CONTRACT

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

THIS CONTRACT, made and entered into the _____ day of _____, 2025, by and between the **City of Murrieta**, a municipal corporation, hereinafter referred to as "CITY," and **Murrieta Development Company, Inc.,** hereinafter referred to as "CONTRACTOR."

WITNESSETH:

That CITY and CONTRACTOR, for the consideration hereinafter named, mutually agree as follows:

1. CONTRACT DOCUMENTS. The complete Contract includes all of the Contract Documents, to wit:

☒Included ☐N/A	Quote
☒Included ☐N/A	Performance Bond
☒Included ☐N/A	Labor and Materials Bond
☒Included ☐N/A	Scope of Work, Plans and Specifications entitled Hayes Ave. at Miller Canyon Creek Bridge Replacement, City Project No. 25-490, CIP No. 11004
☒Included ☐N/A	Insurance Forms
☒Included ☐N/A	This Contract, and all modifications and amendments thereto, and the latest version of the Standard Specifications for Public Works construction, Parts 1 through 6.

The Hayes Ave. at Miller Canyon Creek Bridge Replacement Plans consist of: Sheets 1 – 4: Title Sheet, Details Sheet, RCB Plan and Profile, and Street Plan and Profile

Copies of the Standard Specifications for Public Works Construction are available from the publisher:

Building News, Inc. (BNi)
990 Park Center Drive, Suite E
Vista, CA 92081
(760) 734-1113
www.bnibooks.com

The aforementioned Standard Specifications will control the general provisions, construction materials, and construction methods for this Contract except as amended by the Plans and Technical Specifications of this Contract.

In case of conflict between the Standard Specifications for Public Works Construction and the remaining Contract Documents, the remaining Contract Documents shall take precedence over and be used in lieu of such conflicting portions.

Where the Plans or Technical Specifications describe portions of the work in general terms, but not in complete detail, it is understood that the item is to be furnished and installed completed and in place and that only the best general practice is to be used. Unless otherwise specified, CONTRACTOR shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the Contract.

The Contract Documents are complementary, and what is called for by any one document shall be as binding as if called for by all. Any conflict between this Contract and any other Contract Document shall be resolved in favor of this Contract.

2. SCOPE OF WORK. CONTRACTOR shall perform the work shown in the Scope of Work or Plans and Technical Specifications attached hereto as Appendix A and incorporated by reference; shall furnish all the labor, materials, necessary tools, expendable equipment, and all utility and transportation services required for the completion of the following project:

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
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All of said work to be performed and materials to be furnished shall be in strict accordance with the Scope of Work or Technical Specifications and the provisions of the Contract Documents hereinabove enumerated and adopted by CITY.

To the extent the provisions of Appendix A are ambiguous in relation to the provisions of this Contract, inconsistent with the provisions of this Contract, or expand upon the provisions of this Contract, the provisions of this Contract shall take precedence and the provisions of Appendix A shall not apply.

3. CITY APPROVAL. All labor, materials, tools, equipment, and services shall be furnished and work performed and completed under the direction and supervision and subject to the approval of CITY or its authorized representatives.

4. CONTRACT AMOUNT AND SCHEDULE. CITY agrees to pay and CONTRACTOR agrees to receive and accept the prices set forth in the Quote attached hereto as Appendix B and incorporated by reference as full compensation for furnishing all materials, performing all work, and fulfilling all obligations hereunder. Said compensation shall cover all expenses, losses, damages, and consequences arising out of the nature of the work during its progress or prior to its acceptance, including those for well and faithfully completing the work and the whole thereof in the manner and time specified in the aforesaid contract documents and also including those arising from actions of the elements, unforeseen difficulties or obstructions encountered in the prosecution of the work, suspension or discontinuance of the work, and all other unknowns or risks of any description connected with the work.

CONTRACTOR agrees to complete the work on **HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT** in a period not to exceed **TWENTY-FIVE (25)** working days per Section 6-7 of the Standard Specifications for Public Works Construction, commencing upon the date stated in the Notice to Proceed by CITY. Construction shall not commence until CITY has approved bonds and insurance.

5. CHANGE ORDERS. All change orders shall be approved by the City Council, except that the City Manager or his designee is hereby authorized by the City Council to make, by written order, changes or additions to the work in an amount not to exceed twenty-five (25) percent of this Contract amount and the City Manager or his designee shall notify City Council in a public meeting if changes or additions to the work exceed ten (10) percent of this Contract amount.

6. PAYMENTS/ACCEPTANCE OF WORK. The text of Subsection 9-3.2 of the Standard Specifications for Public Works Construction is hereby deleted and replaced with the following:

   The closure date for the purpose of making partial progress payments will be the last day of each month. CONTRACTOR shall prepare the approximate measurement of the work performed through the closure date and submit it to CITY for approval by the tenth (10th) day of the following month. Payments will be withheld pending receipt of any outstanding reports required by the Contract Documents. A full five percent (5%) retention will be deducted from all progress payments. Partial payments on the Contract price shall not be considered as an acceptance of any part of the work.

   Upon completion of the work, CONTRACTOR shall so notify Engineer, in writing, submit satisfactory evidence of payment for equipment, materials and labor, submit "CONTRACTOR'S AFFIDAVIT." Upon receipt of the notification, Engineer shall promptly, by personal inspection, determine the actual status of the work in accordance with the terms of the Contract. If he finds materials, equipment, or workmanship that do not meet the terms of the Contract, he shall prepare a preliminary punch list of such items and submit it to CONTRACTOR. Final determination of acceptability shall be made by CITY. Upon acceptance of the work, CITY shall file a Notice of Completion. The conditions of the guarantee shall commence on the date that CITY files a Notice of Completion. CITY shall make final payment to CONTRACTOR in the manner provided by law following the expiration of thirty-five (35) days after filing the Notice of Completion.

   The final payment shall include the entire sum found to be due hereunder after deducting all previous payments and such other lawful amounts as the terms of this Contract describe.

7. LIQUIDATED DAMAGES; EXTENSION OF TIME. In accordance with Government Code Section 53069.85, CONTRACTOR agrees to forfeit and pay to CITY the sum of **five hundred dollars ($500)** per day for each calendar day completion is delayed beyond the time allowed pursuant to paragraph 4 of this Contract. Such sum shall be deducted from any payments due to or to become due to CONTRACTOR. CONTRACTOR will be granted an extension of time and will not be assessed liquidated

damages for unforeseeable delays beyond the control of and without the fault or negligence of CONTRACTOR, including delays caused by CITY. CONTRACTOR is required to promptly notify CITY of any such delay.

8. WAIVER OF CLAIMS. Unless a shorter time is specified elsewhere in this Contract, on or before making final request for payment under paragraph 6 above, CONTRACTOR shall submit to CITY, in writing, all claims for compensation under or arising out of this Contract; the acceptance by CONTRACTOR of the final payment shall constitute a waiver of all claims against CITY under or arising out of this Contract except those previously made in writing and request for payment. CONTRACTOR shall be required to execute an affidavit, release, and indemnify agreement with each claim for payment.

9. PREVAILING WAGES. Contractor is hereby notified that this project is a public works and is subject to State prevailing wages. Pursuant to provisions of Section 1773 of the Labor Code of the State of California, the City Council has obtained the general prevailing rate of per diem wages and the general rate for holiday and overtime work in this locality for each craft, classification, or type of workman needed to execute this Contract, from Director of the Department of Industrial Relations. These rates are on file with the City Clerk or online with the California Department of Industrial Relations (www.dir.ca.gov). Copies may be obtained at cost at the City Clerk's office of Murrieta. CONTRACTOR shall post a copy of such rates at the job site and shall pay the adopted prevailing wage rates as a minimum. CONTRACTOR shall comply with the provisions of Sections 1725.5, 1771, 1773.8, 1774, 1775, 1776, 1777.5, 1777.6, 1813, and 1815 of the Labor Code.

   Pursuant to the provisions of 1775 of the Labor Code, CONTRACTOR shall forfeit to CITY, as a penalty, the sum of fifty dollars ($50.00) for each calendar day, or portion thereof, for each laborer, worker, or mechanic employed, paid less than the stipulated prevailing rates for any work done under this Contract, by it or by any subcontractor under it, in violation of the provisions of the Contract.

   All contractors and subcontractors must be registered with the Department of Industrial Relations, State of California (DIR) prior to submitting a bid on any public works project, pursuant to Labor Code section 1725.5. Quotes from contractors or subcontractors that are not currently registered as required will be deemed nonresponsive and will not be considered. This project is subject to compliance monitoring and enforcement by the DIR.

10. WORKERS' COMPENSATION LIABILITY INSURANCE. CONTRACTOR, by executing this Agreement, hereby certifies:

    "I am aware of the provision of Section 3700 of the Labor Code that requires every employer to be insured against liability for Workers' Compensation or undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract."

11. INSURANCE. CONTRACTOR shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property that

may arise from or in connection with the performance of the project by CONTRACTOR, its agents, representatives, employees, or subcontractors. The cost of such insurance shall be borne by CONTRACTOR and, where applicable, included in CONTRACTOR's Quote.

A. Liability Insurance. Before the Contract is executed on behalf of CITY, a bidder to whom the Contract has been awarded shall furnish to CITY original certificates and amendatory endorsements, or copies of the applicable insurance language, effecting coverage required by this contract as listed below. All certificates and endorsements are to be received and approved by CITY before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive CONTRACTOR's obligation to provide them. CITY reserves the right to require complete, certified copies of all required insurance policies, including endorsements, required by these specifications, at any time.

1. Commercial General Liability Insurance: Insurance Services Office Form CG 00 01, including products and completed operations, with limits of no less than **$2,000,000** per occurrence for bodily injury, personal injury, and property damage. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

2. Worker's Compensation insurance as required by the State of California, with Statutory Limits, and Employers' Liability insurance with a limit of no less than $1,000,000 per accident for bodily injury or disease.

3. Automobile Liability: Insurance Services Office Form Number CA 0001 covering Code 1 (any auto), with limits no less than **$1,000,000** per accident for bodily injury and property damage.

4. Excess or Umbrella Liability Insurance (Over Primary) if used to meet limit requirements, shall provide coverage at least as broad as specified for the underlying coverages. Such policy or policies shall include as insureds those covered by the underlying policies, including additional insureds. Coverage shall be "pay on behalf", with defense costs payable in addition to policy limits. There shall be no cross liability exclusion precluding coverage for claims or suits by one insured against another. Coverage shall be applicable to CITY for injury to employees of CONTRACTOR, subcontractors or others involved in the Work. The scope of coverage provided is subject to approval of CITY following receipt of proof of insurance as required herein.

B. Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by CITY. At the option of CITY, either: CONTRACTOR shall cause the insurer to reduce or eliminate such deductibles or self-insured retentions as respects CITY, its officers, officials, employees, and volunteers; or CONTRACTOR shall provide a financial guarantee satisfactory to CITY guaranteeing payment of losses and related investigations, claim administration,

and defense expenses. The insurance policies are to contain, or be endorsed to contain, the following provisions:

1. **CITY, its officers, officials, employees, and volunteers are to be covered as additional insureds** on the CGL and automobile liability policies with respect to liability arising out of work or operations performed by or on behalf of CONTRACTOR including materials, parts, or equipment furnished in connection with such work or operations and automobiles owned, leased, hired, or borrowed by or on behalf of CONTRACTOR. General liability coverage can be provided in the form of an endorsement to CONTRACTOR's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 23 37 forms if later revisions used).

2. For any claims related to this project, **CONTRACTOR's insurance coverage shall be primary** insurance as respects CITY, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by CITY, its officers, officials, employees, or volunteers shall be in excess of CONTRACTOR's insurance and shall not contribute with it.

3. Each insurance policy required by this clause shall provide that coverage shall not be canceled, except with notice to CITY.

C. Acceptability of Insurers. Insurance is to be placed with insurers with a Bests' rating of no less than A:VII.

D. Waiver of Subrogation. **CONTRACTOR hereby agrees to waive rights of subrogation which any insurer of CONTRACTOR may acquire** from CONTRACTOR by virtue of the payment of any loss. CONTRACTOR agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation. **The Workers' Compensation policy shall be endorsed with a waiver of subrogation** in favor of CITY for all work performed by CONTRACTOR, its employees, agents and subcontractors.

E. Subcontractors. CONTRACTOR shall include all subcontractors or shall furnish separate endorsements for each subcontractor. All coverage for subcontractors shall be subject to all the requirements stated herein.

12. TIME OF THE ESSENCE. Time is of the essence in this Contract.

13 INDEMNIFICATION. All work covered by this Contract done at the site of construction or in preparing or delivering materials to the site shall be at the risk of CONTRACTOR alone. CONTRACTOR agrees to save, indemnify, hold harmless, and defend CITY, its officers, employees, and agents against any and all liability, injuries, or death of persons (CONTRACTOR's employees included) and damage to property, arising directly or indirectly out of the obligations herein undertaken or out of the operations conducted by CONTRACTOR, save and except claims or litigations arising through the sole active negligence or sole willful misconduct of CITY.

14 CONTRACTOR'S INDEPENDENT INVESTIGATION. No plea of ignorance of conditions that exist or that may hereafter exist or of conditions of difficulties that may

be encountered in the execution of the work under this Contract, as a result of failure to make the necessary independent examinations and investigations, and no plea of reliance on initial investigations or reports prepared by CITY for purposes of letting this Contract will be accepted as an excuse for any failure or omission on the part of CONTRACTOR to fulfill in every detail all requirements of this Contract. Nor will such reasons be accepted as a basis for any claims whatsoever for extra compensation or for an extension of time.

15. GRATUITIES. CONTRACTOR warrants that neither it nor any of its employees, agents, or representatives has offered or given any gratuities or promises to CITY's employees, agents, or representatives with a view toward securing this Contract or securing favorable treatment with respect thereto.

16. CONFLICT OF INTEREST. CONTRACTOR warrants that he has no blood or marriage relationship, and that he is not in any way associated with any CITY officer or employee, or any architect, engineer, or other preparer of the Plans and Technical Specifications for this project. CONTRACTOR further warrants that no person in its employ has been employed by CITY within one (1) year of the date of this Contract.

17. CONTRACTOR'S AFFIDAVIT AND FINAL RELEASE. After completion of the work contemplated by this Contract, CONTRACTOR shall file with the City Manager an affidavit stating that all workers and persons employed, all firms supplying materials, and all subcontractors upon the project have been paid in full, and that there are no claims outstanding against the project for either labor or materials, except certain items, if any, to be set forth in an affidavit covering disputed claims or items in connection with a Stop Notice that has been filed under the provisions of the laws of the State of California. The Contractor's Affidavit and Final Release shall be in substantially the form provided in Appendix C herein.

18. SIGNATURE OF CONTRACTOR.

Corporations:

The signature must contain the name of the corporation, must be signed by the President and Secretary or Assistant Secretary, and the corporate seal must be affixed. Other persons may sign for the corporation in lieu of the above if a certified copy of a resolution of the corporate board of directors so authorizing them to do so is on file in the City Clerk's office.

Partnerships:

Names of all persons comprising the partnership or co-partnership must be stated. Bid must be signed by all partners comprising the partnership unless proof in the form of a certified copy of a certificate of partnership acknowledging signer to be a general partner is presented to the City Clerk, in which case the general partner may sign.

Joint Ventures:

Bids submitted as joint ventures must so state and be signed by each joint venturer.

Individuals:

Bids submitted by individuals must be signed by the bidder, unless an up-to-date power of attorney is on file in the City Clerk's office, in which case said person may sign for the individual.

The above rules also apply in the case of the use of a fictitious firm name. In addition, however, where the fictitious name is used, it must be so indicated in the signature.

19. SUBSTITUTED SECURITY. In accordance with Section 22300 of the Public Contracts Code, CONTRACTOR may substitute securities for any monies withheld by CITY to ensure performance under the Contract. At the request and expense of CONTRACTOR, securities equivalent to the amount withheld shall be deposited with CITY or with a State or Federally chartered bank or an escrow agent who shall pay such monies to CONTRACTOR upon notification by CITY of CONTRACTOR's satisfactory completion of the Contract. The type of securities deposited and the method of release shall be approved by the City Attorney's office.

20. RESOLUTION OF CLAIMS. Any dispute or claim arising out of this Contract shall be arbitrated pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2 of the California Public Contracts Code.

21. NOTICE TO CITY OF LABOR DISPUTES. Whenever CONTRACTOR has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of the Contract, CONTRACTOR shall immediately give notice thereof, including all relevant information with respect thereto, to CITY.

22. BOOKS AND RECORDS. CONTRACTOR's books, records, and plans or such part thereof as may be engaged in the performance of this Contract, shall at all reasonable times be subject to inspection and audit by any authorized representative of CITY.

23. UTILITY LOCATION. CITY acknowledges its responsibilities with respect to locating utility facilities pursuant to California Government Code Section 4215.

24. REGIONAL NOTIFICATION CENTERS. CONTRACTOR agrees to contact the appropriate regional notification center in accordance with Government Code Section 4216.2.

25. TRENCH PROTECTION AND EXCAVATION. CONTRACTOR shall submit its detailed plan for worker protection during the excavation of trenches required by the scope of the work in accordance with Labor Code Section 6705.

26. HAZARDOUS CONDITIONS

    A. CONTRACTOR shall, without disturbing the condition, notify CITY, in writing, as soon as CONTRACTOR, or any of CONTRACTOR's subcontractors, agents, or employees have knowledge and reporting is possible, of the discovery of any of the following conditions:

        1. The presence of any material that CONTRACTOR believes is hazardous waste, as defined in Section 25117 of the Health and Safety Code;

2. Subsurface or latent physical conditions at the site differing from those indicated in the specifications; or

3. Unknown physical conditions at the site of any unusual nature, different materially for those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract.

B. Pending a determination by CITY of appropriate action to be taken, CONTRACTOR shall provide security measures (e.g., fences) adequate to prevent the hazardous waste or physical conditions from causing bodily injury to any person.

C. CITY shall promptly investigate the reported conditions. If CITY, through and in the exercise of its sole discretion, determines that the conditions do materially differ or do involve hazardous waste, and will cause a decrease or increase in CONTRACTOR's cost of, or time required for, performance of any part of the work, then CITY shall issue a change order.

D. In the event of a dispute between CITY and CONTRACTOR as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in CONTRACTOR's cost of, or time required for, performance of any part of the work, CONTRACTOR shall not be excused from any scheduled completion date, and shall proceed with all work to be performed under the contract. CONTRACTOR shall retain any and all rights that pertain to the resolution of disputes and protests between the parties.

27. INSPECTION. The work shall be subject to inspection and testing by CITY and its authorized representatives during manufacture and construction and all other times and places, including, without limitation, the plans of CONTRACTOR and any of its suppliers. CONTRACTOR shall provide all reasonable facilities and assistance for the safety and convenience of inspectors. All inspections and tests shall be performed in such manner as to not unduly delay the work. The work shall be subject to final inspection and acceptance notwithstanding any payments or other prior inspections. Such final inspection shall be made within a reasonable time after completion of the work.

28. DISCRIMINATION. CONTRACTOR represents that it has not, and agrees that it will not, discriminate in its employment practices on the basis of race, creed, religion, national origin, color, sex, age, or handicap.

29. GOVERNING LAW. This Contract and any dispute arising hereunder shall be governed by the law of the State of California.

30. WRITTEN NOTICE. Any written notice required to be given in any part of the Contract Documents shall be performed by depositing the same in the U.S. Mail, postage prepaid, directed to the address of CONTRACTOR as set forth in the Contract Documents, and to CITY addressed as follows:

Robert K. Moehling
Director of Public Works
City of Murrieta

1 Town Square
Murrieta, CA 92562

31. The Contractor's license required in the performance of this Contract is **Class A.**

32. Contractor shall obtain and pay for all licenses required by City.

33. Contractor's activities shall be confined to the hours between 7:00 a.m. and 4:30 p.m., Monday through Friday, excluding City designated holidays. Deviation from these hours will not be permitted without the prior consent of Engineer, except in emergencies involving immediate hazard to persons or property.

    In the event of either a requested or emergency deviation, inspection service fees will be charged against Contractor. The service fees will be calculated at overtime rates, including benefits, overhead, and travel time. The service fees will be deducted from any amounts due Contractor.

34. GUARANTY

    All work shall be guaranteed for a period of one (1) year from the date of acceptance by City. Contractor shall promptly make all needed repairs arising out of defective materials, workmanship, and equipment.

    City is hereby authorized to make such repairs if within ten (10) days after giving written notice to Contractor, or its agent, Contractor should fail to make or undertake with due diligence the aforesaid repairs; provided, however, that in case of an emergency, where, in the opinion of City, delay would cause serious loss or damage, repairs may be made without notice being sent to Contractor, and Contractor shall pay the costs thereof.

    Contractor shall, upon completion of the Contract and prior to filing of the Notice of Completion, post a Maintenance Bond in the amount of ten percent (10%) of the Contract value. The Maintenance Bond shall remain in full force and effect through the guaranty period of one (1) year.

35. CONTRACT BONDS

    A. General. Before execution of the Contract by City, Contractor shall file with the City Engineer surety bonds satisfactory to City in the amounts and for the purposes noted below. Bonds shall be duly executed and notarized by a responsible corporate surety, authorized to issue such bonds in the State of California and secured through an authorized agent with an office in California. Contractor shall pay all bond premiums, costs, and incidentals.

    B. Payment Bond. The Payment Bond (material and labor) shall be for not less than one hundred percent (100%) of the Contract price to satisfy claims of material suppliers and of mechanics and laborers employed by CONTRACTOR on the work. The bond shall be maintained by Contractor in full force and effect until the completed work is accepted by City and until all claims for materials and labor are paid.

    C. Faithful Performance Bond. The Faithful Performance Bond shall be for one hundred percent (100%) of the Contract price to guaranty faithful performance

of all work, within the time prescribed in a manner satisfactory to City, and that all materials and workmanship will be free from original or developed defects.

IN WITNESS WHEREOF, the parties hereto have caused this Contract to be executed on the date first above written.

DATED:_____

CONTRACTOR:

By:_____

_____
Print or type NAME

_____
Print or type TITLE

_____
Phone Number

By:_____

_____
Print or type NAME

_____
Print or type TITLE

_____
Phone Number

DATED:_____

CITY OF MURRIETA

By:_____
Cindy Warren, Mayor

APPROVED AS TO FORM:

_____
Tiffany Israel, City Attorney

ATTEST:

_____
Cristal McDonald , City Clerk

CITY OF MURRIETA, DEPARTMENT OF PUBLIC WORKS

APPENDIX A

SCOPE OF WORK / PLANS & TECHNICAL SPECIFICATIONS

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

CITY OF MURRIETA, DEPARTMENT OF PUBLIC WORKS
GENERAL SPECIFICATIONS

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

SCOPE OF WORK

The scope of work will consist of demolition (remove existing bridge structure, debris, vegetation, and minor grading), survey, regrading/compaction, construct a Cast-In-Place reinforced concrete box (RCB), concrete wingwall, riprap energy dissipator, concrete barrier and posts, guardrail, full depth pavement structural section, and other ancillary work necessary to complete the scope of the project as shown on the plans, these special provisions, or as directed by the City Engineer.

All material and equipment shall be delivered by Contractor to the site, or to the City yard if removal and salvage is specified on plans.

LOCATION OF WORK

The project is located on Hayes Avenue at Miller Canyon Creek, approximately 500' NW of Ivy Street.

TIME OF COMPLETION

Contractor shall complete all work in every detail within the time limits specified in the Instructions to Bidders, Section 18, herein.

UTILITY REQUIREMENTS

Contractor is advised of the existence of the utility notification service provided by Underground Service Alert (USA). USA member utilities will provide Contractor with the precise locations of their substructures in the construction area when Contractor gives at least two (2) working days' notice to USA by calling l-800-422-4133.

Contractor shall notify the agencies listed in Attachment A (of this Appendix) at least two (2) working days in advance of excavating around any of their structures. The utility companies listed can be contacted as applicable.

The California Public Utilities Commission mandates that, in the interest of public safety, mainline gas valves be maintained in a manner to be readily accessible and in good operating condition. Contractor shall notify the Southern California Gas Company's Headquarters Planning Office at (951) 634-3258 at least two (2) working days prior to the start of construction.

FLOW AND ACCEPTANCE OF WATER

It is anticipated that storm, surface, or other waters will be encountered at various times during the work herein contemplated. Contractor, by submitting a bid, acknowledges that he has investigated the risk arising from such waters and has prepared his bid accordingly; and Contractor submitting a bid assumes all said risk.

Contractor shall conduct his operations in such a manner that storm or other existing waters may proceed uninterrupted along their existing street or drainage courses. Diversions of water for short reaches to

protect construction in progress will be permitted if public and/or private properties, in the opinion of the Engineer, are not subject to probability of damage. Contractor shall obtain written permission from the applicable public agency or property owner before any diversion of water outside of public right-of-way will be permitted.

REMOVAL OF WATER

Contractor shall provide and maintain at all times during construction ample means and devices to promptly remove and properly dispose of all water entering the excavations or other parts of the work. No concrete footing or floor shall be laid in water, nor shall water be allowed to rise over them until the concrete or mortar has set. De-watering for the structures and pipelines shall commence when ground water is first encountered and shall be continuous until such time as water can be allowed to rise in accordance with the above paragraph. De-watering shall be accomplished by well points or some other method that will ensure a dry hole and preservation of final lines and grade of the bottoms of excavation, all subject to the approval of Engineer.

Disposal of water from de-watering operations shall be the sole responsibility of Contractor. Disposal methods shall conform to the Porter-Cologne Water Quality Control Act of 1974, the Federal Water Pollution Control Act Amendments of 1972 & the California Administrative Code, Title 23, Chapter 3.

Full compensation of de-watering shall be considered as included in the Contract prices paid for the related items of work, and no additional compensation will be allowed therefor.

TRENCH SAFETY AND SHORING EXCAVATION

In accordance with Section 6500 of the Labor Code, Contractor is required to obtain a permit from the Division of Industrial Safety for any trench or excavation that is five (5) feet or more in depth and into which a person is required to descend.

Contractor shall furnish all labor, equipment, and materials required to design, construct, and remove all sheeting, shoring, and bracing or other equivalent method of support of this project.

Excavation for any trench five (5) feet or more in depth shall not begin until Contractor has received approval from Engineer of Contractor's detailed plan for worker protection from hazards of caving ground. Such plan shall be submitted at least five (5) days before Contractor intends to begin excavation and shall show the details of the design of shoring, bracing, sloping, or other provisions to be made for worker protection during excavation. No such plan shall allow the use of shoring, sloping, or a protective system less effective than required by Construction Safety Orders of the Division of Industrial Safety; and if such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by Engineer who is registered as a Civil or Structural Engineer in the State of California.

Prior to the beginning of excavations requiring shoring, Contractor shall designate, in writing, to Engineer someone whose responsibility it is to supervise the project safety measures and someone whose responsibility it is to supervise the installation and removal of sheeting, shoring, and bracing.

In addition to shoring the excavations in accordance with the minimum requirements of Industrial Safety Orders, it shall be the Contractor's responsibility to provide any and all additional shoring required to support the sides of the excavation against the effects of load which may exceed those desired by using the criteria set forth in the Industrial Safety Orders. The Contractor shall be solely

responsible for any damages which may result from his failure to provide adequate shoring of the excavation under any and all of the conditions of loading which may exist or which may arise during construction of the project.

Contractor shall include in his bid all costs for the above requirements. Full compensation for sheeting, shoring, bracing, and all other things necessary shall be considered as included in the appropriate bid items of work, and no additional allowance will be made therefor.

STANDARD SPECIFICATIONS

The Standard Specifications are contained in the 2015 edition of the **Standard Specifications for Public Works Construction** (Greenbook), including all supplements as written and promulgated by Public Works Standards, Inc. Copies of those Standard Specifications are available from the publisher:

Building News, Inc. (BNi)
990 Park Center Drive, Suite E
Vista, CA 92081
(760) 734-1113
www.bnibooks.com

The Standard Specifications set forth above will control the general provisions for this Contract except as amended by the Plans, Special Provisions, or other Contract Documents, and the deletion of Part 7: Street lighting and Traffic Signal Systems.

The 2024 edition of Standard Specifications for Public Works Construction (Greenbook) shall be used for the cast-in-place reinforced concrete box as indicated in the Technical Provisions herein.

The 2018 State of California Department of Transportation Standard Specifications will control the installation of signs and striping for this Contract, except as amended by the Plans, Special Provisions, or other Contract Documents. Only those sections requiring amendment or elaboration, or specifying options, are called out.

In case of conflict between the Standard Specifications or State Standard Specifications and the Special Provisions, the Special Provisions shall take precedence over and be used in lieu of such conflicting portions.

Where the Plans or Specifications describe portions of the work in general terms, but not in complete detail, it is understood that the item is to be furnished and installed complete and in place and that only the best general practice is to be used. Unless otherwise specified, Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the Contract.

WAGE RATES AND LABOR CODE REQUIREMENTS

Wage Rates

Contractor and all subcontractors shall be required to adhere to the general prevailing rate of per diem wages as determined and published by the State Director of the Department of Industrial Relations, pursuant to Section 1770, 1773, and 1773.2 of the California Labor Code. Copies of these rates and the latest revisions thereto are on file in the Office of the City Clerk and are available for review upon request.

Apprentices

Section 1777.5 requires Contractor or subcontractor employing tradesmen in any apprenticeable occupation to apply to the Joint Apprenticeship Committee nearest the site of the public works project that administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen to be used in the performance of the Contract.

Contractor is required to make contributions to funds established for the administration of apprenticeship programs if he employs registered apprentices or journeymen in any apprenticeable trade and if other contractors on the public works site are making such contributions.

Information relative to apprenticeship standards, contributions, wage schedules, and other requirements may be obtained from the State Director of Industrial Relations or from the Division of Apprenticeship Standards.

Clayton Act and Cartwright Act

Section 4551 of the State Government Code specifies that in executing a public works contract with City to supply goods, services, or materials, Contractor or subcontractors offer and agree to assign to City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 commencing with Section 16700) of Part 2 of Division 7 of the Business and Professional Code arising from purchase of goods, services, or materials pursuant to the Contract or subcontract. This assignment shall become effective when City tenders final payment to Contractor without further acknowledgment by the parties.

SUBSTITUTION OF SECURITIES

In conformance with the State of California Public Contract Code, Section 22300, Contractor may substitute securities for any monies withheld by City to ensure performance under the Contract.

At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with City or with a State or Federally chartered bank as the escrow agent who shall pay such monies to Contractor upon notification by City of Contractor's satisfactory completion of the Contract.

The type of securities deposited and the method of release shall be approved by the City Attorney's office.

WEEKLY CONSTRUCTION UPDATE MEETINGS

Upon the start of construction, the contractor shall schedule a reoccurring virtual weekly meeting at an agreed upon time with the City. The contractor shall be responsible for providing a meeting agenda as well as an updated **construction schedule** listing construction activities and any subcontractors that will be present on site. The contractor shall have both an office and field representative present at the meeting. Any subcontractors listed on the 3 week look ahead shall have a representative present at the meeting.

SPECIAL PROVISIONS

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

THE FOLLOWING SPECIAL PROVISIONS ARE TO BE USED IN CONJUNCTION WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK)" UNLESS OTHERWISE NOTED.

SECTION 1 — TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 DEFINITIONS

[Add or replace with the following]:

Agency	-	City of Murrieta (City)
Board	-	City Council of the City
Caltrans	-	California Department of Transportation
City	-	City of Murrieta
County	-	County of Riverside
Director	-	Director of the Public Works Department, City of Murrieta, acting either directly or through his properly authorized agents, each agent acting only within the scope of authority designated to him.
EMWD		Eastern Municipal Water District
Engineer	-	Director of the Public Works Department/City Engineer, City of Murrieta, acting either directly or through his properly authorized agents, each agent acting only within the scope of authority designated to him.
EVMWD		Elsinore Valley Municipal Water District
Final Acceptance	-	That stage of construction and plant establishment that allows City to accept the project as completed (no punch list items remaining unresolved). When Contractor believes the project is ready for final acceptance, he shall call for a final acceptance inspection. Director will inspect the project to verify its completion. Should there be elements that are not completed, Director will record same (final acceptance punch list) and bring them to the attention of Contractor. All punch list items must be resolved prior to final acceptance. When, in Director's judgment, the work has been completed in accordance with the Plans and Specifications

		and is ready for final acceptance, he will so certify to the Board, which may accept the completed work. Upon acceptance of the work by the Board, the City Clerk will file the Notice of Completion with the County Recorder.
Federal	-	United States of America
Standard Specifications	-	Standard Specifications for Public Works Construction, 2015 edition (Greenbook)
State Standard Specifications		State of California, Department of Transportation, Standard Specifications, dated 2010
R.C.W.D.	-	Rancho California Water District
R.C.F.C.D. & W.C.D.	-	Riverside County Flood Control and Water Conservation District
Substantial Completion	-	That stage of construction that allows Director to occupy or use the project for its intended purpose. When a project includes a plant establishment period, the date of the start of the plant establishment period may, at the discretion of Director, be used as the basis for determining the substantial completion date, provided that all elements of the project, other than the landscape, are substantially completed as defined above. The substantial completion date will be determined by Director in cooperation with Contractor and establish the termination of the time period for construction, and this date is used as a basis for determining whether liquidated damages are assessable. In no case shall the plant establishment period end prior to the final acceptance of the project. When Contractor believes that construction of the project is substantially complete, he shall call for an inspection. Director will inspect the total project to verify its completion by Contractor. Should there be elements of the project that are not yet completed, Director will record same (substantial completion punch list) and bring them to the attention of Contractor. All such items must be completed prior to acceptance of the project substantially complete. In the event re-inspection of any project element results in additional cost to City for consultant or staff time, Director retains the right to withhold sufficient funds from payments due Contractor to cover the cost to City of such re-inspection.
Traveled Way	-	That portion of the roadway reserved for the movement of vehicles for the general public, exclusive of shoulders and auxiliary lanes. When traffic has been diverted or restricted to certain lanes, with the approval of Engineer, these diversions or restricted lanes become the traveled way.

W.M.W.D. - Western Municipal Water District

PART 1 – GENERAL PROVISIONS

1-4 UNITS OF MEASURE

1-4.1 GENERAL

[Replace with the following]:

U.S. Standard Measure is the principal measurement system in these contract documents and shall be used for construction.

SECTION 2 — SCOPE AND CONTROL OF WORK

2-1 AWARD AND EXECUTION OF CONTRACT

[Add the following]

Within five (5) working days after the date of the Notice of Award, Contractor shall execute and return the following Contract Documents to City:

-Labor and Materials Bond
-Performance Bond
-Insurance Forms in Appendix B
-Vendor Application
-W-9 form
-Business License Application

Failure to comply with the above can result in annulment of the award and forfeiture of the Proposal Guarantee.

The Contract shall not be considered binding upon City until executed by the authorized City officials.

A corporation to which an award is made may be required, before the Contract Agreement is executed by City, to furnish evidence of its corporate existence, of its right to enter into contracts in California, and that the officers signing the Contract and Bonds for the corporation have the authority to do so.

2-5 PLANS AND SPECIFICATIONS

2-5.1 GENERAL

[Replace the first paragraph with the following]:

Contractor shall maintain a control set of Plans and Specifications on the project site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show the as-built conditions. Upon completion of all work, Contractor shall return the control set to Engineer. Final payment will not be made until this requirement is met.

Adjustments to the layout of this Plan may be necessary due to the unknown existing conditions. It is Contractor's responsibility to retain the design intent. If a layout discrepancy should occur, Contractor is to contact City's representative.

2-5.3 SUBMITTALS

[Add the following]:

Contractor shall anticipate submitting the following submittals in addition to those identified in the Special Provisions:

No.	Submittal	Section Reference
1	Construction Schedule	6-1.1 Schedule
2	Project Information Sign	7-12.1 Project Information Sign
3	CAB or CMB	200-2 Untreated Base Material
4	PCC Mix design	201-1 Portland Cement Concrete
5	Asphalt Concrete Mix design	203-6 Asphalt Concrete
6	Hand Rails	
7	Formwork	410 Formwork
8	Riprap/Energy Dissipator System	
9	Guardrail	

2-6 WORK TO BE DONE

2-6.1 CITY-FURNISHED MATERIALS

[Add the following]:

Materials <u>will not</u> be furnished by the City on this project.

