Addendum Number 1
Date: May 16, 2025
Project: Brannan Mountain Water Tank Project
Owner: Willow Creek Community Services District

This addendum provides changes and/or clarifications, to the Contract Documents. These modifications pertain to the sections referenced below and to all other referenced or applicable sections in the Contract Documents.

Please sign the addendum receipt acknowledgment form and return to the Owner with your cost proposal and other required forms and documents.

Changes and/or clarifications to the bidding and contracting documents are as follows:

Change: See attached revised specification section 004100 – Bid Schedule
Clarification: See attached Disadvantaged Business Enterprise (DBE) Requirements.
Clarification: See attached Soils Report
Clarification: The Environmental Documents - Mitigated Negative Declaration and Notice of Determination can be found at: https://ceqanet.opr.ca.gov/Project/2020120462
Clarification: See attached questions and answers.
Clarification: See attached Prebid Meeting Sign in Sheet.
Clarification: See attached Prebid Meeting Minutes.

Addendum Receipt Acknowledgement Form

Receipt of Acknowledgement:

My firm received Addendum No. 1, consisting of 89 pages (including this sheet), for the Brannan Mountain Water Tank Project on May 16, 2025.

Name of Firm _____

Name (Print) _____

Name (Signature) _____

Date: _____

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004100
BID SCHEDULE

Base Bid					
Bid Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Item Total**
000000-01	General Conditions / County Permits	LS	1		
015000-01	Temporary Facilities	LS	1		
017100-01	Mobilization/Demobilization	LS	1		
033000-01	650,000-gal Tank Foundation System	LS	1		
099600-01	650,000-gal Tank Coating / Painting	LS	1		
221200-01	650,000-gal Welded Steel Water Tank	LS	1		
311100-01	Clearing and Grubbing	LS	1		
312200-01	Site Grading	LS	1		
312500-01	Erosion Control	LS	1		
321100-01	Class II Aggregate Base Rock – Access Rd	Ton	50		
321100-02	1” Rock - Upper Site	Ton	70		
321100-03	Rock Dissipation	Ton	25		
323113-01	6’ Tall Chain Link Fencing and Gates	LF	275		
323234-01	Gabion Faced MSE Retaining Wall	LS	1		
331100-01	8” C906 (HDPE) Waterline	LF	535		
331100-02	Miscellaneous Piping / Valving / Joints	LS	1		
331216-01	Altitude Control Valve	LS	1		
334000-01	Caltrans D73 Area Drain	LS	1		
334000-02	12” CMP Culvert Pipe	LF	50		
				Base Bid Grand Total:	

Bid Alternate					
Bid Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Item Total**
033000-01	409,000-gal Tank Foundation System	LS	1		
099600-01	409,000-gal Tank Coating / Painting	LS	1		
221200-01	409,000-gal Welded Steel Water Tank	LS	1		
				Alternate Total:	

<<SEE NEXT PAGE>>

Award of the contract will be based on the lowest responsive and responsible bid. The base bid will be the primary basis of evaluation. If the base bid total is within the available project budget, the award will be made to the lowest responsive bidder based solely on the base bid. However, if the base bid exceeds the project budget, the Owner reserves the right to consider the bid alternate. In that case, the alternate bid item prices will be substituted for the corresponding base bid items as identified in the bid schedule, and award will be made to the lowest responsive bidder based on the aggregate total of the modified bid. This approach ensures the project remains within budget while preserving fair and competitive bidding.

End of Section

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CONTRACT PROVISIONS
RELATIVE TO THE UTILIZATION OF
DISADVANTAGED BUSINESS ENTERPRISE

Compliance with the requirements of this document and attachments satisfies the Disadvantaged Business Enterprise (DBE) requirements for this construction contract. **Failure to take the six (6) affirmative steps listed under Good Faith Effort Requirements, prior to bid opening and to submit SWRCB Form 4500-3 Disadvantaged Business Enterprise Program DBE Subcontractor Performance Form and SWRCB Form 4500-4 Disadvantaged Business Enterprise Program DBE Subcontractor Utilization Form with the bid package shall cause the bid to be rejected as a non-responsive bid**.

The Willow Creek Community Services District advises potential bidders that the project ***may be*** funded in whole or part with federal loan or grant funds through the California Clean Water State Revolving Fund, and, therefore federal Disadvantaged Business Enterprise (DBE) regulations apply to this project. (Reference 40 Code of Federal Regulations Part 33 – Participation by Disadvantaged Business Enterprises in U.S. Environmental Protection Agency Programs).

Disadvantaged Business Enterprises are:

- Entities owned and/or controlled by socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively;
- Minority Business Enterprise (MBE) - entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively;
- Women Business Enterprise (WBE) - entities that are at least 51% owned and/or controlled by women;
- Small Business Enterprise (SBE);
- Small Business in a Rural Area (SBRA);
- Labor Surplus Area Firm (LSAF); or
- Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

The DBE rule requires that responsive bids shall conform with “Good Faith Efforts” to increase DBE awareness of procurement opportunities through race/gender neutral efforts. Race/gender neutral efforts are ones which increase awareness of contracting opportunities in general, including outreach, recruitment and technical assistance. Bidder agrees that it will cooperate with and assist the Willow Creek Community Services District in fulfilling the DBE Good Faith Effort Requirement achieving “fair share objectives” and will exercise “Good Faith Efforts” to achieve such minimum participation of small, minority and women owned businesses. In particular, in submitting a bid, the bidder shall, in the selection of any and all contractors, subcontractors, and vendors for the procurement of equipment, supplies, construction, and services related to the project, at a minimum, undertake the following affirmative “Good Faith Efforts” steps:

Good Faith Effort Requirements

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practical through outreach and recruitment activities. For Tribal, State and Local Government Recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Posting solicitations for bids or proposals for a minimum of 30 calendar days in a local newspaper, before the bid opening date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
4. Encourage contracting with a group of DBEs when a contract is too large for one firm to

handle individually.

5. Use the services of the SBA and/or Minority Business Development Agency (MBDA) of the US Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take the above steps.

The forms listed in the table below and attached; must be completed and submitted with the GFE:

FORM NUMBER	FORM NAME	REQUIRE-MENT	PROVIDED BY	COMPLETED BY	SUBMITTED TO
SWRCB Form 4500-2	**DBE Sub-Contractor Participation Form**	**As Needed to Report Issues**	**WCCSD to Prime Contractor**	**Sub-contractor**	**EPA DBE Coordinator**
SWRCB Form 4500-3	**DBE Sub-Contractor Performance Form**	**Include with Bid Proposal Package**	**Prime Contractor**	**Sub-Contractor**	**SWRCB by WCCSD after bidding**
SWRCB Form 4500-4	**DBE Sub-Contractor Utilization Form**	**Include with Bid Proposal Package**	**WCCSD**	**Prime Contractor**	**SWRCB by WCCSD after bidding**

The completed forms must be submitted with each Bid or Proposal.

Other Requirements:

1. The apparent successful bidder must submit documentation showing that, prior to bid opening, the required "Good Faith Efforts" were made. The documentation must be received by the Willow Creek Community Services District within **5** working days following bid opening, or within **5** working days after request for documentation if initial apparent successful bidder is disqualified for any reason, except SWRCB Forms 4500-3 and 4500-4 which are to be submitted **with the bid**. **Failure to submit these forms with the bid will cause the bid to be rejected as non-responsive.**

2. If the apparent successful bidder is rejected or considered as non-responsible and/or has any non-responsive DBE sub-bidder, a complete explanation must be provided to the Willow Creek Community Services District.

3. Under the DBE Program, entities can no longer self-certify and contractors and sub-contractors must be certified at bid opening. Contractors and sub-contractors must provide to the District proof of DBE certification. Certifications will be accepted from the following:
   - The U.S. Environmental Protection Agency (USEPA)
   - The Small Business Administration(SBA)
   - The Department of Transportation's State implemented DBE Certification Program (with U.S. citizenship)
   - Tribal, State and Local governments
   - Independent private organization certifications

   If an entity holds one of these certifications, it is considered acceptable for establishing status under the DBE Program.

4. If additional procurement becomes necessary after the award of the prime contract, the "Good Faith Efforts" shall be applied.

5. Any deviation from the information contained in SWRCB Forms 4500-3 and 4500-4 shall not result in a reduction of Disadvantaged Business Enterprise participation without prior approval of the Willow Creek Community Services District.

6. Failure of the apparent successful bidder to perform the six affirmative "Good Faith Efforts" steps prior to bid opening and/or to submit SWRCB Forms 4500-3 and 4500-4 with its bid

will lead to its bid being declared non-responsive by the Willow Creek Community Services District. The Willow Creek Community Services District may then award the contract to the next low responsive, responsible bidder meeting the requirements of these contract provisions.

7. Prime contractor must pay its subcontractor(s) for satisfactory performance no more than 30 days from the prime contractor's receipt of payment.

8. Prime contractor must provide each proposed subcontractor/supplier/vendor copies of SWRCB Forms 4500-2.

Fair Share Objectives

Interested bidders are advised that the following fair share objectives have been established by the California State Water Resources Control Board and will be used as a goal for this project. Fulfillment of the Disadvantaged Business Enterprise requirement is based on documented completion of the Good Faith Effort Requirements, not level of Disadvantaged Business Enterprise participation proposed/achieved.

	Minority Business Enterprise	Women's Business Enterprise
CONSTRUCTION	**2%**	**1%**
SUPPLIES	**1%**	**1%**
SERVICES	**1%**	**1%**
EQUIPMENT	**1%**	**1%**

Semiannual DBE Utilization Reporting

In order to fulfill federal reporting requirements, the selected prime contractor must, using Form UR-334, report to Willow Creek Community Services District on an annual basis, their utilization of Minority Business Enterprise and Women's Business Enterprise subcontractor/supplier/vendors. The Willow Creek Community Services District will compile all Utilization reports from prime contractor(s) and sub-contractor(s) into one report and submit to DrinkingWaterSFR@waterboards.ca.gov or CleanWaterSRF@waterboards.ca.gov . Forms are due by December 1 each year and/ or at project close out. See Form UR-334 attached.

Disadvantaged Business Enterprise (DBE) Program

DBE Subcontractor Participation Form

A Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the DBE Coordinator at any time during the project period of performance.

Subcontractor Name	Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.	Email Address	
Prime Contractor Name	Issuing/Funding Entity	

Contract Item Number	**Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies**	**Amount Received by Prime Contractor**

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

Please use the space below to report any concerns regarding the above funded project:

Subcontractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

Send completed Form 4500-2 to:
Mr. Joe Ochab, DBE Coordinator
US EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105

FORM 4500-2 (DBE Subcontractor Participation Form)

Disadvantaged Business Enterprise (DBE) Program

DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name	Project Name	
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.	Email Address	
Prime Contractor Name	Issuing/Funding Entity	

Contract Item Number	**Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies**	**Price of Work Submitted to the Prime Contractor**
DBE Certified By: _ DOT _ SBA Other: _____	Meets/exceeds EPA certification standards? YES NO Unknown	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

Disadvantaged Business Enterprise (DBE) Program

DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE[1] subcontractor's[2] and the estimated dollar amount of each subcontract. A Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
Address		
Telephone No.		Email Address
Issuing/Funding Entity		

I have identified potential DBE certified subcontractors. YES NO

If *yes*, please complete the table below. If *no*, please explain:

Subcontractor Name/ Company Name	**Company Address / Phone / Email**	**Estimated Dollar Amount**	**Currently DBE Certified?**

--Continue on back if needed--

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

STATE WATER RESOURCES CONTROL BOARD – DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS (CASRF)
FORM UR-334

1. Grant/Finance Agreement Number:	2. Annual Reporting Period 10/1/___ through 09/30/_	3. Purchase Period of Financing Agreement:
4. Total Payments Paid to Prime Contractor or Sub-Contractors During Current Reporting Period: $		
5. Recipient's Name and Address:	6. Recipient's Contact Person and Phone Number:	

7. List All DBE Payments Paid by Recipient or Prime Contractor During Current Reporting Period:

Payment or Purchase Paid by Recipient or Prime Contractor	Amount Paid to Any DBE Contractor or Sub-Contractor For Service Provided to Recipient		Date of Payment (MM/DD/YY)	Procurement Type Code** (see below)	Name and Address of DBE Contractor of Sub-Contractor or Vendor
	MBE	**WBE**			

8. Initial here if no DBE contractors or sub-contractors paid during current reporting period:
9. Initial here if all procurements for this contract are completed:
10. Comments:

11. Signature and Title of Recipient's Authorized Representative	12. Date

Email Form UR-334 to:

DrinkingWaterSRF@waterboards.ca.gov OR CleanWaterSRF@waterboards.ca.gov

Questions may be directed to:

Barbara August, SWRCB
Barbara.August@waterboards.ca.gov
Phone: (916) 341-6952
Fax: (916) 327-7469

****Procurement Type:**
1. Construction
2. Supplies
3. Services (includes business services; professional services; repair services and personnel services)
4. Equipment

STATE WATER RESOURCES CONTROL BOARD - DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CALIFORNIA STATE REVOLVING FUNDS

INSTRUCTIONS FOR COMPLETING FORM UR-334

Box 1 Grant or Financing Agreement Number.

Box 2 Annual reporting period.

Box 3 Enter the dates between which you made procurements under this financing agreement or grant.

Box 4 Enter the total amount of payments paid to the contractor or sub-contractors during this reporting period.

Box 5 Enter Recipient's Name and Address.

Box 6 Enter Recipient's Contact Name and Phone Number.

Box 7 Enter details for the **DBE purchases only** and be sure to limit them to the current period. 1) Use either an "R" or a "C" to represent "Recipient" or "Contractor." 2) Enter a dollar total for DBE and total the two columns at the bottom of the section. 3) Provide the payment date. 4) Enter a product type choice from those at the bottom of the page. 5) List the vendor name and address in the right-hand column

Box 8 Initial here if no DBE contractors or sub-contractors were paid during this reporting period.

Box 9 Initial this box only if all purchases under this financing agreement or grant have been completed during this reporting period or a previous period. If you initial this box, we will no longer send you a survey.

Box 10 This box is for explanatory information or questions.

Box 11 Provide an authorized representative signature.

Box 12 Enter the date form completed.

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GEOTECHNICAL INVESTIGATION

Willow Creek
Community Services District Water Tank
Brannan Mountain Road
Willow Creek, California

PREPARED FOR:

TRINITY VALLEY CONSULTING ENGINEERS, INC.
2200 MAIN STREET
WEAVERVILLE, CALIFORNIA 96093

PREPARED BY:

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DRIVE, SUITE 800
RANCHO CORDOVA, CALIFORNIA 95742

GEOCON

GEOCON PROJECT NO. S2904-05-01

MAY 2025

GEOCON
CONSULTANTS, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. S2904-05-01
May 15, 2025

VIA ELECTRONIC MAIL

Josh McKnight
Trinity Valley Consulting Engineers, Inc.
2200 Main Street
Weaverville, California 96093

Subject: GEOTECHNICAL INVESTIGATION
WILLOW CREEK COMMUNITY SERVICES DISTRICT WATER TANK
BRANNAN MOUNTAIN ROAD
WILLOW CREEK, CALIFORNIA

Mr. McKnight:

In accordance with your authorization of our proposal (Geocon Proposal No. SA-24-1620-P-GT, dated September 6, 2024), we have completed a geotechnical investigation for the proposed water storage tank located north of Brannan Mountain Road in Willow Creek, California.

The accompanying report presents our findings, conclusions, and recommendations for the project as presently proposed. In our opinion, no adverse geotechnical conditions were encountered that would preclude development at the site provided recommendations of this report are incorporated into the design and construction of the project.

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

Respectfully Submitted,

GEOCON CONSULTANTS, INC.

Lauren A. Herbert, EIT, GIT
Senior Staff Engineer

Thomas C. DeSimone, PG, CEG
Senior Geologist

PROFESSIONAL GEOLOGIST
THOMAS C. De SIMONE
No. #2715
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Michael M. Watari, PE, GE
Senior Engineer

Jeremy J. Zorne, PE, GE
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
JEREMY J. ZORNE
No. 2636
GEOTECHNICAL
STATE OF CALIFORNIA

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GEOTECHNICAL INVESTIGATION

1.0 PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed water storage tank and associated improvements north of Brannan Mountain Road within the western portion of the community of Willow Creek, California. The approximate site location is depicted on the Vicinity Map, Figure 1.

