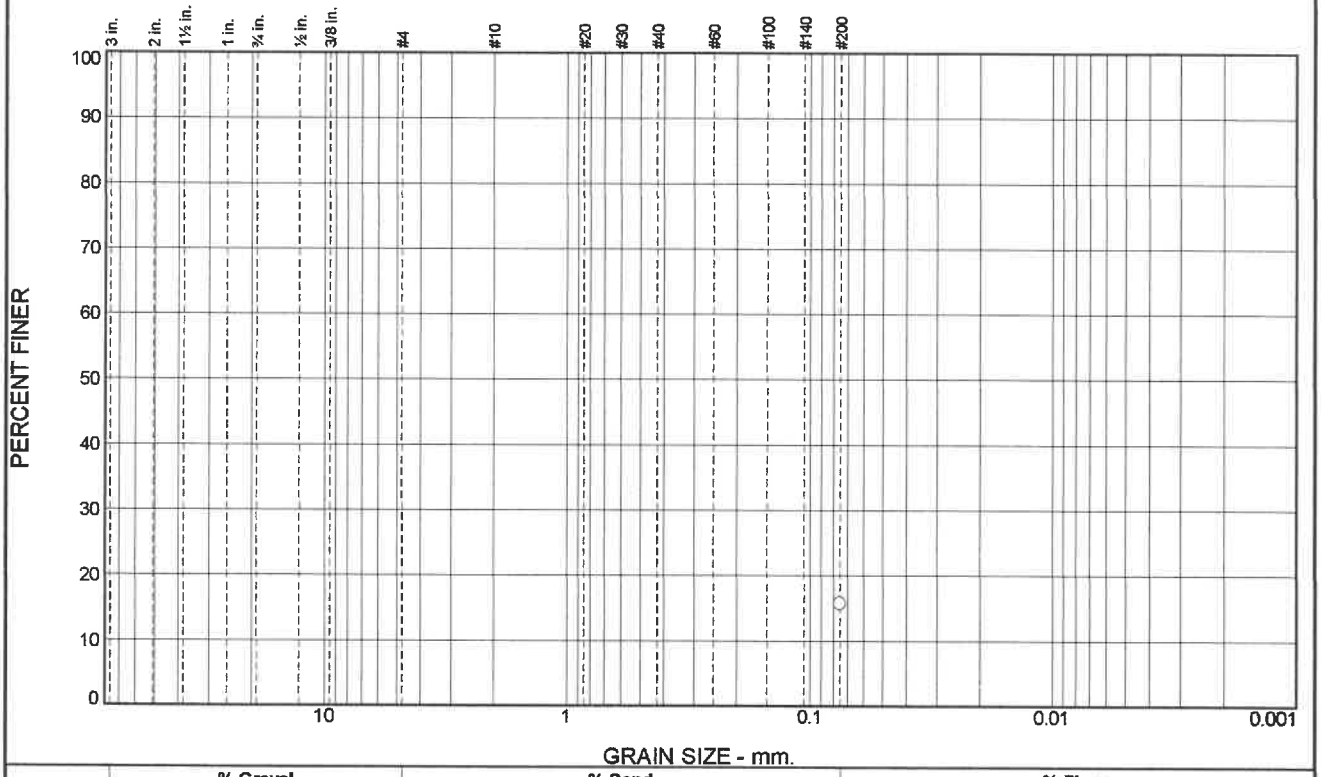
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: G. Criste **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						15.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	15.7		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B2 @ 7-7.5 **Depth:** 7.0-7.5 feet

Date: 09/28/15

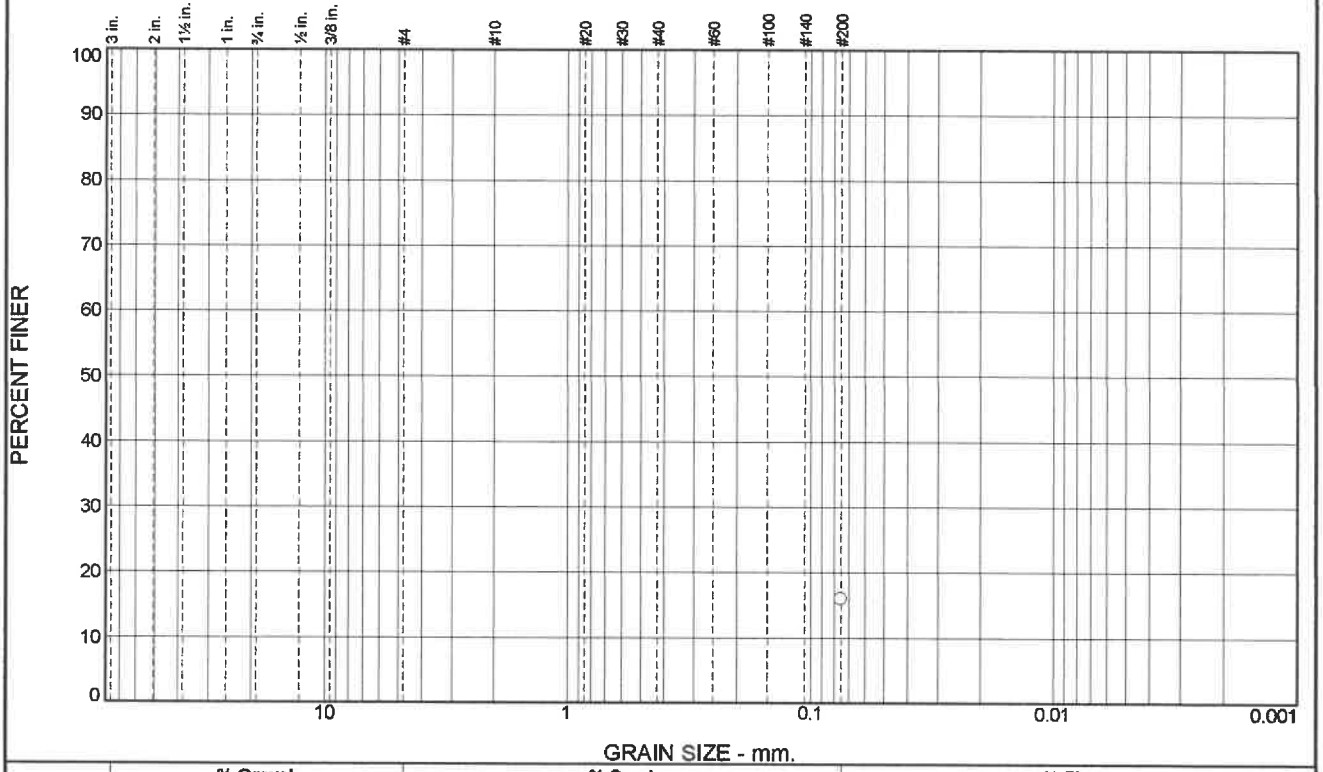
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: G. Criste **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						16.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	16.0		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B2A @ 35-36.5 **Depth:** 35.0-36.5 feet

Date: 09/29/15

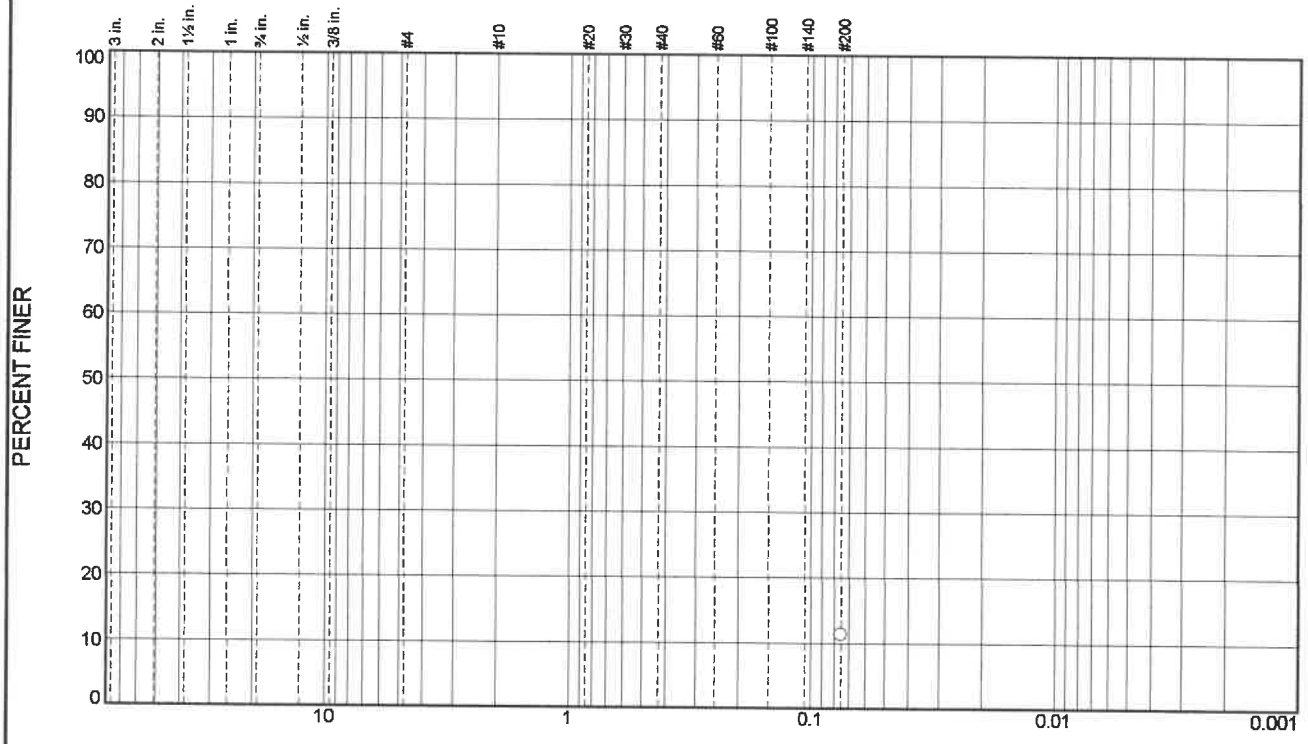
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: J. Lawton **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						11.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	11.3		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B3 @ 16-16.5 **Depth:** 16.0-16.5 feet

Date: 09/29/15

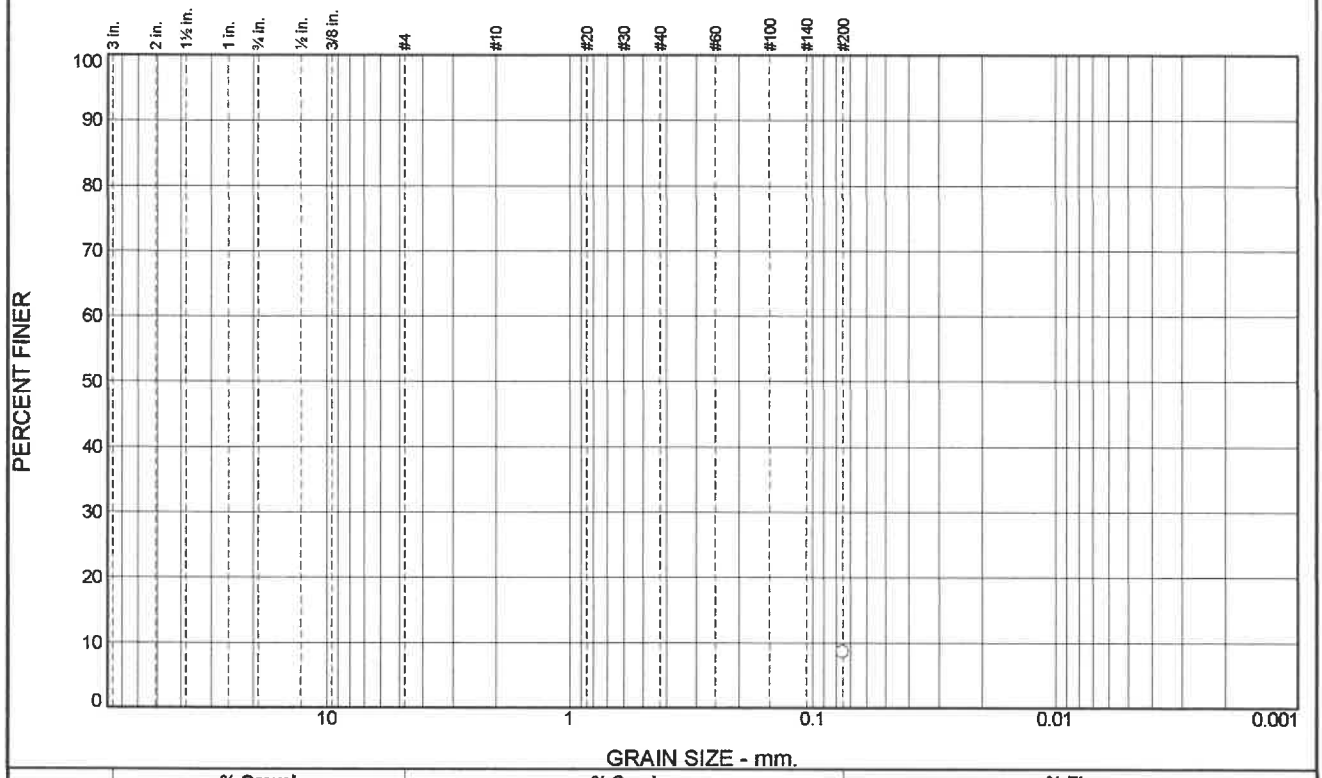
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: J. Lawton **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						8.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	8.6		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B4 @ 21-21.5 **Depth:** 21.0-21.5 feet

Date: 09/29/15

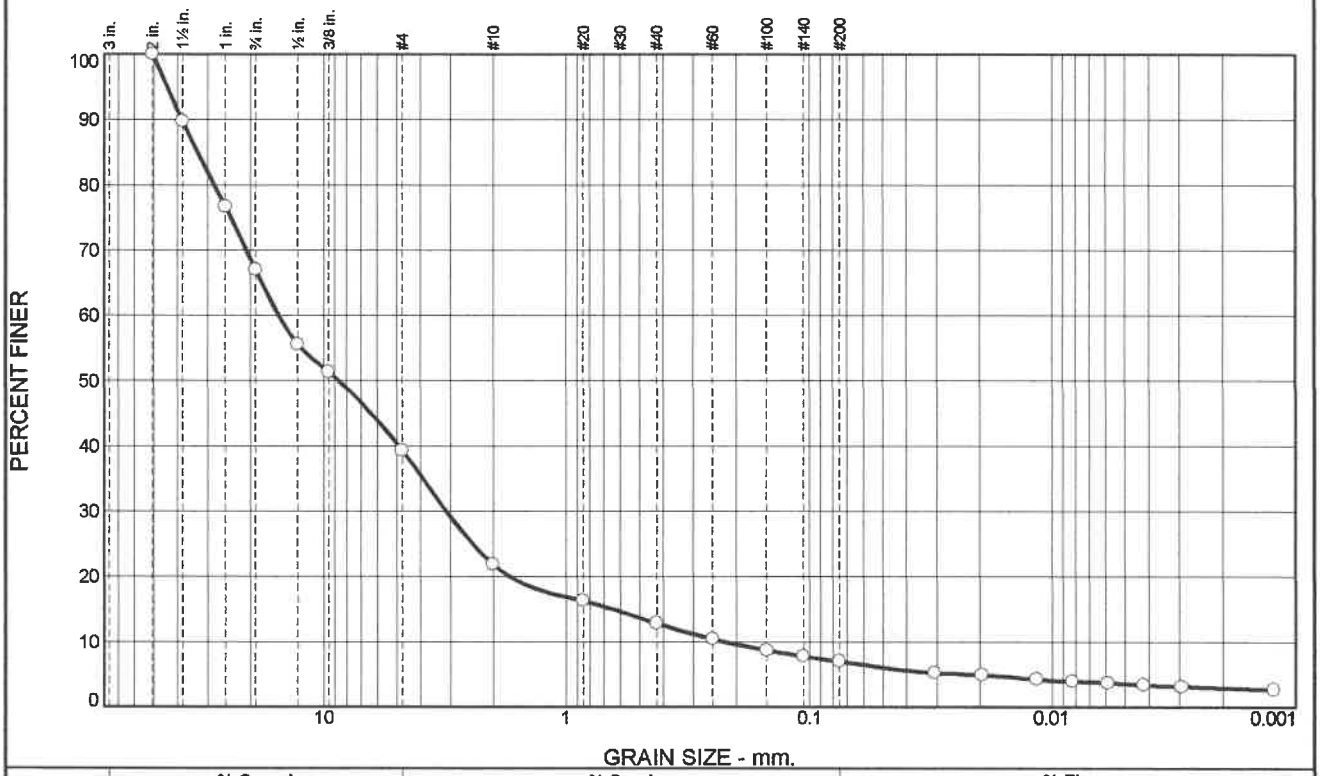
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: J. Lawton **Checked By:** D. Seibold

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	33.0	27.7	17.5	9.0	5.8	3.4	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1-1/2	89.7		
1	76.6		
3/4	67.0		
1/2	55.5		
3/8	51.3		
#4	39.3		
#10	21.8		
#20	16.3		
#40	12.8		
#60	10.4		
#100	8.7		
#140	7.8		
#200	7.0		
0.0306 mm.	5.2		
0.0196 mm.	4.9		
0.0115 mm.	4.3		
0.0083 mm.	3.9		
0.0059 mm.	3.7		
0.0042 mm.	3.4		
0.0029 mm.	3.1		
0.0012 mm.	2.7		

* (no specification provided)

Soil Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 38.4155 D_{85}= 33.0160 D_{60}= 15.2516
D_{50}= 8.6481 D_{30}= 3.1211 D_{15}= 0.6453
D_{10}= 0.2245 C_u= 67.94 C_c= 2.85

Classification

USCS= AASHTO=

Remarks

ASTM D422

Sample Number: 2-B4 @ 5.5-6 **Depth:** 5.5-6.0 feet

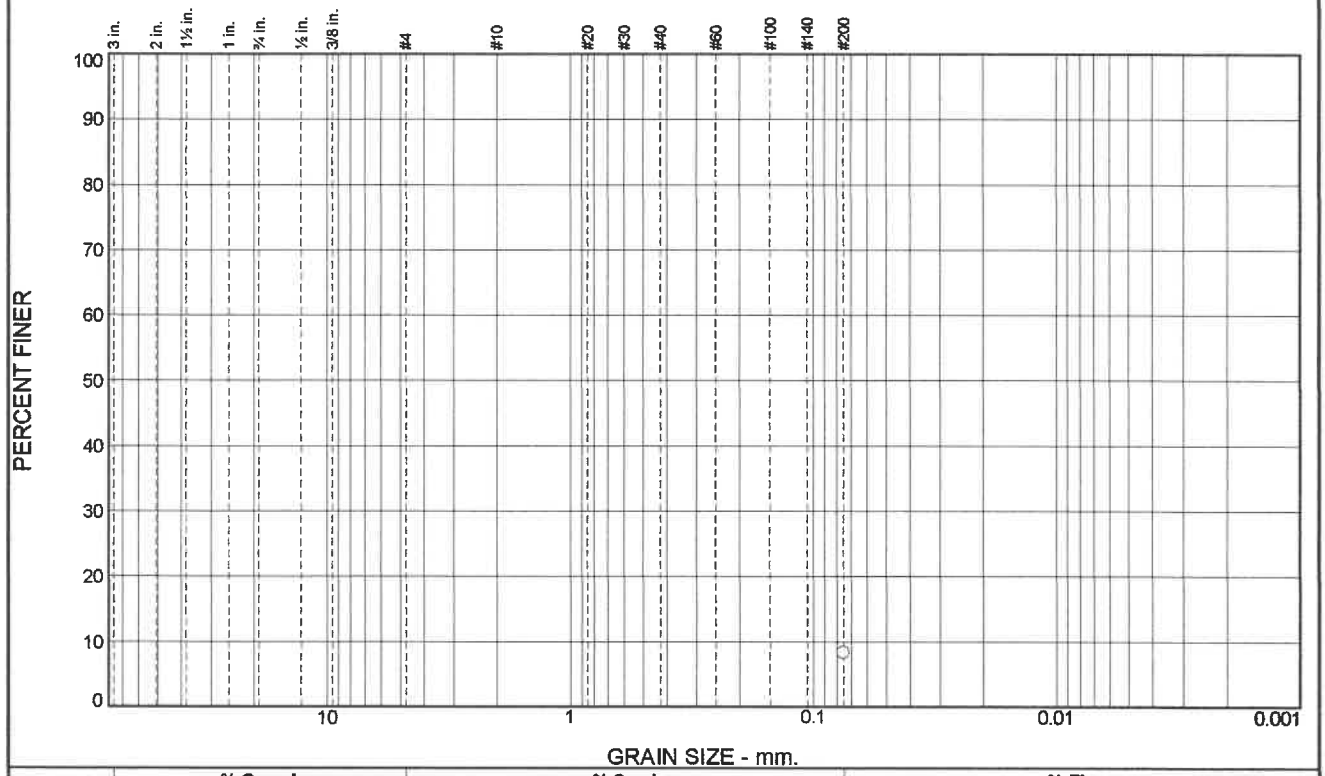
Date: 09/29/15

ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria
Project No: 10451.001.000

Tested By: G. Criste **Checked By:** D. Seibold

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						8.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	8.3		

* (no specification provided)

Material Description

See exploration logs

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

ASTM D1140

Sample Number: 2-B5 @ 5.5-6 **Depth:** 5.5-6.0 feet

Date: 09/29/15

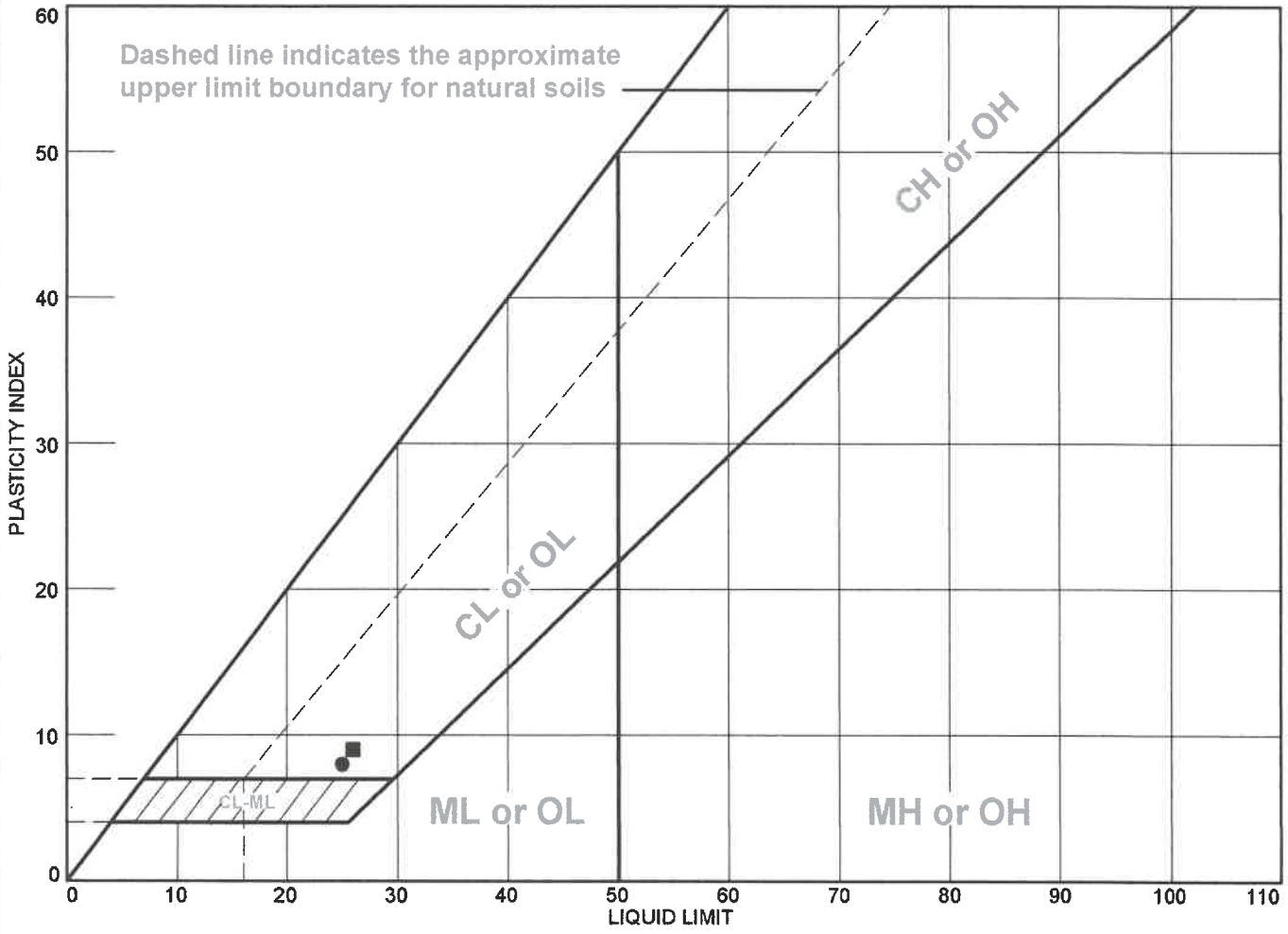
ENGEO INCORPORATED

Client: Standard Pacific Home, Bay Area
Project: Lantana - Wisteria

Project No: 10451.001.000

Tested By: J. Lawton **Checked By:** D. Seibold

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	See exploration logs	25	17	8			
■	See exploration logs	26	17	9			

Project No. 10451.001.000 **Client:** Standard Pacific Homes, Bay Area

Project: Lanatana - Wisteria

●**Depth:** 3-3.5 feet **Sample Number:** 2-B2 @ 3-3.5

■**Depth:** 3-3.5 feet **Sample Number:** 2-B3 @ 3-3.5

Remarks:

●ASTM D4318, wet method

■ASTM D4318, Wet method

ENGEO INCORPORATED

Tested By: G. Criste **Checked By:** D. Seibold

California State Certified Laboratory No. 215

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

28 September, 2015

Job No. 1509177
Cust. No.11521

Mr. Greg Cubbon
ENGEO Incorporated
6399 San Ignacio Avenue, Suite 150
San Jose, CA 95119

Subject: Project No.: 10451.001.000
Project Name: Lantana Wisteria, Morgan Hill
Corrosivity Analysis – ASTM Test Methods

Dear Mr. Cubbon:

Pursuant to your request, Cerco Analytical has analyzed the soil samples submitted on September 23, 2015. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements, both samples are classified as "moderately corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations reflect none detected with a reporting limit of 15 mg/kg.

