THE CITY OF SAN FERNANDO

**Questions and Answers** **November 13, 2024**

## Project: Carlisle Street Green Alley Project

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The following questions and answers are hereby incorporated into this project.

Q1. ***How much space is needed for Garbage Trucks on pickup days?***

A1. During construction, since the street is only 20 feet wide, the roadway will be close to all traffic, as the work progresses block by block. The specs would need to reflect that the contractor will assist the trash company in rolling the small bins in and out. If there are 3 or 4 cubic yard bins, a discussion during design would be needed with the trash company and arrangements made, to be reflected in project specs. Republic Services is the current trash hauler in the City. They confirmed 20 feet is wide enough for their trucks to have access during pickup days. The dimensions of their refuse hauling trucks are W: 11 feet. H: 10-12 feet, L: 25 feet

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Q2. ***Is the Fire Department ok with only 20 feet access?***

A2. Yes

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Q3. ***Can you please elaborate preparing permits required for construction?***

A3. Upon award of construction contract, the Contractor will be required to obtain City business license and pull permits with City such as for Construction Meter, Encroachment Permit, etc. The Consultant will not be required to pull any permits.

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Q4. ***Does the City want ground penetrating utility locating or record drawing research?***

A4. The City wants record drawing research

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Q5. ***Is the current $2.5 million project budget grant-funded?***

A5. Yes

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Q6. ***If so, through which grant program(s)?***

A6. Urban Greening Grant Program – California Natural Resources Agency

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Q7. ***Is there more funding available?***

A7. Total Grant Funding available: $3,482,535 for Design, Construction, and Construction Engineering

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Q8. ***Will the City of San Fernando be the contract holder?***

A8. Yes

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Q9. ***If so, will the City share their standard contract template?***

A9. Please see attachment: Sample Contract – Professional Services Agreement

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Q10. ***We understand the City has approximately $2.5 million for construction – does this include the soft costs/design fee as well?***

A10. Total Grant Funding available: $3,482,535 for Design, Construction, and Construction Engineering

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Q11. ***Please clarify if Environmental Planning Services, including ISMND and Tribal Consultation are required as part of project scope of if the project is California Environmental Quality Act (CEQA) exempt.***

A11. Please see attachment: Recorded Notice of Exemption

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Q12. ***Will the City require Traffic Control Plan (TCP) for the geotechnical boring/testing and if so, will this scope be provided by the City or by the design team?***

A12. Design Team may provide Traffic Control per MUTCD

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Q13. ***Please clarify if Fire Department review, Fire Access Plan, and/or coordination is part of project scope.***

A13. No

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Q14. ***What kind of required permits will be needed per Scope 3 Design item (e)?***

A14. No additional permits will be required.

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Q15. ***Will the City have a dedicated Project Manager for Construction Coordination?***

A15. Yes

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Q16. ***Regarding the required insurance and the City of San Fernando Business License: please note E&O does not contain the endorsement for additional insured. Only general liability and auto liability have that endorsement – will this be a problem?***

A16. Please see attachment: Sample Contract – Professional Services Agreement, for more details regarding insurance requirements and Errors & Omissions.

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Q17. ***Can you provide a sample contract for review?***

A17. Please see attachment: Sample Contract – Professional Services Agreement

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Q18. ***Please confirm RFP response can be electronic via email – without the need to provide three physical copies as noted on Page 7.***

A18. Yes

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Q19. ***Since responses to questions will be available on November 13, it gives the design teams only three full working days to react, coordinate, revise, print, and deliver. May we suggest 1 week extensions?***

A19. This project is on a very tight schedule, however, we will extend the RFP deadline to from Monday, November 18, 2024 to **Wednesday, November 20, 2024 by 5:00pm**.

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Q20. ***Please clarify if fee is to be not-to-exceed per Page 6 for all tasks or if this is a fixed fee scope.***

A20. There should be a NOT-TO-EXCEED for TOTAL DESIGN/SUPPORT COSTS.

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Q21. ***Please clarify if Water Quality Management Plan/Hydrology Report is required as part of project scope.***

A21. No, a Water Quality Management Plan/Hydrology Report are not required.

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Q22. ***Is SWPPP required as part of project scope?***

A22. If the project proposes construction activities that will result one acre or more of land disturbance, then the SWPP has be submitted and implemented by Contract. If the project proposes construction activities that will result in less than one acre of land disturbance, the Contract does not have to submit nor implement SWPPP, however, the Contractor still needs to submit Storm Water Control Plan.

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Q23. ***Please confirm that all proposed work will occur within the public right-of-way and no work/coordination will occur on private property.***

A23. Yes, work will only occur in Public Right-of-Way.

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Q24. ***What is the water type (domestic, recycled, water harvesting) for irrigation system?***

A24. Domestic.

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Q25. ***What is the City's preferred irrigation method (inline drip, point source drip, bubblers)?***

A25. Inline Drip for plants/shrubs, and bubblers for trees. All irrigation valves, sprinklers, etc. should be Rainbird. Please install Weathermatic irrigation timer(s).

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Q26. ***Is June 30, 2025 deadline for 100% CD documents or Finalized Bid Package?***

A26. All Plans, Construction Specifications, and Engineer's Estimate should be completed by 6/30/25 and project should be ready to advertise.

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Q27. ***Please clarify at what stages of the design the community workshops occur – do all three of them need to happen to help develop the 30% PS&E? If so-they will need to occur within a short period of time to adhere to required project schedule.***

A27. The three workshops should happen prior to 30% either February/March/April 2025 (two workshops will be held during the week in the evening at two different parks and one will be held on Saturday evening at Outdoor Mall event).

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Q28. ***Please clarify if the grant deadline on March 1, 2026 means complete project close-out or some other milestone.***

A28. Grant requires project to be completely closed by March 1, 2026.

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Q29. ***The RFP indicates new low level pedestrian pathway lighting – please confirm the existing streetlight on the overhead power poles shall remain or will be removed as part of the project scope?***

A29. Existing overhead power pole lights shall remain

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Q30. ***Can the design team propose solar powered low-level pedestrian lighting to avoid conduit trenching and associated costs?***

A30. Yes, but ensure bolts are the bottom of pole are tack-welded to prevent transients from knocking them down and walking away with them. All light poles should be powder coated.

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Q31. ***Would there be an opportunity for fixed street furnishings-benches, trash receptacles, or other gathering areas as part of the project? We are assuming this would not be included in the current budget.***

A31. No street furniture will be required for this project.

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Q32. ***Of the 52 parking spaces located at Public Lot 9 – how many are required to remain? Can any be removed to accommodate swales/parking lot trees?***

A32. You may remove no more than 10 parking spaces to accommodate swales/trees in Parking Lot No. 9.

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Q33. ***For the utility survey scope, does the scope entails surveying of gravity utilities and use of utility records to prepare utility base file?***

A33. In preparation of the base file, this project does not entail surveying of gravity utilities. However, it does entail using existing utility records.

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Q34. ***Please confirm that the project includes total of 26 curb ramps.***

A34. Yes, there's 26 curb ramps [at O'Melveny (1 qty), Woodworth (2 qty), Mott (4 qty), Griffith (2 qty), Kewen (4 qty), Hewitt (2 qty), Hollister (4 qty), Coronel (4 qty), and Pico (3 qty)]. Please see attachment: Carlisle Green Alley Board.

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Q35. ***Please confirm the horizontal and vertical datum and coordinate system used to establish the existing survey.***

A35. The coordinates and bearings shown hereon are based upon the US State Plan Coordinate System, North American Datum of 19983 (NAD83), California Zone 5 NAD83, Epoch 2011.00; said coordinates and bearings are based locally upon field-observed ties to continuously operating reference stations "WMAP" and "VNCX". The grid bearing between stations being North 59°40'14" West as derived from published values.

The basis of elevations is the City of Los Angeles benchmark 03-02251 at the northwest curb of Brand Blvd with a published elevation of 1059.939 feet (NGVD 1929).

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Q36. ***Does the Geotechnical data along Carlisle from Pico Street to Hollister Street include existing percolation testing?***

A36. Yes, field testing percolation results are included in the Geotechnical report.

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Q37. ***Does the project include an existing preliminary design report?***

A37. No

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Q38. ***Are these BMPs to be designed to contribute to storm water quality objectives similar to previous projects in the City or are they to be designed to the maximum extent practicable (MEP)?***

A38. BMPs should be design to contribute to storm water quality objectives similar to previous projects in the City.

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Q39. ***Will the CEQA documentation and associated technical studies be done per a separate contract, or do they already exist?***

A39. Please see attachment: Recorded Notice of Exemption

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Q40. ***Do consultants need to submit both hard copies and electronic copies of the proposal, or can consultants exclusively submit an electronic copy?***

A40. Consultant has option to submit hard copies or electronic copy in one PDF format no later than **5:00pm on Wednesday, November 20, 2024**.

# PROFESSIONAL SERVICES AGREEMENT

## CONSULTANT

Design Services for Carlisle Street Green Alley Project

THIS PROFESSIONAL SERVICES AGREEMENT ("Agreement") is made and entered into this 6th day of January 2025 (hereinafter, the "Effective Date"), by and between the CITY OF SAN FERNANDO, a municipal corporation ("CITY") and **CONSULTANT** (hereinafter, "CONSULTANT"). For the purposes of this Agreement CITY and CONSULTANT may be referred to collectively by the capitalized term "Parties." The capitalized term "Party" may refer to CITY or CONSULTANT interchangeably.

NOW, THEREFORE, for and in consideration of the mutual covenants and conditions herein contained, CITY and CONSULTANT agree as follows:

## I. ENGAGEMENT TERMS

1.1 SCOPE OF WORK: Subject to the terms and conditions set forth in this Agreement and all exhibits attached and incorporated hereto, CONSULTANT agrees to perform the services and tasks set forth in **Exhibit "A"** (hereinafter referred to as the **"Scope of Work"**). CONSULTANT further agrees to furnish to CITY all labor, materials, tools, supplies, equipment, services, tasks and incidental and customary work necessary to competently perform and timely complete the services and tasks set forth in the Scope of Work. For the purposes of this Agreement the aforementioned services and tasks set forth in the Scope of Work shall hereinafter be referred to generally by the capitalized term "Work." CONSULTANT shall not commence with the performance of the Work until such time as CITY issues a written Notice to Proceed.

1.2 PROSECUTION OF WORK: The Parties agrees as follows:

A. Time is of the essence of this Agreement and each and every provision contained herein. The Work shall be commenced within five ( 5 ) calendar days of CITY's issuance of a Notice to Proceed, and shall be completed on a date not more than _____ calendar days from the issuance of the Notice to Proceed (the "Completion Date");

B. CONSULTANT shall perform the Work continuously and with due diligence so as to complete the Work by the Completion Date. CONSULTANT shall cooperate with CITY and in no manner interfere with the work of CITY, its employees or other consultants, contractors or agents;

C. CONSULTANT shall not claim or be entitled to receive any compensation or damage because of the failure of CONSULTANT, or its subconsultants, to have related services or tasks completed in a timely manner;

D. CONSULTANT shall at all times enforce strict discipline and good order among CONSULTANT's employees; AND

E. CONSULTANT, at its sole expense, shall pay all sales, consumer, use or other similar taxes required by law.

1.3 COMPENSATION:

A. CONSULTANT shall perform the various services and tasks set forth in the Scope of Work in accordance with the compensation fee schedule dated _____ noted in Exhibit "A" (hereinafter, the "Approved Rate Schedule").

B. Section 1.3(A) notwithstanding, CONSULTANT's total compensation for the performance and completion of the Work shall not exceed the sum of $_____DOLLARS ($ XXXXX.XX ) (hereinafter, the "Not-to-Exceed Sum"). CONSULTANT further agrees that the Not-to-Exceed Sum is inclusive of compensation for all labor, materials, tools, supplies, equipment, services, tasks and incidental and customary work necessary to competently perform and timely complete the Work.

1.4 PAYMENT OF COMPENSATION: The Not-to-Exceed Sum shall be paid to CONSULTANT in monthly increments as the Work is completed. Following the conclusion of each calendar month, CONSULTANT shall submit to CITY an itemized invoice indicating the services performed and tasks completed during the recently concluded calendar month, including services and tasks performed and the reimbursable out-of-pocket expenses incurred. If the amount of CONSULTANT's monthly compensation is a function of hours worked by CONSULTANT's personnel, the invoice shall indicate the number of hours worked in the recently concluded calendar month, the persons responsible for performing the Work, the rate of compensation at which such services and tasks were performed, the subtotal for each task and service performed and a grand total for all services performed. Within thirty (30) calendar days of receipt of each invoice, CITY shall notify CONSULTANT in writing of any disputed amounts included in the invoice. Within forty-five (45) calendar days of receipt of each invoice, CITY shall pay all undisputed amounts included on the invoice. CITY shall not withhold applicable taxes or other authorized deductions from payments made to CONSULTANT.

1.5 ACCOUNTING RECORDS: CONSULTANT shall maintain complete and accurate records with respect to all matters covered under this Agreement for a period of three (3) years after the expiration or termination of this Agreement. CITY shall have the right to access

and examine such records, without charge, during normal business hours. CITY shall further have the right to audit such records, to make transcripts therefrom and to inspect all program data, documents, proceedings, and activities.

1.6 ABANDONMENT BY CONSULTANT: In the event CONSULTANT ceases to perform the Work agreed to under this Agreement or otherwise abandons the undertaking contemplated herein prior to the expiration of this Agreement or prior to completion of any or all tasks set forth in the Scope of Work, CONSULTANT shall deliver to CITY immediately and without delay, all materials, records and other work product prepared or obtained by CONSULTANT in the performance of this Agreement. Furthermore, CONSULTANT shall only be compensated for the reasonable value of the services, tasks and other Work performed up to the time of cessation or abandonment, less a deduction for any damages, costs or additional expenses which CITY may incur as a result of CONSULTANT's cessation or abandonment.

## II. PERFORMANCE OF AGREEMENT

2.1 CITY'S REPRESENTATIVES: The CITY hereby designates the City Manager and Civil Engineering Assistant II (hereinafter, the "CITY Representatives") to act as its representatives for the performance of this Agreement. The CITY Manager shall be the chief CITY Representative. The CITY Representatives or their designee shall act on behalf of the CITY for all purposes under this Agreement. CONSULTANT shall not accept directions or orders from any person other than the CITY Representatives or their designee.

2.2 CONSULTANT REPRESENTATIVE: CONSULTANT hereby designates DAVID STUETZEL, PE, PROJECT MANAGER to act as its representative for the performance of this Agreement (hereinafter, "CONSULTANT Representative"). CONSULTANT Representative shall have full authority to represent and act on behalf of the CONSULTANT for all purposes under this Agreement. CONSULTANT Representative or his designee shall supervise and direct the performance of the Work, using his best skill and attention, and shall be responsible for all means, methods, techniques, sequences and procedures and for the satisfactory coordination of all portions of the Work under this Agreement. Notice to the CONSULTANT Representative shall constitute notice to CONSULTANT.

2.3 COORDINATION OF SERVICE; CONFORMANCE WITH REQUIREMENTS: CONSULTANT agrees to work closely with CITY staff in the performance of the Work and this Agreement and shall be available to CITY staff and the CITY Representatives at all reasonable times. All work prepared by CONSULTANT shall be subject to inspection and approval by CITY Representatives or their designees.

2.4 STANDARD OF CARE; PERFORMANCE OF EMPLOYEES: CONSULTANT represents, acknowledges and agrees to the following:

A. CONSULTANT shall perform all Work skillfully, competently and to the highest standards of CONSULTANT's profession;

B. CONSULTANT shall perform all Work in a manner reasonably satisfactory to the CITY;

C. CONSULTANT shall comply with all applicable federal, state and local laws and regulations, including the conflict of interest provisions of Government Code Section 1090 and the Political Reform Act (Government Code Section 81000 et seq.);

D. CONSULTANT understands the nature and scope of the Work to be performed under this Agreement as well as any and all schedules of performance;

E. All of CONSULTANT's employees and agents possess sufficient skill, knowledge, training and experience to perform those services and tasks assigned to them by CONSULTANT; and

F. All of CONSULTANT's employees and agents (including but not limited subcontractors and subconsultants) possess all licenses, permits, certificates, qualifications and approvals of whatever nature that are legally required to perform the tasks and services contemplated under this Agreement and all such licenses, permits, certificates, qualifications and approvals shall be maintained throughout the term of this Agreement and made available to CITY for copying and inspection.

The Parties acknowledge and agree that CONSULTANT shall perform, at CONSULTANT's own cost and expense and without any reimbursement from CITY, any services necessary to correct any errors or omissions caused by CONSULTANT's failure to comply with the standard of care set forth under this Section or by any like failure on the part of CONSULTANT's employees, agents, contractors, subcontractors and subconsultants. Such effort by CONSULTANT to correct any errors or omissions shall be commenced immediately upon their discovery by either Party and shall be completed within seven (7) calendars days from the date of discovery or such other extended period of time authorized by the CITY Representatives in writing and in their sole and absolute discretion. The Parties acknowledge and agree that CITY's acceptance of any work performed by CONSULTANT or on CONSULTANT's behalf shall not constitute a release of any deficiency or delay in performance. The Parties further acknowledge, understand and agree that CITY has relied upon the foregoing representations of CONSULTANT, including but not limited to the representation that CONSULTANT possesses the skills, training,

knowledge and experience necessary to perform the Work skillfully, competently and to the highest standards of CONSULTANT's profession.

2.5 ASSIGNMENT: The skills, training, knowledge and experience of CONSULTANT are material to CITY's willingness to enter into this Agreement. Accordingly, CITY has an interest in the qualifications and capabilities of the person(s) who will perform the services and tasks to be undertaken by CONSULTANT or on behalf of CONSULTANT in the performance of this Agreement. In recognition of this interest, CONSULTANT agrees that it shall not assign or transfer, either directly or indirectly or by operation of law, this Agreement or the performance of any of CONSULTANT's duties or obligations under this Agreement without the prior written consent of the CITY. In the absence of CITY's prior written consent, any attempted assignment or transfer shall be ineffective, null and void and shall constitute a material breach of this Agreement.

2.6 CONTROL AND PAYMENT OF SUBORDINATES; INDEPENDENT CONTRACTOR: The Work shall be performed by CONSULTANT or under CONSULTANT's strict supervision. CONSULTANT will determine the means, methods and details of performing the Work subject to the requirements of this Agreement. CITY retains CONSULTANT on an independent contractor basis and not as an employee. CONSULTANT reserves the right to perform similar or different services for other principals during the term of this Agreement, provided such work does not unduly interfere with CONSULTANT's competent and timely performance of the Work contemplated under this Agreement and provided the performance of such services does not result in the unauthorized disclosure of CITY's confidential or proprietary information. Any additional personnel performing the Work under this Agreement on behalf of CONSULTANT are not employees of CITY and shall at all times be under CONSULTANT's exclusive direction and control. CONSULTANT shall pay all wages, salaries and other amounts due such personnel and shall assume responsibility for all benefits, payroll taxes, Social Security and Medicare payments and the like. CONSULTANT shall be responsible for all reports and obligations respecting such additional personnel, including, but not limited to: Social Security taxes, income tax withholding, unemployment insurance, disability insurance, workers' compensation insurance and the like.

2.7 REMOVAL OF EMPLOYEES OR AGENTS: If any of CONSULTANT's officers, employees, agents, contractors, subcontractors or subconsultants is determined by the CITY Representatives to be uncooperative, incompetent, a threat to the adequate or timely performance of the tasks assigned to CONSULTANT, a threat to persons or property, or if any of CONSULTANT's officers, employees, agents, contractors, subcontractors or subconsultants fail or refuse to perform the Work in a manner acceptable to the CITY, such officer, employee, agent, contractor, subcontractor or subconsultant shall be promptly removed by CONSULTANT and shall not be reassigned to perform any of the Work.

2.8 COMPLIANCE WITH LAWS: CONSULTANT shall keep itself informed of and in compliance with all applicable federal, state or local laws to the extent such laws control or otherwise govern the performance of the Work. CONSULTANT's compliance with applicable laws shall include, without limitation, compliance with all applicable Cal/OSHA requirements.

2.9 NON-DISCRIMINATION: In the performance of this Agreement, CONSULTANT shall not discriminate against any employee, subcontractor, subconsultant, or applicant for employment because of race, color, creed, religion, sex, marital status, sexual orientation, national origin, ancestry, age, physical or mental disability or medical condition.

2.10. INDEPENDENT CONTRACTOR STATUS: The Parties acknowledge, understand and agree that CONSULTANT and all persons retained or employed by CONSULTANT are, and shall at all times remain, wholly independent contractors and are not officials, officers, employees, departments or subdivisions of CITY. CONSULTANT shall be solely responsible for the negligent acts and/or omissions of its employees, agents, contractors, subcontractors and subconsultants. CONSULTANT and all persons retained or employed by CONSULTANT shall have no authority, express or implied, to bind CITY in any manner, nor to incur any obligation, debt or liability of any kind on behalf of, or against, CITY, whether by contract or otherwise, unless such authority is expressly conferred to CONSULTANT under this Agreement or is otherwise expressly conferred by CITY in writing.

## III. INSURANCE

3.1 DUTY TO PROCURE AND MAINTAIN INSURANCE: Prior to the beginning of and throughout the duration of the Work, CONSULTANT will procure and maintain policies of insurance that meet the requirements and specifications set forth under this Article. CONSULTANT shall procure and maintain the following insurance coverage, at its own expense:

A. Commercial General Liability Insurance: CONSULTANT shall procure and maintain Commercial General Liability Insurance ("CGL Coverage") as broad as Insurance Services Office Commercial General Liability coverage (occurrence Form CG 0001) or its equivalent. Such CGL Coverage shall have minimum limits of no less than One Million Dollars ($1,000,000.00) per occurrence and Two Million Dollars ($2,000,000.00) in the general aggregate for bodily injury, personal injury, property damage, operations, products and completed operations, and contractual liability.

B. Automobile Liability Insurance: CONSULTANT shall procure and maintain Automobile Liability Insurance as broad as Insurance Services Office Form Number CA 0001 covering Automobile Liability, Code 1 (any auto). Such Automobile Liability Insurance shall have minimum limits of no less than One Million Dollars ($1,000,000.00) per accident for bodily injury and property damage.

C. Workers' Compensation Insurance/ Employer's Liability Insurance: A policy of workers' compensation insurance in such amount as will fully comply with the laws of the State of California and which shall indemnify, insure and provide legal defense for both CONSULTANT and CITY against any loss, claim or damage arising from any injuries or occupational diseases occurring to any worker employed by or any persons retained by CONSULTANT in the course of carrying out the Work contemplated in this Agreement.

D. Errors & Omissions Insurance: For the full term of this Agreement and for a period of three (3) years thereafter, CONSULTANT shall procure and maintain Errors and Omissions Liability Insurance appropriate to CONSULTANT's profession. Such coverage shall have minimum limits of no less than One Million Dollars ($1,000,000.00) per occurrence and shall be endorsed to include contractual liability.

3.2 ADDITIONAL INSURED REQUIREMENTS: The CGL Coverage and the Automobile Liability Insurance shall contain an endorsement naming the CITY and CITY's elected and appointed officials, officers, employees, agents and volunteers as additional insureds.

3.3 REQUIRED CARRIER RATING: All varieties of insurance required under this Agreement shall be procured from insurers admitted in the State of California and authorized to issue policies directly to California insureds. Except as otherwise provided elsewhere under this Article, all required insurance shall be procured from insurers who, according to the latest edition of the Best's Insurance Guide, have an A.M. Best's rating of no less than A:VII. CITY may also accept policies procured by insurance carriers with a Standard & Poor's rating of no less than BBB according to the latest published edition the Standard & Poor's rating guide. As to Workers' Compensation Insurance/ Employer's Liability Insurance, the CITY Representatives are authorized to authorize lower ratings than those set forth in this Section.