The purpose of our investigation was to evaluate subsurface soil and geologic conditions at the site and provide conclusions and recommendations relative to the geotechnical aspects for the design and construction of the proposed project.

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

- Performed a limited geologic literature review to aid in evaluating the geologic conditions present at the site. A list of referenced material is included in Section 9.0 of this report.
- Notified subscribing utility companies via Underground Service Alert (USA) a minimum of 48 hours (as required by law) prior to performing exploratory excavations at the site.
- Performed seven exploratory test pits (T1 through T7) using a Deere 13L Backhoe. The test pits were excavated to depths ranging from approximately 4 to 13 feet below existing site grades.
- Paid required fees and obtained a subsurface exploration permit from the Humboldt County Environmental Health Division (HCEHD).
- Performed three exploratory borings (B1 through B3) with a truck-mounted drilling rig equipped with hollow-stem auger and mud rotary drilling capabilities. The borings were drilled to depths ranging from approximately 21½ to 26½ feet below existing site grades.
- Logged the exploratory excavations in accordance with American Society for Testing and Materials (ASTM) D2487 which is based on the Unified Soil Classification System (USCS).
- Performed sampling at periodic intervals and collected soil samples from the test pits and borings for subsequent laboratory testing.
- Upon completion, backfilled the test pits with soil cuttings and backfilled the borings with neat cement grout in accordance with HCEHD requirements.
- Performed laboratory tests to evaluate pertinent geotechnical parameters.
- Prepared this report summarizing our findings, conclusions and recommendations regarding the geotechnical aspects of developing the site as presently proposed.

Approximate locations of the exploratory test pits, borings, are shown on the Site Plan, Figure 2. Details of our field exploration program including exploratory test pit and boring logs are presented in Appendix A. Details of our laboratory testing program and test results are summarized in Appendix B. Results of our slope stability analysis are shown in Appendix C.

2.0 SITE AND PROJECT DESCRIPTION

The site consists of approximately 0.52 acres of land identified as Humboldt County Assessor Parcel Number 522-492-011-000. The site is bounded to the north and west by forested mountainous terrain, to the east by Willow Creek Cemetery and Trinity Valley Elementary School, and to the south by Brannan Mountain Road, beyond which are several single-family residences.

At the time of our field explorations, the site was undeveloped aside from an unpaved access road on the southern edge of the site. The surface of the site was covered in a heavy growth of annual grasses and berry shrubs. Vehicles, trailers and loose plastic and metal debris were present across the site. Numerous mature trees were present surrounding the site. Site conditions as of the dates of our field investigation are shown in Photographs 1 through 4.

Based on site-specific topography information presented in the Grading and Erosion Control Plan prepared by Trinity Valley Consulting Engineers, Inc., dated June 2018, the elevation of the site across the proposed tank area where development is targeted, is approximately 730 to 735 feet above mean sea level. The topography surrounding the landing area is steep, with grades ranging from approximately 30% to 60% to the west (uphill) side of the site, and from approximately 35% to 60% to the east (downhill) side of the site. Based on our review of historical imagery of the site (Historic Aerials, 2024) and published historic use of the site (Covina 2007), we understand that the site was undeveloped and forested prior to the 1960s. From approximately 1960 through the 1970s, the site and surrounding area was partially cleared by logging operations. By the time of the 1993 photograph, forest regrowth was underway, and the site appeared similar to the pre-logging condition by the 1998 photograph. The site has remained generally unchanged since the 1998 photograph.

We understand that the Willow Creek CSD needs additional water storage in the northwest quadrant of their water distribution system service area. The proposed water storage tank will likely be a 60- or 72-foot-diameter bolted steel tank with a storage capacity of 400,000- to 650,000-gallons. The proposed water storage tank will likely be supported on a shallow concrete perimeter ring foundation. We understand that a retaining wall may be necessary on the uphill side of the proposed water storage tank to create sufficient space for the tank. However, the retaining wall type, length,

height, and loading conditions are currently unknown and will be evaluated during future design phases. Other planned improvements will include underground utility infrastructure, improvements to the existing access road, and landscaping. Based on the preliminary Grading and Erosion Control Plan prepared by Trinity Valley Consulting Engineers (TVCE 2018), site grading will include cuts and fills on the order of about 7.5 to 10 feet, with the northeast portion of the site requiring a fill slope inclination of 1.5 to 1 (horizontal to vertical) due to the relatively steep existing slopes. We anticipate that underground utility infrastructure may require deeper excavations. Pavement design was outside the scope of services for this report, and flexible pavements are not indicated on the conceptual project plans (TVCE 2018). If needed, we can provide recommendations for flexible pavements upon request. Detailed site topography is included on the Site Plan, Figure 2. Regional topography is depicted on Figure 3, Geologic Map.

3.0 SOIL AND GEOLOGIC CONDITIONS

We identified geologic and soil conditions by observing and sampling exploratory borings and test pits and reviewing the referenced geologic literature (Section 9.0). Soil descriptions below include the USCS symbol where applicable.

3.1 Site and Regional Geology

The site is located within the western edge of the Klamath Mountains Geomorphic Province of California. The Klamath Mountains are comprised of broad peaks and ridges and have been uplifted through tectonic activity. The Klamath Mountains are bounded to the west by the Coast Ranges and are considered to be a northern extension of the Sierra Nevada, which are dominated by granitic and metamorphic rocks.

Based on the California Geological Survey's (CGS) map - Geology of the Willow Creek 15' Quadrangle, Humboldt and Trinity Counties, California, (CGS, 1978), the site is underlain by the Jurassic-age Galice Formation (map symbol Jg). The Galice Formation is described as metamorphosed graywacke, slate, and phyllitic slate, often cut by meta-felsite intrusions. Contact metamorphism of the Galice Formation also results in the formation of greenschist facies. This formation is known to be subject to landslide failures in areas where the slates dip unfavorably. Published geologic mapping indicates that the orientation of bedding and foliation varies in the region, striking generally northwest-southeast, and dipping either northeast or southwest. We did not observe intact bedding structures within test pits or outcrops at the site.

In areas near the Trinity River, the Galice Formation is occasionally overlain by Quaternary Terrace Gravels (map symbol Qt), which have been deposited, cut, and exposed by the river's meander. The conditions encountered in our borings and test pits at the site were consistent with the mapped geology of the area. A Regional Geologic Map is included as Figure 3.

3.2 Undocumented Fill

We encountered fill material within all our test pits and borings, except for Test Pit TP7, extending to depths of approximately 6 inches up to 3 feet below existing grades. There are no records of compaction of the fill, therefore the fill is considered undocumented. The undocumented fill generally consisted of sandy lean clay (CL) and clayey sand with varying amounts of gravel (SC). Based on our understanding of the site's history and the composition of the fill material, the fill is likely derived from upslope material that was historically cut and reworked to create the flat landing space during past logging operations. Undocumented fill, where encountered, should be removed and replaced as engineered fill. Specific recommendations are provided herein.

3.3 Residual Soil

Beneath the undocumented fill, we encountered residual soil in each of our exploratory test pits and borings to depths ranging from 1 to 16 feet below existing site grades. The residual soil (soil that has weathered in-place from rock) consisted of very stiff to hard, moist sandy lean clay (CL) and dense to very dense, moist clayey sand (SC) with varying gravel and boulder content.

3.4 Galice Formation

We encountered the Jurassic-age Galice Formation, variably weathered greenschist and slate bedrock at depths ranging from 5 feet to the maximum explored depth of 26.5 feet below existing site grades. The Galice Formation includes metamorphosed slate, phyllitic slate, and greenschist with felsic intrusions. We encountered practical refusal on Galice Formation bedrock in Test Pits TP2, TP3, TP4, and TP7. The greenschist and slate bedrock generally excavates as poorly graded gravel with sand, silt, and clay. While competent enough to cause practical refusal with backhoe equipment, the bedrock is readily excavatable/friable using auger drilling methods and is unsuitable for rock coring. We did not observe intact bedding or other structural features within the bedrock.

Subsurface conditions described in the previous paragraphs are generalized. The exploratory boring and test pit logs detail soil type, color, moisture, consistency, and USCS classification of the materials encountered at specific locations and elevations.

4.0 GROUNDWATER

We did not encounter groundwater in our exploratory test pits excavated on October 8, 2024 (maximum depth of approximately 13 feet) and exploratory borings performed on October 23, 2024 (maximum depth of approximately 26.5 feet). The Trinity River is located approximately ½ mile east of the site at an elevation of approximately 400 feet MSL, approximately 300 feet lower than the elevation of the site. The Trinity River is fed from the west by downslope-flowing tributaries such as Brannan Creek, Boise Creek, and Willow Creek. Based on this site-specific information from our investigation, coupled with the topographic (mountainous) setting of the site, we anticipate that static groundwater beneath the site may be present at a seasonally variable depth on the order of 100 feet or greater. It should be noted that fluctuations in the level of groundwater may occur due to variations in precipitation, temperature, seasonal fluctuations, subsurface conditions, and other factors. Therefore, it is possible that future groundwater may be higher or lower than the conditions observed during our investigation.

Although the static groundwater is likely relatively deep based on site geology, it is our opinion that perched groundwater/seepage may develop at shallow depths near the contacts between fill/residual soil and formational material (bedrock), especially during winter and spring. Seepage can also occur within formational material based on the degree of weathering, fracturing, and jointing. The occurrence of seepage is dependent on seasonal precipitation, irrigation, and land use, among other factors, and varies as a result. Proper drainage provisions will be important to future performance of the project.

5.0 GEOLOGIC HAZARDS

5.1 Regional Active Faults

The site is not located within an Alquist-Priolo Earthquake Fault Zone as established by the State Geologist around known active faults. The nearest pre-Quaternary fault is an unnamed fault, which is located approximately one mile west of the site. This fault is not considered active by the CGS. Local field reconnaissance did not reveal overt indications of an active fault trace at the site. Review of available literature indicates there are no active fault traces within 1,000 feet of the project location. The USGS Quaternary Fault and Fold Database maps the nearest active (“Historical” and “Latest Quaternary”) fault as the Grogan Fault located 8.5 miles west of the site. Therefore, we consider the potential for ground rupture due to onsite active faulting to be low.

5.2 Seismicity

We used the United States Geological Survey (USGS) Unified Hazard Tool (https://earthquake.usgs.gov/hazards/interactive/) to determine the deaggregated seismic source parameters including controlling magnitude and fault distance. The USGS estimated modal magnitude is 9.1 and the estimated Peak Ground Acceleration (PGA) for the Maximum Considered Earthquake (MCE) is 1.06g with a 2,475-year return period.

5.3 Liquefaction

Liquefaction is a phenomenon in which loose, saturated, cohesionless soil deposits located beneath the groundwater table lose strength when subjected to intense and prolonged ground shaking. The seismic excitation increases pore water pressure creating a buoyant effect of the loose soil. When liquefaction occurs, building foundations may sink or tilt and differential ground settlement may occur. Other effects may include sand boils (ground loss) and lateral spreading if the liquefiable soil is located adjacent to a steep free face. The areas that have the greatest potential for liquefaction are those in which the water table is less than 50 feet below ground surface and the soils are predominately clean, poorly graded sand deposits of loose to medium-dense relative density.

The site is not located in a currently established State of California Seismic Hazard Zone for liquefaction. Based on the subsurface conditions encountered at the site, including shallow bedrock and a lack of groundwater in the top 50 feet, liquefaction is not a hazard for the site. Mitigation and specific design measures with respect to liquefaction are not necessary for the project.

5.4 Landslides and Slope Stability

We are not aware of any landslides which have directly impacted the site. However, the site is located within the Willow Creek Quadrangle, recognized by CGS broadly as a mapped geologic zone of landslide hazard. According to CGS *Map Sheet 58 – Deep-Seated Landslide Susceptibility* (CGS, 2010) the area is ranked as 9 out of 10, indicating a high susceptibility to landsliding. The landslides within the quadrangle have been mapped and discussed within the *Landslides in the Highway 299 Corridor Between Blue Lake and Willow Creek, Humboldt County* (CGS, 2006). Dormant-mature landslides were mapped in the vicinity approximately 0.45 miles south of the site, and the nearest active landslide was mapped approximately ½ mile west of the site. Additionally, no landslide data are available on the California Department of Conservation interactive Landslide Inventory map (https://maps.conservation.ca.gov/cgs/lsi/). The tank site is relatively flat and level from previous grading activities, however there are moderate slopes surrounding the graded area.

Based on conditions observed during site reconnaissance, the existing landing area appears to be stable, without overt indicators of instability. As part of our study, we performed a quantitative slope stability analysis using the using the computer program SLOPE/W, Version 23.1.2.11 (Geo Slope International, 2023) for static and seismic (i.e. pseudo-static) conditions using Spencer's method of limit-equilibrium analysis considering circular modes of failure.

Slope stability analyses evaluate the ratio of the resisting forces (predominantly soil shear strength) to the driving forces that would cause a slope failure (predominantly gravity, soil unit weight, slope/strata geometry). The ratio of the summation of driving forces divided by the summation of resisting forces is termed Factor of Safety (FS). A FS of 1.0 indicates that the driving and resisting forces are equal and the slope is a state of impending failure/movement. A FS greater than 1.0 indicates the presence of reserve strength; however, does not guarantee that failure will not occur. Rather, the probability of failure generally decreases as the FS increases. Typical minimum required FS for slope stability analyses is summarized in Table 5.4.

TABLE 5.4
MINIMUM REQUIRED FACTORS OF SAFETY – SLOPE STABILITY ANALYSES

Analysis Condition	Typical Minimum Factor of Safety (FS)
Static (Long-Term)	1.5[1]
Seismic / Earthquake	1.0 to 1.2[2]

1. *Typically accepted minimum FS by many regulatory agencies.*
2. *Typical minimum FOS range per commonly accepted engineering practice.*

For our analysis, we used the geometry shown in Cross-Section A-A' (Figure 4), which references the site-specific topography presented in the *Preliminary Grading and Drainage Plan* (TVCE 2018), and a second geometry of the same section assuming a 1.5H:1V slope following grading activities. We assigned relatively conservative shear strength values to the various soil layers based on the results of our laboratory testing program, published correlations, and our experience with similar soils. We analyzed dynamic (seismic) slope stability using a pseudo-static approach in which the earthquake load is simulated by an "equivalent" static horizontal acceleration acting on the mass of the slope. This methodology is generally considered to be conservative and is most often used in current practice. For our seismic analysis, we calculated the seismic coefficient using the procedures presented in Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (CGS 2008). In this procedure, the seismic coefficient is equal to a portion of the design-level PGA. Assuming a 15-cm displacement threshold, a design-level PGA of 1.06g, a modal distance of approximately 30 km, and a modal magnitude of 9.1, the calculated seismic coefficient (k_h) is 0.5.

The modeled conditions, geometry, and critical failure surfaces are shown graphically in Appendix C (Figures C1 through C4). The calculated minimum FS against failure for static and seismic conditions exceeds the generally accepted minimums, with FS of 7.3 and 2.2, respectively, for the current site topography, and with FS of 4.2 and 1.9, respectively, for the topography following proposed grading. Therefore, the proposed tank area appears to be stable under static and seismic shaking conditions. We note that our analysis was limited to the tank area and the adjacent slopes.

5.5 Expansive Soil

Laboratory Plasticity Index (PI) and Expansion Index (EI) tests on near surface soil samples indicate low plasticity and corresponding very low expansion potential (Appendix B). Mitigation and specific design measures with respect to expansive soil are not necessary.

5.6 Soil Corrosion Screening

We performed pH, resistivity, chloride, and sulfate tests on one sample to generally evaluate the corrosion potential of the soil with respect to proposed subsurface structures. These tests were performed in accordance with California Test Method (CTM) Nos. 643, 422, and 417. The results are presented in Table 5.6A and should be considered for design of underground structures.