The sulfate ion concentrations reflect none detected with a reporting limit of 15 mg/kg.

The sulfide ion concentrations reflect none detected with a detection limit of 50 mg/kg.

The pH of the soils were 6.80 & 7.14, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potentials were 460-mV & 470-mV, which are indicative of aerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please *call JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,
CERCO ANALYTICAL, INC.

J. Darby Howard, Jr., P.E.
President

JDH/jdl

Enclosure

California State Certified Laboratory No. 2153

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: ENGEO Incorporated
Client's Project No.: 10451.001.000
Client's Project Name: Lantana Wisteria, Morgan Hill
Date Sampled: 18-Sep-15
Date Received: 23-Sep-15
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 28-Sep-2015

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
1509177-001	2-B1 1.5-3'	470	7.14	-	6,300	N.D.	N.D.	N.D.
1509177-002	2-B4 0-3'	460	6.80	-	7,400	N.D.	N.D.	N.D.

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	25-Sep-2015	25-Sep-2015	-	23-Sep-2015	24-Sep-2015	24-Sep-2015	24-Sep-2015

Cheryl McMillen
Laboratory Director

* Results Reported on "As Received" Basis
N.D. - None Detected

Quality Control Summary - All laboratory quality control parameters were found to be within established limits

1509127 11521

CHAIN OF CUSTODY RECORD

PROJECT NUMBER: 10451.001.000	PROJECT NAME: Lantana Wisteria, Morgan Hill
SAMPLED BY: (SIGNATURE/PRINT) Mathew Clark	
PROJECT MANAGER: Greg Cubbon	
ROUTING: E-MAIL gcubbon@engeo.com	Hard Copy Greg Cubbon

	SAMPLE NUMBER	DATE	TIME	MATRIX	NUMBER OF CONTAINERS	CONTAINER SIZE	PRESERVATIVE	Redox	pH	Sulfate	Resistivity	Chloride	Sulfide	REMARKS REQUIRED DETECTION LIMITS
001	2-B1 1.5'-3'	9/18/2015		soil	1	bag	none	X	X	X	X	X	X	ASTM Test Methods w/ Brief Eval
002	2-B4 0'-3'	9/18/2015		soil	1	bag	none	X	X	X	X	X	X	ASTM Test Methods w/ Brief Eval

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
	9/23/15 10:36				
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
	9/23/15 16:10				
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	REMARKS	

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APPENDIX E

Liquefaction Analysis

ENGEO, 2015

APPENDIX E

Liquefaction Evaluation - Youd 2001, Seed 2003, I&B 2008 Methods -

Note, if sloping ground and non-zero static shear stress exist, user may chose to change value of kalpha

Input

Yellow cells are calculated

Green cells require user input - reference respective papers for details
Correction factors on "Driving Force" and "Resisting Force" sheets require user input

Water Table depth at time of Exploration	Water Table depth at time of Liquefaction	amax/g	Mw	V_{s20} *
50	25	0.85	7.9	900

* V_{s20} = Avg shear wave velocity in upper 40 feet expressed in ft/s

					At time of Exploration		At time of Liquefaction	
Boring Designation	Depth [ft]	Soil Type	N_m [Blows/ft]	FC	Total Stress [psf]	Effective Stress [psf]	Total Stress [psf]	Effective Stress [psf]
2-B2	26	GC	45	13	3250	3250	3510	3447.8
2-B2A	31	GC	63	15	3875	3875	4135	3760.8
2-B2A	36	GC	35	15	4500	4500	4760	4073.8
2-B2A	41	GC	51	15	5125	5125	5385	4386.8
B-1	26	GP	54	15	3250	3250	3510	3447.8
B-1	31	GP	35	15	3875	3875	4135	3760.8
B-1	36	GP	43	15	4500	4500	4760	4073.8
B-1	41	SC	30	15	5125	5125	5385	4386.8
B-1	46	SC	100	15	5750	5750	6010	4699.8
						0		0
						0		0
						0		0
						0		0
						0		0

N_m = Measured SPT Blow Count

YOUD 2001 Methodology Results

Boring Designation	Depth	CRR	CSR	FS
2-B2	26	TDL	0.49	TDL
2-B2A	31	TDL	0.43	TDL
2-B2A	36	TDL	0.44	TDL
2-B2A	41	TDL	0.44	TDL
B-1	26	TDL	0.49	TDL
B-1	31	TDL	0.43	TDL
B-1	36	TDL	0.44	TDL
B-1	41	TDL	0.44	TDL
B-1	46	TDL	0.43	TDL
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!

TDL = Too Dense to Liquefy based on blowcount criteria

SEED 2003 Methodology Results

			CSR			Calculated FS		
Boring Designation	Depth	CRR	mean rd	rd + sigma	rd - sigma	mean rd	rd + sigma	rd - sigma
2-B2	26	1.43	0.50	0.56	0.44	FS>2.5	FS>2.5	FS>2.5
2-B2A	31	THC	0.56	0.64	0.48	THC	THC	THC
2-B2A	36	0.44	0.61	0.70	0.52	0.73	0.63	0.85
2-B2A	41	1.53	0.65	0.76	0.54	2.37	2.02	FS>2.5
B-1	26	THC	0.50	0.56	0.44	THC	THC	THC
B-1	31	0.53	0.56	0.64	0.48	0.95	0.83	1.10
B-1	36	0.94	0.61	0.70	0.51	1.55	1.34	1.83
B-1	41	0.23	0.58	0.79	0.56	0.40	0.29	0.41
B-1	46	THC	0.68	0.80	0.56	THC	THC	THC
0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#N/A	#DIV/0!	#DIV/0!	#DIV/0!	#N/A	#N/A	#N/A
0	0	#N/A	#DIV/0!	#DIV/0!	#DIV/0!	#N/A	#N/A	#N/A
0	0	#N/A	#DIV/0!	#DIV/0!	#DIV/0!	#N/A	#N/A	#N/A

THC = CRR capped at 4, in high seismicity cases, verify

Idriss & Boulanger 2008 Methodology Results

Boring Designation	Depth	CRR	CSR	FS
2-B2	26	THC	0.53	THC
2-B2A	31	THC	0.44	THC
2-B2A	36	THC	0.63	THC
2-B2A	41	THC	0.47	THC
B-1	26	THC	0.41	THC
B-1	31	THC	0.58	THC
B-1	36	THC	0.63	THC
B-1	41	0.79	0.61	1.29
B-1	46	THC	0.48	THC
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!

THC = CRR capped at 4, in high seismicity cases, verify

Liquefaction Evaluation - Driving Force

Boring No.	0

Youd 2001

Boring Designation	Depth	Total Stress (psf)	Effective Stress (psf)	rd	CSR
3-B2	26	3510	3448	0.937	0.40
3-B3A	31	4135	3761	0.913	0.43
3-B3A	36	4760	4074	0.890	0.44
3-B3A	41	5385	4387	0.837	0.44
B-1	26	3510	3448	0.937	0.40
B-1	31	4135	3761	0.913	0.43
B-1	36	4760	4074	0.890	0.44
B-1	41	5385	4387	0.837	0.44
B-1	46	6010	4700	0.799	0.43
0	0	0	0	1.000	#DIV/0!
0	0	0	0	1.000	#DIV/0!
0	0	0	0	1.000	#DIV/0!
0	0	0	0	1.000	#DIV/0!

SEED 2003

Boring Designation	Depth	Total Stress (psf)	Effective Stress (psf)	CH	(N)160	Ce	Cb	Cr	Cs
3-B2	26	3250	3250	0.78	51	1.1	1.05	0.8533	1.3
3-B3A	31	3875	3875	0.72	77	1.1	1.15	0.9717	1.3
3-B3A	36	4500	4500	0.67	36	1.1	1.15	0.98	1.23333333
3-B3A	41	5125	5125	0.62	53	1.1	1.15	0.9867	1.3
B-1	26	3250	3250	0.78	84	1.1	1.15	0.92	1.3
B-1	31	3875	3875	0.72	38	1.1	1.15	0.9533	1.26144742
B-1	36	4500	4500	0.67	45	1.1	1.15	0.9717	1.28888887
B-1	41	5125	5125	0.62	26	1.1	1.15	0.995	1.19740851
B-1	46	5750	5750	0.58	88	1.1	1.15	0.9867	1.3
0	0	0	0	#DIV/0!	#DIV/0!	1.1	1.15	0.9907	#DIV/0!
0	0	0	0	#DIV/0!	#N/A	1.1	1	#N/A	#DIV/0!
0	0	0	0	#DIV/0!	#N/A	1.1	1	#N/A	#DIV/0!
0	0	0	0	#DIV/0!	#N/A	1.1	1	#N/A	#DIV/0!

DWF
0.83

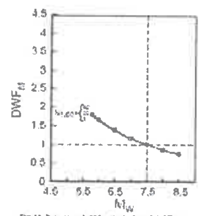
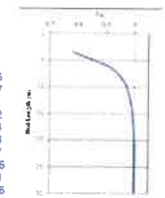


Fig. 13. Recommended Magnitude Correlated Duration Weighting Factor as a Function of M_w

Rod Length (feet)	CR
9	0.8
12	0.85
15	0.87
18	0.9
21	0.92
24	0.94
27	0.96
30	0.97
33	0.975
36	0.98
39	0.985
45	0.99
60	1
100	1



Boring Designation	Depth	Cfines	(N1)60cs	rd	sigma	rd+sigma	rd-sigma	f	K sigma	K alpha ~
3-B2	26	1.06	54	0.987	0.115	1.106	0.877	0.80	0.92	1.00
3-B3A	31	1.07	77	0.986	0.133	1.119	0.853	0.80	0.89	1.00
3-B3A	36	1.09	39	0.978	0.151	1.129	0.826	0.79	0.88	1.00
3-B3A	41	1.07	56	0.965	0.166	1.131	0.800	0.80	0.84	1.00
B-1	26	1.07	88	0.982	0.115	1.106	0.877	0.80	0.82	1.00
B-1	31	1.08	41	0.986	0.133	1.119	0.853	0.80	0.89	1.00
B-1	36	1.08	49	0.978	0.151	1.129	0.826	0.80	0.88	1.00
B-1	41	1.09	30	0.965	0.166	1.131	0.800	0.75	0.80	1.00
B-1	46	1.07	102	0.948	0.166	1.114	0.783	0.80	0.82	1.00
0.00	0	1.00	#DIV/0!	1.000	0.000	1.000	1.000	#DIV/0!	#DIV/0!	1.00
0.00	0	1.00	#N/A	1.000	0.000	1.000	1.000	#N/A	#N/A	1.00
0.00	0	1.00	#N/A	1.000	0.000	1.000	1.000	#N/A	#N/A	1.00
0.00	0	1.00	#N/A	1.000	0.000	1.000	1.000	#N/A	#N/A	1.00

Boring Designation	mean value of rd				rd + sigma				rd - sigma			
	CSReq	CSRN	CSR*	CSR*a=0	CSReq	CSRN	CSR*	CSR*a>0	CSReq	CSRN	CSR*	CSR*a=0
3-B2	0.43	0.48	0.50	0.50	0.48	0.51	0.58	0.58	0.38	0.41	0.44	0.44
3-B3A	0.48	0.50	0.56	0.56	0.52	0.58	0.64	0.64	0.40	0.43	0.48	0.49
3-B3A	0.48	0.52	0.61	0.61	0.56	0.60	0.70	0.70	0.41	0.44	0.52	0.52
3-B3A	0.50	0.54	0.65	0.65	0.56	0.63	0.76	0.76	0.42	0.45	0.54	0.54
B-1	0.43	0.48	0.50	0.50	0.48	0.51	0.56	0.56	0.38	0.41	0.44	0.44
B-1	0.48	0.50	0.58	0.56	0.52	0.58	0.64	0.64	0.40	0.43	0.48	0.49
B-1	0.48	0.52	0.61	0.61	0.50	0.60	0.70	0.70	0.41	0.44	0.51	0.51
B-1	0.50	0.64	0.69	0.58	0.59	0.63	0.79	0.79	0.42	0.45	0.56	0.66
B-1	0.51	0.65	0.69	0.80	0.60	0.65	0.80	0.80	0.43	0.46	0.56	0.58
0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

~ K alpha = 1.0 for level ground conditions only (no static shear stress)

I&B 2008

MSF
0.83

Boring Designation	Depth	Total Stress (psf)	Effective Stress (psf)	rd	CSR	Csigma	K sigma	K alpha ~	CSR7.5
3-B2	26	3510	3448	0.945	0.41	0.300	0.95	1.00	0.53
3-B3A	31	4135	3761	0.929	0.43	-0.249	1.10	1.00	0.44
3-B3A	36	4760	4074	0.912	0.45	0.300	0.80	1.00	0.65
3-B3A	41	5385	4387	0.894	0.47	-0.699	1.10	1.00	0.47
B-1	26	3510	3448	0.945	0.41	-0.449	1.10	1.00	0.41
B-1	31	4135	3761	0.929	0.43	0.300	0.93	1.00	0.59
B-1	36	4760	4074	0.912	0.45	0.300	0.80	1.00	0.53
B-1	41	5385	4387	0.894	0.47	0.202	0.95	1.00	0.51
B-1	46	6010	4700	0.876	0.48	-0.115	1.08	1.00	0.48
0	0	0	0	1.008	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!
0	0	0	0	1.008	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!
0	0	0	0	1.006	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!
0	0	0	0	1.006	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!

~ K alpha = 1.0 for level ground conditions only (no static shear stress)

Liquefaction Evaluation - Resisting Force

Boring No.	0

YOUD 2001

Boring Designation	Depth	Total Stress [psf]	Effective Stress [psf]	CN	Ce	Cb	Cr	Cs	(N1)60
2-B2	26	3250	3250	0.78	1.05	1.05	0.9533	1.3	48
2-B2A	31	3875	3875	0.72	1.05	1.15	0.9717	1.3	69
2-B2A	36	4500	4500	0.67	1.05	1.15	0.98	1.23333333	34
2-B2A	41	5125	5125	0.62	1.05	1.15	0.9867	1.3	49
B-1	26	3250	3250	0.78	1.05	1.15	0.92	1.3	61
B-1	31	3875	3875	0.72	1.05	1.15	0.9533	1.25144742	36
B-1	36	4500	4500	0.67	1.05	1.15	0.9717	1.28888887	43
B-1	41	5125	5125	0.62	1.05	1.15	0.98	1.18740851	26
B-1	46	5750	5750	0.59	1.05	1.15	0.9867	1.3	91
0	0	0	0	#DIV/0!	1.05	1.15	0.9907	#DIV/0!	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!	#DIV/0!

MSF
0.87513418

Boring Designation	Depth	alpha	beta	(N1)60cs	r	K sigma	K alpha ~	CRR-B	CRR-M
2-B2	26	1.89	1.04	52	0.80	0.92	1.00	0.32	TDL
2-B2A	31	2.50	1.05	75	0.80	0.89	1.00	0.53	TDL
2-B2A	36	2.77	1.05	39	0.79	0.86	1.00	0.07	TDL
2-B2A	41	2.50	1.05	54	0.80	0.84	1.00	0.35	TDL
B-1	26	2.50	1.05	67	0.80	0.92	1.00	0.46	TDL
B-1	31	2.50	1.05	40	0.80	0.89	1.00	0.14	TDL
B-1	36	2.50	1.05	48	0.80	0.86	1.00	0.28	TDL
B-1	41	2.50	1.05	30	0.75	0.80	1.00	0.47	TDL
B-1	46	2.50	1.05	98	0.80	0.82	1.00	0.71	TDL
0.00	0	0.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!	#DIV/0!
0.00	0	0.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!	#DIV/0!
0.00	0	0.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!	#DIV/0!
0.00	0	0.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	1.00	#DIV/0!	#DIV/0!

~ K alpha = 1.0 for level ground conditions only (no static shear stress)

SEED 2003

Boring Designation	Depth	CRR
2-B2	26	1.43
2-B2A	31	8.24
2-B2A	36	0.44
2-B2A	41	1.53
B-1	26	4.36
B-1	31	0.53
B-1	36	0.94
B-1	41	0.23
B-1	46	49.76
0	0	#DIV/0!
0	0	#N/A
0	0	#N/A
0	0	#N/A

I&B 2008

Boring Designation	Depth	Total Stress [psf]	Effective Stress [psf]	(N)60	Ce	Cb	Cr	Cs
2-B2	26	3250	3250	61	1.05	1.05	0.9533	1.3
2-B2A	31	3875	3875	96	1.05	1.15	0.9717	1.3
2-B2A	36	4500	4500	51	1.05	1.15	0.98	1.23333333
2-B2A	41	5125	5125	79	1.05	1.15	0.9867	1.3
B-1	26	3250	3250	78	1.05	1.15	0.92	1.3
B-1	31	3875	3875	50	1.05	1.15	0.9533	1.25144742
B-1	36	4500	4500	65	1.05	1.15	0.9717	1.28888887
B-1	41	5125	5125	42	1.05	1.15	0.98	1.18740851
B-1	46	5750	5750	155	1.05	1.15	0.9867	1.3
0	0	0	0	#DIV/0!	1.05	1.15	0.9907	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!
0	0	0	0	#DIV/0!	1.05	1	0.95	#DIV/0!

Iterations of CN Value

Boring Designation	Depth	CN i	N1-1	Cn1	N1-2	Cn2	N1-3	Cn3	N14	CN	(N1)60
2-B2	26	0.92	46	0.88	46	0.88	46	0.88	46	0.88	54
2-B2A	31	0.88	46	0.84	46	0.84	46	0.84	46	0.84	81
2-B2A	36	0.83	42.2146418	0.79	40.5402634	0.79	40.2129708	0.79	40.5485235	0.79	40
2-B2A	41	0.81	46	0.78	46	0.78	46	0.78	46	0.78	62
B-1	26	0.95	46	0.88	46	0.88	46	0.88	46	0.88	69
B-1	31	0.85	43.0567848	0.83	41.8941645	0.83	41.7047804	0.83	41.6737657	0.83	42
B-1	36	0.87	46	0.81	46	0.81	46	0.81	46	0.81	52
B-1	41	0.76	32.2265845	0.72	30.3817064	0.71	30.0218292	0.71	29.9508753	0.71	30
B-1	46	1.20	46	0.76	46	0.76	46	0.76	46	0.76	117
0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Boring Designation	Depth	Delta N	(N1)60cs	CRR-B
2-B2	26	2.51	57	219219.07
2-B2A	31	3.26	84	##########
2-B2A	36	3.58	44	17.07
2-B2A	41	3.26	65	##########
B-1	26	3.26	72	##########
B-1	31	3.26	45	30.08
B-1	36	3.26	56	83172.46
B-1	41	3.26	33	0.79
B-1	46	3.26	121	##########
0.00	0	0.00	#DIV/0!	#DIV/0!
0.00	0	0.00	#DIV/0!	#DIV/0!
0.00	0	0.00	#DIV/0!	#DIV/0!
0.00	0	0.00	#DIV/0!	#DIV/0!

APPENDIX F

Supplemental Recommendations

APPENDIX F

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GENERAL INFORMATION

PREFACE

These supplemental recommendations are intended as a guide for earthwork and are in addition to any previous earthwork recommendations made by the Geotechnical Engineer. If there is a conflict between these supplemental recommendations and any previous recommendations, it should be immediately brought to the attention of ENGEO. Testing standards identified in this document shall be the most current revision (unless stated otherwise).

DEFINITIONS

Backfill	Soil, rock or soil-rock material used to fill excavations and trenches.
Drawings	Documents approved for construction which describe the work.
The Geotechnical Engineer	The project geotechnical engineering consulting firm, its employees, or its designated representatives.
Engineered Fill	Fill upon which the Geotechnical Engineer has made sufficient observations and tests to confirm that the fill has been placed and compacted in accordance with geotechnical engineering recommendations.
Fill	Soil, rock, or soil-rock materials placed to raise the grades of the site or to backfill excavations.
Imported Material	Soil and/or rock material which is brought to the site from offsite areas.
Onsite Material	Soil and/or rock material which is obtained from the site.
Optimum Moisture	Water content, percentage by dry weight, corresponding to the maximum dry density as determined by ASTM D-1557.
Relative Compaction	The ratio, expressed as a percentage, of the in-place dry density of the fill or backfill material as compacted in the field to the maximum dry density of the same material as determined by ASTM D-1557.
Select Material	Onsite and/or imported material which is approved by the Geotechnical Engineer as a specific-purpose fill.

PART I - EARTHWORK

1.1 GENERAL

1.1.1 WORK COVERED

Supplemental recommendations for performing earthwork and grading. Activities include:

- ✓ Site Preparation and Demolition
- ✓ Excavation
- ✓ Grading
- ✓ Backfill of Excavations and Trenches
- ✓ Engineered Fill Placement, Moisture Conditioning, and Compaction

1.1.2 CODES AND STANDARDS

The contractor should perform their work complying with applicable occupational safety and health standards, rules, regulations, and orders. The Occupational Safety and Health Standards (OSHA) Board is the only agency authorized in the State to adopt and enforce occupational safety and health standards (Labor Code § 142 et seq.). The owner, their representative and contractor are responsible for site safety; ENGEO representatives are not responsible for site safety.

Excavating, trenching, filling, backfilling, shoring and grading work should meet the minimum requirements of the applicable Building Code, and the standards and ordinances of state and local governing authorities.

1.1.3 TESTING AND OBSERVATION

Site preparation, cutting and shaping, excavating, filling, and backfilling should be carried out under the testing and observation of ENGEO. ENGEO shall be retained to perform appropriate field and laboratory tests to check compliance with the recommendations. Any fill or backfill that does not meet the supplemental recommendations shall be removed and/or reworked, until the supplemental recommendations are satisfied.

Tests for compaction shall be made in accordance with test procedures outlined in ASTM D-1557, as applicable, unless other testing methods are deemed appropriate by ENGEO. These and other tests shall be performed in accordance with accepted testing procedures, subject to the engineering discretion of ENGEO.

1.2 MATERIALS

1.2.1 STANDARD

Materials, tools, equipment, facilities, and services as required for performing the required excavating, trenching, filling and backfilling should be furnished by the Contractor.

1.2.2 ENGINEERED FILL AND BACKFILL

Material to be used for engineered fill and backfill should be free from organic matter and other deleterious substances, and of such quality that it will compact thoroughly without excessive voids when watered and rolled.

Unless specified elsewhere by ENGEO, engineered fill and backfill shall be free of significant organics, or any other unsatisfactory material. In addition, engineered fill and backfill shall comply with the grading requirements shown in the following table:

TABLE 1.2.2-1
Engineered Fill and Backfill Requirements

US Standard Sieve	Percentage Passing
3"	100
No. 4	35–100
No. 30	20–100

Earth materials to be used as engineered fill and backfill shall be cleared of debris, rubble and deleterious matter. Rocks and aggregate exceeding the maximum allowable size shall be removed from the site. Rocks of maximum dimension in excess of two-thirds of the lift thickness shall be removed from any fill material to the satisfaction of ENGEO.

ENGEO shall be immediately notified if potential hazardous materials or suspect soils exhibiting staining or odor are encountered. Work activities shall be discontinued within the area of potentially hazardous materials. ENGEO shall be notified at least 72 hours prior to the start of filling and backfilling operations. Materials to be used for filling and backfilling shall be submitted to ENGEO no less than 10 days prior to intended delivery to the site. Unless specified elsewhere by ENGEO, where conditions require the importation of low expansive fill material, the material shall be an inert, low to non-expansive soil, or soil-rock material, free of organic matter and meeting the following requirements:

TABLE 1.2.2-2
Imported Fill Material Requirements

GRADATION (ASTM D-421)	**SIEVE SIZE**	**PERCENT PASSING**
	2-inch	100
	#200	15 - 70
PLASTICITY (ASTM D-4318)	Plasticity Index < 12	
ORGANIC CONTENT (ASTM D-2974)	Less than 2 percent	

A sample of the proposed import material should be submitted to ENGEO no less than 10 days prior to intended delivery to the site.

1.2.3 SUBDRAINS

A subdrain system is an underground network of piping used to remove water from areas that collect or retain surface water or subsurface water. Subsurface water is collected by allowing water into the pipe through perforations. Subdrain systems may drain and discharge to an appropriate outlet such as storm drain, natural swales or drainage, etc.. Details for subdrain systems may vary depending on many items, including but not limited to site conditions, soil types, subdrain spacing, depth of the pipe and pervious medium, as well as pipe diameter.