Note: All materials and equipment shall be furnished by the <u>Contractor</u>.

2-7 SUBSURFACE DATA

[Add the following]:

The City has performed a geotechnical investigation and commissioned the preparation of a report for this project, which has been included in Attachment B. The City takes no responsibility for the interpretations made by the Contractor in his review of this information. Should the Contractor obtain any additional geotechnical information for this project, it shall be at no additional cost to the City.

2-9 SURVEYING

2-9.1 PERMANENT SURVEY MARKERS

[Replace the entire section with the following]:

The Contractor shall take all necessary measures to ensure the preservation of survey monuments, ties and benchmarks. The Contractor shall not disturb permanent survey monuments, ties or benchmarks without the consent of the Engineer. The Contractor will bear the expense for replacing any monumentation that may be disturbed without permission.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the Contractor shall adjust the monument cover to the new grade or remove and replace the monument and/or ties per the City of Murrieta Standard No. 's 616, 617b, and 617c, unless otherwise specified. All new monuments and ties shall conform to the Professional Land Surveyors' Act of the Business and Professions Code, Section 8700 et seq. When a monument or tie is to be re-set, the Contractor will be required to record a map, field notes, and/or other pertinent record, with the County of Riverside and shall submit a copy to the City Engineer.

2-9.2 SURVEY SERVICE

[Replace the entire section with the following]:

The Contractor shall provide all surveying and construction services. All work shall be performed under the supervision of a Licensed Surveyor or a pre-1982 Registered Civil Engineer, pursuant to the California Business and Professions Code 8729, and shall conform to the quality and practice required by the Engineer.

Construction staking shall be performed as necessary to control the work. Construction stakes and marks shall be furnished and set with accuracy adequate to assure that the completed work conforms to the lines, grades, and sections shown on the plans.

All horizontal and vertical survey control monuments shown on the layout plans shall be checked by the contractor for description, location and accuracy, prior to their use.

The Contractor shall be responsible for protecting all existing horizontal and vertical survey controls, monuments, ties and bench marks located within the limits of the project. If any of the above requires removal, relocating or resetting, the Contractor shall, prior to any construction work and under the supervision of a California-licensed land surveyor or pre-1982 licensed civil engineer, establish sufficient temporary ties and bench marks to enable the points to be reset after completion of construction.

Any ties, monuments and bench marks disturbed during construction shall be reset per Caltrans standards after construction and the tie notes submitted to the Engineer on 8-1/2" x 11" note paper. The Contractor and its sureties shall be liable for, at his expense, any resurvey required due to his negligence in protecting existing ties, monuments, bench marks or any such horizontal and vertical controls.

The Contractor shall comply with The Land Surveyors Acts//9771 (Record of Surveys - Monumentation) and//8773 (Corner Records - Records of Survey for "Lost Corners").

Survey monuments and ties shall be established, marked, identified and referenced in accordance with the Riverside County Road Improvement Standards and Specifications, Specification Section 21. Survey notes, drawings, calculations and other survey documents/materials shall be completed and delivered to the Engineer on survey note sheets.

Field surveys for control of construction shall be the responsibility of the Contractor.

The Contractor shall be wholly responsible for the lines and grades and for the stakes and marks for the construction of all improvements shown on the plans.

All computations necessary to establish the exact position of the work from control points shall be made by the Contractor. All computations, survey notes, and other records necessary to accomplish work shall be neat, legible and accurate. Copies of such computations, notes and other records shall be furnished to the Engineer prior to beginning work that requires their use. Construction stakes shall be removed from the site of the work when no longer needed.

Upon completion of construction staking and prior to acceptance of the contract, all computations, survey notes, and other data used to accomplish the work shall be furnished to the Engineer. All computations and final survey notes shall be reviewed and accepted by the Engineer. Prior to completion of contract, and shall become the property of the City before the acceptance of the contract.

The Contractor shall provide one set of line and grade stakes referring to ultimate centerline immediately prior to the beginning of the period of utility relocation by others (immediately after pavement removal). This set of stakes is for utility owner use to control the relocation of their utilities. Stakes shall be a minimum of 100-foot on center and shall be at an offset or offsets suitable for the stated purpose, or as directed by the Engineer. Contractor shall provide survey notes to each utility owner.

Grade certifications shall be provided by a Licensed Surveyor or a pre-1982 Registered Civil Engineer for each grade plane for the project including, but not limited to, subgrade, base grade, and finished surface.

The Contractor shall be responsible for providing sufficient topographical surveying necessary for determining earthwork calculations. The Contractor shall verify the accuracy of the existing topography as identified on the plans and provide sufficient survey shots during excavation to establish a full topography of the finish grade surface. Copies of the survey notes shall be submitted to the City Engineer.

The Contractor shall submit to the Engineer a minimum of 7 days prior to the start of work a list of controlling survey monuments which may be disturbed, or installed per plan. The Registered Land Surveyor shall:
a) set survey points outside the affected work area that reference and locate each controlling survey monument that may be disturbed,
b) file a Corner Record or Record of Survey with the County Surveyor after setting the survey points to be used for re-establishment of the disturbed controlling survey monuments, and

c) file a Corner Record or Record of Survey with the County Surveyor after re-establishment of the disturbed controlling survey monuments, or establishment of a new survey monument.

All cost associated with Surveying Services and Construction staking shall be considered included in the cost of various bid items and no additional compensation will be allowed thereafter and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing all surveying services for construction staking, tying out existing survey monuments if in conflict with the plan, and resetting conflicting existing monuments, all as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

SECTION 3 — CHANGES IN WORK

3-3 EXTRA WORK

3-3.2.3 MARKUP

[Add the following as the first paragraph]:

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers, and other personnel not working directly on the change order and pickups or yard trucks used by the above personnel. These costs shall not be reported as labor or equipment elsewhere except when actually performing work directly on the change order and then shall only be reported at the labor classification of the work performed.

3-3.2.3.1 WORK BY CONTRACTOR

[Add the following]:

The Contractor's markup to the Contractor's costs as determined under 3-3.2.2 shall not exceed 20% for labor and 15% for materials and equipment and shall constitute the markup for all overhead and profit on work by the Contractor.

3-3.2.3.2 WORK BY SUBCONTRACTOR

[Add the following]:

The Contractor's markup to the Subcontractor's costs and markup shall not exceed 5% and shall constitute the markup for all overhead and profit for the Contractor on work by the Subcontractor.

SECTION 5 – UTILITIES

5-1 LOCATION

5-1.1 GENERAL

[Add the following]:

Contractor shall understand that the existing underground/overhead facilities as shown on the Drawings are from record only, and NO FIELD CHECK was made to establish their exact location. Also, other underground facilities may exist. Therefore, it shall be Contractor's responsibility to locate, protect, and preserve, etc., all existing underground or overhead facilities.

In order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take other appropriate measures to ensure that there is no delay in work, the Contractor shall expose ("pothole") all utility mains that must be crossed or closely paralleled as well as the existing pipelines at all connection points at least fifteen (15) working days in advance of commencing construction. Location of existing pipeline shall include determination of its existing slope at the points of connection. Contractor shall then immediately provide the location and elevations of the "potholed" utilities to the City. In the event information received from potholing indicates a conflict or discrepancy, the City will make recommendations to remedy the conflict or discrepancy.

All costs incurred in exposing utilities shall be included in the cost associated with the respective bid item listed on the Bid Sheet. All pothole information shall be added to "as built" drawings. It shall be the Contractor's responsibility to determine the type, material, and condition of any utility which may be affected by or affect the work. The Contractor shall call Dig Alert and have all utility companies field locate all underground lines before start of construction.

The City reserves the right to make minor adjustments in pipeline alignment and grade, all at no additional cost to the City. Failure of the Contractor to comply with these provisions will result in an order to suspend work until these provisions are complied with, and no additional compensation will be allowed as a result of such suspension.

5-6.1 UTILITY COORDINATION

[Add the following section]:

If necessary, the Contractor shall ensure that the various utility companies relocate their facilities that are in conflict with the Project. The Contractor shall provide sufficient time in the construction schedule to allow for the completion of all utility relocations and manhole adjustments that are necessary to avoid conflicts with the construction of the contract work.

Full compensation for coordinating efforts with Utility Companies and their contractors, labor, equipment and materials, down time, and any other activity that may pertain to coordinating utility relocations shall be considered included in the cost of various bid items and no additional compensation will be allowed therefor. Extra time may be allowed to the contractor in the event of Utility Companies delaying relocation.

SECTION 6 — PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK

[Replace with the following]:

Contractor's proposed Construction Schedule shall be submitted to Engineer within five (5) working days after the date of the Notice of Award of Contract. The schedule shall be supported by written statements from each supplier of materials or equipment indicating that all orders have been placed and acknowledged and setting forth the dates that each item will be delivered.

Prior to issuing the Notice to Proceed, Engineer will schedule a pre-construction meeting with Contractor to review the proposed Construction Schedule and delivery dates, arrange for utility construction surveying and utility coordination, discuss construction methods, and clarify inspection procedures.

Contractor shall submit periodic Progress Reports to Engineer by the tenth (10th) day of each month. The report shall include an updated Construction Schedule. Any deviations from the original schedule shall be explained. Progress payments will be withheld pending receipt of any outstanding reports.

6-7 TIME OF COMPLETION

6-7.1 GENERAL

[Add the following]:

The time for completion shall be as set forth in the Instructions to Bidders herein, if not identified in the contract.

The Contractor shall comply with the following schedule:

- **City Council Award/Notice of Award: July 1, 2025**
- **Expected Notice to Proceed: July 7, 2025 (Subject to environmental permits)**

The Notice to Proceed date shall be considered the first day of work.

6-7.2 WORKING DAY

[Replace with the following]:

Contractor's activities shall be confined to the hours between 7:00 a.m. and 4:30 p.m., Monday through Friday, excluding City designated holidays except as modified below. Deviation from these hours will not be permitted without the prior consent of Engineer, except in emergencies involving immediate hazard to persons or property.

In the event of either a requested or emergency deviation, inspection service fees will be charged against Contractor. The service fees will be calculated at overtime rates, including benefits, overhead, and travel time. The service fees will be deducted from any amounts due Contractor.

6-9 LIQUIDATED DAMAGES

[Replace the last sentence of the first paragraph with the following]:

Liquidated damages shall be as set forth in the Contract.

[Delete the second paragraph in its entirety]

SECTION 7—RESPONSIBILITIES OF CONTRACTOR

7-2 LABOR

7-2.1 PREVAILING WAGES

[Add the following]:

Contractor, and all subcontractors, suppliers, and vendors shall comply with applicable City, State, and Federal orders regarding affirmative action to ensure equal employment opportunities and fair employment practices. Failure to file any report due under said orders will result in suspension of periodic progress payments.

Contractor shall ensure unlimited access to the job site for all equal employment opportunity compliance officers.

7-5 PERMITS

[Add the following]:

Prior to the start of any work, Contractor shall take out the applicable City permits and make arrangements for City inspections. Contractor and all subcontractors shall each obtain any and all other permits, licenses, inspections, certificates, or authorizations required by any governing body or public utility.

7-8 WORK SITE MAINTENANCE

7-8.3 NOISE CONTROL

[Add the following]:

A noise level limit of 86-dba at a distance of fifty (50) feet shall apply to all construction equipment on or related to the job, whether owned by Contractor or not. The use of excessively loud warning signals shall be avoided except in those cases required for the protection of personnel.

7-8.4.2 STORAGE IN PUBLIC STREETS

[Replace the first paragraph with the following]:

Construction materials and equipment shall not be stored in streets, roads, or highways unless otherwise specified in the Special Provisions or approved by the Engineer. All materials or equipment shall be stored at a location approved by the Engineer.

7-8.6 WATER POLLUTION CONTROL

[Add the following]:

This project is subject to the requirements of the National Pollutant Discharge Elimination System (NPDES) and the associated Construction General Permit (CGP) No. 2009-0009-DWQ as amended by No. 2010-0014-DWQ and No. 2012-006-DWQ issued by the California State Water Resources Control Board (SWRCB). This permit regulates storm water discharges associated with construction activities. Copies of the permit can be obtained from the SWRCB website at www.waterboards.ca.gov. The Contractor shall fully inform itself of the conditions of the CGP which govern its operations and shall conduct its construction operations accordingly. Specifically, the Contractor shall comply with the CGP's discharge prohibitions and receiving water limitations.

The Contractor shall allow authorized agents of the City, SWRCB, Regional Water Quality Control Board (RWQCB), United States Environmental Protection Agency (EPA), local storm water management agency, and other applicable state or federal agencies upon the presentation of credentials and other documents as may be required by law, to:

1. Enter, at reasonable times, upon the construction site and the Contractor's facilities pertinent to the work.
2. Have access to and copy, at reasonable times, any records that must be kept as specified in the CGP and these Special Provisions.
3. Inspect, at reasonable times, the construction site and related erosion and sediment control measures.
4. Sample or monitor, at reasonable times, for the purpose of ensuring compliance with the CGP and these Special Provisions.

Conformance with the requirements of this section shall in no way relieve the Contractor from its responsibilities, as provided in Section 5-1.36, "Property and Facility Preservation" and Section 5-1.39, "Damage Repair and Restoration," of the State Standard Specifications.

WM-8 Concrete Waste Management along with street sweeping and inlet protection will be the primary BMPs utilized on this project. Contractor's project manager, superintendent along with the job foreman shall be trained and aware of the requirements to ensure water quality protection. Asphalt materials and concrete waste will be protected from entering flow lines and curb inlets.

The Contractor shall be liable for any violations of the CGP issued to the City as a direct result of the Contractor's failure to comply with the CGP and these Special Provisions.

7-8.6.3 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

[Add the following]:

Although a Storm Water Pollution Prevention Plan (SWPPP) is not required as part of this project, Contractor shall include erosion control measures and Best Management Practices (BMPs), for all phases of the work. The erosion control measures and Best Management Practices (BMPs) shall achieve the basic objectives of a SWPPP, and shall satisfy the requirements of the CGP related to the Contractor's operations for the period of time that the Contractor is responsible for the construction site up to the approval of the Notice of Termination.

7-8.6.4 DEWATERING

[Replace the third sentence with the following]:

Permits necessary for treatment and disposal of accumulated water shall be obtained by the Contractor.

7-8.6.5 PAYMENT

[Add the following]:

Full compensation for conforming to the requirements in Section 7-8.6 "Water Pollution Control" and these special provisions shall be considered as included in the contract unit price paid for each respective bid item and no additional compensation will be made therefore.

Payment for dewatering shall be considered as included in the Contract Unit Price for each item in the bid necessitating dewatering.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

[Add the following after the second paragraph]

The Contractor shall protect existing buildings, paving, and other services or facilities on-site and adjacent to the site from damage caused by site work operations. Cost of repair and restoration of damaged items shall be at Contractor's expense.

The Contractor shall protect the existing environmental area as identified on the plans. Contractor shall place an orange construction fence at the limits of construction to ensure personnel, equipment, and construction debris do not encroach upon this area. The Contractor shall be responsible for any damages, repairs, or other mitigation assessed by a regulatory body such as US Fish and Wildlife Service, US Army Corps of Engineers, and State Water Quality Resources Board for failure to comply with these requirements.

The quality of construction is the responsibility of Contractor.

7-10 SAFETY

7-10.4.1.1 GENERAL

[Add the following]**:**

The Contractor shall provide for the safety of traffic and the public in accordance with the provisions in Section 7-1.04, "Public Safety," of the State Standard Specifications and these special provisions.

All existing traffic control signs and street name signs shall be maintained in visible locations as directed by the Engineer.

All warning lights, signs, flares, barricades and other facilities for the sole convenience and direction of public traffic shall be furnished and maintained by the Contractor. All signs shall conform to and be placed in accordance with the current "Manual of Traffic Controls", issued by

the California Department of Transportation for construction and maintenance of work zones. The Contractor shall utilize Solar Powered Equipment to maintain and control existing traffic. Battery operated equipment shall be utilized for night time operations.

All construction signs shall be either covered or removed when not required by the nature of the work, or if no present hazard to the motorists exists.

Payment for implementing traffic controls as required by these Special Provisions shall be considered included in the cost of various bid items including full compensation for all labor, materials, and equipment necessary to install and maintain traffic controls throughout the construction period.

7-10.4.2 SAFETY ORDERS

[Add the following]:

Contractor shall comply with the provisions of any City ordinances or regulations regarding requirements for the protection of excavations and the nature of such protection.

7-10.4.1.3 PUBLIC SAFETY DURING NON-WORKING HOURS

[Add the following section]:

Notwithstanding Contractor's primary responsibility for safety on the job site, when Contractor is not present, Engineer may, at his option after attempting to contact Contractor, direct City forces to perform any functions he may deem necessary to ensure public safety at or in the vicinity of the job site. If such procedure is implemented, Contractor will bear all expenses incurred by City.

7-12 ADVERTISING

7-12.1 PROJECT INFORMATION SIGN

[Add the following]:

This work shall consist of furnishing, installing, maintaining, and removing project information signs, posts, mounting, and hardware at the location designated by the Engineer.

The project information signs shall be installed prior to the beginning of construction work and removed and dropped off to the City of Murrieta Public Works yard when all construction work for the project is complete. The sign dimension and appearance should be as follows:

Full compensation for furnishing all labor, materials, including posts, equipment, tools and incidentals necessary to furnish, install, maintain, remove and salvage Project Information Sign shall be considered as included in the cost of various bid items and no additional compensation will be allowed therefore.

7-15 PAYROLL RECORDS

Payroll records, if required, shall be submitted to City by the tenth (10th) day of each month. Progress payments will be withheld pending receipt of any outstanding reports.

SECTION 8— FACILITIES FOR AGENCY PERSONNEL

8-1 GENERAL

8-1.1 FACILITIES FOR AGENCY PERSONNEL

[Replace with the following]:

Facilities for Agency personnel will not be required on this project.

SECTION 9 – MOBILIZATION

9-3.4 MOBILIZATION

[Replace with the following]:

Mobilization shall be paid on the basis of a lump sum price bid for "Mobilization" and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing

all the work involved in performing Mobilization, as shown on the exhibits, as specified in these Special Provisions and as directed by the Engineer.

Payments for mobilization will be made as follows:

(a) When 5 percent of the original contract amount is earned, 50 percent of the amount bid for mobilization, or 5 percent of the original contract amount, whichever is lesser, may be paid.

(b) When 10 percent of the original contract amount is earned, 75 percent of the amount bid for mobilization or 7.5 percent of the original contract amount, whichever is lesser, may be paid.

(c) When 20 percent of the original contract amount is earned, 95 percent of the amount bid for mobilization, or 9.5 percent of the original contract amount, whichever is lesser, may be paid.

(d) When 50 percent of the original contract amount is earned, 100 percent of the amount bid for mobilization, or 10 percent of the original contract amount, whichever is lesser, may be paid.

Upon completion of all work on the project, payment of any amount bid for mobilization in excess of 10 percent of the original contract amount will be paid.

TECHNICAL SPECIFICATIONS

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

THE FOLLOWING TECHNICAL SPECIFICATIONS ARE TO BE USED IN CONJUNCTION WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK)" UNLESS OTHERWISE NOTED.

PART 2 – CONSTRUCTION MATERIALS

SECTION 200 – ROCK MATERIALS

200-2 UNTREATED BASE MATERIAL

200-2.1 GENERAL

Base material for roadway and driveway paving shall be Crushed Aggregate Base (CAB) or Crushed Miscellaneous Base (CMB).

201-1 PORTLAND CEMENT CONCRETE

201-1.1.2 CONCRETE SPECIFIED BY CLASS
[add the following]

Except for bridge construction, all Portland Cement concrete for construction in the public right of way shall be Class 560-C-3250, Type II or V unless otherwise specified in a referenced standard detail.

SECTION 203 – BITUMINOUS MATERIALS

203-6 ASPHALT CONCRETE

203-6.1 GENERAL
[Add the following]:

Asphalt Concrete for paving shall be PG-64-10. Performance graded (PG) binder shall conform to the requirements set forth in Section 92: Asphalts of the Caltrans State Standard Specifications. Reclaimed asphalt pavement (RAP) shall be permitted in the asphalt concrete mix and shall not to exceed 15%. Payment will be per ton and will include all costs to place and compact the Asphalt Concrete.

203-6.4.3 COMPOSITION AND GRADING

Asphalt concrete shall use the B gradation for the base course and the C2 gradation for the finished roadway and driveway overlay courses. When only one course is used, C2 gradation shall be used.

PART 3 – CONSTRUCTION METHODS

SECTION 300 – EARTHWORK

300-1 CLEARING AND GRUBBING

[Add the following]:

Landscape and irrigation that is disturbed by the construction of the project shall be restored to its original condition. Landscape and irrigation shall be restored consistent with Part 8 of the SSPWC. Payment shall be included in the cost for bid item "Demolition and Removal of Existing Wood Bridge & Prepare for New RCB." And no additional compensation will be allowed thereafter.

300-1.3.2 – REQUIREMENTS

a) Bituminous Pavements [Replace the second sentence with the following]:

Sawcutting of all edges to be joined will be required.

SECTION 301 – TREATED SOIL, SUBGRADE PREPARATION, AND PLACEMENT OF BASE MATERIALS

301-1.3 RELATIVE COMPACTION

[Replace the second sentence with the following]:

When base or subbase material are to be placed on subgrade material, the top six (6) inches of such subgrade material shall be compacted to a relative compaction of 95 percent. When curb, gutter, alley pavement, driveways, or sidewalks are to be placed on subgrade material, the top six (6) inches of such subgrade material shall be compacted to a relative compaction of 90 percent.

SECTION 302 – ROADWAY SURFACING

302-1 COLD MILLING ASPHALT CONCRETE PAVEMENT AND SAWCUTTING

[Add the following sections]:

302-1.1 GENERAL

The Contractor shall locate and protect any and all existing, abandoned or undocumented utility facilities, valve covers, manhole covers and frames that may affect cold mill

operations. The Contractor shall take all necessary precautions to prevent damage to the above mentioned facilities and/or to the cold milling equipment that may result from said facilities. No additional compensation will be considered.

Milled widths of pavement shall be continuous except for intersections at cross streets where the milling shall be carried around the corners and through the conform lines. Following milling operations, a drop-off of more than 1" will not be allowed between adjacent lanes open to public traffic. Temporary ramps may be installed as described above in areas where this criterion cannot be maintained.

302-1.12 PAYMENT

[Replace with the following]:

Full compensation for grinding existing pavement shall be considered as included in the contract price for bid item "Demolition and Removal of Existing Wood Bridge & Prepare for New RCB" including all equipment, labor, disposal of millings and pavement fabric, construction and removal of pavement transitions, any and all incidental and necessary work, and no additional payments will be made thereafter. The equipment shall have the ability to process, grind and remove any existing pavement fabric.

302-5 ASPHALT CONCRETE PAVEMENT

[Add the following]:

Asphalt concrete materials shall conform to Section 203-6 of the Standard Specifications. Construction shall be in accordance with Section 302-5 of the Standard Specifications. The weight of asphaltic concrete used on this project will be determined as the weight as shown on the weight tickets for asphaltic concrete. Legible certified weight tickets (tons) of asphalt concrete shall be submitted to the City's inspector on the job site as the material is delivered and signed, so as to certify delivery and acceptance. Any material, for which weight tickets are not submitted as the material is delivered, will not be accepted.

All paving machines, rollers, automatic screed, laser ski, and control equipment including size, number and type, are subject to the approval of the Engineer and City inspector. A laser ski shall be utilized without exception, unless directed otherwise by City Engineer.

After the final course and/or overlay is completed and before the road surface is open to traffic, the Contractor shall place temporary striping tabs (tab spacing shall not exceed 50') delineating centerline and lane temporary reflective traffic tape arrows placed at beginning of pocket, and cross walk and limit line delineation shall be min. 12" temporary reflective traffic tape. The cost of temporary striping will be considered as included in the contract unit price for "Asphalt Concrete Pavement".

302-5.2.2 REMOVAL AND DISPOSAL OF MATERIAL

During the milling operation, the Contractor shall sweep the street with mechanical equipment and remove all loosened material from the Project site until completion of the removal work. The removal crew shall follow within fifty (50) feet of the milling machine unless otherwise directed by the Engineer or City inspector. The Contractor shall take all necessary measures to avoid dispersion of dust. All material removed shall be considered property of the Contractor and shall be disposed of by the Contractor at his expense.

302-5.5 DISTRIBUTION AND SPREADING

[Add the following]:

In addition to the requirements in Section 302-5.5, "Distribution and Spreading", of the Standard Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete, the automatic controls shall control the longitudinal grade and transverse slope of the screed. A laser ski shall be utilized without exception, unless directed otherwise by City Engineer. Grade and slope references shall be furnished, installed, and maintained by the Contractor.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the requirements, including straight hedge tolerance, of Section 302-5.6.2, "Density and Smoothness", of the Standard Specifications, the paving operations shall be discontinued and the Contractor shall modify his equipment or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of the spreading equipment for the remainder of the day; however, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting another day's work. Pavement surface that is not within tolerance will be subject to profile corrections.

A material transfer vehicle shall be utilized during the distribution and spreading of the asphalt concrete pavement pursuant to Caltrans Section 39-2.01C(2)(b) Material Transfer Vehicle. Payment for use of the material transfer vehicle shall be included in the Contract unit price per ton of AC Pavement.

SECTION 303 – CONCRETE AND MASONRY CONSTRUCTION

303-1 CONCRETE STRUCTURES

303-1.11 PAYMENT

[Add the following]:

Payment for bid item “Std Dwg D84 Headwalls per Detail on Sheet 2” shall be paid for on an each unit price and shall include all equipment, labor, material, concrete, steel, rebar, ties, forms, necessary grading, subgrade preparation, compaction, any and all incidental and necessary work, and no additional payments will be made thereafter. One headwall includes both wings on one side of the CIPRCB.

303-5 CONCRETE CURBS, CURB AND GUTTERS AND SIDEWALKS

303-5.1 REQUIREMENTS

303-5.1.1 GENERAL

[Add the following]:

Curbs, curb and gutters and sidewalks shall be constructed to the dimensions as specified in the each of the respective City’s Standard Drawings, but application details and other specifications not explicitly shown or stated in the City’s Standard Drawings, shall conform to Section 303-5 of the Standard Specifications.

306-11 CAST-IN-PLACE REINFORCED CONCRETE BOX (CIPRCB).

[Add the aforementioned section from the 2024 Edition Greenbook]:

306-11.1 GENERAL

[Add the following]:

PAYMENT:

Full compensation for installing the cast-in-place reinforced concrete box per specified size shall be paid per Linear Foot for bid item “Install 14’W x 7’H Cast-in-Place Reinforced Concrete Box per Caltrans D80” and shall include all equipment, labor, material, concrete, steel, rebar, dowels, ties, forms, necessary grading, subgrade preparation, aggregate base, compaction, any and all incidental and necessary work, and no additional payments will be made thereafter. The CIPRCB shall include the specified cutoff walls, concrete barrier wall, and included tubular handrail.

Full compensation for installing the CIPRCB parapet walls shall be paid per Linear Foot for bid item “Parapet Walls per Detail on Sheet 1” and shall include all equipment, labor, material, concrete, steel, rebar, dowels, ties, forms, necessary grading, subgrade preparation, aggregate base, compaction, any and all incidental and necessary work, and no additional payments will be made thereafter.

Full compensation for installing the CIPRCB cutoff walls shall be paid per Linear Foot for bid item “Cutoff Wall under RCB Assume 1’ Thk w/ #4 @18” OC” and shall include all equipment, labor, material, concrete, steel, rebar, dowels, ties, forms, necessary grading, subgrade preparation, aggregate base, compaction, any and all incidental and necessary work,

and no additional payments will be made thereafter.

Full compensation for installing the CIPRCB concrete barriers shall be paid per Linear Foot for bid item "Concrete Barrier Type 836 per Caltrans B11-80 Modified to 26" Tall" and shall include all equipment, labor, material, concrete, steel, rebar, dowels, ties, forms, necessary grading, subgrade preparation, aggregate base, compaction, any and all incidental and necessary work, and no additional payments will be made thereafter.

Full compensation for installing the CIPRCB tubular handrailings shall be paid per Linear Foot for bid item "Tubular Handrailings per Caltrans Std Plan B11-51" and shall include all equipment, labor, material, concrete, steel, rebar, dowels, ties, forms, necessary grading, subgrade preparation, aggregate base, compaction, any and all incidental and necessary work, and no additional payments will be made thereafter.

Wingwalls shall be in compliance with Section 303-1 Concrete Structures.

SECTION 314 – TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

Traffic Striping, Pavement Markings and Markers, and Curb Markings shall be installed at the locations shown on the Plans or where directed by Engineer, and shall conform to the provisions in Section 84: "Traffic Stripes and Pavement Markings" and Section 85: "Pavement Markers" of the State Standard Specifications and latest Amendments unless modified herein.

314-2 REMOVAL OF TRAFFIC STRIPING, MARKERS AND PAVEMENT MARKINGS

[Add the following]:

Traffic stripes and pavement markings to be removed will be designated by Engineer and shall be removed by sand-blast methods for painted surfaces, and polish grinder methods for thermoplastic coated surfaces. Image shadowing shall be minimized by performing removals in a rectangular block area. When removing pavement markings, the removal process shall be applied to a rectangular area around and covering the pavement marking, such that the resulting pavement does not exhibit a "shadowed" pavement marking. If, in the opinion of the City Inspector or Engineer, the removal process does not completely erase any sign of the pavement marking, the City Inspector or Engineer may require that the rectangular area be seal coated.

Full compensation for removal of traffic stripes, markers and pavement markings, including any necessary seal coating, shall be considered in the various contract bid item prices for Striping and no additional compensation will be allowed therefor.

314-4 APPLICATION OF TRAFFIC STRIPING AND CURB AND PAVEMENT MARKINGS

314-4.2 CONTROL OF ALIGNMENT AND LAYOUT

[Add the following]:

The Contractor shall furnish the necessary control points for all markings, and shall be responsible for the completeness and accuracy thereof to the satisfaction of the Engineer.

Spotting shall be completed prior to the removal of any existing markings.

Traffic stripes and pavement markings to be removed will be designated by Engineer and shall be removed by sand-blast method for painted surfaces, and surface abrasion methods for thermoplastic coated surfaces. Image shadowing shall be minimized by performing removals in a rectangular block area.

When more than 1-coat of paint is to be applied, the 2nd coat shall be applied at least 7 calendar days after the 1st coat.

Full compensation for removal of traffic stripes, markers and pavement markings, including any necessary seal coating, shall be considered in the contract unit price for "Remove Striping and RPM's" and "Remove Type IV Pavement Arrows" and no additional compensation will be allowed therefor.

314-4.3 PAINTED TRAFFIC STRIPING AND PAVEMENT MARKINGS

314-4.3.1 GENERAL

[Add the following]:

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the State Standard Specifications and these special provisions.

Traffic stripe paint shall conform to the requirements in State Specification No. PTWB-01.

Traffic stripe paint shall be full width for both coats.

The color of the painted traffic stripes shall conform to the requirements in ASTM Designation: D 6628-01.

Retroreflectivity of the painted traffic stripes shall conform to the requirements in ASTM Designation: D 6359-99. White painted traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 250 mcd m-2 lx-1. Yellow painted traffic stripes and shall have a minimum initial retroreflectivity of 150 mcd m-2 lx-1.

314-4.3.2 PAYMENT

[Add the following]:

Full compensation for furnishing paint shall be considered as included in the Contract prices paid for Pavement Striping (all detail numbers), and no additional compensation will be allowed therefor.

PART 6 - TEMPORARY TRAFFIC CONTROL

SECTION 600 - ACCESS

[Add the following]:

At no point in time shall the Contractor block access to the residential home owners along Hayes Ave.

600-2 VEHICULAR ACCESS

[Add the following paragraphs]:

The Contractor shall provide for the safety of traffic and the public in accordance with the provisions in Section 7-1.09, "Public Safety," of the State Standard Specifications and these special provisions.

The subject project location along Hayes Ave. is currently closed to vehicular access and will remain closed for the duration of construction. The Contractor will be responsible for maintaining restricted access from the project site for all vehicles, pedestrians, and bicyclist for the duration of the project.

The Contractor's work force shall not park their vehicles or stage their equipment in a way which blocks access to a residential home.

600-3 PEDESTRIAN ACCESS

[Add the following]:

The subject project location along Hayes Ave. is currently closed to vehicular access and will remain closed for the duration of construction. The Contractor will be responsible for maintaining restricted access from the project site for all vehicles, pedestrians, and bicyclist for the duration of the project.

Bicyclist and pedestrian access shall be in accordance with the Manual on Uniform Traffic Control (MUTCD), 2014 edition and Work Area Traffic Control Handbook (WATCH), 2018 edition.

Attention is directed to Section 6G.05, "Work Affecting Pedestrian and Bicycle Facilities," Section 6D.01, "Pedestrian Considerations," and Section 6D.101(CA), "Bicycle Considerations" of the MUTCD.

Bicyclists and pedestrians should not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions.

Payment for conforming to these provisions shall be considered as included in the contract lump sum price paid for "Traffic Control based on WATCH manual and assuming existing road closure.". Payment shall include full compensation for all labor, materials, and equipment necessary to prepare plans, install, maintain, store, and relocate pavement, traffic control devices, and construction signing during the construction period, for all pedestrian and bicycle traffic. Payment will be made on a basis of the percentage of work completed on the entire project.

SECTION 601 – WORK AREA TRAFFIC CONTROL

601-1 GENERAL

[Add the following]:

Attention is directed to Section 12, "Temporary Traffic Control," of the State Standard Specifications and to these Special Provisions.

The Contractor shall install temporary railing (Type K) as necessary for construction, or between any lanes carrying public traffic and any excavation, obstacle or storage area when the following conditions exist:

(1) Excavation -- Any excavation, the near edge of which is 12 feet or less from the edge of the lane, except:

(a) Excavation covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
(b) Excavations less than one foot deep.
(c) Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot in diameter.
(d) Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
(e) Excavations in side slopes, where the slope is steeper than 4:1 (horizontal:vertical).
(f) Excavations protected by existing barrier or railing.

(2) Temporarily Unprotected Permanent Obstacles -- Whenever the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or whenever the Contractor, for his convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

(3) Storage Areas -- Whenever material or equipment is stored within 12 feet of the lane and such storage is not otherwise prohibited by the specifications.

The approach end of temporary railing (Type K), installed in accordance with the requirements in this section "Work Area Traffic Control" and in Section 7-1.09, "Public Safety," of the State Standard Specifications shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Type K Temporary Railing" of the State Standard Specifications, except temporary railing (Type K) fabricated prior to January 1, 1993, with one longitudinal No. 5 reinforcing steel bar near the top in lieu of the 2 longitudinal No. 5 reinforcing steel bars near the top, as shown on the plans, may be used.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" elsewhere in these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas the Contractor shall close the adjacent traffic lane unless otherwise provided in the plans and specifications:

Approach speed of public traffic (Posted Limit) (Miles per Hour)	Work Areas
Over 45	Within 6 feet of a traffic lane but not on a traffic lane.
35 to 45	Within 3 feet of a traffic lane but not on a traffic lane.

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cone or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 11 feet without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

When entering or leaving roadways carrying public traffic, Contractor's equipment, whether empty or loaded, shall in all cases yield to public traffic.

Maintaining traffic shall conform to the provisions in 5-1.37B , "Load Limits"; 7-1.02K(6), "Occupational Safety and Health Standards"; 7-1.03, "Public Convenience"; 7-1.04, "Public Safety"; and Section 12-3.04, "Portable Delineators," of the State Standard Specifications, and these Special Provisions.

All existing traffic control signs and street name signs shall be maintained in visible locations as directed by the Engineer or City Inspector.

The contractor shall conduct his operation in such a manner that traffic will be able to pass through the work and access existing businesses with as little delay as possible.