TABLE 5.6A
SOIL CORROSION PARAMETER TEST RESULTS
(CALIFORNIA TEST METHODS 643, 417, AND 422)

Sample No.	Sample Depth (ft.)	pH	Minimum Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)
TP3-Bulk	0-5	5.0	16,350	1.4	9.5

Note: ppm = parts per million

Soil with a low pH (higher acidity) is considered corrosive as it can react with lime in cement to leach out soluble reaction products and result in a more porous and weaker concrete. Per Caltrans *Corrosion Guidelines* (Caltrans, 2021), soil with a pH of 5.5 or lower may be corrosive to concrete or steel in contact with the ground.

Soil resistivity is the measure of the soil's ability to transmit electric current. Corrosion of buried ferrous metal is proportional to the resistivity of the soil. A lower resistivity indicates a higher propensity for transmitting electric currents that can cause corrosion of buried ferrous metal items. In general, the higher the resistivity, the lower the rate for corrosion. Per Caltrans *Corrosion Guidelines* (Caltrans, 2021), resistivity serves as an indicator parameter for the possible presence of soluble salts

and it is not included as a parameter to define a corrosive area for structures. A minimum resistivity value for soil less than 1,500 ohm-cm may indicate the presence of high quantities of soluble salts and a higher propensity for corrosion. Based on the laboratory minimum resistivity test results and Caltrans criteria, soil at the location tested does not have higher propensity for corrosion.

Table 5.6B presents a summary of concrete requirements set forth by the California Building Code (CBC) Section 1904 and American Concrete Institute (ACI) 318 for possible chloride exposure. Chlorides can break down the protective oxide layer on steel surfaces resulting in corrosion. Sources of chloride include, but are not limited to, deicing chemicals, salt, brackish water, seawater, or spray from these sources.

TABLE 5.6B
REQUIREMENTS FOR CONCRETE EXPOSED TO CHLORIDE-CONTAINING SOLUTIONS
(AFTER ACI 318 TABLES 19.3.1.1 and 19.3.2.1)

Chloride Severity	Exposure Class	Condition	Maximum Water to Cement Ratio by Weight	Minimum Compressive Strength (psi)
Not Applicable	C0	Concrete dry or protected from moisture	N/A	2,500
Moderate	C1	Concrete exposed to moisture but not to external sources of chlorides	N/A	2,500
Severe	C2	Concrete exposed to moisture and an external source of chlorides	0.40	5,000

The appropriate Chloride Severity/Exposure Class should be determined by the project designer based on the specific conditions at the location of the proposed improvements. Further guidance is provided in ACI 318. Per Caltrans *Corrosion Guidelines*, soil with a chloride concentration of 500 ppm or higher may be corrosive to steel structures or steel reinforcement in concrete. Based on Caltrans criteria, soil at the locations tested is not corrosive with respect to chloride content.

Table 5.6C presents a summary of concrete requirements set forth by CBC Section 1904 and ACI 318 for sulfate exposure. Similar to chlorides, sulfates can break down the protective oxide layer on steel leading to corrosion. Sulfates can also react with lime in cement to soften and crack concrete.

TABLE 5.6C
REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS
(AFTER ACI 318 TABLES 19.3.1.1 and 19.3.2.1)

Sulfate Severity	Exposure Class	Water-Soluble Sulfate (SO4) Content		Cement Type (ASTM C 150)	Maximum Water to Cement Ratio by Weight1	Minimum Compressive Strength (psi)
		Percent By Mass	Parts Per Million (ppm)			
Not Applicable	S0	$SO_4 < 0.10$	$SO_4 < 1,000$	No Type Restriction	N/A	2,500
Moderate	S1	$0.10 \leq SO_4 < 0.20$	$1,000 \leq SO_4 < 2,000$	II	0.50	4,000
Severe	S2	$0.20 \leq SO_4 \leq 2.00$	$2,000 \leq SO_4 \leq 20,000$	V	0.45	4,500
Very Severe	S3	$SO_4 > 2.00$	$SO_4 > 20,000$	V+Pozzolan or Slag	0.45	4,500

Notes:
1. Maximum water to cement ratio limits are different for lightweight concrete, see ACI 318 for details.

Based on the laboratory test results, the Sulfate Severity is classified as “Not Applicable” and the Exposure Class is S0. The concrete mix design(s) should be developed accordingly. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Additionally, over time landscaping activities (i.e., addition of fertilizers and other soil nutrients) may affect the concentration.

Geocon does not practice in the field of corrosion engineering and the above information is provided as screening criteria only. If corrosion sensitive improvements are planned, we recommend that further evaluations by a corrosion engineer be performed to incorporate the necessary precautions to avoid premature corrosion on buried metal pipes and metal or concrete structures in direct contact with the soils.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General

6.1.1 No soil or geologic conditions were encountered during our investigation that would preclude development of the site as planned, provided the recommendations contained in this report are incorporated into the design and construction of the project.

6.1.2 Based on the results of our research and analyses, there are no significant geologic hazards that would prevent the proposed construction at the site as presently proposed. The primary geotechnical constraints identified in our investigation are:

- **Undocumented Fill:** Fill material is present in the landing area where the water tank location is proposed. Since we do not know the placement and compaction history of undocumented fill, if/where present, it is not suitable for support of proposed structures or additional fill. Therefore, undocumented fill material will need to be removed to expose undisturbed native soil. Specific recommendations are provided in this report.
- **Differential Fill/Soil Thickness:** Based on the variable thickness of residual soil and variable depth to intact bedrock, overexcavation and recompaction of near-surface soils will be required to create a uniform pad of engineered fill.
- **Shallow Bedrock:** The presence of Galice Formation bedrock is throughout the project area, which will present moderately difficult excavation conditions and the generation of oversize materials. Specific recommendations regarding grading, excavations, and backfilling are provided in this report.

6.1.3 Conclusions and recommendations provided in this report are based on our review of referenced literature, analysis of data obtained from our field exploration, laboratory testing program, and our understanding of the proposed development at this time. Geocon should be retained to review the project plans as they develop further, provide engineering consultation as needed, and perform geotechnical observation and testing services during construction.

6.2 Seismic Design Criteria

6.2.1 Seismic design of structures should be performed in accordance with the provisions of the 2022 California Building Code (CBC) which is based on the American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) publication: *ASCE/SEI 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE/SEI, 2017). We used the *Structural Engineers Association of California* (SEAOC) and *Office of Statewide*

Health Planning and Development (OSHPD) web application *Seismic Design Maps* (https://seismicmaps.org/) to evaluate site-specific seismic design parameters in accordance with ASCE 7-16.

For seismic design purposes, sites are classified as Site Class "A" through "F" as follows:

- Site Class A – Hard Rock;
- Site Class B – Rock;
- Site Class C – Very Dense Soil and Soft Rock;
- Site Class D – Stiff Soil;
- Site Class E – Soft Clay Soil; and
- Site Class F – Soils Requiring Site Response Analysis.

Based on the subsurface conditions at the site and measured penetration resistance in our borings, the Site Classification is Site Class "C – Very Dense Soil and Soft Rock" per Table 20.3-1 of ASCE/SEI 7-16. For the purpose of evaluating code-based seismic parameters for design, we assumed a seismic Risk Category II (per the CBC) for the project. Results are summarized in Table 6.2.1.

TABLE 6.2.1
ASCE 7-16 (CODE-BASED) SEISMIC DESIGN PARAMETERS
SITE CLASS "C" – VERY DENSE SOIL AND SOFT ROCK

Parameter	Value	ASCE 7-16 Reference
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.874g	Figure 22-1
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.824g	Figure 22-2
Site Coefficient, F_A	1.200	Table 11.4-1
Site Coefficient, F_V	1.400	Table 11.4-2
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	2.248g	Eq. 11.4-1
Site Class Modified MCE_R Spectral Response Acceleration (1 sec), S_{M1}	1.154g	Eq. 11.4-2
5% Damped Design Spectral Response Acceleration (short), S_{DS}	1.499g	Eq. 11.4-3
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.769g	Eq. 11.4-4

6.2.2 Table 6.2.2 presents additional seismic design parameters for projects with Seismic Design Categories of D through F in accordance with ASCE 7-16 for the mapped maximum considered geometric mean (MCE_G).

TABLE 6.2.2
ASCE 7-16 SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value	ASCE 7-16 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.853g	Figure 22-7
Site Coefficient, F_{PGA}	1.200	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	1.024g	Section 11.8.3 (Eq. 11.8-1)

6.2.3 Conformance to the criteria presented in Tables 6.2.1 and 6.2.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid structural damage, since such design may be economically prohibitive.

6.3 Excavation Characteristics/Rippability

6.3.1 Excavation characteristics will vary at the site depending on location and excavation depths. Table 6.3 summarizes anticipated excavation characteristics in each geologic unit identified at the site.

TABLE 6.3.1
ANTICIPATED EXCAVATION CHARACTERISTICS

Geologic Unit	Excavation Characteristics
Fill	Existing fill generally consists of sandy lean clay/clayey sand with gravel, cobbles, and boulders. We anticipate moderate excavation effort with conventional, heavy-duty grading equipment. The fill was readily excavatable with a standard backhoe. However, the presence of oversize rock (greater than 12 inches in maximum dimension) should be anticipated and may increase excavation difficulty.
Residual Soil	Residual soil at the site generally consists of medium dense to very dense clays and clayey sands with gravel, cobbles and boulders. We anticipate moderate excavation effort with conventional, heavy-duty grading equipment, except where large boulders are encountered. The presence of oversize rock should be anticipated and may increase excavation difficulty.
Galice Formation	Galice Formation bedrock generally excavates as sandy gravel with silt, cobbles and boulders. The presence of oversize rock exceeding 24 inches in maximum dimension should be anticipated and may increase excavation difficulty. We encountered excavation refusal at depths ranging from 4 to 7 feet within the Galice Formation using a Deere 13L backhoe with a 12-inch bucket. Difficult excavation characteristics and the presence of cobbles should be anticipated. Pre-ripping with a large dozer (such as Caterpillar D8R or larger) will likely be required for grading, and large excavators (such as Caterpillar 245 or equal) or rock trenchers will likely be required for trenching.

6.3.2 Protruding rocks in excavation bottoms should be removed and resulting depressions filled in accordance with the recommendations in this report

6.3.3 Temporary excavation slopes must meet Cal/OSHA requirements as appropriate. We anticipate that the majority of excavations in fill and residual soil will be classified as Cal/OSHA "Type B" soil while excavations in Galice Formation bedrock may be classified as Cal/OSHA "Type A" soil if cementation is present. Trench/excavation wall sloping, benching, the use of trench shields, and the placement of excavation spoils should conform to the latest applicable Cal/OSHA standards. The contractor should have a Cal/OSHA-approved "competent person" onsite during excavation and pipe placement to evaluate excavation conditions and to make appropriate recommendations where necessary. It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements.

6.4 Permanent Cut and Fill Slopes

6.4.1 Permanent cut slopes should be constructed no steeper than 1½H:1V and fill slopes should be constructed no steeper than 2H:1V. To mitigate potential erosion, slopes should be vegetated as soon as possible, and surface drainage should be directed away from the tops of slopes.

6.4.2 Fill slopes, if applicable, should be overbuilt a minimum of 2 feet and cut back to finished grade or track-walked with a D6 dozer (or similar equipment) such that the fill soils are uniformly compacted to at least 90% relative compaction and are moisture conditioned at or near optimum moisture content.

6.5 Water Tank Location

6.5.1 To reduce the potential for post-construction tank foundation differential settlement and potential slope instability (surficial slope creep or potential seismic slope deformation) below the tank, the proposed water tank should be located completely within engineered fill that extends at least 5 feet horizontally from the outside edge of the tank foundation. A cut-fill transition exceeding 5 feet below the tank should be avoided if possible. If a cut-fill transition cannot be avoided, remedial grading (undercut and backfill) will be necessary. Specific recommendations are provided herein.

6.6 Materials for Fill

6.6.1 Excavated soil and rock generated from cut operations at the site are suitable for use as engineered fill in structural areas provided they are selectively placed during grading in accordance with the following recommendations:

- Deleterious material, material with greater than 3 percent organics by weight, and debris should be exported from the site and not incorporated into structural fill.
- Fill material in areas with underground utilities, foundations, and areas within 5 feet of slope faces should consist of 6-inch-minus material with a sufficient amount of soil to provide adequate binder to reduce the potential for excavation caving.
- In other areas (general fill areas without utilities, foundations, and not within 5 feet of slope faces) rock or cementations up to 2 feet in maximum dimension may be used. However, this material should contain a sufficient amount of smaller rock and soil to fill void spaces between large rocks and avoid rock nesting (concentrations of rock with void space).
- If sufficient soil fill materials are not present at the site to mix with onsite rock material, import of soil fill material will be necessary.

6.6.2 Import fill material should be primarily granular with a “very low” expansion potential (Expansion Index less than 20), a Plasticity Index less than 15, be free of organic material and construction debris, and not contain rock/cementations larger than 6 inches in greatest dimension.

6.6.3 Environmental characteristics and corrosion potential of import soil materials should also be considered. Proposed import materials should be sampled, tested, and approved by Geocon prior to its transportation to the site.

6.7 Seepage, Groundwater, and Wet Weather Grading Considerations

6.7.2 Based on the conditions observed during our investigation, we do not anticipate groundwater to significantly affect foundation or underground utility construction if conducted during the summer and/or fall seasons. However, perched groundwater (seepage) may be present near residual soil/weathered bedrock or fill/native contacts (as shallow as 1 to 3 feet deep) year-round. If encountered, mitigation will likely consist of constructing French drains between seepage-prone areas (e.g., seasonal drainages, swales) and structures. We should provide specific recommendations at the time of construction based on actual conditions encountered.

6.7.3 If grading commences in winter or spring, or in periods of precipitation, excavated and in-place soils will likely be wet. Earthwork contractors should be aware of the moisture-sensitivity of site soils that may result in subgrade instability and/or potential compaction difficulties. Earthwork operations in these conditions will likely be difficult with low productivity. Often, a period of at least one month of warm and dry weather is necessary to allow the site to dry sufficiently so that heavy grading equipment can operate effectively. If the construction schedule allows, we recommend performing earthwork construction during the seasonal dry months.

6.8 Grading

6.8.1 Earthwork operations should be observed and fills tested for recommended compaction and moisture content by a representative of Geocon.

6.8.2 References to relative compaction and optimum moisture content in this report are based on the latest ASTM D1557 Test Procedure. Structural areas should be considered as areas extending a minimum of 5 feet horizontally beyond the outside dimensions of footings carrying structural loads.

6.8.3 Prior to commencing grading, a pre-construction conference with representatives of the client, grading contractor, and Geocon should be held at the site. Site preparation, soil handling and/or the grading plans should be discussed at the pre-construction conference.

6.8.4 Site preparation should begin with removal of existing surface/subsurface structures, if any, underground utilities (as required), any existing fill/backfill, and debris. Existing trees and similar large vegetation and associated roots larger than 1 inch in diameter should be completely removed. Smaller roots may be left in-place as conditions warrant as evaluated by our representative. Surface vegetation consisting of grasses and other similar vegetation (if present) should be removed by stripping to a sufficient depth to remove organic-rich topsoil. Material generated during stripping is not suitable for use within 5 feet of structures or within pavement areas but may be placed in landscaped or non-structural areas or exported from the site.

6.8.5 In order to provide uniform support of the new water tank, the tank pad should be over-excavated to remove all existing fill, and beyond to a depth of one foot below bottom of new footings or 2 feet below existing grade, whichever is deeper. The over-excavation should extend at least 5 feet beyond the structure perimeter. Existing fill may be reused as

engineered fill provided it meets the requirements of Section 6.6 of this report. Oversize rock (larger than 6 inches in greatest dimension) should be screened and removed from the excavated fill prior to re-use in building areas. The over-excavation bottom should be proof-rolled in the presence of a Geocon representative with a loaded water truck (or similar equipment with high contact pressure) to evaluate the performance of exposed subgrade and to identify any loose or unstable conditions that could require additional excavation.

6.8.6 Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with engineered fill in accordance with the recommendations of this report.