3.4 PRIMACY OF CONSULTANT'S INSURANCE: All policies of insurance provided by CONSULTANT shall be primary to any coverage available to CITY or CITY's elected or appointed officials, officers, employees, agents or volunteers. Any insurance or self-insurance maintained by CITY or CITY's elected or appointed officials, officers, employees, agents or volunteers shall be in excess of CONSULTANT's insurance and shall not contribute with it.

3.5 WAIVER OF SUBROGATION: All insurance coverage provided pursuant to this Agreement shall not prohibit CONSULTANT or CONSULTANT's officers, employees, agents, subcontractors or subconsultants from waiving the right of subrogation prior to a loss. CONSULTANT hereby waives all rights of subrogation against CITY.

3.6 VERIFICATION OF COVERAGE: CONSULTANT acknowledges, understands and agrees, that CITY's ability to verify the procurement and maintenance of the insurance required under this Article is critical to safeguarding CITY's financial well-being and, indirectly, the collective well-being of the residents of the CITY. Accordingly, CONSULTANT warrants, represents and agrees that its shall furnish CITY with original certificates of insurance and endorsements evidencing the coverage required under this Article on forms satisfactory to CITY in its sole and absolute discretion. **The certificates of insurance and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf, and shall be on forms provided by the CITY if requested**. All certificates of insurance and endorsements shall be received and approved by CITY as a condition precedent to CONSULTANT's commencement of any Work or any of the Work. Upon CITY's written request, CONSULTANT shall also provide CITY with certified copies of all required insurance policies and endorsements.

## IV. INDEMNIFICATION

4.1 The Parties agree that CITY and CITY's elected and appointed officials, officers, employees, agents and volunteers (hereinafter, the "CITY Indemnitees") should, to the fullest extent permitted by law, be protected from any and all loss, injury, damage, claim, lawsuit, cost, expense, attorneys' fees, litigation costs, or any other cost arising out of or in any way related to the performance of this Agreement. Accordingly, the provisions of this indemnity provision are intended by the Parties to be interpreted and construed to provide the CITY Indemnitees with the fullest protection possible under the law. CONSULTANT acknowledges that CITY would not enter into this Agreement in the absence of CONSULTANT's commitment to indemnify, defend and protect CITY as set forth herein.

4.2 To the fullest extent permitted by law, CONSULTANT shall indemnify, hold harmless and defend the CITY Indemnitees from and against all liability, loss, damage, expense, cost (including without limitation reasonable attorneys' fees, expert fees and all other costs and fees of litigation) of every nature arising out of or in connection with CONSULTANT's performance of Work hereunder or its failure to comply with any of its obligations contained in this Agreement, except such loss or damage which is caused by the sole negligence or willful misconduct of the CITY.

4.3 CITY shall have the right to offset against the amount of any compensation due CONSULTANT under this Agreement any amount due CITY from CONSULTANT as a result of CONSULTANT's failure to pay CITY promptly any indemnification arising under this Article and related to CONSULTANT's failure to either (i) pay taxes on amounts received pursuant to this Agreement or (ii) comply with applicable workers' compensation laws.

4.4 The obligations of CONSULTANT under this Article will not be limited by the provisions of any workers' compensation act or similar act. CONSULTANT expressly waives its statutory

immunity under such statutes or laws as to CITY and CITY's elected and appointed officials, officers, employees, agents and volunteers.

4.5 CONSULTANT agrees to obtain executed indemnity agreements with provisions identical to those set forth here in this Article from each and every subcontractor or any other person or entity involved by, for, with or on behalf of CONSULTANT in the performance of this Agreement. In the event CONSULTANT fails to obtain such indemnity obligations from others as required herein, CONSULTANT agrees to be fully responsible and indemnify, hold harmless and defend CITY and CITY's elected and appointed officials, officers, employees, agents and volunteers from and against any and all claims and losses, costs or expenses for any damage due to death or injury to any person and injury to any property resulting from any alleged intentional, reckless, negligent, or otherwise wrongful acts, errors or omissions of CONSULTANT's subcontractors or any other person or entity involved by, for, with or on behalf of CONSULTANT in the performance of this Agreement. Such costs and expenses shall include reasonable attorneys' fees incurred by counsel of CITY's choice.

4.6 CITY does not, and shall not, waive any rights that it may possess against CONSULTANT because of the acceptance by CITY, or the deposit with CITY, of any insurance policy or certificate required pursuant to this Agreement. This hold harmless and indemnification provision shall apply regardless of whether or not any insurance policies are determined to be applicable to the claim, demand, damage, liability, loss, cost or expense.

4.7 This Article and all provisions contained herein (including but not limited to the duty to indemnify, defend and hold free and harmless) shall survive the termination or normal expiration of this Agreement and is in addition to any other rights or remedies which the CITY may have at law or in equity.

## V. TERMINATION

5.1 TERMINATION WITHOUT CAUSE: CITY may terminate this Agreement at any time for convenience and without cause by giving CONSULTANT a minimum of five (5) calendar days' prior written notice of CITY's intent to terminate this Agreement. Upon such termination for convenience, CONSULTANT shall be compensated only for those services and tasks which have been performed by CONSULTANT up to the effective date of the termination. CONSULTANT may not terminate this Agreement except for cause as provided under Section 5.2, below. If this Agreement is terminated as provided herein, CITY may require CONSULTANT to provide all finished or unfinished Documents and Data, as defined in section 6.1 below, and other information of any kind prepared by CONSULTANT in connection with the performance of the Work. CONSULTANT shall be required to provide such Documents and Data within fifteen (15) calendar days of CITY's written request. No actual or asserted breach of this Agreement on the part of CITY

pursuant to Section 5.2, below, shall operate to prohibit or otherwise restrict CITY's ability to terminate this Agreement for convenience as provided under this Section.

5.2 EVENTS OF DEFAULT; BREACH OF AGREEMENT:

A. In the event either Party fails to perform any duty, obligation, service or task set forth under this Agreement (or fails to timely perform or properly perform any such duty, obligation, service or task set forth under this Agreement), an event of default (hereinafter, "Event of Default") shall occur. For all Events of Default, the Party alleging an Event of Default shall give written notice to the defaulting Party (hereinafter referred to as a "Default Notice") which shall specify: (i) the nature of the Event of Default; (ii) the action required to cure the Event of Default; (iii) a date by which the Event of Default shall be cured, which shall not be less than the applicable cure period set forth under Sections 5.2B and 5.2C below or if a cure is not reasonably possible within the applicable cure period, to begin such cure and diligently prosecute such cure to completion. The Event of Default shall constitute a breach of this Agreement if the defaulting Party fails to cure the Event of Default within the applicable cure period or any extended cure period allowed under this Agreement.

B. CONSULTANT shall cure the following Events of Defaults within the following time periods:

i. Within three (3) business days of CITY's issuance of a Default Notice for any failure of CONSULTANT to timely provide CITY or CITY's employees or agents with any information and/or written reports, documentation or work product which CONSULTANT is obligated to provide to CITY or CITY's employees or agents under this Agreement. Prior to the expiration of the 3-day cure period, CONSULTANT may submit a written request for additional time to cure the Event of Default upon a showing that CONSULTANT has commenced efforts to cure the Event of Default and that the Event of Default cannot be reasonably cured within the 3-day cure period. The foregoing notwithstanding, CITY shall be under no obligation to grant additional time for the cure of an Event of Default under this Section 5.2B.i. that exceeds seven (7) calendar days from the end of the initial 3-day cure period; or

ii. Within fourteen (14) calendar days of CITY's issuance of a Default Notice for any other Event of Default under this Agreement. Prior to the expiration of the 14-day cure period, CONSULTANT may submit a written request for additional time to cure the Event of Default upon a showing that CONSULTANT has commenced efforts to cure the Event of Default and that the Event of Default cannot be reasonably cured within the 14-day cure period. The foregoing notwithstanding, CITY shall be under no obligation to grant

additional time for the cure of an Event of Default under this Section 5.2B.ii that exceeds thirty (30) calendar days from the end of the initial 14-day cure period.

In addition to any other failure on the part of CONSULTANT to perform any duty, obligation, service or task set forth under this Agreement (or the failure to timely perform or properly perform any such duty, obligation, service or task), an Event of Default on the part of CONSULTANT shall include, but shall not be limited to the following: (i) CONSULTANT's refusal or failure to perform any of the services or tasks called for under the Scope of Work; (ii) CONSULTANT's failure to fulfill or perform its obligations under this Agreement within the specified time or if no time is specified, within a reasonable time; (iii) CONSULTANT's and/or its employees' disregard or violation of any federal, state, local law, rule, procedure or regulation; (iv) the initiation of proceedings under any bankruptcy, insolvency, receivership, reorganization, or similar legislation as relates to CONSULTANT, whether voluntary of involuntary; (v) CONSULTANT's refusal or failure to perform or observe any covenant, condition, obligation or provision of this Agreement; and/or (vii) CITY's discovery that a statement representation or warranty by CONSULTANT relating to this Agreement is false, misleading or erroneous in any material respect.

C. CITY shall cure any Event of Default asserted by CONSULTANT within forty-five (45) calendar days of CONSULTANT's issuance of a Default Notice, unless the Event of Default cannot reasonably be cured within the 45-day cure period. Prior to the expiration of the 45-day cure period, CITY may submit a written request for additional time to cure the Event of Default upon a showing that CITY has commenced its efforts to cure the Event of Default and that the Event of Default cannot be reasonably cured within the 45-day cure period. The foregoing notwithstanding, an Event of Default dealing with CITY's failure to timely pay any undisputed sums to CONSULTANT as provided under Section 1.4, above, shall be cured by CITY within five (5) calendar days from the date of CONSULTANT's Default Notice to CITY.

D. CITY, in its sole and absolute discretion, may also immediately suspend CONSULTANT's performance under this Agreement pending CONSULTANT's cure of any Event of Default by giving CONSULTANT written notice of CITY's intent to suspend CONSULTANT's performance (hereinafter, a "Suspension Notice"). CITY may issue the Suspension Notice at any time upon the occurrence of an Event of Default. Upon such suspension, CONSULTANT shall be compensated only for those services and tasks which have been rendered by CONSULTANT to the reasonable satisfaction of CITY up to the effective date of the suspension. No actual or asserted breach of this Agreement on the part of CITY shall operate to prohibit or otherwise restrict CITY's ability to suspend this Agreement as provided herein.

E. No waiver of any Event of Default or breach under this Agreement shall constitute a waiver of any other or subsequent Event of Default or breach. No waiver, benefit, privilege, or service voluntarily given or performed by a Party shall give the other Party any contractual rights by custom, estoppel, or otherwise.

F. The duties and obligations imposed under this Agreement and the rights and remedies available hereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. In addition to any other remedies available to CITY at law or under this Agreement in the event of any breach of this Agreement, CITY, in its sole and absolute discretion, may also pursue any one or more of the following remedies:

i. Upon written notice to CONSULTANT, the CITY may immediately terminate this Agreement in whole or in part;

ii. Upon written notice to CONSULTANT, the CITY may extend the time of performance;

iii. The CITY may proceed by appropriate court action to enforce the terms of the Agreement to recover damages for CONSULTANT's breach of the Agreement or to terminate the Agreement; or

iv. The CITY may exercise any other available and lawful right or remedy.

CONSULTANT shall be liable for all legal fees plus other costs and expenses that CITY incurs upon a breach of this Agreement or in the CITY's exercise of its remedies under this Agreement.

G. In the event CITY is in breach of this Agreement, CONSULTANT's sole remedy shall be the suspension or termination of this Agreement and/or the recovery of any unpaid sums lawfully owed to CONSULTANT under this Agreement for completed services and tasks.

5.3 SCOPE OF WAIVER: No waiver of any default or breach under this Agreement shall constitute a waiver of any other default or breach, whether of the same or other covenant, warranty, agreement, term, condition, duty or requirement contained in this Agreement. No waiver, benefit, privilege, or service voluntarily given or performed by a Party shall give the other Party any contractual rights by custom, estoppel, or otherwise.

5.4 SURVIVING ARTICLES, SECTIONS AND PROVISIONS: The termination of this Agreement pursuant to any provision of this Article or by normal expiration of its term or any extension thereto shall not operate to terminate any Article, Section or provision

contained herein which provides that it shall survive the termination or normal expiration of this Agreement.

## VI. MISCELLANEOUS PROVISIONS

6.1 DOCUMENTS & DATA; LICENSING OF INTELLECTUAL PROPERTY: All Documents and Data shall be and remain the property of CITY without restriction or limitation upon their use or dissemination by CITY. For purposes of this Agreement, the term "Documents and Data" means and includes all reports, analyses, correspondence, plans, drawings, designs, renderings, specifications, notes, summaries, strategies, charts, schedules, spreadsheets, calculations, lists, data compilations, documents or other materials developed and/or assembled by or on behalf of CONSULTANT in the performance of this Agreement and fixed in any tangible medium of expression, including but not limited to Documents and Data stored digitally, magnetically and/or electronically. This Agreement creates, at no cost to CITY, a perpetual license for CITY to copy, use, reuse, disseminate and/or retain any and all copyrights, designs, and other intellectual property embodied in all Documents and Data. CONSULTANT shall require all subcontractors and subconsultants working on behalf of CONSULTANT in the performance of this Agreement to agree in writing that CITY shall be granted the same right to copy, use, reuse, disseminate and retain Documents and Data prepared or assembled by any subcontractor or subconsultant as applies to Documents and Data prepared by CONSULTANT in the performance of this Agreement.

6.2 CONFIDENTIALITY: All data, documents, discussion, or other information developed or received by CONSULTANT or provided for performance of this Agreement are deemed confidential and shall not be disclosed by CONSULTANT without prior written consent by CITY. CITY shall grant such consent of disclosure as legally required. Upon request, all CITY data shall be returned to CITY upon the termination or expiration of this Agreement. CONSULTANT shall not use CITY's name or insignia, photographs, or any publicity pertaining to the Work in any magazine, trade paper, newspaper, television or radio production or other similar medium without the prior written consent of CITY.

6.3 FALSE CLAIMS ACT: CONSULTANT warrants and represents that neither CONSULTANT nor any person who is an officer of, in a managing position with, or has an ownership interest in CONSULTANT has been determined by a court or tribunal of competent jurisdiction to have violated the False Claims Act, 31 U.S.C., Section 3789 et seq. and the California False Claims Act, Government Code Section 12650 et seq.

6.4 NOTICES: All notices permitted or required under this Agreement shall be given to the respective Parties at the following addresses, or at such other address as the respective Parties may provide in writing for this purpose:

**CONSULTANT:**
Consultant
Street Number, Street Name (Address)
City, CA Zip Code
Attn: XXXXXXXXX
Title
Phone: (XXX) XXX-XXXX
Fax: (XXX) XXX-XXXX
Email: work email

**CITY:**
City of San Fernando
Public Works/Engineering
117 Macneil Street
San Fernando, CA 91340
Attn: Civil Engineering Assistant II
Phone: (818) 898-1222
Fax: (818) 361-6728

Such notices shall be deemed effective when personally delivered or successfully transmitted by facsimile as evidenced by a fax confirmation slip or when mailed, forty-eight (48) hours after deposit with the United States Postal Service, first class postage prepaid and addressed to the Party at its applicable address.

6.5 COOPERATION; FURTHER ACTS: The Parties shall fully cooperate with one another, and shall take any additional acts or sign any additional documents as are reasonably necessary, appropriate or convenient to achieve the purposes of this Agreement.

6.6 SUBCONTRACTING: CONSULTANT shall not subcontract any portion of the Work required by this Agreement, except as expressly stated herein, without the prior written approval of CITY. Subcontracts (including without limitation subcontracts with subconsultants), if any, shall contain a provision making them subject to all provisions stipulated in this Agreement, including provisions relating to insurance requirements and indemnification.

6.7 CITY'S RIGHT TO EMPLOY OTHER CONSULTANTS: CITY reserves the right to employ other contractors in connection with the various projects worked upon by CONSULTANT.

6.8 PROHIBITED INTERESTS: CONSULTANT warrants, represents and maintains that it has not employed nor retained any company or person, other than a *bona fide* employee working solely for CONSULTANT, to solicit or secure this Agreement. Further, CONSULTANT warrants and represents that it has not paid nor has it agreed to pay any company or person, other than a *bona fide* employee working solely for CONSULTANT, any fee, commission, percentage, brokerage fee, gift or other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to rescind this Agreement without liability. For the term of this Agreement, no member, officer or employee of CITY, during the term of his or her service with CITY, shall have any direct interest in this Agreement, or obtain any present or anticipated material benefit arising therefrom.

6.9 TIME IS OF THE ESSENCE: Time is of the essence for each and every provision of this Agreement.

6.10 GOVERNING LAW AND VENUE: This Agreement shall be interpreted and governed according to the laws of the State of California. In the event of litigation between the Parties, venue, without exception, shall be in the Los Angeles County Superior Court of the State of California. If, and only if, applicable law requires that all or part of any such litigation be tried exclusively in federal court, venue, without exception, shall be in the Central District of California located in the City of Los Angeles, California.

6.11 ATTORNEYS' FEES: If either Party commences an action against the other Party, either legal, administrative or otherwise, arising out of or in connection with this Agreement, the prevailing Party in such litigation shall be entitled to have and recover from the losing Party reasonable attorneys' fees and all other costs of such action.

6.12 SUCCESSORS AND ASSIGNS: This Agreement shall be binding on the successors and assigns of the Parties.

6.13 NO THIRD PARTY BENEFIT: There are no intended third party beneficiaries of any right or obligation assumed by the Parties. All rights and benefits under this Agreement inure exclusively to the Parties.

6.14 CONSTRUCTION OF AGREEMENT: This Agreement shall not be construed in favor of, or against, either Party but shall be construed as if the Parties prepared this Agreement together through a process of negotiation and with the advice of their respective attorneys.

6.15 SEVERABILITY: If any portion of this Agreement is declared invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions shall continue in full force and effect.

6.16 AMENDMENT; MODIFICATION: No amendment, modification or supplement of this Agreement shall be valid or binding unless executed in writing and signed by both Parties, subject to CITY approval. The requirement for written amendments, modifications or supplements cannot be waived and any attempted waiver shall be void and invalid.

6.17 CAPTIONS: The captions of the various articles, sections and paragraphs are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, or intent of this Agreement.

6.18 INCONSISTENCIES OR CONFLICTS: In the event of any conflict or inconsistency between the provisions of this Agreement and any of the exhibits attached hereto, the provisions of this Agreement shall control.

6.19 ENTIRE AGREEMENT: This Agreement including all attached exhibits is the entire, complete, final and exclusive expression of the Parties with respect to the matters

addressed herein and supersedes all other agreements or understandings, whether oral or written, or entered into between CITY and CONSULTANT prior to the execution of this Agreement. No statements, representations or other agreements, whether oral or written, made by any Party which are not embodied herein shall be valid or binding. No amendment, modification or supplement to this Agreement shall be valid and binding unless in writing and duly executed by the Parties pursuant to Section 6.16, above.

6.20 COUNTERPARTS: This Agreement shall be executed in three (3) original counterparts each of which shall be of equal force and effect. No handwritten or typewritten amendment, modification or supplement to any one counterparts shall be valid or binding unless made to all three counterparts in conformity with Section 6.16, above. One fully executed original counterpart shall be delivered to CONSULTANT and the remaining two original counterparts shall be retained by CITY.

**(SIGNATURE PAGE TO FOLLOW)**

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed the day and year first appearing in this Agreement, above.

**CITY OF SAN FERNANDO**

By: _____

Nick Kimball, City Manager

**CONSULTANT**

By: _____

Name: _____

Title: _____

**APPROVED AS TO FORM**

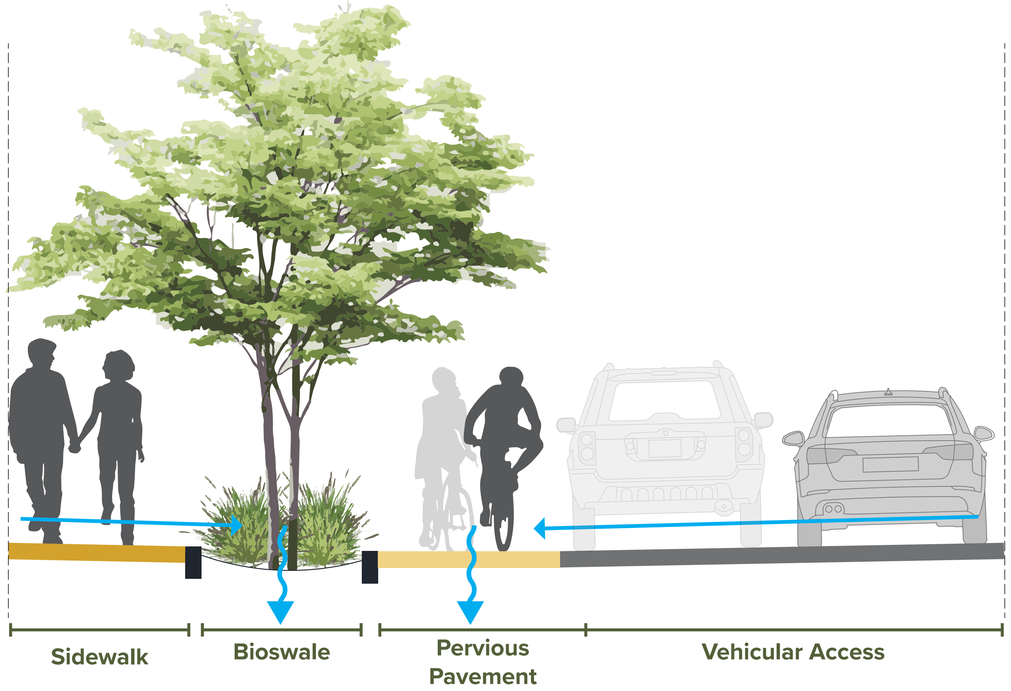
By: _____

Rick R. Olivarez, City Attorney

# Carlisle Street **Green Alley**

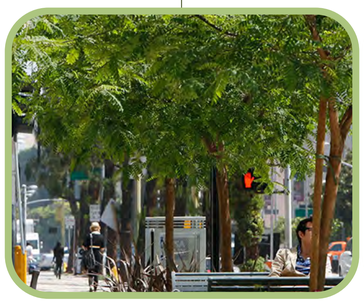
The Carlisle Green Alley project transforms an underutilized alley located within a high-need neighborhood into a new linear green space that provides multiple benefits to residents and fulfills the City's goals for **resiliency**, **climate adaptation**, and **active transportation**. This project will create permeable surfaces for groundwater infiltration, trees and native landscaping, a clear bikeway, bioswales, a dedicated pedestrian pathway, and intersection improvements that encourage more walking and biking trips through San Fernando.