Contractor shall erect changeable message signs (CMS) in accordance with MUTCD requirements a minimum of five (5) calendar days prior to the start of construction, notifying the general public of the upcoming construction event. The CMS shall indicate start and completion dates (the expected duration of the construction). Contractor to coordinate with the Engineer and City Inspector(s) for the desired language to be displayed on the CMS. After the five (5) day notification period, Contractor may elect to remove the CMS's. Should the Contractor elect to maintain the CMS's beyond the required five (5) day period, no additional compensation will be allowed. All costs shall be included in the unit price bid for "Changeable Message Signs", and no additional compensation will be made therefore. Payment shall include full compensation for all labor, materials, coordination, and equipment to deliver, install, maintain, store, and relocate the CMS as required.

All warning lights, signs, flares, barricades, and other facilities for the sole convenience and direction of public traffic shall be furnished and maintained by Contractor.

All signs shall conform to and be placed in accordance with the current Manual on Uniform Traffic Control Devices (MUTCD) and associated California Supplements as issued by Caltrans. Traffic control devices shall be new or like-new condition. Traffic control devices that are bent, faded, illegible or otherwise damaged as determined by the City Inspector shall be promptly replaced. All construction signs shall be either covered or removed when not required by the nature of the work, or if no present hazard to the motorists exists.

No payment for extra work will be allowed for work performed as specified in Section 12-1.03, "Flagging Costs," of the State Standard Specifications.

Personal vehicles of Contractor's employees may not be parked on the shoulders of any section closed to public traffic. Whenever vehicles or equipment are parked on the shoulder

within six (6) feet of a traffic lane, the shoulder area shall be closed. Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make his own arrangements relative to keeping the working area clear of parked vehicles.

The Contractor shall notify local authorities of the Contractor's intent to begin work or rerouting of traffic at least ten (10) calendar days before work is begun.

In the event the City Inspector determines that the Contractor is not complying with the requirements of the MUTCD and/or the Work Area Traffic Control Handbook (WATCH), the Contractor will be required to cease work and provide a Traffic Control Plan prepared, signed, and stamped by a Civil Engineer to accommodate each phase of traffic control. The Civil Engineer preparing the Traffic Control Plans shall be a Professional Engineer registered with the State of California. The Contractor shall submit Traffic Control Plans to the City and allow two (2) working days for City review and approval. Once approved, Contractor may start work again.

Contractor shall adhere to the requirements set forth in the Work Area Traffic Control Handbook (WATCH), 2018 edition except as otherwise provided for in these specifications.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location.

Minor deviations from the requirements of this section which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

Payment for conforming to these provisions shall be considered as included in the contract lump sum price paid for “Traffic Control based on WATCH manual and assuming existing road closure”. Payment shall include full compensation for all labor, materials, and equipment necessary to prepare plans, install, maintain, store, and relocate pavement, traffic control devices, and construction signing during the construction period.

APPENDIX B

QUOTE

CITY OF MURRIETA, DEPARTMENT OF PUBLIC WORKS

BID SHEET

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

BID ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL ITEM PRICE
1	Mobilization	1	LS	$5,300.00	$5,300.00
2	Bond Costs for Project	1	LS	$7,330.00	$7,330.00
3	Pothole Existing Utilities Prior to Demo of Existing Bridge	1	LS	$8,205.00	$8,205.00
4	Develop Construction Water	1	LS	$5,220.00	$5,220.00
5	Demolition & Removal Existing Wood Bridge & Prepare for New RCB	1	LS	$21,940.00	$21,940.00
6	Install 14'W x 7'H Cast-in-Place Reinforced Concrete Box per Caltrans D80	27.5	LF	$4,860.00	$133,650.00
7	Std Dwg D84 Headwalls per Detail on Sheet 2	2	EA	$50,625.00	$101,250.00
8	Parapet Walls per Detail on Sheet 1	32	LF	$987.00	$31,584.00
9	Cutoff Wall under RCB Assume 1' Thk w/#4 @18" OC	32	LF	$308.00	$9,856.00
10	Concrete Barrier Type 836 per Caltrans B11-80 Modified to 26" Tall	32	LF	$1,045.00	$33,440.00
11	Tubular Handrailings per Caltrans Std Plan B11-51	30	LF	$506.00	$15,180.00
12	Std Dwg A77L1 Midwest Guardrail Section	132	LF	$284.00	$37,488.00
13	Std Dwg 446 A Rip Rap Pad per City of Murrieta	374	TON	$243.00	$90,882.00
14	Construct Full Depth Pavement Section per Detail on Sheet 2	1450	SF	$23.50	$34,075.00
15	2" Mill & Overlay per Details on Plans	3014	SF	$8.00	$24,112.00
16	Re-stripe Center Line per Plans	1	LS	$3,820.00	$3,820.00
17	Traffic Control - Excludes Engineered Traffic Control Plan. Based off existing road closure for entire duration. Only providing flaggers for access to existing home owners.	1	LS	$4,470.00	$4,470.00
Total Base Bid:				**567,802.00**	
Total Base Bid in Words:	**Five Hundred Sixty Seven Thousand Eight Hundred Two Dollars**				

The unit price or lump sum prices to be paid for the items listed in the Proposal Bid Sheet shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all work involved in furnishing and installing the materials complete and in place, in accordance with the details as shown on the plans and as specified herein. Any items shown on the plans, but not included in the bid items, shall be considered as appurtenant items. All costs shall be included within the appropriate item of the Contractor's bid.

APPENDIX C

CONTRACTOR'S AFFIDAVIT AND FINAL RELEASE

CITY OF MURRIETA, DEPARTMENT OF PUBLIC WORKS

CONTRACTOR'S AFFIDAVIT AND FINAL RELEASE

This is to certify that

_____

FILL IN CONTRACTOR'S NAME

(hereinafter the "undersigned") declares to the City of Murrieta, hereinafter referred to as "City," under oath, that it has paid in full for all materials, supplies, labor, services, tools, equipment, and all other bills contracted for by the undersigned or by any of the undersigned's agents, employees, or subcontractors used or in contribution to the execution of its contract with City with regard to the building, erection, construction, or repair of that certain work of improvement known as **CITY PROJECT NO. 25-490 (CIP No. 11004,** situated in the City of Murrieta, State of California, more particularly described as follows:

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

The undersigned declares that it knows of no unpaid debts or claims arising out of said Contract that would constitute grounds for any third party to claim a stop notice of any unpaid sums owing to the undersigned.

Further, for valuable consideration, the receipt of which is hereby acknowledged, the undersigned does hereby fully release and acquit City and all agents and employees of City, and each of them, from any and all claims, debts, demands, or causes of action that exist or might exist in favor of the undersigned by reason of the Contract executed between the undersigned and City or that relate in any way to the work performed by the undersigned with regard to the above-referenced construction project.

Further, the undersigned expressly acknowledges its awareness of, and waives the benefits of, Section 1542 of the Civil Code of the State of California which provides: "A general release does not extend to claims that the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."

This release is intended to be a full and general release of any and all claims that the undersigned now has or may, in the future, have against City and/or its agents and employees with regard to any matter arising from the construction of the above-referenced project or the Contract between City and the undersigned with respect thereto, whether such claims are now known or unknown or are suspected or unsuspected.

CONTRACTOR

Dated:_____ By: _____

Signature

_____

Print Name and Title

APPENDIX D

BONDS

BOND NO. _____

LABOR AND MATERIALS BOND

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, WHEREAS, the City of Murrieta has awarded to

_____

CONTRACTOR

_____

CONTRACTOR'S ADDRESS,

hereinafter called "Contractor," a contract for the work described as follows:

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

hereinafter called "Contract," and

WHEREAS, said Contractor is required by the provisions of Sections 3247-3252 of the Civil Code to furnish a bond in connection with said Contract, as hereinafter set forth.

NOW, THEREFORE, WE, the undersigned Contractor, as Principal, and

_____

_____

FILL IN NAME AND ADDRESS OF SURETY

duly authorized to transact business under the laws of the State of California, as Surety, hereinafter called "Surety," are held and firmly bound unto the City of Murrieta, California, and all contractors, subcontractors, laborers, materialmen, and other persons employed in the performance of the aforesaid Contract and referred to in Title 15 of the Civil Code, in the penal sum of _____ **dollars and** _____ **cents ($**_____**),** lawful money of the United States, said sum being not less than one hundred percent (100%) of the estimated amount payable by the said City of Murrieta under the terms of the Contract, for the payment of which, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, if said Contractor, his/her or its heirs, executors, administrators, successors, and assigns, or subcontractors, shall fail to pay for any materials, provisions, provender, or other supplies, or teams, implements, or machinery used in, upon, for, or about the performance of the work under the Contract to be done, or for any work or labor thereon of any kind or for amounts due under the Unemployment Insurance Code with

respect to such work or labor, as required by the provisions of Chapter 7 of Title 5 of Part 4 of Division 3 of the Civil Code, and provided that the claimant shall have complied with the provisions of said Civil Code, Surety shall pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, Surety will pay costs and reasonable expenses and fees, including reasonable attorney's fees to be fixed by the Court.

This bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Section 3181 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond, and shall also cover payment for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor or his/her or its subcontractors pursuant to Section 13020 of the Unemployment Insurance Code.

Surety hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or to the specifications accompanying the same, shall in any way affect its obligations on this bond. Surety hereby waives notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or to the specifications accompanying the same.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named, on _____, 20___.

(Seal)

SURETY

By: _____

_____
(Name)

_____
(Title)

APPROVED AS TO FORM:

_____
Tiffany Israel, City Attorney

CONTRACTOR

By: _____

_____
(Name)

_____
(Title)

By: _____

_____
(Name)

_____
(Title)

BOND NO. _____

PERFORMANCE BOND

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

THAT, WHEREAS, the City of Murrieta, State of California, entered into a contract dated **_____, 20___,** hereinafter called "Contract," with

_____

CONTRACTOR

_____

CONTRACTOR'S ADDRESS

hereinafter called "Principal," for the work described as follows:

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

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

NOW, THEREFORE, WE, the Principal, and

_____,

FILL IN NAME AND ADDRESS OF SURETY

duly authorized to transact business under the laws of the State of California, as Surety, hereinafter called "Surety," are held and firmly bound unto the City of Murrieta in the penal sum of **_____ dollars and _____ cents ($_____),** lawful money of the United States, for the payment of which sum we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, if Principal, his/her or its heirs, executors, administrators, successors or assigns shall in all things stand to, abide by, and well and truly keep and perform the covenants, conditions, and agreements in the said Contract, and in any alteration thereof made as therein provided, on his/her or its part to be kept and performed, at the time and in the manner therein specified, in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Murrieta, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

As a part of the obligation secured hereby and in addition to the face amount specified, costs and reasonable expenses and fees shall be included, including reasonable attorneys' fees incurred by the City of Murrieta in successfully enforcing this obligation, all to be taxed as costs and included in any judgment rendered.

Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the Contract, or to the work to be performed thereunder, or to the specifications accompanying the same, shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work, or to the Specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by Principal and Surety above named, on _____, 20___.

(Seal)

SURETY

By: _____

_____
(Name)

_____
(Title)

APPROVED AS TO FORM:

_____
Tiffany Israel, City Attorney

PRINCIPAL

By: _____

_____
(Name)

_____
(Title)

By: _____

_____
(Name)

_____
(Title)

MAINTENANCE BOND

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

KNOW ALL PERSONS BY THESE PRESENTS THAT:

a _____, hereinafter called "Principal," and
(fill in whether a Corporation, Partnership, or Individual)

_____

_____,
FILL IN NAME AND ADDRESS OF SURETY

hereinafter called "Surety," are held and firmly bound unto the City of Murrieta, a municipal corporation, hereinafter called "City," in the penal sum of _____ **dollars and** _____ **cents ($**_____**)** in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas Principal entered into a certain Contract with City, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof for the construction of**:**

HAYES AVE. AT MILLER CANYON CREEK BRIDGE REPLACEMENT

CITY PROJECT NO. 25-490
CIP NO. 11004

WHEREAS, said Contract provides that Principal will furnish a bond conditioned to guarantee for the period of one (1) year after approval of the final payment on said job, by the City, against all defects in workmanship and materials that may become apparent during said period; and

WHEREAS, the said Contract has been completed, and was approved on _____, 20__.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if within one (1) year from the date of approval of the said Contract, the work done under the terms of said Contract shall disclose poor workmanship in the execution of said work, and the carrying out of the terms of

said Contract, or it shall appear that defective materials were furnished thereunder, then this obligation shall remain in full force and virtue, otherwise this instrument shall be void.

Signed and sealed this _____ day of _____, 20____.

(Seal)

SURETY

By: _____

_____
(Name)

_____
(Title)

APPROVED AS TO FORM:

_____
Tiffany Israel, City Attorney

PRINCIPAL

By: _____

_____
(Name)

_____
(Title)

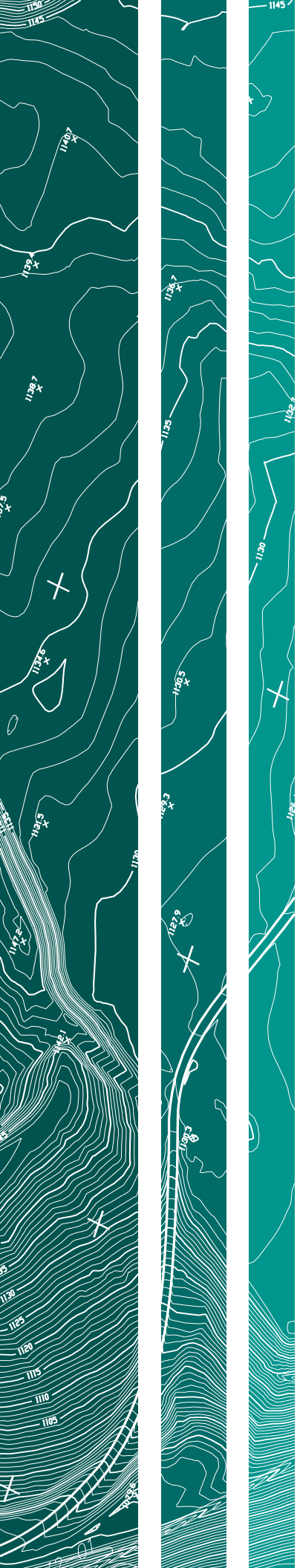
By: _____

_____
(Name)

_____
(Title)

ATTACHMENT E

GEOTECHNICAL REPORT



GEOCON

FOUNDATION REPORT

HAYES AVENUE
BRIDGE EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

MAY 29, 2025
PROJECT NO. T2647-22-19

PREPARED FOR:
City of Murrieta
Murrieta, California

Project No. T2647-22-19
May 29, 2025

City of Murrieta
1 Town Square
Murrieta, California 92562

Attention: Mr. Jeff Hitch

Subject: FOUNDATION REPORT
HAYES AVENUE BRIDGE EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

Mr. Hitch:

In accordance with Purchase Order P04764 (dated April 4, 2025), Geocon West, Inc. (Geocon) herein submits our Foundation Report (FR) for the proposed Hayes Avenue emergency replacement project at Miller Canyon Creek, in the City of Murrieta, California. A proposed box culvert will replace the existing bridge at Miller Canyon Creek.

The accompanying FR presents our evaluation of the geotechnical and geological conditions at the proposed box culvert location, and provides foundation and geotechnical recommendations for design and construction of the project.

Please contact us if you have any questions regarding this FR or if we may be of further service.

Sincerely,

GEOCON WEST, INC.

Andrew T. Shoashekan
PE 93940

Lisa A. Battiato
CEG 2316

Ronald E. Loutzenheiser
GE 2865

ATS:LAB:REL:hd

Distribution: Addressee (email)

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FOUNDATION REPORT

1. INTRODUCTION

This Foundation Report (FR) was prepared for the proposed Caltrans *2024 Standard Plan* cast-in-place reinforced concrete single box culvert that will replace the Hayes Avenue bridge that crosses Miller Canyon Creek, between Ivy Street and Juniper Street, in the City of Murrieta, California. The approximate project location is shown on the *Vicinity Map* (see Figure 1).

Our geotechnical investigation included drilling of two hollow-stem auger borings, laboratory testing, and preparing this FR. Appendix A presents a discussion of the field investigation and logs of the borings. The approximate locations of the exploratory excavations are presented on the *Boring Location Map* (Figure 2). We performed laboratory tests on soil samples obtained from the exploratory drilling to evaluate pertinent physical and chemical properties for engineering analysis. The results of the laboratory testing are presented in Appendix B.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. References reviewed to prepare this report are provided in the *List of References* section.

2. SCOPE OF SERVICES

To prepare this FR, we performed the following scope of services:

- Marking proposed boring locations and notifying Underground Service Alert (USA) to locate and mark utilities in the proposed investigation area.
- Obtaining a City of Murrieta encroachment permit.
- Retaining the services of a California C57-licensed drilling subcontractor to perform exploratory borings.
- Drilling two (2) geotechnical borings to observe subsurface geologic conditions and collect soil samples. The borings were drilled using a truck-mounted drill-rig equipped with hollow-stem augers to a maximum depth of approximately 61½ feet. The borings were logged in general conformance with Caltrans guidelines. Borings were backfilled with soil cuttings upon completion and capped with asphalt concrete cold-patch.
- Performing laboratory tests on selected samples to evaluate pertinent geotechnical parameters.
- Performing engineering analyses to develop geotechnical design criteria and evaluate existing site conditions.
- Preparing this FR, which presents our findings, conclusions, and recommendations, as it would pertain to the proposed box culvert.

3. PROJECT DESCRIPTION

Based on information provided by Michael Baker International, we understand that the existing Hayes Avenue bridge at Miller Canyon Creek will be replaced with a Caltrans 2024 Standard Plan D80 cast-in-place reinforced concrete single box culvert. The existing Hayes Avenue bridge consists of a wood and concrete composite bridge with wingwalls. The wood portion of the existing bridge makes up the superstructure, while the concrete portion makes up the abutments and wingwalls. Overlaying the wooden superstructure is an asphalt concrete roadway surface. We expect the existing bridge is supported by a shallow foundation system at the abutments. The existing bridge has exceeded its design life and the wood superstructure has experienced a significant amount of creep, which manifests as significant cracking distress in the asphalt concrete that overlays the wooden superstructure. Construction debris consisting of broken concrete appeared to have been dumped at the upstream side of the bridge. The current elevation at the northwest and southeast abutments is approximately 1,090 feet above mean sea level. The current elevation at the Miller Canyon Creek channel bottom is approximately 1,082 feet above mean sea level on the upstream side and approximately 1,080 feet above mean sea level on the downstream side of the Hayes Avenue bridge. As-built plans of the existing bridge were unavailable for review.

Based on the *Storm Drain Improvement* Plan, prepared by Michael Baker International and dated May 21, 2025, the proposed Caltrans *2024 Standard Plan D80* cast-in-place, reinforced concrete single box culvert that will replace the bridge will be 26 feet long, with a span of 14 feet, and a height of 7 feet. The maximum earth cover in design will be approximately 1½ feet. Cut-off walls with Class III riprap will be constructed at the inlet and outlet of the culvert to control scour. Wingwalls will be constructed at the inlet and outlet of the proposed box culvert. The invert elevation of the culvert will be between 1,080.32 and 1,080.47 feet above mean sea level. Fill slopes of up to 8 feet in height, at slope ratios of 2:1 (horizontal:vertical) or flatter, are proposed adjacent to the wingwalls. We expect cuts and fills of up to 10 feet (exclusive of remedial grading) will be required to install the proposed box culvert.

Project elevations within this report are referenced to the project plans, which uses the National Geodetic Vertical Datum of 1929 (NGVD29).

4. FIELD INVESTIGATION AND LABORATORY TESTING PROGRAMS

Our field investigation was performed on April 10, 2025 and consisted of the drilling of two (2) exploratory borings (B-1 and B-2) to depths of approximately 61½ feet below the ground surface. The approximate exploration locations are shown on the *Boring Location* Map, Figure 2. The following table summarizes the details of our exploratory borings.

TABLE 4
SUMMARY OF BORINGS

Boring ID	Approximate Boring Location		Approx. Boring Depth (feet)	Drilling Equipment
	Latitude (°)	Longitude (°)		
B-1	33.547002	-117.218832	61½	CME-75, 8-inch-diameter hollow stem auger; auto-hammer
B-2	33.546883	-117.218717		

Soil samples were collected within the borings from near the ground surface and at 2½- and 5-foot intervals. Sampling with the truck mounted rig was accomplished using a 140-pound, auto-hammer with a 30-inch drop. Samples were obtained with a 3-inch, outside-diameter (OD), California Modified split-spoon sampler. The California Modified sampler was equipped with 1-inch-long by 2.4-inch-diameter brass rings. Standard Penetration Tests (SPT) were also performed using a 2-inch OD split-spoon sampler. Blow count information is reported on the boring logs of Appendix A.

We performed laboratory testing on samples collected, in general conformance with generally accepted California Test Methods (CTM) and the test methods of ASTM International (ASTM). We analyzed selected soil samples for maximum dry density and optimum moisture content, expansion index, plasticity index, consolidation/collapse, pH/resistivity, sulfates, chlorides, grain size distribution / #200 wash, and direct shear strength. The results of the laboratory tests are presented in Appendix B. The in-situ dry density and moisture content test results of samples tested are presented on the boring logs in Appendix A.

5. SITE GEOLOGY AND SUBSURFACE CONDITIONS

The following geologic and soil conditions are based on our review of the referenced geologic literature and field investigation.

5.1 Regional Geology

The site is located within the Peninsular Ranges Geomorphic Province at the eastern foot of the Santa Ana Mountains. Miller Canyon Creek drains northeastward from the mountains into southeast flowing Murrieta Creek. The Peninsular Ranges are bound by the Transverse Ranges (San Gabriel and San Bernardino Mountains) to the north and the Colorado Desert Geomorphic Province to the east. The Peninsular Ranges extend westward into the Pacific Ocean and southward to the tip of Baja California. Overall, the province is characterized by Cretaceous-age granitic rock and a lesser amount of Mesozoic-age metamorphic rock overlain by terrestrial and marine sediments. Pleistocene-age terrestrial sediments form low hills and alluvial fans near the site. They consist of Pauba Sandstone and Pauba Fanglomerate. Faulting within the province is typically northwest trending and includes the San Andreas, San Jacinto, Elsinore, and Newport-Inglewood faults. The site is located between the Wildomar and Willard branches of the Elsinore fault zone at distances of 0.85 and 0.86 miles, respectively. The Wildomar branch is considered the active branch of the Elsinore fault in the area and the Willard fault is considered inactive near the site.

5.2 Site Geology and Anticipated Soil Conditions

Site geologic materials encountered within our borings consist of undocumented artificial fill (afu) overlying Holocene and late Pleistocene age young alluvial valley deposits (Qyv). The nomenclature of these geologic units follow that of Kennedy, M.P. and Morton, D.M. (2003).

5.3 Undocumented Artificial Fill (afu)

Undocumented artificial fill was encountered to depths of 5 feet below ground surface at the site. The fill consists of silty sand, which is slightly moist, generally brown to olive brown and medium dense to dense. Some fine to course gravels were encountered within these materials in Boring B-1.

5.4 Young Alluvial Valley Deposits (Qyv)

Young alluvial valley deposits were observed underlying the undocumented artificial fill in both borings to the maximum depth explored of approximately 61½ feet below the ground surface. We encountered interbedded layers of silty sand and clayey sand, with lesser amounts of silt with sand, clay, poorly graded sand, and poorly graded sand with silt. The alluvial deposits in Boring B-1 varies in shades of brown, olive brown, olive gray, and gray, and is very loose to very dense (for granular soils) or stiff to hard (for fine soils), and slightly moist to saturated (where below the static groundwater level) with

various amounts of gravel, fine sand, and trace clay. The alluvial deposits in Boring B-2 varies in shades of brown to olive brown and olive gray, and is medium dense to very dense (for granular soils) or hard (for fine soils), and moist to saturated (where below the static groundwater level) with medium to coarse sand and trace clay.

5.5 Groundwater

Static groundwater was measured within Boring B-1 at a depth of 19 feet below the ground surface (approximate elevation of 1,071 feet above mean sea level), and within Boring B-2 at a depth of 22 feet below the ground surface (approximate elevation of 1,068 feet above mean sea level).

A review of historic well records provided by the California Department of Water Resources for Riverside County (WDL, 2025) indicates that the highest recorded static groundwater level in vicinity of the subject site is 29 feet below the ground surface (approximate elevation of 1,087 feet above mean sea level), recorded in 1968. This historic record is provided by Well 335484N1172207W001, which is located approximately 770 feet northwest of the subject site.

It is not uncommon for static groundwater levels to vary seasonally or for groundwater seepage conditions to develop where none previously existed (especially within impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall). Groundwater levels encountered during construction may be higher than those encountered during our field investigation. Proper surface drainage of irrigation and precipitation will be critical for future performance of the project. Recommendations for drainage are provided in the *Surface Drainage* section of this report.

We have used a design groundwater elevation of 1,071 feet above mean sea level for our analysis for this project.

6. SCOUR EVALUATION

The site is located where Hayes Avenue crosses Miller Canyon Creek. No scour or hydraulic/hydrologic analysis for the project site has been provided for our review. The design scour evaluation should be that determined in the project hydraulic/hydrologic report. Foundations should be properly protected against the potential scour or extended below the zone affected by scour.

We obtained samples at various depths and performed grain size distribution analysis on the samples to provide information for a scour analysis. The particle size at which 30, 50, and 90 percent is passing (D_{30}, D_{50}, D_{90}) is presented in the following table. Geocon should be contacted for additional parameters if needed.

TABLE 6
SOIL GRAIN SIZE DISTRIBUTION TEST RESULTS

Sample ID (Boring Number & Sample Depth)	D_{90} (mm)	D_{50} (mm)	D_{30} (mm)
B1@5’	6.3	0.99	0.26
B1@10’	5.4	0.8	0.19
B1@15’	0.44	-	-
B1@17.5’	9.6	-	-
B1@25’	7.2	0.57	0.074
B2@2.5’	0.75	0.099	-
B2@7.5’	0.39	0.083	-
B2@12.5’	0.12	-	-
B2@20’	0.14	-	-
B2@25’	0.63	0.28	0.2

7. CORROSION EVALUATION

According to Caltrans *Corrosion Guidelines* (Version 3.2; May 2021), soils are considered corrosive to foundation elements if one or more of the following conditions exist: chloride concentration is 500 parts per million (ppm) or greater, or sulfate concentration is 1,500 ppm or greater, or the potential of hydrogen (pH) is 5.5 or less. Resistivity serves as an indicator parameter for the possible presence of soluble salts and is not included as a parameter to define a corrosive area for structures. A minimum resistivity value for soil and/or water less than 1,500 ohm-centimeters may indicate the presence of high quantities of soluble salts and a higher propensity for corrosion. Laboratory testing was performed on select soil samples and is summarized in the following table.

TABLE 7
SOIL CORROSION TEST SUMMARY

Sample ID (Boring No./ Sample Depth)	pH	Minimum Resistivity (ohm-centimeters)	Chloride Content (ppm)	Sulfate Content (ppm)	Corrosive
B2@10-15’	8.4	1,800	110	0	No

Based on the corrosivity test results, site soils would be classified as “not corrosive” to buried improvements, according to the Caltrans *Corrosion Guidelines*. Proposed improvements in contact with the ground should be designed and constructed in accordance with the Caltrans *Standard Specifications* and generally accepted construction practices. Geocon does not practice in the field of corrosion engineering. If corrosion sensitive improvements are planned, it is recommended that further evaluations by a corrosion engineer be performed to incorporate the necessary precautions to avoid premature corrosion on buried metal pipes and concrete structures in direct contact with the soils.

8. SEISMIC EVALUATION

8.1 Ground Motion Evaluation

The design response spectrum for the Safety Evaluation Earthquake (SEE), as specified in Caltrans *Seismic Design Criteria* (v2.1), is the probabilistic response spectrum representing the horizontal ground motion at the site with a 7% probability of exceedance in 75 years (return period of 975 years). The 2023 United States Geological Survey (USGS) *National Seismic Hazard Model* is used as the basis to determine the design Acceleration Response Spectrum (ARS). The ARS for the site was estimated using Caltrans' *ARS Online* web tool. The following table summarizes the site-specific information used for the analysis and the *ARS Online* results.

TABLE 8.1
GROUND MOTION PARAMETERS

Site Parameters			Design Ground Motion Parameters[1] (Return Period = 975 Years)			Soil Profile Class[5]
Approx. Latitude, °	Approx. Longitude, °	Average Estimated Shear Wave Velocity (VS_{30})[2], feet/second	Design Peak Ground Acceleration (PGA)[3], g	Deaggregated Mean Earthquake Moment Magnitude (M)	Mean Site-to-Source Distance (R)[4], miles	
33.546938	-117.218787	761	0.58	6.98	6.4	S2

Notes:
1. Based on Caltrans web tool ARS Online (Version 4.0), accessed May 2025.
2. Estimated time-average shear wave velocity for the upper 100 feet of soil at the site.
3. Where "g" represents the acceleration due to gravity.
4. Mean site-to-source distance for PGA 0-period spectral acceleration.
5. Based on the subsurface soil conditions encountered and Caltrans *Seismic Design Criteria* Sections 6.1 and 6.2.3

The subject site is not located within a deep sedimentary basin per Caltrans *ARS Online*. Based on the subsurface materials encountered during our investigation, the site is generally underlain by medium dense to very dense granular soils, with some hard cohesive soils. The shear wave velocity, VS_{30}, is the average of the estimated shear wave velocity profiles of the two borings performed (B-1 and B-2). The recommended design response spectra for the proposed box culvert is presented as Figure 3, *Design Response Spectrum*.

8.2 Fault Rupture

The culvert site does not lie within or adjacent to a State of California Earthquake Fault Zone or a Riverside County Fault Hazard Zone. In addition, the proposed structure is not located on any known "active" earthquake fault trace. The USGS *2008 National Seismic Hazard Maps – Source Parameters* website indicates that the closest active fault is the Elsinore fault zone at over 1 mile away from the site. Therefore, the potential for ground rupture due to onsite active faulting is considered to be low.

8.3 Liquefaction and Lateral Spreading

Liquefaction is a phenomenon in which loose, saturated, relatively cohesionless soil deposits lose shear strength during strong ground motions. Primary factors controlling liquefaction include intensity and duration of ground motion, gradation characteristics of the subsurface soils, in-situ stress conditions, and the depth to groundwater. Liquefaction is typified by a loss of shear strength in the liquefied layers due to rapid increases in pore water pressure generated by earthquake accelerations.

The current standard of practice, as outlined in the "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California" and "Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California" requires liquefaction analysis to a depth of 50 feet below the lowest portion of the proposed structure. Liquefaction typically occurs in areas where the soils below the water table are composed of poorly consolidated, fine- to medium-grained, primarily sandy soil. In addition to the requisite soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to induce liquefaction.

We performed a liquefaction analysis of the soils underlying the site using the 1996 NCEER method of analysis with the updates by Youd et al. (2001). The liquefaction potential evaluation was performed by utilizing a design static groundwater depth of 19 feet, a magnitude 6.98 earthquake, and the peak ground acceleration (PGA_M) of 0.58g. This semi-empirical method is based on a correlation between values of Standard Penetration Test (SPT) resistance.

Based on our analysis, total liquefaction settlement on the order of approximately 2½ inches could manifest at the site, with a differential settlement of approximately 1¼ inches. Furthermore, an evaluation of seismically induced "dry-sand" settlement indicates that settlement associated with this phenomenon is negligible (less than ¼-inch). Our evaluation of seismic settlement is provided on Figures 4 and 5.

Current understanding within the geotechnical engineering profession is that lateral spreading can be expected in liquefiable sites adjacent to slopes such as river channels or large bodies of water. The observed horizontal ground displacement typically decreases with increased distances from the open face. Because of the lack of liquefiable soil near the surface and considering the proposed box culvert system does not have an open embankment face, the potential for lateral spreading of channel slopes is not a design consideration.

8.4 Slope Stability

New embankment fill and backfill is expected to maintain adequate factors of safety of 1.5 or greater under static loading conditions for global and surficial stability, and factors of safety of 1.1 or greater under pseudo-static loading conditions for global stability; however, existing embankment slopes upstream and downstream of the proposed box culvert may be subject to slope instability during a seismic event.

9. SITE GRADING AND EARTHWORK RECOMMENDATIONS

9.1 Cuts and Excavations

Based on the existing site topography and planned box culvert improvement, we expect earthwork to consist of cuts of up to 10 feet (exclusive of remedial grading) in order to construct the proposed improvements. Based on the subsurface conditions encountered during field explorations, excavations at the site can likely be performed using conventional heavy-duty grading and excavation equipment in proper functioning order.

Excavation depths greater than 5 feet will need to be sloped and shored in accordance with Cal/OSHA guidelines. Temporary excavations must conform to Cal/OSHA requirements. It is the contractor's responsibility to provide sufficient and safe support for excavation, as well as nearby utilities, structures and other improvements that could be damaged by earth movements. Temporary excavations should be in compliance with applicable governing agency regulations. The contractor should also execute a monitoring program for structures in proximity to deep excavations so that appropriate modifications to the excavation/shoring system can be implemented to minimize the surface deflection or structure damage in a timely manner, if warranted. The contractor should also provide a temporary dewatering system if excavations extend below the groundwater elevation or where seepage is encountered. The top of the excavation should be a minimum of 10 feet from the edge of existing improvements. Excavations steeper than those recommended or closer than 10 feet from an existing improvement should be shored in accordance with applicable OSHA codes and regulations.

Based on our field explorations and experience in the area, soil generated from onsite and local excavations should be generally suitable for use as embankment fill. However, some screening and selection may be required depending on excavation location and intended use. For example, structure backfill may require the use of primarily granular (sandy) soil rather than silty or clayey soil. In addition, the minimum sand equivalent criterion need not apply for embankment fill. Grading should be performed in conformance with Section 19 of the Caltrans *Standard Specifications*.

9.2 Materials for Fill

Excavated soil generated from cut operations should be generally suitable for use as general fill and backfill in structural areas provided they are examined and selectively placed during grading in accordance with the following recommendations:

- Deleterious material, material with greater than 3% organics, and debris should be exported from the site and not incorporated into structural fill. We anticipate limited quantities of these materials (primarily organics).
- Re-use of existing alluvial materials should follow the recommendations of Section 19-6.03C of the Caltrans *Standard Specifications*.
- Backfill placed for proposed box culvert foundations and behind box culvert walls should consist of "structure backfill" meeting Section 19-3.02C of the Caltrans *Standard Specifications*. In addition to the criteria shown in Section 19-3.02C, structure backfill should have a "very low" to "low" expansion potential (Expansion Index of 50 or less).
    - Laboratory expansion index testing (see Figure B-14) indicates a "low" expansion potential, however, the Expansion Index value is 50, which is the upper limit of the "low" expansion potential category, and therefore, we expect there to be site soils that exceed this Expansion Index value (given the laboratory test and some silty/clayey soil types present at the site). Expansion Index testing should be performed during the course of grading to confirm if soils used as structure backfill maintain the "low" expansion potential category. Where soils exceed an Expansion Index of 50, they should be stockpiled and selectively graded as non-structure backfill or hauled off site.
- Excavated onsite soils exhibiting clayey characteristics should not be used within structural areas, or pavement areas at approaches, without additional testing. For design purposes, it is assumed that the R-value for on-site soils to be used below pavement areas is not less than 30 (this assumed value is based on the soil types encountered near the surface of existing pavement), which the pavement structural section recommendations provided herein are based on; laboratory testing after the preparation of subgrade should confirm this value (a lower R-value may require a more robust pavement structural section).
- Proposed import materials should be sampled, tested, and approved by Geocon prior to its transportation to the site. Import material should be primarily granular with a "very low" to "low" expansion potential (Expansion Index of 50 or less), a maximum Plasticity Index of 12, be free of organic material, and construction debris, and not contain rock larger than 6 inches in greatest dimension. Environmental characteristics and corrosion potential of import soil materials should also be considered. Import materials used within 2 feet of pavement subgrade should have an R-value of 30 or greater and a maximum Plasticity Index of 12.