1.2.3A Pipe

Subdrain pipe shall conform with these supplemental recommendations unless specified elsewhere by ENGEO. Perforated pipe for various depths shall be manufactured in accordance with the following requirements:

TABLE 1.2.3A-1
Perforated Pipe Requirements

Pipe Type	Standard	Typical Sizes (inches)	Pipe Stiffness (psi)
Pipe Stiffness above 200 psi (Below 50 feet of Finished Grade)			
ABS SDR 15.3		4 to 6	450
PVC Schedule 80	ASTM D1785	3 to 10	530
Pipe Stiffness between 100 psi and 150 psi (Between 15 and 50 feet of Finished Grade)			
ABS SDR 23.5	ASTM D2751	4 to 6	150
PVC SDR 23.5	ASTM D3034	4 to 6	153
PVC Schedule 40	ASTM D1785	3 to 10	135
ABS Schedule 40/DWV	ASTM D1527 & D2661	3 to 10	
Pipe Stiffness between 45 psi and 50 psi* (Between 0 to 15 feet of Finished Grade)			
PVC A-2000	ASTM F949	4 to 10	50
PVC SDR 35	ASTM D3034	4 to 8	46
ABS SDR 35	ASTM D2751	4 to 8	45
Corrugated PE	AASHTO M294 Type S	4 to 10	45

*Pipe with a stiffness less than 45 psi should not be used.

Other pipes not listed in the table above shall be submitted for review by the Geotechnical Engineer not less 72 hours before proposed use.

1.2.3B Outlets and Risers

Subdrain outlets and risers must be fabricated from the same material as the subdrain pipe. Outlet and riser pipe and fittings must not be perforated. Covers must be fitted and bolted into the riser pipe or elbow. Covers must seat uniformly and not be subject to rocking.

1.2.3C Permeable Material

Permeable material shall generally conform to Caltrans Standard Specification unless specified otherwise by ENGEO. Class 2 permeable material shall comply with the gradation requirements shown in the following table.

TABLE 1.2.3C-1
Class 2 Permeable Material Grading Requirements

Sieve sizes	Percentage passing
1"	100
3/4"	90 to 100
3/8"	40 to 100
No. 4	25 to 40
No. 8	18 to 33
No. 30	5 to 15
No. 50	0 to 7
No. 200	0 to 3

1.2.3D Filter Fabric

Filter fabric shall meet the following Minimum Average Roll Values unless specified elsewhere by ENGEO.

Grab Strength (ASTM D-4632) ..... 180 lbs
Mass per Unit Area (ASTM D-4751) ..... 6 oz/yd^2
Apparent Opening Size (ASTM D-4751) ..... 70-100 U.S. Std. Sieve
Flow Rate (ASTM D-4491) ..... 80 gal/min/ft^2
Puncture Strength (ASTM D-4833) ..... 80 lbs

Areas to receive filter fabric must comply with the compaction and elevation tolerance specified for the material involved. Handle and place filter fabric under the manufacturer's instructions. Align and place filter fabric without wrinkles.

Overlap adjacent roll ends of filter fabric in accordance with manufacturer's recommendations. The preceding roll must overlap the following roll in the direction that the permeable material is being spread. Completely replace torn or punctured sections damaged during placement or repair by placing a piece of filter fabric that is large enough to cover the damaged area and comply with the overlap specified. Cover filter fabric with the thickness of overlying material shown within 72 hours of placing the fabric.

1.2.4 GEOCOMPOSITE DRAINAGE

Geocomposite drainage is a prefabricated material that includes filter fabric and plastic pipe. Filter fabric must be Class A. The drain shall be of composite construction consisting of a supporting structure or drainage core material surrounded by a geotextile. The geotextile shall

encapsulate the drainage core and prevent random soil intrusion into the drainage structure. The drainage core material shall consist of a three-dimensional polymeric material with a structure that permits flow along the core laterally. The core structure shall also be constructed to permit flow regardless of the water inlet surface. The drainage core shall provide support to the geotextile.

A geotextile flap shall be provided along drainage core edges. This flap shall be of sufficient width for sealing the geotextile to the adjacent drainage structure edge to prevent soil intrusion into the structure during and after installation. The geotextile shall cover the full length of the core. The geocomposite core shall be furnished with an approved method of constructing and connecting with outlet pipes. If the fabric on the geocomposite drain is torn or punctured, replace the damaged section completely. The specific drainage composite material and supplier shall be preapproved by ENGEO.

The Contractor shall submit a manufacturer's certification that the geocomposite meets the design properties and respective index criteria measured in full accordance with applicable test methods. The manufacturer's certification shall include a submittal package of documented test results that confirm the design values. In case of dispute over validity of design values, the Contractor will supply design property test data from a laboratory approved by ENGEO, to support the certified values submitted.

Geocomposite material suppliers shall provide a qualified and experienced representative onsite to assist the Contractor and ENGEO at the start of construction with directions on the use of drainage composite. If there is more than one application on a project, this criterion will apply to construction of the initial application only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining applications. The soil surface against which the geocomposite is to be placed shall be free of debris and inordinate irregularities that will prevent intimate contact between the soil surface and the drain.

Edge seams shall be formed by utilizing the flap of the geotextile extending from the geocomposite's edge and lapping over the top of the fabric of the adjacent course. The fabric flap shall be securely fastened to the adjacent fabric by means of plastic tape or non-water-soluble construction adhesive, as recommended by the supplier. To prevent soil intrusion, exposed edges of the geocomposite drainage core edge must be covered.

Approved backfill shall be placed immediately over the geocomposite drain. Backfill operations should be performed to not damage the geotextile surface of the drain. Also during operations, avoid excessive settlement of the backfill material. The geocomposite drain, once installed, shall not be exposed for more than 7 days prior to backfilling.

PART II - GEOGRID SOIL REINFORCEMENT

Geogrid soil reinforcement (geogrid) shall be submitted to ENGEO and should be approved before use. The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under construction stresses and shall have high resistance to damage during construction to ultraviolet degradation and to chemical and biological degradation encountered in the soil being reinforced. The geogrids shall have an Allowable Tensile Strength (T_a) and Pullout Resistance, for the soil type(s) as specified on design plans.

The contractor shall submit a manufacturer's certification that the geogrids supplied meet plans and project specifications. The contractor shall check the geogrid upon delivery to ensure that the proper material has been received. During periods of shipment and storage, the geogrid shall be protected from temperatures greater than 140°F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geogrid will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geogrid damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

Geogrid material suppliers shall provide a qualified and experienced representative onsite at the initiation of the project, for a minimum of three days, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall also be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s). Geogrid reinforcement may be joined with mechanical connections or overlaps as recommended and approved by the manufacturer. Joints shall not be placed within 6 feet of the slope face, within 4 feet below top of slope, nor horizontally or vertically adjacent to another joint.

The geogrid reinforcement shall be installed in accordance with the manufacturer's recommendations. The geogrid reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed. The geogrid reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. However, if the Contractor is unable to complete a required length with a single continuous length of geogrid, a joint may be made with the manufacturer's approval. Only one joint per length of geogrid shall be allowed. This joint shall be made for the full width of the strip by using a similar material with similar strength. Joints in geogrid reinforcement shall be pulled and held taut during fill placement.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacing between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings. Adjacent rolls of geogrid reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable.

The Contractor may place only that amount of geogrid reinforcement required for immediately pending work to prevent undue damage. After a layer of geogrid reinforcement has been placed, the next succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geogrid reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geogrid reinforcement and soil. Geogrid reinforcement shall be placed to lay flat and pulled tight prior to backfilling. After a layer of geogrid reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geogrid reinforcement in position until the subsequent soil layer can be placed.

Under no circumstances shall a track-type vehicle be allowed on the geogrid reinforcement before at least 6 inches of soil have been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geogrid reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided. During construction, the surface of the fill should be kept approximately horizontal. Geogrid reinforcement shall be placed directly on the compacted horizontal fill surface. Geogrid reinforcements are to be placed as shown on plans, and oriented correctly.

PART III - GEOTEXTILE SOIL REINFORCEMENT

The specific geotextile material and supplier shall be preapproved by ENGEO. The contractor shall submit a manufacturer's certification that the geotextiles supplied meet the respective index criteria set when geotextile was approved by ENGEO, measured in full accordance with specified test methods and standards.

The contractor shall check the geotextile upon delivery to ensure that the proper material has been received. During periods of shipment and storage, the geotextile shall be protected from temperatures greater than 140°F, mud, dirt, dust, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the geotextile will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be repaired by placing a patch over the damaged area. Any geotextile damaged during storage or installation shall be replaced by the Contractor at no additional cost to the owner.

Geotextile material suppliers shall provide a qualified and experienced representative onsite at the initiation of the project to assist the Contractor and ENGEO personnel at the start of construction. The geotextile reinforcement shall be installed in accordance with the manufacturer's recommendations. The geotextile reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed, secured with staples, pins, or small piles of backfill, placed without wrinkles, and aligned with the primary strength direction perpendicular to slope contours. Cover geotextile reinforcement with backfill within the same work shift. Place at least 6 inches of backfill on the geotextile reinforcement before operating or driving equipment or vehicles over it, except those used under the conditions specified below for spreading backfill.

Adjacent strips, in the case of 100 percent coverage in plan view, need not be overlapped. The minimum horizontal coverage is 50 percent, with horizontal spacing between reinforcement no greater than 40 inches. Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings. Adjacent rolls of geotextile reinforcement shall be overlapped or mechanically connected where exposed in a wraparound face system, as applicable.

The contractor may place only that amount of geotextile reinforcement required for immediately pending work to prevent undue damage. After a layer of geotextile reinforcement has been placed, the succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geotextile reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geotextile reinforcement and soil.

Geotextile reinforcement shall be placed to lay flat and be pulled tight prior to backfilling. After a layer of geotextile reinforcement has been placed, suitable means, such as pins or small piles of soil, shall be used to hold the geotextile reinforcement in position until the subsequent soil layer can be placed. Under no circumstances shall a track-type vehicle be allowed on the geotextile reinforcement before at least six inches of soil has been placed. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geotextile reinforcement. If approved by the Manufacturer, rubber-tired equipment may pass over the geotextile reinforcement as slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided.

During construction, the surface of the fill should be kept approximately horizontal. Geotextile reinforcement shall be placed directly on the compacted horizontal fill surface. Geotextile reinforcements are to be placed within three inches of the design elevations and extend the length as shown on the elevation view unless otherwise directed by ENGEO.

Replace or repair any geotextile reinforcement damaged during construction. Grade and compact backfill to ensure the reinforcement remains taut. Geotextile soil reinforcement must be tested to the required design values using the following ASTM test methods.

TABLE III-1
Geotextile Soil Reinforcements

Property	Test
Elongation at break, percent	ASTM D 4632
Grab breaking load, lb, 1-inch grip (min) in each direction	ASTM D 4632
Wide width tensile strength at 5 percent strain, lb/ft (min)	ASTM D 4595
Wide width tensile strength at ultimate strength, lb/ft (min)	ASTM D 4595
Tear strength, lb (min)	ASTM D 4533
Puncture strength, lb (min)	ASTM D 6241
Permittivity, sec^{-1} (min)	ASTM D 4491
Apparent opening size, inches (max)	ASTM D 4751
Ultraviolet resistance, percent (min) retained grab break load, 500 hours	ASTM D 4355

PART IV - EROSION CONTROL MAT

Work shall consist of furnishing and placing a synthetic erosion control mat and/or degradable erosion control blanket for slope face protection and lining of runoff channels. The specific erosion control material and supplier shall be pre-approved by ENGEO.

The Contractor shall submit a manufacturer's certification that the erosion mat/blanket supplied meets the criteria specified when the material was approved by ENGEO. The manufacturer's certification shall include a submittal package of documented test results that confirm the property values. Jute mesh shall consist of processed natural jute yarns woven into a matrix, and netting shall consist of coconut fiber woven into a matrix. Erosion control blankets shall be made of processed natural fibers that are mechanically, structurally, or chemically bound together to form a continuous matrix that is surrounded by two natural nets.

The Contractor shall check the erosion control material upon delivery to ensure that the proper material has been received. During periods of shipment and storage, the erosion mat shall be protected from temperatures greater than 140°F, mud, dirt, and debris. Manufacturer's recommendations in regard to protection from direct sunlight must also be followed. At the time of installation, the erosion mat/blanket shall be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. If approved by ENGEO, torn or punctured sections may be removed by cutting out a section of the mat. The remaining ends should be overlapped and secured with ground anchors. Any erosion mat/blanket damaged during storage or installation shall be replaced by the Contractor at no additional cost to the Owner.

Erosion control material suppliers shall provide a qualified and experienced representative onsite, to assist the Contractor and ENGEO personnel at the start of construction. If there is more than one slope on a project, this criterion will apply to construction of the initial slope only. The representative shall be available on an as-needed basis, as requested by ENGEO, during construction of the remaining slope(s). The erosion control material shall be placed and anchored on a smooth graded, firm surface approved by the Engineer. Anchoring terminal ends of the erosion control material shall be accomplished through use of key trenches. The material in the trenches shall be anchored to the soil on maximum 1½ foot centers. Topsoil, if required by construction drawings, placed over final grade prior to installation of the erosion control material shall be limited to a depth not exceeding 3 inches.

Erosion control material shall be anchored, overlapped, and otherwise constructed to ensure performance until vegetation is well established. Anchors shall be as designated on the construction drawings, with a minimum of 12 inches length, and shall be spaced as designated on the construction drawings, with a maximum spacing of 4 feet.

APPENDIX B
Monitoring Well Summary Report by LSCE (2024)

Luhdorff & Scalmanini
Consulting Engineers

February 28, 2024
File No. 23-2-162

Mr. David Gittleson, P.E.
Associate Engineer
City of Morgan Hill
Engineering & Utilities
17575 Peak Avenue
Morgan Hill, CA 95037

SUBJECT: CITY OF MORGAN HILL – EAGLE VIEW TEST HOLE AND MONITORING WELL INSTALLATION SUMMARY AND DESIGN REPORT

Dear Mr. Gittleson,

Luhdorff and Scalmanini, Consulting Engineers (LSCE) is pleased to submit this summary report to the City of Morgan Hill (City) of our investigation of the Eagle View site and well design recommendations for the planned Eagle View Production Well. Based on our investigation, LSCE believes that this site would be suitable for a community supply well with a design capacity of 800 gallons per minute (gpm) while meeting all primary and secondary water quality standards.

With this summary report we have included an as-built monitoring well profile, geophysical logs, a water quality summary sheet, sieve analysis of selected formation samples, monitoring well completion report, a copy of the drill permit, and a proposed production well design.

Investigation

The purpose of the site investigation was to determine if a new community supply well could be constructed at the Eagle View site that could yield water in sufficient quantity and quality to be utilized for community supply. During the course of our investigation, LSCE reviewed well construction, yield, and water quality records from existing City production wells and other wells in the vicinity of the Eagle View site. Based on our review, LSCE developed a conceptual hydrogeologic model of the area that was used to develop a preliminary test hole drilling depth and estimate the depth, yield, and water quality of a community supply well constructed at the Eagle View site.

Test Hole Exploration and Monitoring Well Construction

The Eagle View test hole/monitoring well is located at 19201 Eagle View Drive in Morgan Hill (Figure 1). The ground surface elevation of the site at the time of our investigation was approximately 383 feet above mean sea level. The preliminary test hole exploration depth was 400 feet below ground surface (bgs).

Beginning on November 27, 2023, Bradley and Sons Drilling of Del Rey, California (Bradley) drilled an 8.75-inch diameter borehole to a depth of 400 feet by the direct rotary drilling method. The test hole was geophysically logged to the completed depth by Pacific Surveys of Claremont, California on November 30, 2023. The lithology encountered in the test hole is detailed on the attached monitoring well profile (Figure 2). LSCE geologists analyzed drill cuttings and geophysical logs and identified zones of aquifer material that would likely produce water in sufficient quantity to meet project demands. LSCE directed Bradley to ream the test hole to a diameter of 10.75-inches from ground surface to 280 feet bgs and to a diameter of 8.75-inches from 280 feet to 365 feet bgs. Bradley then installed two piezometers that would allow for the collection of zone-specific water quality samples and water levels.

The piezometers, MW-280 and MW-350, are constructed of 2-inch ASTM F480-88A, Schedule 40 PVC (Figure 2). The perforated well screen sections are fabricated of the same material as the blank casing and have machine cut 0.030-inch slots. MW-685 has a 20-foot screened interval from 255 to 275 feet bgs, while MW-350 has a 20-foot screened interval from 325 to 345 feet bgs.

A gravel envelope consisting of SRI #8 sand was used to fill the annular space between the casings and the borehole wall. The gravel envelope was placed from 230 to 280, 290 to 310, and 320 to 355 feet bgs. Bentonite seals were placed from 280 to 290, 310 to 320, and 355 to 365 feet bgs to isolate specific water bearing zones and piezometer screen intervals. Native material was allowed to fill the borehole from 365 feet to 400 feet bgs. An annular seal consisting of 10.5-sack sand/cement grout was placed from 230 feet bgs to ground surface on December 7, 2023. After construction, each piezometer was developed by airlifting until the water produced had a turbidity of less than 5 NTU.

Water Quality

On January 4, 2024, LSCE collected water samples for Title 22 drinking water analysis from the two Eagle View piezometers. The tested water from each piezometer met all primary and secondary standards for drinking water. It should be noted that there were detections of haloacetic acids, perchlorate, and 2,3,7,8-TCDD (TCDD), however all of the detections were well below their respective minimum contamination levels (MCLs). Haloacetic acid (MCL of 60 µg/L) was detected at a concentration of 6.3 µg/L in MW-280 and 10.3 µg/L in MW-350. Haloacetic acid is a byproduct of disinfection, which was likely a result of the drilling contractor using chlorine during well development activities to facilitate the well development process. Perchlorate (MCL of 6 µg/L) was detected at a concentration of 1.8 µg/L in MW-280 and 1.4 µg/L in MW-350. Perchlorate is a historical groundwater contaminant found in the Llagas Groundwater Subbasin caused by improper chemical waste disposal from a signal flare manufacturing plant. According to the State Water Resources Control Board, remediation of the perchlorate contamination has shown to be very successful and remediation efforts are still ongoing. TCDD (MCL of 30 µg/L) was detected at a concentration of 1.87 µg/L in MW-280 and 1.82 µg/L in MW-350. TCDD is part of the chemical family commonly called dioxins, which are mainly by-products of industrial processes such as smelting, paper pulp production, and the manufacturing of certain pesticides and herbicides. The TCDD detection in the Eagle View piezometers is likely the result of historical uses (i.e., agricultural) of the lands surrounding the Eagle View site.

LSCE examined water quality analytical results from the State Water Resouces Control Baord SDWIS website for City wells in the vicinity of the Eagle View site, including all 3 Boys Ranch Wells, Diana Well 3, and the Nordstrom Park Well. None of the aforementioned wells had samples with detectable concentrations of either perchlorate or TCDD.

Yield Estimation

LSCE identified approximately 90 feet of aquifer material (sands and gravels) in the test hole that could potentially be targeted for municipal supply. The thickness, depth, and nature of the encountered aquifer materials in the test hole is similar to that encountered in the City's Boys Ranch Wells, which suggests that a new well constructed on the Eagle View site could yield 800 gpm.

Assuming that the City will ultimately construct a production well at the Eagle View Site, LSCE has prepared the following preliminary well design.

Well Design

The proposed production well design is based on a flow rate of 800 gpm. The well design incorporates the following elements, all to be installed as shown on (Figure 3).

Conductor Casing / Sanitary Seal –The conductor casing shall be installed in a 48-inch diameter borehole and cemented in place to a depth of 50 feet bgs. The conductor casing shall be fabricated of a 36-inch O.D. by 3/8-inch wall ASTM A-53 Grade B steel. The conductor casing will stabilize the upper portions of the borehole during drilling and well construction, while ensuring that the requirements for a sanitary seal are met.

Production Borehole – The production borehole shall be drilled using the reverse circulation drilling method. The final borehole diameter shall be 30-inches to a depth of 370 feet bgs.

Well Casing and Accessory Pipes – The well casing assembly shall consist of 260 feet of 16-inch I.D. by 5/16-inch wall ASTM A-778, Type 304 stainless steel, and an SE type end cap. A 2-foot long sounding port shall be installed from 210 to 206 feet bgs. A 2-inch stainless steel sounding tube shall be connected to the sounding port. A 3-inch Schedule 40, BSP gravel fill tube shall be installed to a depth of 235 feet bgs.

Well Screen – "Ful-Flo" louvered well screen was selected for this well because it provides an acceptable inlet velocity of 0.001 feet/second at the design capacity of 800 gpm. The well screen shall consist of 90 feet of 16-inch I.D., ASTM A-778, Type 304 stainless steel. The slot size of the screens shall be 0.070-inches. The well screen will be installed from 250 to 280 feet bgs and 290 to 350 feet bgs.

Gravel Envelope – Based on the sieve analysis of selected formation samples (attached), a 6 x 12 graded gravel envelope material was selected for use in this well. The gravel chosen is 1.9 times larger than the finest formation sample to be screened (250-260') at the d_{70} (cumulative percent retained) value. The 0.070-inch screen slot size will retain 90-percent of the gravel envelope material. The gravel envelope material will be placed from 220 to 370 feet bgs.

Annular Seal – The annular seal shall consist of "10.3-sack" sand/cement grout and shall be placed from a depth of 220-feet to the ground surface in one continuous lift.

Items such as water supply for drilling, fluid and cutting disposal, development water disposal, material and equipment storage, sound attenuation, and site security and safety will need to be addressed in the final specifications before bidding.

LSCE's preliminary Engineer's Estimate for the well construction, development and testing is approximately $550,000. This estimate includes the cost for temporary sound wall installation and prevailing wage labor rates.

If you should have any questions, or would like additional information, we will be pleased to respond.