6.8.7 In general, where fill will be placed on slopes steeper than 5H:1V, we recommend that horizontal benches angled slightly into the slope be cut into competent formational material on the slopes prior to placing fill. Benches should roughly parallel slope contours and extend at least 2 feet into competent formational material. In addition, a keyway should be cut into the slope at the base of the fill. In general, keyways should be at least 15 feet wide and extend at least 2 feet into competent formational material. Subdrains may be required along the back edge of keyways and/or benches. Bench and keyway criteria may need revision during construction based on the actual materials encountered and grading performed in the field. A typical keying and benching detail is presented as Figure 6.

6.8.8 After site preparation, over-excavation bottoms, areas to receive fill or left at-grade should be scarified at least 12 inches, uniformly moisture-conditioned at or above optimum moisture content and compacted to at least 90 percent relative compaction. Scarification and recompaction operations should be performed in the presence of a Geocon representative to evaluate performance of the subgrade under compaction equipment loading.

6.8.9 Engineered fill consisting of onsite soil or approved import sources should be compacted in horizontal lifts not exceeding 8 inches (loose thickness) and brought to final subgrade elevations. Each lift should be moisture-conditioned at or above optimum and compacted to at least 90 percent relative compaction.

6.8.10 Fill slopes should be built such that soils are uniformly compacted to at least 90 percent relative compaction to the face of the completed slope.

6.8.11 Underground utility trenches within structural areas should be backfilled with properly compacted material. Pipe bedding, shading and backfill should conform to the requirements of the appropriate utility authority. Material excavated from trenches should be adequate for use as general backfill above shading provided it does not contain deleterious matter, vegetation or cementations larger than 6 inches in maximum dimension. Trench backfill should be placed in loose lifts not exceeding 8 inches. Lifts should be compacted to a minimum of 90 percent relative compaction at or above optimum moisture content. Compaction should be performed by mechanical means only; jetting of trench backfill is not recommended.

6.8.12 The upper 6 inches of roadway or pavement subgrade, whether completed at-grade, by excavation, or by filling, should be uniformly moisture-conditioned at or above optimum moisture content and compacted to at least 95 percent relative compaction. Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing AB.

6.9 Foundations – Water Tank

6.9.1 Provided the tank pad is graded in accordance with the recommendations of this report, the water storage tank may be supported on a perimeter ring footing with an interior concrete slab-on-grade supported on a gravel cushion. As previously discussed, a minimum setback of 10 feet should be maintained between the outer edge of tank foundations to the hinge point of the tank pad and adjacent descending slope.

6.9.2 Ring footings should extend at least 12 inches below pad grade and may be designed using an allowable bearing capacity of 3,000 pounds per square foot (psf) for dead plus live loads with a one-third increase for short-term transient loading such as wind and seismic.

6.9.3 Allowable passive pressure used to resist lateral movement of footings may be assumed to be equal to a fluid weighing 350 pounds per cubic foot (pcf). The allowable coefficient of friction to resist sliding of footings is 0.35 for concrete against soil. Combined passive resistance and friction may be utilized for footing design provided that the frictional resistance is reduced by 50 percent.

6.9.4 Water tank foundations designed in accordance with the recommendations above should experience total settlement of less than one inch and differential settlement on the order of ½ inch from center to tank edge. The majority of settlement will be immediate and occur as the tank is filled to nominal capacity.

6.9.5 Concrete slabs-on grade (if used) for the tank should be underlain by a minimum of 6 inches of Class 2 AB uniformly compacted to at least 95 percent relative compaction at or above optimum moisture content.

6.10 Retaining Walls and Lateral Loads

6.10.1 Lateral earth pressures may be used in the design of retaining walls. Lateral earth pressures may be assumed to be equal to an equivalent fluid pressure (EFP). Table 6.10 summarizes our recommended EFP values for design.

TABLE 6.10
RECOMMENDED LATERAL EARTH PRESSURES

Condition	Equivalent Fluid Density
Active – level backfill	40 pcf
Active – sloping backfill (2H:1V)	60 pcf
At-Rest	60 pcf
Seismic Earth Pressure[1]	20 pcf

Note:

1. *Applicable for walls that support more than 6 feet of backfill in accordance with Section 1803.5.12 of the 2022 CBC. Conventional triangular distribution (zero at the top). Should be combined with ACTIVE lateral earth pressure for seismic case analysis.*

6.10.2 Unrestrained walls should be designed using the active case. Unrestrained walls are those that are allowed to rotate more than 0.001H (where H is the height of the wall). Walls restrained from movement (such as basement walls) should be designed using the at-rest case.

6.10.3 An allowable downward drag friction coefficient of 0.35 may be used for resistance to sliding between backfill soil and the concrete tank wall.

6.10.4 We anticipate that retaining wall foundations will be founded in cut, exposing Galice Formation bedrock at the bottom of footing. Retaining wall foundations with a minimum depth of 18 inches in intact Galice Formation or on at least 1 foot of engineered fill may be designed using the allowable bearing capacity provided in Paragraph 6.9.2 of this report.

Lateral resistance of footings will be provided by passive resistance of the soil in front and frictional resistance along the base of the footings. An allowable passive resistance of 350 pcf may be used where level ground extends at least 5 feet or three times the depth of the footing or shear key, whichever is greater, beyond the face of the retaining wall footing. Where sloping ground (up to 2H:1V) is present in front of footings, a reduced passive resistance of 175 pcf should be used. If this surface is not protected by floor slabs or pavement, the upper 12 inches of material should not be included in the design for lateral resistance. An allowable friction coefficient of 0.35 may be used for resistance to sliding between soil and concrete. Combined passive resistance and friction may be utilized for design provided that the frictional resistance is reduced by 50 percent.

6.10.5 Retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and should be waterproofed as required by the project architect. Positive drainage for retaining walls should consist of a vertical layer of permeable material positioned between the retaining wall and the soil backfill. The permeable material may be composed of a composite drainage geosynthetic or a natural permeable material such as crushed gravel at least 12 inches thick and capped with at least 12 inches of native soil. A geosynthetic filter fabric should be placed between the gravel and the soil backfill. Provisions for removal of collected water should be provided for either system by installing a perforated drainage pipe along the bottom of the permeable material which leads to suitable drainage facilities.

6.11 Concrete Flatwork

6.11.1 Concrete flatwork not subjected to vehicular traffic should be underlain by at least 4 inches of Class 2 AB compacted to at least 90% relative compaction at or above optimum moisture content. Prior to placing the AB, the top 6 inches of soil subgrade soil should be uniformly moisture-conditioned above optimum moisture content and compacted to 90% relative compaction.

6.11.2 Concrete jointing and reinforcement (if used) should be detailed in accordance with ACI or PCA guidelines.

6.11.3 Exterior concrete flatwork should be structurally independent of building foundations except at doorways where dowels should be used to reduce vertical offset that could affect door operation.

6.12 Drainage

6.12.1 Proper site drainage is critical to reduce the potential for differential soil movement, soil expansion, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to structure foundations. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with the 2022 CBC or other applicable standards. Water should not be allowed to pond in relatively flat areas. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices.

6.12.2 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

6.12.3 Landscaping planters adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. We recommend that area drains to collect excess irrigation water and transmit it to drainage structures or impervious above-grade planter boxes be used. In addition, where landscaping is planned adjacent to the pavement, we recommend construction of a cutoff wall (deepened concrete curb, plastic root barrier, or similar cutoff) along the edge of the pavement that extends at least 4 inches into the soil subgrade below the bottom of the base material.

6.12.4 Roof drains should be connected to water-tight drainage piping connected to the storm drain system. Consideration should be given to draining roofs to lined planter boxes or placing liners below the proposed landscape areas to prevent infiltration of water. Geocon can be contacted for additional recommendations.

6.12.5 Experience has shown that even with these provisions, subsurface seepage may develop in areas where no such water conditions existed prior to site development. This is particularly true where a substantial increase in surface water infiltration has resulted from an increase in landscape irrigation.

7.0 FURTHER GEOTECHNICAL SERVICES

7.1 Plan and Specification Review

7.1.1 We should review the foundation and grading plans prior to final design submittal to assess whether our recommendations have been properly incorporated and evaluate if additional analysis and/or recommendations are required.

7.2 Testing and Observation Services

7.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered during construction are similar to those anticipated during design. Testing and observation services by the Geotechnical Engineer of Record are necessary to verify that construction has been performed in accordance with this report, approved plans, and specifications. If we are not retained for these services, we cannot assume any responsibility for other's interpretation of our recommendations or the future performance of the project.

8.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

The recommendations of this report pertain only to the site investigated and are based upon the assumption that the 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, we should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous materials or environmental contamination was not part of our scope of services.

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 design team for the project and incorporated into the plans and specifications and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

The recommendations contained in this report are preliminary until verified during construction by representatives of our firm. Changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. Additionally, 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 partially or wholly 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, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices used in the site area at this time. No warranty is provided, express or implied.

9.0 REFERENCES

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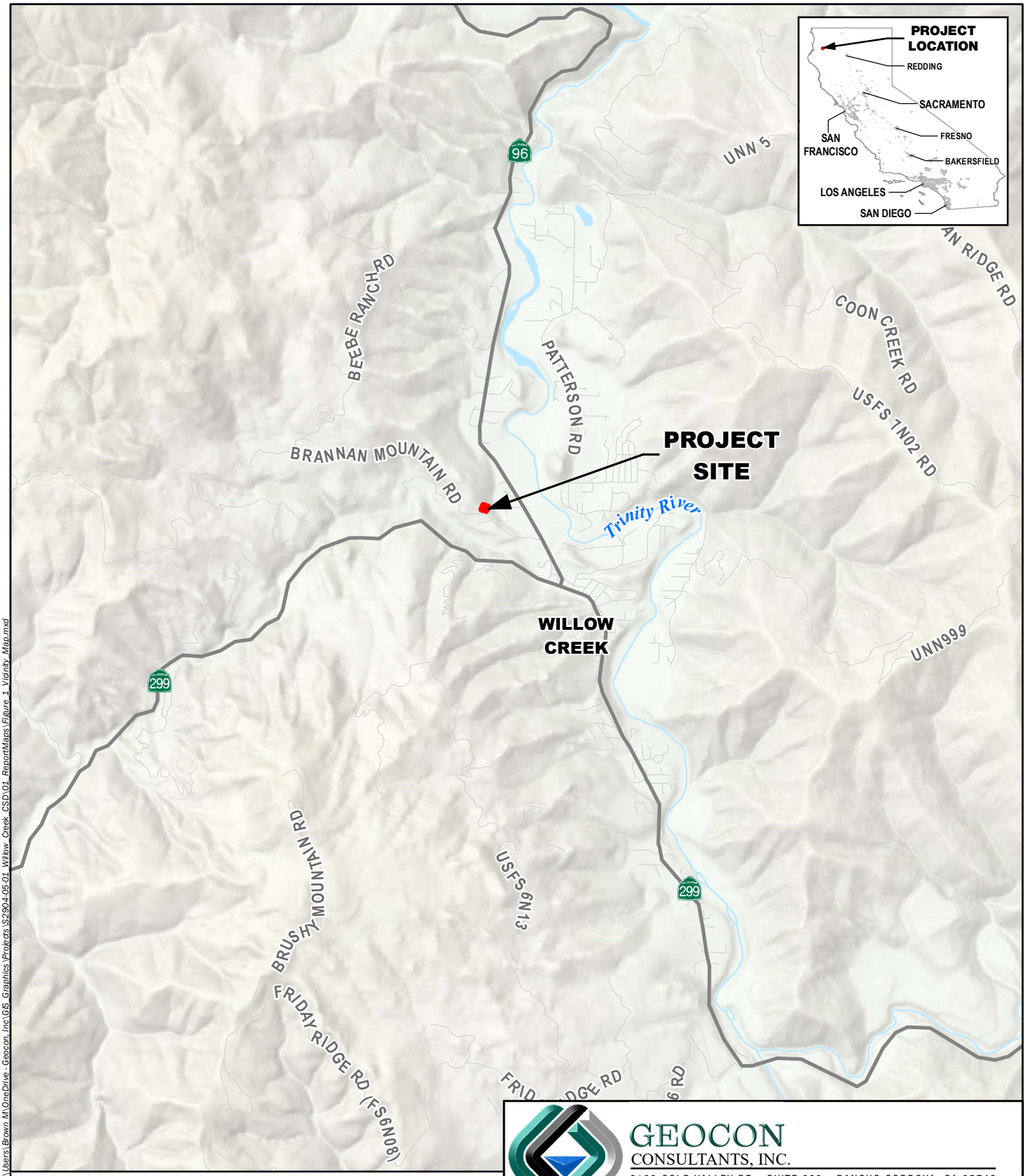

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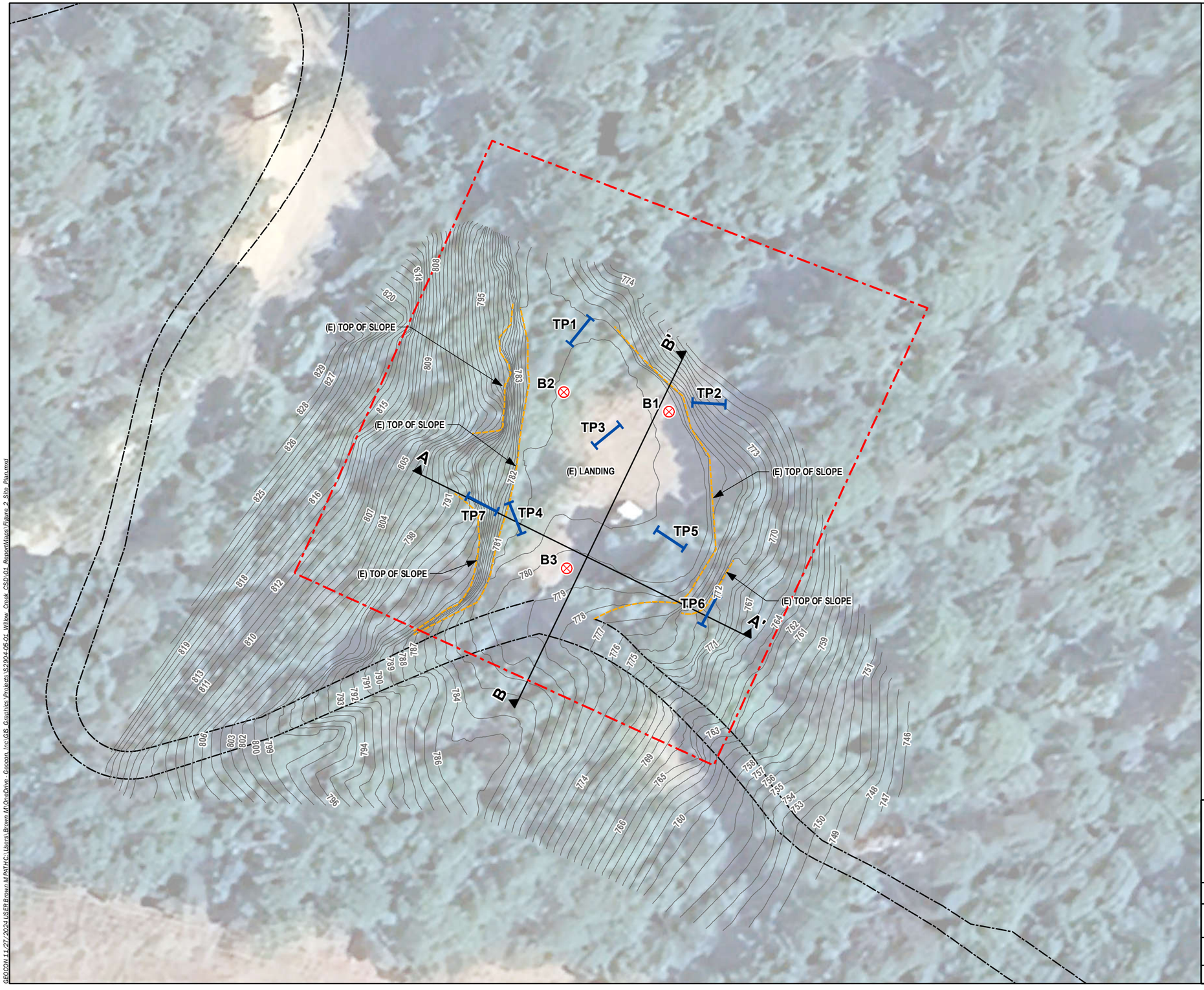
Willow Creek Community Services District Water Tank