9.3 Fill Area Preparation and Fill Placement

Fill areas should be cleared and stripped of obstructions, debris, trees, bushes, grass, roots, and topsoil containing organic material. Soils/organics removed by stripping should be transported offsite. Existing drainage and utility lines or other existing subsurface structures that are not to be utilized, if any, should be removed, destroyed or abandoned in compliance with applicable regulations.

In general, loose, soft, or wet surficial soil in the areas planned to receive new improvements or fill materials should be removed to expose competent materials that are relatively dense sandy material, achieving a minimum relative compaction of 85 percent. Removals should be performed to a minimum depth of 3 feet below proposed box culvert foundations, and a minimum depth of 2 feet below subgrade in approach areas. The actual removal depth is dependent upon the depth to competent materials and will be evaluated by the geotechnical consultant in the field during grading operations.

New embankment fill placed on sloping ground and adjacent to existing embankments/slopes should be keyed and benched into firm/dense alluvial soils in accordance with the Caltrans *Standard Specifications*.

Earthwork, grading, and engineered fill placement should be performed in conformance with Section 19 of the Caltrans *Standard Specifications*. Backfill placed below and behind proposed box culvert foundations/walls is to be considered structural backfill. Structural backfill should be compacted to 95 percent of the maximum dry density at 0 to 2 percent above optimum moisture content, as determined by ASTM D1557. Compaction on the project should be based on this test method. Other backfill should be compacted to a minimum of 90 percent relative compaction. Fill should be mechanically compacted. Ponding or jetting of backfill should not be permitted.

Where rock slope protection is used to mitigate erosion and scour, rock slope protection material and construction requirements should conform to Section 72-2 of the Caltrans *Standard Specifications.*

10. FOUNDATION RECOMMENDATIONS

We understand that the proposed bridge replacement will consist of a box culvert structure. Our analysis for this project indicates that due to the alluvial deposition environment, a potentially liquefiable zone of soil exists in the Boring B-1 location at a depth of approximately 20 to 29 feet below existing site grade. The proposed box culvert should be designed such that differential settlement of approximately 1¼ inches may be experienced for this structure during a design-level seismic event.

Per communication by Michael Baker International, we understand that the proposed Caltrans 2024 Standard Plan D80 cast-in-place reinforced concrete box culvert will have a length of 26 feet, span of 14 feet, and a height of 7 feet. Earth cover over the box culvert will consist of approximately 1½ feet of structure backfill. Table 10A summarizes the proposed details.

TABLE 10A
SUMMARY OF PROPOSED BOX CULVERT

Structure No.	Maximum Design Height (feet)	Bottom of Footing Elevation (feet)	Span (feet)	Length (feet)	Service Limit State (ksf)	Strength Limit State (ksf)
D80 Box Culvert	7	~1,079.50	14	26	2.2	3.0

Backfill soil placed below and behind the box culvert's walls and foundation should be primarily granular in nature and conform to Caltrans requirements for structure backfill in accordance with Section 19-3.02C of the Caltrans *Standard Specifications*.

We analyzed foundation settlement under service loading using immediate "elastic" settlement theory developed by Schmertmann. We checked for bearing capacity shear failure using the bearing capacity equation developed by Munfakh, et al. (2001). Our analyses indicates total settlement of less than 1 inch under service loading conditions and adequate bearing capacity under strength loading conditions.

Based on the subsurface conditions encountered in our investigation and the currently proposed location and design details, we anticipate that after grading operations are complete, the bottom of the proposed box culvert will be located within dense engineered fill. Tables 10B through 10D summarizes the permissible net bearing stress and factored bearing resistances, and Table 10E provides the Spread Footing Data Table for the proposed box culvert.

TABLE 10B
SERVICE LIMIT STATE FOUNDATION DATA

Structure No.	Effective Footing Width (feet)	Calculated Service Limit State Permissible Net Bearing Stress (ksf)	Total Permissible Settlement (inches)
D80 Box Culvert	14	2.41	1

TABLE 10C
STRENGTH LIMIT STATE FOUNDATION DATA

Structure No.	Effective Footing Width (feet)	Calculated Strength Limit State Factored Bearing Resistance (ksf) $\phi_b (q_n)$ $\phi_b = 0.45$
D80 Box Culvert	14	7.26

TABLE 10D
SPREAD FOOTING DATA

Structure No.	Calculated Service Limit State Permissible Net Bearing Stress (ksf)	Calculated Strength Limit State Factored Bearing Resistance (ksf) $\phi_b (q_n)$ $\phi_b = 0.45$
D80 Box Culvert	2.41	7.26

10.1 Lateral Earth Pressures

Backfill soil placed behind box culvert walls should be primarily granular in nature and conform to Caltrans requirements for structure backfill, in accordance with Section 19-3.02C of the Caltrans *Standard Specifications*. Table 10.1 summarizes our recommended lateral earth pressures in terms of equivalent fluid pressure (EFP) for design.

TABLE 10.1
RECOMMENDED LATERAL EARTH PRESSURES

Condition	Equivalent Fluid Density (pounds per cubic foot [pcf])
Active (Level Backfill)	52
At-rest (Level Backfill)	74
Active (2:1 [H:V] Backfill)	77
At-rest (2:1 [H:V] Backfill)	99
Seismic Increment	+25
Passive	315

The soil pressures provided in Table 10.1 assume free draining conditions within an area bounded by the box culvert walls and a 1:1 plane extending upward from the base of the wall; where box culvert walls will not be free draining, a hydrostatic pressure increase of +27 pcf should be added to the at-rest pressure. For vehicular loads impacting the box culvert walls, a surcharge equivalent of 2 feet of fill soil (unit weight of 130 pcf) should be added.

To resist lateral movement, the passive earth pressure of Table 10.1 may be used for the box culvert foundation placed neat against properly compacted engineered fill. This passive pressure is based on the assumption that a horizontal surface extends at least 5 feet or three times (3x) the depth of the foundation, whichever is greater, beyond the face of the foundations. A friction coefficient of 0.31 may be used for resistance to sliding between soil and concrete. Combined passive resistance and friction may be utilized for design provided that the passive resistance is reduced by 50%.

10.2 Preliminary Pavement Recommendations

Existing pavement structural section thicknesses at boring locations consist of 8 inches of asphalt concrete over 4 inches of aggregate base at Boring B-1 and 7 inches of asphalt concrete over 4 inches of aggregate base at Boring B-2.

The final pavement sections should be based on the R-value of the subgrade soils encountered at final subgrade elevation. The civil engineer should evaluate the final traffic index for the pavements. Pavements should be designed and constructed in accordance with the City of Murrieta *Roadway Structural Section Requirements* (Standard No. 120) when final Traffic Indices and R-value test results of subgrade soil are completed. We have assumed an R-value of 30 based on site soil conditions and have utilized an R-Value of 78 for Class 2 Aggregate Base material, for the purposes of this preliminary analysis. Preliminary flexible pavement sections for both composite and alternate full-depth asphalt concrete pavements are presented in Table 10.2A.

TABLE 10.2A
PRELIMINARY FLEXIBLE PAVEMENT SECTIONS

Roadway Classification	Traffic Index	Assumed Subgrade R-Value	Asphalt Concrete (inches)	Aggregate Base (inches)	Full-Depth Asphalt Concrete (inches)
Local Road	5.0	30	3	6	6
Residential Collector	6.0	30	4	8	7½

Subgrade for approaches should be prepared in conformance with Section 19 of the Caltrans *Standard Specifications*. Subgrade for approaches is to be considered structural backfill. Structural backfill should be compacted to 95 percent of the maximum dry density at 0 to 2 percent above optimum moisture content, as determined by ASTM D1557. Pavement subgrade should be proof rolled with a fully-loaded water truck (or similar heavy vehicle) to check for subgrade stability prior to pavement section construction.

Asphalt concrete should conform to Section 39-2.02B of the Caltrans *Standard Specifications*. Class 2 aggregate base materials should conform to Section 26-1.02A of the Caltrans *Standard Specifications*. Aggregate base materials should be compacted to a dry density of at least 95 percent of the maximum dry density at 0 to 2 percent above optimum moisture content, as determined by ASTM D1557. Asphalt concrete should be compacted to a density of 95 percent of the laboratory Hveem density in accordance with ASTM D1561.

A rigid Portland cement concrete (PCC) pavement section should be placed in roadway aprons and cross gutters. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330-21 *Commercial Concrete Parking Lots and Site Paving Design and Construction – Guide.* Table 10.2B provides the traffic categories and design parameters used for the calculations for 20-year design life.

TABLE 10.2B
TRAFFIC CATEGORIES

Traffic Category	Description	Reliability (%)	Slabs Cracked at End of Design Life (%)
A	Car Parking Areas and Access Lanes	60	15
B	Entrance and Truck Service Lanes	60	15
C	School or City Buses (Excluding Large Articulated Buses)	75	15
D	Heavy Duty Trucks (Gross Weight of 80 Kips)	75	15
E	Garbage or Fire Truck Lane	75	15

We used the parameters presented in Table 10.2C to calculate the pavement design sections. We should be contacted to provide updated design sections, if necessary.

TABLE 10.2C
RIGID PAVEMENT DESIGN PARAMETERS

Design Parameter	Design Value
Modulus of subgrade reaction, k	100 pci
Modulus of rupture for concrete, M_R	500 psi
Concrete Compressive Strength	3,000 psi
Concrete Modulus of Elasticity, E	3,150,000

Based on the criteria presented above, the PCC pavement sections should have a minimum thickness as presented in Table 10.2D.

TABLE 10.2D
RIGID VEHICULAR PAVEMENT RECOMMENDATIONS

Traffic Category	Trucks Per Day	Portland Cement Concrete (Inches)
A = Car Parking Areas and Access Lanes	10	5½
B = Entrance and Truck Service Lanes	10	6
	50	6½
	100	6½
C = School or City Buses	50	9½
	100	9½
D = Heavy Duty Trucks	50	6½
	100	7
E = Garbage or Fire Truck Lanes	5	6½
	10	7

Adequate joint spacing should be incorporated into the design and construction of the rigid pavement in accordance with Table 10.2E.

TABLE 10.2E
MAXIMUM JOINT SPACING

Pavement Thickness, T (Inches)	Maximum Joint Spacing (Feet)
$4<T<5$	10
$5\leq T<6$	12.5
$6\leq T$	15

The rigid pavement should also be designed and constructed incorporating the parameters presented in Table 10.2F.

TABLE 10.2F
ADDITIONAL RIGID PAVEMENT RECOMMENDATIONS

Subject	Value
Thickened Edge	1.2 Times Slab Thickness Adjacent to Structures
	1.5 Times Slab Thickness Adjacent to Soil
	Minimum Increase of 2 Inches
	4 Feet Wide
Crack Control Joint Depth	Early Entry Sawn = T/6 to T/5, 1.25 Inch Minimum
	Conventional (Tooled or Conventional Sawing) = T/4 to T/3
Crack Control Joint Width	¼-Inch for Sealed Joints and Per Sealer Manufacturer's Recommendations
	$^{1}/_{16}$- to $^{1}/_{4}$-Inch is Common for Unsealed Joints

Reinforcing steel will not be necessary within the concrete for geotechnical purposes with the possible exception of dowels at construction joints as discussed herein.

To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement slab. Crack-control joints should be sealed with an appropriate sealant to prevent the migration of water through the control joint to the subgrade materials. The depth of the crack-control joints should be in accordance with the referenced ACI guide.

To provide load transfer between adjacent pavement slab sections, a butt-type construction joint should be constructed. The butt-type joint should be thickened by at least 20 percent at the edge and taper back at least 4 feet from the face of the slab.

Concrete curb/gutter, and cross gutters that receive vehicular traffic should be placed on soil subgrade compacted to a dry density of at least 95 percent of the laboratory maximum dry density at optimum moisture content to 0 to 2 percent above optimum moisture content. Base materials should not be placed below the curb/gutter, or cross-gutters so water is not able to migrate from the adjacent parkways to the pavement sections. Where flatwork is located directly adjacent to the curb/gutter, the concrete flatwork should be structurally connected to the curbs to help reduce the potential for offsets between the curbs and the flatwork.

The performance of pavements is highly dependent on providing positive surface drainage away from the edge of the pavement. Ponding of water on or adjacent to the pavement surfaces will likely result in pavement distress and subgrade failure. Drainage from landscaped areas should be directed to controlled drainage structures. Landscape areas adjacent to the edge of asphalt pavements are not recommended due to the potential for surface or irrigation water to infiltrate the underlying permeable aggregate base and cause distress. Where such a condition cannot be avoided, consideration should be given to incorporating measures that will significantly reduce the potential for subsurface water migration into the aggregate base. If planter islands are planned, the perimeter curb should extend at least 6 inches below the level of the base materials.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

The recommendations of this report pertain only to the site investigated and are based upon the assumption that soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon.

This report is issued with the understanding that it is the responsibility of the owner or their representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years. Our professional services were performed in accordance with generally acceptable geotechnical engineering principles and practices in the site area at this time. No warranty is provided, either express or implied.

REFERENCES

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4. California Department of Transportation, 2024, *Standard Plan D80, Cast-In-Place Reinforced Concrete Single Box Culvert.*

5. California Department of Transportation, 2024, *Standard Plan D82, Cast-In-Place Reinforced Concrete Box Culvert Miscellaneous Detail.*

6. California Department of Transportation, 2023, *Standard Specifications.*

7. California Department of Water Resources, *Water Data Library*, https://wdl.water.ca.gov/waterdatalibrary/, accessed April 2025.

8. CGS, *Fault Activity Map of California* web tool, https://maps.conservation.ca.gov/cgs/fam/, accessed May 2025.

9. City of Murrieta, 2010, *Roadway Structural Section Requirements*, Standard No. 120.

10. Kennedy, M.P., Morton, D.M., Alvarez, R.M. and Morton, G., 2003, *Preliminary Geologic Map of the Murrieta 7.5' Quadrangle, Riverside County, California*, Open-File Report 03-189.

11. Michael Baker International, 2025, *City of Murrieta, Storm Drain Improvement Plan, Hayes Avenue Bridge at Miller Canyon Creek, Bridge Replacement,* 4-Sheets, dated May 21.

12. Riverside County, RCIT, Map My County webtool, gis1.countyofriverside.us/html5viewer/index.html?viewer=MMC_Public, accessed May 2025.

13. USGS, *2008 National Seismic Hazard Maps - Source Parameters* web tool, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/, accessed May 2025.

14. Unpublished reports, aerial photographs, and maps on file with Geocon West, Inc.

0’ 410’ 820’

SCALE: 1” = 410’

N

SOURCE: Google Earth Pro, 2025

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RNP		

VICINITY MAP

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

MAY 2025	PROJECT NO. T2647-22-09	FIG. 1

GEOCON LEGEND

Locations are approximate

B-2 ……GEOTECHNICAL BORING LOCATION

……LIMITS OF THIS INVESTIGATION

0’ 20’ 40’

SCALE

N

SOURCE: Google Earth Pro, 2025

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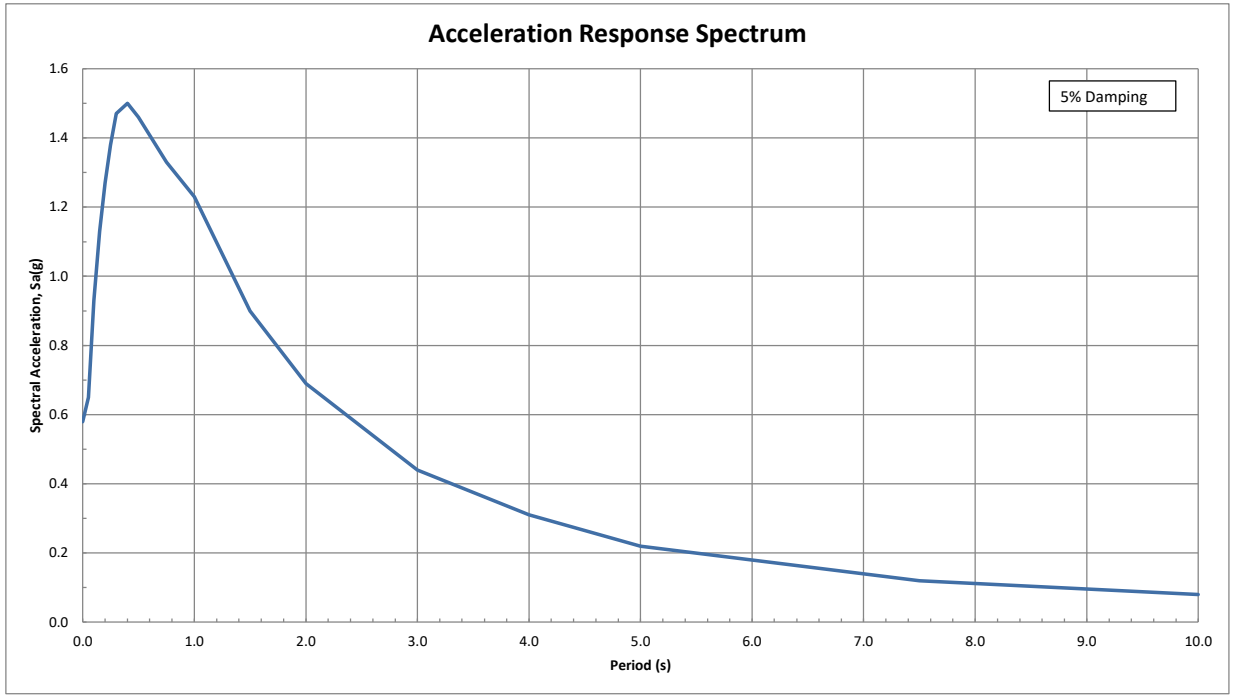
BORING LOCATION MAP

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

RNP			MAY 2025	PROJECT NO. T2647-22-19	FIG. 2

ARS Data for: ***Hayes Avenue Bridge Emergency Replacement***

Period, T (s)	Spectral Acceleration, S_a (g)
0.00	0.58
0.05	0.65
0.10	0.93
0.15	1.13
0.20	1.27
0.25	1.38
0.30	1.47
0.40	1.50
0.50	1.46
0.75	1.33
1.00	1.23
1.50	0.90
2.00	0.69
3.00	0.44
4.00	0.31
5.00	0.22
7.50	0.12
10.00	0.08



Latitude, degrees		
33.546938		
Longitude, degrees		
-117.218787		
Seismic Loading Table		
Soil Profile (V_{S30}):	232	m/s
or:	761	ft/s
PGA Mean Moment Magnitude (M) for PGA:	6.98	
Rupture Distance: R:	10.3	km
or:	6.4	mi
PGA (HPGA):	**0.58**	**g**

The ARS curve was developed based on the USGS 2023 National Seismic Hazard Model for a 975 year return period (obtained by using ARS Online v4.0). Modifications for basin effects are incorporated by the 2023 NSHM and near fault effects were applied, where applicable, per Appendix B of SDC v2.1.

SEE Design - Ground Motion Data Sheet

Response spectrum was generated using ARS Online on:

May 7, 2025

GEOCON
CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Hayes Avenue Bridge Emergency Replacement

Murrieta,
California

RECOMMENDED DESIGN RESPONSE SPECTRUM

T2647-22-19	May 2025	Figure 3

LIQUEFACTION SETTLEMENT ANALYSIS
SAFETY EVALUATION EARTHQUAKE

NCEER (1996) METHOD W 2001 UPDATES

Boring ID: B-1

EARTHQUAKE INFORMATION:

Earthquake Magnitude:	6.98
PGA_M (g):	0.580
Magnitude Scaling Factor:	1.202
Historic High Groundwater:	19.0
Groundwater @ Exploration:	19.0

DEPTH TO BASE	BLOW COUNT N	WET DENSITY (PCF)	TOTAL STRESS O (TSF)	EFFECT STRESS O' (TSF)	REL. DEN. Dr (%)	ADJUST BLOWS (N1)60	Tav/σ'o	LIQUEFACTION SAFETY FACTOR	VOL. STRAIN [e15] (%)	EQ. SETTLE. Pe (in.)
1.0	60	134.1	0.034	0.034	176	124	0.377	--	0.00	0.00
2.0	60	134.1	0.101	0.101	176	124	0.377	--	0.00	0.00
3.0	60	134.1	0.168	0.168	176	124	0.377	--	0.00	0.00
4.0	60	134.1	0.235	0.235	176	124	0.377	--	0.00	0.00
5.0	28	117.5	0.298	0.298	114	59	0.377	--	0.00	0.00
6.0	28	117.5	0.356	0.356	114	59	0.377	--	0.00	0.00
7.0	28	117.5	0.415	0.415	114	55	0.377	--	0.00	0.00
8.0	32	140.4	0.480	0.480	114	61	0.377	--	0.00	0.00
9.0	32	140.4	0.550	0.550	114	57	0.377	--	0.00	0.00
10.0	32	134.2	0.618	0.618	109	54	0.377	--	0.00	0.00
11.0	32	134.2	0.686	0.686	109	52	0.377	--	0.00	0.00
12.0	32	134.2	0.753	0.753	109	49	0.377	--	0.00	0.00
13.0	31	130.0	0.819	0.819	101	46	0.377	--	0.00	0.00
14.0	31	130.0	0.884	0.884	101	45	0.377	--	0.00	0.00
15.0	24	126.2	0.948	0.948	86	42	0.377	--	0.00	0.00
16.0	24	126.2	1.011	1.011	86	40	0.377	--	0.00	0.00
17.0	24	126.2	1.074	1.074	86	39	0.377	--	0.00	0.00
18.0	8	132.2	1.139	1.139	48	17	0.377	--	0.00	0.00
19.0	8	132.2	1.205	1.205	48	17	0.377	--	0.00	0.00
20.0	3	136.5	1.272	1.256	28	9	0.382	0.33	2.70	0.32
21.0	3	136.5	1.340	1.293	28	9	0.391	0.32	2.70	0.32
22.0	0	136.5	1.408	1.330	28	9	0.399	0.31	2.70	0.32
23.0	0	136.5	1.477	1.367	28	9	0.407	0.30	2.70	0.32
24.0	0	136.5	1.545	1.404	28	9	0.415	0.30	2.70	0.32
25.0	0	135.9	1.613	1.441	47	18	0.422	0.52	1.70	0.20
26.0	0	135.9	1.681	1.478	47	17	0.429	0.51	1.70	0.20
27.0	0	135.9	1.749	1.515	47	17	0.435	0.50	1.70	0.20
28.0	0	135.9	1.817	1.552	47	17	0.441	0.48	1.70	0.20
29.0	0	135.9	1.885	1.588	47	17	0.447	0.47	1.70	0.20
30.0	0	134.4	1.952	1.625	94	60	0.453	Non-Liq.	0.00	0.00
31.0	0	134.4	2.019	1.661	94	60	0.458	Non-Liq.	0.00	0.00
32.0	0	134.4	2.087	1.697	94	59	0.464	Non-Liq.	0.00	0.00
33.0	0	134.4	2.154	1.733	94	59	0.469	Non-Liq.	0.00	0.00
34.0	0	134.4	2.221	1.769	94	58	0.473	Non-Liq.	0.00	0.00
35.0	0	127.4	2.287	1.803	123	102	0.478	Non-Liq.	0.00	0.00
36.0	0	127.4	2.350	1.835	123	101	0.483	Non-Liq.	0.00	0.00
37.0	0	127.4	2.414	1.868	123	100	0.487	Non-Liq.	0.00	0.00
38.0	0	127.4	2.478	1.900	123	99	0.492	Non-Liq.	0.00	0.00
39.0	0	127.4	2.541	1.933	123	98	0.496	Non-Liq.	0.00	0.00
40.0	0	138.9	2.608	1.968	79	46	0.500	Non-Liq.	0.00	0.00
41.0	0	138.9	2.677	2.007	79	46	0.503	Non-Liq.	0.00	0.00
42.0	0	138.9	2.747	2.045	79	45	0.506	Non-Liq.	0.00	0.00
43.0	0	138.9	2.816	2.083	79	45	0.510	Non-Liq.	0.00	0.00
44.0	0	138.9	2.886	2.121	79	44	0.513	Non-Liq.	0.00	0.00
45.0	0	140.1	2.955	2.160	115	92	0.516	Non-Liq.	0.00	0.00
46.0	0	140.1	3.025	2.199	115	91	0.519	Non-Liq.	0.00	0.00
47.0	0	140.1	3.096	2.238	115	90	0.522	Non-Liq.	0.00	0.00
48.0	0	140.1	3.166	2.276	115	90	0.524	Non-Liq.	0.00	0.00
49.0	0	140.1	3.236	2.315	115	89	0.527	Non-Liq.	0.00	0.00
50.0	0	142.3	3.306	2.355	75	42	0.529	Non-Liq.	0.00	0.00

TOTAL SETTLEMENT = 2.64 inches

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LIQUEFACTION INDUCED SETTLEMENT
SAFETY EVALUATION EARTHQUAKE

Hayes Avenue Bridge
Emergency Replacement
Murrieta, California

DRAFTED BY: ATS	CHECKED BY:	May 2025	PROJECT NO. T2647-22-19	FIG. 4

MCE EARTHQUAKE INFORMATION:

Earthquake Magnitude:	6.98
Peak Horiz. Acceleration (g):	0.580

Boring ID: B-1

Depth of Base of Strate (ft)	Thickness of Layer (ft)	Depth of Mid-point of Layer (ft)	Soil Unit Weight (pcf)	Overburden Pressure at Mid-point (tsf)	Mean Effective Pressure at Mid-point (tsf)	Average Cyclic Shear Stress [Tav]	Field SPT [N]	Correction Factor [Cer]	Relative Density [Dr] (%)	Correction Factor [Cn]	Corrected [N1]60	rd Factor	Maximum Shear Mod. [Gmax] (tsf)	[yeff]*[Geff] [Gmax]	yeff Shear Strain	[yeff]*100%	Volumetric Strain M7.5 [E15] (%)	Number of Strain Cycles [Nc]	Corrected Vol. Strains [Ec]	Estimated Settlement [S] (inches)
1.0	1.0	0.5	134.1	0.03	0.02	0.013	60	1.25	176.2	1.7	123.7	1.0	333.8	3.75E-05	4.00E-05	0.004	4.49E-04	10.7	3.86E-04	0.00
2.0	1.0	1.5	134.1	0.10	0.07	0.038	60	1.25	176.2	1.7	123.7	1.0	578.2	6.37E-05	1.00E-04	0.010	1.12E-03	10.7	9.64E-04	0.00
3.0	1.0	2.5	134.1	0.17	0.11	0.063	60	1.25	176.2	1.7	123.7	1.0	746.4	8.06E-05	1.40E-04	0.014	1.57E-03	10.7	1.35E-03	0.00
4.0	1.0	3.5	134.1	0.23	0.16	0.088	60	1.25	176.2	1.7	123.7	1.0	883.2	9.35E-05	1.60E-04	0.016	1.80E-03	10.7	1.54E-03	0.00
5.0	1.0	4.5	117.5	0.30	0.20	0.112	28	1.25	114.2	1.7	59.2	1.0	777.9	1.32E-04	1.70E-04	0.017	4.62E-03	10.7	3.97E-03	0.00
6.0	1.0	5.5	117.5	0.36	0.24	0.134	28	1.25	114.2	1.7	59.2	1.0	851.3	1.42E-04	1.50E-04	0.015	4.08E-03	10.7	3.50E-03	0.00
7.0	1.0	6.5	117.5	0.42	0.28	0.156	28	1.25	114.2	1.6	55.4	1.0	898.7	1.54E-04	1.50E-04	0.015	4.41E-03	10.7	3.79E-03	0.00
8.0	1.0	7.5	140.4	0.48	0.32	0.180	32	1.25	114.3	1.5	61.0	1.0	997.1	1.57E-04	1.50E-04	0.015	3.94E-03	10.7	3.38E-03	0.00
9.0	1.0	8.5	140.4	0.55	0.37	0.206	32	1.25	114.3	1.4	57.2	1.0	1045.1	1.68E-04	1.50E-04	0.015	4.25E-03	10.7	3.65E-03	0.00
10.0	1.0	9.5	134.2	0.62	0.41	0.231	32	1.25	109.3	1.3	54.1	1.0	1088.2	1.79E-04	1.50E-04	0.015	4.54E-03	10.7	3.90E-03	0.00
11.0	1.0	10.5	134.2	0.69	0.46	0.256	32	1.25	109.3	1.2	51.6	1.0	1127.6	1.88E-04	1.50E-04	0.015	4.81E-03	10.7	4.13E-03	0.00
12.0	1.0	11.5	134.2	0.75	0.50	0.280	32	1.25	109.3	1.2	49.4	1.0	1164.5	1.96E-04	1.60E-04	0.016	5.41E-03	10.7	4.64E-03	0.00
13.0	1.0	12.5	130.0	0.82	0.55	0.304	31	1.25	101.5	1.1	46.1	1.0	1187.3	2.05E-04	3.70E-04	0.037	1.36E-02	10.7	1.17E-02	0.00
14.0	1.0	13.5	130.0	0.88	0.59	0.327	31	1.25	101.5	1.1	44.5	1.0	1219.1	2.12E-04	3.70E-04	0.037	1.42E-02	10.7	1.22E-02	0.00
15.0	1.0	14.5	126.2	0.95	0.63	0.350	24	1.25	86.3	1.0	41.6	1.0	1233.9	2.21E-04	3.70E-04	0.037	1.54E-02	10.7	1.32E-02	0.00
16.0	1.0	15.5	126.2	1.01	0.68	0.372	24	1.25	86.3	1.0	40.4	1.0	1262.3	2.26E-04	3.70E-04	0.037	1.59E-02	10.7	1.37E-02	0.00
17.0	1.0	16.5	126.2	1.07	0.72	0.394	24	1.25	86.3	1.0	39.4	1.0	1289.7	2.31E-04	3.70E-04	0.037	1.64E-02	10.7	1.41E-02	0.00
18.0	1.0	17.5	132.2	1.14	0.76	0.416	8	1.25	47.5	1.0	16.8	1.0	999.8	3.11E-04	7.10E-04	0.071	8.75E-02	10.7	7.52E-02	0.02
19.0	1.0	18.5	132.2	1.20	0.81	0.439	8	1.25	47.5	0.9	16.5	1.0	1023.2	3.16E-04	7.10E-04	0.071	8.92E-02	10.7	7.66E-02	0.02
20.0	1.0	19.5	136.5	1.27	0.85	0.462	3	1.25	28.3	0.9	9.0	1.0	858.2	3.91E-04	7.10E-04	0.071	1.85E-01	10.7	1.59E-01	0.00
21.0	1.0	20.5	136.5	1.34	0.90	0.485	3	1.25	28.3	0.9	8.9	1.0	878.9	3.96E-04	7.10E-04	0.071	1.87E-01	10.7	1.60E-01	0.00
22.0	1.0	21.5	136.5	1.41	0.94	0.507	3	1.25	28.3	0.9	8.9	1.0	898.9	4.00E-04	1.20E-03	0.120	3.18E-01	10.7	2.73E-01	0.00
23.0	1.0	22.5	136.5	1.48	0.99	0.530	3	1.25	28.3	0.9	8.8	0.9	918.4	4.04E-04	1.20E-03	0.120	3.21E-01	10.7	2.75E-01	0.00
24.0	1.0	23.5	136.5	1.54	1.03	0.552	3	1.25	28.3	0.9	8.8	0.9	937.4	4.07E-04	8.10E-04	0.081	2.18E-01	10.7	1.87E-01	0.00
25.0	1.0	24.5	135.9	1.61	1.08	0.574	9	1.25	47.2	0.9	17.5	0.9	1206.8	3.25E-04	5.20E-04	0.052	6.10E-02	10.7	5.24E-02	0.00
26.0	1.0	25.5	135.9	1.68	1.13	0.595	9	1.25	47.2	0.8	17.4	0.9	1228.1	3.28E-04	5.20E-04	0.052	6.17E-02	10.7	5.29E-02	0.00
27.0	1.0	26.5	135.9	1.75	1.17	0.616	9	1.25	47.2	0.8	17.2	0.9	1248.8	3.30E-04	5.20E-04	0.052	6.23E-02	10.7	5.35E-02	0.00
28.0	1.0	27.5	135.9	1.82	1.22	0.637	9	1.25	47.2	0.8	17.0	0.9	1269.1	3.32E-04	5.20E-04	0.052	6.30E-02	10.7	5.41E-02	0.00
29.0	1.0	28.5	135.9	1.88	1.26	0.657	9	1.25	47.2	0.8	16.9	0.9	1288.9	3.34E-04	5.20E-04	0.052	6.37E-02	10.7	5.47E-02	0.00
30.0	1.0	29.5	134.4	1.95	1.31	0.677	38	1.25	93.5	0.8	60.4	0.9	2005.4	2.19E-04	3.00E-04	0.030	7.97E-03	10.7	6.84E-03	0.00
31.0	1.0	30.5	134.4	2.02	1.35	0.697	38	1.25	93.5	0.8	59.8	0.9	2032.7	2.20E-04	3.00E-04	0.030	8.07E-03	10.7	6.93E-03	0.00
32.0	1.0	31.5	134.4	2.09	1.40	0.716	38	1.25	93.5	0.8	59.2	0.9	2059.4	2.21E-04	3.00E-04	0.030	8.17E-03	10.7	7.01E-03	0.00
33.0	1.0	32.5	134.4	2.15	1.44	0.734	38	1.25	93.5	0.8	58.6	0.9	2085.5	2.22E-04	3.00E-04	0.030	8.26E-03	10.7	7.09E-03	0.00
34.0	1.0	33.5	134.4	2.22	1.49	0.753	38	1.25	93.5	0.8	58.0	0.9	2111.0	2.23E-04	3.00E-04	0.030	8.36E-03	10.7	7.18E-03	0.00
35.0	1.0	34.5	127.4	2.29	1.53	0.770	70	1.25	122.8	0.8	101.7	0.9	2582.7	1.85E-04	1.30E-04	0.013	1.85E-03	10.7	1.59E-03	0.00
36.0	1.0	35.5	127.4	2.35	1.57	0.787	70	1.25	122.8	0.8	100.8	0.9	2610.9	1.85E-04	1.30E-04	0.013	1.87E-03	10.7	1.60E-03	0.00
37.0	1.0	36.5	127.4	2.41	1.62	0.803	70	1.25	122.8	0.8	100.0	0.9	2638.5	1.85E-04	1.30E-04	0.013	1.88E-03	10.7	1.62E-03	0.00
38.0	1.0	37.5	127.4	2.48	1.66	0.819	70	1.25	122.8	0.7	99.2	0.9	2665.7	1.85E-04	1.30E-04	0.013	1.90E-03	10.7	1.63E-03	0.00
39.0	1.0	38.5	127.4	2.54	1.70	0.834	70	1.25	122.8	0.7	98.4	0.9	2692.4	1.86E-04	1.30E-04	0.013	1.92E-03	10.7	1.65E-03	0.00
40.0	1.0	39.5	138.9	2.61	1.75	0.850	31	1.25	79.4	0.7	46.0	0.9	2116.6	2.39E-04	3.00E-04	0.030	1.11E-02	10.7	9.49E-03	0.00
41.0	1.0	40.5	138.9	2.68	1.79	0.867	31	1.25	79.4	0.7	45.6	0.8	2138.3	2.39E-04	3.00E-04	0.030	1.12E-02	10.7	9.59E-03	0.00
42.0	1.0	41.5	138.9	2.75	1.84	0.883	31	1.25	79.4	0.7	45.2	0.8	2159.7	2.39E-04	3.00E-04	0.030	1.13E-02	10.7	9.69E-03	0.00
43.0	1.0	42.5	138.9	2.82	1.89	0.899	31	1.25	79.4	0.7	44.8	0.8	2180.8	2.40E-04	3.00E-04	0.030	1.14E-02	10.7	9.79E-03	0.00
44.0	1.0	43.5	138.9	2.89	1.93	0.915	31	1.25	79.4	0.7	44.4	0.8	2201.5	2.40E-04	3.00E-04	0.030	1.15E-02	10.7	9.88E-03	0.00
45.0	1.0	44.5	140.1	2.96	1.98	0.930	69	1.25	114.9	0.7	92.0	0.8	2839.4	1.88E-04	1.30E-04	0.013	2.08E-03	10.7	1.79E-03	0.00
46.0	1.0	45.5	140.1	3.03	2.03	0.945	69	1.25	114.9	0.7	91.2	0.8	2864.6	1.88E-04	1.00E-02	1.000	1.62E-01	10.7	1.39E-01	0.00
47.0	1.0	46.5	140.1	3.10	2.07	0.960	69	1.25	114.9	0.7	90.4	0.8	2889.5	1.88E-04	1.00E-02	1.000	1.64E-01	10.7	1.40E-01	0.00
48.0	1.0	47.5	140.1	3.17	2.12	0.974	69	1.25	114.9	0.7	89.7	0.8	2914.0	1.88E-04	1.00E-02	1.000	1.65E-01	10.7	1.42E-01	0.00
49.0	1.0	48.5	140.1	3.24	2.17	0.988	69	1.25	114.9	0.7	89.0	0.8	2938.1	1.88E-04	1.00E-02	1.000	1.67E-01	10.7	1.43E-01	0.00
50.0	1.0	49.5	142.3	3.31	2.22	1.001	31	1.25	74.7	0.7	42.4	0.8	2320.0	2.40E-04	1.00E-02	1.000	4.06E-01	10.7	3.48E-01	0.00

REFERENCE: TECHNICAL ENGINEERING AND DESIGN GUIDES AS ADAPTED FROM THE US ARMY CORPS OF ENGINEERS, NO. 9

TOTAL SETTLEMENT (inches) = 0.06

GEOCON WEST, INC.