Sincerely,

LUHDORFF AND SCALMANINI,
CONSULTING ENGINEERS

Scott Lewis, P.G.
Senior Principal Geologist

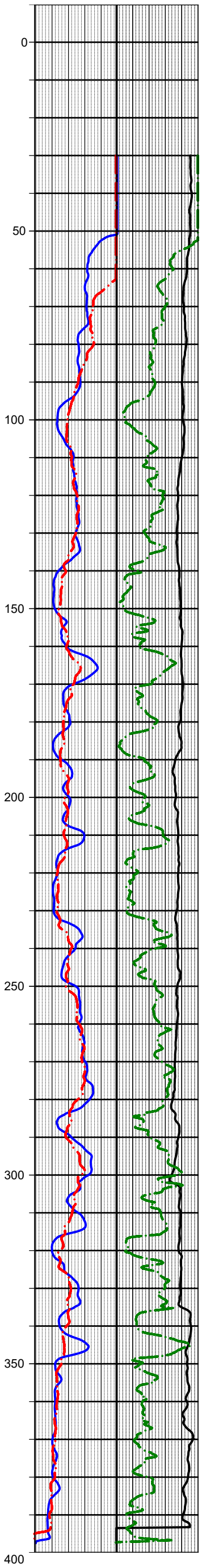
Charlie Jenkins, P.G.
Project Geologist

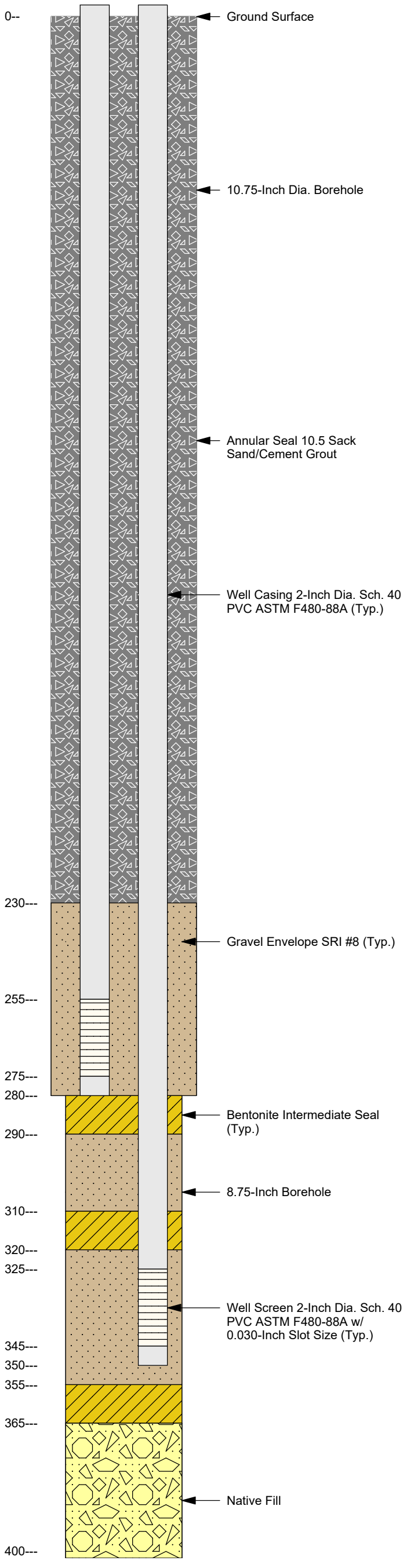
Attachments: Site Location Map
Monitoring Well As-Built
Proposed Well Design
Water Quality Summary Table
Sieve Analysis
Drill Permit
Monitoring Well Completion Report

LSCE

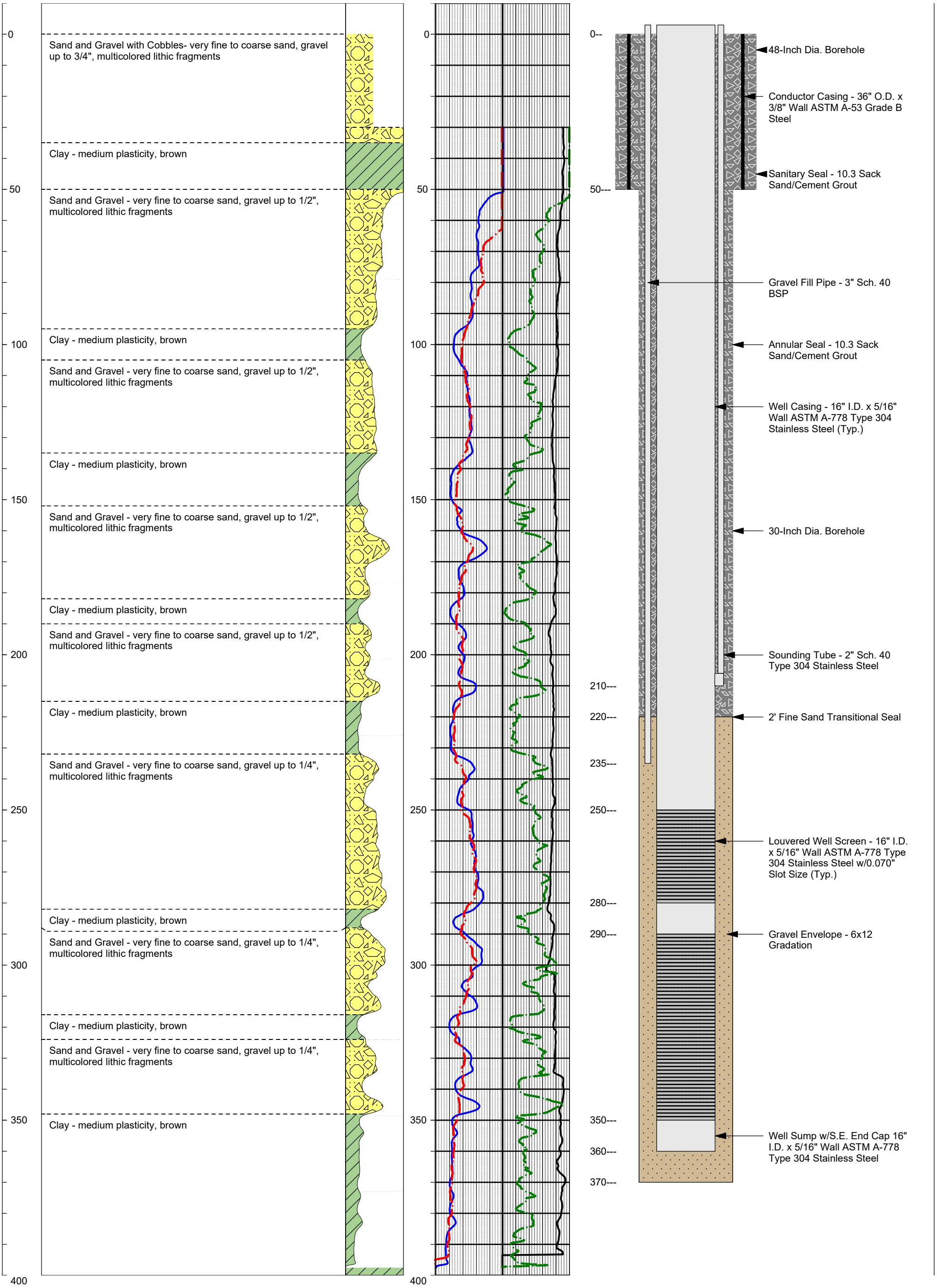
Client: City of Morgan Hill	**Lat/Long:** 37.1620486/-121.6530725
Project Name: Eagle View. Monitoring Well	**GSE (ft-msl)** 380' +/-
LSCE #: 23-2-162	**Drill Date:** 11/30/2023
Location: Morgan Hill, CA	**Drilling Method:** Direct Mud Rotary
Geologist: CJ	**Driller:** Bradley and Sons

Depth (ft bgs)	Lithologic Description	Strat-Column
0	Sand and Gravel with Cobbles- very fine to coarse sand, gravel up to 3/4", multicolored lithic fragments	
50	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/2", multicolored lithic fragments	
100	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/2", multicolored lithic fragments	
150	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/2", multicolored lithic fragments	
200	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/2", multicolored lithic fragments	
250	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/4", multicolored lithic fragments	
300	Clay - medium plasticity, brown	
	Sand and Gravel - very fine to coarse sand, gravel up to 1/4", multicolored lithic fragments	
350	Clay - medium plasticity, brown	
400		





Client: City of Morgan Hill	**Lat/Long:** TBD
Project Name: Eagle View Production Well	**GSE (ft-msl)** TBD
LSCE #: 23-2-162	**Drill Date:** TBD
Location: Morgan Hill, CA	**Drilling Method:** Reverse Mud Rotary
Geologist: CJ	**Driller:** TBD

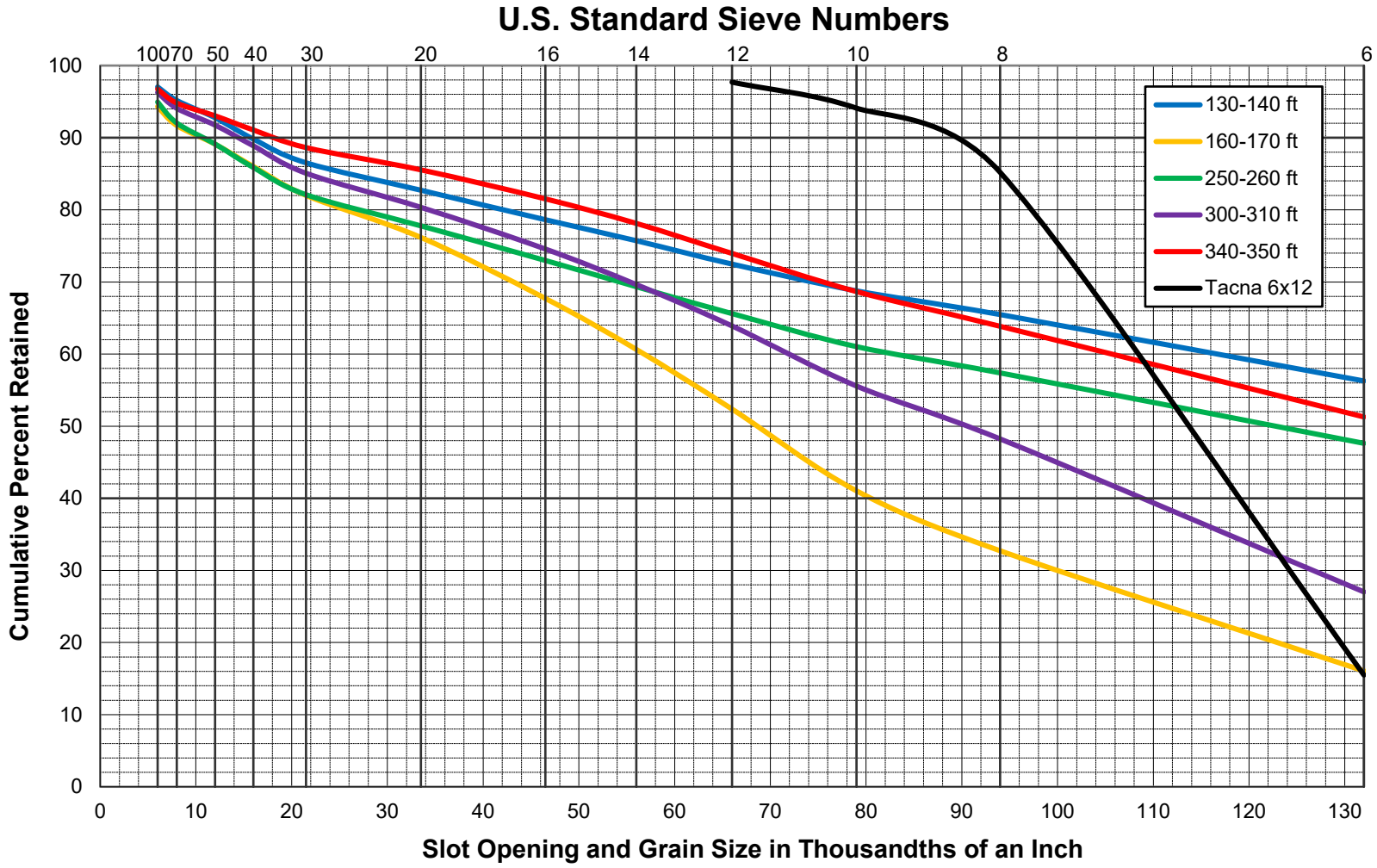


Project Name

ANALYTE	UNITS	REPORTING LIMIT	METHOD	MCL	MW-280 1/4/2024	MW-350 1/4/2024
CATIONS						
Calcium	mg/L	1.0	200.7		32	21
Magnesium	mg/L	1.0	200.7		49	53
Potassium	mg/L	1.0	200.7		1.1	1.0
Sodium	mg/L	1.0	200.7		30	24
Hardness as $CaCO_3$	mg/L	1.0	200.7		280	270
ANIONS						
Bicarbonate Alkalinity	mg/L	5.0	SM 2320B		230	230
Carbonate Alkalinity	mg/L	5.0	SM 2320B		ND	ND
Chloride (Cl)	mg/L	2.5	300.0	250/500[2]	35	36
Cyanide	µg/L	100	SM4500-CNE	150[1]	ND	ND
Fluoride	mg/L	0.10	300.0	2[1]	ND	ND
Hydroxide Alkalinity	mg/L	5.0	SM 2320B		ND	ND
Nitrate (as N)	mg/L	0.40	300.0	45[1]	10	4.5
Nitrate/Nitrite (as N)	mg/L	0.40	300.0	10[1]	10	4.5
Nitrite (as N)	mg/L	0.40	300.0	1[1]	ND	ND
Sulfate (as SO4)	mg/L	2.5	300.0	250/500[2]	45	37
Sulfide	mg/L	1.0	SM4500-S F		1.5	1.3
Total Alkalinity	mg/L	5.0	SM 2320B		230	230
Perchlorate	µg/L	2.0	314.0	6[1]	1.8	1.4
PHYSICAL PARAMETERS						
Color (A.P.H.A)	Color Units	1	SM 2120B	15[2]	ND	ND
pH	pH units	0.01	SM 4500-H B	6.5/8.5[4]	7.53	7.61
Methylene Blue Active Substance	mg/L	0.10	SM 5540C	0.5[2]	0.11	ND
Specific Conductance	µmhos/cm	1.0	SM 2510 B-1997	900/1,600[2]	640	580
Total Dissolved Solids (TDS)	mg/L	10	SM 2540C	500/1,000[2]	380	330
Odor	TON	1	140.1	3	ND	ND
Turbidity	NTU	0.10	180.1	5[2]	0.2	0.15
INORGANICS						
Aluminum	µg/L	50	200.8	1000[1]/200[3]	ND	ND
Aluminum (Dissolved)	µg/L	100	200.8		ND	ND
Antimony	µg/L	4.0	200.8	6[1]	ND	ND
Antimony (Dissolved)	µg/L	8.0	200.8		ND	ND
Arsenic	µg/L	2.0	200.8	10[1]	ND	ND
Arsenic (Dissolved)	µg/L	4.0	200.8		ND	ND
Barium	µg/L	100	200.8	1000[1]	ND	120
Barium (Dissolved)	µg/L	200	200.8		ND	ND
Beryllium	µg/L	1.0	200.8	4[1]	ND	ND
Beryllium (Dissolved)	µg/L	2.0	200.8		ND	ND
Boron	µg/L	100	200.8	1000[3]	ND	170
Boron (Dissolved)	µg/L	200	200.8		ND	ND
Cadmium	µg/L	1.0	200.8	5[1]	ND	ND
Cadmium (Dissolved)	µg/L	2.0	200.8		ND	ND
Chromium (Total)	µg/L	10	200.8	50[1]	ND	ND
Chromium (Dissolved)	µg/L	20	200.8		ND	ND
Hexavalent Chromium	µg/L	1.0	218.6		3.7	3.4
Copper	µg/L	50	200.8	1300[2]	ND	ND
Copper (Dissolved)	µg/L	100	200.8		ND	ND
Iron	µg/L	100	200.7	300[2]	ND	ND
Iron (Dissolved)	µg/L	100	200.7		ND	ND
Lead	µg/L	5.0	200.8	15[3]	ND	ND
Lead (Dissolved)	µg/L	10	200.8		ND	ND
Manganese	µg/L	20	200.8	50[2]	ND	ND
Manganese (Dissolved)	µg/L	40	200.8		ND	ND
Nickel	µg/L	10	200.8	100[1]	ND	ND
Nickel (Dissolved)	µg/L	20	200.8		ND	ND
Selenium	µg/L	5.0	200.8	50[1]	ND	ND
Selenium (Dissolved)	µg/L	10	200.8		ND	ND
Silver	µg/L	10	200.8	100[2]	ND	ND
Silver (Dissolved)	µg/L	20	200.8		ND	ND
Thallium	µg/L	1.0	200.8	2[1]	ND	ND
Thallium (Dissolved)	µg/L	2.0	200.8		ND	ND
Vanadium	µg/L	3.0	200.8	50[3]	ND	ND
Vanadium (Dissolved)	µg/L	6.0	200.8		ND	ND
Zinc	µg/L	50	200.8	5000[2]	ND	ND
Zinc (Dissolved)	µg/L	100	200.8		ND	ND
RADIOCHEMISTRY						
Gross Alpha	pCi/L	1.04	900.0	15[1]	1.04±0.42	4.91±1.16
Gross Beta	pCi/L	2.40	900.0		4.97±1.54	4.49±1.94
Uranium	pCi/L	1.00	908.1	20[1]	ND	ND
Ra 226	pCi/L	0.89	903.1		0.51±0.56	0.19±0.44
Ra 228	pCi/L	0.15	904.0		1.14±1.19	0.00±1.34
Ra 226 + Ra 228	pCi/L			5[1]	1.65±1.75	0.19±1.78
Strontium-90	pCi/L	0.36	905.0	8[1]	1.42±0.13	0.33±0.14
Tritium	pCi/L	186	906.0	20,000[1]	1329±141	36±115
OTHER ANALYSES						
Asbestos	MFL	0.18	600/R-94/134	7[1]	ND	ND
Purgeable Organic Compounds (VOCs)	µg/L	*	524.2		ND	ND
Semi-Volatile Organic Compounds (SVOCs)	µg/L	*	525.3		ND	ND
EDB and DBCP	µg/L	*	504.1		ND	ND
Nitrogen/Phosphorus Pesticides	µg/L	*	507		ND	ND
Chlorinated Pesticides and PCB's	µg/L	*	525.3		ND	ND
Chlorinated Acids	µg/L	*	515.3		ND	ND
DEHA/DEHP	µg/L	*	525		ND	ND
Carbamates	µg/L	*	531.1		ND	ND
Glyphosate	µg/L	5	547	700[1]	ND	ND
Endothall	µg/L	5	548.1	100[1]	ND	ND
Diquat and Paraquat	µg/L	*	549.2	20[1]	ND	ND
Benzo-a-pyrene	µg/L	0.10	525.3	0.2[1]	ND	ND
2,3,7,8-TCDD (Dioxin)	pg/L	5	1613B	30[1]	1.87	1.82
1,2,3-Trichloropropane	µg/L	0.0050	SRL 524M-TCP	0.0050[1]	ND	ND
Total Trihalomethanes (TTHM)	µg/L	0.50	524.2	80[1]	ND	ND
Haloacetic acids (five) HAA5	µg/L	*	552.2	60[1]	6.3	10.3
Bromate	µg/L	5	300.1	10	ND	ND
Chlorite (ClO2)	mg/L	0.02	300	1.0	ND	ND

[1] - Primary MCL
[2] - Secondary MCL (recommended/upper range)
[3] - Notification Level
[4] - Suggested lower/upper acceptable range
* - Various Reporting Limits
ND = Non-Detect

Luhdorff & Scalmanini
Consulting Engineers



Luhdorff & Scalmanini
Consulting Engineers

Eagle View MW Sieve Analysis

Eagle Dr. Site Investigation
Morgan Hill, California

Valley Water
5750 Almaden Expressway
San Jose, CA 95118-3686
(408) 265-2600

WELL CONSTRUCTION PERMIT*

VALLEY WATER WELL PERMIT NO. C20231109001

Based on information provided on the attached application and subject to approval noted below, permission is hereby granted to construct (drill) the described well. Permission to start work may be withheld until a field check verifies all statements made on application by permittee and is also subject to the "General" and "Special" Conditions stated below.

SANTA CLARA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH APPROVAL (Water Supply Well Only)

NOTE: Department of Environmental Health approval must be granted before this application will be accepted by Valley Water.

Approved by: _____ REHS

☐ Approved as submitted
☐ Approved as corrected

Date: _____

TO BE COMPLETED BY VALLEY WATER

Valley Water Permit No: C20231109001	Date Issued: 11/9/2023	Well Registration No:
Geologic Setting: 3	Expiration Date: 11/9/2024	Driller's Log No:
Executive Order N-7-22 Exempt? X Yes ☐ No	Meter? ☐ Yes X No	

GENERAL CONDITIONS

A. **Valley Water's Well Ordinance Program** (408-630-2660) **must be notified a minimum of one working day before construction of the annular seal**. An authorized Valley Water representative must be on site to witness the construction of the annular seal.

B. Permittee agrees to construct, operate, and maintain the well according to provisions of the latest Valley Water Ordinance and the latest published revisions of Valley Water Well Standards to the end that this well will not cause pollution or contamination of groundwater or otherwise jeopardize the health, safety, or welfare of the people of Valley Water.

C. This permit is valid only for the purpose specified herein. Well construction methods authorized under this permit may not be changed except by written approval of an authorized Valley Water representative, and only if Valley Water believes that such a change will result in equal or superior compliance with Valley Water and State Well Standards (e.g., if Valley Water representative finds that site conditions warrant such a change).

D. This permit is only valid for the Assessor's Parcel No. indicated on it.

E. This permit may be voided if it contains incorrect information. If the permit is voided after work has begun, the well or boring that was constructed under this permit must be destroyed in accordance with Valley Water and State Well Standards.

F. If any work associated with this permit will take place on Valley Water property/easement, an encroachment or construction permit must be granted by the Valley Water's Community Projects Review Unit (telephone (408) 630-2589).

G. Before the well constructed under this permit can be used as a drinking water source, its use must be approved by the regulatory agency with authority over such use (typically the Santa Clara County Department of Environmental Health or the State of California Division of Drinking Water). A completed Well Inventory Form must also be approved.

H. If the well constructed under this permit cannot be or is not being used for its intended purpose, permittee is hereby required to destroy the well according to Valley Water Well Standards and under permit from Valley Water. Any test holes drilled under this permit must be destroyed within 24 hours of completion of testing activities. Destruction activities must be completed according to Valley Water standards. Valley Water must be notified a minimum of 24 hours prior to destruction.

I. Within 30 days of the completion of the well construction activities, the driller or consultant identified on this permit shall fully complete State of California DWR Form 188 and mail the original to Valley Water's Well Ordinance Program.

J. The permittee(s) shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend, and hold Valley Water, its officers, agents, and employees, free and harmless from any and all expense, cost, and liability in connection with or resulting from the granting or exercise of this permit including, but not limited to, property damage, personal injury, and wrongful death.

K. Permittees are required to be in full compliance with Cal/OSHA California Labor Code Section 6300.

L. A current C-57 Water Well Drilling Contractor's License is required for the construction of all wells.

M. Permittee, permittee's contractors, consultants, or agents shall be responsible to assure that all materials or waters generated during drilling, well construction, well development, pump testing, or other activities associated with this permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on- or off-site storm sewers, dry wells, or waterways. Such materials/waters must not be allowed to move off the property where the work is being completed.

N. The driller and consultants (if applicable) shall have an active copy of their Worker's Compensation Insurance on file with Valley Water.

O. This permit shall expire if not executed within one (1) calendar year of its approval.

P. This permit must be kept on site during all activities associated with it and shall immediately be presented to an authorized Valley Water representative upon request.

Q. Permittee shall notify Underground Service Alert (USA) at 1-800-227-2600 or 811 prior to any digging.

SPECIAL CONDITIONS

If surface seal depth <100', please contact Wells Section for seal approval prior to sealing.

Community Projects Review Unit Approval (if needed)	CPRU Permit No:
Approved by:	Date: 11/09/23

Please allow 10 working days to process this application.

Attachment: Permit Application

Santa Clara Valley Water District

5750 Almaden Expressway
San Jose, CA 95118-3686
(408) 265-2600

WELL CONSTRUCTION APPLICATIC

FC 158 (03-26

TO BE COMPLETED BY DISTRICT

District Permit No.: C20231109001	Date Issued: 11/9/2023	Well Registration No.:
Geologic Setting: 3	Expiration Date: 11/9/2024	Driller's Log No.:

TO BE COMPLETED BY OWNER AND DRILLER

Well Owner: City of Morgan Hill	Property Owner: City of Morgan Hill	Name of Business at Well Site: None
Well Owner's Mailing Address: 1757 Peak Avenue	Property Owner's Mailing Address: 1757 Peak Avenue	**Address of Well Site:** 19201 Eagle View Drive
City, State, Zip Morgan Hill, CA 95037	City, State, Zip Morgan Hill, CA 95037	City, State, Zip Morgan Hill, CA 95037
Telephone No. & Contact Name: 408-310-4642 David Gittleson	Telephone No. & Contact Name: 408-310-4642 David Gittleson	Telephone No.: 408-310-4642 David Gittleson

Owner's/Consultant's Well No.: Eagle View MW | Assessor's Parcel No. of **Well Site**: Book 728 Page 59 Parcel 070

Consultant (Company): Luhdorff & Scalmanini Consulting Engineers	Drilling Company: Bradley & Sons, Inc	
Address: 500 First Street City, State, Zip Woodland, CA 95695	Address: 3625 S. Highland Avenue City, State, Zip Del Rey, CA 93616	
Telephone No.: 530-661-0109	Telephone No.: 559-441-1401	C-57 License No.: 414178
☐ Check if address or phone number has changed	☐ Check if address or phone number has changed	

THIS SECTION TO BE COMPLETED FOR ALL MONITORING WELLS OR EXTRACTION/RECOVERY WELLS

Case Name/No.: NA	Caseworker Name: NA
Oversight Agency: NA	Caseworker Telephone No.: NA

Charlie Jenkins — Digitally signed by Charlie Jenkins Date: 2023.11.01 16:40:42 -07'00' — Signature of Responsible Professional

11/1/23 — Date

Charlie Jenkins — Print Name

(No substitution of signature will be accepted)

Civil Engineer Registration No. — OR — 9154 Geologist Registration No.

Estimated Depth of Completed Well: ☐ Less than 50 feet ☐ 50 to 300 feet ☒ Over 300 feet ☐ Other:

Well is to be constructed: ☐ In a public sidewalk ☐ In a public road ☒ On public property ☐ On private property ☐ On District property/easemen

*See General Condition F, page

USE	☐ WATER	☒ MONITORING	☐ REMEDIATION	☐ DEWATERING	☐ HEAT	☐ INJECTION	☐ CATHODIC	☐ OTHER

WELL TYPE/U	PRODUCTION				EXCHANGE		PROTECTION
	☐ Agricultural ☐ Domestic ☐ Industrial ☐ Municipal	☒ GW Level ☒ GW Quality ☐ Inclinometer ☐ Vapor ☐ Other	☐ Air Sparge ☐ GW Extraction ☐ Material Emplacement ☐ Vapor Extraction ☐ Other	☐ Permanent ☐ Temporary	☐ Closed Loop ☐ Open Loop	☐ Groundwater Cleanup Reinjection ☐ Stormwater ☐ Water Supply Recharge ☐ Other	

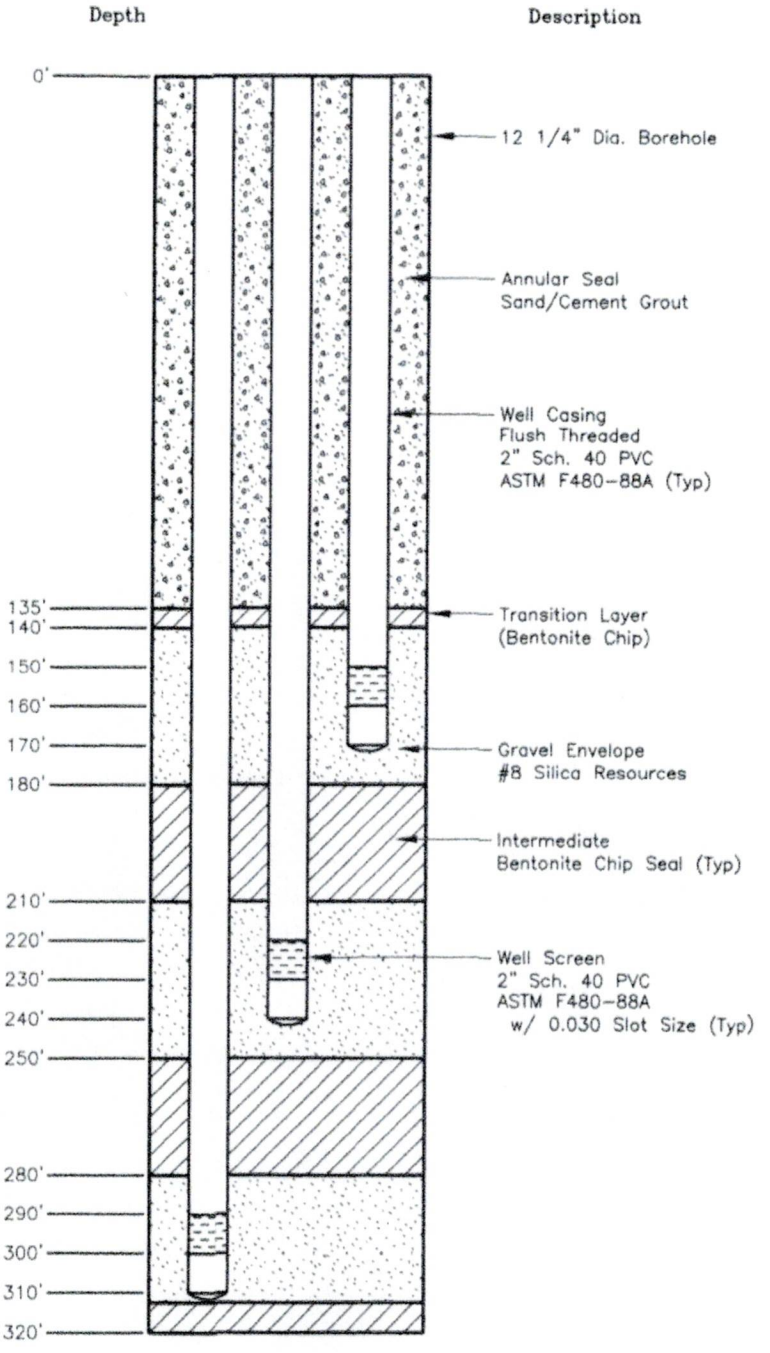
Other wells exist on this property? ☐ Yes ☒ No If yes, status: ☐ Active ☐ Inactive ☐ Abandoned

SIGNATURES

I understand and agree that all work associated with this permit is required to be done in accordance with Santa Clara Valley Water District (District) Well Ordinance 90-1, the District Well Standards, and the conditions of this permit (see page 2). I certify that the information given in this permit is correct to the best of my knowledge and that the signature below, whether original, electronic, or photocopied, is authorized and valid, and is affixed with the intent to be enforceable. I also certify that a right of entry/encroachment agreement has been formalized between the well owner and property owner, if parties differ. I also understand that it is my responsibility, as the well owner, to notify the District of any changes in the purpose of this well, from which, is indicated on this application.