- **Reduced Air Pollution**
- **Reduced Water Pollution**
- **Stormwater Infiltration**
- **Community Cooling**
- **Clear Bikeway**
- **Improved Pedestrian Realm**
- **Access to Green Space**
- **Increased Biodiversity**



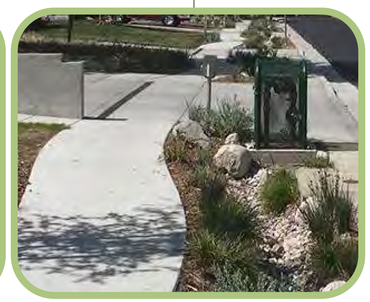


Bioswale



Shade Trees

Permeable Surfaces



Sidewalk

Mini Traffic Circles

Bicycle Sharrows

Crosswalks

THE CITY OF SAN FERNANDO

TreePeople

CH# 2149149
CHECK # 232847

12400 Imperial Highway, Norwalk, CA
(800)201-8999

BUSINESS FILINGS REGISTRATION

NORWALK DEPARTMENT HEADQUARTER

Cashier: G. LIMON

*20230127122200 27*

Friday, January 27, 2023 2:36 PM

Item(s)

| Fee | Qty | Total |
|---|---|---|
| NoE - County Posting Fee 2023020836 | 1 | $75.00 |

**Total** **$75.00**

Total Documents: 1

Customer payment(s):

Check $75.00

Check List:
#232847 $75.00

SAN FERNANDO

# NOTICE OF EXEMPTION

TO: ☑ LOS ANGELES COUNTY CLERK
ENVIRONMENTAL FILING
12400 EAST IMPERIAL HWY. RM. 1101
NORWALK, CA 90650

RECEIVED
JAN 27 2023
LOS ANGELES, COUNTY CLERK

FROM: CITY OF SAN FERNANDO
117 MACNEIL STREET
SAN FERNANDO, CA 91340

☑ OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

DATE: JANUARY 26, 2023

**PROJECT TITLE:** Carlisle Green Alley Project

**PROJECT LOCATION:** 0.4 Mile segment of Carlisle Street from Pico Street to O'Melveny Avenue, in San Fernando, CA 91340

**DESCRIPTION, PURPOSE, AND BENEFICIARIES OF PROJECT:**
The Carlisle Green Alley project transforms an underutilized alley located in a high-need neighborhood into a new linear greenspace that provides multiple benefits to residents and fulfills the City's goals for resiliency, climate adaptation, and active transportation. This project will include permeable surfaces for groundwater infiltration, trees and native landscaping, a class III bikeway, bio-swales, a dedicated pedestrian pathway, and nine intersection improvements that encourage more walking and biking trips through San Fernando. The transformation of the alley will also address long-standing issues of blight and neglect often associated with alleys, and provide key connections to activity centers such as parks, churches, schools, and the Downtown San Fernando Mall. The project also delivers on a citywide planning effort to green adjacent public parking lots by installing trees and vegetated bio-swales in the city-owned parking lot at Carlisle and Pico Streets.

**PUBLIC AGENCY APPROVING PROJECT:** City of San Fernando

**PERSON/AGENCY CARRYING OUT PROJECT:** City of San Fernando, Public Works Department

**EXEMPTION STATUS:**
- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☑ Categorical Exemption. State type and section number: Existing Facilities Class 1, Section 15301(c)
- ☐ Statutory Exemptions. State code number:_____

**REASONS WHY PROJECT IS EXEMPT:**
The Carlisle Green Alley project qualifies for a Class 1 Categorical Exemption for improvements to existing facilities pursuant to the California Environmental Quality Act guidelines Section 15301(c). Class 1 exemption consists of operation, repair, maintenance, or minor alternation of existing public or private structures, facilities, or topographical features, involving negligible or no expansion of existing or former use. Specifically, Class 1 Section 15301(c) allows modification to existing public facilities such as highways, streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities; and allows addition of bicycle facilities, pedestrian crossing, street trees, and other similar alternations that do not create additional automobile lanes. The Carlisle Green Alley project qualifies for this exemption because it involves minor alternation to an existing public alley and an adjacent public parking lot that does not create additional automobile lanes or expansion of existing use. On the contrary, the project will create an attractive and inviting multi-use alley that will promote walking and biking in the City by providing key pedestrian and bicycle connections to activity centers such as parks, churches, schools, and the Downtown San Fernando Mall.

Lead Agency Contact Person: Matthew Baumgardner, Public Works Director Area Code/Telephone/Extension: 818-898-1237

**If filed by applicant:**
1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☑ No

Signature: _____ Title: Director of Community Development Date: 1/26/23

☑ Signed by Lead Agency ☐ Signed by Applicant Date Received for filing at OPR:_____

THE CITY OF SAN FERNANDO

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117 MACNEIL STREET
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Lead Agency Contact Person: Matthew Baumgardner, Public Works Director Area Code/Telephone/Extension: 818-898-1237

**If filed by applicant:**
1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☑ No

Signature: _____ Title: Director of Community Development Date: 1/26/23

☑ Signed by Lead Agency ☐ Signed by Applicant Date Received for filing at OPR:_____

THE CITY OF SAN FERNANDO

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Lead Agency Contact Person: Matthew Baumgardner, Public Works Director Area Code/Telephone/Extension: 818-898-1237

**If filed by applicant:**
1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☑No

Signature: _____ Title: Director of Community Development Date: 1/26/23

☑ Signed by Lead Agency ☐ Signed by Applicant Date Received for filing at OPR:_____

TETRA TECH

Geotechnical Engineering ● Engineering Geology

# Preliminary Geotechnical Investigation and Infiltration Report

## CALLES VERDES PROJECT
### STORMWATER INFILTRATION FACILITIES
### San Fernando, California


Prepared for:

TreePeople
12601 Mulholland Drive
Beverly Hills, CA 90210

Prepared by:

Tetra Tech
1360 Valley Vista Drive
Diamond Bar, California 91765

February 14, 2018
Project No. TET 17-141E

TETRA TECH

Project No. TET 17-141E
February 14, 2018

Mr. Daniel Berger
12601 Mulholland Drive
Beverly Hills, CA 90210

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION AND INFILTRATION REPORT**
**CALLES VERDES PROJECT**
**STORMWATER INFILTRATION FACILITIES**
**San Fernando, California**

Dear Mr. Berger:

Presented herein is Tetra Tech's preliminary geotechnical investigation and infiltration report for the proposed Calles Verdes stormwater infiltration facilities in the City of San Fernando, California. The project site includes the following locations:

- City Parking Lot # 4 located at 942-1060 Truman Street;
- S. Brand Boulevard from Truman Street to Hollister Street;
- S. Carlisle Street from Pico Street to Hollister Street; and
- Maclay Avenue from Truman Street to Omelveny Avenue.

This report summarizes the results of our geotechnical investigation and infiltration testing to characterize the soils below the invert of the proposed infiltration facilities at the site and provides geotechnical considerations for the preliminary design of the proposed facilities. The appendices of the report include logs of borings from the current investigation, and results of laboratory and infiltration tests.

We appreciate the opportunity to provide our professional services on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
**Tetra Tech**

Fernando Cuenca, Ph.D., P.E.
Senior Project Engineer

REGISTERED PROFESSIONAL ENGINEER · FERNANDO AUGUSTO CUENCA · 50097 · CIVIL · STATE OF CALIFORNIA

Andrew McLarty, M. Sc., C.E.G.
Senior Engineering Geologist

CERTIFIED ENGINEERING GEOLOGIST · ANDREW HARRISON McLARTY · No. 2632 · STATE OF CALIFORNIA

Douglas Bell, G.E.
Senior Project Manager

REGISTERED PROFESSIONAL ENGINEER · DOUGLAS R. BELL · No. GE 2140 · Exp. _____ · GEOTECHNICAL · STATE OF CALIFORNIA

Distribution: Addressee (pdf by email dberger@treepeople.org )
Jason Wright (pdf by email jason.wright@tetratech.com)

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## 1. INTRODUCTION

This report presents the results of Tetra Tech's preliminary geotechnical investigation and infiltration report for the proposed Calles Verdes stormwater infiltration facilities in the City of San Fernando, California. The project site includes the following locations (see Figure 1):

- City Parking Lot # 4 located at 942-1060 Truman Street;
- S. Brand Boulevard from Truman Street to Hollister Street;
- S. Carlisle Street from Pico Street to Hollister Street; and
- Maclay Avenue from Truman Street to Omelveny Avenue.

The project consists in creating bioretention landscape areas including rain garden areas and infiltration facilities to properly manage stormwater runoff in such a way as to reduce impervious areas, and to maintain hydrologic functions that existed prior to major urban development including stormwater interception, shallow surface storage, infiltration, evapotranspiration, and groundwater recharge.

The purpose of this study was to evaluate the subsurface conditions at the site, perform preliminary infiltration testing, and provide recommendations for the preliminary design of the proposed bioretention and infiltration facilities. The geotechnical investigation was conducted mainly to provide a preliminary assessment of the infiltration capacity of the soils at the site and to inform future design decisions. It should be noted that the level of investigation was somewhat limited relative to the size of the project area being considered. Additional investigations and infiltration testing during final design are recommended.

## 2. SCOPE OF WORK

Tetra Tech's scope of services for this project consisted of the following tasks:

- Review of readily available background data, including in-house geotechnical data from our soil explorations in the vicinity of the proposed facilities.
- Perform a reconnaissance site visit to observe ground conditions and mark boring locations.
- Obtain drilling permits from the City of San Fernando.
- Coordinate with City of San Fernando personnel, and Underground Service Alert (USA) for access and clearance of buried utilities prior to drilling.
- Provide traffic control measures during drilling and infiltration testing in accordance with the Work Area Traffic Control Handbook (WATCH) Manual.
- Conduct a subsurface investigation within the general area where the proposed infiltration and bioretention facilities could be located, including excavating, logging, and geotechnical sampling of 4 soil exploratory borings to a maximum depth of 13 feet.
- Install 4 percolation borings in the vicinity of the soil exploratory borings and perform boring percolation tests to a depth of approximately 3 feet in general accordance with the LACDPW infiltration guidelines GS200.2 (2017).
- Perform laboratory testing of selected samples recovered from the borings to evaluate geotechnical engineering properties of the on-site soils.
- Conduct an evaluation of the geotechnical data to develop preliminary geotechnical considerations for the design and construction of the proposed structures including the following items:
    - An evaluation of general subsurface conditions and description of types, distribution, and engineering characteristics of subsurface materials;
    - An evaluation of constructability issues;
    - An evaluation of the suitability of on-site soils for infiltration.
- Prepare this written report documenting the work performed, physical data acquired, and preliminary geotechnical considerations.

## 3. PROJECT BACKGROUND AND DESCRIPTION

Urban areas are covered with impervious surfaces including sidewalks, parking lots, roads, roofs, etc. Although all contribute to stormwater runoff, of these roads and parking lots present the largest source of urban pollution and also one of the greatest opportunities for green infrastructure use.

The City of San Fernando in conjunction with TreePeople are working, with the support of a grant provided by the California Coastal Conservancy, on a green streets project called Calles Verdes that will create a model "cool" city. The City of San Fernando plans to transform the streets described in the Introduction section of this report by planting several hundreds of trees, and installing and bioretention facilities including native plant rain gardens, and other infiltration facilities such as infiltration trenches. It is anticipated that the bioretention and infiltration facilities will be relatively shallow with an estimated invert depth ranging between 2 and 4 feet.

## 4. SUBSURFACE EXPLORATIONS

A screening subsurface investigation was conducted at the locations indicated on Figures 2a, 2b, and 2c. The subsurface soil and groundwater conditions at the site were explored on January 18, 2018 and included the drilling, logging, and sampling of 4 hollow stem auger exploratory borings B-1 through B-4.

Prior to starting the field exploration program, a field reconnaissance was conducted to observe surface conditions and to mark the locations of the planned boreholes in agreement with the City of San Fernando. A drilling permit was obtained from the City of San Fernando for the subsurface explorations. Underground Service Alert and the City were also notified of the drilling schedule at least 48 hours prior to drilling.

The hollow stem auger borings were excavated using a CME-75 truck-mounted drill rig equipped with an 8-inch diameter auger. Approximate locations of the borings are indicated on Figures 2a, 2b, and 2c – Site Layout and Boring Location Map. The borings were advanced to a maximum depth of 13 feet. Subsequently, 4 boreholes for percolation testing P-1 through P-4 were drilled in the vicinity of the numerically corresponding borehole. The percolation testing boreholes were drilled to a depth of about 3 feet, within the anticipated depth range for the invert of the infiltration facilities. Borehole percolation tests were then conducted as described in the Section Field Percolation Testing.

The approximate latitude and longitude of the current soil exploration locations, the approximate elevations, and depths are included in Table 1.

Bulk, driven ring-type, and small bag samples were retrieved at selected depths during drilling of the exploratory borings. Standard Penetration Testing (SPT) was performed using an SPT sampler driven by an automatic 140-pound hammer with a drop of 30 inches in general accordance with ASTM D1586. The hammer calibration record indicated an energy transfer ratio of 81 percent. Ring-type samples were collected utilizing a California-type sampler driven by the same equipment used for the SPTs. Sampling was carried out at 2.5-foot intervals.

The soil borings were surface-logged by a California licensed Engineering Geologist in general accordance with the visual-manual procedure for description and identification of soils, ASTM D2488. The Engineering Geologist prepared the recovered samples for subsequent reference and laboratory testing. The soil boring logs are presented in Appendix A.

At the completion of drilling, the borings were backfilled with tamped soil cuttings and quickcrete patches were placed to restore the drilled asphalt surface.

**Table 1**
**Borehole Information**

| Exploration Number | General Location | Latitude (degrees) | Longitude (degrees) | Approximate Depth (ft) | Approximate Top of Borehole Elevation (ft)* |
|---|---|---|---|---|---|
| B-1 | City Parking Lot # 4 | 34.282261 | -118.439912 | 13 | 1,068 |
| B-2 | Along southbound Brand Avenue (western lane) adjacent to City Parking Lot # 9 | 34.280402 | -118.441733 | 12.8 | 1,056 |
| B-3 | Southeastern part of City Parking Lot #10 adjacent to Carlisle Street | 34.280442 | -118.442698 | 12.5 | 1,054 |
| B-4 | Along southbound Maclay (western lane) | 34.278661 | -118.447766 | 11.5 | 1,041 |
| P-1 | City Parking Lot # 4 | 34.282274 | -118.439926 | 3.1 | 1,068 |
| P-2 | Along southbound Brand Avenue (western lane) adjacent to City Parking Lot # 9 | 34.280392 | -118.441748 | 3.3 | 1,056 |
| P-3 | Southeastern part of City Parking Lot #10 adjacent to Carlisle Street | 34.280435 | -118.442697 | 3.0 | 1,054 |
| P-4 | Along southbound Maclay (western lane) | 34.278657 | -118.447772 | 3.3 | 1,041 |

*Estimated from Google Earth

## 5. LABORATORY TESTING

Laboratory tests were performed on selected samples recovered from the soil boring to aid in the classification of soils and to evaluate pertinent engineering properties. The following tests were performed:

- Moisture Content of Soil, ASTM D2216;
- Density of Soil Specimens, ASTM D7263; and
- Particle Size Analysis of Soils, ASTM D6913 and ASTM D7928.

Results of all laboratory tests are presented in Appendix B. For ease of referral to the soil profile, most of the laboratory results have also been included on the boring logs in Appendix A.

# 6. SUBSURFACE CONDITIONS

## 6.1. Regional Geology

The subject site is located in the San Fernando Valley which is an east-trending structural trough within the Transverse Ranges of southern California (CDCDMG, 1998). The valley is bound by the San Gabriel Mountains to the northeast which are composed of plutonic and metamorphic rocks that are being thrust over the valley from the north. As the mountain range has been raised and deformed, the San Fernando Valley has subsided and filled with sediments. Sediment in the valley originating from drain sources in the San Gabriel Mountains have granitic or other plutonic rock sources, and thus the alluvial sediments tend to be sandy in nature. The Pacoima and Little Tujunga Washes are large river systems having their origin in the San Gabriel Mountains and have the capacity to carry large volumes of sediments. The alluvial fans deposited by these drainage systems have their apexes on the southern part of the San Fernando Quadrangle and therefore it is expected that coarser-grained materials mantle the area where the project is located.

The oldest alluvial units in the San Fernando Valley are found within an uplift in the San Fernando area and on the south flank of the San Gabriel Mountains. The Saugus and Pacoima formations, both Pleistocene alluvial units, are exposed in the core of the San Fernando uplift and on the south flank of the Santa Susana Mountains. Overlying the Saugus and Pacoima formations in the San Fernando area are very old alluvial deposits. These deposits were uplifted, deformed, and are typically dense to very dense. Overlying the old alluvial deposits are remnants of alluvial fans from the San Gabriel Mountains. These deposits are composed of sand, silt, and gravel. The fan surfaces are no longer active because they have either been lifted out of the area of deposition or they have been buried by younger alluvium. The younger alluvium deposits mantle the project site.

## 6.2. Site Geology

Based on a review of the geologic maps for the San Fernando Quadrangle (CDCDMG, 1998) the subject site is underlain by Quaternary young alluvial fans consisting of silty sand and sand with minor deposits of clay, with a loose to moderately dense consistency. Dibblee (1991) confirms the geologic mapping by the CDCDMG by describing the alluvial deposits as gravel, sand, and clay in valley areas (see Figure 3 - Geologic Map).

Geologic units encountered during our reconnaissance and subsurface exploration of the project site included relatively thin fill soils below the asphalt paved surfaces, which mantle the underlying alluvium. The alluvium was encountered to the maximum explored depth of 13 feet. Additional descriptions are provided on the boring logs in Appendix A. A geologic map of the region is presented on Figure 3. Generalized descriptions of the encountered units are provided in the subsequent sections.

### 6.2.1. Fill

At all boring locations the surface was covered with flexible asphalt pavement varying in thickness between 3 and 5 inches placed over an aggregate base to a depth of about 7 to 11 inches. Below

the aggregate base fill materials were encountered in all soil borings extending to a depth of 2 to 3 feet. As observed, the fill materials generally consisted of dark brown, moist, medium dense to dense, silty sand. Scattered wood and concrete fragments and grass were encountered in the fill materials.

### 6.2.2. Native Alluvium

Native alluvium was encountered below the fill materials. The alluvium consisted of coarse-grained materials light brownish gray to yellowish brown in color, classified as poorly- to well-graded sands with silt and gravel. The alluvium was found to be medium dense to dense, and with some cobbles present at a depth of 11 to 13 feet. SPT blowcounts in the alluvium generally varied from 17 to greater than 50 blows per foot indicating medium dense to very dense materials. Detailed descriptions of the soil conditions encountered in the boring are presented on the boring logs in Appendix A.

## 6.3. Groundwater

Groundwater was not encountered during the geotechnical exploration. According to the State of California Seismic Hazard Zone Report for the San Fernando 7.5-minute Quadrangle (CDMG, 1998), the historic high groundwater level near the site has been mapped at a depth ranging from about 40 to 200 feet (Figure 4 – Historic High Groundwater Map).

Well data from the Los Angeles County Department of Public Works (LACDPW) database (http://dpw.lacounty.gov/general/wells/) for nearby wells indicate groundwater depths as summarized in Table 2.

**Table 2**
**Groundwater Wells in the Vicinity of the Site**

| Well Identification | Monitoring Period | Approximate location relative to the site | Shallowest groundwater depth |
|---|---|---|---|
| LACDPW Well ID 4842A State # 2N15W09G02 | August 1964 to December 2015 | 0.4 miles to the southwest | 289 feet on December 1966 |
| LACDPW Well ID 4841B State # 2N15W04J01 | August 1964 to December 2015 | 0.5 miles to the west | 7 feet on January 1967* |
| Geotracker Well cluster ID T0603702254 MW-9 through MW-17 | March 2007 to December 2013 | 0.3 miles to the northwest | 34 feet on December 2012 |
| Geotracker Well cluster ID T0603705005 MW-1 through MW-10 | March 2007 to December 2013 | 0.3 miles to the west | 39 feet on December 2012 |

*This shallow groundwater may not be representative of the project site because it is located on the other side of the Sierra Madre Fault Zone, San Fernando section which may act as a groundwater barrier

Based on the assessment of the local stratigraphy and local topography, it is our opinion that the LACDPW wells can be utilized for interpretation of the project groundwater conditions. Considering also the current soil exploration, it is our conclusion that the groundwater at the site could indeed range from 35 to over 200 feet within the last 50 years.

Based on the research and observed conditions, groundwater is not expected to impact the design or the construction of the proposed facilities. Fluctuations of the groundwater level, localized zones of perched water, and increased soil moisture content should be anticipated during and following the rainy season. Irrigation of landscaped areas on or adjacent to the site can also cause a fluctuation of local groundwater levels. Evaluation of such factors is beyond the scope of our services.

## 7. FIELD PERCOLATION TESTING

Tetra Tech performed 4 borehole percolation tests denoted P-1 through P-4 located within 20 feet of the geotechnical borings P-1 through P-4 respectively using the test procedure described in the LACDPW infiltration guidelines GS200.2 (2017). P-1 through P-4, were installed to a depth of about 3 to 3.3 feet. The approximate coordinates of the percolation tests, the approximate top of borehole elevations, and borehole depths are included in Table 1. A 3-inch-diameter perforated PVC pipe with 5/8-inch-diameter holes was installed in all the borings. The casing was wrapped in a protective cloth sock to limit the migration of soil particles into the pipe. The pipe was surrounded by a free-draining gravel pack with a hydraulic conductivity significantly larger than that of the surrounding soil.

Percolation boreholes were presoaked for at least 1 hour before the test. For the percolation testing an initial constant water level of about 1 foot was maintained above the bottom of the borehole. The readings to determine the water depth were taken with a well sounder every 10 minutes with the exception of P-2 where the readings were taken every 20 minutes, until a stabilized drop rate was obtained (per GS 200.2 a stabilized rate is obtained when the highest and lowest readings are within 10 percent from each other for 3 consecutive readings), however testing was not completed until a 90-minute minimum testing period was completed. Logs of the percolation testing are included in Appendix D. After conclusion of the boring percolation testing, the boreholes were backfilled with a tamped soil cuttings.

The field percolation rate expressed in inches per hour was adjusted as explained below and on the percolation logs. A testing method reduction factor $RF_t$ of 2 was applied as required by the guidelines to account for the direction of flow during the test and the reliability of the method. To account for effects related to the limited number of tests and the large area considered for the project, a reduction factor $RF_v$ of 2 was used (typical range between 1 and 3). Lastly, to account for long-term siltation, and plugging, a reduction factor $RF_s$ of 2 was considered (typical range between 1 and 3). The results of the borehole percolation testing and calculation of the adjusted percolation rates are summarized in Table 2.

The percolation results from this exploration indicate that the adjusted percolation rate ranges between 0.1 and 0.3 inches/hour. The lower percolation rate in P-2 is likely attributed to higher percentage of fines (silts) observed in the testing zone in the fill material. P-1, P-3 and P-4 seem to have fully penetrated into the underlying native stratum of silty sands and poorly graded sands and thus the percolation rate is higher.

The percolation results suggest that a design infiltration rate of about 0.3 inches/hour can be used for this site as long as the invert of the infiltration facilities is placed at a depth of at least 2.5 feet or to a depth where native sandy materials are encountered, whichever is deeper. This design infiltration rate is equal to the minimum of 0.3 inches/hour required by the LACDPW guidelines and corresponds to soils with good permeability and good drainage characteristics. This is further confirmed by our soil exploration which consistently characterized the soils as coarse grained from a depth of about 2 to the maximum explored depth of 13 feet. Therefore, infiltration of stormwater at the explored sites is considered viable.