ENVIRONMENTAL GEOTECHNICAL MATERIALS
41571 CORNING PLACE - SUITE 101 - MURRIETA, CA 92562
PHONE: 951-304-2300

EVALUATION OF EARTHQUAKE-INDUCED SETTLEMENTS IN DRY SANDY SOILS

SAFETY EVALUATION EARTHQUAKE

Hayes Avenue Bridge
Emergency Replacement
Murrieta, California

DRAFTED BY: ATS	CHECKED BY:	May 2025	PROJECT NO. T2647-22-19	FIG. 5

APPENDIX A

APPENDIX A

EXPLORATORY EXCAVATIONS

GEOCON

Soil Boring Number: B - 1

PROJECT NAME Hayes Ave Bridge ER GI | **LOGGED BY** RNP

PROJECT NUMBER T2647-22-19 | **LATITUDE / LONGITUDE** 33.547002, -117.218832

BORING DATE 04/10/2025 | **FIGURE NUMBER** A-1 | **DEPTH** 61.5' | **SURFACE ELEVATION** ~1090'

LOCATION Hayes Bridge between Ivy Street and Juniper Street | **CLIENT NAME** City of Murrieta

DRILLING FIRM 2R DRILLING | **COMPLETED** 04/10/2025 | **EQUIPMENT** CME-75 | -

METHOD Hollow Stem Auger | **BORING DIAMETER** 8 in | **HAMMER TYPE** Auto | **NOTES** N/A

HAMMER WEIGHT / DROP 140 lb / 30"

Depth (ft)	Elevation (ft)	USCS	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Dry Density (pcf)	Moisture Content (%)
	1090		**ASPHALT CONCRETE**, 8"						
2		SM	**AGGREGATE BASE**, 4"						
			ARTIFICIAL FILL						
			afu						
4	1085		**Silty SAND**, dense, slightly moist, olive brown, medium sand, some fine to coarse gravel			B-1@2.5'	31 30 30	127.1	5.5
6		SC	**YOUNG ALLUVIAL VALLEY DEPOSITS** (**Qyv**)			B-1@5'	20 14 14	111.8	5.1
			Clayey SAND, medium dense, moist, brown, fine sand						
8		SM	**Silty SAND**, medium dense, moist, olive brown, fine sand, trace clay and gravel			B-1@7.5'	4 10 22	127.3	10.3
10	1080								
						B-1@10'	18 16 16	127.1	5.6
12			slightly moist						
						B-1@12.5'	10 14 17	118.6	9.6
14	1075								
16		ML	**SILT with Sand**, hard, moist, brown, little gravel			B-1@15'	11 11 13	114.8	9.9
			stiff						
18						B-1@17.5'	3 3 5	113.3	16.7
20	1070	SC	**Clayey SAND**, very loose, saturated, brown						
						B-1@20'	2 2 1	114.3	19.4
22									
24	1065								
26		SM	**Silty SAND**, loose, saturated, dark brown, some gravel			B-1@25'	3 4 5	115.8	17.4
28									
30	1060	SC	**Clayey SAND**, very dense, saturated, light brown			B-1@30'	12 20 18		17.6
32									
34									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES. THE STRATIFICATION LINES PRESENTED HEREIN REPRESENT THE APPROXIMATE BOUNDARY BETWEEN EARTH TYPES; THE TRANSITIONS MAY BE GRADUAL.

GEOCON

SOIL BORING: B-1

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Dry Density (pcf)	Moisture Content (%)
36				CL	**CLAY**, hard, moist, brown			B-1@35'	18 27 43	105.9	20.3
38											
40	1050			ML	**SILT**, hard, moist, gray			B-1@40'	7 12 19		22.6
42											
44	1045			SC	**Clayey SAND**, dense, saturated, olive gray						
46								B-1@45'	12 28 41	119.0	17.7
48											
50	1040							B-1@50'	8 12 19		19.6
52											
54					harder drilling very dense						
	1035			SM	**Silty SAND**, very dense, saturated, olive gray						
56								B-1@55'	50/6"	110.5	15.7
58											
60	1030			SP	**Poorly Graded SAND**, very dense, saturated, olive gray			B-1@60'	15 33 50/6"		17.0
62					Total Depth: 61 1/2 feet Groundwater encountered at 19 feet Backfilled with soil cuttings						
64											
	1025										
66											
68											

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES. THE STRATIFICATION LINES PRESENTED HEREIN REPRESENT THE APPROXIMATE BOUNDARY BETWEEN EARTH TYPES; THE TRANSITIONS MAY BE GRADUAL.

GEOCON

Soil Boring Number: B - 2

PROJECT NAME Hayes Ave Bridge ER GI | **LOGGED BY** RNP

PROJECT NUMBER T2647-22-19 | **LATITUDE / LONGITUDE** 33.546883, -117.218717

BORING DATE 04/10/2025 | **FIGURE NUMBER** A-2 | **DEPTH** 61.5' | **SURFACE ELEVATION** ~1090'

LOCATION Hayes Bridge between Ivy Street and Juniper Street | **CLIENT NAME** City of Murrieta

DRILLING FIRM 2R DRILLING | **COMPLETED** 04/10/2025 | **EQUIPMENT** CME-75 | -

METHOD Hollow Stem Auger | **BORING DIAMETER** 8 in | **HAMMER TYPE** Auto | **NOTES** N/A

HAMMER WEIGHT / DROP 140 lb / 30"

Depth (ft)	Elevation (ft)	USCS	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Dry Density (pcf)	Moisture Content (%)
	1090		**ASPHALT CONCRETE**, 7"						
2		SM	**AGGREGATE BASE**, 4"						
			ARTIFICIAL FILL						
			afu						
4	1085		**Silty SAND**, medium dense, slightly moist, brown, trace roots		■	B-2@2.5'	7 15 26	126.6	6.9
6		SC	**YOUNG ALLUVIAL VALLEY DEPOSITS** (**Qyv**)						
			Clayey SAND, dense, moist, brown		■	B-2@5'	15 19 32	130.4	8.8
8					■	B-2@7.5'	20 27 35	128.0	10.5
10	1080								
					■	B-2@10'	9 18 33	123.0	12.2
12		CL	**Lean CLAY with Sand**, hard, moist, dark brown						
14					■	B-2@12.5'	7 13 30	108.8	24.1
	1075								
16		SM	**Silty SAND**, dense, moist, brown with dark brown mottles		■	B-2@15'	15 25 29	129.6	8.7
18					■	B-2@17.5'	6 6 16	103.3	23.3
20	1070		medium dense						
		ML	**SILT with Sand**, hard, moist, brown		■	B-2@20'	8 18 35	110.2	20.0
22									
		SP-SM	**Poorly Graded SAND w/ Silt**, dense, saturated, olive brown, medium to coarse sand		■	B-2@22.5'	22 50/5"	116.0	13.4
24	1065								
26			very dense, medium sand		■	B-2@25'	20 34 50/5"	109.1	17.8
28									
	1060								
30			dense, becomes coarser		■	B-2@30'	14 7 14		17.3
32									
34									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES. THE STRATIFICATION LINES PRESENTED HEREIN REPRESENT THE APPROXIMATE BOUNDARY BETWEEN EARTH TYPES; THE TRANSITIONS MAY BE GRADUAL.

GEOCON

SOIL BORING: B-2

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Dry Density (pcf)	Moisture Content (%)
36				SP-SM	**Poorly Graded SAND w/ Silt**, medium dense, saturated, brown, medium to coarse sand			B-2@35'	9 20 23	114.8	8.8
38											
40	1050			SM	**Silty SAND**, dense, saturated, brown, trace clay			B-2@40'	7 11 19		19.5
42											
44	1045				olive brown						
46								B-2@45'	11 24 30	109.6	19.3
48											
50	1040			SC	**Clayey SAND**, dense, saturated, olive gray			B-2@50'	9 12 22		28.0
52											
54	1035				very dense, light brown						
56								B-2@55'	17 50/6"	119.9	115.6
58											
60	1030							B-2@60'	17 23 30		18.9
62					Total Depth: 61 1/2 feet Groundwater encountered at 22 feet Backfilled with soil cuttings and capped with AC cold-patch						
64	1025										
66											
68											

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES. THE STRATIFICATION LINES PRESENTED HEREIN REPRESENT THE APPROXIMATE BOUNDARY BETWEEN EARTH TYPES; THE TRANSITIONS MAY BE GRADUAL.

APPENDIX B

APPENDIX B

LABORATORY TESTING

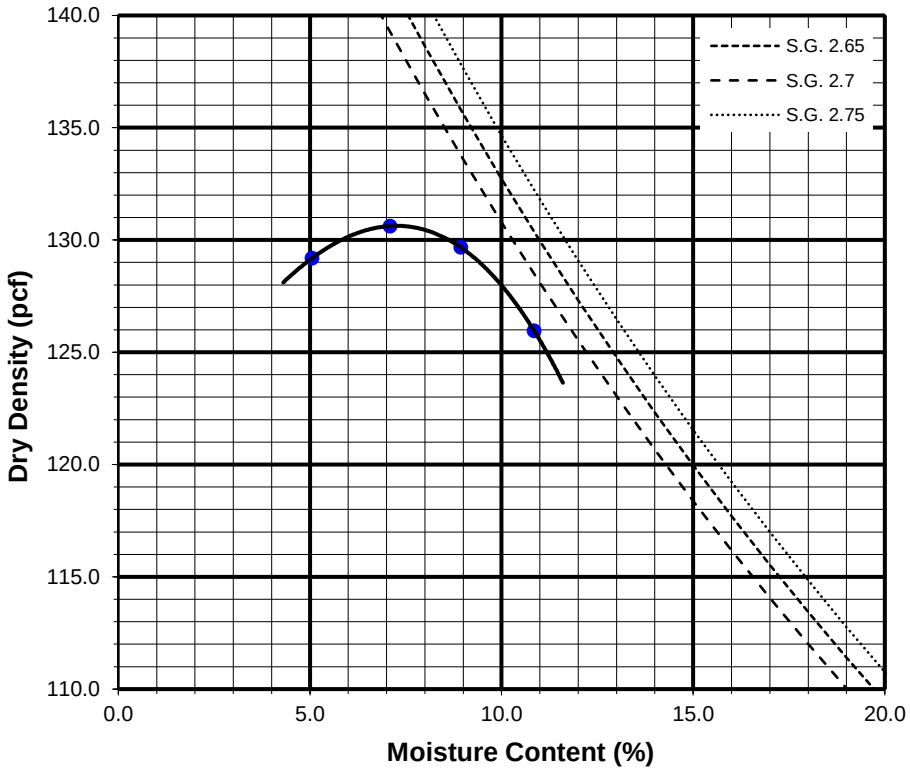
Sample No:

B-1@3-8'	Silty SAND with trace Clay (SM), olive brown

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	6382	6357	6361	6298		
Weight of Mold	(g)	4248	4248	4248	4248		
Net Weight of Soil	(g)	2134	2109	2113	2050		
Wet Weight of Soil + Cont.	(g)	771.0	823.7	999.2	758.2		
Dry Weight of Soil + Cont.	(g)	728.7	768.3	950.2	734.1		
Weight of Container	(g)	255.2	257.7	259.4	257.3		
Moisture Content	(%)	8.9	10.8	7.1	5.1		
Wet Density	(pcf)	141.3	139.6	139.9	135.7		
Dry Density	(pcf)	129.7	126.0	130.6	129.2		

Maximum Dry Density (pcf)	**131.0**
Bulk Specific Gravity (dry)	**2.58**
Corrected Maximum Dry Density (pcf)	**137.5**

Optimum Moisture Content (%)	**8.0**
Oversized Fraction (%)	**25.0**
Corrected Moisture Content (%)	**6.0**



Preparation Method: A

GEOCON

COMPACTION CHARACTERISTICS USING MODIFIED EFFORT TEST RESULTS

ASTM D-1557

Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-1

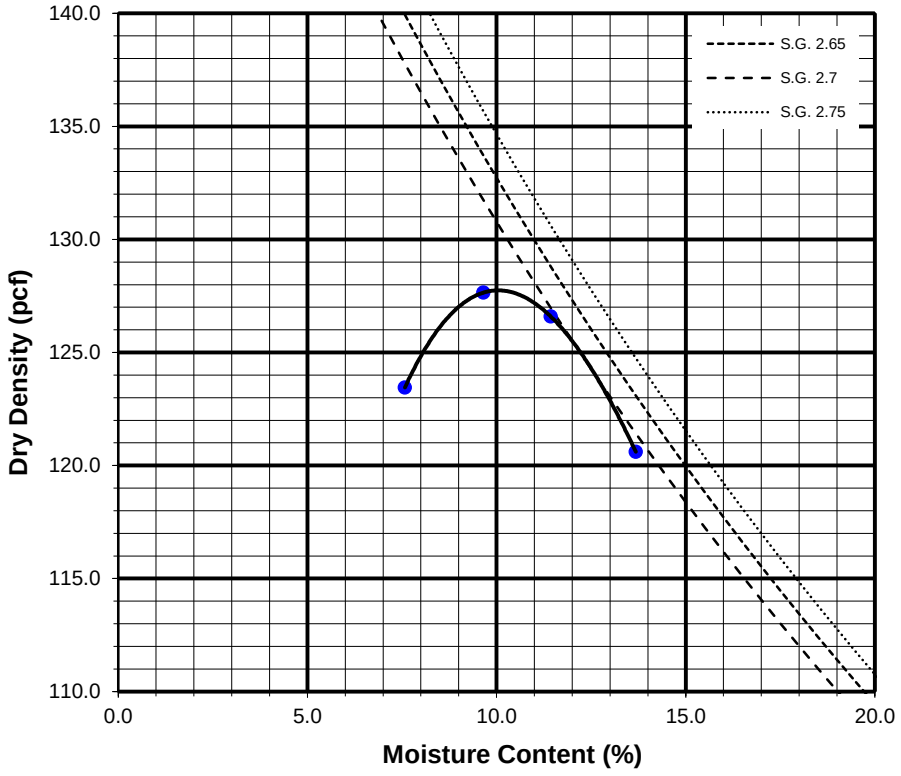
Sample No:

B-2@10-15'	Clayey SAND (SC), brown

TEST NO.		1	2	3	4	5	6
Wt. Compacted Soil + Mold	(g)	6319	6379	6362	6254		
Weight of Mold	(g)	4248	4248	4248	4248		
Net Weight of Soil	(g)	2071	2131	2114	2006		
Wet Weight of Soil + Cont.	(g)	815.3	792.5	845.0	816.9		
Dry Weight of Soil + Cont.	(g)	748.0	737.8	793.3	777.8		
Weight of Container	(g)	256.1	259.4	257.9	261.8		
Moisture Content	(%)	13.7	11.4	9.7	7.6		
Wet Density	(pcf)	137.1	141.1	140.0	132.8		
Dry Density	(pcf)	120.6	126.6	127.6	123.5		

Maximum Dry Density (pcf)	**128.5**

Optimum Moisture Content (%)	**10.5**



Preparation Method: A

GEOCON

COMPACTION CHARACTERISTICS USING MODIFIED EFFORT TEST RESULTS

ASTM D-1557

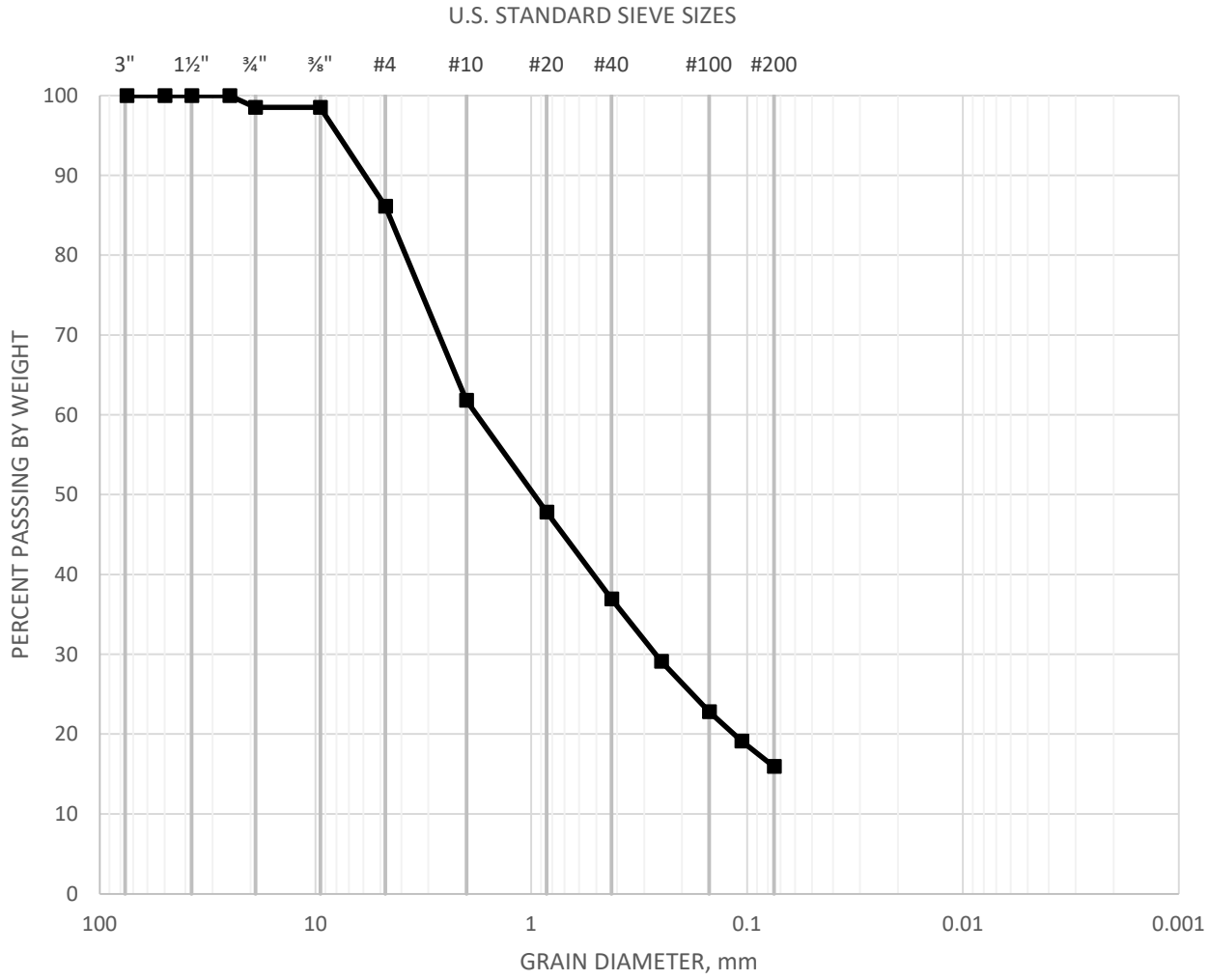
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-2

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-1@5'	Clayey SAND (SC), brown	6.3	0.99	0.26

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

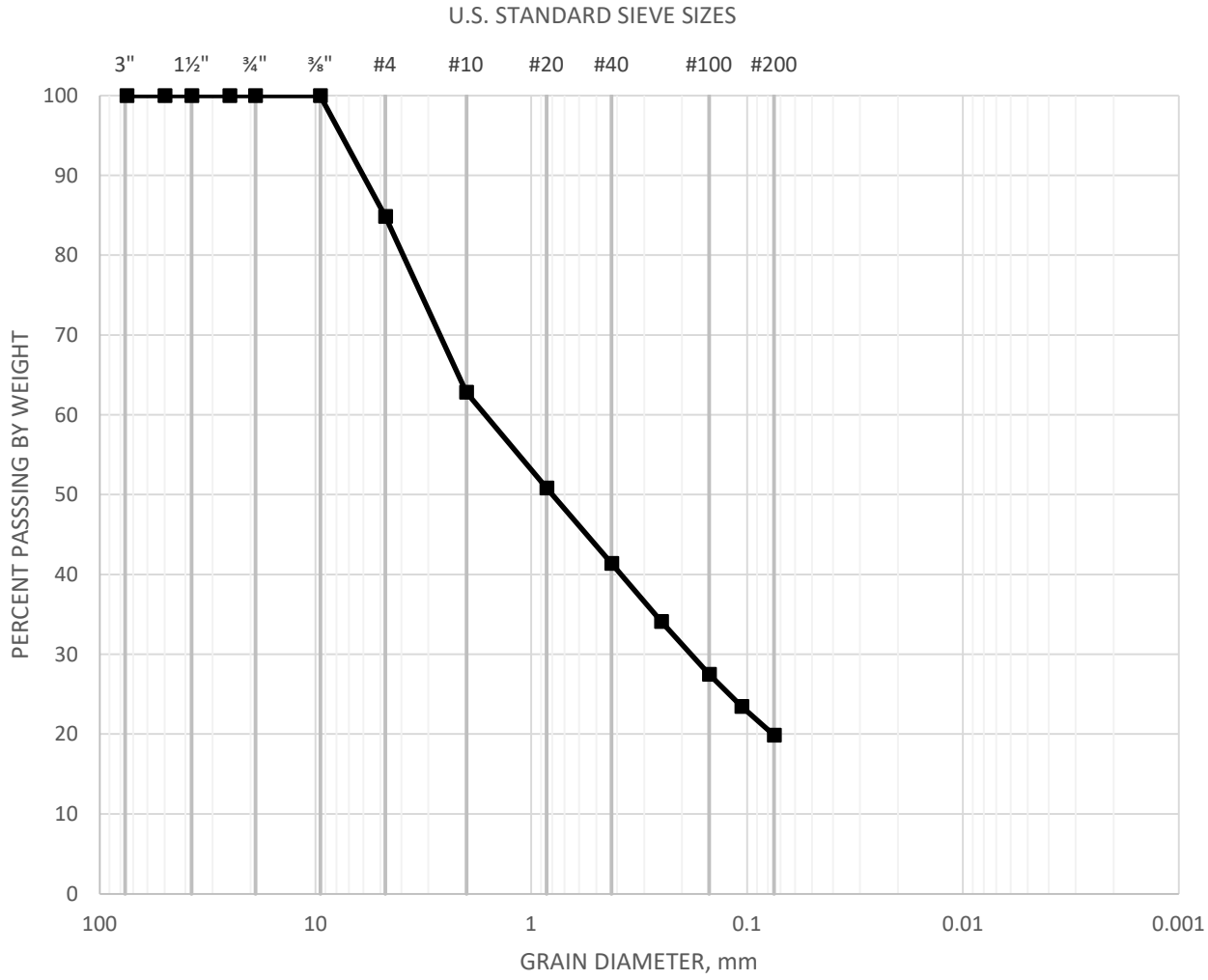
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-3

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-1@10'	Silty SAND with Gravel (SM), olive brown	5.4	0.8	0.19

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

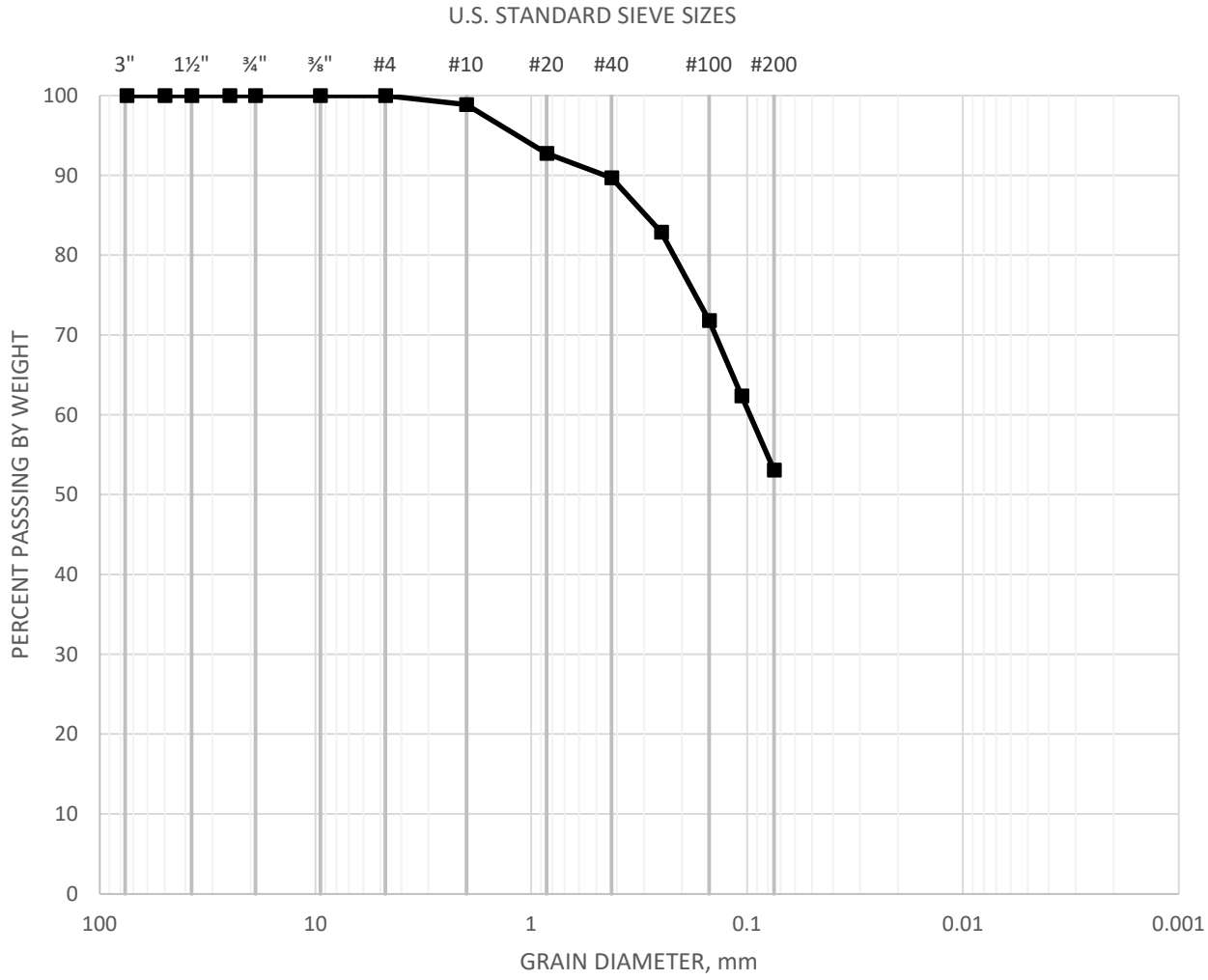
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-4

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-1@15'	SILT with Sand (ML), brown	0.44		

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

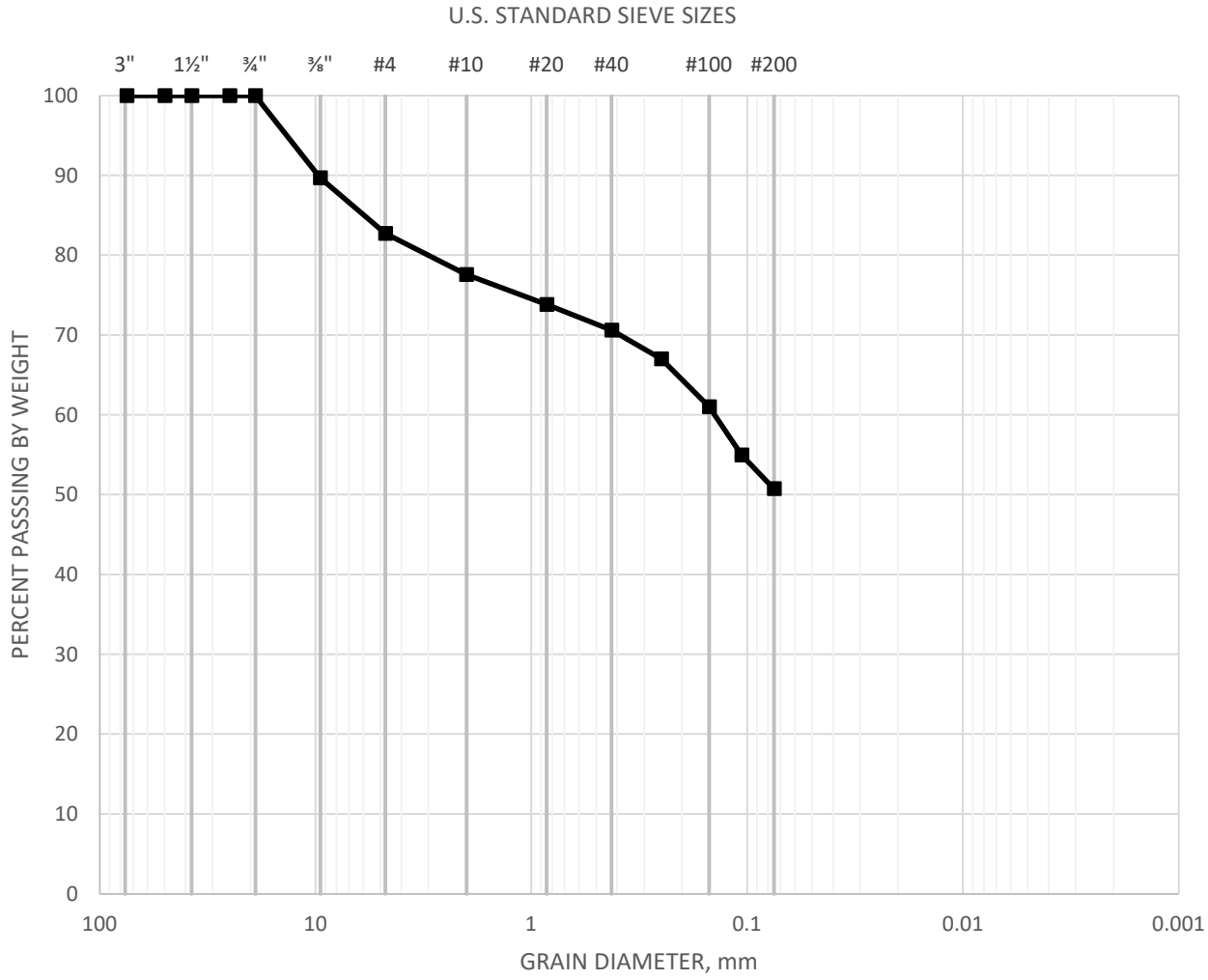
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-5

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-1@17.5'	SILT with Sand and Gravel (ML), brown	9.6		

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

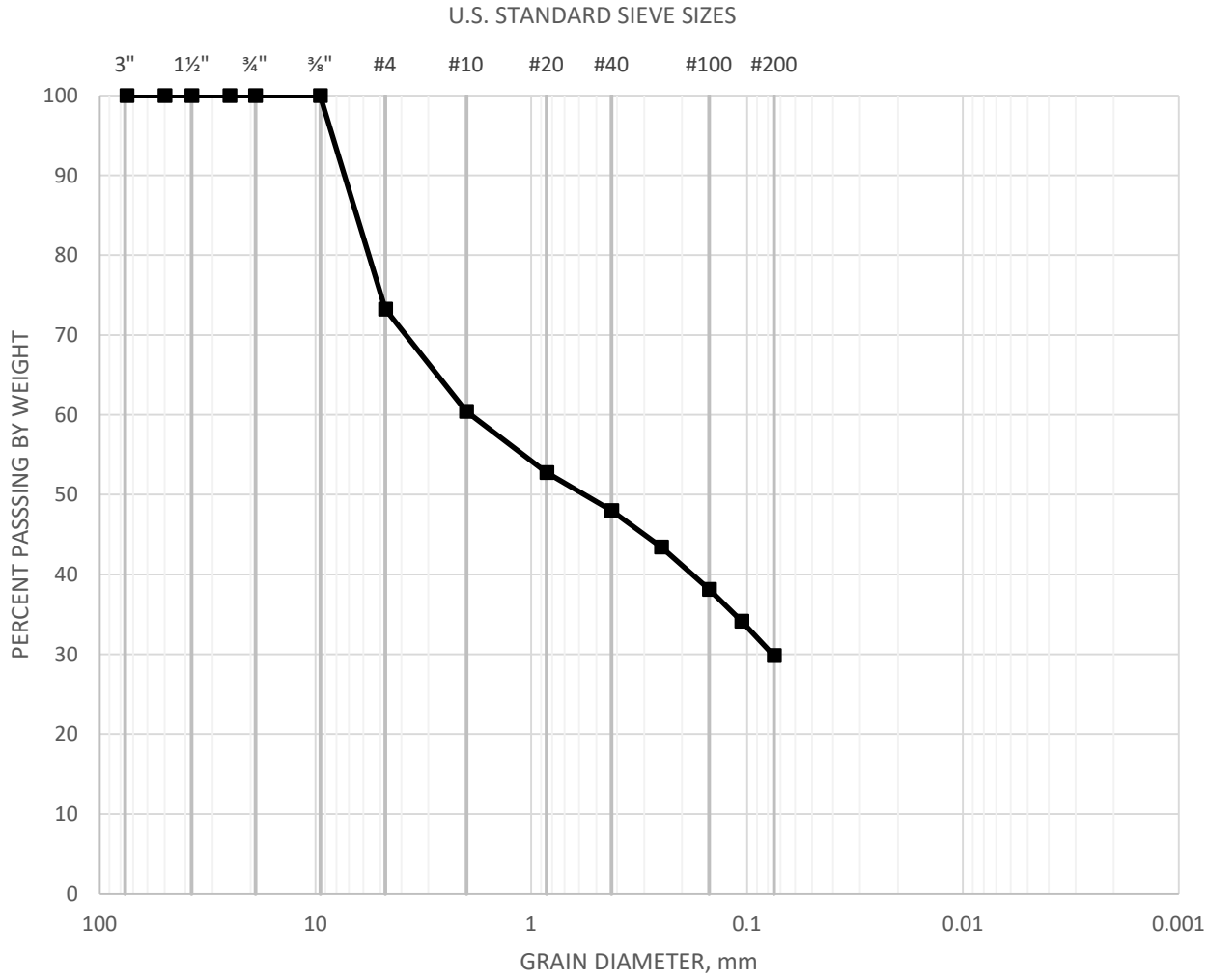
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-6

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-1@25'	Silty SAND with Gravel (SM), dark brown	7.2	0.57	0.074