Brannan Mountain Road
Willow Creek, California

VICINITY MAP

S2904-05-01	May 2025	Figure 1



Legend

- B3 ⊗ Approximate Boring Location
- TP10 Approximate Test Pit Location
- B B' Approximate Cross-Section Location (Figures 4 and 5)
- Break in Cut/Fill Slope
- 1-Foot Elevation Contours
- Approximate Site Boundary

Topographic Survey by Trinity Valley Consulting Engineers, Inc. (6/2018)

N

0 40

Scale in Feet

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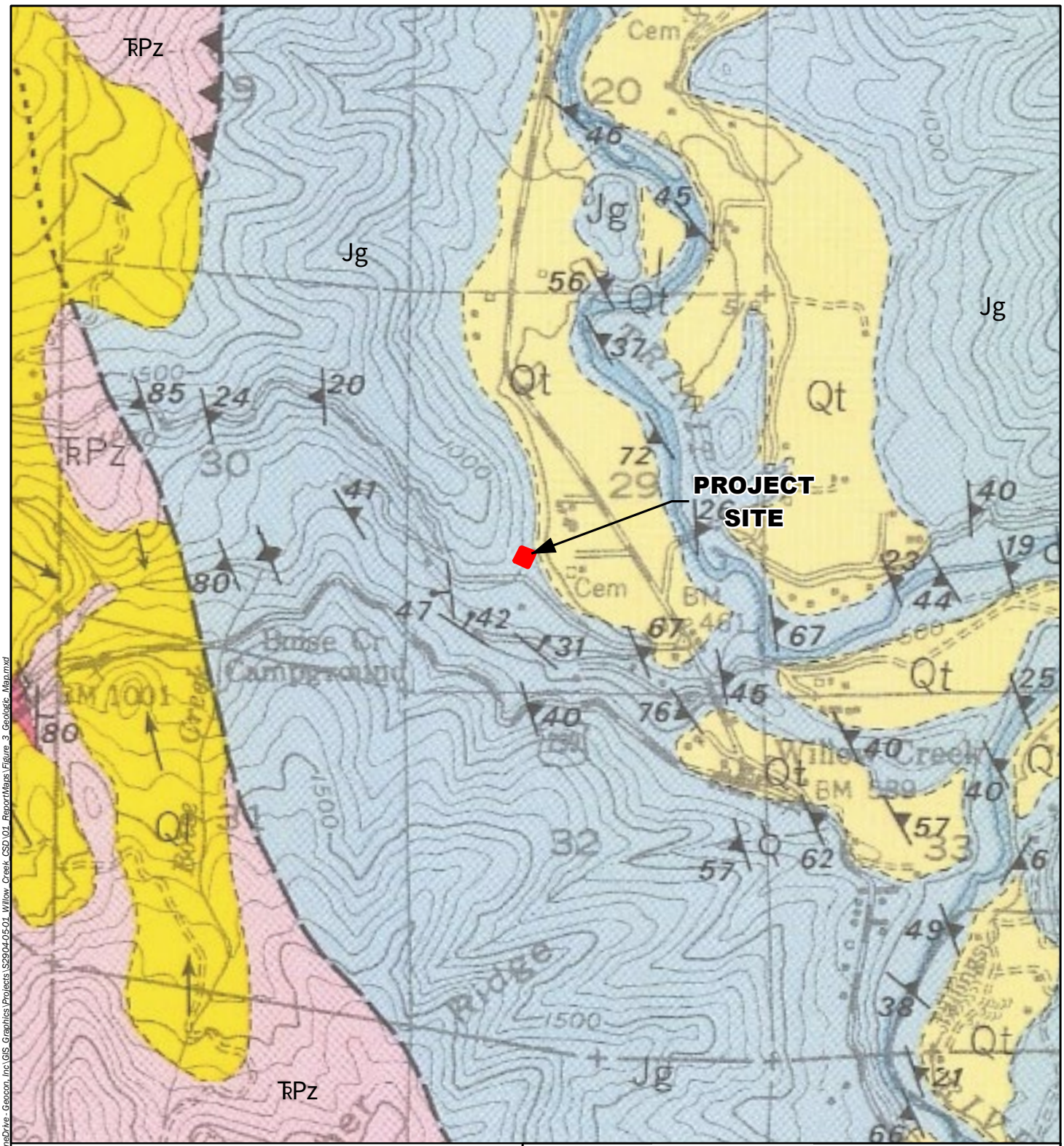
SITE PLAN

S2904-05-01	May 2025	Figure 2



Geologic and and Sections of the Willow Creek 15' Quadrangle, Humboldt and Trinity Counties, California; J.C. Young; 1978

Unit Explantion

Qt	Quaternary Terrace gravels
Ql	Landslide or Slump
Jg	Galice Formation
TRPz	Western Paleozoic and Triassic belt rocks (melange)
30	Strike and Dip of Beds
25	Strike and Dip of Foliation

N

0 2,000

Scale in Feet

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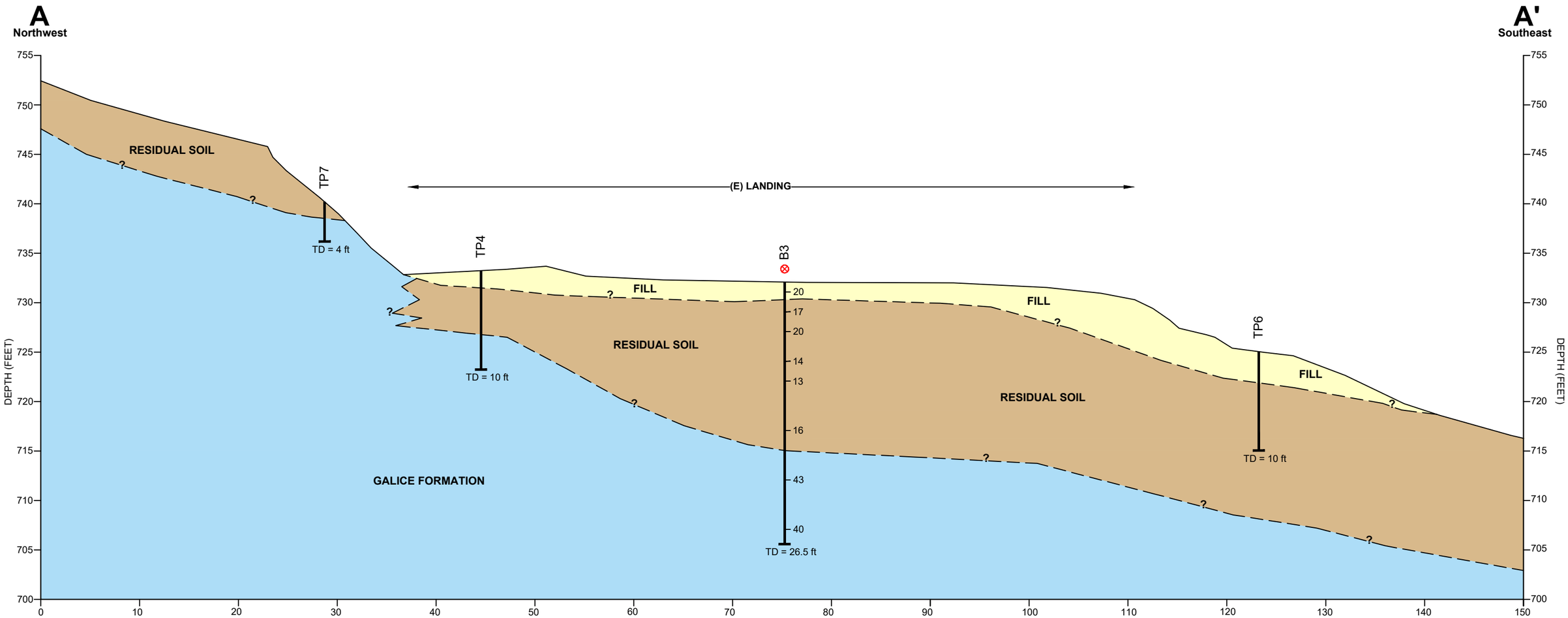
GEOLOGIC MAP

S2904-05-01	May 2025	Figure 3



Legend

B3 — Exploration Location

15 — Blow Count (California Modified Sampler)

Lithology Contacts

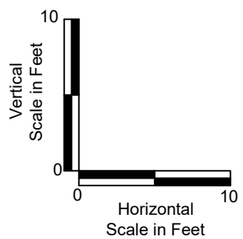
Fill

Residual Soil

Galice Formation

Abbreviations:
ft = Feet

Notes:
1. This figure depicts generalized subsurface conditions inferred from our explorations and is intended for use as general geotechnical characterization and an aid for design. Actual subsurface conditions, including groundwater depths/elevations, may vary. Please refer to the Boring Logs (Appendix A) for detailed subsurface conditions encountered at each boring location.



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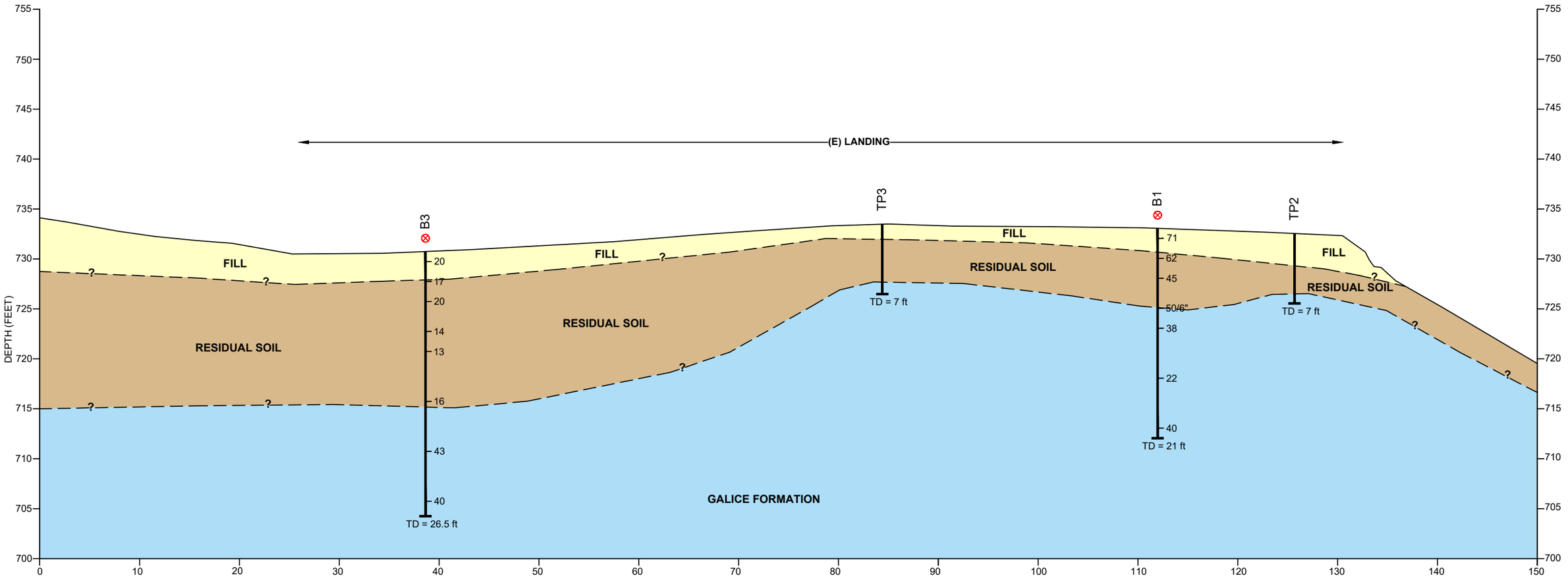
CROSS SECTION A-A'

S2904-05-01	May 2025	Figure 4

B
Southwest

B'
Northeast



Legend

B3 — Exploration Location

15 — Blow Count (California Modified Sampler)

Lithology Contacts

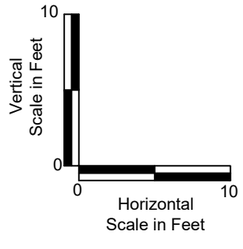
Fill

Residual Soil

Galice Formation

Abbreviations:
ft = Feet

Notes:
1. This figure depicts generalized subsurface conditions inferred from our explorations and is intended for use as general geotechnical characterization and an aid for design. Actual subsurface conditions, including groundwater depths/elevations, may vary. Please refer to the Boring Logs (Appendix A) for detailed subsurface conditions encountered at each boring location.



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CROSS SECTION B-B'

S2904-05-01	May 2025	Figure 5

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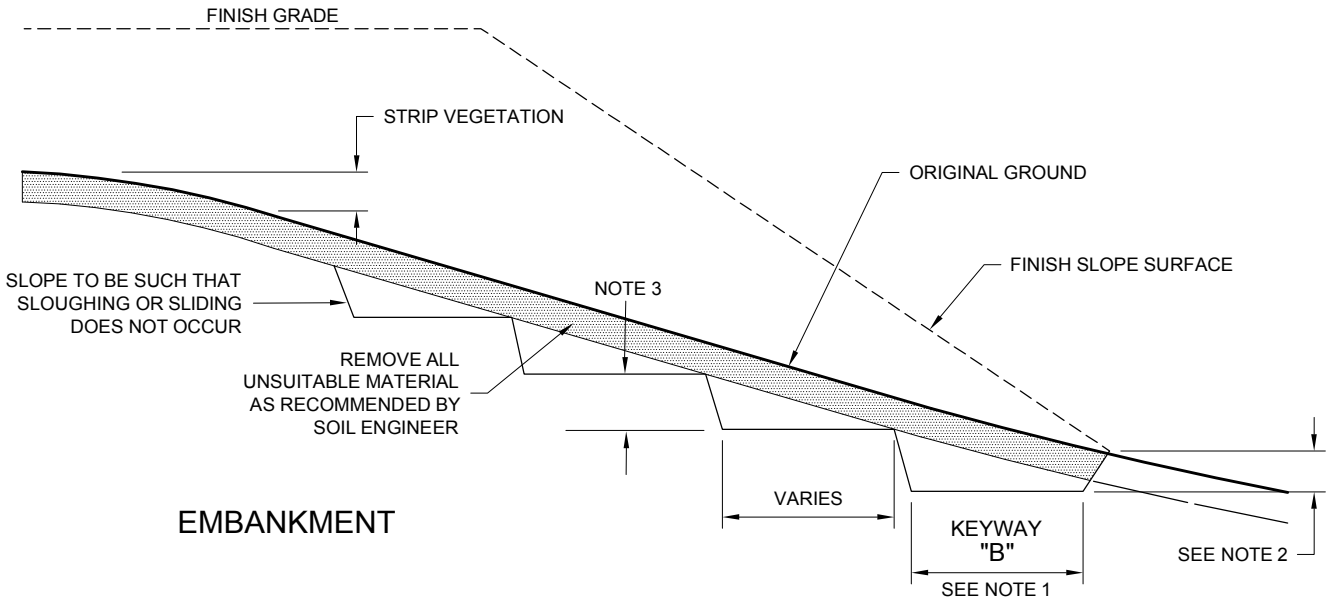

Notes:

1... The minimum width “B” of keyway shall be 2 feet wider than the compaction equipment and not less than 15 feet.

2... The outside edge of bottom key shall be below topsoil or loose surface material and at least 2 feet into competent formational material.

Keys are required where the existing slopes are steeper than 5 horizontal to 1 vertical.

The base of the key and each bench shall be inclined slightly into the slope.

3... Bench height not to exceed 3 feet.