Signature of Property Owner/Agent: David Gittleson Digitally signed by David Gittleson Date: 2023.11.02 09:01:21 -07'00'	Date: 11/2/23	Print Name of Property Owner/Agent: David Gittleson (City of Morgan Hill)
Signature of Well Owner/Agent:: David Gittleson Digitally signed by David Gittleson Date: 2023.11.02 09:01:36 -07'00'	Date: 11/2/23	Print Name of Well Owner/Agent: David Gittleson (City of Morgan Hill)
Signature of Well Driller/Agent: Rod Bradley	Date: 11-2-23	Print Name of Driller/Agent: Rod Bradley
Signature of Consultant/Agent: Charlie Jenkins Digitally signed by Charlie Jenkins Date: 2023.11.01 14:46:10 -07'00'	Date: 11/1/23	Print Name of Consultant/Agent: Charlie Jenkins (Luhdorff & Scalmanini)

IMPORTANT: **A minimum 24-hour notice must be given to Santa Clara Valley Water District Well Inspection Department prior to installing th annular seal. Call (408) 265-2607, ext. 2660. Please allow 10 working days to process permit application.**

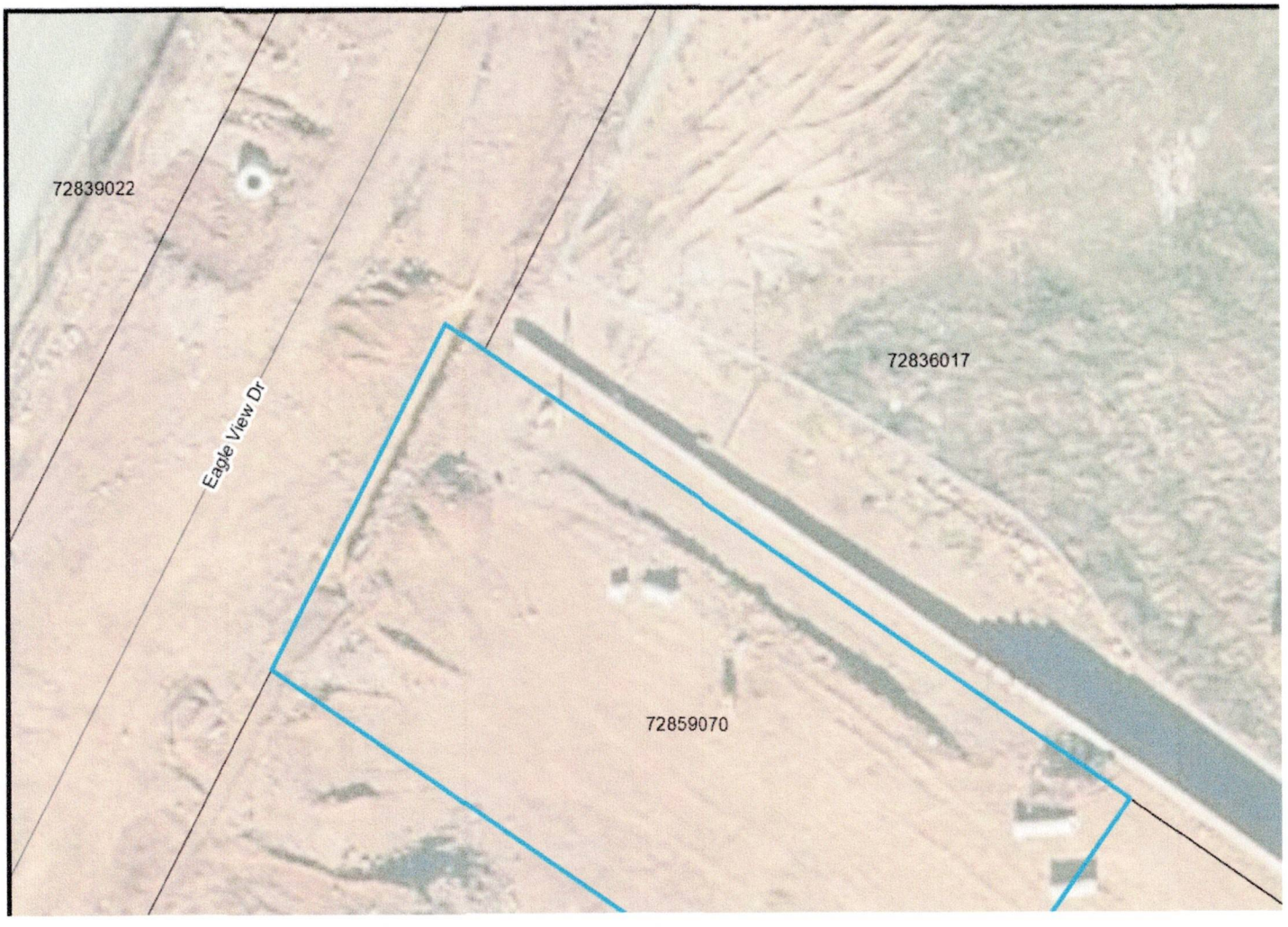


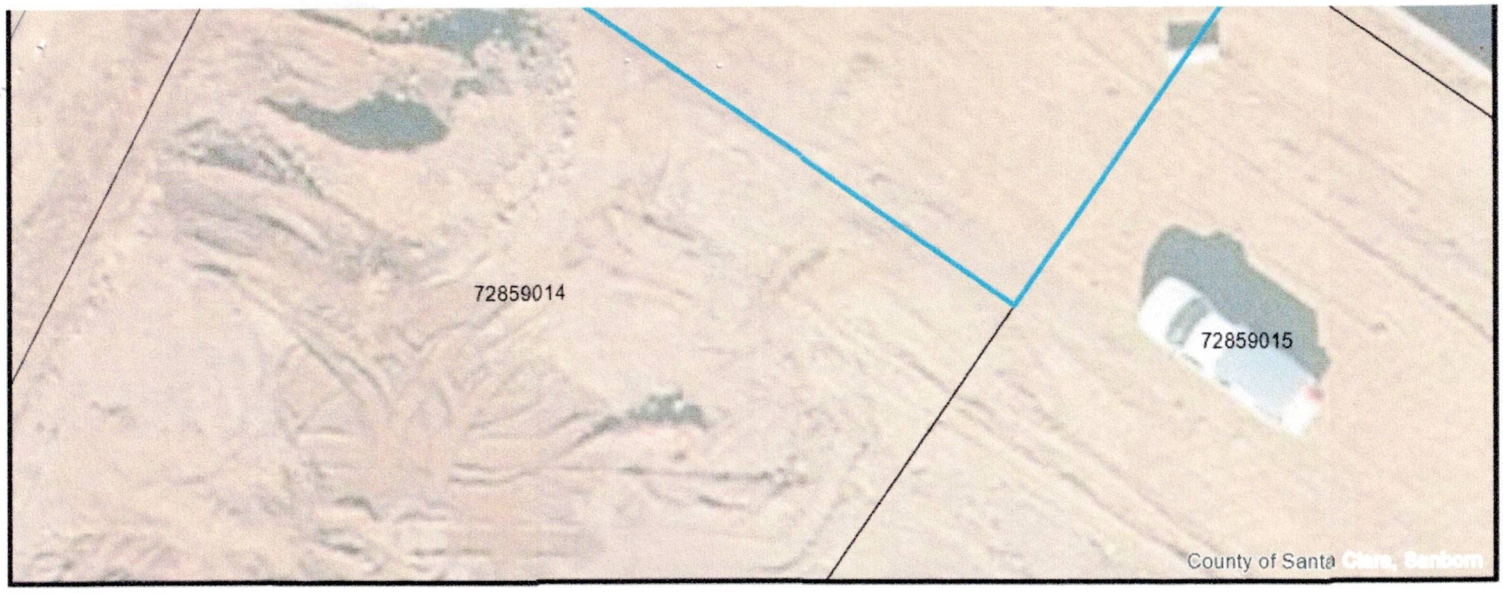
Luhdorff & Scalmanini
Consulting Engineers

Conceptual Monitoring Well Profil

CITY OF MORGAN HILL

APN: 728-59-070
19201 Eagle View Drive
Morgan Hill, CA 95037





Approximate Scale

0 60 120 Feet

Wells

- A01: Water Supply - Active
- S: Water Supply - Standby
- IS01: Water Supply - Inactive
- A02: Extraction (Env) - Active
- I02: Extraction (Env) - Inactive
- A: Other - Active
- I: Other - Inactive
- B: Abandoned
- D: Destroyed
- Undet: Status Undetermined
- Parcels

11/8/20

State of California

Well Completion Report

Form DWR 188 Submitted 12/12/2023

WCR2023-013483

Owner's Well Number: EAGLE VIEW | Date Work Began: 11/27/2023 | Date Work Ended: 12/07/2023

Local Permit Agency: Santa Clara Valley Water District

Secondary Permit Agency: | Permit Number: C20231109001 | Permit Date: 11/09/2023

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: CITY OF MORGAN HILL,

Mailing Address: 1757 PEAK AVENUE

City: MORGAN HILL | State: CA | Zip: 95037

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: 19201 EAGLE VIEW DR

City: MORGAN HILL | Zip: 95037 | County: Santa Clara

Latitude: 37 (Deg.) 9 (Min.) 43.794 (Sec.) N | Longitude: -121 (Deg.) 39 (Min.) 10.7676 (Sec.) W

Dec. Lat.: 37.162165 | Dec. Long.: -121.652991

Vertical Datum: | Horizontal Datum: WGS84

Location Accuracy: | Location Determination Method:

APN: 72859070

Township: 09 S

Range: 03 E

Section: 09

Baseline Meridian: Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Other - DIRECT MUD ROTARY | Drilling Fluid: Bentonite

Total Depth of Boring: 400 Feet

Total Depth of Completed Well: 350 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: (Feet) | Date Measured:

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	20	SILTY BROWN CLAY, GRAVELS AND COBBLE
20	40	SILTY SOFT BROWN CLAY, SMALL GRAVELS, COBBLE, FINE SAND
40	160	FINE SMALL SAND, SOFT BROWN CLAY, SMALL PEA GRAVEL, COBBLE
160	280	FINE SMALL MEDIM SAND, SMALL GRAVEL, SOFT HARD BROWN CLAY
280	400	FINE SMALL MEDIUM SAND, SMALL GRAVEL, SOFT CLAY

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	255	Blank	PVC	N/A	0.154	2			SCH40
1	255	275	Screen	PVC	N/A	0.154	2	Milled Slots	0.03	SCH40
1	275	280	Blank	PVC	N/A	0.154	2			SCH40
2	0	325	Blank	PVC	N/A	0.154	2			SCH40
2	325	345	Screen	PVC	N/A	0.154	2	Milled Slots	0.03	SCH40
2	345	350	Blank	PVC	N/A	0.154	2			SCH40

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	230	Cement	Other Cement	11 SACK	CONCRETE
230	280	Filter Pack	8 x 16		GRAVEL
280	290	Bentonite	Low Solids		
290	310	Filter Pack	8 x 16		GRAVEL
310	320	Bentonite	Low Solids		
320	355	Filter Pack	8 x 16		GRAVEL
355	365	Bentonite	Low Solids		
365	400	Other Fill	See description.		NATIVE FILL

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	280	10.625
280	400	8.75

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: BRADLEY & SONS INC
Person, Firm or Corporation

3625 SOUTH HIGHLAND | DEL REY | CA | 93616
Address | City | State | Zip

Signed: *electronic signature received* | 12/12/2023 | 414178
C-57 Licensed Water Well Contractor | Date Signed | C-57 License Number

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

APPENDIX C
Liquefaction Evaluation

GEOLOGISMIKI
Geotechnical Software

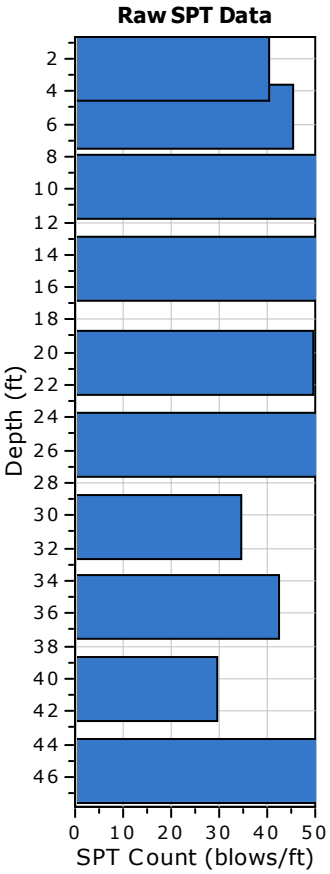
SPT BASED LIQUEFACTION ANALYSIS REPORT

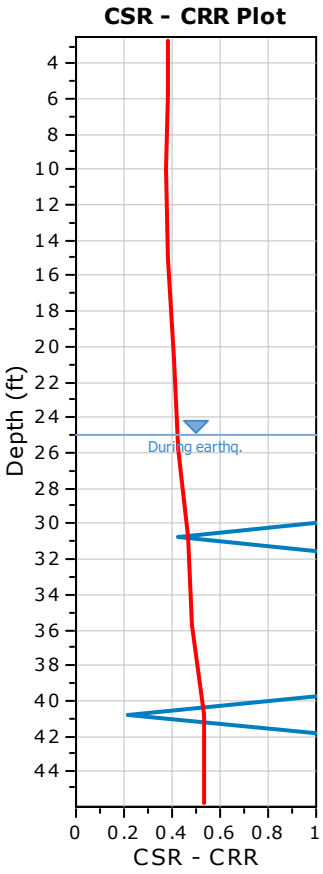
Project title : Morgan Hill Well Facility **SPT Name: B-1**

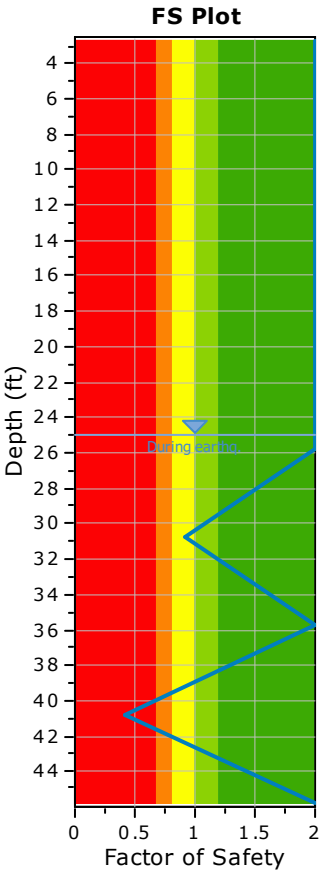
Location :

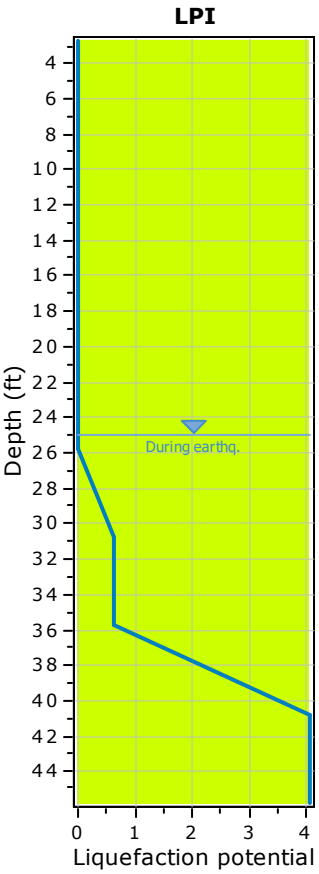
:: Input parameters and analysis properties ::

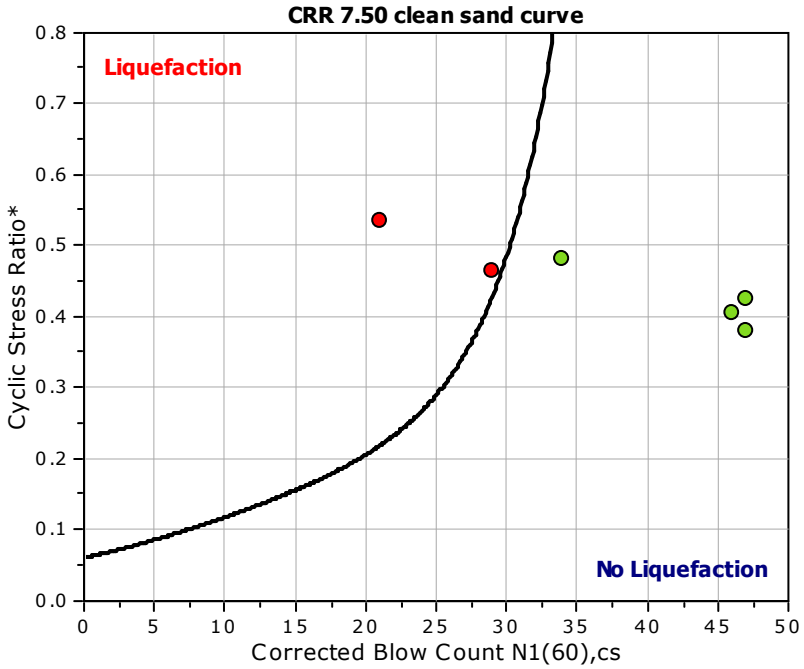
Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		











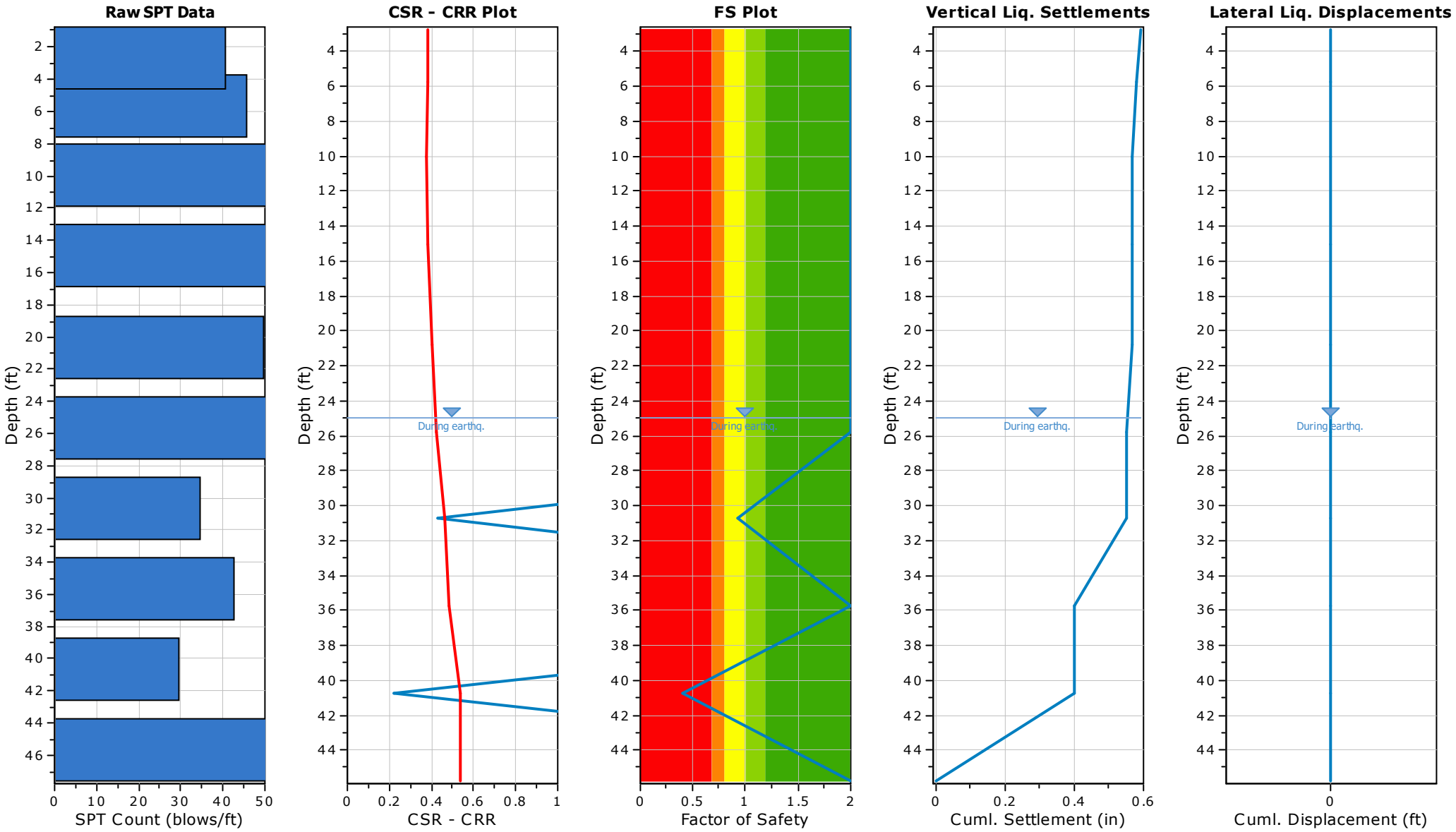
F.S. color scheme

- 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
2.75	41	0.00	115.00	1.50	Yes
5.75	46	0.00	115.00	1.50	Yes
10.00	100	0.00	115.00	0.20	Yes
15.00	100	0.00	115.00	0.20	Yes
20.75	50	0.00	115.00	1.50	Yes
25.75	54	0.00	115.00	1.50	Yes
30.75	35	0.00	115.00	1.50	Yes
35.75	43	0.00	115.00	1.50	Yes
40.75	30	0.00	115.00	1.50	Yes
45.75	100	0.00	115.00	0.20	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