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

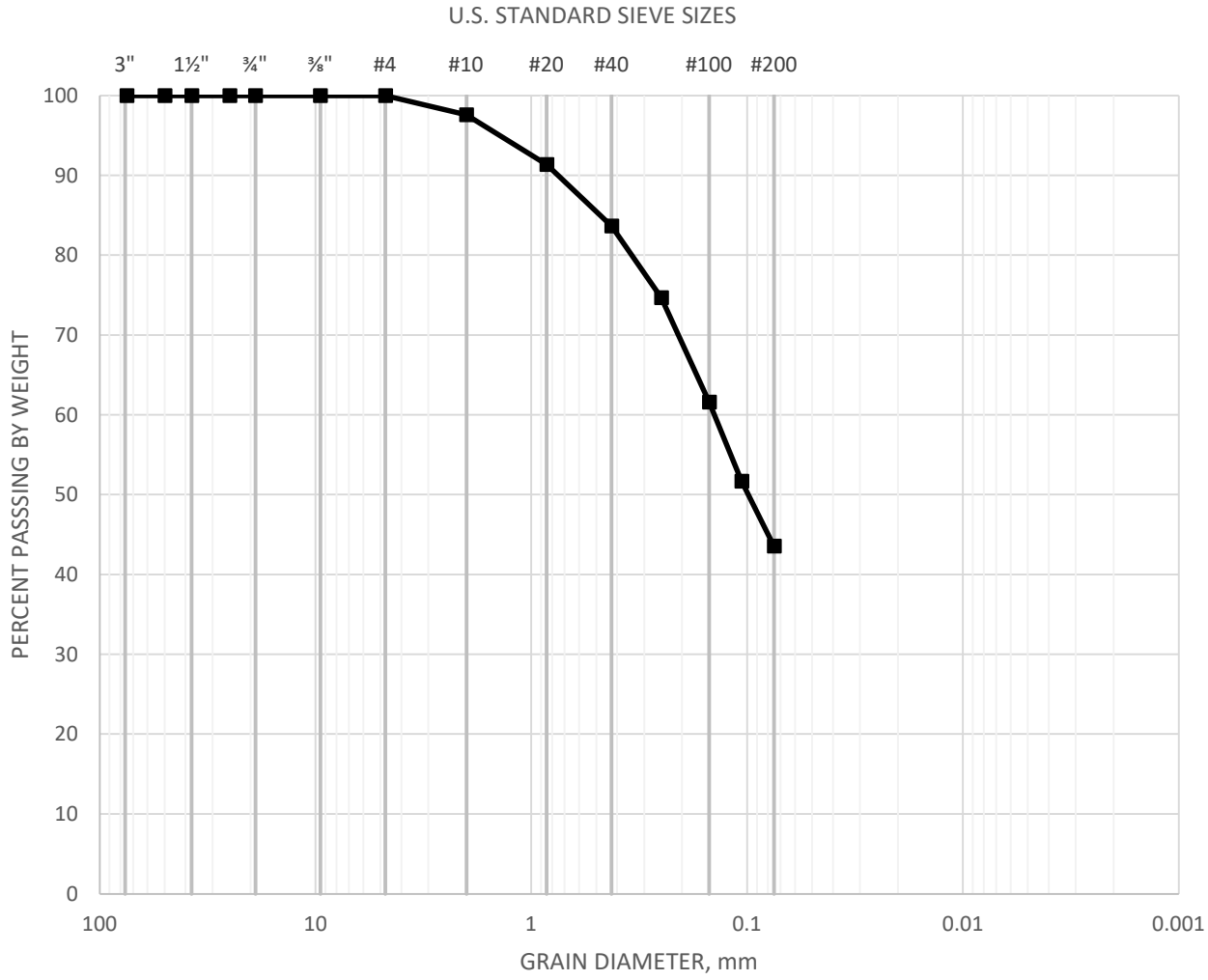
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-7

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-2@2.5'	Silty SAND (SM), brown	0.75	0.099	

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

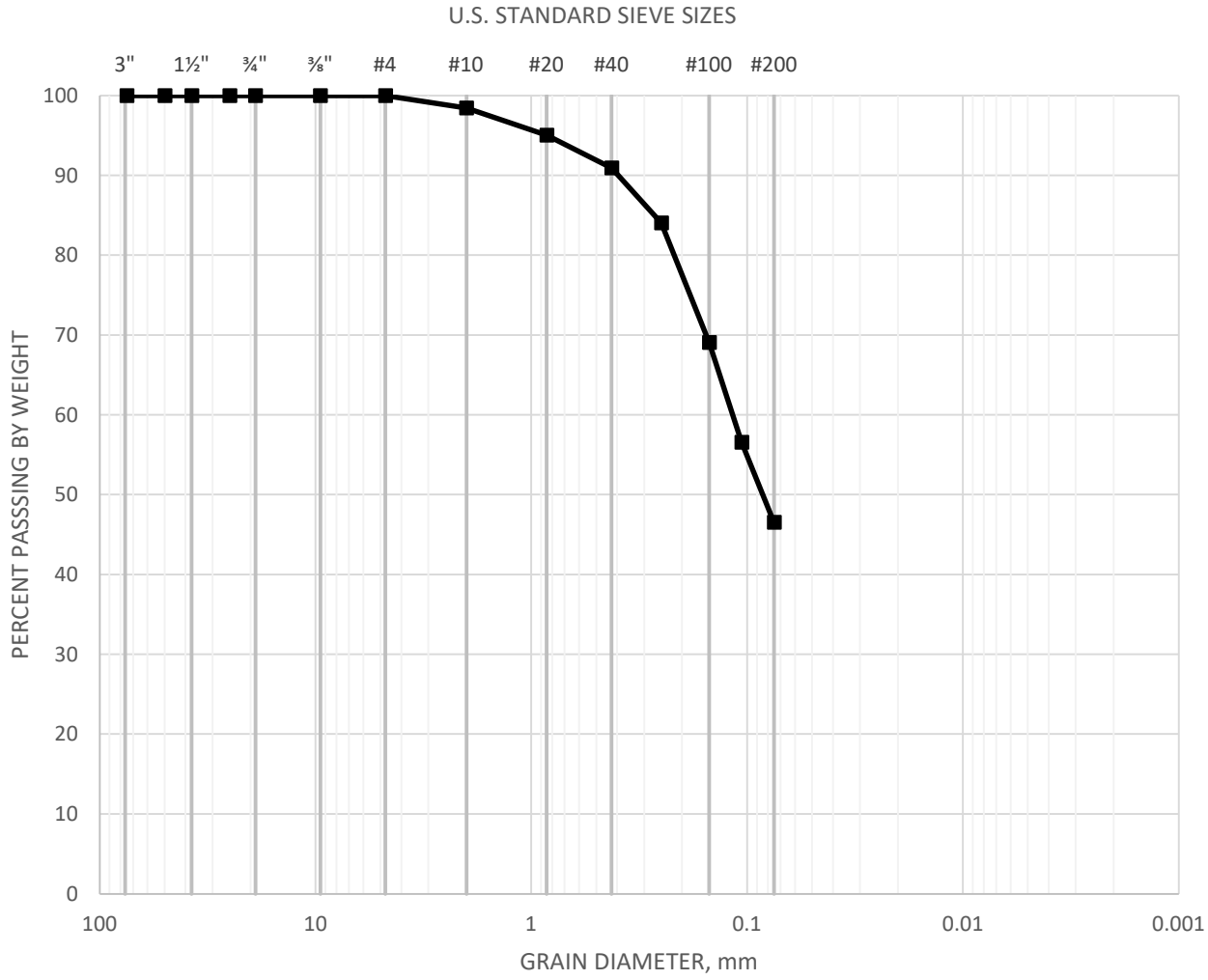
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-8

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-2@7.5'	Silty SAND (SM), brown	0.39	0.083	

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

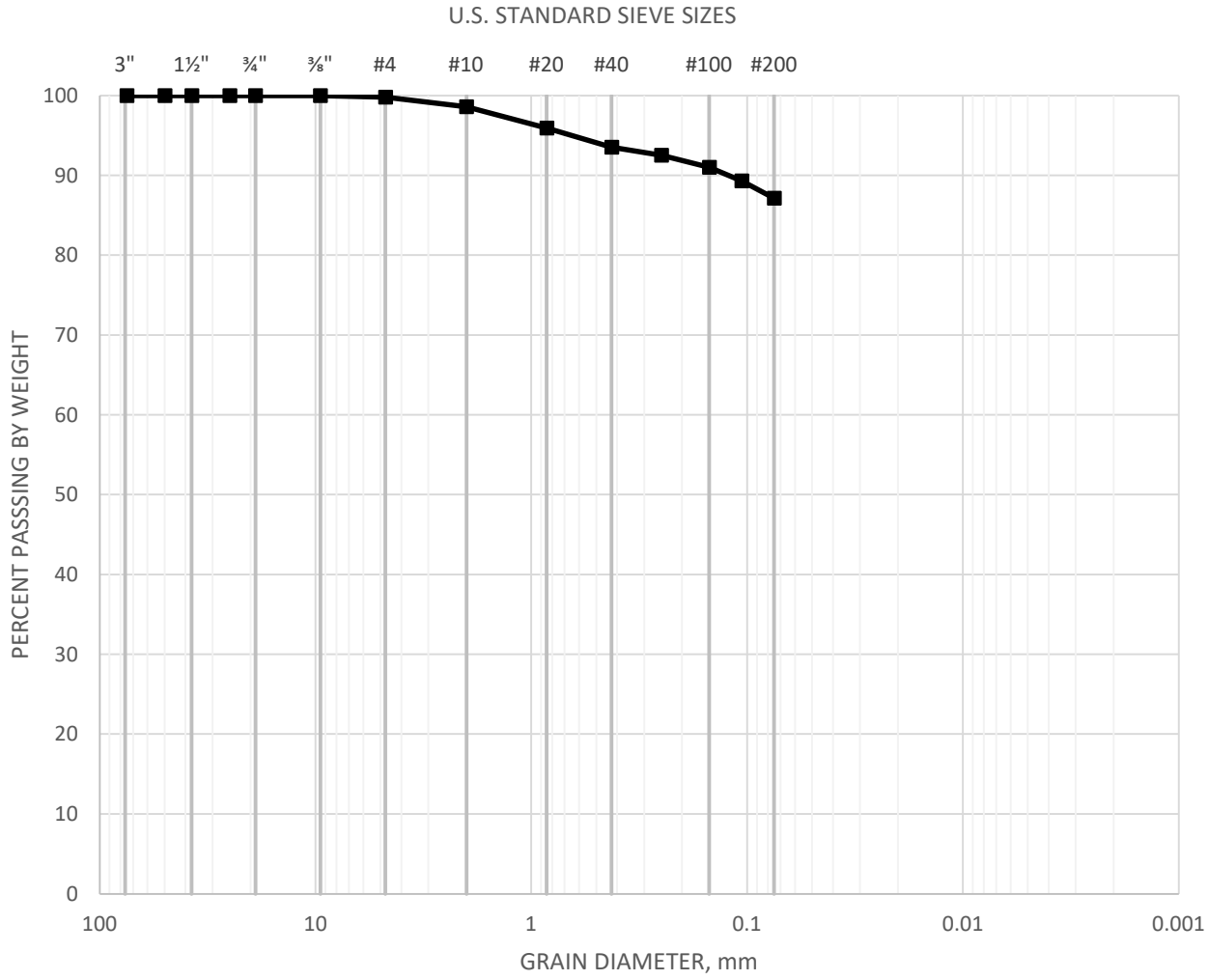
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-9

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-2@12.5'	Lean CLAY (CL), dark brown	0.12		

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

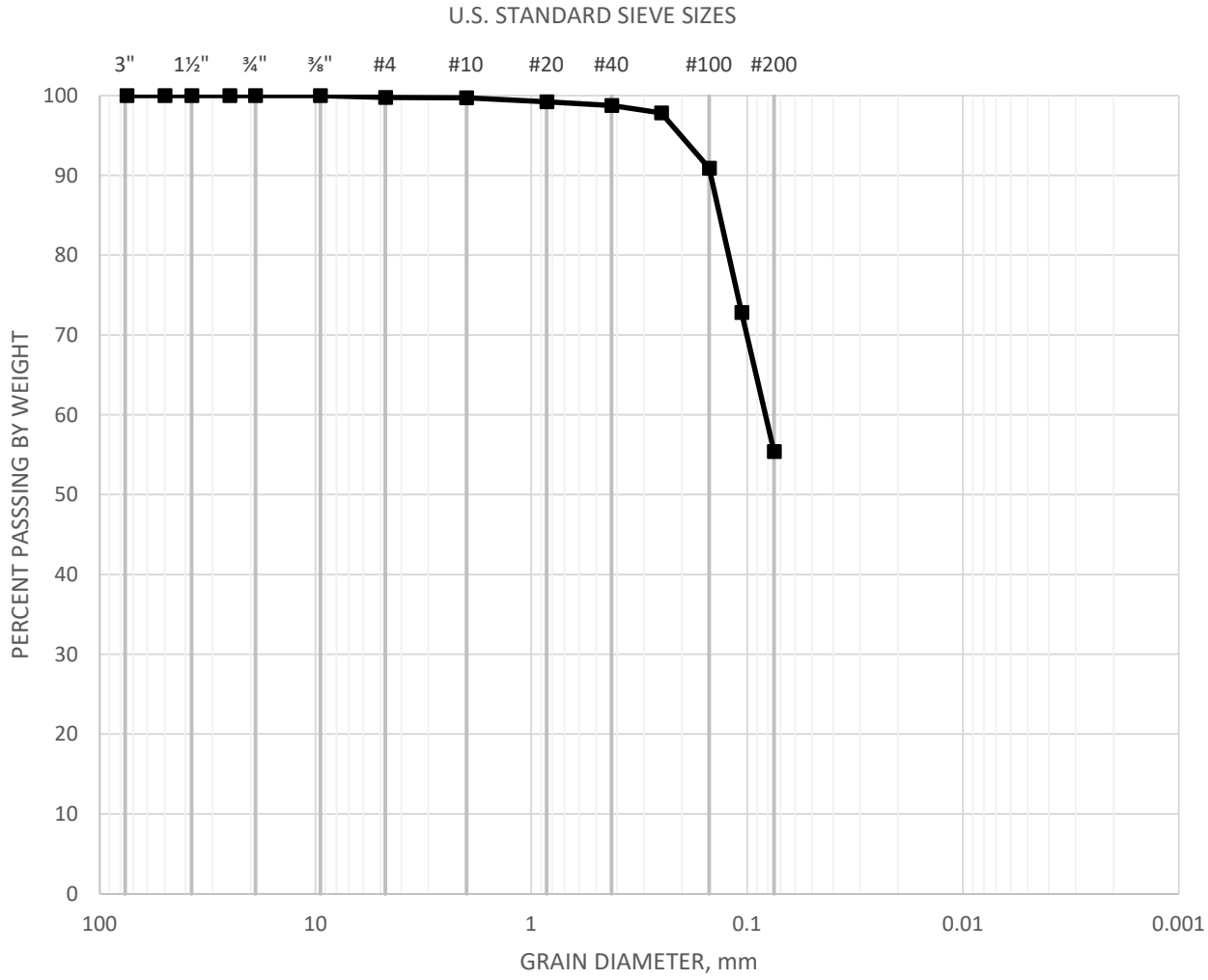
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-10

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-2@20'	SILT with Sand (ML), brown	0.14		

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

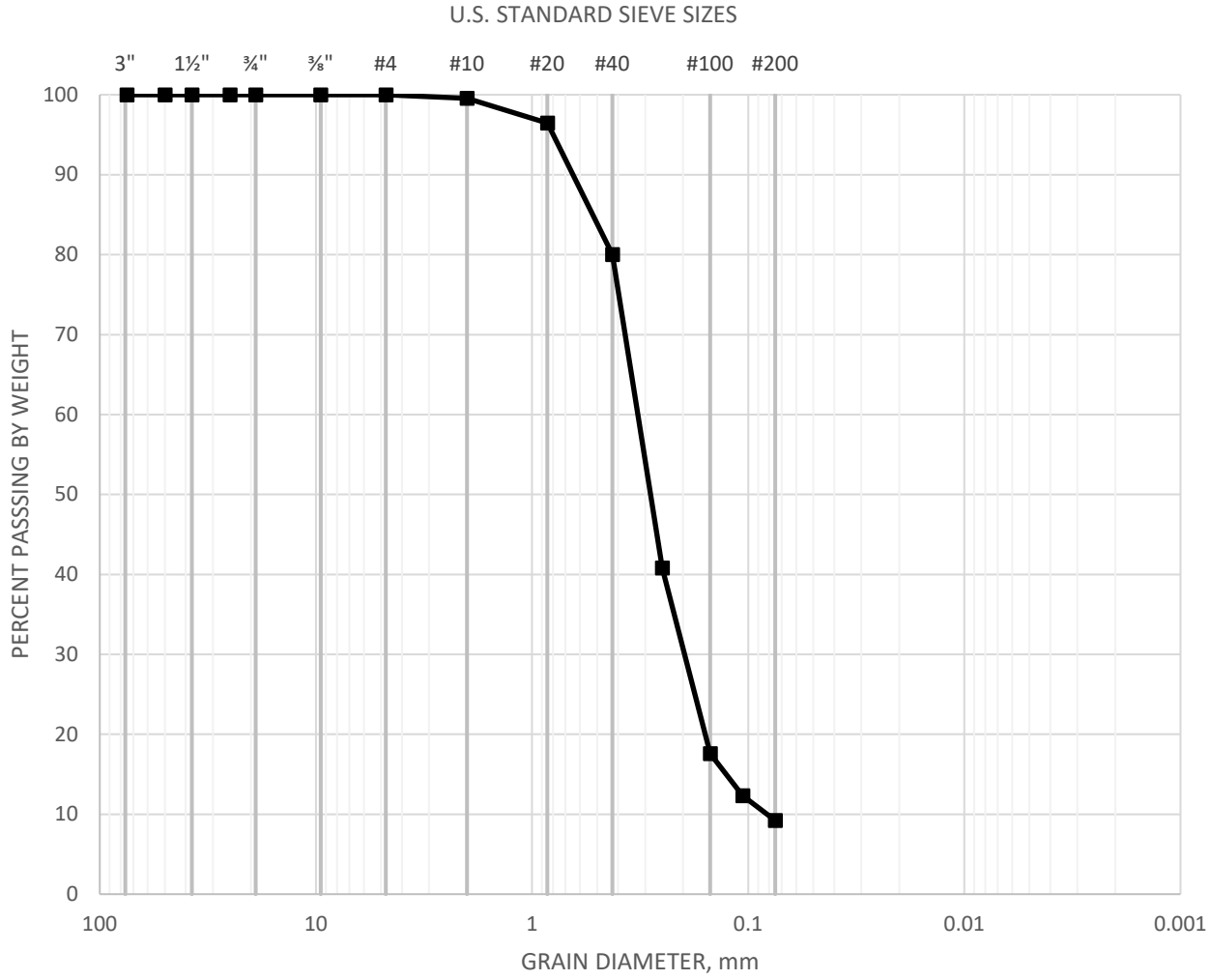
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-11

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



SAMPLE	CLASSIFICATION	D_{90}	D_{50}	D_{30}
B-2@25'	Poorly Graded SAND with Silt (SP-SM), olive brown	0.63	0.28	0.2

GEOCON

GRAIN SIZE DISTRIBUTION

ASTM D 6913

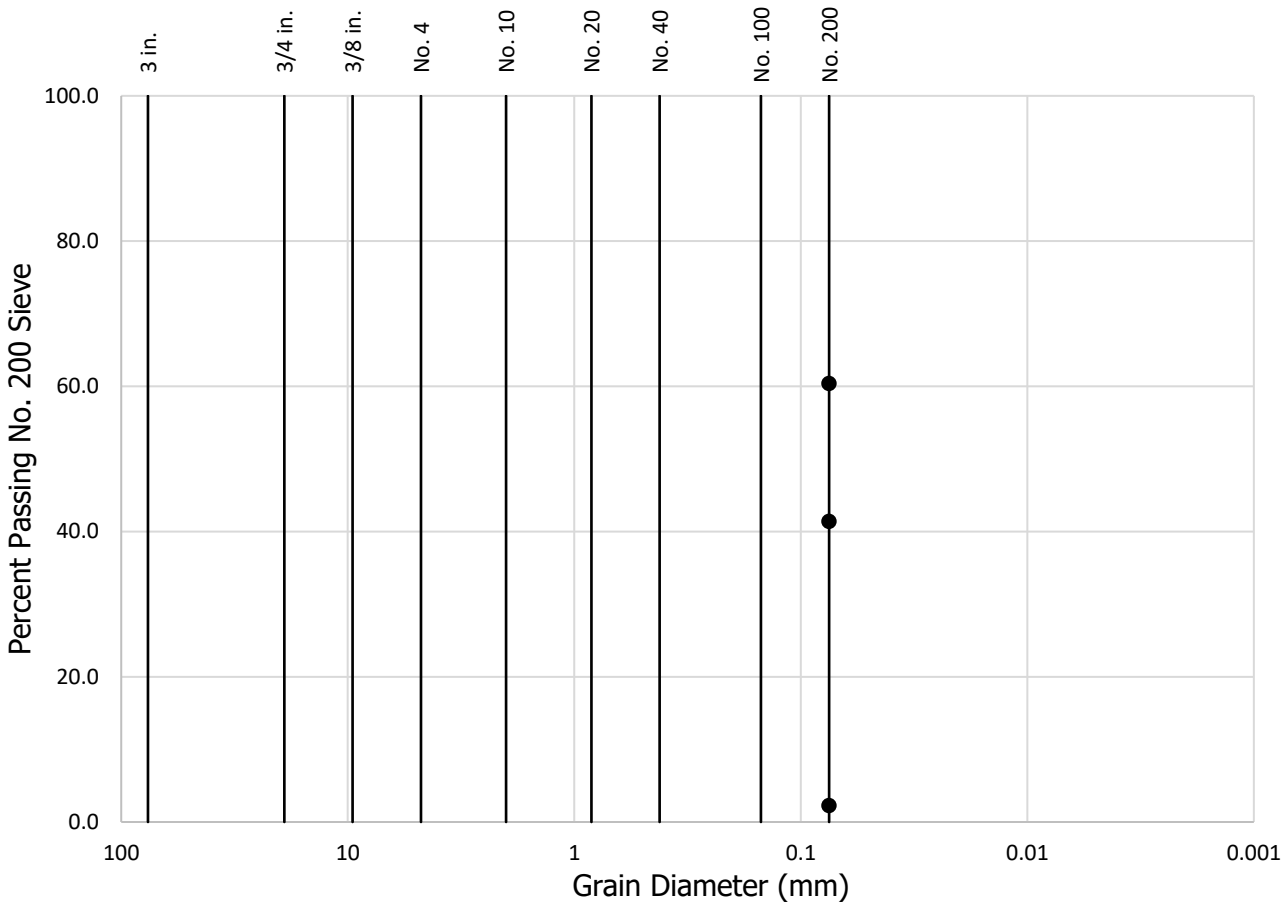
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 25 Figure B-12

GRAVEL		SAND			SILT AND CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Sample No.	Percent Passing No. 200 Sieve
B-1 @ 30'	41.4
B-1 @ 40'	60.4
B-2 @ 30'	2.3

GEOCON

GRAIN SIZE ANALYSIS

ASTM D-1140

Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-13

B-2@10-15'

MOLDED SPECIMEN		BEFORE TEST	AFTER TEST
Specimen Diameter	(in.)	4.0	4.0
Specimen Height	(in.)	1.0	1.0
Wt. Comp. Soil + Mold	(gm)	594.0	633.5
Wt. of Mold	(gm)	200.3	200.3
Specific Gravity	(Assumed)	2.7	2.7
Wet Wt. of Soil + Cont.	(gm)	473.3	633.5
Dry Wt. of Soil + Cont.	(gm)	443.6	354.7
Wt. of Container	(gm)	173.3	200.3
Moisture Content	(%)	11.0	22.1
Wet Density	(pcf)	118.8	130.5
Dry Density	(pcf)	107.0	106.9
Void Ratio		0.6	0.7
Total Porosity		0.4	0.4
Pore Volume	(cc)	75.6	85.9
Degree of Saturation	(%) [S_{meas}]	52.0	91.4

Date	Time	Pressure (psi)	Elapsed Time (min)	Dial Readings (in.)
4/23/2025	10:00	1.0	0	0.3431
4/23/2025	10:10	1.0	10	0.3421
Add Distilled Water to the Specimen				
4/24/2025	10:00	1.0	1430	0.3916
4/24/2025	11:00	1.0	1490	0.3916

Expansion Index (EI meas) =	49.5
Expansion Index (Report) =	**50**

Expansion Index, EI_{50}	CBC CLASSIFICATION *	UBC CLASSIFICATION **
0-20	Non-Expansive	Very Low
21-50	Expansive	Low
51-90	Expansive	Medium
91-130	Expansive	High
>130	Expansive	Very High

* Reference: 2022 California Building Code, Section 1803.5.3

** Reference: 1997 Uniform Building Code, Table 18-I-B.

GEOCON

EXPANSION INDEX TEST RESULTS

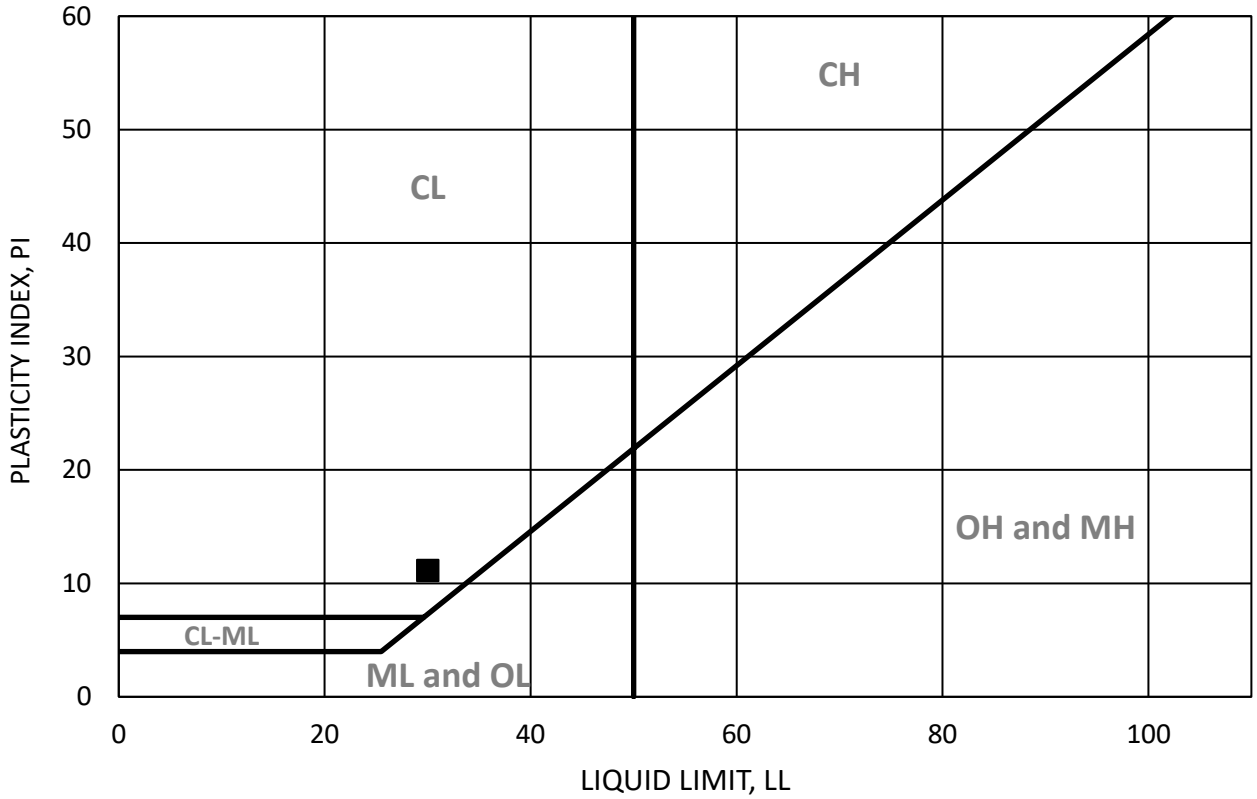
ASTM D-4829

Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-14



SYMBOL	BORING	DEPTH (ft)	LL	PL	PI	MOISTURE CONTENT AT SATURATION	SOIL BEHAVIOR
■	B-2	10-15	30	19	11		CL
◆							
▲							
●							
□							
◇							
△							
○							

N/P = Non-Plastic

GEOCON

ATTERBERG LIMITS

ASTM D-4318

Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-15

SUMMARY OF LABORATORY
POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS
AASHTO T289 ASTM D4972 and AASHTO T288 ASTM G187

Sample No.	pH	Resistivity (ohm centimeters)
B-2@10-15'	8.4	1800

SUMMARY OF LABORATORY CHLORIDE CONTENT TEST RESULTS
AASHTO T291 ASTM C1218

Sample No.	Chloride Ion Content (%)
B-2@10-15'	0.011

SUMMARY OF LABORATORY WATER SOLUBLE SULFATE TEST RESULTS
AASHTO T290 ASTM C1580

Sample No.	Water Soluble Sulfate (% SO_4)	Sulfate Exposure
B-2@10-15'	0.000	S0

GEOCON

CORROSIVITY TEST RESULTS

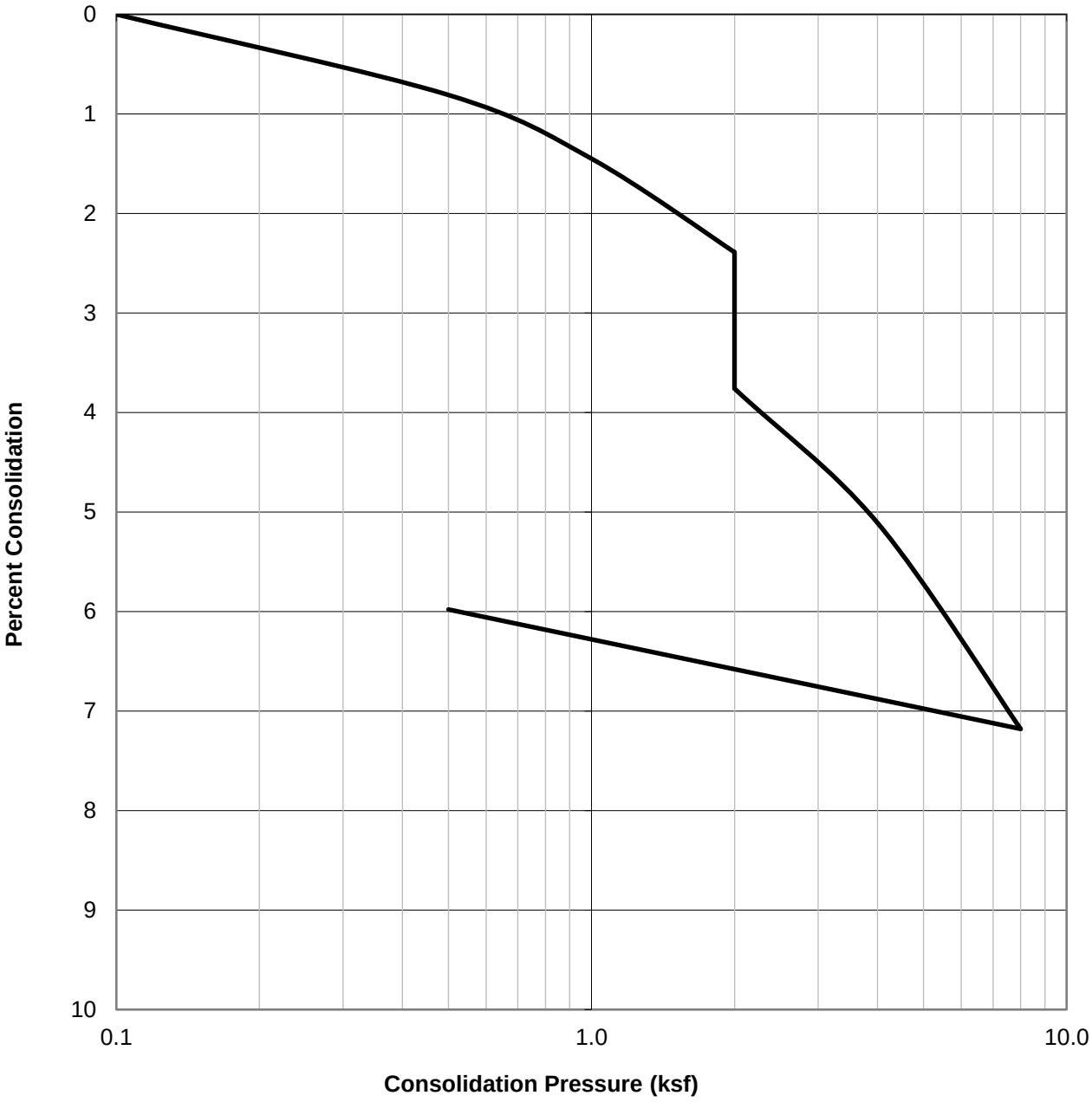
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-16

WATER ADDED AT 2.0 KSF



SAMPLE ID.	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B-1@15'	SILT with Sand (ML), brown	112.2	10.7	16.0

GEOCON

CONSOLIDATION TEST RESULTS

ASTM D-2435

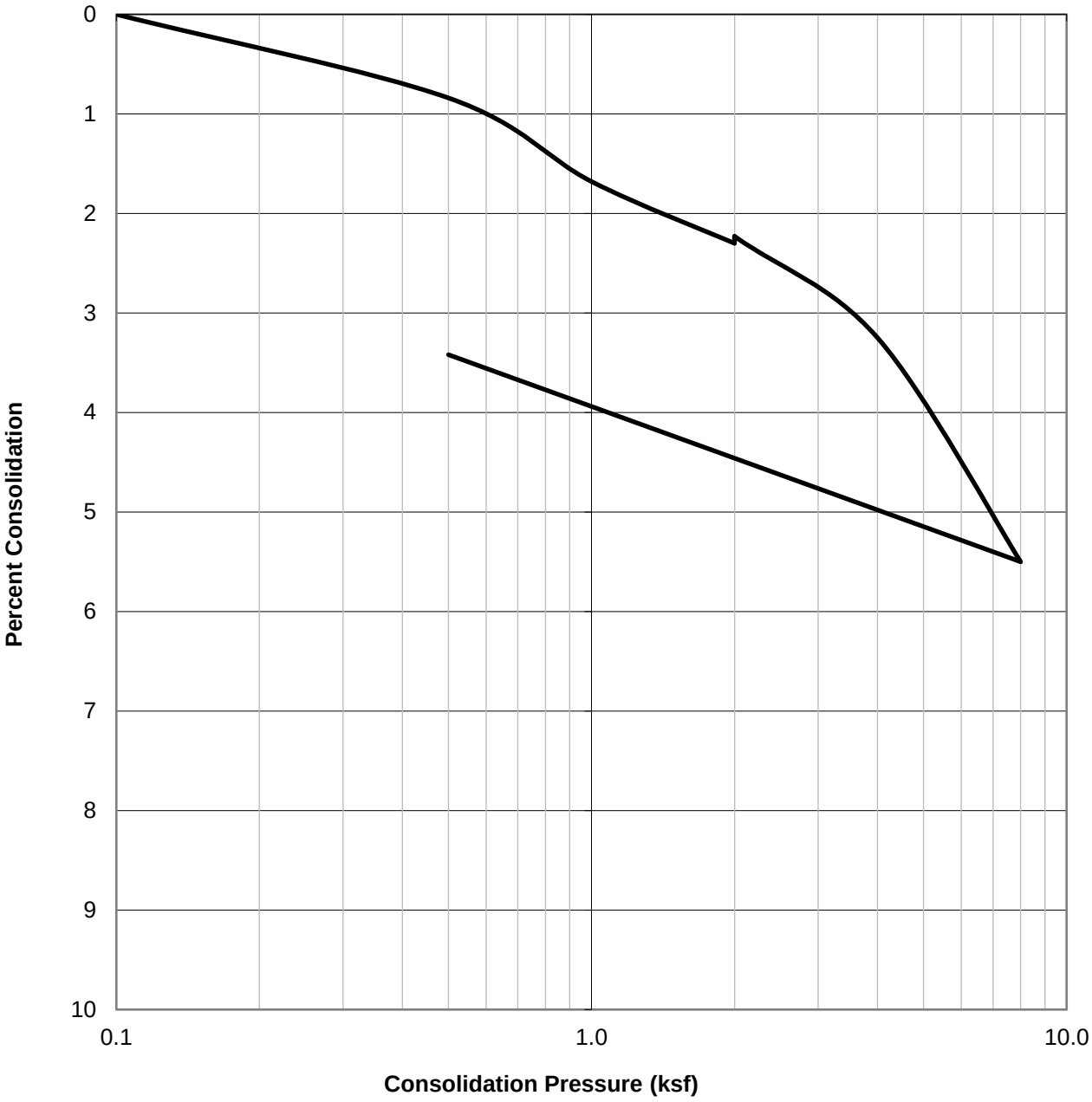
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-17