**Table 3**
**Adjusted Percolation Rates**

| Boring Percolation Test No. | Borehole Depth (ft) | Adjusted Infiltration Rate (inches/hour) |
|---|---|---|
| P-1 | 3.1 | 0.3 |
| P-2 | 3.3 | 0.1 |
| P-3 | 3.0 | 0.3 |
| P-4 | 3.3 | 0.3 |

## 8. ESTIMATED SATURATED HYDRAULIC CONDUCTIVITY

In order to further estimate the magnitude of the hydraulic conductivity of the materials below the invert of the proposed infiltration facilities, the following analyses were performed. It should be noted that the estimates given by empirical formulas should be viewed as "order-of magnitude" estimates and field data should always be considered more reliable. An estimate of the saturated soil field permeability of soils within the anticipated invert depth and below was calculated from the grain size distributions using the approximation based on Massmann (2003) formula:

$$log_{10}(K_{sat}) = -1.57 + 1.9D_{10} + 0.015D_{60} - 0.013D_{90} - 2.08\, f_{fines}$$

where:

$K_{sat}$ ..... is the saturated hydraulic conductivity in cm/s
$D_{10}$ ..... is the grain size in mm for which 10% of the sample is finer
$D_{60}$ ..... is the grain size in mm for which 60% of the sample is finer
$D_{90}$ ..... is the grain size in mm for which 90% of the sample is finer
$f_{fines}$ .... is the ratio or fraction by weight that passes the # 200 sieve

Although hydraulic conductivities are not directly equivalent to infiltration rates, they are usually relatively close for this type of field percolation testing because hydraulic gradients during field testing are relatively close to 1. To compare the hydraulic conductivity with the infiltration rates from the borehole percolation testing described in the previous section, the saturated hydraulic conductivities calculated using the equation above were further adjusted using the same reduction factors as for the calculation of the infiltration rates, i.e., a reduction factor for testing method $RF_t$ of 2, a site subsurface variability factor $RF_v$ of 2, and a long-term siltation factor $RF_s$ of 2. The resulting infiltration-equivalent computed hydraulic conductivities are shown on Table 4.

The infiltration-equivalent computed hydraulic conductivities using Massmann's formula tend to be higher than the design field infiltration rate of 0.3 inches/hour, which validates the conclusion that the site is acceptable for infiltration. The higher estimates indicated by the Massmann's formula are likely due to the fact that this formula does not consider the in situ density of the soils but it is only based on particle size, therefore, may yield higher values than those measured on dense to very dense soils.

**Table 4**
**Computed Hydraulic Conductivities from Grain Size Distributions**

| Boring and Sample No. | USCS Classification | Sample Depth (ft) | Applicable Depth Interval (ft) | Infiltration-Equivalent Computed Hydraulic Conductivity (inches/hour) |
|---|---|---|---|---|
| B-1 SK-1 | SM | 1-5 | 1-5 | 1.2 |
| B-1 SPT-2 | SM | 2-3.5 | 2-5 | 2.3 |
| B-1 R-3 | SW-SM | 6-6.5 | 5-13 | 2.3 |
| B-2 SK-1 | SM | 1-5 | 1-5 | 1.0 |
| B-2 R-2 | SW-SM | 2-3.5 | 2-3 | 3.6 |
| B-2 SPT-3 | SM | 5-6.5 | 3-10 | 1.1 |
| B-3 SK-1 | SM | 1-5 | 1-5 | 0.8 |
| B-3 SPT-2 | SM | 2-3.5 | 2-5 | 0.6 |
| B-3 R-3 | SW-SM | 6-6.5 | 5-10 | 3.9 |
| B-4 SK-1 | SM | 1-5 | 1-5 | 0.7 |
| B-4 SPT-2 | SM | 2-3.5 | 1-3 | 0.6 |
| B-4 R-3 | SW-SM | 6-6.5 | 3-11.5 | 3.7 |

# 9. ENGINEERING SEISMOLOGY AND GEOLOGIC HAZARDS

## 9.1. General Seismic Setting

The Southern California region is known to be seismically active. Earthquakes occurring within approximately 60 miles of the site are generally capable of generating ground shaking of engineering significance to the proposed construction. The project area is located in the general proximity of several active and potentially active faults, as shown on Figure 5 – Regional Faults and Seismicity Map. Active faults are defined as those that have experienced surface displacement within the Holocene period (approximately the last 11,000 years).

Table 5 lists selected principal known active faults that may affect the subject site and the maximum moment magnitude ($M_{max}$) as published by Cao et al. (2003) for the California Geological Survey (CGS). The approximate distance was calculated from Jennings (2010). Table 5 also indicates the direction relative to the site.

Superimposed on the area map in Figure 5 are earthquake epicenters recorded by the USGS between 1900 to present day. A large amount of seismic activity and associated events with their epicenters have been recorded surrounding the project site. Notable historic earthquakes in Southern California of significance to the project are listed in Table 6.

**Table 5**
**Main Active Faults**

| Fault Zone/Fault Name | Approximate Fault Distance to Site[1] (miles) | Direction Relative to the Site | Maximum Moment Magnitude[2] (Mmax) |
|---|---|---|---|
| Sierra Madre fault zone San Fernando section | 0.3 | north northwest | 6.0-7.0 |
| Mission Hills fault zone (Mission Hill fault) | 0.5 | west southwest | 7.0 |
| Sierra Madre fault zone San Fernando section (Reservoir fault) | 0.8 | north northwest | 6.0-7.0 |
| Sierra Madre fault zone San Fernando section (Sylmar fault) | 1.0 | north | 7.0 |
| Sierra Madre fault zone San Fernando section (Tujunga fault) | 1.7 | northeast | 7.0 |
| Verdugo fault | 2.4 | southeast | 6.8 |
| Northridge Hills fault | 3.1 | southwest | 7.0 |
| Sierra Madre fault zone Santa Susana section (Santa Susana fault) | 3.1 | northwest | 7.3 |
| unnamed fault in North Hollywood | 8 | southeast | N/A[3] |
| Chatsworth fault | 8.6 | southwest | 6.8 |
| Hollywood fault | 13 | southeast | 6.8 |
| San Andreas fault zone (Mojave section) | 23 | northeast | 7.8 |

Notes:
[1] per Jennings, 2010
[2] per Cao, et al., 2003
[3] not available

**Table 6**
**Historic Earthquakes in Southern California**

| Earthquake Name | Year | Fault and Fault Type | Earthquake Magnitude* | Epicenter | |
|---|---|---|---|---|---|
| | | | | Latitude | Longitude |
| Chino Hills | 2008 | Whittier Fault (Yorba Linda Trend) (left- lateral thrust) | 5.5 $M_w$ | 33.95°N | 117.76°W |
| Northridge | 1994 | Northridge Thrust (Blind Thrust) (a.k.a. Pico Thrust) | 6.7 $M_w$ | 34.21°N | 118.54°W |
| Sierra Madre | 1991 | Clamshell-Sawpit Canyon Fault (Reverse) | 5.8 $M_L$ | 34.20°N | 118.14°W |
| Upland | 1990 | San Jose Fault (left- lateral strike-slip) | 5.4 $M_L$ | 34.13°N | 117.70°W |
| Pasadena | 1988 | Raymond Fault (left lateral strike-slip) | 5.0 $M_w$ | 34.14°N | 118.13°W |
| Whittier Narrows | 1987 | Puente Hills Fault (Blind Thrust Fault) | 5.9 $M_L$ | 34.06°N | 118.08°W |
| San Fernando | 1971 | San Fernando Fault (thrust) | 6.5-6.7 $M_w$ | 34.42°N | 118.37°W |
| Lytle Creek | 1970 | Lytle Creek fault (right-reverse) | 5.2 $M_L$ | 34.27°N | 117.54°W |
| Torrance-Gardena | 1941 | Palos Verdes Fault (right-reverse) | 4.8 $M_L$ | 33.82°N<br>33.78°N | 118.22°W<br>118.25°W |
| Long Beach | 1933 | Newport-Inglewood Fault (right- lateral strike-slip) | 6.4 $M_w$ | 33.63°N | 118.00°W |
| San Jacinto | 1923 | San Jacinto Fault (right- lateral strike-slip) | 6.3 $M_L$ | 34.00°N | 117.24°W |
| San Jacinto | 1918 | San Jacinto Fault (right- lateral strike-slip) | 6.7 $M_w$ | 33.65°N | 117.43°W |
| Elsinore | 1910 | Elsinore Fault (right- lateral strike-slip) | 6 $M_L$ | 33.75°N | 117.45°W |
| Fort Tejon | 1857 | South Central Segment of the San Andreas Fault (right- lateral strike-slip) | 7.9 $M_w$ | 35.43°N | 120.19°W |

*$M_w$ refers to Moment Magnitude scale
$M_L$ refers to Local Magnitude scale

## 9.2. Surface Fault Rupture

Official Maps of Earthquake Fault Zones were reviewed to evaluate the location of the project site relative to active fault zones. Earthquake Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act enacted in 1972. The Act directs the State Geologist to delineate the regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The purpose of the Alquist-Priolo Act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

The site is not located within a designated Earthquake Fault Zone for fault surface rupture hazard. Based on a review of State of California Earthquake Fault Zone maps, the closest zoned fault for surface rupture is Sierra Madre fault zone San Fernando section located approximately 0.3 miles northwest of the site and is mapped within the San Fernando Quadrangle (CGS, 1999).

No surface traces of any active or potentially active faults are known to pass directly through or project towards the site. Neither our field exploration nor literature review disclosed an active fault trace projecting to the ground surface in the project area. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low.

### 9.3. Seismic Hazard Zones

Maps of seismic hazard zones are issued by the California Geological Survey (CGS, formerly California Department of Conservation, Division of Mines and Geology (CDMG)) in accordance with the Seismic Hazards Mapping Act enacted in April 1997. The intent of the Seismic Hazards Mapping Act is to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in developing compliance requirements to protect the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes.

Based on the review of the San Fernando Quadrangle Official Map of Seismic Hazard Zones issued March 25, 1999 (see Figure 6), the majority of the proposed development is not located within an area identified by the State of California as subject to the hazard of liquefaction. A limited area (less than 10 percent of the project area) as indicated in Figure 6 is mapped as being susceptible to the hazard of liquefaction.

### 9.4. Liquefaction Potential, Dynamic Settlement, and Cyclic Softening

Liquefaction of soils can be caused by ground shaking during earthquakes. Research and historical data indicate that loose, relatively clean granular soils and low plasticity silts are susceptible to liquefaction and dynamic settlement, whereas the stability of the majority of clayey silts, silty clays and clays are not typically adversely affected by ground shaking. Liquefaction is generally known to occur in saturated or near-saturated cohesionless soils at depths shallower than about 50 feet. However, cyclic mobility and seismically induced strength softening with effects similar to liquefaction can occur also in fine-grained soils. Since the historic high groundwater level near the site has been mapped at a depth deeper than 40 feet, and the subsurface soils appear to be mostly dense to very dense coarse grained soils, the liquefaction hazard is considered minimal even in the area currently mapped as susceptible.

The operation of the infiltration facilities is not expected to significantly alter the local groundwater regime, therefore, the liquefaction hazard potential should not be impacted. Significant infiltration is anticipated to take place only seasonally and only during those times where runoff would be generated.

### 9.5. Earthquake-Induced Landslides

The site is not located in an Earthquake-Induced Landslide Hazard Zone on the State of California Seismic Hazard Zones Map (see Figure 6). No evidence of landsliding was observed on or in the immediate vicinity of the site. Therefore an occurrence of an earthquake-induced landslide is not considered to be a hazard to the site.

### 9.6. Subsidence

Land subsidence is the lowering of the ground surface due to extraction or lowering of water levels or other fluids within the subsurface soil pores, or due to seismic activity. The fluid withdrawal causes the alluvial sediments in the basin to compact. Damage caused by subsidence can be visible cracks, fissures, or surface depression.

The site is not located in an area mapped by the USGS (https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html) where either historical or current subsidence has been recorded. Therefore, subsidence is not considered a hazard for this site.

## 10. PRELIMINARY DESIGN CONSIDERATIONS

Based on the results of the field exploration and engineering analyses for the proposed Calles Verdes stormwater infiltration facilities, it is Tetra Tech's opinion that stormwater infiltration is a viable option for the project site, provided that the subsurface materials be overexcavated to a depth of at least 2.5 feet, or to the depth where native sandy materials are encountered, or to the depth of the invert of the infiltration/bioretention facility, whichever is deeper. The design of the bioretention and/or infiltration facilities shall be performed by the designer in accordance with the LACDPW Low Impact Development Standards Manual (2014). The recorded depths of groundwater in the project area indicate that the groundwater does not affect the installation of bioretention or shallow infiltration facilities and the clearance requirement of 10 feet between the invert of the facility and the groundwater is met at all locations.

If the invert depth of infiltration/bioretention facility is shallower than the overexcavation depth, the excavated soils between the native soils and the invert of the facility should be replaced with relatively clean sand, i.e., less than 5 percent of fines. The sand backfill should be compacted wet of optimum to about 85 % of relative compaction (+/- 2%), according to ASTM D1556.

Given the limited level of investigation relative to the size of the considered project area, it is recommended that additional soil explorations and infiltration testing be performed during final design.

It is recommended that for the bio-retention facilities including rain gardens, the planting media layer be placed over at least 6 inches of gravel. A geotextile layer should be used to separate the planting media layer from the gravel. For the design of the remaining filter bed media layers for the infiltration trench, the designer should follow the design recommendations for gradation and minimum thicknesses specified in the LACDPW Standards Manual (2017).

For infiltration trench facilities it is recommended that after the trench invert depth is reached, the trench bottom layer immediately above the invert be built of 6 inches of relatively clean sand, i.e., less than 5 percent of fines (no geomembrane liner should be used). The sand backfill should be compacted wet of optimum to about 85% of relative compaction (+/- 2%), according to ASTM D1556.

During construction, activities should avoid compaction of native soils below the infiltration zone, or below the planting media and/or the gravel zone for bioretention facilities. Sediment control measures should be used around the bioretention and infiltration areas to prevent high sediment loads from entering the area during construction activities.

The project site must be graded to minimize erosion to the facilities as stormwater runoff enters the bioretention/infiltration area by creating sheet flow conditions rather than a concentrated stream condition, or by providing energy dissipation devices at the inlet of the facility. Pretreatment to remove sediments (e.g., vegetated swales, vegetated filter strips, sedimentation manholes, and proprietary devices) is required to protect bioretention and infiltration trenches from plugging due to high sediment loads. The use of at least two pretreatment devices is highly recommended for bioretention areas.

Any parking areas around the bioretention area must be monolithically poured concrete and the concrete curb must be deepened to provide structural stability to the parking section. The invert of the stormwater bioretention/infiltration facility should be set back at least 15 feet away from nearby building foundations and outside a 1:1 plane drawn up from the bottom of adjacent foundations. Stormwater infiltration shall not be located near utility lines where the introduction of stormwater could cause damage to utilities or settlement of trench backfill.

Wherever is not possible to maintain the lateral setback from roads, parking lots, or other minor infrastructure, then lateral infiltration pathways may need to be restricted. In those cases, a geomembrane liner or other water-proofing may be placed along the vertical walls of the bioretention/infiltration facility to minimize lateral flows. The geomembrane should extend for a depth of at least 4 feet below the road grade or to the depth of the invert of the bioretention/infiltration facility, whichever is deeper. The geomembrane liner should have a minimum thickness of 30 mil and meet the material requirements specified in LACDPW Standards Manual (2014).

If the recommended horizontal setback cannot be maintained from other structures like buildings or houses, the Geotechnical Engineer of record shall be consulted to ascertain the possibility of using geomembranes at that particular location and the recommended depth of installation.

Stormwater infiltration is not allowed within 100 feet of any groundwater production wells used for drinking water per LA County infiltration guidelines GS200.2 (2017).

## 11. LIMITATIONS

This report presents preliminary design considerations for the proposed bioretention and infiltration facilities at San Fernando. It is not intended to be the geotechnical document suitable for final design of the proposed development as the extent and scope of the performed field and laboratory testing and engineering analyses was not developed for the anticipated relatively complex specific configuration of the proposed development. Consequently, additional field investigation, infiltration testing, laboratory testing, and engineering analyses will be required once the final configuration, location, and extent of the project are determined including the precise type of facilities that will be built.

The recommendations and opinions expressed in this report are based on Tetra Tech's review of background documents and on information obtained from the current geotechnical investigation and infiltration testing. It should be noted that this study did not evaluate the possible presence of hazardous materials on any portion of the site.

Due to the limited nature of the field explorations and the large area encompassed by the project, conditions not observed and described in this report may be present on the site. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration and infiltration testing at different depths and locations. Additional subsurface evaluation and infiltration testing, as well as additional laboratory testing can be performed upon request. It should be understood that conditions different from those anticipated in this report may be encountered during grading operations, for example, the extent of unsuitable soil, the depth of fill to be removed, and the associated additional effort required to mitigate them.

Site conditions, including groundwater level, can change with time as a result of natural processes or the activities of man at the subject site or at nearby sites. Changes to the applicable laws, regulations, codes, and standards of practice may occur as a result of government action or the broadening of knowledge. The findings of this document may, therefore, be invalidated over time, in part or in whole, by changes over which Tetra Tech has no control. Therefore, this report should reviewed and recertified if it were to be used for a project design commencing more than 1 year after the date of issuance of this report.

Tetra Tech's recommendations for this site are dependent upon verification of the actual encountered field conditions, appropriate quality control of grading operations including overexcavation, processing, and replacement of the on-site materials, shoring, and foundation construction. Accordingly, the recommendations are made contingent upon the opportunity for Tetra Tech to observe all aspects of subgrade preparation for the proposed construction. If parties other than Tetra Tech are engaged to provide such services, such parties are assuming complete responsibility as the Geotechnical Engineer of Record for the geotechnical phase of the project and implicitly concur with the recommendations provided in this report or may provide alternative recommendations.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Tetra Tech should be contacted if the reader requires additional information or has questions regarding the content,

interpretations presented, or completeness of this document. Reliance by others on the data presented herein or for purposes other than those stated in the text is authorized only if so permitted in writing by Tetra Tech. It should be understood that such an authorization may incur additional expenses and charges.

Tetra Tech has endeavored to perform its evaluation using the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical professionals with experience in this area in similar soil conditions. No other warranty, either expressed or implied, is made as to the conclusions and recommendations contained in this report.

## 12. SELECTED REFERENCES

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# Figures


FIGURE 1

TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
Tel 909.860.7777 Fax 909.860.8017

CALLES VERDES INFILTRATION - SAN FERNANDO, CA

SITE LOCATION MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | AHM |
| CHECKED BY | FC |

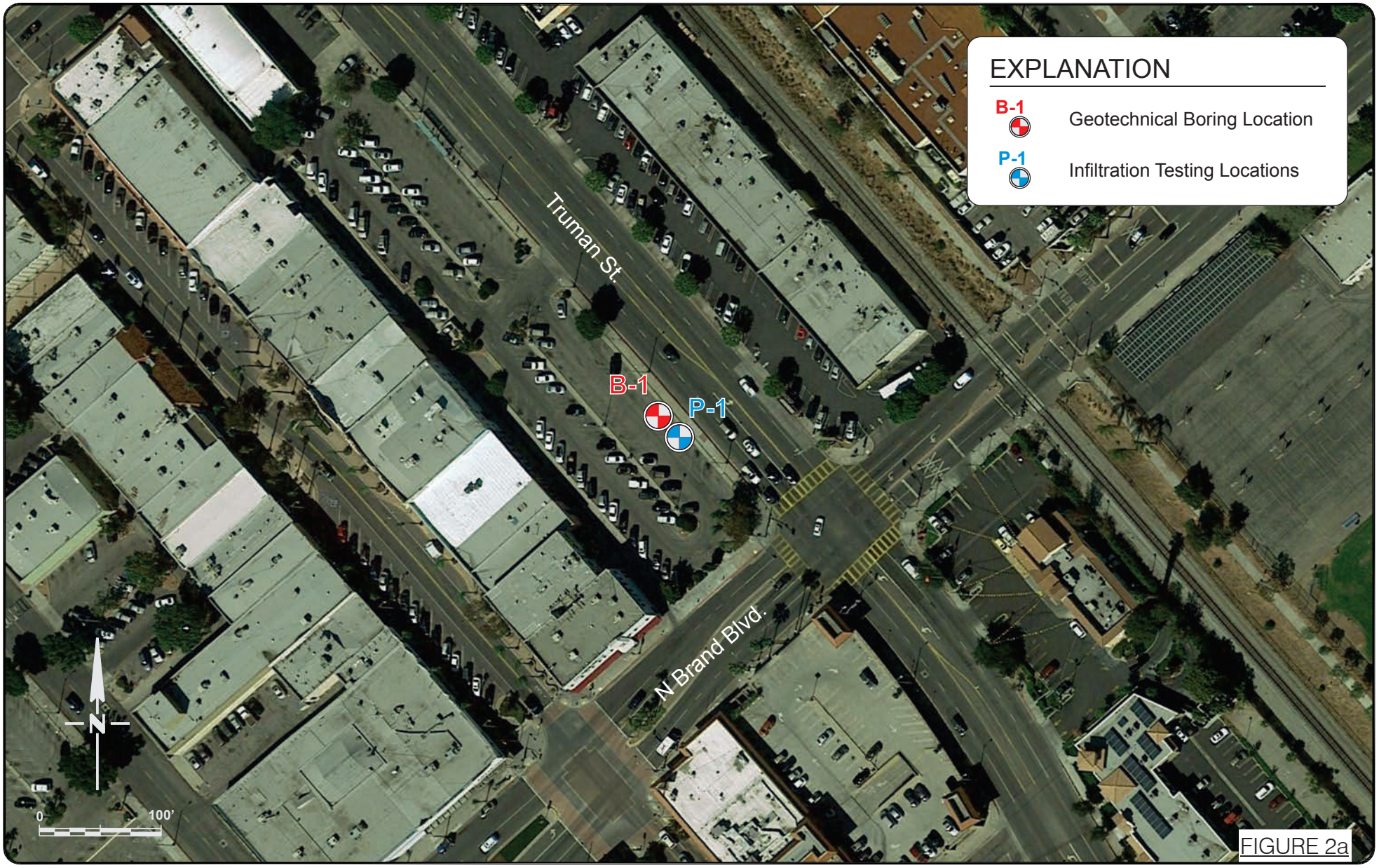



FIGURE 2a

TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
Tel 909.860.7777 Fax 909.860.8017

CALLES VERDES INFILTRATION - SAN FERNANDO, CA

BORING LOCATION MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | SCM |
| CHECKED BY | FC |