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Willow Creek Community Services District Water Tank

Brannan Mountain Road
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Typical Keying and Benching Detail

S2904-05-01	May 2025	Figure 6

APPENDIX A

APPENDIX A

FIELD EXPLORATION

Our geotechnical field exploration program was performed on October 8 and 23, 2024, and consisted of excavating seven exploratory test pits (TP1 through TP7) and drilling three exploratory borings (B1 through B3) at the approximate locations shown on the Site Plan, Figure 2.

The exploratory borings were performed using a truck-mounted CME 55 drill rig equipped with 6-inch outside diameter (OD) solid-flight augers and 7-inch OD hollow-stem augers. Soil sampling was performed using an automatic 140-pound hammer with a 30-inch drop. We obtained samples using a 3-inch OD split-spoon (California Modified) sampler. We recorded the number of blows required to drive the sampler the last 12 inches (or portion thereof) of the 18-inch sampling interval on the boring logs. Upon completion, the borings were backfilled with neat cement grout.

Test pits were performed using a Deere 310L backhoe equipped with an 18-inch-wide bucket. Soil samples were collected from the test pits at various locations and depths. Upon completion, the test pits were backfilled with the excavated material.

We visually examined, classified, and logged the subsurface conditions in the exploratory borings and test pits in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488-90). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which we obtained samples. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, drill rig penetration rates, excavation characteristics, and other factors. The transition between materials may be abrupt or gradual. Where applicable, we revised the field logs based on subsequent laboratory testing. Logs of exploratory borings are presented herein.

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISIONS			TYPICAL NAMES	
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC	CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS WITH OR WITHOUT GRAVEL
			SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL	ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS		PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

BORING/TRENCH LOG LEGEND

- No Recovery (NOREC)
- Chunk Sample (CHK)
- Shelby Tube Sample (ST)
- Bulk Sample (B)
- Standard Penetration Test Sample (SPT)
- Modified California Sample (MC)
- Continuous Push (CP)
- Groundwater Level (At Time of Drilling)
- Groundwater Level (After Drilling)
- Groundwater Level (Seepage Encountered)

PENETRATION RESISTANCE

SAND AND GRAVEL			SILT AND CLAY			
RELATIVE DENSITY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	CONSISTENCY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	COMPRESSIVE STRENGTH (tsf)
VERY LOOSE	0 - 4	0 - 6	VERY SOFT	0 - 2	0 - 3	0 - 0.25
LOOSE	5 - 10	7 - 16	SOFT	3 - 4	4 - 6	0.25 - 0.50
MEDIUM DENSE	11 - 30	17 - 48	FIRM	5 - 8	7 - 13	0.50 - 1.0
DENSE	31 - 50	49 - 79	STIFF	9 - 15	14 - 24	1.0 - 2.0
VERY DENSE	OVER 50	OVER 79	VERY STIFF	16 - 30	25 - 48	2.0 - 4.0
			HARD	OVER 30	OVER 48	OVER 4.0

*NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE LAST 12 INCHES

MOISTURE DESCRIPTIONS

FIELD TEST	APPROX. DEGREE OF SATURATION, S (%)	DESCRIPTION
NO INDICATION OF MOISTURE; DRY TO THE TOUCH	S<25	DRY
SLIGHT INDICATION OF MOISTURE	25≤S<50	DAMP
INDICATION OF MOISTURE; NO VISIBLE WATER	50≤S<75	MOIST
MINOR VISIBLE FREE WATER	75≤S<100	WET
VISIBLE FREE WATER	100	SATURATED

QUANTITY DESCRIPTIONS

APPROX. ESTIMATED PERCENT	DESCRIPTION
<5%	TRACE
5 - 10%	FEW
11 - 25%	LITTLE
26 - 50%	SOME
>50%	MOSTLY

GRAVEL/COBBLE/BOULDER DESCRIPTIONS

CRITERIA	DESCRIPTION
PASS THROUGH A 3-INCH SIEVE AND BE RETAINED ON A NO. 4 SIEVE (#4 TO 3")	GRAVEL
PASS A 12-INCH SQUARE OPENING AND BE RETAINED ON A 3-INCH SIEVE (3"-12")	COBBLE
WILL NOT PASS A 12-INCH SQUARE OPENING (>12")	BOULDER

BEDDING SPACING DESCRIPTIONS

THICKNESS/SPACING	DESCRIPTOR
GREATER THAN 10 FEET	MASSIVE
3 TO 10 FEET	VERY THICKLY BEDDED
1 TO 3 FEET	THICKLY BEDDED
3 ⅝-INCH TO 1 FOOT	MODERATELY BEDDED
1 ⅛-INCH TO 3 ⅝-INCH	THINLY BEDDED
⅜-INCH TO 1 ⅛-INCH	VERY THINLY BEDDED
LESS THAN ⅜-INCH	LAMINATED

STRUCTURE DESCRIPTIONS

CRITERIA	DESCRIPTION
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST ¼-INCH THICK	STRATIFIED
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN ¼-INCH THICK	LAMINATED
BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	FISSURED
FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	SLICKENSIDED
COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALLER ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN	BLOCKY
INCLUSION OF SMALL POCKETS OF DIFFERENT SOIL, SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY	LENSED
SAME COLOR AND MATERIAL THROUGHOUT	HOMOGENOUS

CEMENTATION/INDURATION DESCRIPTIONS

FIELD TEST	DESCRIPTION
CRUMBLES OR BREAKS WITH HANDLING OR LITTLE FINGER PRESSURE	WEAKLY CEMENTED/INDURATED
CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE	MODERATELY CEMENTED/INDURATED
WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE	STRONGLY CEMENTED/INDURATED

IGNEOUS/METAMORPHIC ROCK STRENGTH DESCRIPTIONS

FIELD TEST	DESCRIPTION
MATERIAL CRUMBLES WITH BARE HAND	WEAK
MATERIAL CRUMBLES UNDER BLOWS FROM GEOLOGY HAMMER	MODERATELY WEAK
⅛-INCH INDENTATIONS WITH SHARP END FROM GEOLOGY HAMMER	MODERATELY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **ONE** BLOW FROM GEOLOGY HAMMER	STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **COUPLE** BLOWS FROM GEOLOGY HAMMER	VERY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **MANY** BLOWS FROM GEOLOGY HAMMER	EXTREMELY STRONG

IGNEOUS/METAMORPHIC ROCK WEATHERING DESCRIPTIONS

DEGREE OF DECOMPOSITION	FIELD RECOGNITION	ENGINEERING PROPERTIES
SOIL	DISCOLORED, CHANGED TO SOIL, FABRIC DESTROYED	EASY TO DIG
COMPLETELY WEATHERED	DISCOLORED, CHANGED TO SOIL, FABRIC MAINLY PRESERVED	EXCAVATED BY HAND OR RIPPING (Saprolite)
HIGHLY WEATHERED	DISCOLORED, HIGHLY FRACTURED, FABRIC ALTERED AROUND FRACTURES	EXCAVATED BY HAND OR RIPPING, WITH SLIGHT DIFFICULTY
MODERATELY WEATHERED	DISCOLORED, FRACTURES, INTACT ROCK-NOTICEABLY WEAKER THAN FRESH ROCK	EXCAVATED WITH DIFFICULTY WITHOUT EXPLOSIVES
SLIGHTLY WEATHERED	MAY BE DISCOLORED, SOME FRACTURES, INTACT ROCK-NOT NOTICEABLY WEAKER THAN FRESH ROCK	REQUIRES EXPLOSIVES FOR EXCAVATION, WITH PERMEABLE JOINTS AND FRACTURES
FRESH	NO DISCOLORATION, OR LOSS OF STRENGTH	REQUIRES EXPLOSIVES

IGNEOUS/METAMORPHIC ROCK JOINT/FRACTURE DESCRIPTIONS

FIELD TEST	DESCRIPTION
NO OBSERVED FRACTURES	UNFRACTURED/UNJOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1 TO 3 FOOT INTERVALS	SLIGHTLY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 4-INCH TO 1 FOOT INTERVALS	MODERATELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1-INCH TO 4-INCH INTERVALS WITH SCATTERED FRAGMENTED INTERVALS	INTENSELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT LESS THAN 1-INCH INTERVALS; MOSTLY RECOVERED AS CHIPS AND FRAGMENTS	VERY INTENSELY FRACTURED/JOINTED

GEOCON

KEY TO LOGS

Plotted:09/20/2024 2:38PM | By:RUBEN AGUILAR | File Location:Y:\Key to Logs-Boring and Trench Log Descriptions\KeyToLogs_GeoconLegend-Soil&RockDescriptions.dwg

SOIL BORING NUMBER: B 1

PROJECT NAME Willow Creek CSD Water Tank
LOGGED BY Lauren Herbert
PROJECT NUMBER S2904-05-01
LATITUDE / LONGITUDE 40.94773, -123.642291
DATE STARTED 10/23/2024 **COMPLETED** 10/23/2024
DEPTH 21.5' **SURFACE ELEVATION** ~733'
LOCATIO Willow C eek, CA
DRILLING FIRM V&W Drilling
RIG TYPE CME-55
METHOD Auge **BORING DIAMETER** 7 in
HAMMER TYPE Auto
HAMMER WEIGHT / DROP 140 lb / 30 in

Depth (ft)	USCS	Material Description	Sample Number	Blow Counts/6"	Penetration Resistance (blows/foot)
	SC-SM	**FILL** Medium dense, moist, brown to yellowish brown, **Silty, Clayey SAND** with **Gravel**	B1-1.5 B1-2	12 21 50	71/12"
	SC-SM	**RESIDUAL SOIL** Very dense, moist, yellowish brown, **Silty, Clayey**, fine to medium grained **SAND** with **Gravel**; up to 2" in diameter	B1-3.5 B1-4	8 22	62
5		Dense; increasing gravel content and size	B1-5.5 B1-6	40 10 20	45
		Very dense; increasing gravel size		25 50/6"	
	GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Dense, moist, grayish brown, **Poorly graded GRAVEL** with **Sand and Clay**	B1-10.5 B1-11	24 19 19	38
10		rig grinding on rocks			
15		Medium dense; highly variable rock weathering	B1-15.5 B1-16	9 11 11	22
20		Dense, grayish brown with iron oxide staining, some **Clay**	B1-20.5 B1-21	11 16 24	40
		Boring terminated at 21.5 feet. Groundwater not encountered. Backfilled with neat cement grout.			

Water Levels

▽ No free water encountered on 10/23

▼ -

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

SOIL BORING NUMBER: B 2

PROJECT NAME Willow Creek CSD Water Tank
LOGGED BY Lauren Herbert
PROJECT NUMBER S2904-05-01
LATITUDE / LONGITUDE 40.947757, -123.642448
DATE STARTED 10/23/2024 **COMPLETED** 10/23/2024
DEPTH 25.5' **SURFACE ELEVATION** ~733'
LOCATIO Willow C eek, CA
DRILLING FIRM V&W Drilling
RIG TYPE CME-55
METHOD Auge **BORING DIAMETER** 7 in
HAMMER TYPE Auto
HAMMER WEIGHT / DROP 140 lb / 30 in

Depth (ft)	Elevation (ft)	Graphic Log	USCS	Water Levels	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Penetration Resistance (blows/foot)
	733		SC-SM		**FILL** Moist, yellowish brown, **Silty, Clayey SAND** with **Gravel**		■	B2-1.5 B2-2	13 31 36	67
	730				**RESIDUAL SOIL** Very dense, moist, yellowish brown to brown, **Silty, Clayey**, fine to medium grained **SAND** with **Gravel** increasing gravel content		■	B2-3.5 B2-4	11 30	65
5							■	B2-5.5 B2-6	35 14 22	72/12"
	725				Brown; increasing clay content, gravel up to 1" in diameter		■	B2-8 B2-8.5	50 13 15	36
			GP		Dense				21	
10					**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Dense, moist, grayish brown, **Poorly graded GRAVEL** with **Sand and Clay**		■	B2-10.5 B2-11	13 17 24	41
	720									
15					gravel up to 2.5" in diameter in recovery		■	B2-15.5 B2-16	22 18 18	36
	715									
20					Very dense, brown to grayish brown; decreasing clay content		■	B2-21	30 50/6"	80/6"
	710				material breaks down in auger but is hard to drive sample into					
25					sampling refusal Boring terminated at 25.5 feet. Groundwater not encountered. Backfilled with neat cement grout.		■	B2-25	50/6"	50/6"

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

SOIL BORING NUMBER: B 3

PROJECT NAME Willow Creek CSD Water Tank
LOGGED BY Lauren Herbert
PROJECT NUMBER S2904-05-01
LATITUDE / LONGITUDE 40.947559, -123.642439
DATE STARTED 10/23/2024 **COMPLETED** 10/23/2024
DEPTH 26.5' **SURFACE ELEVATION** ~732'
LOCATIO Willow C eek, CA
DRILLING FIRM V&W Drilling
RIG TYPE CME-55
METHOD Auge **BORING DIAMETER** 7 in
HAMMER TYPE Auto
HAMMER WEIGHT / DROP 140 lb / 30 in

Depth (ft)	Elevation (ft)	Graphic Log	USCS	Water Levels	Material Description	Bulk	Driven	Sample Number	Blow Counts/6"	Penetration Resistance (blows/foot)	Pocket Penetrometer (tsf)
	732										
	730		CL		**FILL** Moist, reddish brown, **Sandy LEAN CLAY** with **Gravel**		■	B3-1.5 B3-2	15 10	20	>4.5
					RESIDUAL SOIL Hard, moist, reddish brown, **Sandy**, fine to medium grained **LEAN CLAY** with **Gravel**; up to 1/2" in diameter		■	B3-3.5 B3-4	10 7 8	17	
5					increasing gravel content and size, gravel up to 1" in diameter		■	B3-5.5 B3-6	9 6 8	20	4.0
	725				Very stiff; increasing gravel content decreasing gravel size, gravel up to 1/2" in diameter		■	B3-8 B3-8.5	12 5 7	14	3.75
10							■	B3-10.5 B3-11	7 5 6 7	13	3.25
	720										
15					Hard; with gravel up to 2.5" in diameter in recovery, gradational contact with bedrock		■	B3-15.5 B3-16	5 6 10	16	4.0
	715		GP		**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, grayish brown, **Poorly graded GRAVEL** with **Sand**		■	B3-20.5 B3-21	8 21 22	43	
20											
	710										
25					rock fragments up to 2.5" in diameter in recovery		■	B3-25.5 B3-26	10 15 25	40	
	705				Boring terminated at 26.5 feet. Groundwater not encountered. Backfilled with neat cement grout.						

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

TEST PIT NUMBER: TP1

PROJECT NAME Willow Creek CSD Water Tank | **PROJECT NUMBER** S2904-05-01

DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024 | **LATITUDE / LONGITUDE** 40.947826, -123.642426

CONTRACTOR Geocon | **EQUIPMENT** Deere 13L Backhoe

METHOD Backhoe | **LOCATION** Willow Creek, CA

LOGGED BY Lauren Herbert | **DEPTH** 13' **SURFACE ELEVATION** ~734'

Depth (ft)	Water Levels	Graphic Log	USCS	Material Description	Sample Graphic	Sample ID
0			SM	**FILL** Dry, light brown to reddish brown, **Silty**, fine grained **SAND** with trace boulders up to 2' in diameter Moist		TP1-BULK TP1-2
3			SM	**RESIDUAL SOIL** Moist, brown to yellowish brown, **Silty SAND** with **Gravel**; with boulders Brown to grayish brown		TP1-5
8			GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with **Sand and Silt**		TP1-8
13				Test pit terminated at 13 feet. Groundwater not encountered. Backfilled with soil cuttings.		