GEOLOGISMIKI Geotechnical Software

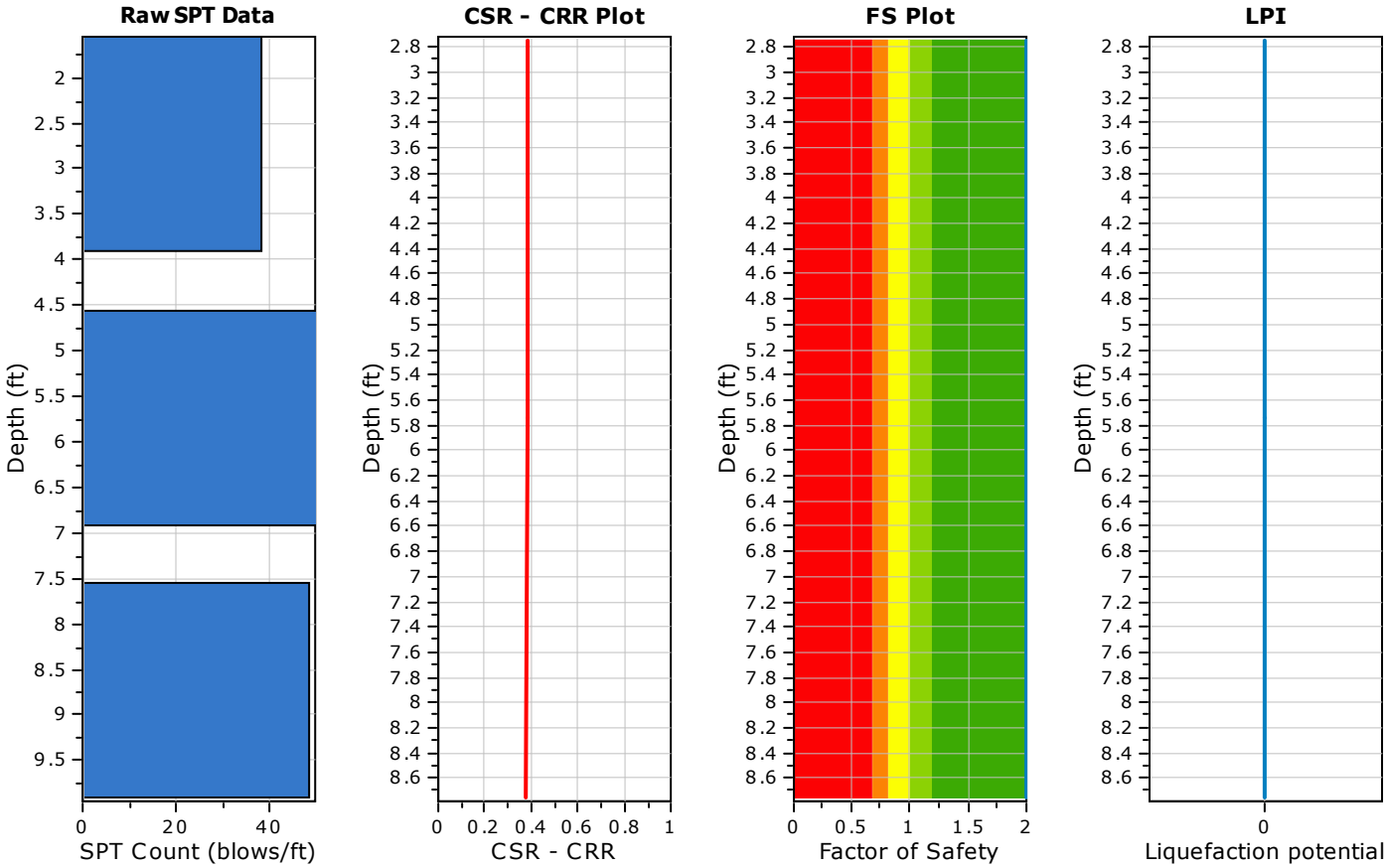
SPT BASED LIQUEFACTION ANALYSIS REPORT

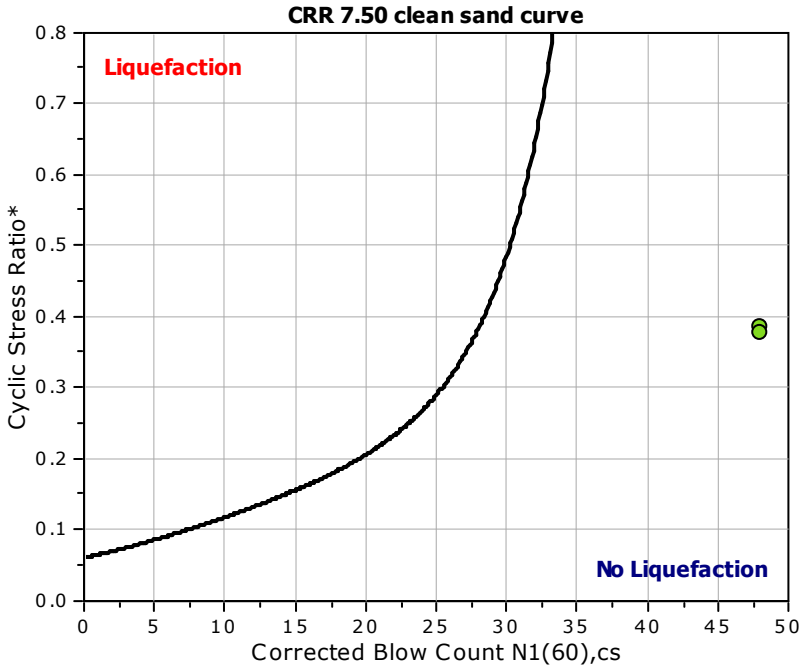
Project title : Morgan Hill Well Facility **SPT Name: B-2**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





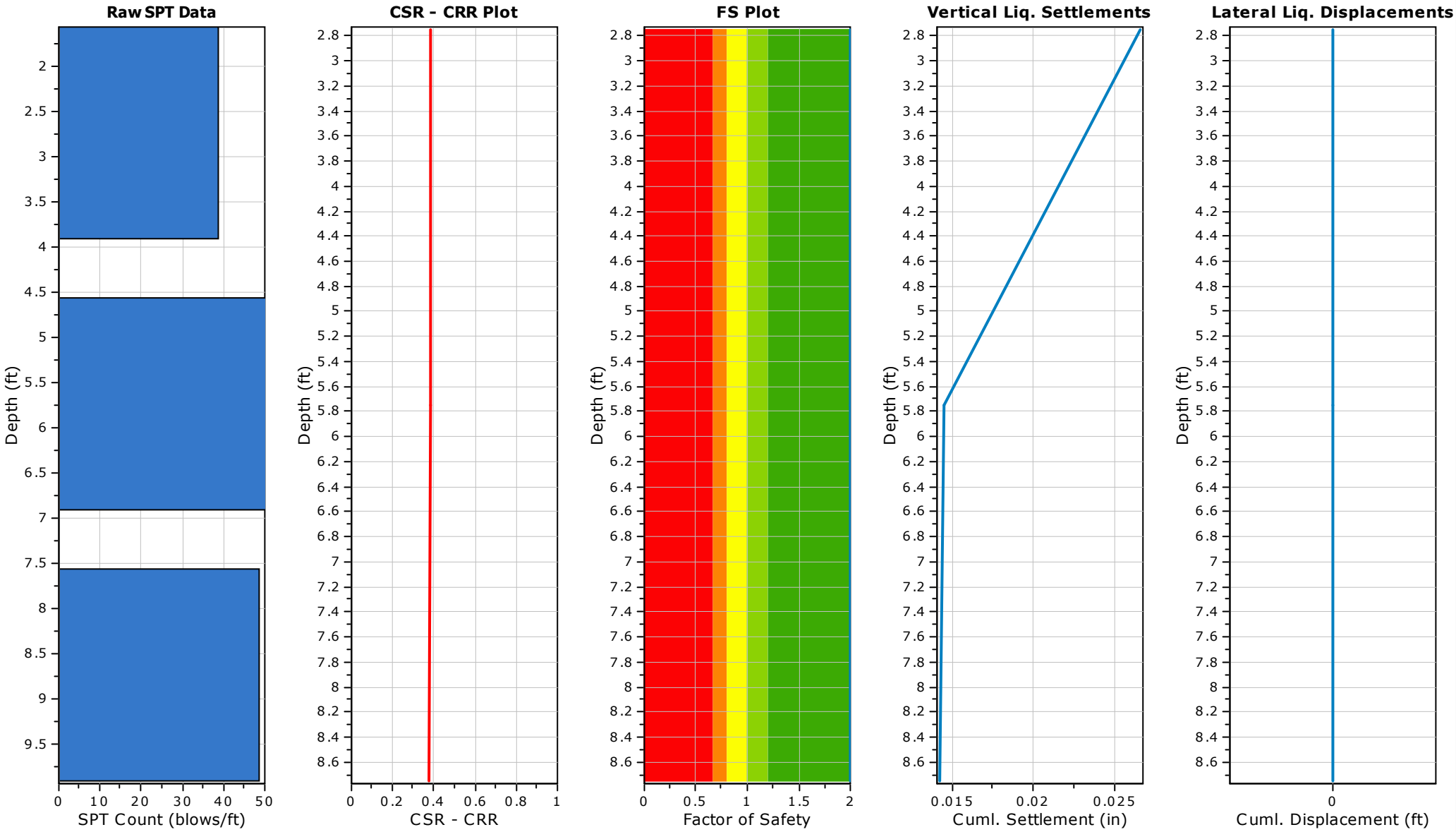
F.S. color scheme

- 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
2.75	39	0.00	115.00	1.50	Yes
5.75	100	0.00	115.00	0.20	Yes
8.75	49	0.00	115.00	1.50	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

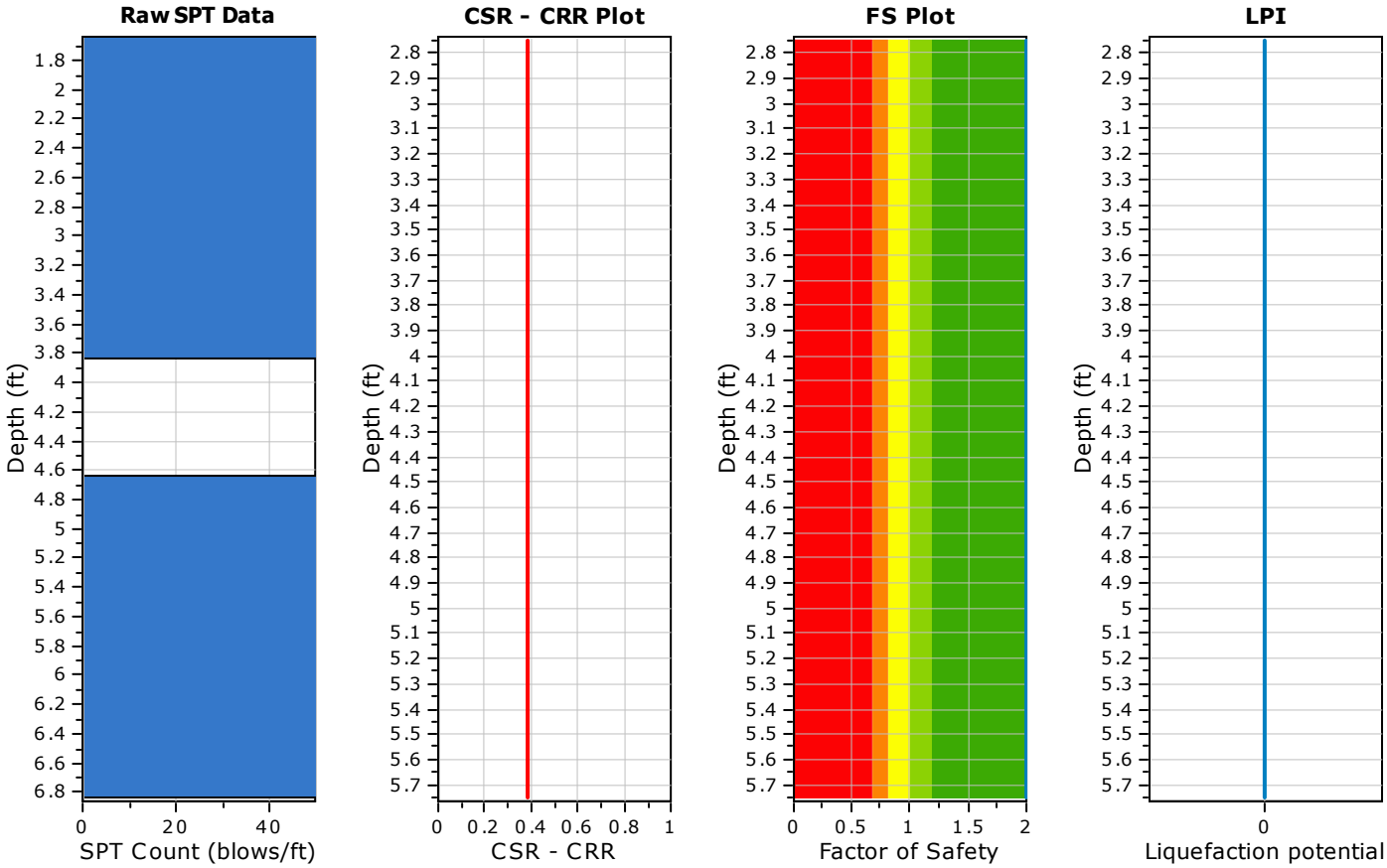
SPT BASED LIQUEFACTION ANALYSIS REPORT

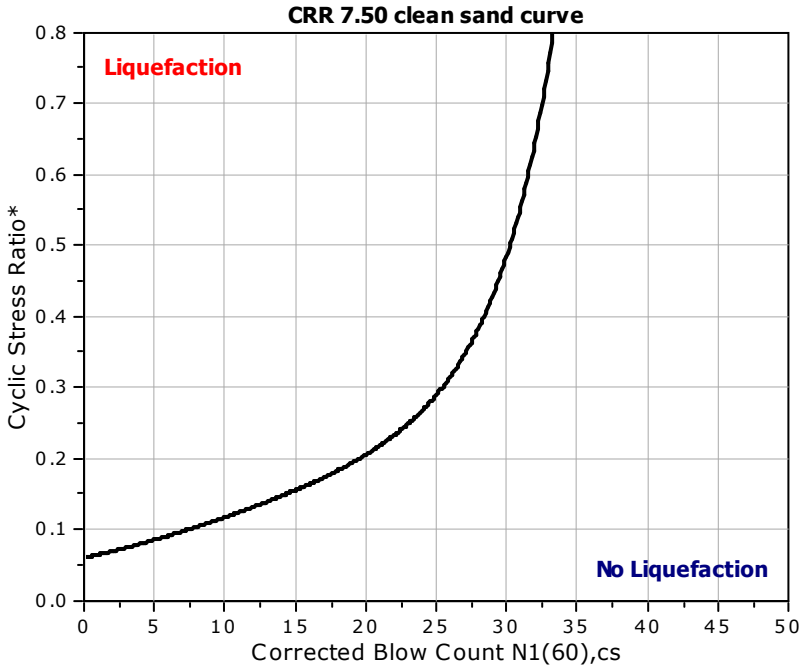
Project title : Morgan Hill Well Facility **SPT Name: B-3**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





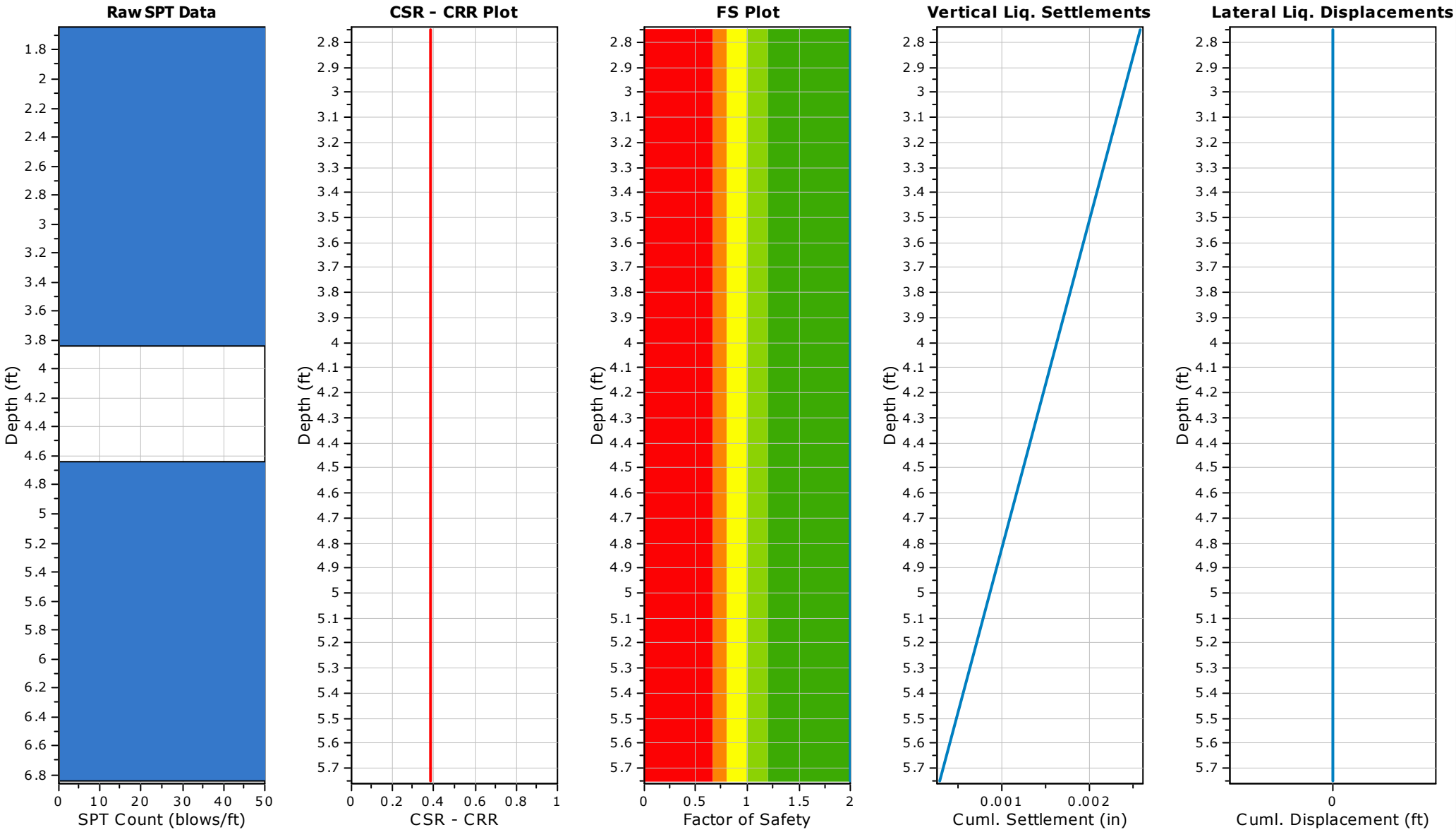
F.S. color scheme

- 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
2.75	75	0.00	115.00	1.50	Yes
5.75	100	0.00	115.00	0.20	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

GEOLOGISMIKI Geotechnical Software

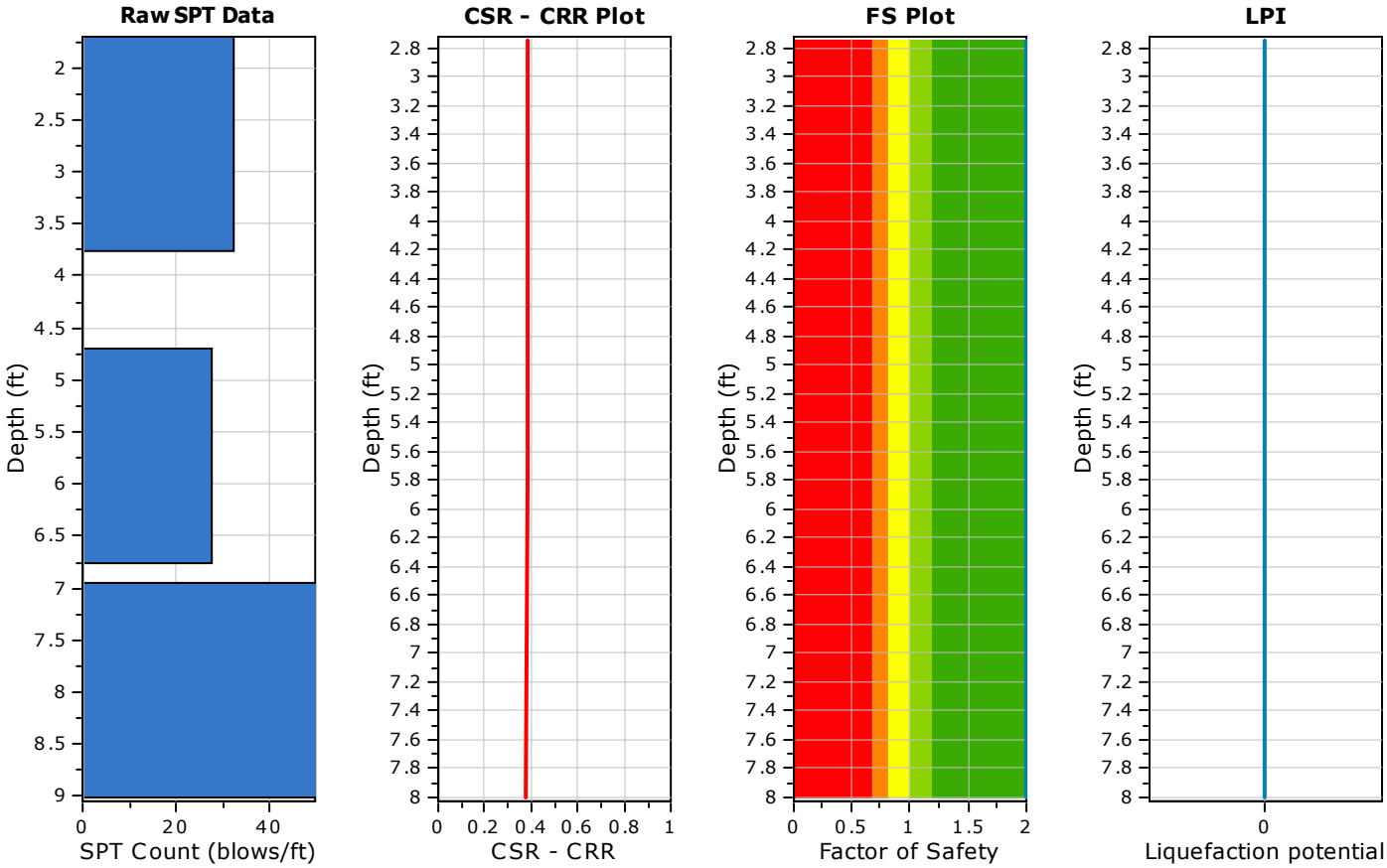
SPT BASED LIQUEFACTION ANALYSIS REPORT

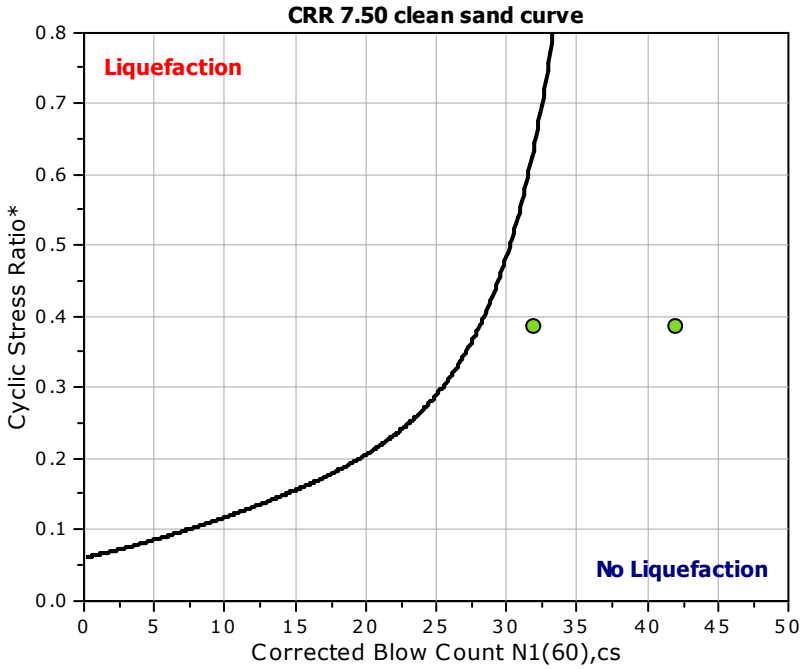
Project title : Morgan Hill Well Facility **SPT Name: B-4**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





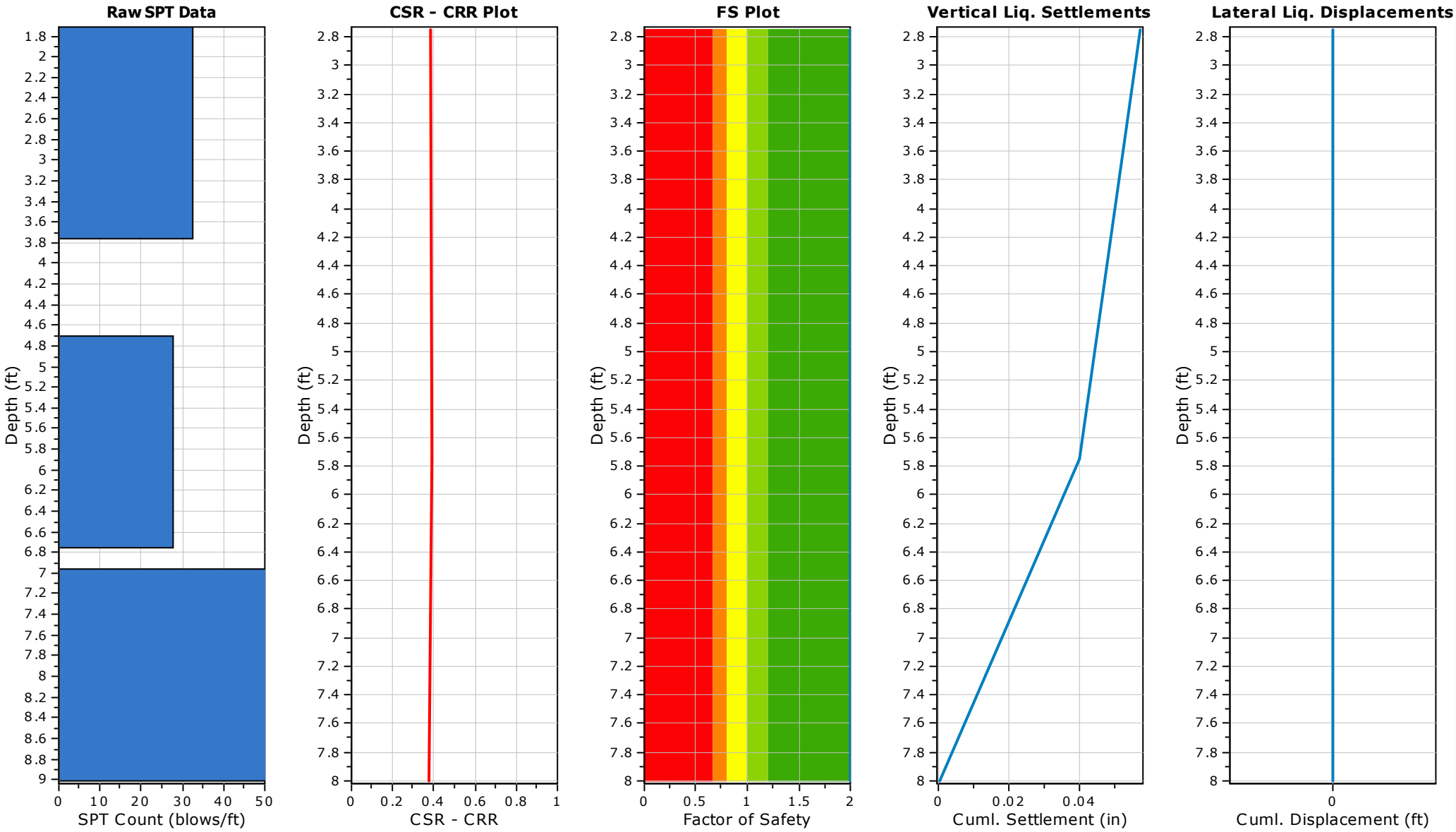
F.S. color scheme

- 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
2.75	33	0.00	115.00	1.50	Yes
5.75	28	0.00	115.00	1.50	Yes
8.00	100	0.00	115.00	0.20	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