WATER ADDED AT 2.0 KSF



SAMPLE ID.	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B-1@17.5'	SILT with Sand and Gravel (ML), brown	105.6	22.3	21.5

GEOCON

CONSOLIDATION TEST RESULTS

ASTM D-2435

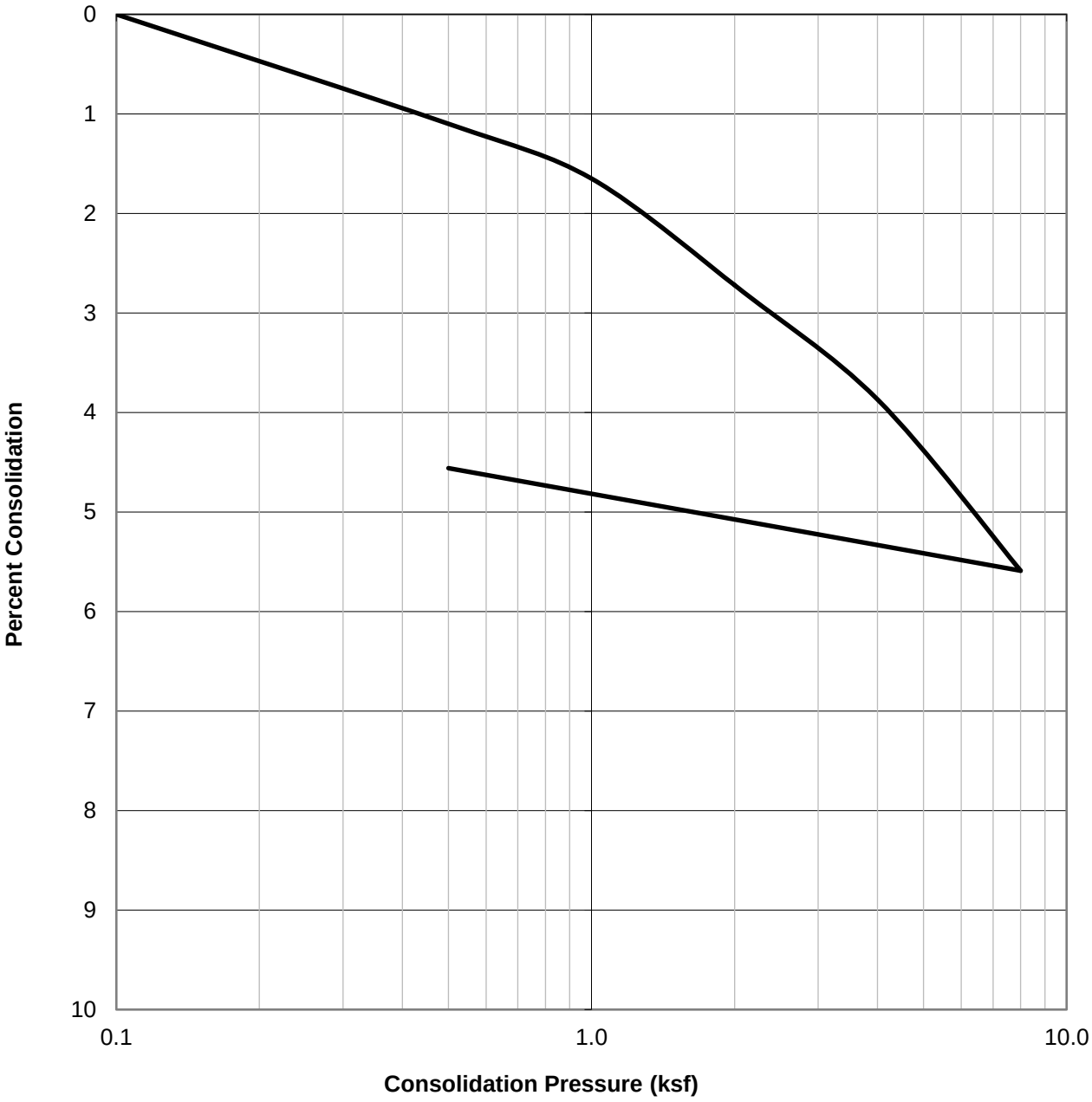
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-18

WATER ADDED AT 2.0 KSF



SAMPLE ID.	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B-1@20'	Clayey SAND (SC)	110.3	19.4	17.9

GEOCON

CONSOLIDATION TEST RESULTS

ASTM D-2435

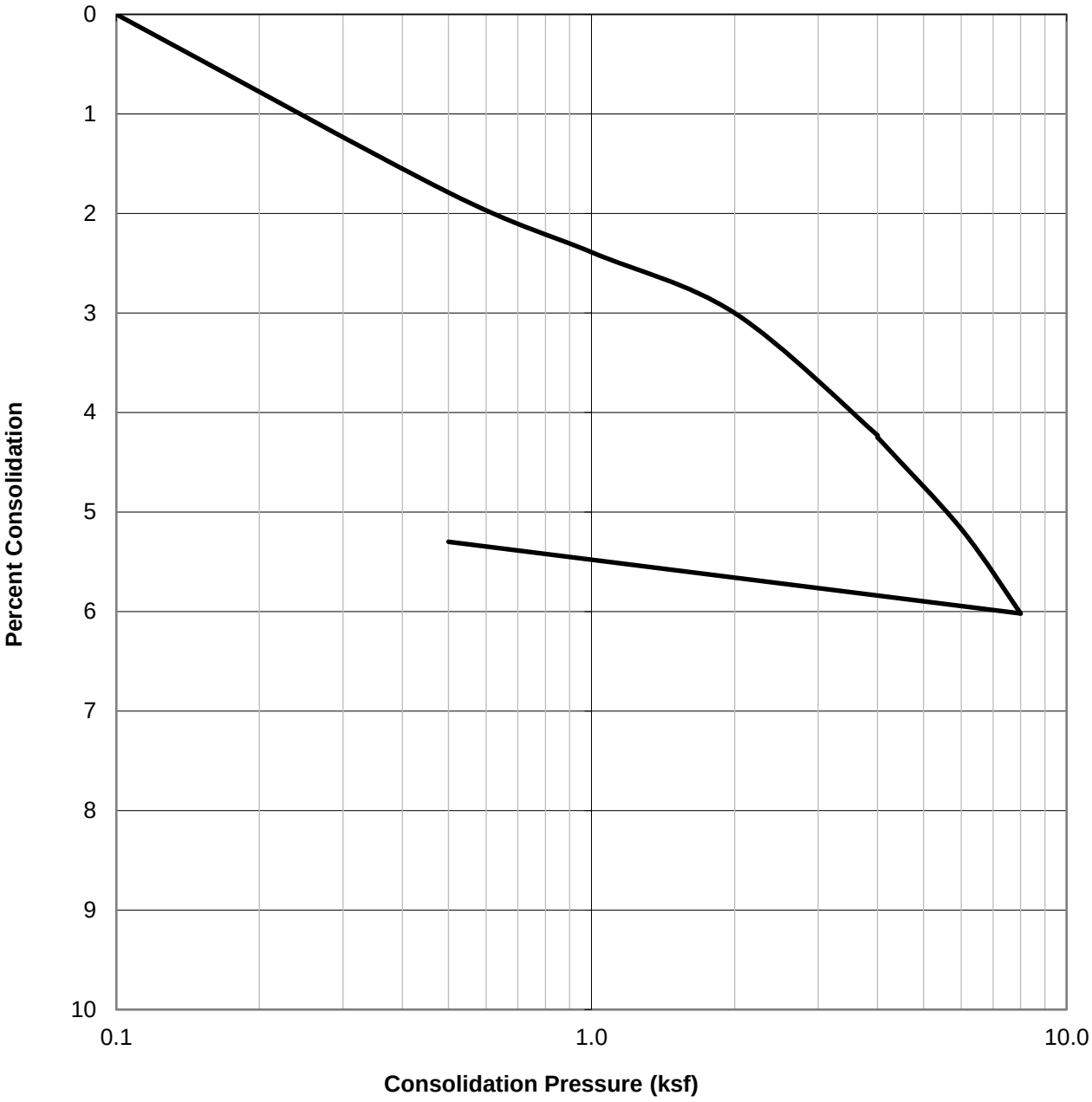
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-19

WATER ADDED AT 4.0 KSF



SAMPLE ID.	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B-1@25'	Silty SAND (SM), dark brown	118.3	17.4	18.0

GEOCON

CONSOLIDATION TEST RESULTS

ASTM D-2435

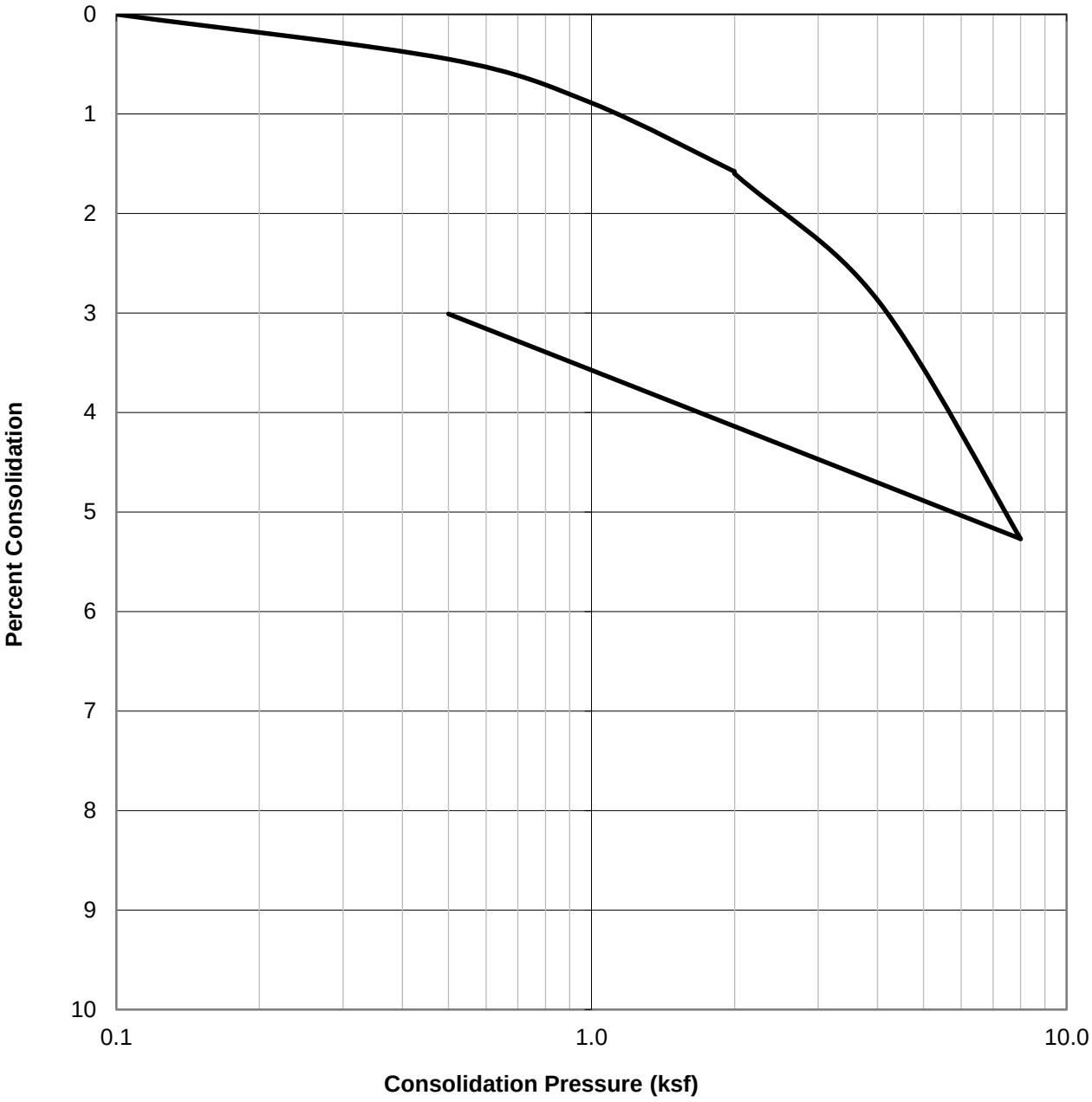
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-20

WATER ADDED AT 2.0 KSF



SAMPLE ID.	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B-2@17.5'	Silty SAND (SM), brown	102.2	24.4	25.1

GEOCON

CONSOLIDATION TEST RESULTS

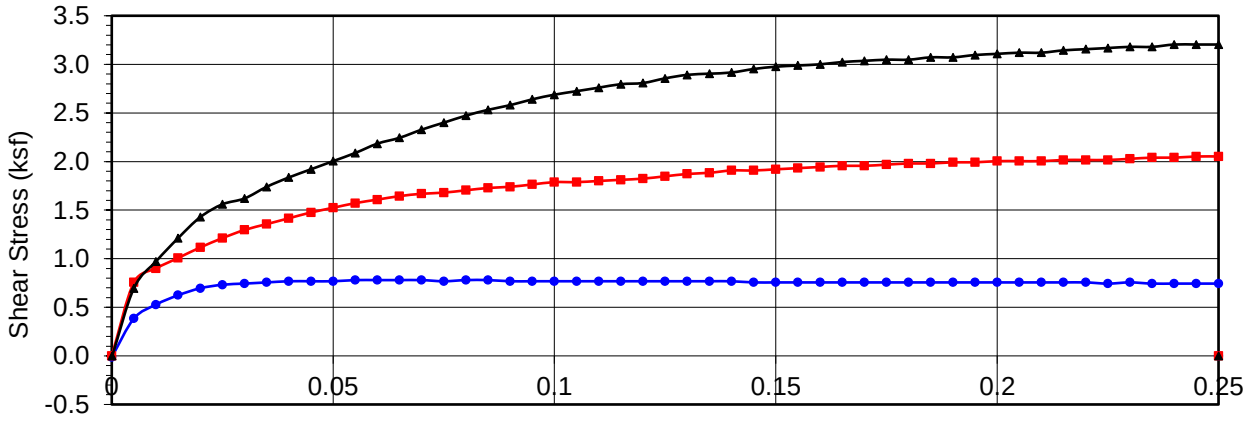
ASTM D-2435

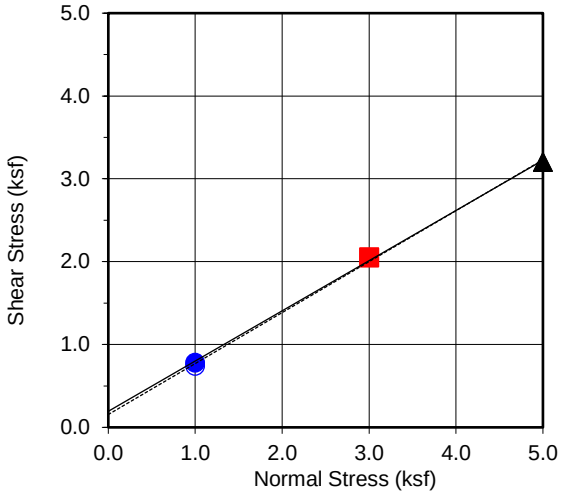
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-21





Boring No.	**B-1**
Sample No.	**B-1@3-8'**
Depth (ft)	**3-8'**
Sample Type:	Bulk

Soil Identification:

Silty SAND with trace Clay (SM), olive brown

Strength Parameters

	C (psf)	ϕ (^{o})
Peak	194	31
Ultimate	155	32

Normal Stress (kip/ft2)	1	3	5
Peak Shear Stress (kip/ft²)	● 0.78	■ 2.05	▲ 3.20
Shear Stress @ End of Test (ksf)	○ 0.74	□ 2.05	△ 3.20
Deformation Rate (in./min.)	0.05	0.05	0.05
Initial Sample Height (in.)	1.0	1.0	1.0
Ring Inside Diameter (in.)	2.375	2.375	2.375
Initial Moisture Content (%)	8.1	8.1	8.0
Initial Dry Density (pcf)	117.9	118.0	117.9
Initial Degree of Saturation (%)	51.2	51.2	50.5
Soil Height Before Shearing (in.)	1.2	1.2	1.2
Final Moisture Content (%)	13.4	11.0	11.9

GEOCON

DIRECT SHEAR TEST RESULTS

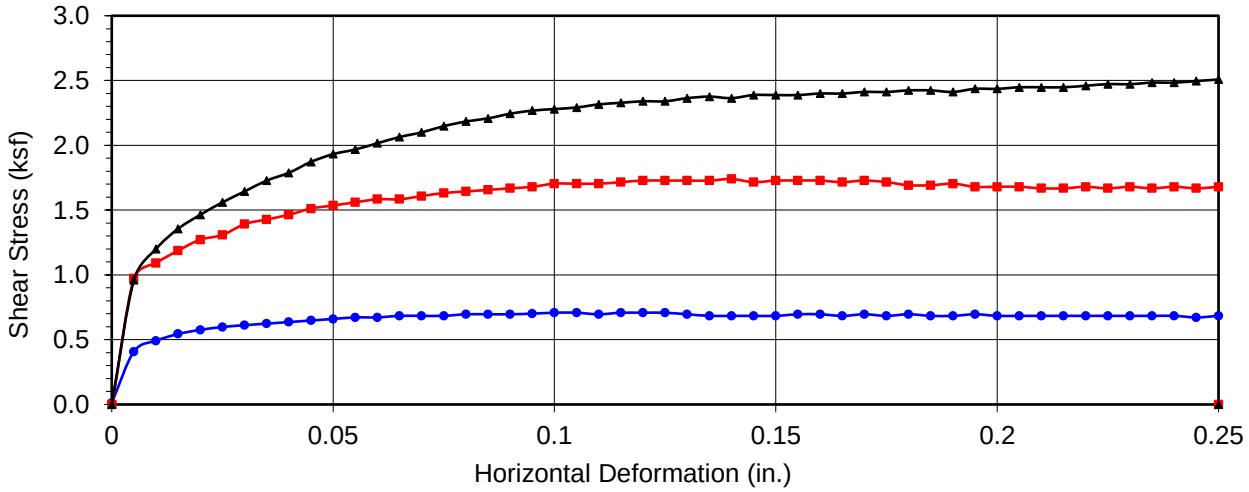
Consolidated Drained ASTM D-3080

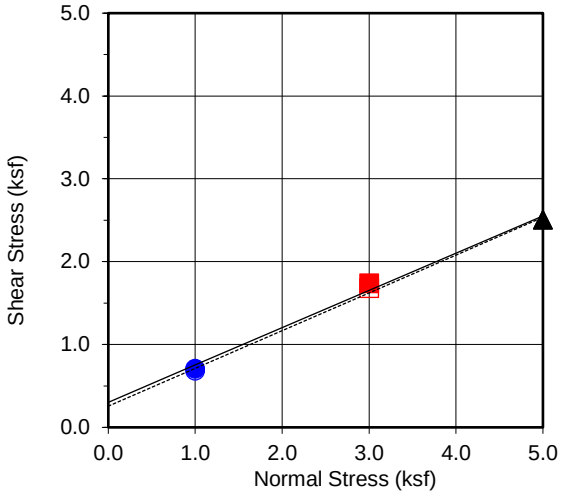
Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-22





Boring No.	**B-2**
Sample No.	**B-2@10-15'**
Depth (ft)	**10-15'**
Sample Type:	Bulk

Soil Identification:		
Clayey SAND (SC), brown		
Strength Parameters		
	C (psf)	ϕ (^{o})
Peak	302	24
Ultimate	256	25

Normal Stress (kip/ft2)	1	3	5
Peak Shear Stress (kip/ft²)	● 0.71	■ 1.74	▲ 2.51
Shear Stress @ End of Test (ksf)	○ 0.68	□ 1.68	△ 2.51
Deformation Rate (in./min.)	0.05	0.05	0.05
Initial Sample Height (in.)	1.0	1.0	1.0
Ring Inside Diameter (in.)	2.375	2.375	2.375
Initial Moisture Content (%)	10.6	10.5	10.5
Initial Dry Density (pcf)	115.9	116.1	116.0
Initial Degree of Saturation (%)	62.9	62.5	62.8
Soil Height Before Shearing (in.)	1.2	1.2	1.2
Final Moisture Content (%)	15.5	12.3	11.5

GEOCON

DIRECT SHEAR TEST RESULTS

Consolidated Drained ASTM D-3080

Checked by: RNP

Project No.: T2647-22-19

HAYES AVENUE BRIDGE
EMERGENCY REPLACEMENT
MURRIETA, CALIFORNIA

May 2025 Figure B-23

ATTACHMENT F

PLANS

CITY OF MURRIETA
STORM DRAIN IMPROVEMENT PLAN
HAYES AVE BRIDGE AT MILLER CANYON CREEK
BRIDGE REPLACEMENT

GRADING NOTES

1. ALL GRADING SHALL CONFORM TO THE CITY OF MURRIETA GRADING CODE AND MANUAL.
2. MINIMUM BUILDING PAD AND DRAINAGE SWALE SLOPE SHALL BE 1%. DRAINAGE SWALES SHALL BE A MINIMUM OF 0.2' DEEP AND BE CONSTRUCTED A MINIMUM OF 2' FROM THE TOP OF CUT OR FILL SLOPES.
3. MAXIMUM CUT AND FILL SLOPE = 2: 1
4. PROVIDE 4' WIDE BY 1' HIGH BERM OR EQUIVALENT ALONG THE TOP OF ALL FILL SLOPES OVER 5' HIGH.
5. ALL GRADING SHALL BE DONE UNDER THE SUPERVISION OF A COMPETENT SOILS ENGINEER WHO SHALL CERTIFY THAT ALL FILL HAS BEEN PROPERLY PLACED AND WHO SHALL SUBMIT A FINAL COMPACTION REPORT FOR ALL FILLS OVER 1' DEEP.
6. NO FILL SHALL BE PLACED ON EXISTING GROUND UNTIL THE GROUND HAS BEEN CLEARED OF WEEDS, DEBRIS, TOPSOIL, AND OTHER DELETERIOUS MATERIAL.
7. DUST SHALL BE CONTROLLED BY WATER OR OTHER APPROVED METHODS
8. ALL EXISTING DRAINAGE COURSES ON THE PROJECT SITE MUST CONTINUE TO FUNCTION, ESPECIALLY DURING STORM CONDITIONS. PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS MUST BE USED TO PROTECT ADJOINING PROPERTIES DURING GRADING OPERATIONS.
9. "NO OBSTRUCTION OF FLOOD PLAINS OR NATURAL WATER COURSES SHALL BE PERMITTED."
10. ALL PROPERTY CORNERS SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION/GRADING.
11. WORK MAY NOT START UNTIL PERMITS HAVE BEEN OBTAINED.
12. PURSUANT TO THE CITY OF MURRIETA MUNICIPAL CODE 15.52.150, GRADING AND EQUIPMENT OPERATION WITHIN ONE-HALF (1/2) MILE OF A STRUCTURE FOR HUMAN OCCUPANCY SHALL NOT BE CONDUCTED BETWEEN THE HOURS OF 8: 00 PM AND 7: 00 AM, NOR ON SUNDAY AND FEDERAL HOLIDAYS WITHOUT THE APPROVAL OF THE CITY ENGINEER.
13. SOURCE OF TOPOGRAPHY WAS COMPILED BY MICHAEL BAKER INTL., DATED: 04/1/2025.
14. SEPARATE HAUL PERMIT IS REQUIRED FOR ANY IMPORT/ EXPORT OF MATERIAL TO/FROM PROJECT SITE.
15. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY LANDSCAPE ARCHITECT AT LEAST 48 HOURS PRIOR TO POURING ANY CONCRETE CURBS IN PLANTER AREAS. THE CITY LANDSCAPE ARCHITECT'S PHONE NUMBER IS (951)698-0122.
16. THE APPLICANT IS HEREBY NOTICED THAT THEY COMPLY WITH ALL STATE AND FEDERAL ENDANGERED SPECIES LAW. THE CITY OF MURRIETA IS NOT RESPONSIBLE FOR ANY SUCH VIOLATION OF STATE OR FEDERAL ENDANGERED SPECIES LAW DUE TO THE APPLICANT'S NON-COMPLIANCE.
17. IN CASE OF EMERGENCY, 24 HOUR CONTACT IS MIKE BURRIS AT (951) 453-0047 (CELL).

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION COST OF ALL EXISTING UTILITIES. PERMITTEE MUST INFORM THE CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION PHONE: (951) 304-2489.
2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF MURRIETA PUBLIC WORKS DEPARTMENT IMPROVEMENT STANDARDS AND THE 2015 EDITION OF STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3. BLUE RAISED REFLECTIVE PAVEMENT MARKERS SHALL BE PLACED TO MARK FIRE HYDRANT AND/OR WATER SUPPLY LOCATIONS AT THE DIRECTION OF THE CITY INSPECTOR FOLLOWING FINAL SEALANT AND STRIPING.
4. WORK MAY NOT START UNTIL PERMITS HAVE BEEN OBTAINED.
5. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS WITH UNDERGROUND SERVICE ALERT AT 1-800-422-4133 AT LEAST TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION.
6. ALL PAVEMENT SECTIONS ARE AT MINIMUM REQUIREMENTS. ADDITIONAL SOIL TEST SHALL BE TAKEN AFTER ROUGH GRADING TO DETERMINE THE EXACT STRUCTURAL SECTION REQUIREMENTS. USE STANDARD NO. 320 IF EXPANSIVE SOIL ARE ENCOUNTERED.
7. DUST CONTROL SHALL BE MAINTAINED AT ALL TIMES BY WATER OR OTHER APPROVED METHODS.
8. EQUIPMENT AND MATERIALS SHALL BE STORED IN A NEAT AND PROTECTED MANNER.
9. THE CONTRACTOR WILL CONDUCT HIS OPERATIONS AS TO OFFER THE LEAST POSSIBLE OBSTRUCTION AND INCONVENIENCE TO PUBLIC TRAFFIC, AND HE SHALL HAVE UNDER CONSTRUCTION NO GREATER LENGTH OR AMOUNT OF WORK THAN HE CAN EXECUTE PROPERLY. ON EXISTING ROADS, TRAFFIC SHALL BE PERMITTED TO PASS THROUGH THE WORK AREA WITH AS LITTLE INCONVENIENCE AND DELAY AS POSSIBLE.
10. EXISTING TRAFFIC SIGNALS AND LIGHTING SYSTEMS SHALL BE KEPT IN OPERATION FOR THE BENEFIT OF THE TRAVELING PUBLIC, AND TO MINIMIZE ANY INTERFERENCE WITH ROUTINE MAINTENANCE OF EXISTING SYSTEMS DURING WORK PROGRESS.

GENERAL NOTES (CONTD.)

13. WHENEVER THE CONTRACTOR'S OPERATION CREATES A HAZARDOUS CONDITION TO TRAFFIC OR TO THE PUBLIC, HE SHALL FURNISH AT HIS OWN EXPENSE, SUCH FLAGMEN AND GUARDS AS ARE NECESSARY TO GIVE ADEQUATE WARNING TO THE PUBLIC OF ANY DANGEROUS CONDITIONS. HE SHALL ALSO FURNISH, ERECT AND MAINTAIN SUCH FENCES BARRICADES, LIGHTS, SIGNS, AND OTHER DEVICES NECESSARY TO PREVENT ACCIDENTS AND INJURY TO THE PUBLIC.
14. WHERE SURVEY MONUMENTS EXIST, SUCH MONUMENTS WILL BE PROTECTED OR SHALL BE REFERENCED AND RESET, PURSUANT TO BUSINESS AND PROFESSIONS CODE, SECTION 8700 TO 8805 (LAND SURVEYOR'S ACT).
15. WHERE NEW A.C. PAVEMENT JOIN EXISTING PAVEMENT, SAWCUT TO A NEAT EDGE. THE SAWCUTS MUST BE PERPENDICULAR, PARALLEL OR RADIAL TO THE ROADWAY CENTERLINE. OVERLAY AND FEATHER NEW A.C. PAVEMENT TO PROVIDE SMOOTH TRANSITION.
16. ALL EXISTING STREET SIGNS, ROADSIDE MARKERS ETC., SHALL BE PROTECTED AND/OR REPLACED IN KIND TO THE CURRENT CITY STANDARD PLANS AND CURRENT TRAFFIC MANUAL, AT NO COST TO THE CITY.
17. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN (14) DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING AND SHALL BE APPLIED AT A MIN. RATE OF 0.05 GALLON PER SQUARE YARD. ASPHALTIC EMULSION SHALL CONFORM TO SECTION 37, 39, AND 94 OF THE STATE STANDARD SPECIFICATIONS.
18. ALL UNDERGROUND FACILITIES, WITH LATERALS SHALL BE IN PLACE PRIOR TO PAVING THE STREET SECTION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: WATER, SEWER, GAS, ELECTRIC, CABLE T.V., TELEPHONE, AND DRAINAGE.
19. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS, THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITY LINES, INCLUDING ANY OTHER LINES NOT SHOWN ON THESE PLANS OR NOT OF RECORD.
20. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY TO THE CITY OF MURRIETA ENGINEERING DEPARTMENT, FOR AN ENCROACHMENT PERMIT FOR ALL WORK ON EXISTING CITY MAINTAINED ROADS, AND FOR UTILITY WORK WITHIN OFFERS OF DEDICATION FOR PUBLIC USE.
21. ALL GTE, SCE AND SCG FACILITIES WILL BE RELOCATED OR MODIFIED BY THE RESPECTIVE UTILITIES OR THEIR APPOINTED REPRESENTATIVES.
22. ALL SEWER RELATED WORK SHALL BE DONE IN ACCORDANCE WITH THE SERVICING WATER DISTRICT STANDARDS AND SPECIFICATIONS.
23. ANY SERVICE SHUT DOWN SHALL BE DONE AT NIGHT, PRIOR TO ANY SHUT DOWN, THE CONTRACTOR SHALL NOTIFY THE DIRECTOR, ENGINEER, CUSTOMER, FIRE DEPARTMENT, SERVICING WATER DISTRICT, AND ALL OTHERS AFFECTED BY THE SHUT DOWN A MINIMUM OF TWO (2) WEEKS IN ADVANCE.
24. 24 HOUR EMERGENCY CONTACT:
CONTACT: MIKE BURRIS
CELL: (951) 453-0047

PAVING NOTES

1. AN APPROVED SOIL STERILIZER SHALL BE USED ON ALL SUBGRADE SURFACES PRIOR TO PLACEMENT OF PAVING.
2. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NO LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING AND SHALL BE APPLIED AT A RATE OF 0.05 GALLONS PER SQUARE YARD, ASPHALT EMULSION SHALL CONFORM TO SECTION 37, 39 AND 94 OF THE STATE STANDARD SPECIFICATIONS.
3. THE SUBDIVIDER OR CONTRACTOR SHALL APPLY TO THE CITY ENGINEERING DEPARTMENT FOR AN ENCROACHMENT PERMIT FOR ALL WORK WITHIN THE RIGHT-OF-WAY.
4. TWO SPECIAL INSPECTIONS ARE REQUIRED BY THE CITY ENGINEERING DEPARTMENT. ONE INSPECTION AT THE TIME THE BASE IS PLACED AND THE SECOND WHEN THE A.C. HAS BEEN PLACED.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEARING OF THE PROPOSED WORK AREA, AND RELOCATION AND COST OF ALL EXISTING UTILITIES. THE CITY SHALL BE INFORMED 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION AT (951)304-2489.
6. A COMPACTION REPORT BY A SOIL ENGINEER SHALL CERTIFY 95% COMPACTION OF BASE PRIOR TO CALLING FOR SECOND INSPECTION AND PLACEMENT OF ASPHALT PAVING.

EROSION CONTROL NOTES

1. IN CASE OF EMERGENCY, CALL: MIKE BURRIS
WORK: (951) 453-0047
2. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
3. DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE ENGINEERING DEPARTMENT.
4. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 5-DAY RAIN PROBABILITY FORECAST EXCEEDS 40%.
5. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND DESILTING BASINS, AND THE BASINS PUMPED DRY.
6. GRADED AREAS AROUND THE TRACT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
7. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.
8. GRAVEL BAG LAYOUT SHALL BE INSTALLED AS SHOWN PER PLAN OR AS DIRECTED BY THE CITY INSPECTOR.

STREET NOTES

1. THE STRUCTURAL SECTION SHOWN ON THE PLANS IS THE MINIMUM SECTION REQUIRED BY THE CITY. ACTUAL STRUCTURAL SECTIONS WILL BE DETERMINED AFTER THE "R" VALUE TEST HAS BEEN CONDUCTED BY A QUALIFIED SOILS ENGINEER ON THE PREPARED SUB-BASE MATERIAL. THE "R" VALUE TEST AND ENGINEERED STRUCTURAL SECTION MUST BE APPROVED BY THE ENGINEERING INSPECTOR PRIOR TO THE INSTALLATION OF BASE AND PAVING MATERIALS. STRUCTURAL SECTIONS DIFFERING FROM THE MINIMUM SHALL BE NOTED ON THE "AS-BUILT" DRAWINGS.
2. A RIGHT-OF-WAY PERMIT IS REQUIRED FROM THE ENGINEERING DEPARTMENT PRIOR TO START OF ANY CONSTRUCTION WITHIN CITY RIGHT-OF-WAY.
3. FIRE HYDRANT MARKERS SHALL BE PLACED IN THE STREET ADJACENT TO ALL NEW AND EXISTING FIRE HYDRANTS IN CONFORMANCE WITH CITY FIRE DEPARTMENT REQUIREMENTS.

OWNER:

CITY OF MURRIETA
1 TOWN SQUARE
MURRIETA, CA. 92562
CONTACT: JEFFREY J. HITCH
PHONE: (949) 461-6076

ENGINEER / REPRESENTATIVE:

MICHAEL BAKER INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA. 92591
CONTACT: TODD L. PITNER
PHONE: (949) 933-2552

GEOTECHNICAL ENGINEER

GEOCON WEST, INC.
41571 CORNING PLACE
SUITE 101
MURRIETA, CA 92562
CONTACT: ANDREW T. SHOASHEKAN
PHONE: (951) 225-2628

FLOOD PLAIN NOTE

PROPERTY IS LOCATED ADJACENT TO FLOOD ZONE "AE" BEING DESCRIBE AS SPECIAL HAZARD FLOOD AREA WITH BASE FOOD ELEVATION PER NATIONAL FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 06065C2715G, EFFECTIVE AS OF 8-28-2008.