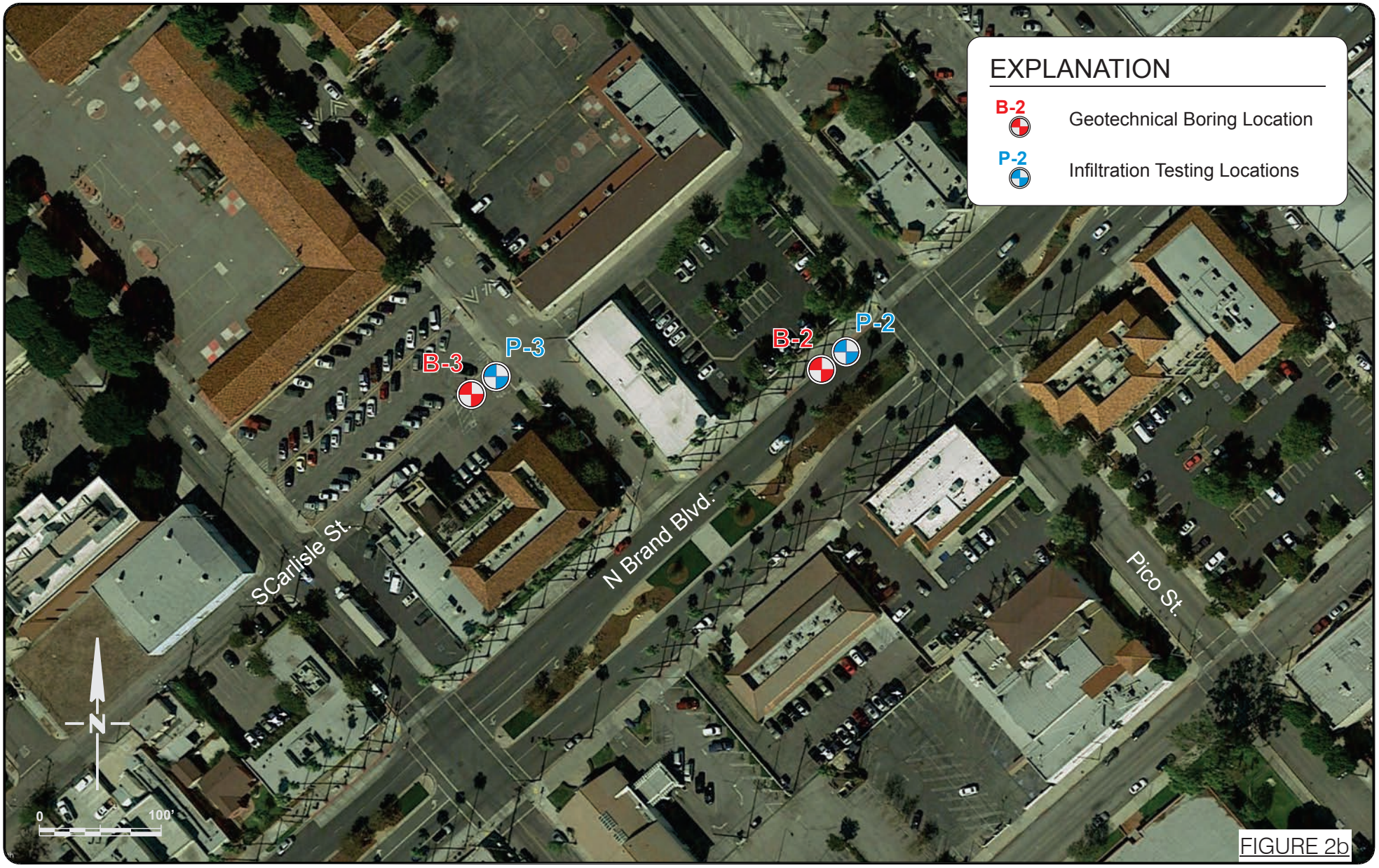



FIGURE 2b

TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
Tel 909.860.7777 Fax 909.860.8017

CALLES VERDES INFILTRATION - SAN FERNANDO, CA

BORING LOCATION MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | SCM |
| CHECKED BY | FC |

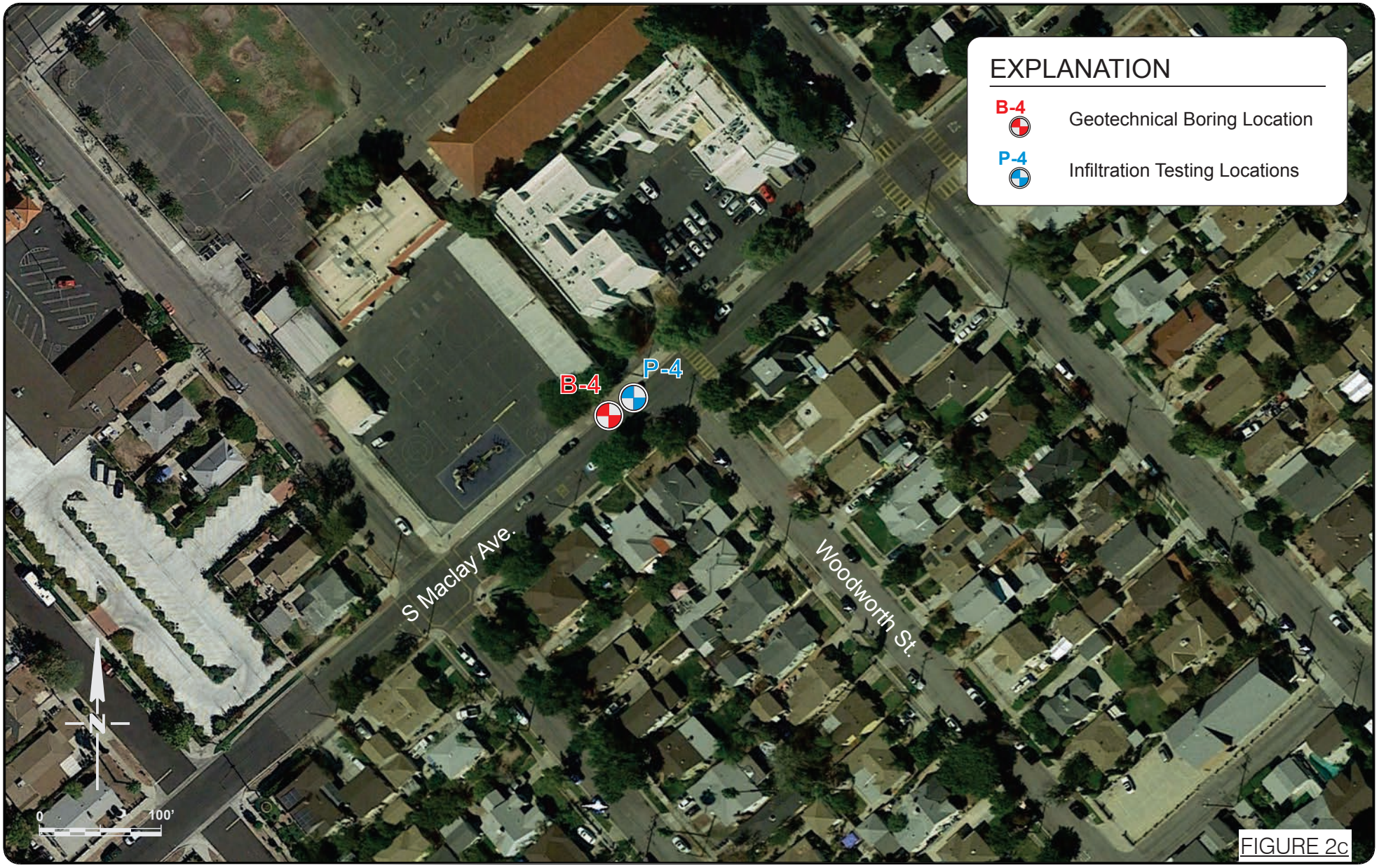



FIGURE 2c

TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
Tel 909.860.7777 Fax 909.860.8017

CALLES VERDES INFILTRATION - SAN FERNANDO, CA

BORING LOCATION MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | SCM |
| CHECKED BY | FC |

**PORTION OF THE**
**GEOLOGIC MAP OF THE SAN FERNANDO AND NORTH 1/2 VAN NUYS**
**QUADRANGLES, LOS ANGELES COUNTY, CALIFORNIA**
**By THOMAS W. DIBBLEE, JR., 1991**

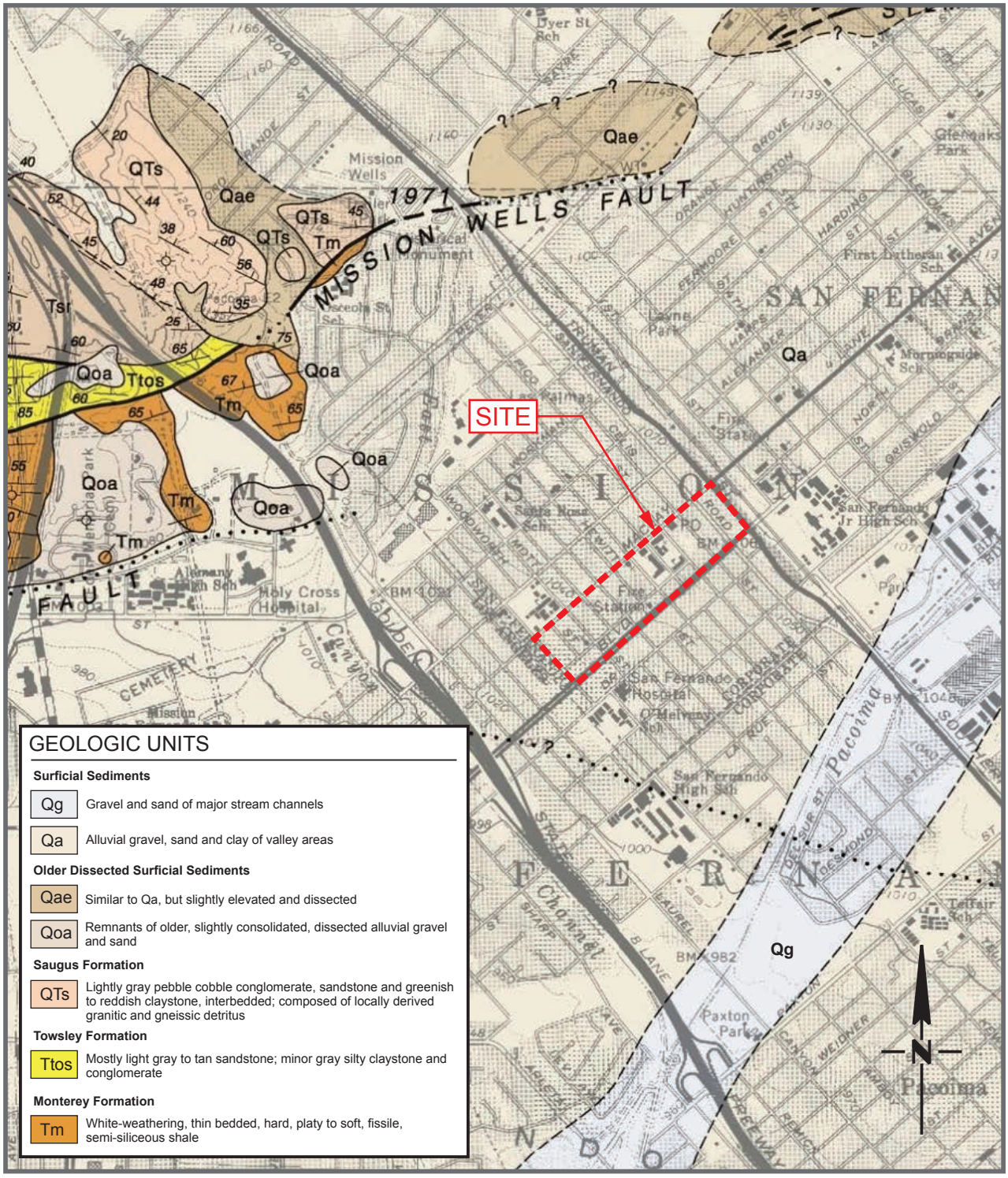


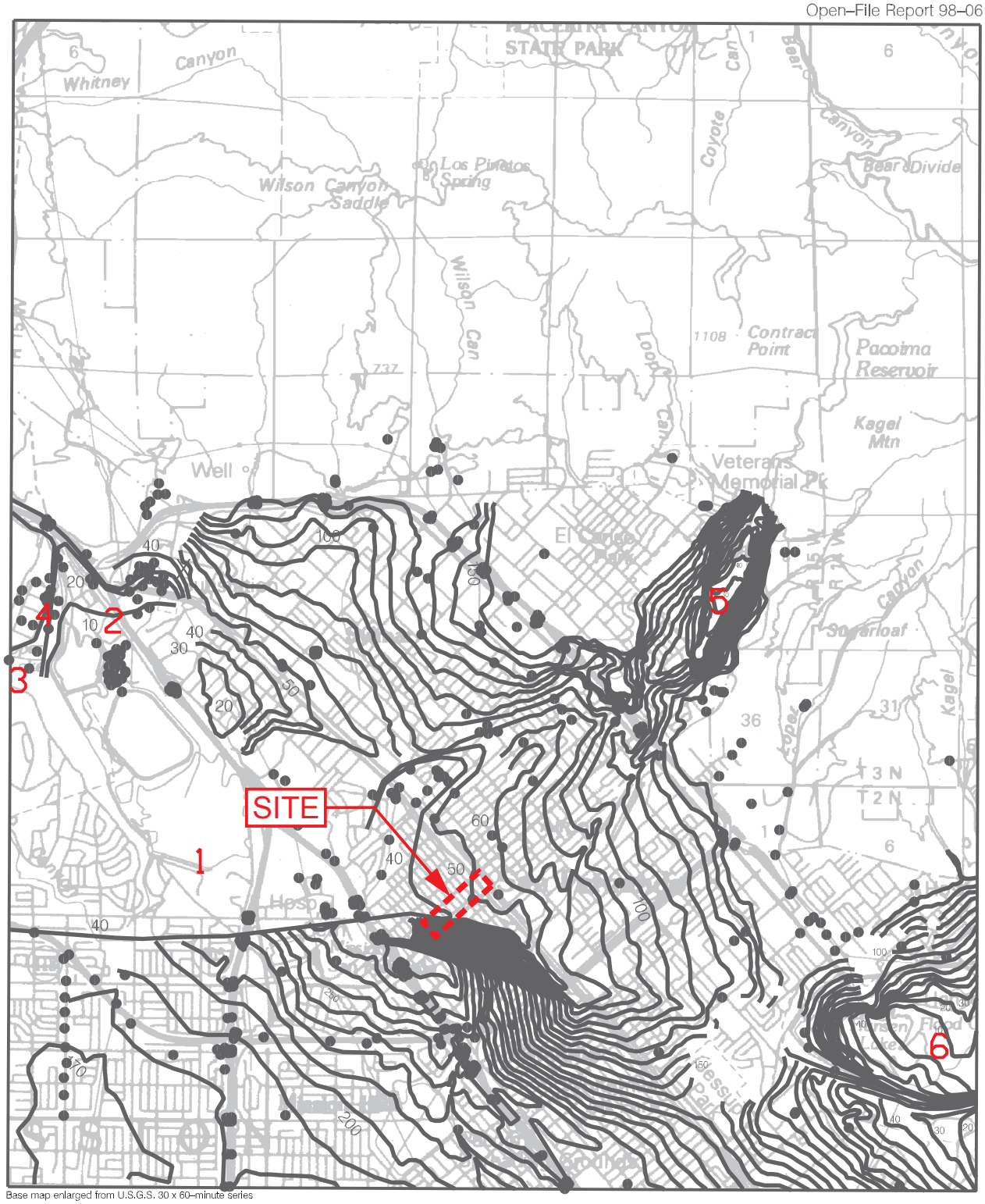

FIGURE 3


TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017


CALLES VERDES INFILTRATION - SAN FERNANDO, CA

GEOLOGIC MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | SCM |
| CHECKED BY | FC |




Base map enlarged from U.S.G.S. 30 x 60–minute series

Plate 1.2 Historically Highest Ground–Water Contours and Borehole Log Data Locations, San Fernando Quadrangle.

●Borehole Site  30  Depth to ground water in feet

6 Site of historical earthquake–generated liquefaction. See "Areas of Past Liquefaction" discussion in text.

ONE MILE
SCALE

FIGURE 4

TETRA TECH
1360 Valley Vista Drive, Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017

LA RIVER URBAN ORCHARD - SOUTH GATE, CA

HISTORIC HIGH GROUNDWATER MAP

| | |
|---|---|
| JOB NO. | TET 17-142E |
| DATE | FEB 2017 |
| DRAWN BY | SCM |
| CHECKED BY | FC |

EARTHQUAKE EPICENTERS

M 5.0 to 5.9

M 6.0 to 6.9

M 7.0 to 7.9

HISTORIC EARTHQUAKE EVENTS

| | | |
|---|---|---|
| 1) | 1812 Wrightwood | M7 |
| 2) | 1827 Ventura County | M6 |
| 3) | 1855 Los Angeles | M6? |
| 4) | 1858 San Bernardino | M6? |
| 5) | 1880 San Bernardino | M6 |
| 6) | 1889 Monrovia | M5.5 |
| 7) | 1893 San Fernando Valley | M5.9 |
| 8) | 1894 n/o Pomona | M6 |
| 9) | 1899 Cajon Pass | M6.5 |
| 10) | 1899 San Jacinto | M6.4 |
| 11) | 1907 San Bernardino | M6 |
| 12) | 1910 Elsinore | M6 |
| 13) | 1918 San Jacinto-Hemet | M6.8 |
| 14) | 1920 Inglewood | M4.9 |
| 15) | 1923 Loma Linda | M6 |
| 16) | 1930 Santa Monica Bay | M5.2 |
| 17) | 1933 Long Beach | M6.4 |
| 18) | 1941 Gardena | M4.8 |
| 19) | 1971 San Fernando | M6.7 |
| 20) | 1973 Pt. Mugu | M5.9 |
| 21) | 1979 Malibu | M5.2 |
| 22) | 1981 Pt. Mugu | M6.0 |
| 23) | 1986 N Palm Sprins | M6.2 |
| 24) | 1987 Whittier-Narrows | M5.9 |
| 25) | 1988 Pasadena | M5.0 |
| 26) | 1989 Malibu | M5.0 |
| 27) | 1990 Pomona | M5.3 |
| 28) | 1991 Sierra Madre | M5.8 |
| 29) | 1994 Northridge | M6.7 |
| 30) | 1992 Landers | M7.3 |
| 31) | 1992 Big Bear | M6.2 |
| 32) | 2005 Chino Hills | M5.2 |

Map Reference: Excerpt of Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California; California Geologic Survey, Date Map No. 6, map scale ~ 1:750,00

Used in permission from California Geologic Survey.

Earthquake epicenters from SP 116

SITE

EXPLANATION

| Geologic Time Scale | | | Years Before Present (Approx.) | Fault Symbol | Recency of Movement | DESCRIPTION: ON LAND | DESCRIPTION: OFFSHORE |
|---|---|---|---|---|---|---|---|
| Quaternary | Late Quaternary | Historic | | | | Displacement during historic time (e.g. San Andreas fault 1096). Includes areeas of known fault creep. | |
| | | Holocene | 200 | | | Displacement during Holocene time. | Faults offsets sea floor sediments or strata of Holocene age. |
| | | Pleistocene | 11,700 | | | Fault showing evidence of displacement during late Quaternary time. | Faults cuts strata of LatePleistocene age. |
| | Early Quaternary | | 700,000 | | | Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,00 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. | Faults cuts strata of Quaternary age. |
| Pre-Quaternary | | | 1,600,000 | -—-? | | Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive. | Faults cuts strata of Pliocene or older age. |

MAP SYMBOLS

- Triangle - termination portion data. Square - fault creep slippage. Hachure - linear extent of fault creep. (other symbols - see below)
- Approximate located trace
- Location uncertain
- Bar and ball on dowthrown side
- Arrows along fault indicate relative or apparent direction of lateral movement.
- Direction of fault dip
- Low angle fault (barbs on upper plate)
- 171 Numbers refer to annotations listed in explanatory text of map.
- Subject Site Location

FIGURE 5

TETRA TECH
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TEL 909.860.7777 FAX 909.860.8017

CALLES VERDES INFILTRATION - SAN FERNANDO, CA

REGIONAL FAULTS AND SEISMICITY MAP

| | |
|---|---|
| JOB NO. | TET 17-141E |
| DATE | FEB 2018 |
| DRAWN BY | SCM |
| CHECKED BY | FC |

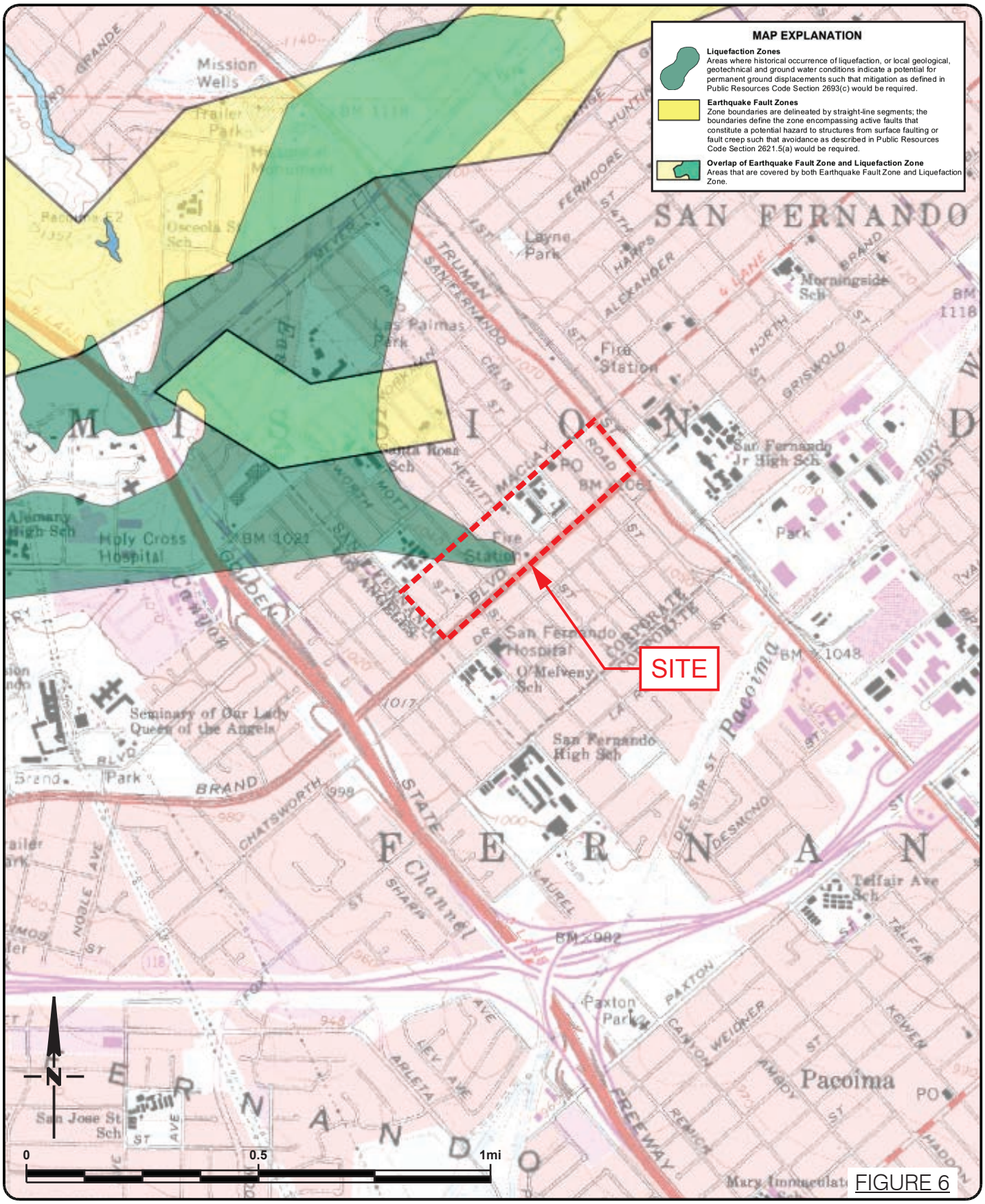



FIGURE 6

| | | |
|---|---|---|
| TETRA TECH<br>1360 Valley Vista Drive, Diamond Bar, CA 91765<br>TEL 909.860.7777 FAX 909.860.8017 | CALLES VERDES INFILTRATION - SAN FERNANDO, CA | JOB NO. TET 17-141E |
| | SEISMIC HAZARD ZONES MAP | DATE FEB 2018 |
| | | DRAWN BY SCM |
| | | CHECKED BY FC |