GEOLOGISMIKI Geotechnical Software

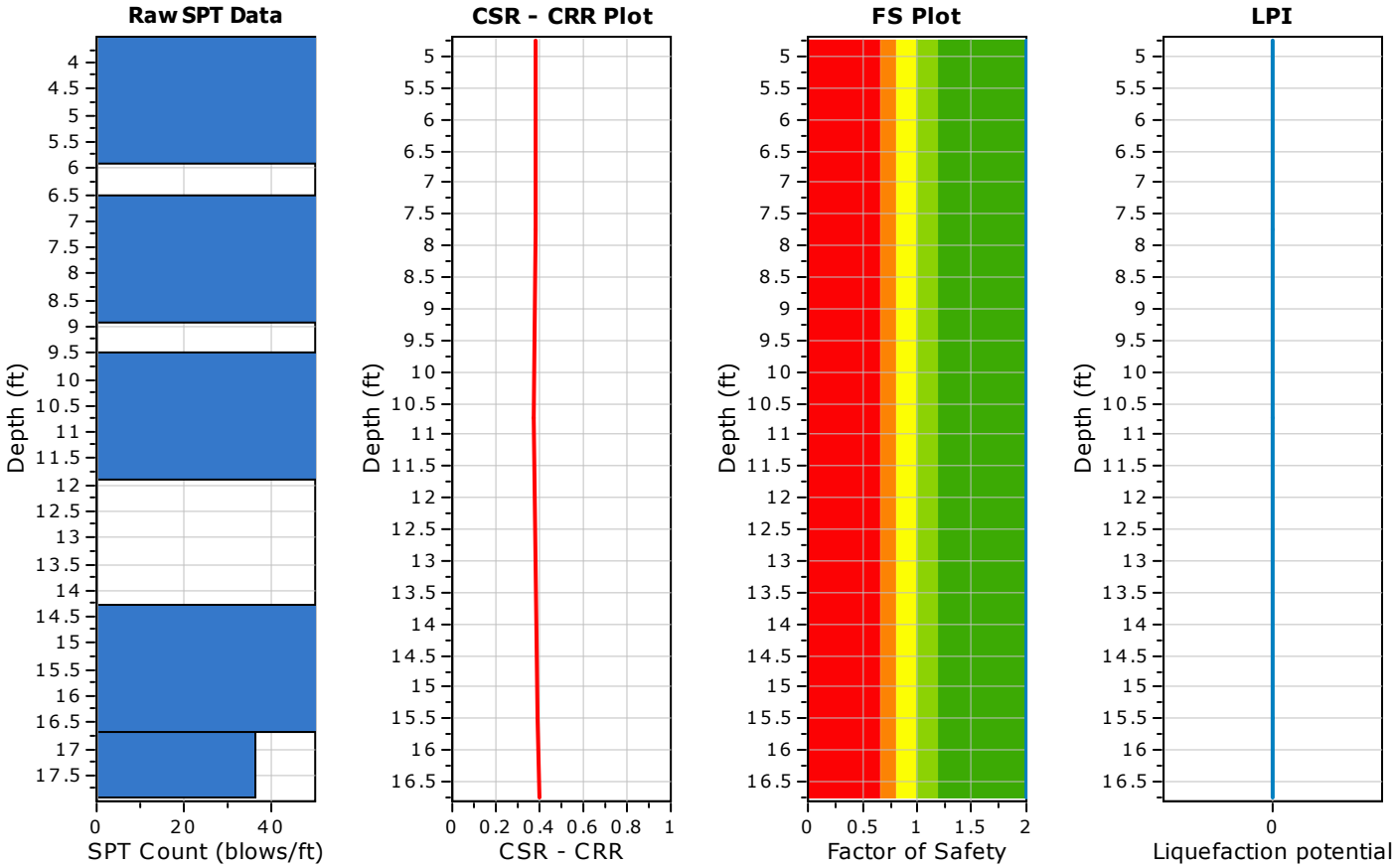
SPT BASED LIQUEFACTION ANALYSIS REPORT

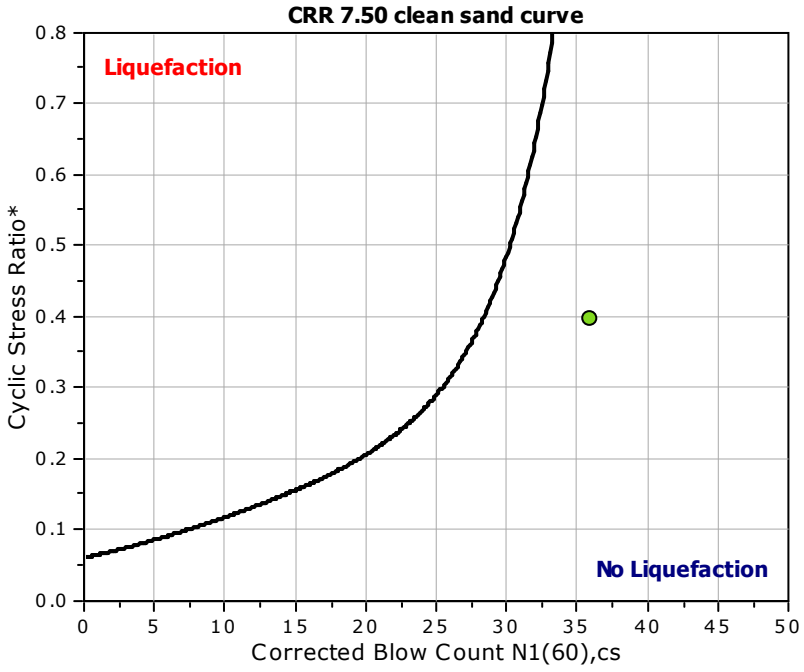
Project title : Morgan Hill Well Facility **SPT Name: 2B-1**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





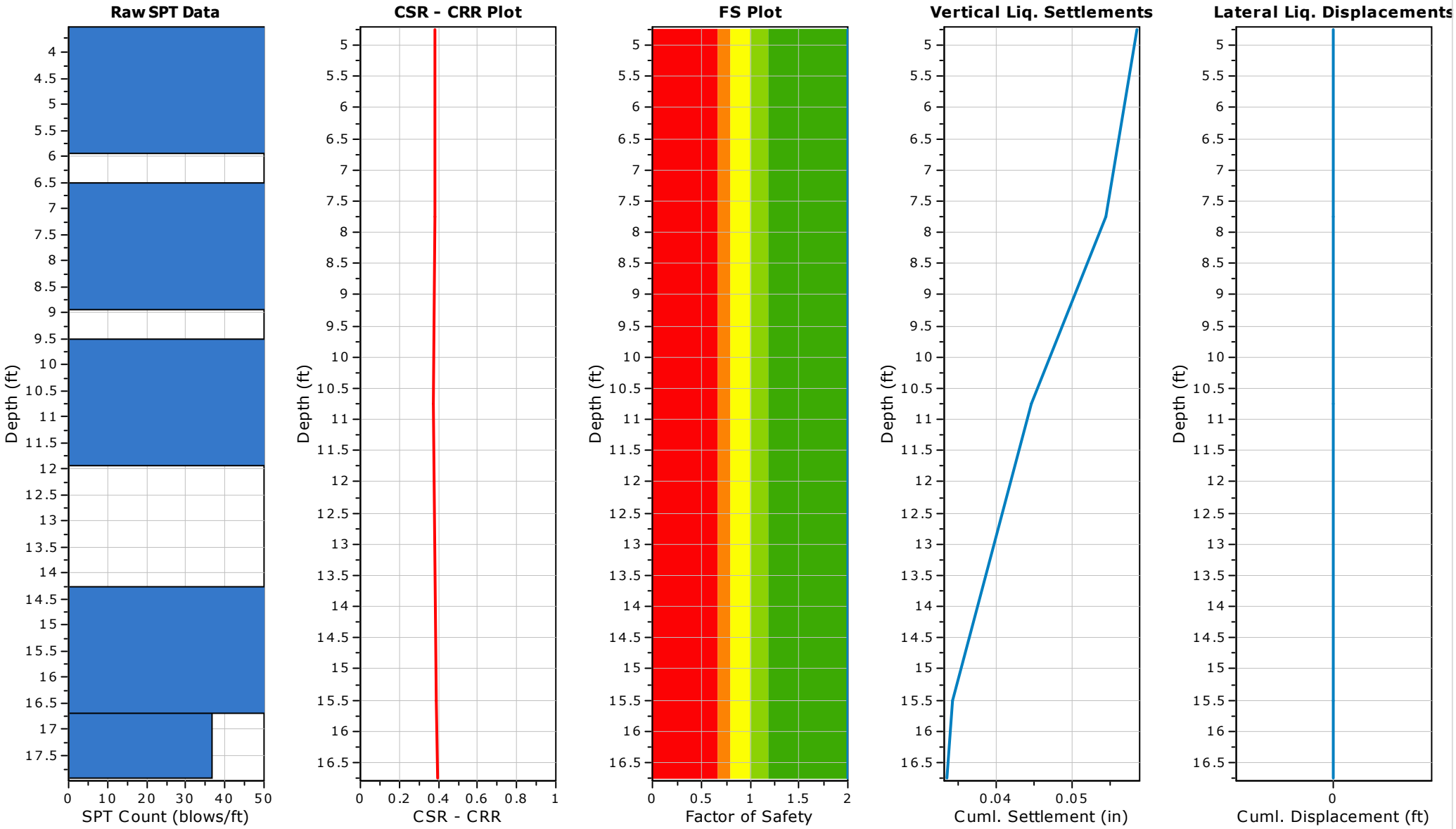
F.S. color scheme

- 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
4.75	72	8.50	114.00	1.50	Yes
7.75	56	8.50	126.00	1.50	Yes
10.75	58	8.50	129.00	1.50	Yes
15.50	100	8.50	125.00	0.30	Yes
16.75	37	8.50	125.00	1.50	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

GEOLOGISMIKI
Geotechnical Software

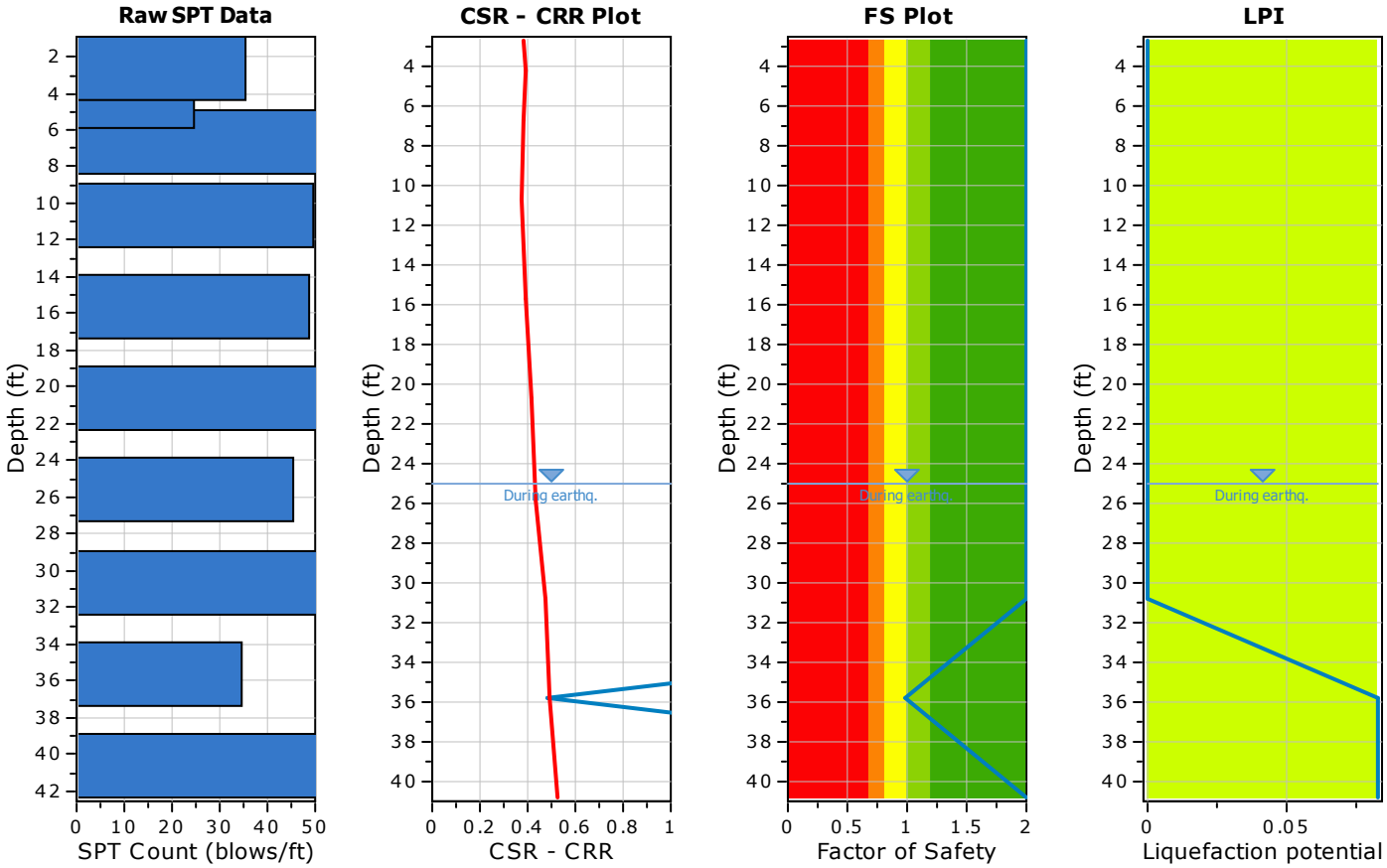
SPT BASED LIQUEFACTION ANALYSIS REPORT

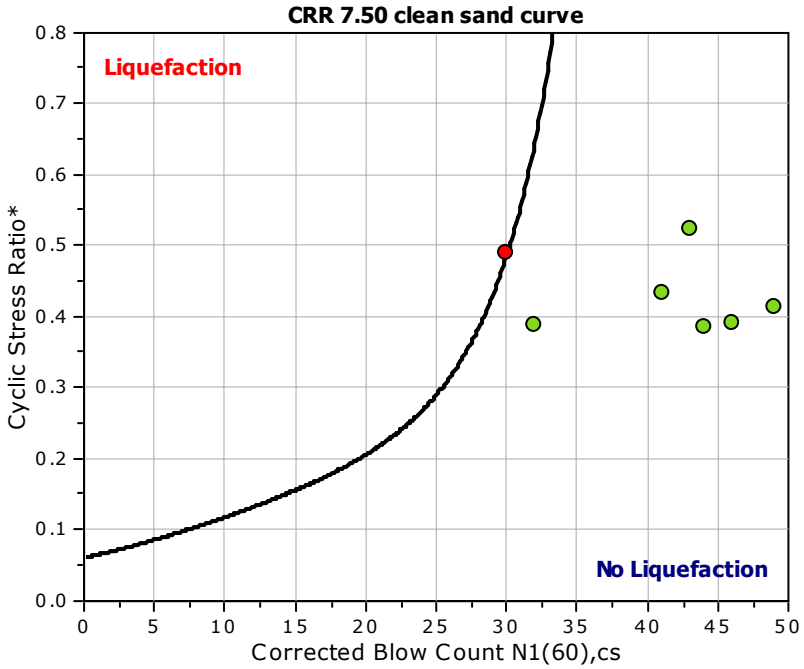
Project title : Morgan Hill Well Facility **SPT Name: 2B-2**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





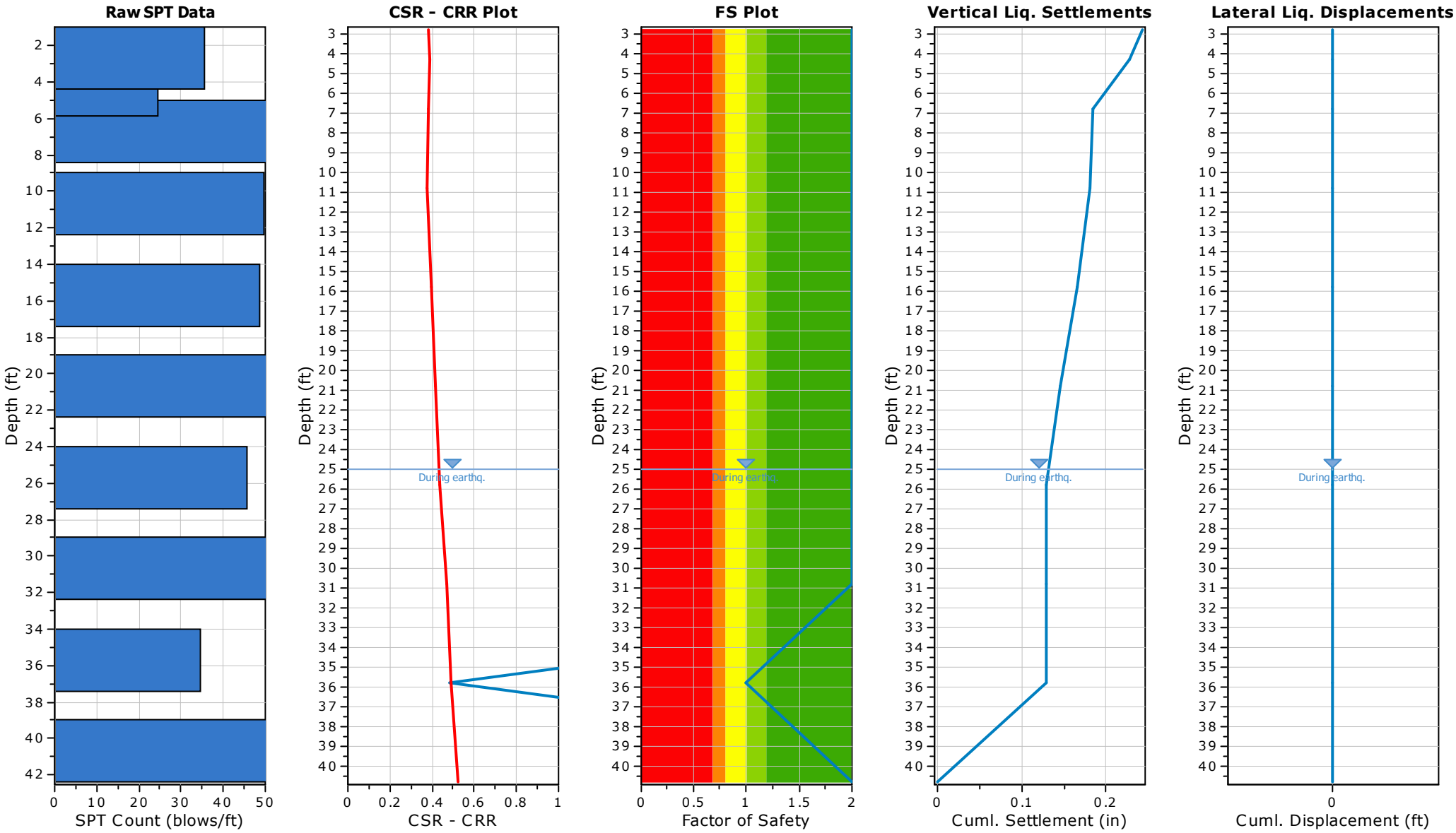
F.S. color scheme

- 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
2.75	36	0.00	132.10	1.50	Yes
4.25	25	10.50	111.00	1.50	Yes
6.75	93	15.70	140.90	1.50	Yes
10.75	50	15.70	120.00	1.50	Yes
15.75	49	15.70	120.00	1.50	Yes
20.75	51	15.70	120.00	1.50	Yes
25.75	46	12.90	120.00	1.50	Yes
30.75	63	12.90	120.00	1.50	Yes
35.75	35	16.00	120.00	1.50	Yes
40.75	51	16.00	120.00	1.50	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

GEOLOGISMIKI Geotechnical Software

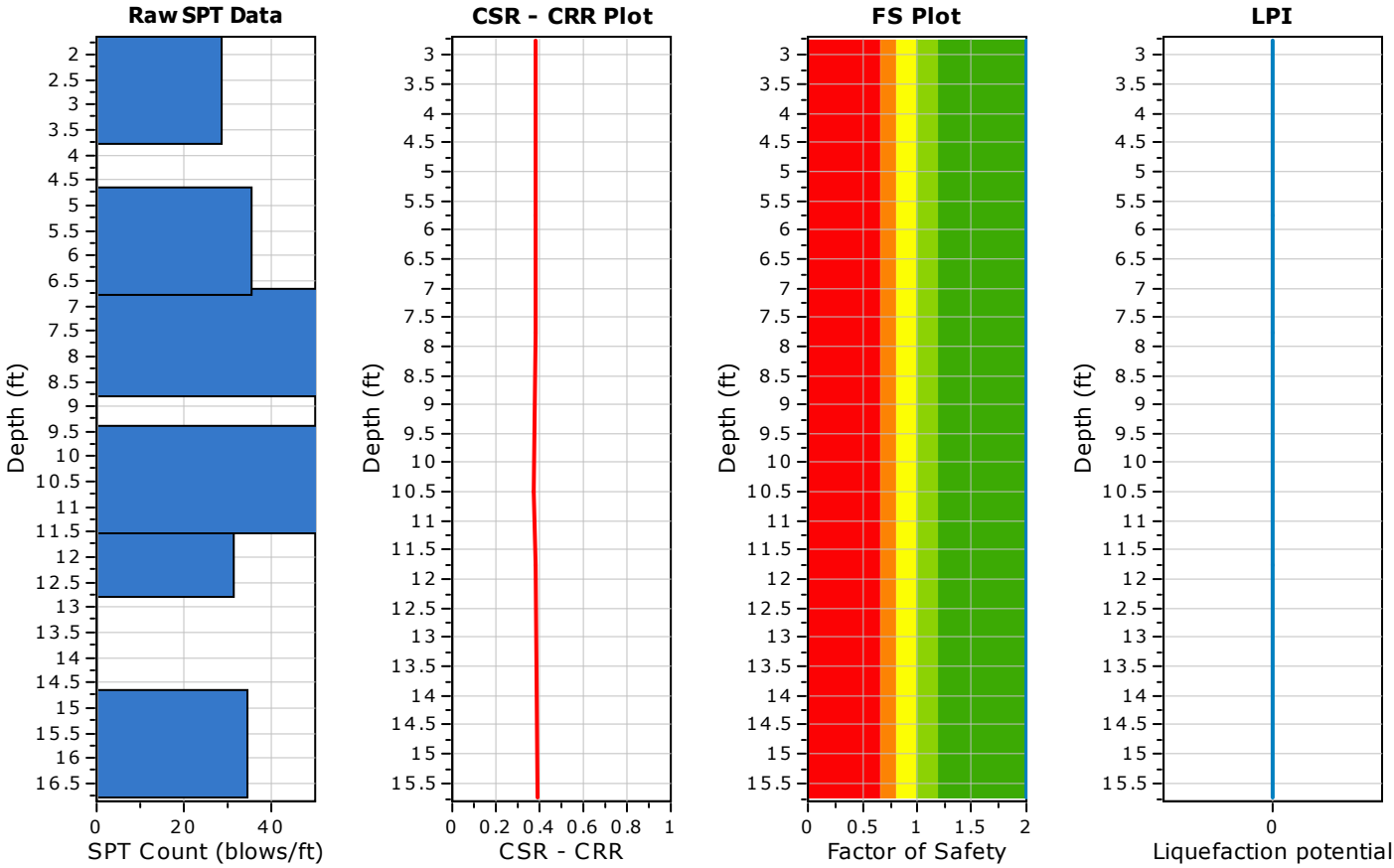
SPT BASED LIQUEFACTION ANALYSIS REPORT

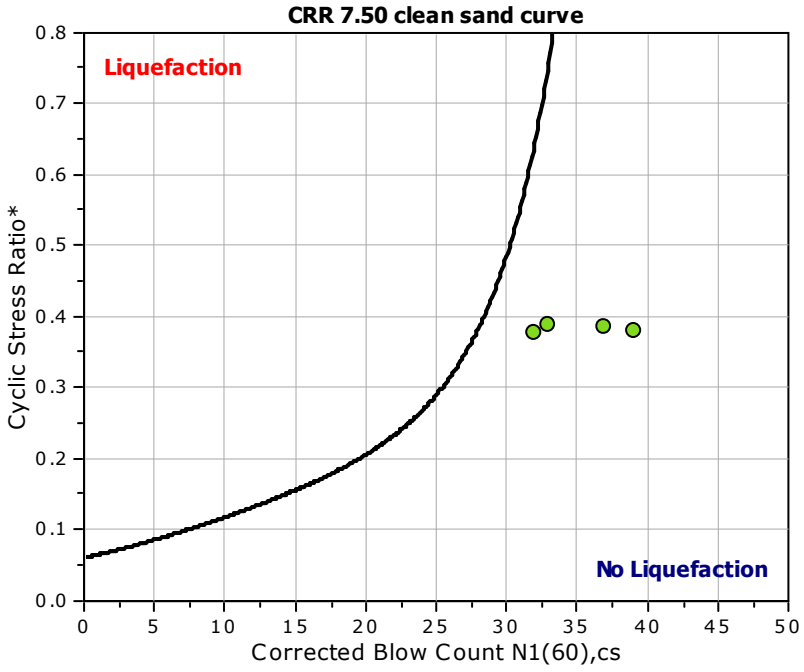
Project title : Morgan Hill Well Facility **SPT Name: 2B-3**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