CONSTRUCTION NOTES

		QUANTITY
1	CONSTRUCT CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT (14' W X 7' H) PER CALTRANS STD PLAN D80, EXCAVATE AND BACKFILL PER RCFCD STD DWG NO. M815.	27.5 LF
2	CONSTRUCT BOX CULVERT WINGWALLS TYPE A PER CALTRANS STD PLAN D84.	4 EA
3	CONSTRUCT MODIFIED APPROACH AND MODIFIEID DEPARTURE MIDWESTERN GUARDRAIL SYSTEM STANDARD RAILING SECTION PER CALTRANS STD PLAN A77Q1 (APPROACH) AND A77Q4 (DEPARTURE) WITH TYPE 12B AND TYPE 12BB END POSTS, RESPECTIVELY. SEE LAYOUT DETAIL ON SHEET 2	125 LF
4	INSTALL RIPRAP ENERGY DISSIPATOR PER CITY OF MURRIETA STD PLAN NO. 446A, AND OMIT CONCRETE SILL. DESIGN VELOCITY 16-18 FT/SEC. SEE WINGWALL DETAIL 1 ON SHEET 2.	62 CY
5	CONSTRUCT CONCRETE BARRIER TYPE 836 PER CALTRANS STD PLAN B11-79 & B11-80 WITH TUBULAR HANDRAIL PER CALTRANS STD PLAN B-11-51.	32 LF
6	CONSTRUCT FULL DEPTH PAVEMENT SECTION PER DETAIL 2 ON SHEET 2	1450 SF
7	COLDPLANE AND OVERLAY 0.17' OF HMA PER DETAIL 2 ON SHEET 2	3000 SF
8	RESTRIPE STREET CENTERLINE WITHIN LIMITS OF IMPROVEMENTS UPON COMPLETION OF AC PAVEMENT.	195 LF

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE. AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATION BY THE CITY OF MURRIETA IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

ENGINEER COMPANY NAME:
MICHAEL BAKER INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA 92591
(951) 676-8042

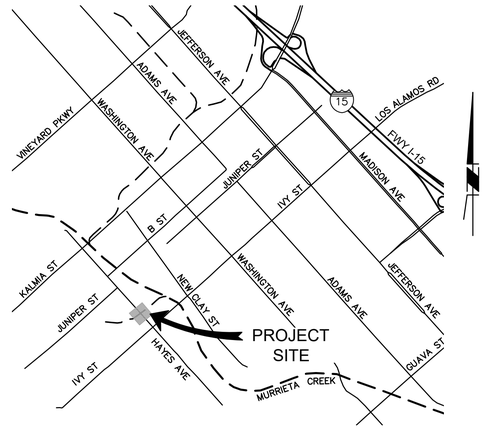
_____DATE_____
TODD L. PITNER
RCE NO. 58606

SOURCE OF TOPOGRAPHY

MICHAEL BAKER INTL. COMPILED DATE 4/1/2025

BASIS OF BEARINGS

BEARINGS AND COORDINATES SHOWN HEREON ARE BASED UPON THE CALIFORNIA COORDINATE SYSTEM OF 1983, ZONE 6 (2017.50) IN ACCORDANCE WITH THE CALIFORNIA PUBLIC RESOURCES CODE SECTIONS 8801-8819; SAID COORDINATES ARE BASED LOCALLY UPON FIELD-OBSERVED TIES TO THE FOLLOWING, OR EQUIVALENT STATIONS: "CASE", "DLUZ", "P476", AND "P477" MAINTAINED AND PUBLISHED BY CALIFORNIA SPATIAL REFERENCE CENTER (CSRC).



VICINITY MAP:
NOT TO SCALE

SHEET INDEX

DISTURBED AREA

0.20 AC

EARTHWORK QUANTITIES

DESCRIPTION	CUT (CY)		FILL (CY)
MASS EXCAVATION (RAW)	220		150
(EXPORT)	70		0

THIS OPINION OF EARTHWORK QUANTITIES IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND SHALL BE VERIFIED BY THE CONTRACTOR. THE GROSS VOLUMES DO NOT INCLUDE THE EFFECTS OF SCARIFYING, RECOMPACTION, OR OTHER FACTORS AND ARE SUBJECT TO FIELD CONDITIONS THAT MAY BE SPECIFIED IN THE SOILS REPORT.

OVER EXCAVATION, SHRINKAGE AND SUBSIDENCE WERE ESTIMATED IN THE TAKEOFFS LISTED ABOVE. SINCE THE CIVIL ENGINEER CANNOT CONTROL THE EXACT MEANS AND METHODS USED BY THE CONTRACTOR DURING GRADING OPERATIONS, NOT CAN THE CIVIL ENGINEER GUARANTEE THE EXACT SOIL CONDITIONS OVER THE ENTIRE SITE, THE CIVIL ENGINEER ASSUMES NO RESPONSIBILITY FOR FINAL EARTHWORK QUANTITIES. NO GUARANTEE OR WARRANTY EXPRESSED OR IMPLIED IS MADE WITH RESPECT TO THE ACCURACY OF THIS DATA OR INFORMATION. IN NO EVENT WILL MICHAEL BAKER INTL. BE LIABLE FOR ANY LOSS OF PROFIT OR ANY OTHER COMMERCIAL DAMAGE INCLUDING BUT NOT LIMITED TO SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES RESULTING FROM THE USE OF THIS INFORMATION OR DATA.

Preliminary
05/22/2025 11:02:06 AM

"AS BUILT"
THE RECEIPT OF AS-BUILT PLANS AND CITY'S ACCEPTANCE THEREOF DOES NOT ABSOLVE THE ENGINEER OF WORK OF ANY RESPONSIBILITY FOR THE PROJECT DESIGN.
ENGINEER OF WORK _____ DATE _____
RCE NO. _____ EXPIRATION DATE _____

REGISTERED PROFESSIONAL ENGINEER TODD L. PITNER No. 58606 CIVIL STATE OF CALIFORNIA

Michael Baker INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA 92591
PHONE: (951) 676-8042 · MBAKERINTL.COM

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE 1-800 422-4133
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
DESCRIPTON: R-1-70
LOCATION: FOUND AT THE NORTHEAST CORNER OF WASHINGTON AVENUE AND C STREET
RECORDED: 1-31-1983
ELEVATION: 1090.024' DATUM: NGVD 29

RECOMMEND APPROVAL
PLAN CHECK ENGR. NAME TYPED _____ DATE _____
PLAN CHECK FIRM
RCE NO.

SCALE
HORIZONTAL
AS NOTED
VERTICAL
AS NOTED

PREPARED BY _____ DATE _____
TODD L. PITNER
R.C.E NO. 58606

DATE	INITIAL	ENGINEER OF WORK

REVISION DESCRIPTION

SHT. NO.	DATE	INITIAL	CITY APPROVAL

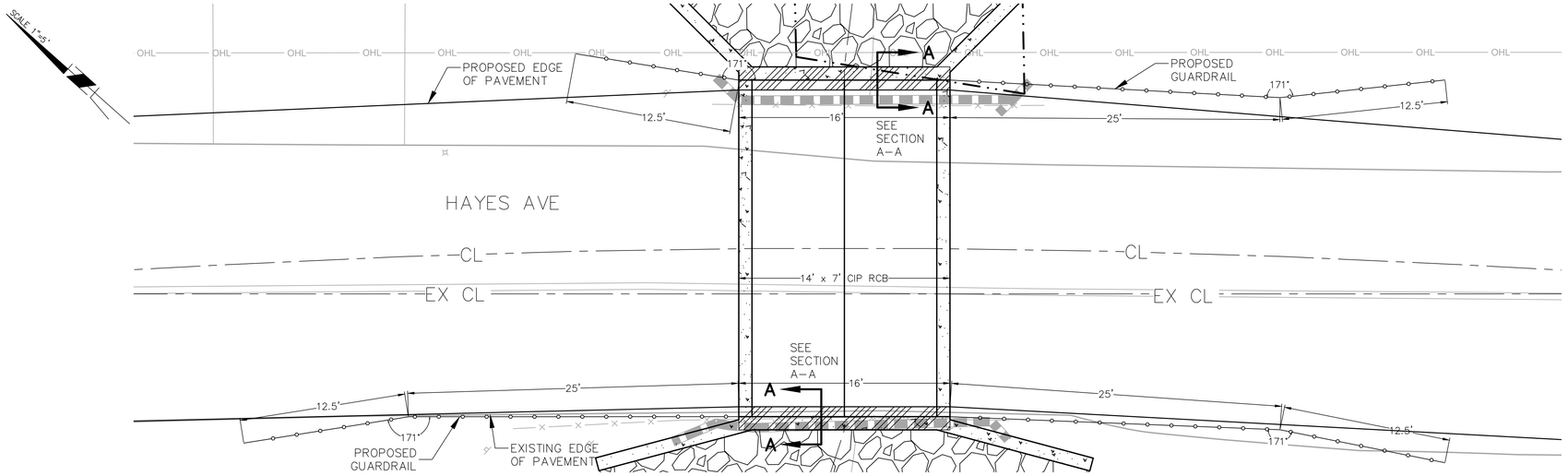
SHEET 1 | CITY OF MURRIETA ENGINEERING DEPARTMENT | SHEETS 4

STORM DRAIN IMPROVEMENT PLAN
HAYES AVE BRIDGE REPLACEMENT
TITLE SHEET

APPROVED
JEFFREY J. HITCH, PE _____ DATE _____
CITY ENGINEER RCE 58994

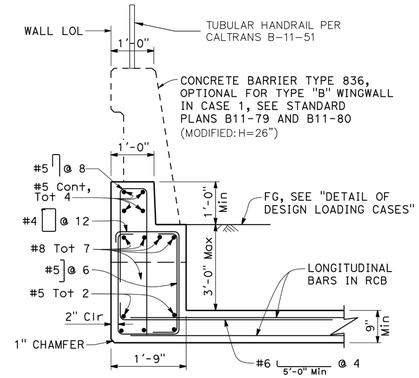
DWN BY: _____
CHKD BY: _____
FIELD BK: _____
PROJECT NO.
DRAWING NO.

H:\PDATA\206533\CADD\STORMWATER\DLV\206533-SD-TT-01.DWG ALEXANDER.SVEC2 5/22/2025 10:46 AM



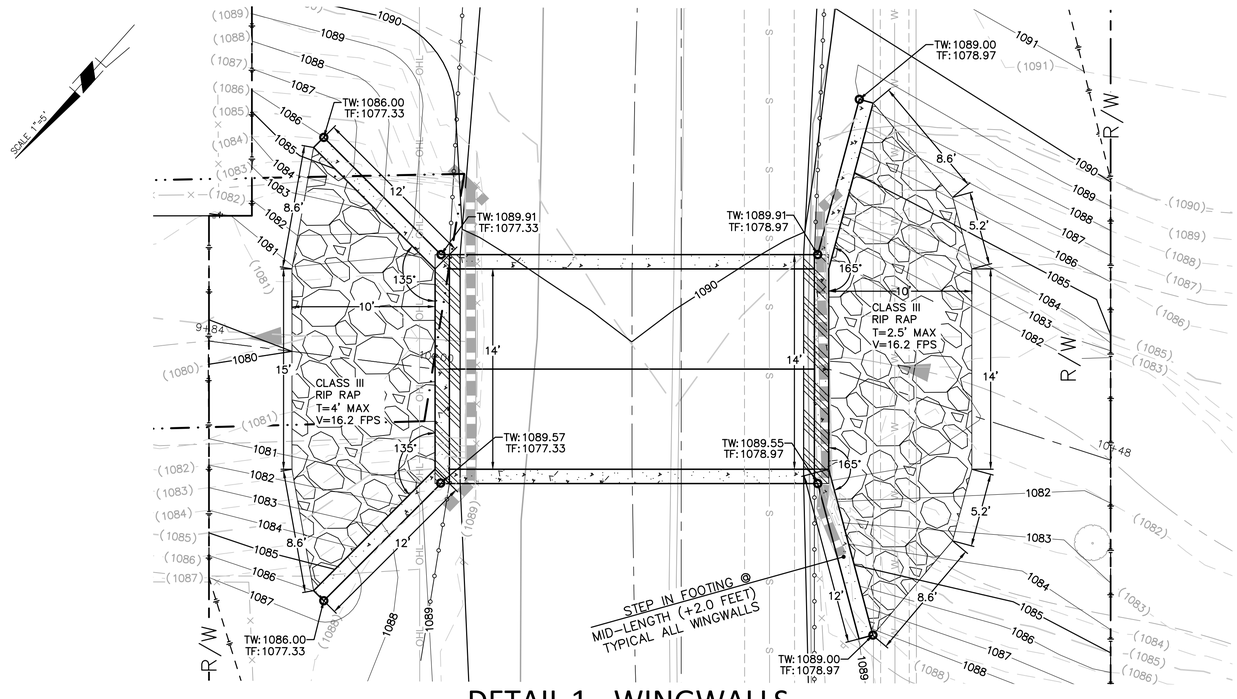
GUARDRAIL LAYOUT DETAIL

SCALE 1" = 5'



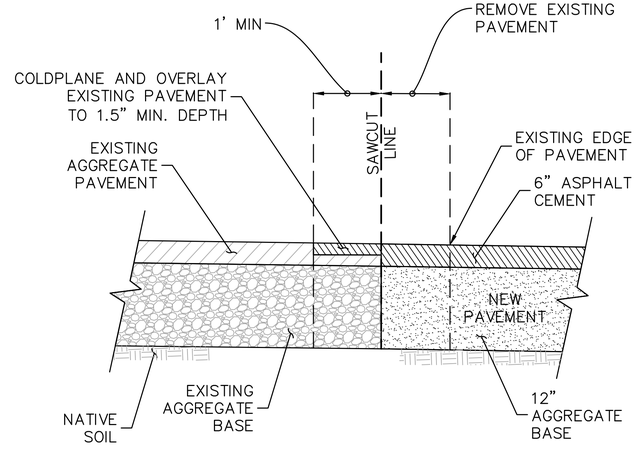
SECTION A-A

NOT TO SCALE



DETAIL 1 - WINGWALLS

SCALE 1" = 5'



DETAIL 2 - SAWCUT AND COLDPLANE AND OVERLAY JOIN DETAIL

NOT TO SCALE

10 5 0 10 20 30

SCALE: 1"=10'

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TWO WORKING DAYS BEFORE YOU DIG

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ENGINEER OF WORK _____ DATE _____

RCE NO. _____ EXPIRATION DATE _____

BENCH MARK
DESCRIPTON: R-1-70
LOCATION: FOUND AT THE NORTHEAST CORNER OF WASHINGTON AVENUE AND C STREET
RECORDED: 1-31-1983
ELEVATION: 1090.024' DATUM: NGVD 29

RECOMMEND APPROVAL

PLAN CHECK ENGR. NAME TYPED _____ DATE _____

PLAN CHECK FIRM
RCE NO.

REGISTERED PROFESSIONAL ENGINEER TODD L. PITNER No. 58606 CIVIL STATE OF CALIFORNIA

SCALE
HORIZONTAL
AS NOTED
VERTICAL
AS NOTED

PREPARED BY _____ DATE _____

TODD L. PITNER
R.C.E NO. 58606

Michael Baker INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA 92591
PHONE: (951) 676-8042 · MBAKERINTL.COM

DATE	INITIAL	ENGINEER OF WORK

REVISION DESCRIPTION	SHT. NO.	DATE	INITIAL	CITY APPROVAL

SHEET 2 | CITY OF MURRIETA ENGINEERING DEPARTMENT | SHEETS 4

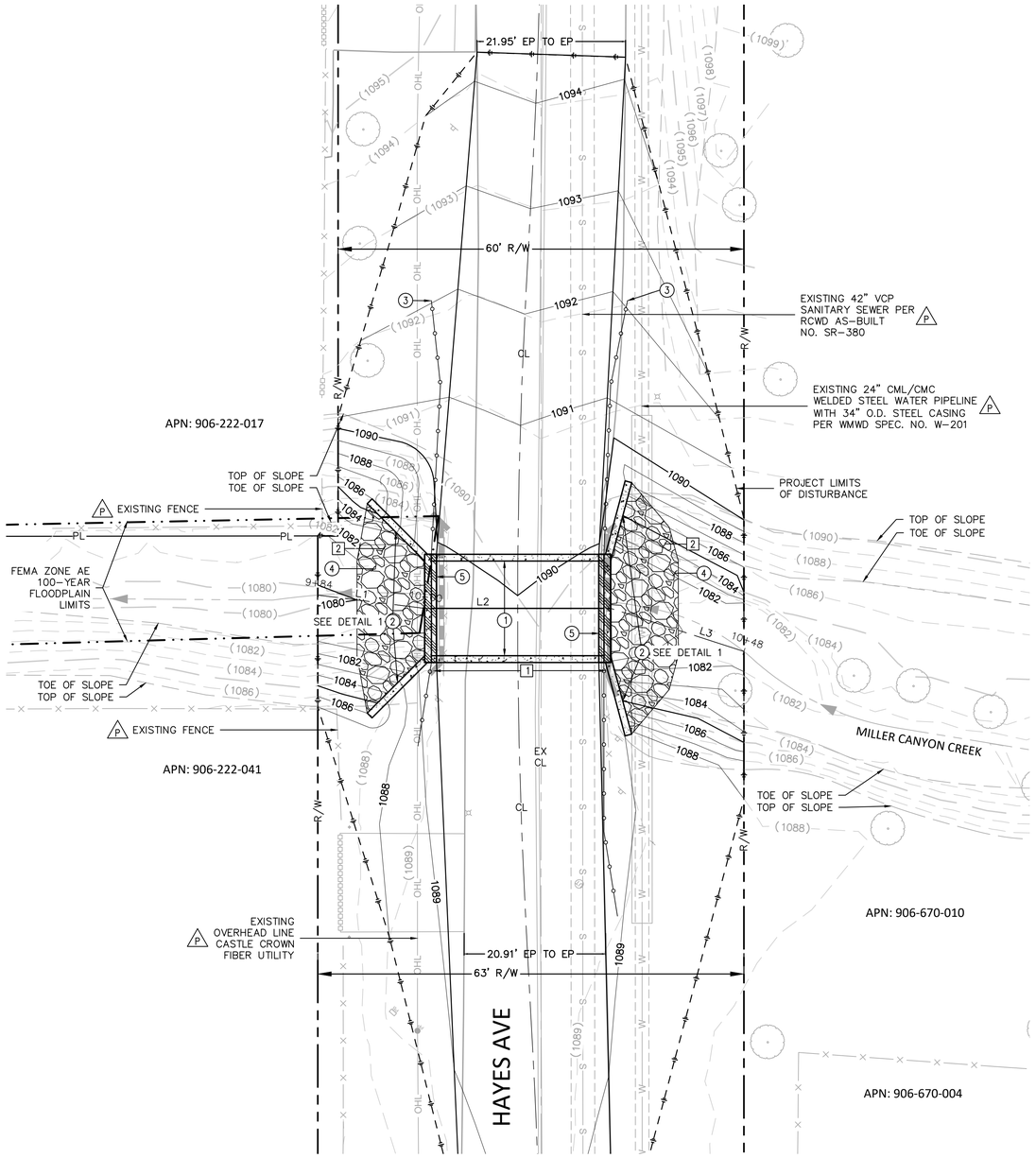
STORM DRAIN IMPROVEMENT PLAN
HAYES AVE BRIDGE REPLACEMENT
DETAILS SHEET

APPROVED
JEFFREY J. HITCH, PE _____ DATE _____
CITY ENGINEER RCE 58994

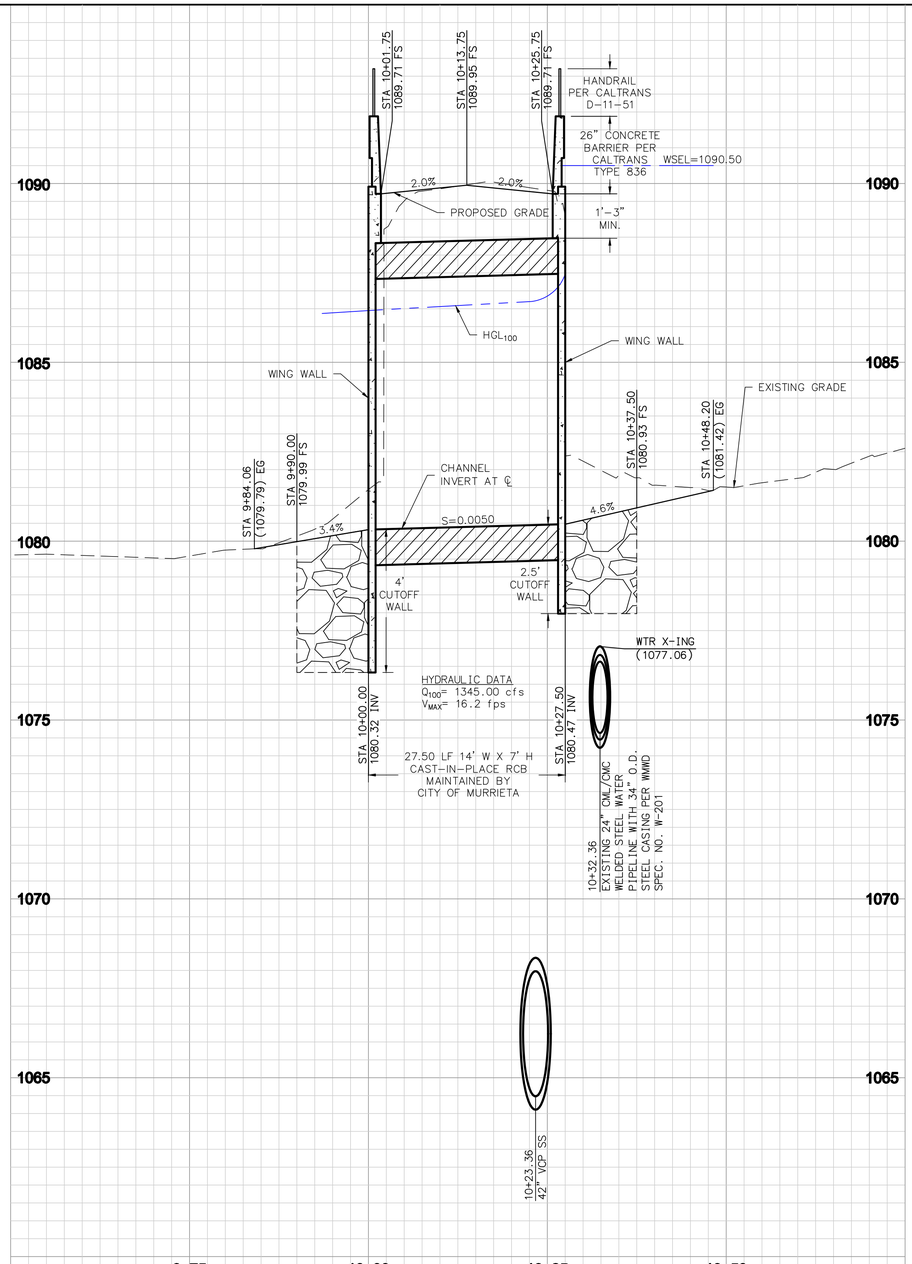
DWN BY: _____
CHKD BY: _____
FIELD BK: _____

PROJECT NO. | DRAWING NO.

H:\PDATA\206533\CADD\STORMWATER\DLV\206533-SD-DD-02.DWG ALEXANDER.SVECZ 5/22/2025 10:47 AM



PLAN



PROFILE

PROFILE SCALE:
HORIZ: 1"=10'
VERT: 1"=2'

LEGEND

- CENTERLINE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- FLOODPLAIN DELINEATION
- DAYLIGHT LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING FENCE
- EXISTING WING WALL
- EXISTING SANITARY SEWER
- EXISTING WATER LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING CREEK FLOW LINE
- CONTROL POINT
- FIRE HYDRANT
- FOUND MONUMENT
- PILASTER
- SIGN
- TRAFFIC SIGN
- TREE
- TV PULLBOX
- UTILITY MANHOLE

ABBREVIATIONS

AC	ASPHALT CEMENT
CL	CENTERLINE
CFS	CUBIC FEET PER SECOND
H	HEIGHT
HGL	HYDRAULIC GRADE LINE
OHL	OVERHEAD UTILITY LINE
FPS	FEET PER SECOND
FS	FINISHED SURFACE
MIN	MINIMUM
PL	PROPERTY LINE
Q	FLOW RATE
RCB	REINFORCED CONCRETE BOX
RCWD	RANCHO CALIFORNIA WATER DISTRICT
R/W	RIGHT-OF-WAY
SS	SANITARY SEWER
STD	STANDARD
TW	TOP OF WALL
TF	TOP OF FOOTING
V	VELOCITY
WTR	WATER
W	WIDTH
WMWD	WESTERN MUNICIPAL WATER DISTRICT
WSEL	WATER SURFACE ELEVATION

CONSTRUCTION NOTES

1. CONSTRUCT CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT (14' W X 7' H) PER CALTRANS STD PLAN D80, EXCAVATE AND BACKFILL PER RCFCD STD DWG NO. M815.
2. CONSTRUCT BOX CULVERT WINGWALLS TYPE A PER CALTRANS STD PLAN D84.
3. CONSTRUCT MODIFIED APPROACH AND MODIFIEID DEPARTURE MIDWESTERN GUARDRAIL SYSTEM STANDARD RAILING SECTION PER CALTRANS STD PLAN A77Q1 (APPROACH) AND A77Q4 (DEPARTURE) WITH TYPE 12B AND TYPE 12BB END POSTS, RESPECTIVELY. SEE LAYOUT DETAIL ON SHEET 2
4. INSTALL RIPRAP ENERGY DISSIPATOR PER CITY OF MURRIETA STD PLAN NO. 446A, AND OMIT CONCRETE SILL. DESIGN VELOCITY 16-18 FT/SEC. SEE WINGWALL DETAIL 1 ON SHEET 2.
5. CONSTRUCT CONCRETE BARRIER TYPE 836 PER CALTRANS STD PLAN B11-79 & B11-80 WITH TUBULAR HANDRAIL PER CALTRANS STD PLAN B-11-51.

DEMOLITION NOTES

1. REMOVE AND PROPERLY DISPOSE OF EXISTING CONCRETE-WOOD BRIDGE STRUCTURE AND WING WALLS.
2. REMOVE AND PROPERLY DISPOSE OF EXISTING CONCRETE AND FOREIGN MATERIAL.

P PROTECT IN PLACE

LINE DATA TABLE

NO.	BEARING/DELTA	LENGTH	START NORTHING & EASTING
L1	S55°21'34"W	15.94'	N: 2144023.5740 E: 6266532.1572
L2	S48°17'56"W	27.50'	N: 2144014.5138 E: 6266519.0435
L3	S66°13'23"W	20.70'	N: 2143996.2196 E: 6266498.5113

SCALE 1"=10'

10 5 0 10 20 30

SCALE: 1"=10'

"AS BUILT"

THE RECEIPT OF AS-BUILT PLANS AND CITY'S ACCEPTANCE THEREOF DOES NOT ABSOLVE THE ENGINEER OF WORK OF ANY RESPONSIBILITY FOR THE PROJECT DESIGN.

ENGINEER OF WORK _____ DATE _____

RCE NO. _____ EXPIRATION DATE _____

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Call: TOLL FREE 1-800 422-4133
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
DESCRIPTN: R-1-70
LOCATION: FOUND AT THE NORTHEAST CORNER OF WASHINGTON AVENUE AND C STREET
RECORDED: 1-31-1983
ELEVATION: 1090.024' DATUM: NGVD 29

RECOMMEND APPROVAL

PLAN CHECK ENGR. NAME TYPED _____ DATE _____

PLAN CHECK FIRM

RCE NO.

REGISTERED PROFESSIONAL ENGINEER
TODD L. PITNER
No. 58606
CIVIL
STATE OF CALIFORNIA

SCALE
HORIZONTAL
AS NOTED
VERTICAL
AS NOTED

PREPARED BY _____ DATE _____

TODD L. PITNER
R.C.E NO. 58606

Michael Baker
INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA 92591
PHONE: (951) 676-8042 · MBAKERINTL.COM

DATE	INITIAL	REVISION DESCRIPTION	SHT. NO.	DATE	INITIAL

ENGINEER OF WORK — CITY APPROVAL

SHEET 3 — CITY OF MURRIETA, ENGINEERING DEPARTMENT — SHEETS 4

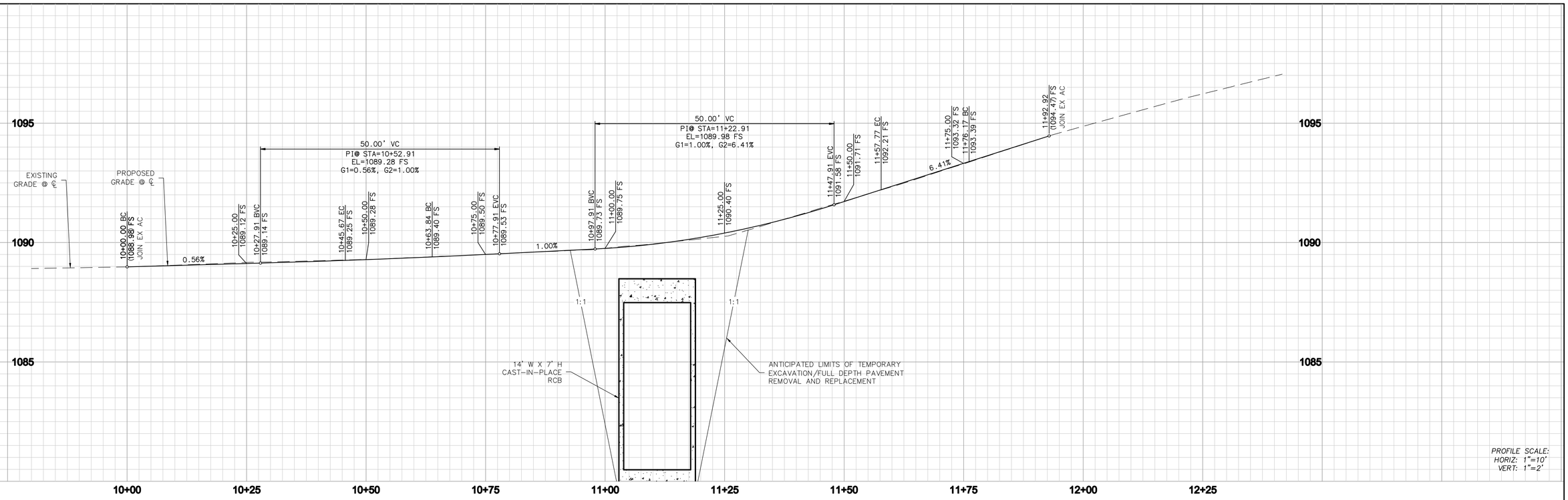
STORM DRAIN IMPROVEMENT PLAN
HAYES AVE BRIDGE REPLACEMENT
RCB PLAN & PROFILE

APPROVED
JEFFREY J. HITCH, PE _____ DATE _____
CITY ENGINEER RCE 58994

DWN BY: _____
CHKD BY: _____
FIELD BK: _____

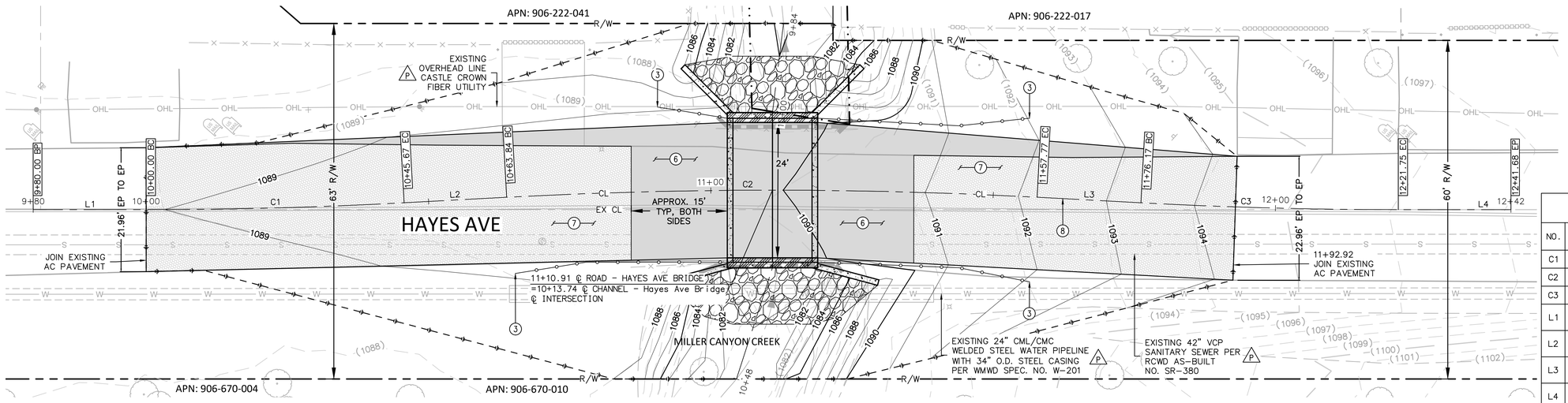
PROJECT NO. | DRAWING NO.

H:\PDATA\206553\CADD\STORMWATER\DLV\206533-SD-PP-03.DWG ALEXANDER.SVECZ 5/22/2025 10:47 AM



PROFILE SCALE:
HORIZ: 1"=10'
VERT: 1"=2'

PROFILE



PLAN

CONSTRUCTION NOTES

3. CONSTRUCT MODIFIED APPROACH AND MODIFIEID DEPARTURE MIDWESTERN GUARDRAIL SYSTEM STANDARD RAILING SECTION PER CALTRANS STD PLAN A77Q1 (APPROACH) AND A77Q4 (DEPARTURE) WITH TYPE 12B AND TYPE 12BB END POSTS, RESPECTIVELY. SEE LAYOUT DETAIL ON SHEET 2
6. CONSTRUCT FULL DEPTH PAVEMENT SECTION PER DETAIL 2 ON SHEET 2
7. COLDPLANE AND OVERLAY 0.17' OF HMA PER DETAIL 2 ON SHEET 2
8. RESTRIPE STREET CENTERLINE WITHIN LIMITS OF IMPROVEMENTS UPON COMPLETION OF AC PAVEMENT.

P PROTECT IN PLACE

LINE/CURVE TABLE

NO.	RADIUS	LINE/CHORD DIRECTION	LENGTH	START NORTHING & EASTING
C1	850.00'	S43° 14' 24.69"E	45.67'	
C2	875.00'	S41° 42' 14.74"E	93.93'	
C3	850.00'	S40° 09' 53.67"E	45.58'	
L1		S41° 42' 03.62"E	20.00'	N: 2144100.7625 E: 6266419.1591
L2		S44° 46' 45.76"E	18.18'	N: 2144052.5625 E: 6266463.7480
L3		S38° 37' 43.71"E	18.40'	N: 2143969.5676 E: 6266539.0104
L4		S41° 42' 03.62"E	19.93'	N: 2143920.3691 E: 6266579.8894

SCALE 1"=10'

10 5 0 10 20 30
SCALE: 1"=10'

Underground Service Alert
Call: TOLL FREE
1-800
422-4133
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
DESCRIPTON: R-1-70
LOCATION: FOUND AT THE NORTHEAST CORNER OF WASHINGTON AVENUE AND C STREET
RECORDED: 1-31-1983
ELEVATION: 1090.024' DATUM: NGVD 29

RECOMMEND APPROVAL
PLAN CHECK ENGR. NAME TYPED DATE
PLAN CHECK FIRM
RCE NO.

"AS BUILT"
THE RECEIPT OF AS-BUILT PLANS AND CITY'S ACCEPTANCE THEREOF DOES NOT ABSOLVE THE ENGINEER OF WORK OF ANY RESPONSIBILITY FOR THE PROJECT DESIGN.
ENGINEER OF WORK DATE
RCE NO. EXPIRATION DATE

REGISTERED PROFESSIONAL ENGINEER TODD L. PITNER No. 58606 CIVIL STATE OF CALIFORNIA

SCALE	
HORIZONTAL	AS NOTED
VERTICAL	AS NOTED

PREPARED BY DATE
TODD L. PITNER
R.C.E NO. 58606

Michael Baker INTERNATIONAL
40810 COUNTY CENTER DRIVE, SUITE 200
TEMECULA, CA 92591
PHONE: (951) 676-8042 · MBAKERINTL.COM

DATE	INITIAL	REVISION DESCRIPTION	SHT. NO.	DATE	INITIAL
ENGINEER OF WORK				CITY APPROVAL	

SHEET 4 | CITY OF MURRIETA ENGINEERING DEPARTMENT | SHEETS 4

STORM DRAIN IMPROVEMENT PLAN
HAYES AVE BRIDGE REPLACEMENT
STREET PLAN & PROFILE

APPROVED
JEFFREY J. HITCH, PE DATE
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