# Appendix A

# Logs of Exploratory Borings

| | |
|---|---|
| Project: **Calles Verdes Infiltration**<br>Project Location: **City of San Fernando**<br>Project Number: **TET 17-141E** | Log of Boring B-1/P-1<br>**Sheet 1 of 1** |

| | | |
|---|---|---|
| Date(s) Drilled **1/18/2018** | Logged By **Andrew McLarty** | Checked By **Fernando Cuenca** |
| Drilling Method **Hollow-stem auger** | Drill Bit Size/Type **8-inch** | Total Depth of Borehole **13 feet bgs** |
| Drill Rig Type **CME 75** | Drilling Contractor **2R Drilling Inc.** | Approximate Surface Elevation **1068 feet MSL (GoogleEarth)** |
| Groundwater Level and Date Measured **None encountered** | Sampling Method(s) **Bulk, Modified California, SPT** | Hammer Data **CME auto-trip: 140 lbs. with 30-inch drop** |
| Borehole Backfill **Cuttings and tamped** | Location **Lattitude: 34.282261 Longitude:-118.439912, SE Parking Lot #4** | |

| Elevation (feet) | Depth (feet) | Sample Type | Sample Number | Sampling Resistance, blows/ft | Material Type | Graphic Log | MATERIAL DESCRIPTION | Water Content, % | Dry Unit Weight, pcf | Well Log | REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1068 | 0 | | | | Asphalt | | 4 inches of AC over 5 inches of base | | | | |
| | | | | | Base | | [FILL] Artificial Fill (af) | | | | Gravel pack |
| | | | SK-1 | | SM | | Silty SAND with Gravel, medium dense, dark brown (7.5YR 3/4), damp | | | | G/S/F = 23/59/18% |
| | | | SPT-2 | 5\8\9 | SP-SM | | [NATIVE] Alluvium (Qa) | | | | 3" dia. PVC pipe |
| | | | | | | | Poorly graded SAND with Silt and Gravel, medium dense, yellowish brown (10YR 5/8), dry to damp | | | | 8" dia. borehole |
| 1063 | 5 | | | | SW-SM | | | | | | G/S/F = 7/74/19% |
| | | | R-3 | 23\35\38 | | | Well graded SAND with Silt and Gravel, very dense, light brownish gray (2.5Y 6/2), trace of sub-angular gravel up to 2 inches in diameter | 3.9 | 126 | | G/S/F = 21/69/10% |
| | | | SPT-4 | 37\39\40 | | | ... as above | | | | |
| 1058 | 10 | | R-5 | 50/6" | | | ... Very dense, brown (10YR 5/4), little gravel, trace of cobbles in cuttings | 3.3 | 122 | | @10 feet, rig chatter, difficult drilling, driller indicates cobbles |
| | | | SPT-6 | 50/5" | | | ... Very dense, light yellowish brown (2.5Y 6/3), damp, possible cobbles | | | | |
| 1053 | 15 | | | | | | Bottom of boring at 13 feet below ground surface (BGS).<br>No groundwater encountered.<br>Location taken with hand-held GPS. | | | | |
| 1048 | 20 | | | | | | | | | | |
| 1043 | 25 | | | | | | | | | | |
| 1038 | 30 | | | | | | | | | | |

L:\02 - PROJECTS\2017 Projects\TET 17-141E (4552-0141) Calles Verdes Infiltration - San Fernando\03 Field & Lab\Borings\Boring Logs B-1 thru B-4.bg4[wells2.tpl]

| Project: **Calles Verdes Infiltration**<br>Project Location: **City of San Fernando**<br>Project Number: **TET 17-141E** | Log of Boring B-2/P-2<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **1/18/2018** | Logged By **Andrew McLarty** | Checked By **Fernando Cuenca** |
| Drilling Method **Hollow-stem auger** | Drill Bit Size/Type **8-inch** | Total Depth of Borehole **12.8 feet bgs** |
| Drill Rig Type **CME 75** | Drilling Contractor **2R Drilling Inc.** | Approximate Surface Elevation **1056 feet MSL (GoogleEarth)** |
| Groundwater Level and Date Measured **None encountered** | Sampling Method(s) **Bulk, Modified California, SPT** | Hammer Data **CME auto-trip: 140 lbs. with 30-inch drop** |
| Borehole Backfill **Cuttings and tamped** | Location **Lattitude: 34.280402 Longitude:-118.441733, Along southbound Brand Ave (western lane), adjacent to Parking Lot #9** | |

| Elevation (feet) | Depth (feet) | Sample Type | Sample Number | Sampling Resistance, blows/ft | Material Type | Graphic Log | MATERIAL DESCRIPTION | Water Content, % | Dry Unit Weight, pcf | Well Log | REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1056 | 0 | | | | Asphalt | | 5 inches of AC over 6 inches of base | | | | |
| | | | | | Base | | | | | | |
| | | | SK-1 | | SM | | [FILL] Artificial Fill (af)<br>Silty SAND with Gravel, medium dense, dark brown (7.5YR 3/4), damp | | | | Gravel pack<br>G/S/F = 8/58/33% |
| | | | R-2 | 10\14\18 | SW-SM | | Well graded SAND with Silt and Gravel, medium dense, reddish brown (5YR 4/3), damp | 2.5 | 123 | | 3" dia. PVC pipe<br>G/S/F = 21/71/8% |
| 1051 | 5 | | SPT-3 | 16\14\17 | SM | | [NATIVE] Alluvium (Qa)<br>Silty SAND with Gravel, dense, light yellow gray (2.5Y 6/2), damp, traces of silt | | | | 8" dia. borehole<br>G/S/F = 28/51/21% |
| | | | R-4 | 22\40\50 | | | ... as above<br>... very dense, sub-angular gravel up to 2 inches in diameter | 1.8 | 126 | | @9.5 feet, rig chatter, difficult drilling, driller indicates cobbles |
| 1046 | 10 | | SPT-5 | 18\21\37 | SP-SM | | Poorly graded SAND with Silt and Gravel, very dense, light yellowish gray (2.5YR 6/2), damp, iron staining along partings | | | | |
| | | | R-6 | 50/3" | | | ... as above | | | | No recovery of sample, cobble stuck in head of sampler |
| 1041 | 15 | | | | | | Bottom of boring at 12.8 feet BGS.<br>No groundwater encountered.<br>Location taken with hand-held GPS. | | | | |
| 1036 | 20 | | | | | | | | | | |
| 1031 | 25 | | | | | | | | | | |
| 1026 | 30 | | | | | | | | | | |

L:\02 - PROJECTS\2017 Projects\TET 17-141E (4552-0141) Calles Verdes Infiltration - San Fernando\03 Field & Lab\Borings\Boring Logs B-1 thru B-4.bg4[wells2.tpl]

| Project: **Calles Verdes Infiltration**<br>Project Location: **City of San Fernando**<br>Project Number: **TET 17-141E** | Log of Boring B-3/P-3<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **1/18/2018** | Logged By **Andrew McLarty** | Checked By **Fernando Cuenca** |
| Drilling Method **Hollow-stem auger** | Drill Bit Size/Type **8-inch** | Total Depth of Borehole **12.5 feet bgs** |
| Drill Rig Type **CME 75** | Drilling Contractor **2R Drilling Inc.** | Approximate Surface Elevation **1054 feet MSL (GoogleEarth)** |
| Groundwater Level and Date Measured **None encountered** | Sampling Method(s) **Bulk, Modified California, SPT** | Hammer Data **CME auto-trip: 140 lbs. with 30-inch drop** |
| Borehole Backfill **Cuttings and tamped** | Location **Lattitude: 34.280442 Longitude:-118.442698, SE Parking Lot #10 (adjacent to Carlisle St.)** | |

| Elevation (feet) | Depth (feet) | Sample Type | Sample Number | Sampling Resistance, blows/ft | Material Type | Graphic Log | MATERIAL DESCRIPTION | Water Content, % | Dry Unit Weight, pcf | Well Log | REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1054 | 0 | | | | Asphalt | | 3 inches of AC over 4 inches of base | | | | |
| | | | | | Base | | [FILL] Artifical Fill (af) | | | | |
| | | | SK-1 | | SM | | Silty fine SAND, medium dense, dark brown (7.5YR 3/4), dry to damp, trace of concrete fragments | | | | Gravel pack<br>G/S/F = 7/58/35% |
| | | | SPT-2 | 10\15\20 | SM | | [NATIVE] Alluvium (Qa) | | | | 3" dia.PVC pipe<br>8" dia. borehole |
| 1049 | 5 | | R-3 | 9\12\15 | SW-SM | | Silty SAND with Gravel, dense, yellowish brown (10YR 5/6), damp, trace of gravel, trace of clay | 7.0 | 120 | | G/S/F = 21/52/27%<br>G/S/F = 9/82/9% |
| | | | SPT-4 | 10\20\23 | | | Well graded SAND with Silt and Gravel, medium dense, light brownish gray (2.5Y 6/2), damp<br>... dense | | | | |
| 1044 | 10 | | SPT-5 | 39\40\50/3" | SW | | Well graded SAND with Cobbles, very dense, light yellowish brown (10YR 6/4), damp, mafic igneous cobbles and gravel | | | | |
| | | | SPT-6 | 50/6" | | | Bottom of boring at 12.5 feet BGS<br>No groundwater encountered.<br>Location taken with hand-held GPS. | | | | |
| 1039 | 15 | | | | | | | | | | |
| 1034 | 20 | | | | | | | | | | |
| 1029 | 25 | | | | | | | | | | |
| 1024 | 30 | | | | | | | | | | |

L:\02 - PROJECTS\2017 Projects\TET 17-141E (4552-0141) Calles Verdes Infiltration - San Fernando\03 Field & Lab\Borings\Boring Logs B-1 thru B-4.bg4[wells2.tpl]

| Project: **Calles Verdes Infiltration**<br>Project Location: **City of San Fernando**<br>Project Number: **TET 17-141E** | Log of Boring B-4/P-4<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **1/18/2018** | Logged By **Andrew McLarty** | Checked By **Fernando Cuenca** |
| Drilling Method **Hollow-stem auger** | Drill Bit Size/Type **8-inch** | Total Depth of Borehole **11.5 feet bgs** |
| Drill Rig Type **CME 75** | Drilling Contractor **2R Drilling Inc.** | Approximate Surface Elevation **1041 feet MSL (GoogleEarth)** |
| Groundwater Level and Date Measured **None encountered** | Sampling Method(s) **Bulk, Modified California, SPT** | Hammer Data **CME auto-trip: 140 lbs. with 30-inch drop** |
| Borehole Backfill **Cuttings and tamped** | Location **Lattitude: 34.278661 Longitude:-118.447766, Southbound Maclay (western lane)** | |

| Elevation (feet) | Depth (feet) | Sample Type | Sample Number | Sampling Resistance, blows/ft | Material Type | Graphic Log | MATERIAL DESCRIPTION | Water Content, % | Dry Unit Weight, pcf | Well Log | REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1041 | 0 | | | | Asphalt | | 4 inches of AC over 4 inchs of base | | | | |
| | | | | | Base | | [FILL] Artifical Fill (af) | | | | |
| | | | SK-1 | | SM | | Silty SAND, dense, reddish yellow (5YR 6/6), to brown (10YR 3/4), dry, trace of concrete and old wood fragments | | | | Gravel pack<br>G/S/F = 11/51/38% |
| | | | SPT-2 | 10\15\21 | SW-SM | | [NATIVE] Alluvium (Qa) | | | | 3" dia. PVC pipe |
| 1036 | 5 | | | | | | Well graded SAND with Silt, dense, light yellowish brown (10YR 6/4), dry, sub-rounded gravel up to 2 inches in diameter | | | | G/S/F = 1/56/43%<br>8" dia. borehole |
| | | | R-3 | 42\41\41 | | | | 2.4 | 131 | | G/S/F = 6/84/10% |
| | | | SPT-4 | 23\33\34 | | | ... as above<br>... very dense | | | | @9 feet, rig chatter, difficult drilling<br>@10 feet, Poor recover of sample, cobble stuck in head of sampler |
| 1031 | 10 | | SPT-5 | 50/3" | | | ... as above, with cobbles | | | | |
| | | | | | | | Bottom of boring at 11.5 feet bgs<br>Refusal on cobbles at 11.5 feet.<br>No groundwater encountered.<br>Location taken with hand-held GPS. | | | | |
| 1026 | 15 | | | | | | | | | | |
| 1021 | 20 | | | | | | | | | | |
| 1016 | 25 | | | | | | | | | | |
| 1011 | 30 | | | | | | | | | | |

L:\02 - PROJECTS\2017 Projects\TET 17-141E (4552-0141) Calles Verdes Infiltration - San Fernando\03 Field & Lab\Borings\Boring Logs B-1 thru B-4.bg4[wells2.tpl]

Project: **Calles Verdes Infiltration**
Project Location: **City of San Fernando**
Project Number: **TET 17-141E**

# Key to Log of Boring
**Sheet 1 of 1**

| 1 Elevation (feet) | 2 Depth (feet) | 3 Sample Type | 4 Sample Number | 5 Sampling Resistance, blows/ft | 6 Material Type | 7 Graphic Log | 8 MATERIAL DESCRIPTION | 9 Water Content, % | 10 Dry Unit Weight, pcf | 11 Well Log | 12 REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|

## COLUMN DESCRIPTIONS

**1** Elevation (feet): Elevation (MSL, feet).
**2** Depth (feet): Depth in feet below the ground surface.
**3** Sample Type: Type of soil sample collected at the depth interval shown.
**4** Sample Number: Sample identification number.
**5** Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
**6** Material Type: Type of material encountered.
**7** Graphic Log: Graphic depiction of the subsurface material encountered.
**8** MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
**9** Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
**10** Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
**11** Well Log: Graphical representation of well installed upon completion of drilling and sampling.
**12** REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

## FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

## MATERIAL GRAPHIC SYMBOLS

Asphaltic Concrete (AC)
Gravel
Silty SAND (SM)
Poorly graded SAND with Silt (SP-SM)
Well graded SAND (SW)
Well graded SAND with Silt (SW-SM)

## TYPICAL SAMPLER GRAPHIC SYMBOLS

Auger sampler
Bulk Sample
3-inch-OD California w/ brass rings
CME Sampler
Grab Sample
2.5-inch-OD Modified California w/ brass liners
Pitcher Sample
2-inch-OD unlined split spoon (SPT)
Shelby Tube (Thin-walled, fixed head)

## OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)
Water level (after waiting)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
Queried contact between strata

## GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

L:\02 - PROJECTS\2017 Projects\TET 17-141E (4552-0141) Calles Verdes Infiltration - San Fernando\03 Field & Lab\Borings\Boring Logs B-1 thru B-4.bg4[wells2.tpl]

**Figure B-1**

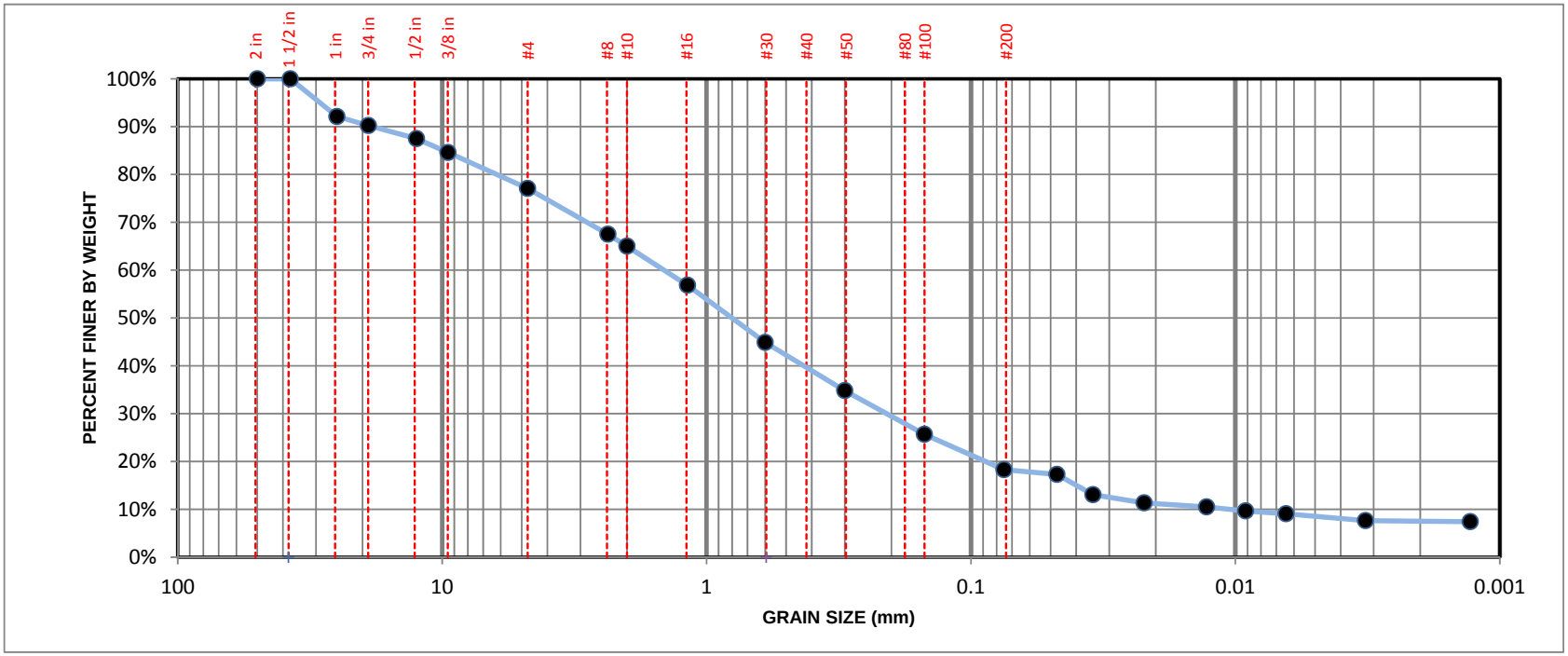
# Appendix B

# Laboratory Testing

# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-1, SK-1 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-1 | SK-1 | 1.0-5.0 | - | - | **SM** | **23%** | **59%** | **18%** | **7%** |
| | | | | | | | | | | |
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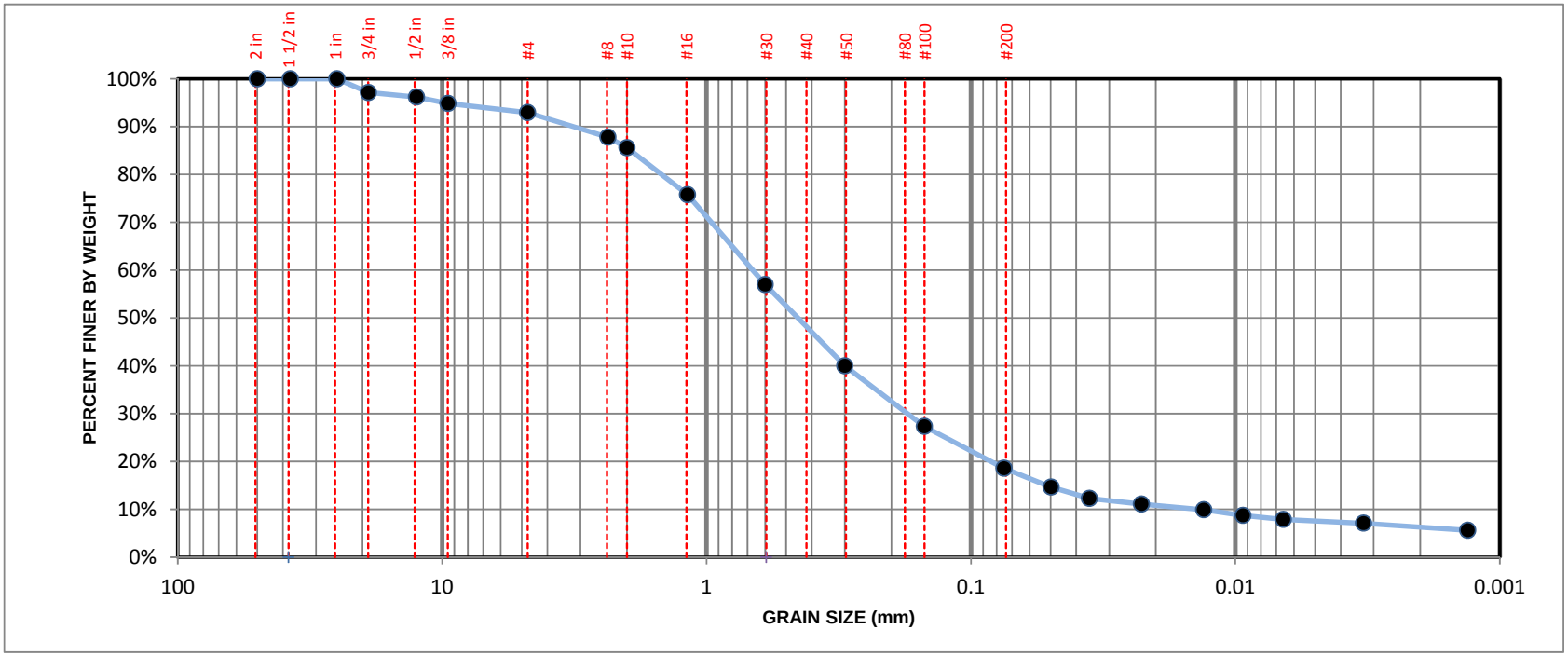
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-1, SPT-2 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2µ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-1 | SPT-2 | 2-3.5 | - | - | **SM** | **7%** | **74%** | **19%** | **6%** |
| | | | | | | | | | | |
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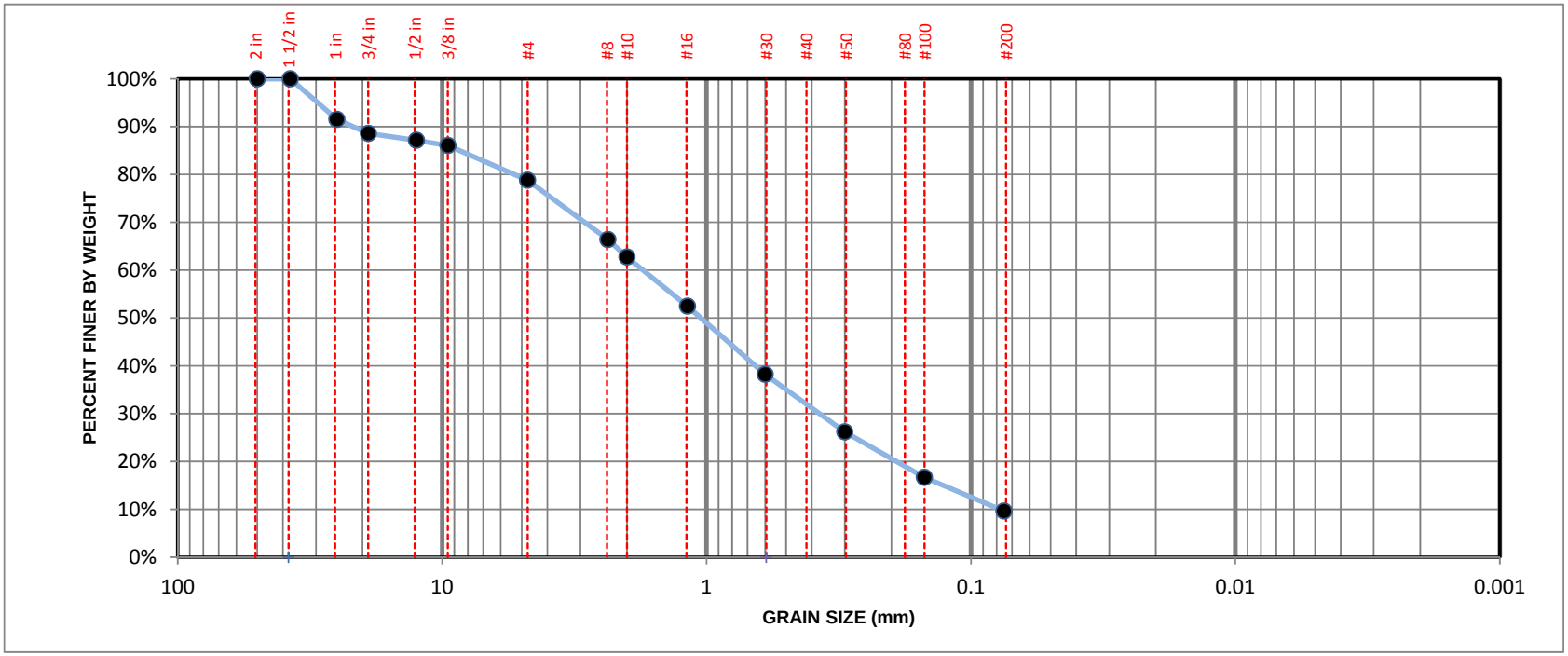
TETRA TECH BAS GEOSCIENCE

# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-1, R-3 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-1 | R-3 | 6-6.5 | - | - | **SW-SM** | **21%** | **69%** | **10%** | |
| | | | | | | | | | | |
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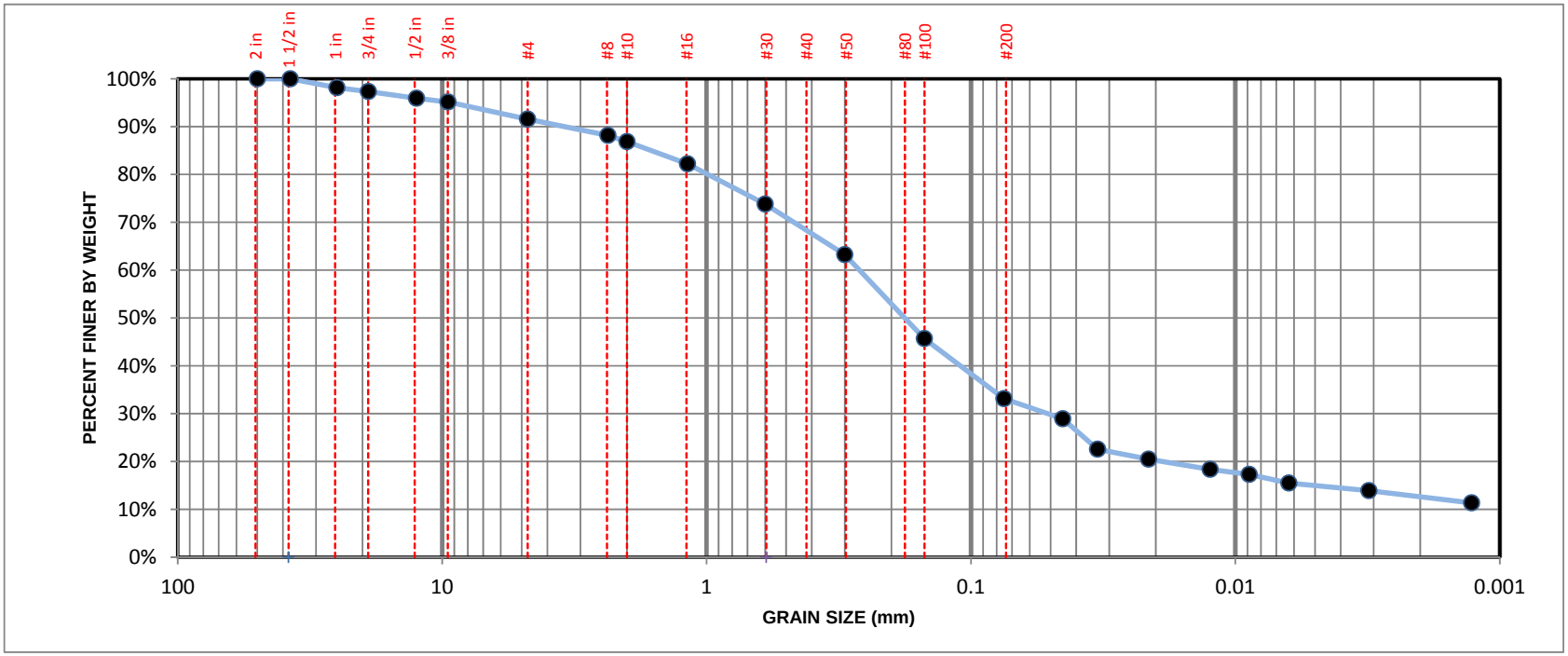
TETRA TECH BAS GEOSCIENCE

# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-2, SK-1 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-2 | SK-1 | 1.0-5.0 | - | - | **SM** | **8%** | **58%** | **33%** | **12%** |
| | | | | | | | | | | |
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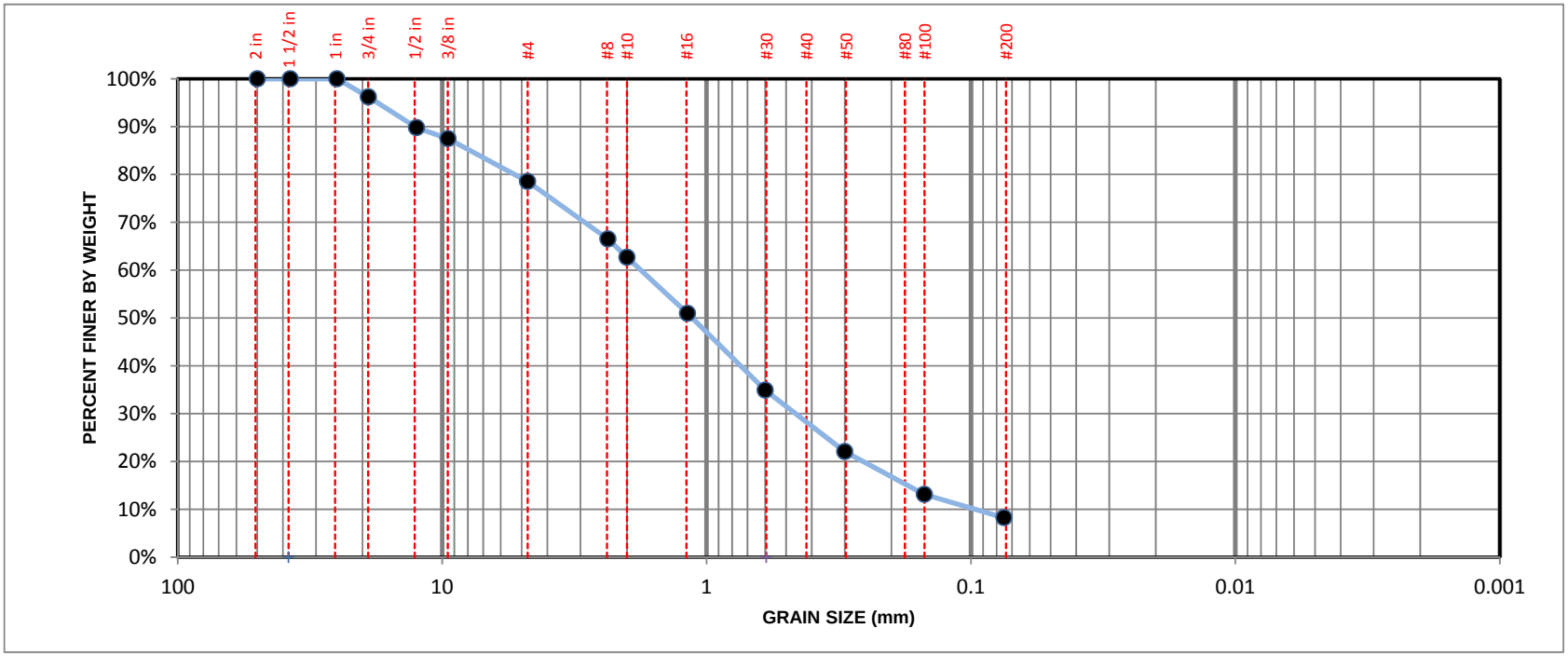
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-2, R-2 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-2 | R-2 | 2-3.5 | - | - | **SW-SM** | **21%** | **71%** | **8%** | |
| | | | | | | | | | | |
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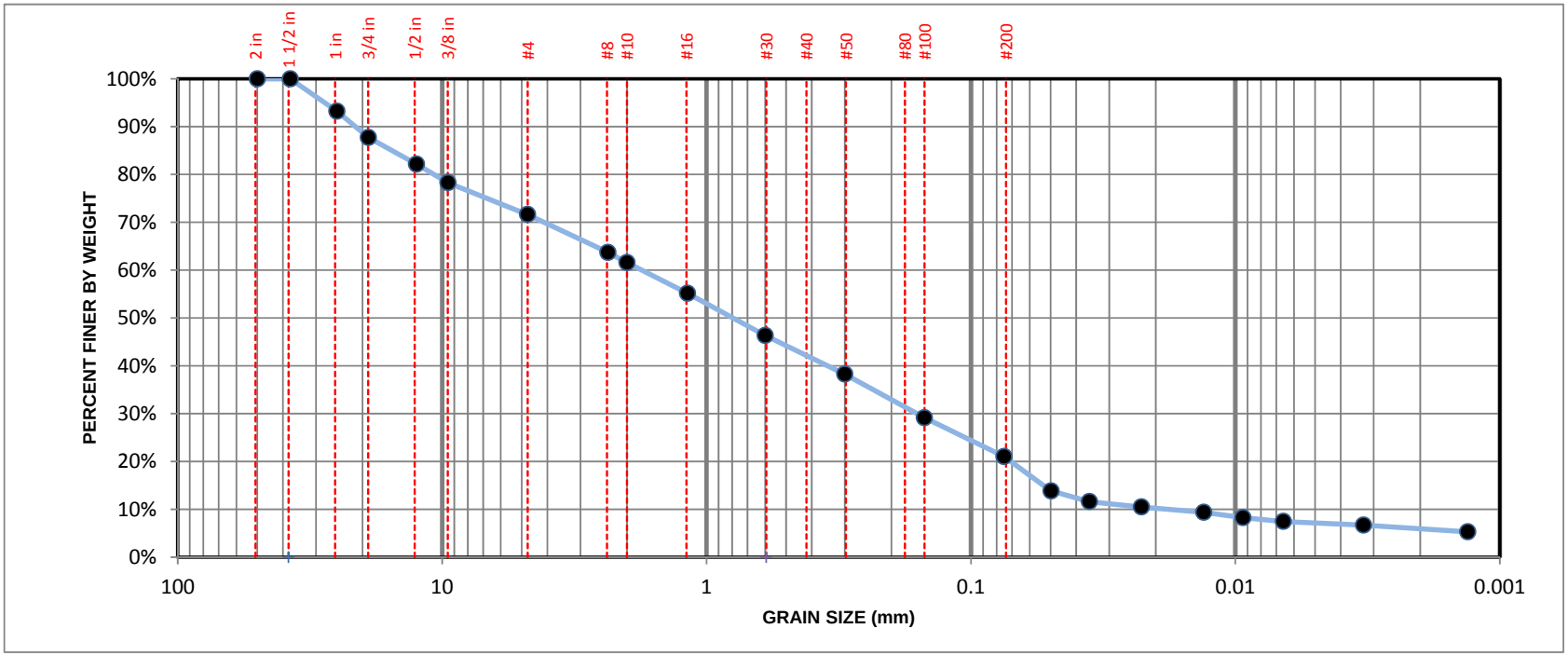
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 1, 2018 |
| **Address:** | | **Sample Number:** | B-2, SPT-3 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-2 | SPT-3 | 5-6.5 | - | - | **SM** | **28%** | **51%** | **21%** | **6%** |
| | | | | | | | | | | |
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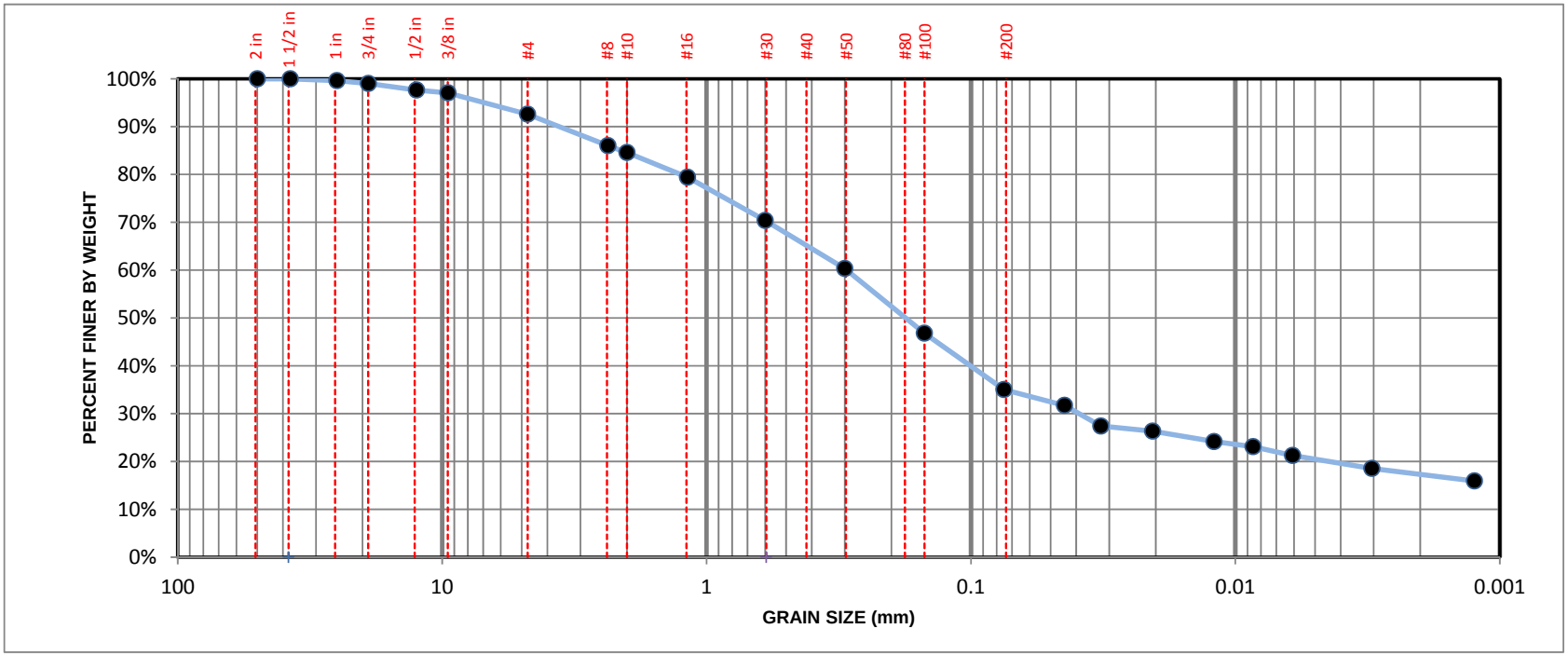
TETRA TECH BAS GEOSCIENCE

# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-3, SK-1 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2µ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-3 | SK-1 | 1.0-5.0 | - | - | **SM** | **7%** | **58%** | **35%** | **17%** |
| | | | | | | | | | | |
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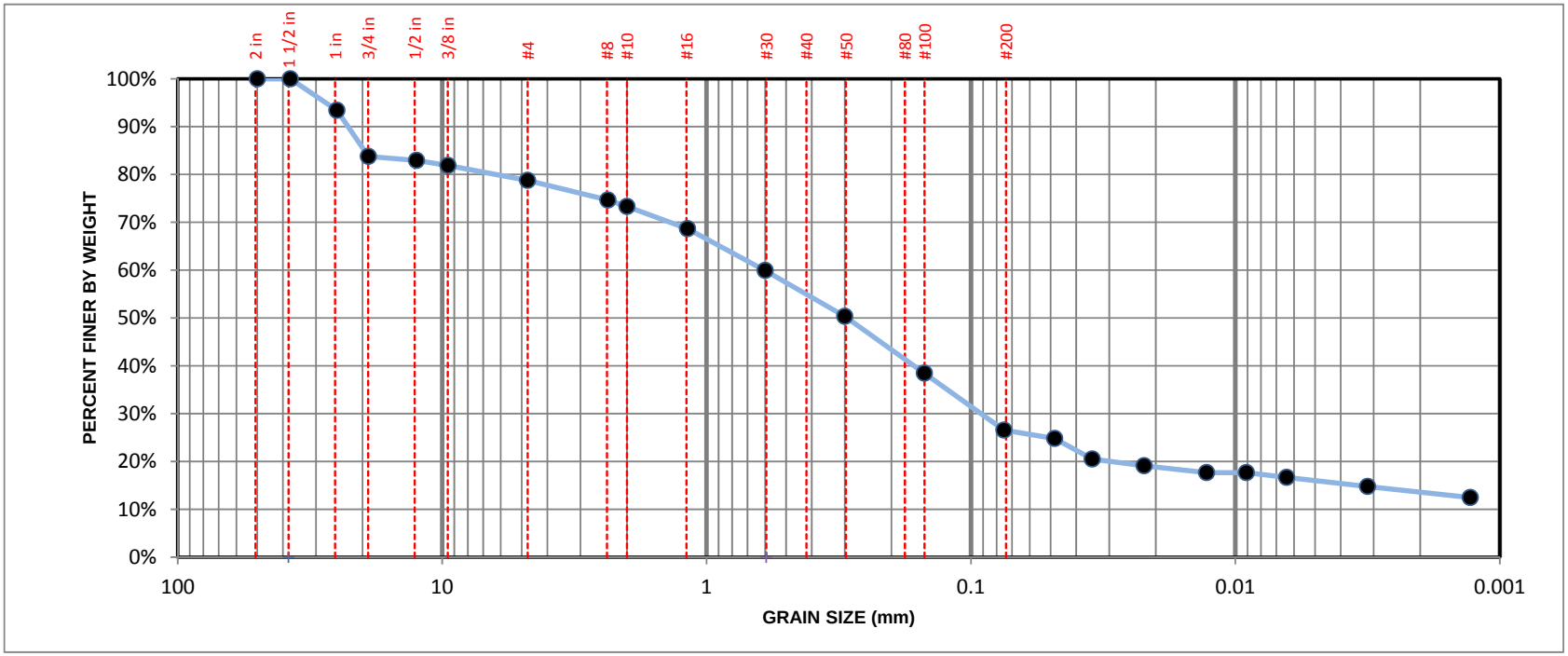
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-3, SPT-2 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-3 | SPT-2 | 2-3.5 | - | - | **SM** | **21%** | **52%** | **27%** | **13%** |
| | | | | | | | | | | |
| | | | | | | | | | | |
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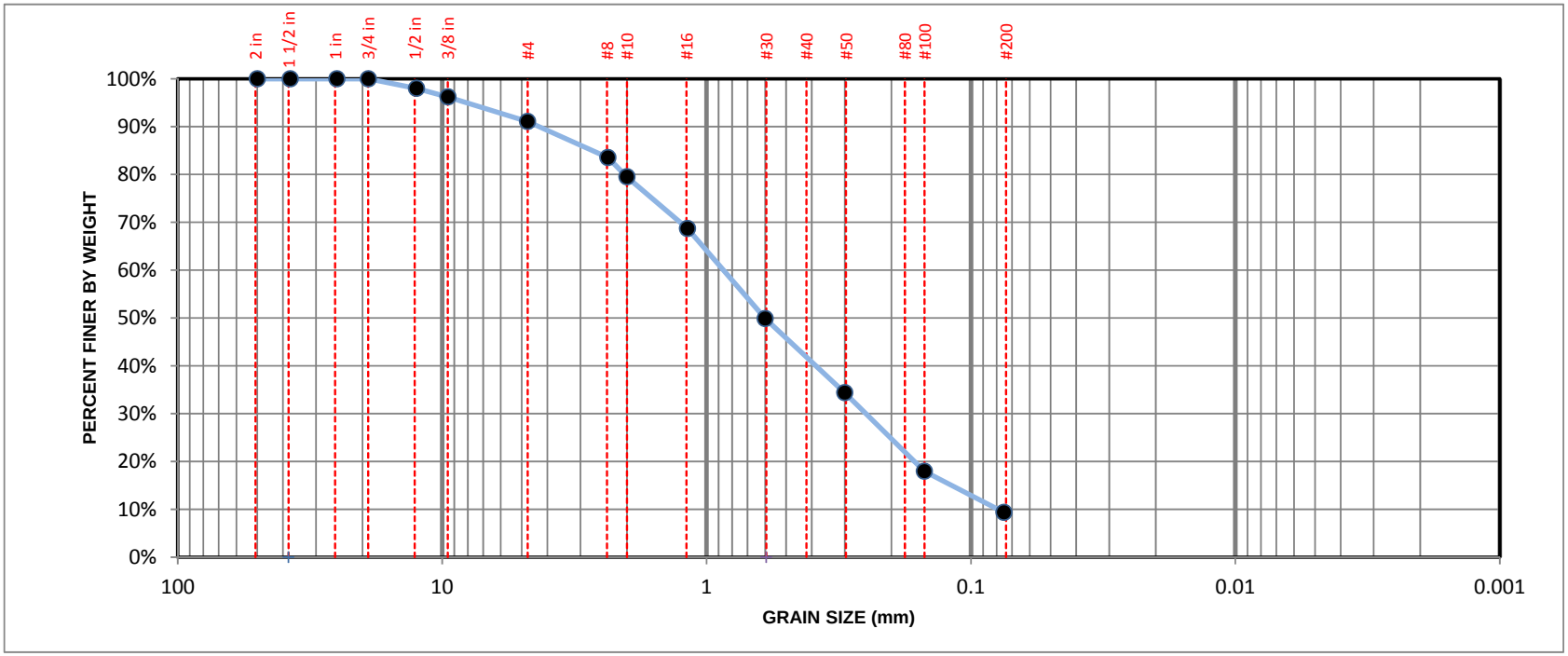
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-3, R-3 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-3 | R-3 | 6-6.5 | - | - | **SW-SM** | **9%** | **82%** | **9%** | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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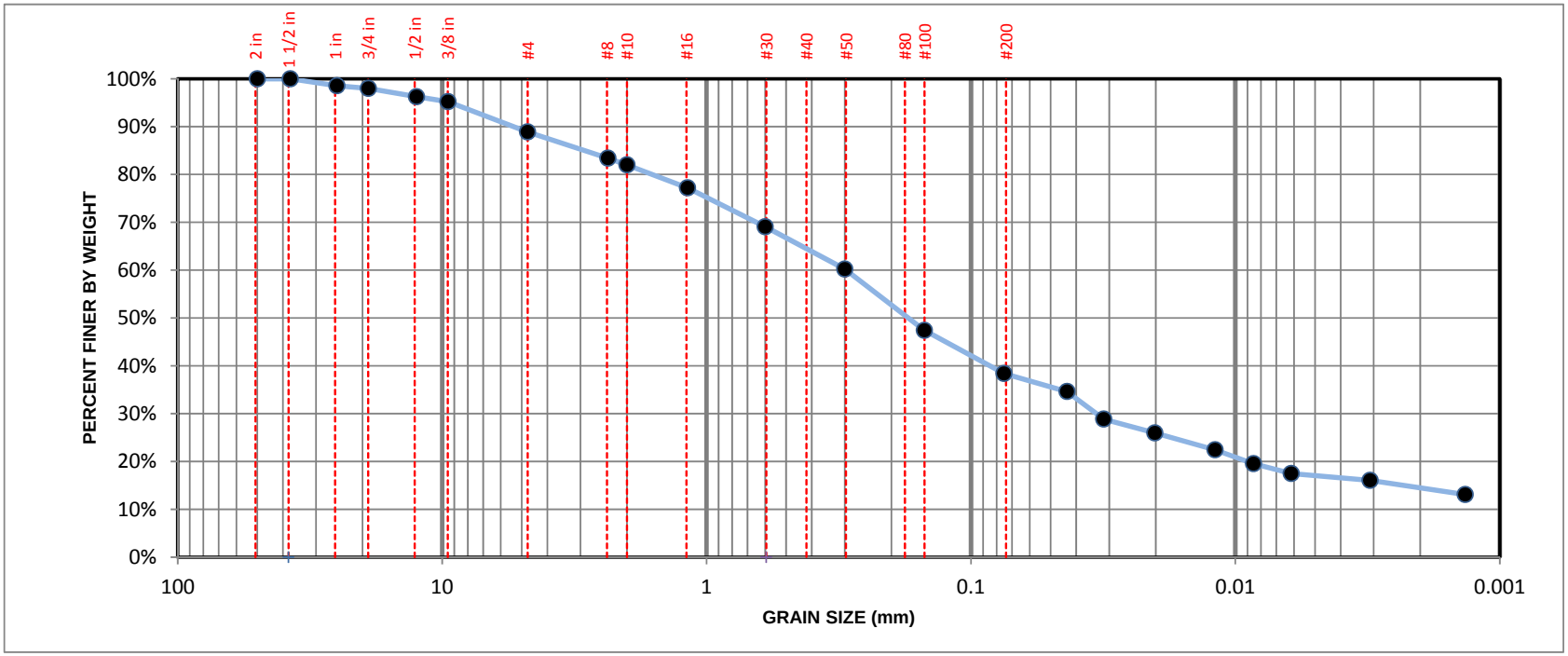
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-4, SK-1 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-4 | SK-1 | 1.0-5.0 | - | - | **SM** | **11%** | **51%** | **38%** | **14%** |
| | | | | | | | | | | |
| | | | | | | | | | | |
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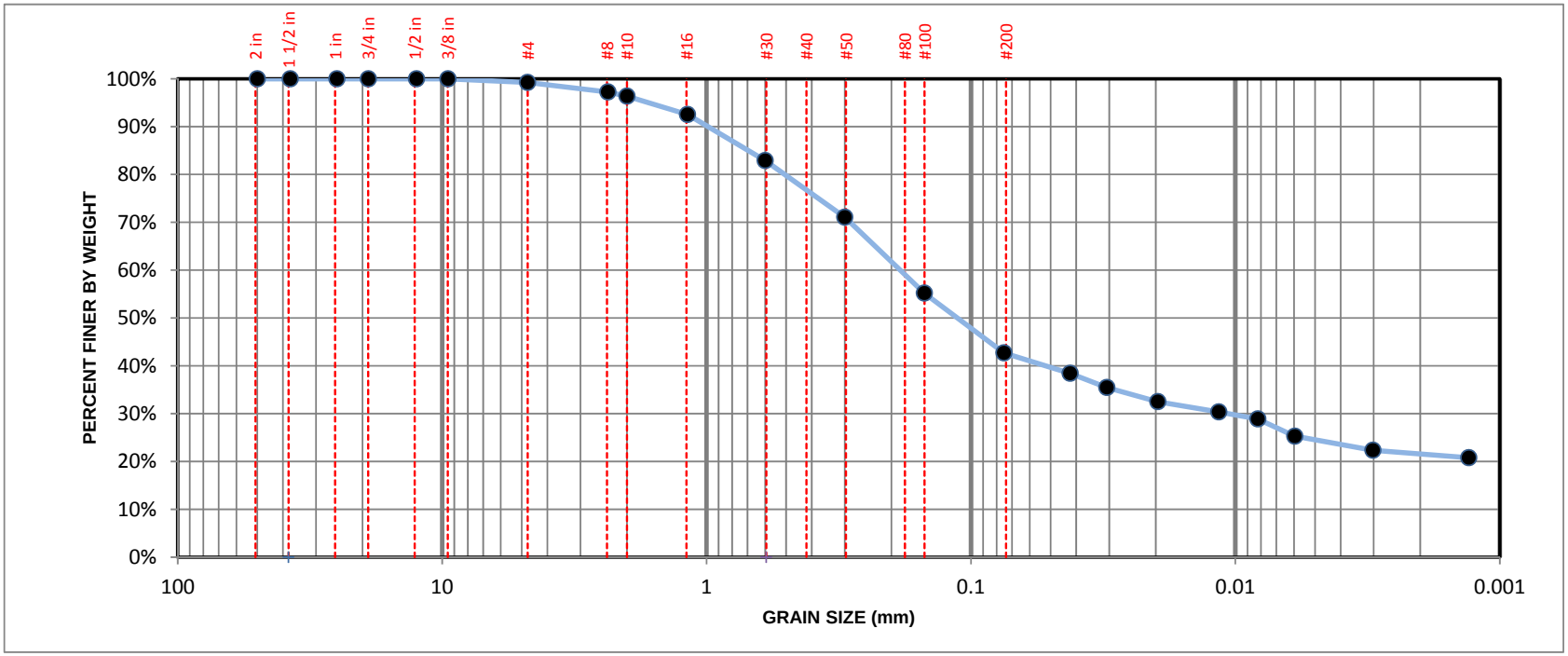
# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-4, SPT-2 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-4 | SPT-2 | 2-3.5 | - | - | **SM** | **1%** | **56%** | **43%** | **21%** |
| | | | | | | | | | | |
| | | | | | | | | | | |
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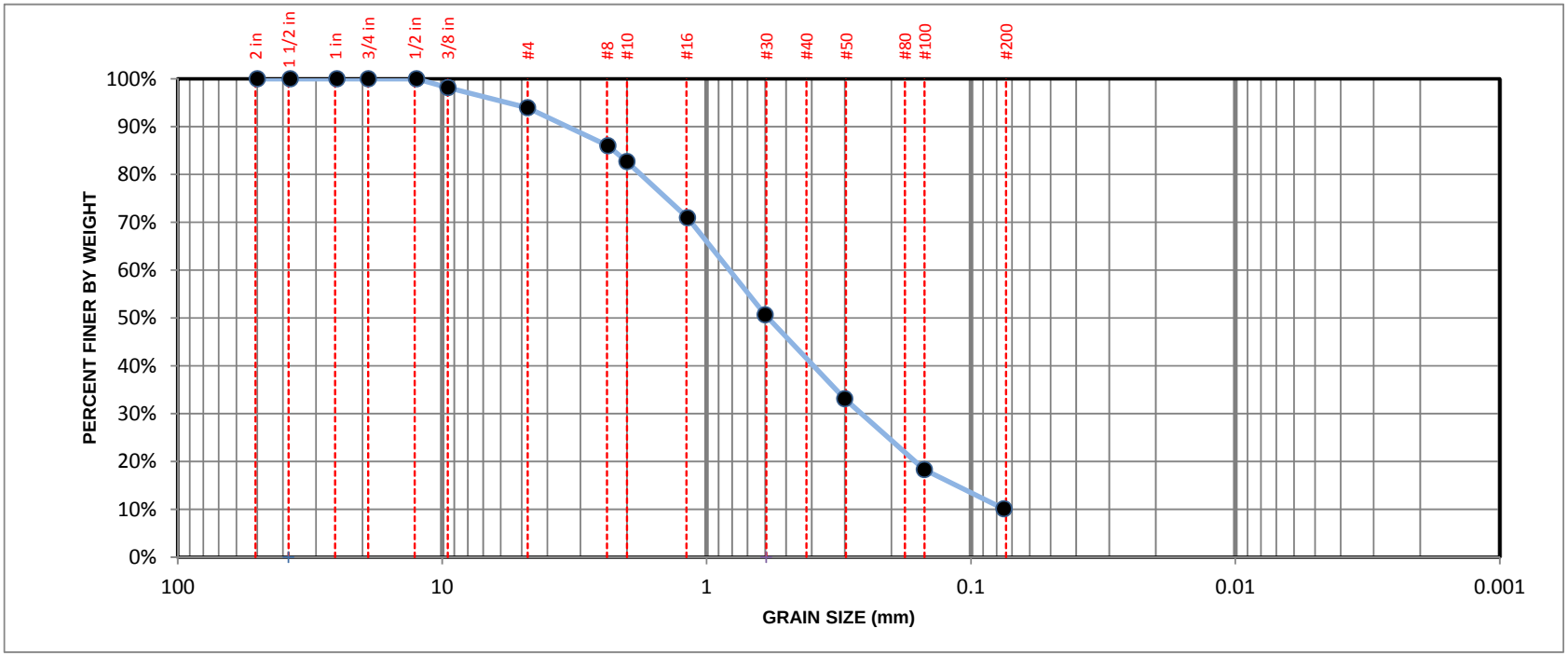
| | | | | | | | | | | |

# GRAIN SIZE DISTRIBUTION ANALYSIS

**ASTM C136/C117/D422**

| | | | |
|---|---|---|---|
| **Job Name:** | Calle Verdes | **Tested By :** | MG |
| **Job Number:** | 197-4552-0141 | **Date Completed:** | February 2, 2018 |
| **Address:** | | **Sample Number:** | B-4, R-3 |
| **Date Sampled:** | January 24, 2018 | | |




| Symbol | Boring No. | Sample # | Deph (feet) | LL | PI | USCS | Gravel | Sand | Fines | 2μ |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-4 | R-3 | 6-6.5 | - | - | **SW-SM** | **6%** | **84%** | **10%** | |
| | | | | | | | | | | |
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# Appendix C

# Field Infiltration Testing Results

TETRA TECH

# PERCOLATION DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project: | Cales Verdes, San Fernando | | Job No: | TET 17 141E | |
| Test Hole No: | **P-1** | | Date Excavated: | Thursday, January 18, 2018 | |
| Test Hole Depth (feet): | 3.1 | feet | Soil Classification: | Silty SAND and Poorly graded SAND with Silt and Gravel (SM/SP-SM) | |
| Stick up Length (feet): | 0.0 | feet | | | |
| Sandy Soil Criteria Tested By: | Andrew McLarty C.E.G | | Date: | Thursday, January 18, 2018 | Presoak: 1 hours |
| Actual Percolation Tested By: | Cliff Von Ting | | Date: | Thursday, January 18, 2018 | |
| Test Hole Diameter Inches): | 8 | inches | Latitude: | 34.282274° | Longitude: -118.439926° |
| Casing Diameter: | 3 | inches | Elevation: | 1,068 feet | |

**PERCOLATION TEST** (presoaking for a mimimum of 1 hour)

| Time | Time Interval (min) | Initial Reading (feet below the top of the pipe) | Final Reading (feet below the top of the pipe) | Initial Water Level (feet above bottom of hole) | Final Water Level (feet above bottom of hole) | Δ in Water Level (inches) | Measured Raw Percolation Rate (inches/hour) |
|---|---|---|---|---|---|---|---|
| 9:50 AM | 30.0 | 2.00 | 2.86 | 1.1 | 0.24 | 10.32 | 4.1 |
| 10:20 AM | | | | | | | |
| 10:29 AM | 10.0 | 2.00 | 2.30 | 1.1 | 0.80 | 3.60 | 3.2 |
| 10:39 AM | | | | | | | |
| 10:40 AM | 10.0 | 2.00 | 2.23 | 1.1 | 0.87 | 2.76 | 2.4 |
| 10:50 AM | | | | | | | |
| 10:51 AM | 10.0 | 2.00 | 2.23 | 1.1 | 0.87 | 2.76 | 2.4 |
| 11:01 AM | | | | | | | |
| 11:12 AM | 10.0 | 2.00 | 2.22 | 1.1 | 0.88 | 2.64 | 2.3 |
| 11:22 AM | | | | | | | |
| 11:23 AM | 10.0 | 2.00 | 2.20 | 1.1 | 0.90 | 2.40 | 2.1 |
| 11:34 AM | | | | | | | |
| 11:35 AM | 10.0 | 2.00 | 2.20 | 1.1 | 0.90 | 2.40 | 2.1 |
| 11:45 AM | | | | | | | |
| 11:46 AM | 10.0 | 2.00 | 2.20 | 1.1 | 0.90 | 2.40 | 2.1 |
| 11:56 AM | | | | | | | |
| 11:58 AM | 10.0 | 2.00 | 2.20 | 1.1 | 0.90 | 2.40 | 2.1 |
| 12:08 PM | | | | | | | |
| | | | | | | | 2.1 |

| | | |
|---|---|---|
| Reduction factor for boring percolation | $RF_t$ = | 2.00 |
| Site variability, number of tests, and thoroughness of subsurface investigation | $RF_v$= | 2.00 |
| Long-term siltation, plugging, and maintenance | $RF_s$= | 2.00 |

**Percolation Test performed according to the Administrative Manual, County of los Angeles, Department of Public Works, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS 200.2 (6/30/17)**

| | | |
|---|---|---|
| Corrected Percolation Rate (Infiltration Rate) = | 0.3 | in/hour |

TETRA TECH

# PERCOLATION DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project: | Cales Verdes, San Fernando | | Job No: | TET 17 141E | |
| Test Hole No: | **P-2** | | Date Excavated: | Thursday, January 18, 2018 | |
| Test Hole Depth (feet): | 3.3 | feet | Soil Classification: | Silty SAND with Gravel and Silt with Sand (SM/ML) | |
| Stick up Length (feet): | 0.0 | feet | | | |
| Sandy Soil Criteria Tested By: | Andrew McLarty C.E.G | | Date: | Thursday, January 18, 2018 | Presoak: >1 hours |
| Actual Percolation Tested By: | Andrew McLarty | | Date: | Friday, January 19, 2018 | |
| Test Hole Diameter Inches): | 8 | inches | Latitude: | 34.280392° | Longitude: -118.441748° |
| Casing Diameter: | 3 | inches | Elevation: | 1,056 feet | |

**PERCOLATION TEST** (presoaked for more than 1 hour)

| Time | Time Interval (min) | Initial Reading (feet below the top of the pipe) | Final Reading (feet below the top of the pipe) | Initial Water Level (feet above bottom of hole) | Final Water Level (feet above bottom of hole) | Δ in Water Level (inches) | Measured Raw Percolation Rate (inches/hour) |
|---|---|---|---|---|---|---|---|
| 2:15 PM | 30.0 | 2.00 | 2.41 | 1.3 | 0.89 | 4.92 | 1.3 |
| 2:45 PM | | | | | | | |
| 6:35 AM | 20.0 | 2.00 | 2.30 | 1.3 | 1.00 | 3.60 | 1.4 |
| 6:55 AM | | | | | | | |
| 7:00 AM | 20.0 | 2.00 | 2.28 | 1.3 | 1.02 | 3.36 | 1.3 |
| 7:20 AM | | | | | | | |
| 7:20 AM | 20.0 | 2.00 | 2.28 | 1.3 | 1.02 | 3.36 | 1.3 |
| 7:40 AM | | | | | | | |
| 7:40 AM | 20.0 | 2.00 | 2.28 | 1.3 | 1.02 | 3.36 | 1.3 |
| 8:00 AM | | | | | | | |
| 8:00 AM | 20.0 | 2.00 | 2.24 | 1.3 | 1.06 | 2.88 | 1.1 |
| 8:20 AM | | | | | | | |
| 8:20 AM | 20.0 | 2.00 | 2.24 | 1.3 | 1.06 | 2.88 | 1.1 |
| 8:40 AM | | | | | | | |
| 8:40 AM | 20.0 | 2.00 | 2.24 | 1.3 | 1.06 | 2.88 | 1.1 |
| 9:00 AM | | | | | | | |
| 9:00 AM | 20.0 | 2.00 | 2.24 | 1.3 | 1.06 | 2.88 | 1.1 |
| 9:20 AM | | | | | | | |
| | | | | | | | 1.1 |

| | | |
|---|---|---|
| Reduction factor for boring percolation | $RF_t$ = | 2.00 |
| Site variability, number of tests, and thoroughness of subsurface investigation | $RF_v$= | 2.00 |
| Long-term siltation, plugging, and maintenance | $RF_s$= | 2.00 |

**Percolation Test performed according to the Administrative Manual, County of los Angeles, Department of Public Works, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS 200.2 (6/30/17)**

| | | |
|---|---|---|
| Corrected Percolation Rate (Infiltration Rate) = | 0.1 | in/hour |

TETRA TECH

# PERCOLATION DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project: | Cales Verdes, San Fernando | | Job No: | TET 17 141E | |
| Test Hole No: | **P-3** | | Date Excavated: | Thursday, January 18, 2018 | |
| Test Hole Depth (feet): | 3.0 | feet | Soil Classification: | Silty SAND (SM) | |
| Stick up Length (feet): | 0.0 | feet | | | |
| Sandy Soil Criteria Tested By: | Andrew McLarty C.E.G | | Date: | Thursday, January 18, 2018 | Presoak: 1 hours |
| Actual Percolation Tested By: | Cliff Von Ting | | Date: | Thursday, January 18, 2018 | |
| Test Hole Diameter Inches): | 8 | inches | Latitude: | 34.280435° | Longitude: -118.442697° |
| Casing Diameter: | 3 | inches | Elevation: | 1,054 feet | |

**PERCOLATION TEST** (presoaking for a minimum of 1 hour)

| Time | Time Interval (min) | Initial Reading (feet below the top of the pipe) | Final Reading (feet below the top of the pipe) | Initial Water Level (feet above bottom of hole) | Final Water Level (feet above bottom of hole) | Δ in Water Level (inches) | Measured Raw Percolation Rate (inches/hour) |
|---|---|---|---|---|---|---|---|
| 12:50 PM | 30.0 | 2.00 | 2.95 | 1.0 | 0.05 | 11.40 | 5.5 |
| 1:20 PM | | | | | | | |
| 1:22 PM | 10.0 | 2.00 | 2.40 | 1.0 | 0.60 | 4.80 | 5.0 |
| 1:32 PM | | | | | | | |
| 1:33 PM | 10.0 | 2.00 | 2.35 | 1.0 | 0.65 | 4.20 | 4.2 |
| 1:43 PM | | | | | | | |
| 1:44 PM | 10.0 | 2.00 | 2.30 | 1.0 | 0.70 | 3.60 | 3.5 |
| 1:54 PM | | | | | | | |
| 1:55 PM | 10.0 | 2.00 | 2.25 | 1.0 | 0.75 | 3.00 | 2.9 |
| 2:05 PM | | | | | | | |
| 2:06 PM | 10.0 | 2.00 | 2.25 | 1.0 | 0.75 | 3.00 | 2.9 |
| 2:16 PM | | | | | | | |
| 2:17 PM | 10.0 | 2.00 | 2.25 | 1.0 | 0.75 | 3.00 | 2.9 |
| 2:27 PM | | | | | | | |
| 2:28 PM | 10.0 | 2.00 | 2.24 | 1.0 | 0.76 | 2.88 | 2.8 |
| 2:38 PM | | | | | | | |
| 2:39 PM | 10.0 | 2.00 | 2.24 | 1.0 | 0.76 | 2.88 | 2.8 |
| 2:49 PM | | | | | | | |
| | | | | | | | 2.8 |

| | | |
|---|---|---|
| Reduction factor for boring percolation | $RF_t$ = | 2.00 |
| Site variability, number of tests, and thoroughness of subsurface investigation | $RF_v$= | 2.00 |
| Long-term siltation, plugging, and maintenance | $RF_s$= | 2.00 |

**Percolation Test performed according to the Administrative Manual, County of los Angeles, Department of Public Works, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS 200.2 (6/30/17)**

| | | |
|---|---|---|
| Corrected Percolation Rate (Infiltration Rate) = | 0.3 | in/hour |

TETRA TECH

# PERCOLATION DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Project: | Cales Verdes, San Fernando | | Job No: | TET 17 141E | |
| Test Hole No: | **P-4** | | Date Excavated: | Thursday, January 18, 2018 | |
| Test Hole Depth (feet): | 3.3 | feet | Soil Classification: | Silty SAND with Gravel and Well graded SAND with Gravel (SM/SW) | |
| Stick up Length (feet): | 0.0 | feet | | | |
| Sandy Soil Criteria Tested By: | Andrew McLarty C.E.G | | Date: | Thursday, January 18, 2018 | Presoak: >1 hours |
| Actual Percolation Tested By: | Andrew McLarty | | Date: | Friday, January 19, 2018 | |
| Test Hole Diameter Inches): | 8 | inches | Latitude: | 34.278657° | Longitude: -118.447772° |
| Casing Diameter: | 3 | inches | Elevation: | 1,041 feet | |

**PERCOLATION TEST** (presoaked for more than 1 hour)

| Time | Time Interval (min) | Initial Reading (feet below the top of the pipe) | Final Reading (feet below the top of the pipe) | Initial Water Level (feet above bottom of hole) | Final Water Level (feet above bottom of hole) | Δ in Water Level (inches) | Measured Raw Percolation Rate (inches/hour) |
|---|---|---|---|---|---|---|---|
| 4:00 PM | 30.0 | 2.00 | 2.87 | 1.3 | 0.43 | 10.44 | 3.4 |
| 4:30 PM | | | | | | | |
| 6:45 AM | 10.0 | 2.00 | 2.30 | 1.3 | 1.00 | 3.60 | 2.7 |
| 6:55 AM | | | | | | | |
| 7:05 AM | 10.0 | 2.00 | 2.30 | 1.3 | 1.00 | 3.60 | 2.7 |
| 7:15 AM | | | | | | | |
| 7:25 AM | 10.0 | 2.00 | 2.25 | 1.3 | 1.05 | 3.00 | 2.2 |
| 7:35 AM | | | | | | | |
| 7:42 AM | 10.0 | 2.00 | 2.25 | 1.3 | 1.05 | 3.00 | 2.2 |
| 7:52 AM | | | | | | | |
| 8:10 AM | 10.0 | 2.00 | 2.27 | 1.3 | 1.03 | 3.24 | 2.4 |
| 8:20 AM | | | | | | | |
| 8:30 AM | 10.0 | 2.00 | 2.26 | 1.3 | 1.04 | 3.12 | 2.3 |
| 8:40 AM | | | | | | | |
| 8:40 AM | 10.0 | 2.00 | 2.25 | 1.3 | 1.05 | 3.00 | 2.2 |
| 9:50 AM | | | | | | | |
| 8:50 AM | 10.0 | 2.00 | 2.25 | 1.3 | 1.05 | 3.00 | 2.2 |
| 9:00 AM | | | | | | | |
| | | | | | | | 2.3 |

| | | |
|---|---|---|
| Reduction factor for boring percolation | $RF_t$ = | 2.00 |
| Site variability, number of tests, and thoroughness of subsurface investigation | $RF_v$= | 2.00 |
| Long-term siltation, plugging, and maintenance | $RF_s$= | 2.00 |

**Percolation Test performed according to the Administrative Manual, County of los Angeles, Department of Public Works, Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration, GS 200.2 (6/30/17)**

| | | |
|---|---|---|
| Corrected Percolation Rate (Infiltration Rate) = | 0.3 | in/hour |