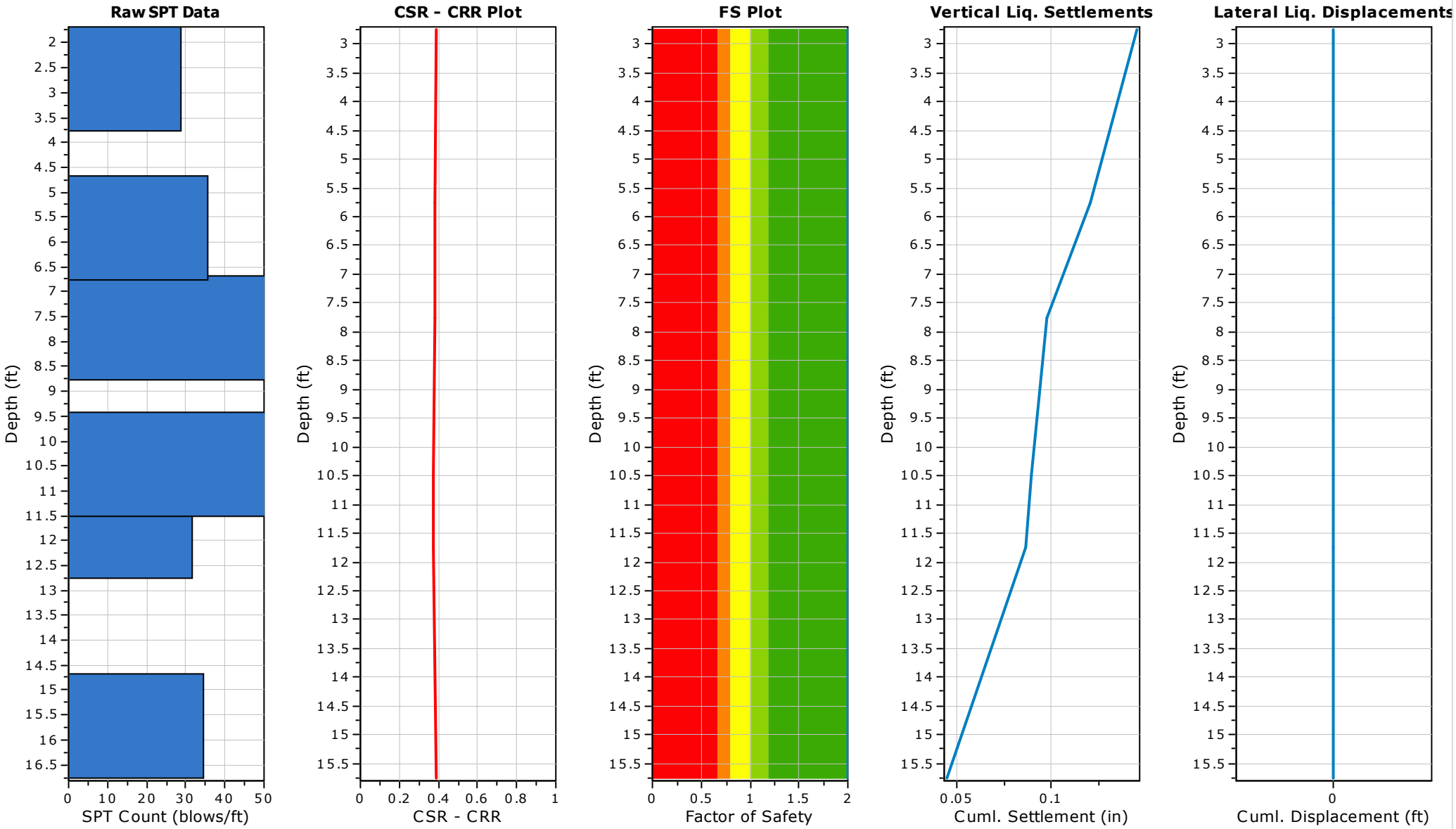
F.S. color scheme

- 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
2.75	29	0.00	110.00	1.50	Yes
5.75	36	0.00	109.20	1.50	Yes
7.75	60	0.00	115.00	1.50	Yes
10.50	90	0.00	115.00	1.50	Yes
11.75	32	0.00	115.00	1.50	Yes
15.75	35	11.30	127.90	1.50	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

GEOLOGISMIKI Geotechnical Software

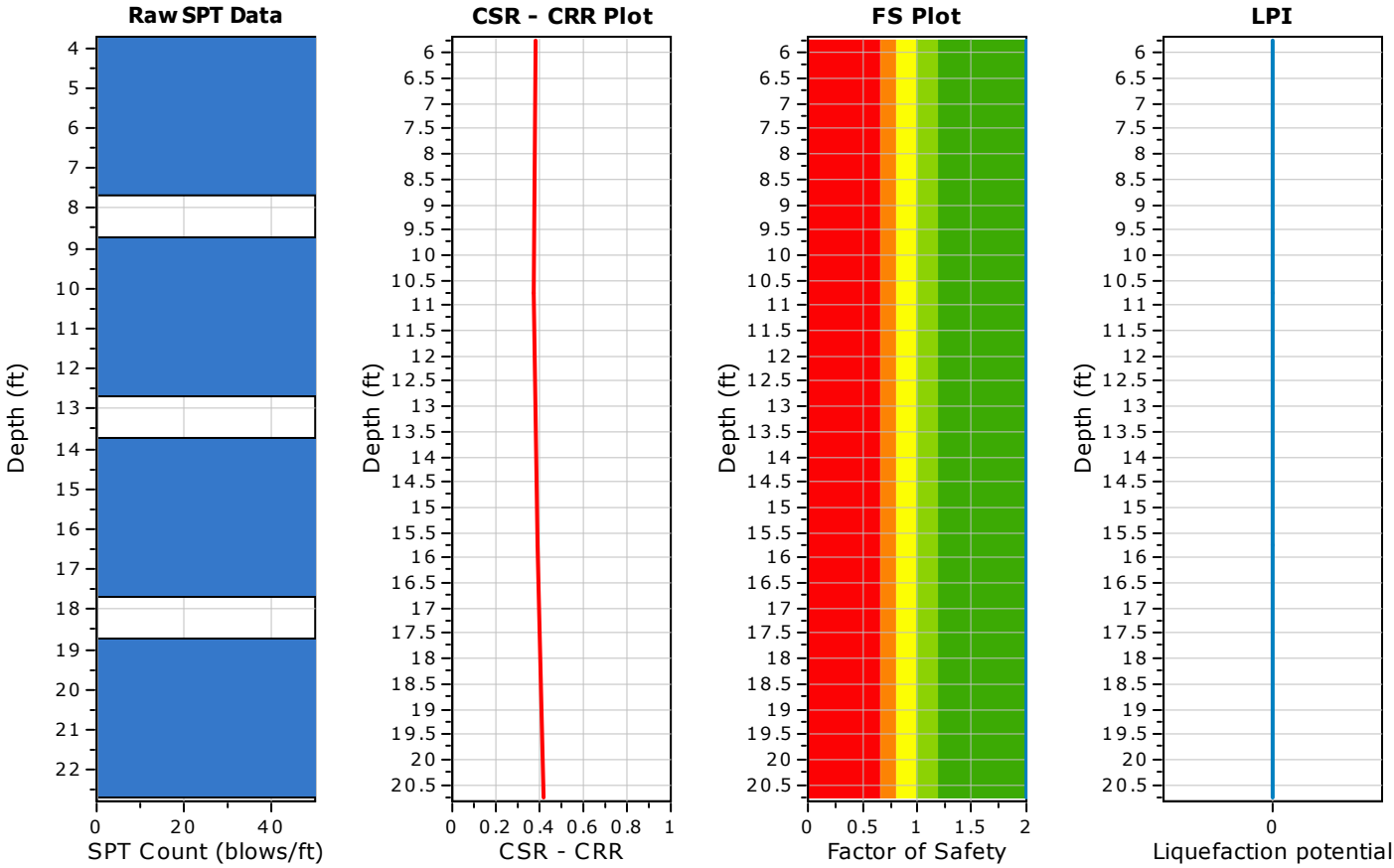
SPT BASED LIQUEFACTION ANALYSIS REPORT

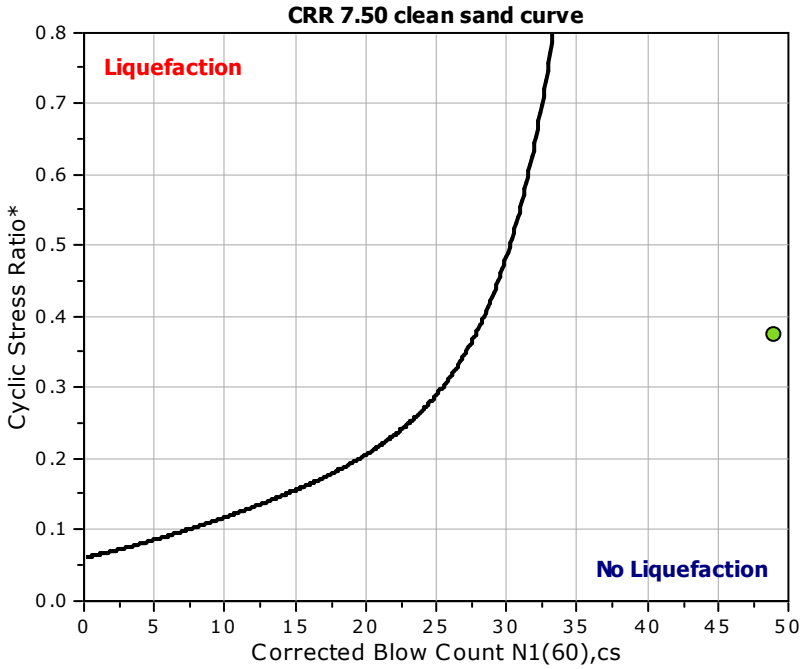
Project title : Morgan Hill Well Facility **SPT Name: 2B-4**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





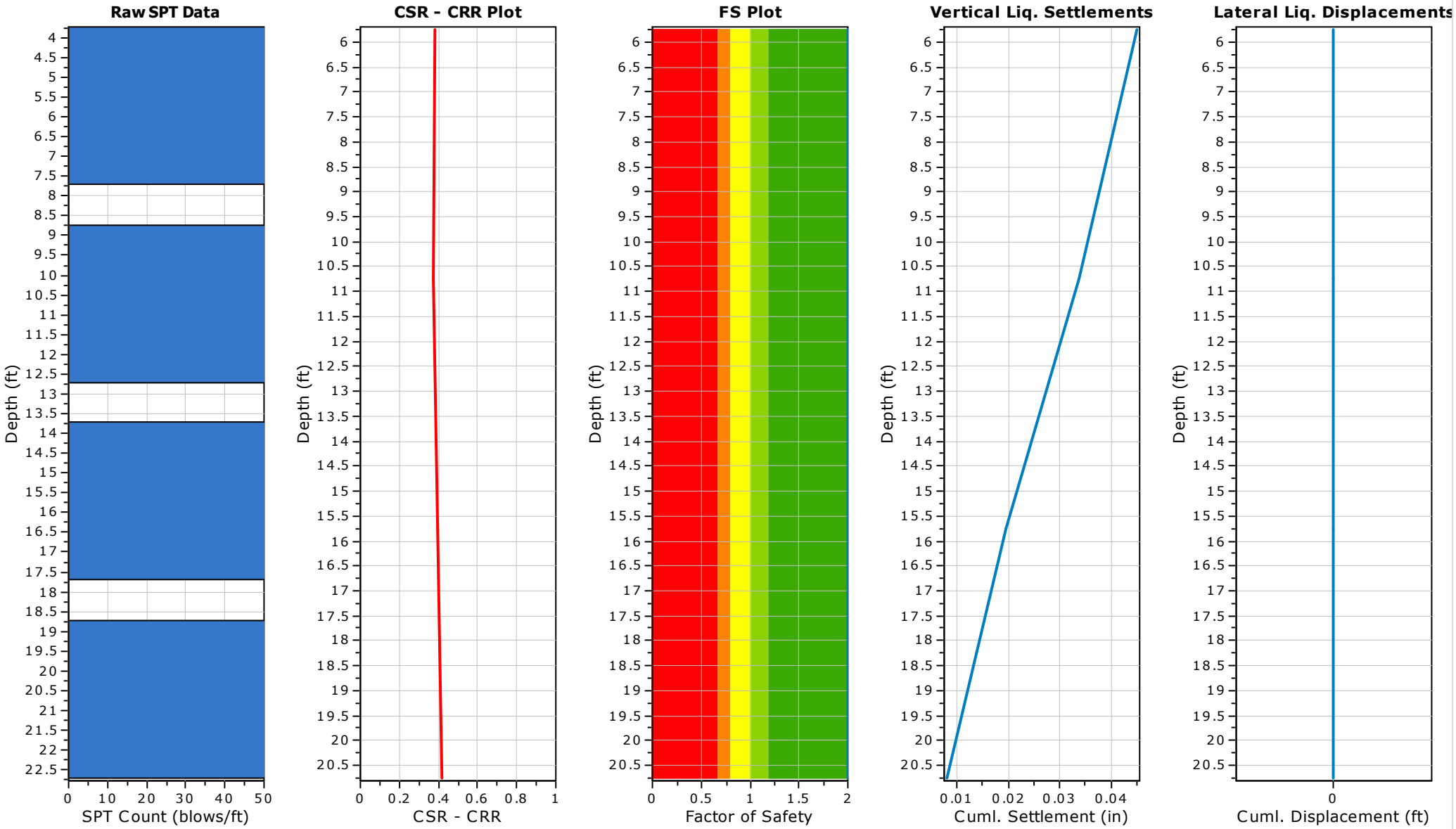
F.S. color scheme

- 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
5.75	52	7.00	125.00	1.50	Yes
10.75	51	7.00	116.60	1.50	Yes
15.75	63	7.00	133.80	1.50	Yes
20.75	72	8.60	130.00	1.50	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

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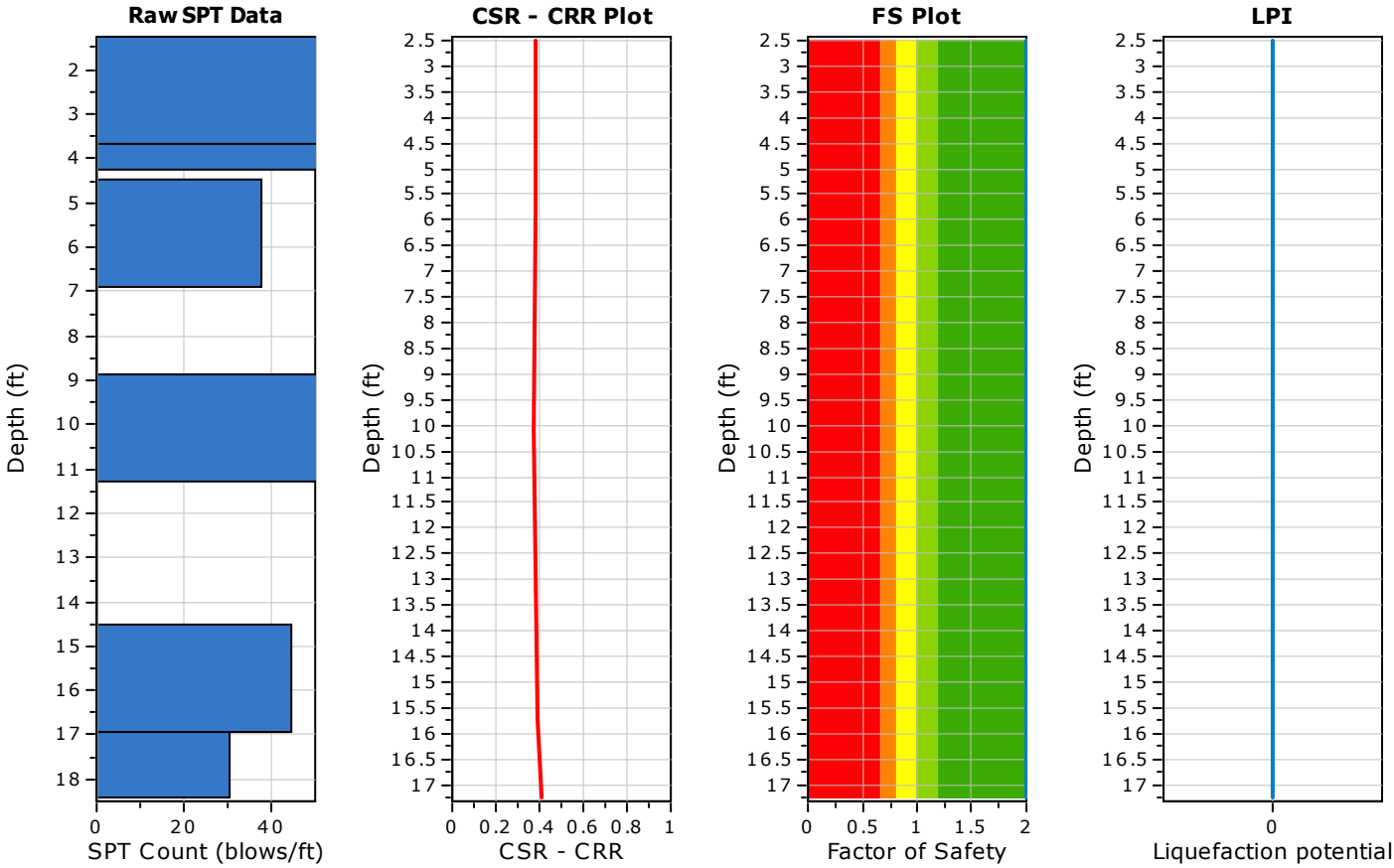
SPT BASED LIQUEFACTION ANALYSIS REPORT

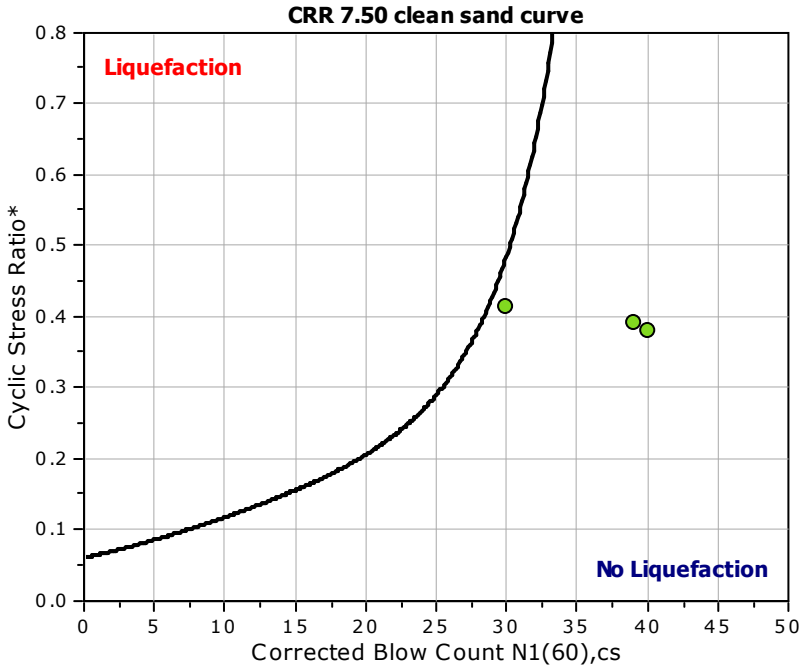
Project title : Morgan Hill Well Facility **SPT Name: 2B-5**

Location :

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	100.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	25.00 ft
Sampling method:	Standard Sampler	Earthquake magnitude M_w:	6.84
Borehole diameter:	65mm to 115mm	Peak ground acceleration:	0.84 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		





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LPI color scheme

- Very high risk
- High risk
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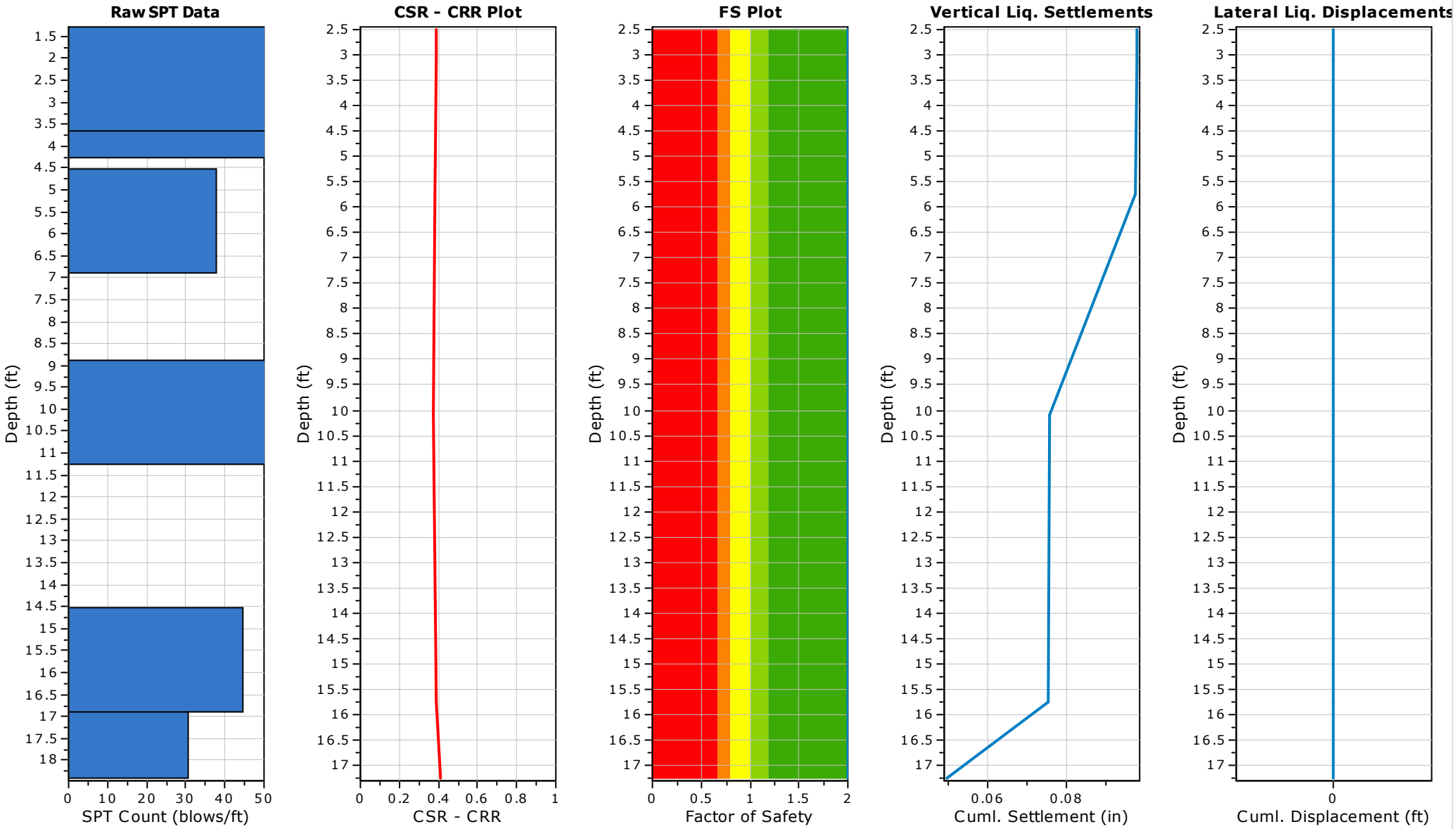
:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.50	100	0.00	120.00	0.20	Yes
3.10	100	0.00	120.00	0.20	Yes
5.75	38	8.30	121.80	1.50	Yes
10.10	100	8.30	120.00	0.20	Yes
15.75	45	8.30	125.40	1.50	Yes
17.25	31	8.30	120.00	1.50	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

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SUMMARY CALCULATION REPORT

Project title : Morgan Hill Well Facility

Location :