Water Levels

▽ No free water encountered on 10/08

▼ -

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

TEST PIT NUMBER: TP2

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.947747, -123.642233
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 7' **SURFACE ELEVATION** ~732'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	732				
2	730			SC-SM	**FILL** Dry, light brown to reddish brown, **Silty, Clayey**, fine grained **SAND** with **Gravel**; trace cobbles up to 10" in diameter, with rootlets Moist
4				CL	**RESIDUAL SOIL** Moist, brown to yellowish brown, **Sandy LEAN CLAY** with **Gravel**; with boulders
6				GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with **Sand and Silt**
	725				
					Test pit terminated upon practical refusal at 7 feet. Groundwater not encountered. Backfilled with soil cuttings.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

TEST PIT NUMBER: TP3

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.947709, -123.642383
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 7' **SURFACE ELEVATION** ~732'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	732			SC-SM	**FILL** Moist, brown to reddish brown, **Silty, Clayey SAND** with **Gravel**; trace cobbles up to 10" in diameter
				SC-SM	**RESIDUAL SOIL** Moist, brown, **Silty, Clayey SAND** with **Gravel**; with boulders
2	730				
4					
				GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with **Sand and Silt**; with felsic inclusions
6					
	725				
					Test pit terminated upon practical refusal at 7 feet. Groundwater not encountered. Backfilled with soil cuttings.

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TEST PIT NUMBER: TP4

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.947614, -123.642516
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 10' **SURFACE ELEVATION** ~733'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	733			SC-SM	**FILL** Dry, light brown to reddish brown, **Silty, Clayey SAND** with **Gravel**; trace boulders up to 15" in diameter
2	730			SC-SM	**RESIDUAL SOIL** Moist, brown to grayish brown, **Silty, Clayey SAND** with **Gravel**; with boulders Increase in boulder content
6				GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with
8	725				
10					Test pit terminated upon practical refusal at 10 feet. Groundwater not encountered. Backfilled with soil cuttings.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

GEOCON

TEST PIT NUMBER: TP5

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.947594, -123.642287
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 11' **SURFACE ELEVATION** ~731'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	731				
	730			SC-SM	**FILL** Dry to moist, light brown to reddish brown, **Silty, Clayey SAND** with **Gravel**; trace boulders up to 1' in diameter
2				SC-SM	**RESIDUAL SOIL** Moist, brown to grayish brown, **Silty, Clayey SAND** with **Gravel**; with boulders
4					
6	725				Increase in boulder content
8				GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with **Sand and Silt**
10	720				

Test pit terminated at 11 feet. Groundwater not encountered. Backfilled with soil cuttings.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

GEOCON

TEST PIT NUMBER: TP6

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.947515, -123.642227
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 10' **SURFACE ELEVATION** ~725'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	725			SC	**FILL** Moist, brown to reddish brown, **Clayey SAND** with **Gravel**; trace cobbles up to 10" in diameter
2				SC	**RESIDUAL SOIL** Moist, brown to reddish brown, **Clayey**, fine grained **SAND** with **Gravel**; with cobbles
4					Brown to grayish brown
	720				
6					
8					
	715				
10					Test pit terminated at 10 feet. Groundwater not encountered. Backfilled with soil cuttings.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

GEOCON

TEST PIT NUMBER: TP7

PROJECT NAME Willow Creek CSD Water Tank
PROJECT NUMBER S2904-05-01
DATE STARTED 10/08/2024 **COMPLETED** 10/08/2024
LATITUDE / LONGITUDE 40.94763, -123.642566
CONTRACTOR Geocon
EQUIPMENT Deere 13L Backhoe
METHOD Backhoe
LOCATION Willow Creek, CA
LOGGED BY Lauren Herbert
DEPTH 4' **SURFACE ELEVATION** ~740'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description
	740			SC-SM	**RESIDUAL SOIL** Moist, brown to grayish brown, **Silty, Clayey SAND** with **Gravel**
2				GP	**GALICE FORMATION** Highly weathered Greenschist and Slate; excavates as Medium dense, moist, gray to greenish gray, **Poorly graded GRAVEL** with **Sand and Silt**
4					Test pit terminated upon practical refusal at 4 feet. Groundwater not encountered. Backfilled with soil cuttings.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

APPENDIX B

APPENDIX B

LABORATORY TESTING PROGRAM

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected soil samples were tested for their in-place dry density and moisture content, plasticity characteristics, grain size distribution, corrosion potential, expansion potential, unconfined compressive strength, and moisture-density relationship. The results of the laboratory tests are presented below and on the following pages.

TABLE B1
EXPANSION INDEX TEST RESULTS
ASTM D4829

Sample Number	Depth (feet)	Moisture Content (%)		Expansion Index	Classification*
		Before Test	After Test		
B3 – Bulk	0-5	9.6	18.0	8	Very Low

**Expansion Potential Classification per ASTM D4829.*

Sample ID	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Expansion Index	%<#200 Sieve	Water Content (%)	Dry Density (pcf)
B1-2	2						4.7	117.8
B1-6	6						9.3	84.9
B1-11	11						8.7	118.6
B1-16	16						10.4	94.2
B1-21	21						10.0	114.7
B2-2	2						9.0	120.1
B2-4	4						10.4	117.5
B2-8.5	8.5						10.9	112.6
B2-16	16						13.5	124.9
B3-Bulk	0-5	35	20	15	8			
B3-2	2						12.8	102.2
B3-4	4						12.6	110.7
B3-6	6						13.5	109.4
B3-8.5	8.5						13.1	105.8
B3-11	11	29	20	9			13.1	114.1
B3-16	16						12.3	104.9
B3-21	21						8.7	125.0
TP1-Bulk	1-8					19.2		
TP2-Bulk	1-7					39.1		
TP4-Bulk	1-6					38.3		
TP6-Bulk	2-7	34	19	15		47.2		

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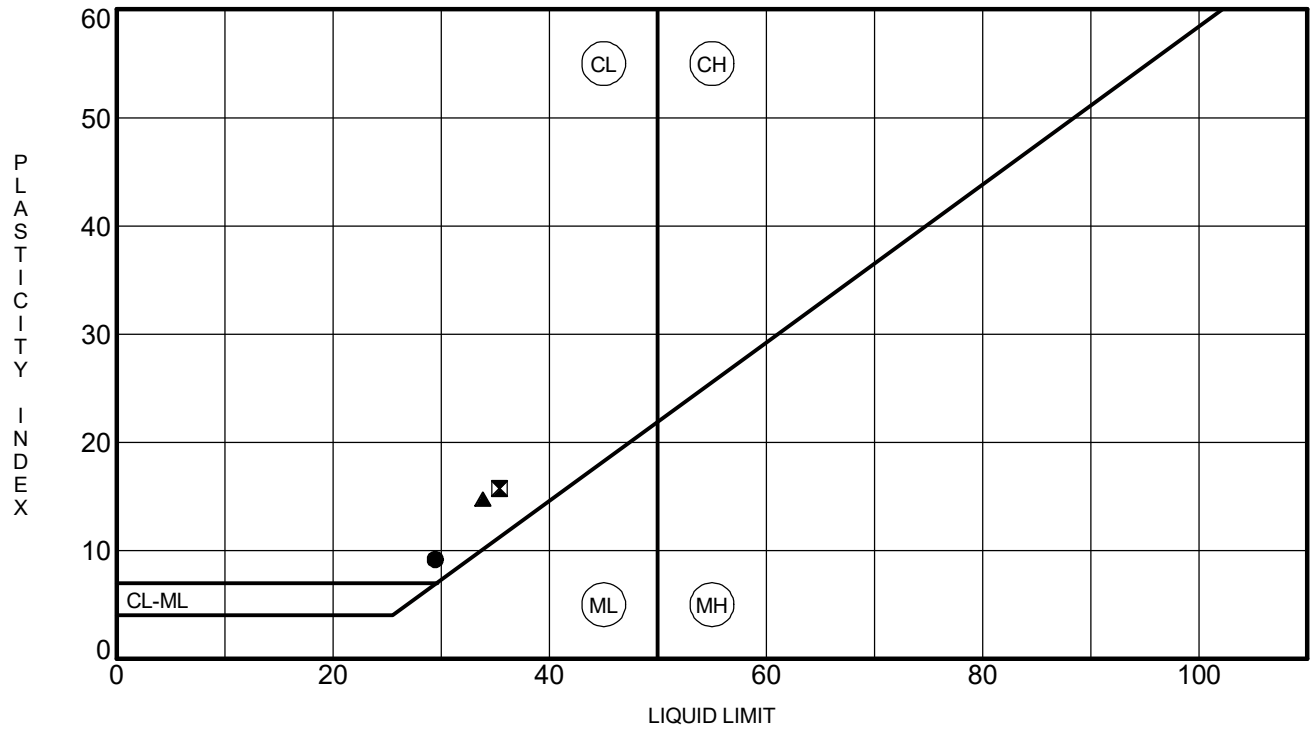
Rancho Cordova, CA 95742
Telephone: 916-852-9118

Summary of Laboratory Results

Project: Willow Creek CSD
Location: Willow Creek, California
Number: S2904-05-01
Figure: B1



	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index	% Pass #200 Sieve	Unified Soil Classification Description	Preparation Method
●	**B3-11**	**29**	**20**	**9**		**SANDY LEAN CLAY (CL)**	**dry**
⊠	**B3-Bulk**	**35**	**20**	**15**		**SANDY LEAN CLAY (CL)**	**dry**
▲	**TP6-Bulk**	**34**	**19**	**15**	**47.2**	**CLAYEY SAND(SC)**	**dry**

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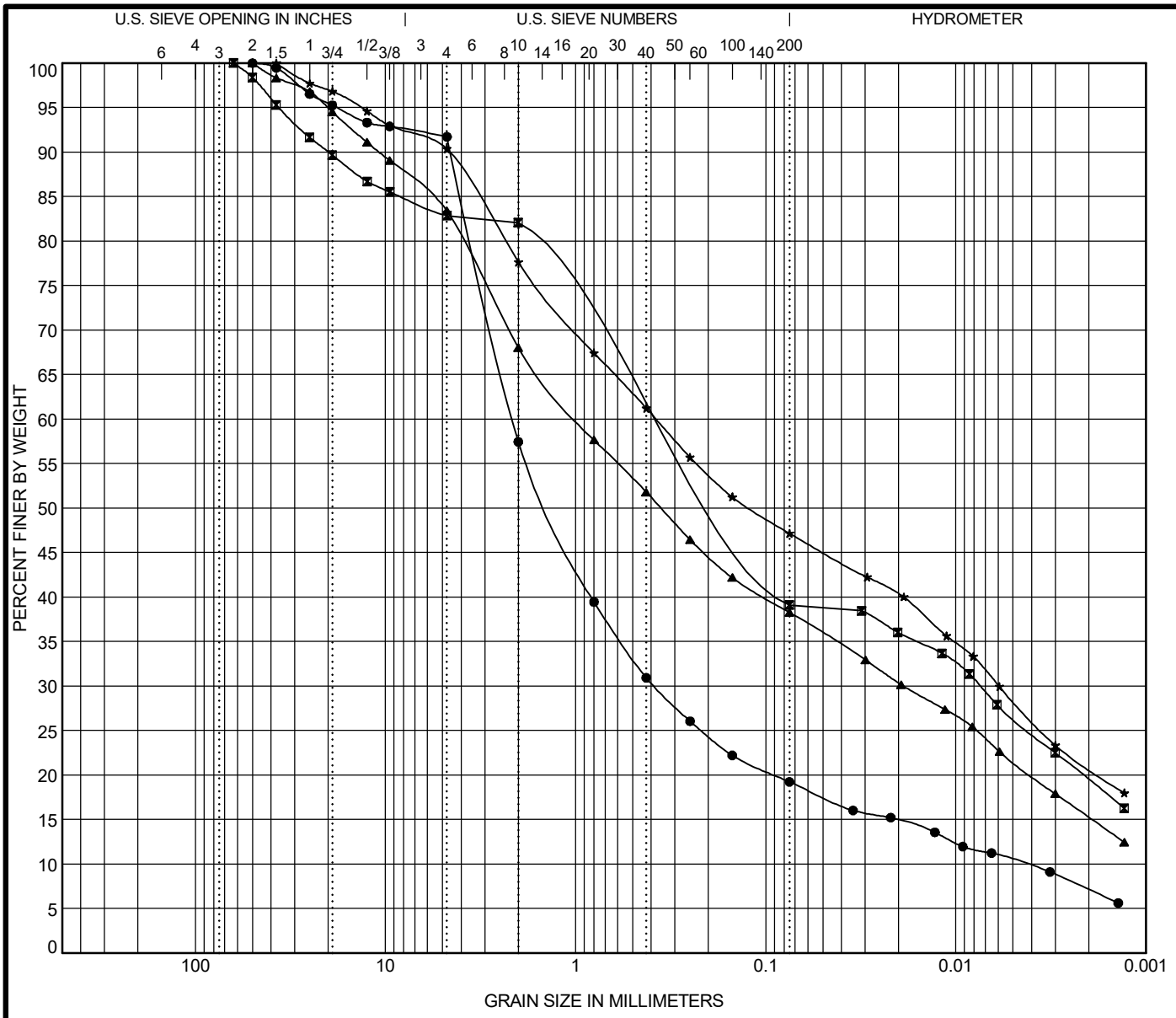
ATTERBERG LIMITS (ASTM D4318)

Project: Willow Creek CSD
Location: Willow Creek, California
Number: S2904-05-01
Figure: B2 Date:



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample No.	Classification	LL	PL	PI	Cc	Cu
●	**TP1-Bulk**	**SILTY SAND (SM)**				**16.03**	**495.1**
⊠	**TP2-Bulk**	**SILTY CLAYEY SAND WITH GRAVEL (SC-SM)**					
▲	**TP4-Bulk**	**SILTY CLAYEY SAND WITH GRAVEL (SC-SM)**					
★	**TP6-Bulk**	**CLAYEY SAND(SC)**	**34**	**19**	**15**		

	Sample No.	D100	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP1-Bulk**	**50**	**1.369**	**0.384**	**0.004**	**8.3**	**72.5**	**12.1**	**7.1**
⊠	**TP2-Bulk**	**63**	**0.172**	**0.007**		**17.1**	**43.8**	**19.6**	**19.5**
▲	**TP4-Bulk**	**50**	**0.355**	**0.019**		**16.6**	**45.1**	**23.0**	**15.3**
★	**TP6-Bulk**	**37.5**	**0.121**	**0.006**		**9.6**	**43.2**	**26.4**	**20.7**

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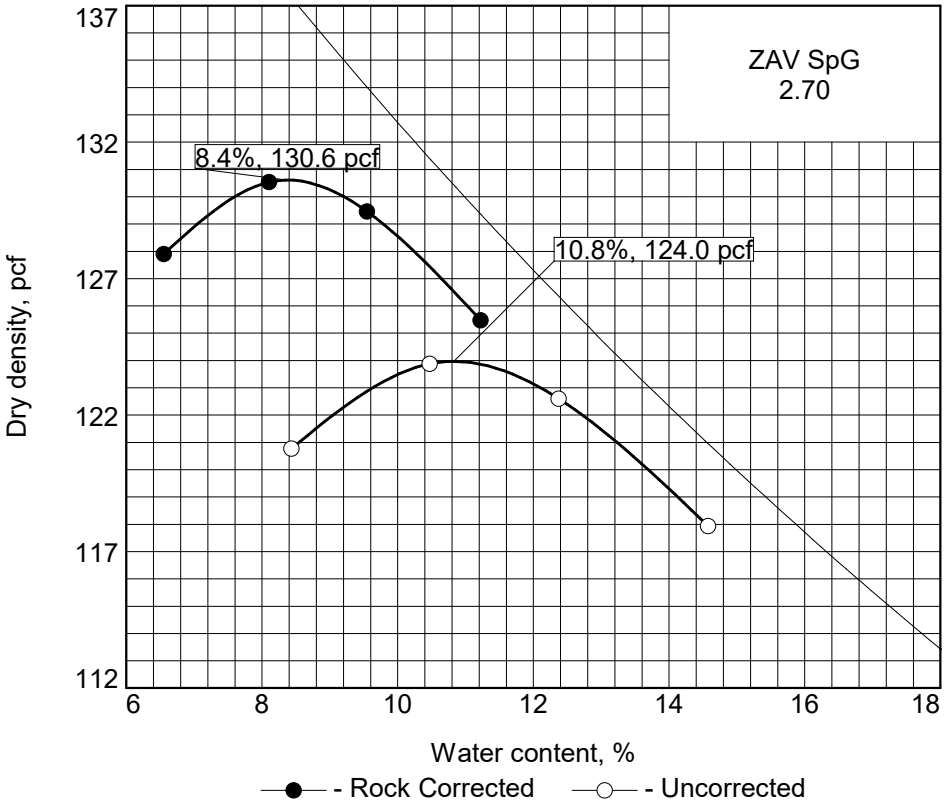
GRAIN SIZE DISTRIBUTION (ASTM D422, D6913)

Project: Willow Creek CSD
Location: Willow Creek, California
Number: S2904-05-01
Figure: B3

COMPACTION TEST REPORT



Curve No.
TP3 Bulk

Test Specification:
ASTM 1557 Method A 2024 Mold PM9
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Preparation Method
Hammer Wt. 10
Hammer Drop 18
Number of Layers 5
Blows per Layer 25
Mold Size 0.0333 cu. ft.

Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (ASTM D 854) 2.7
%>#4 24.0 **%<No.200**
USCS **AASHTO**
Date Sampled
Date Tested 11/21/24
Tested By RS

TESTING DATA

	1	2	3	4	5	6
WM + WS	4105.0	4119.0	4016.0	4079.0		
WM	2038.0	2038.0	2038.0	2038.0		
WW + T #1	2522.0	2539.0	2422.0	2495.0		
WD + T #1	2326.5	2310.1	2269.3	2236.0		
TARE #1	459.0	460.0	458.0	459.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	8.1	9.5	6.6	11.2		
DRY DENSITY	130.5	129.5	127.9	125.5		

ROCK CORRECTED TEST RESULTS	UNCORRECTED
Maximum dry density = 130.6 pcf	124.0 pcf
Optimum moisture = 8.4 %	10.8 %

Material Description
Brown sandy lean clay

Remarks:

Project No. S2904-05-01 **Client:**
Project: Willow Creek CSD Tank

○ **Sample Number:** TP3 Bulk

Checked by: AD
Title: LC

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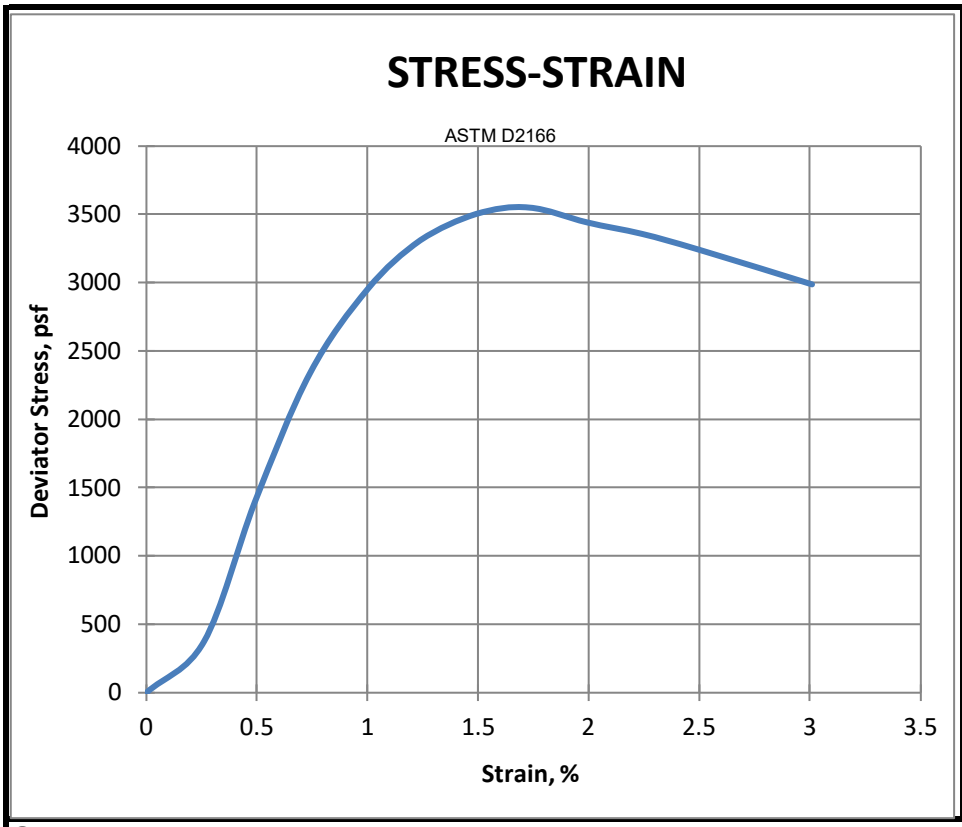
Figure B4



Failure Photo

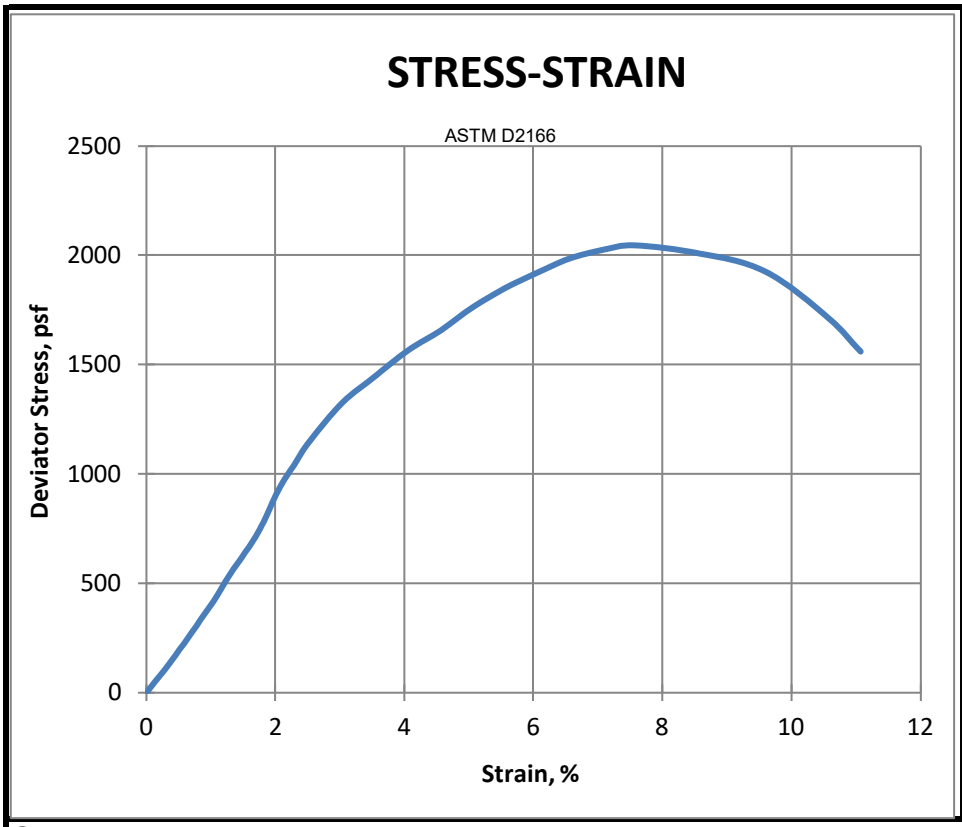
No Photo, fell apart after test, material similar looking to B3-11

Sample Description	
Sample ID	B3-4
Sample Depth (feet)	4.00
Material Description	Strong Brown and Gray Lean CLAY with Gravel
Initial Conditions at Start of Test	
Height (inch) average of 3	4.92
Diameter (inch) average of 3	2.41
Moisture Content (%)	12.6
Dry Density (pcf)	110.7
Estimated Specific Gravity	2.7
Saturation (%)	65.4
Shear Test Conditions	
Strain Rate (%/min)	0.9949
Major Principal Stress at Failure (psf)	3550
Strain at Failure (%)	1.7
Test Results	
Unconfined Compressive Strength (tons/ft^2)	1.8
Unconfined Compressive Strength (lbs/ft^2)	3553
Unconfined Compressive Strength (psi)	25
Shear Strength (tons/ft^2)	0.9
Shear Strength (lbs/ft^2)	1777

GEOCON CONSULTANTS, INC.
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742
Telephone: (916) 852-9118
Fax: (916) 852-9132

Unconfined Compressive Strength (ASTM D2166)

Project: Willow Creek CSD
Location: Willow Creek, CA
Number: S2904-05-01
Figure: B5



Failure Photo

Sample Description	
Sample ID	B3-11
Sample Depth (feet)	11.00
Material Description	Strong Brown and Gray Lean CLAY with Gravel
Initial Conditions at Start of Test	
Height (inch) average of 3	4.91
Diameter (inch) average of 3	2.34
Moisture Content (%)	13.1
Dry Density (pcf)	114.1
Estimated Specific Gravity	2.7
Saturation (%)	74.3
Shear Test Conditions	
Strain Rate (%/min)	1.0008
Major Principal Stress at Failure (psf)	2050
Strain at Failure (%)	7.6
Test Results	
Unconfined Compressive Strength (tons/ft^2)	1.0
Unconfined Compressive Strength (lbs/ft^2)	2046
Unconfined Compressive Strength (psi)	14
Shear Strength (tons/ft^2)	0.5
Shear Strength (lbs/ft^2)	1023

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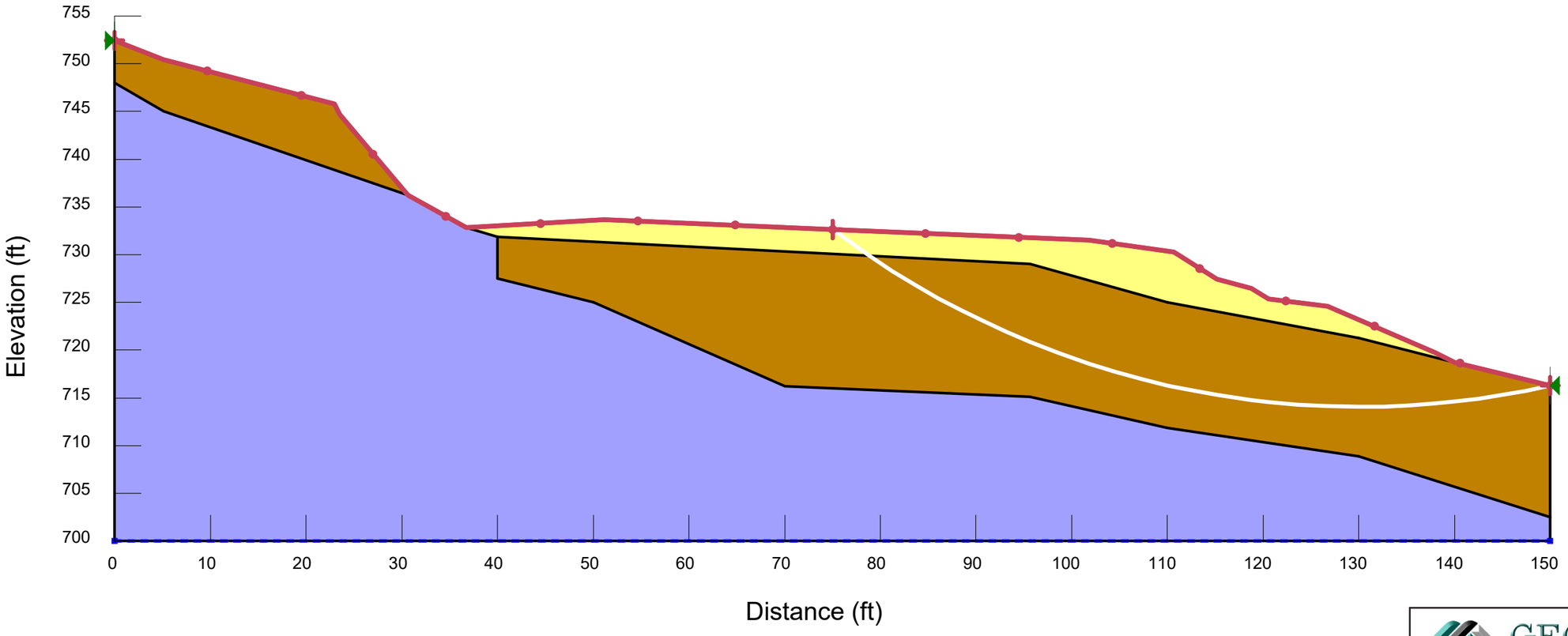
Unconfined Compressive Strength (ASTM D2166)

Project: Willow Creek CSD
Location: Willow Creek, CA
Number: S2904-05-01
Figure: B6

APPENDIX C

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	125	50	35
	Galice Formation	Mohr-Coulomb	130	2,000	35
	Residual Soil	Mohr-Coulomb	120	1,000	30

7.3



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Willow Creek Community Services District Water Tank

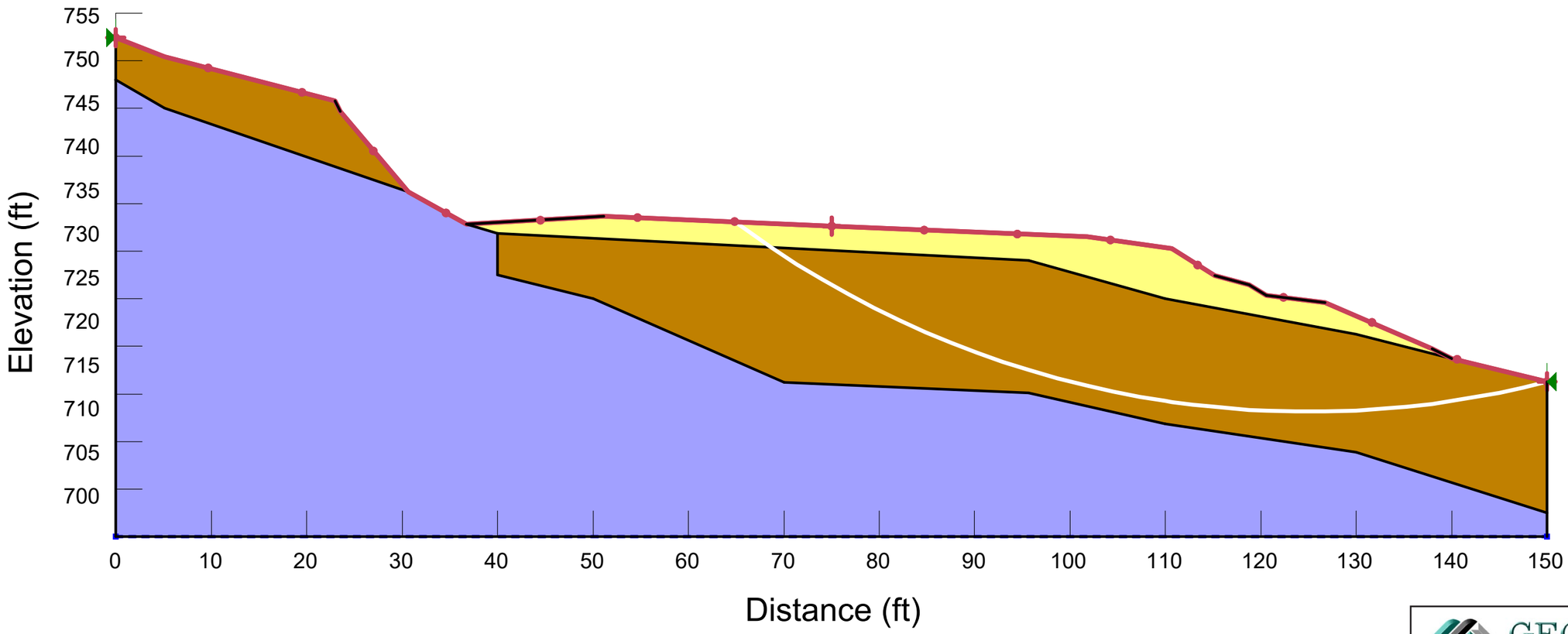
Willow Creek,
California

SLOPE STABILITY ANALYSIS (STATIC)

S2904-05-01	May 2025	Figure C1

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	125	50	35
	Galice	Mohr-Coulomb	130	2,000	35
	Residual Soil	Mohr-Coulomb	120	1,000	30

2.2



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Willow Creek Community Services District Water Tank

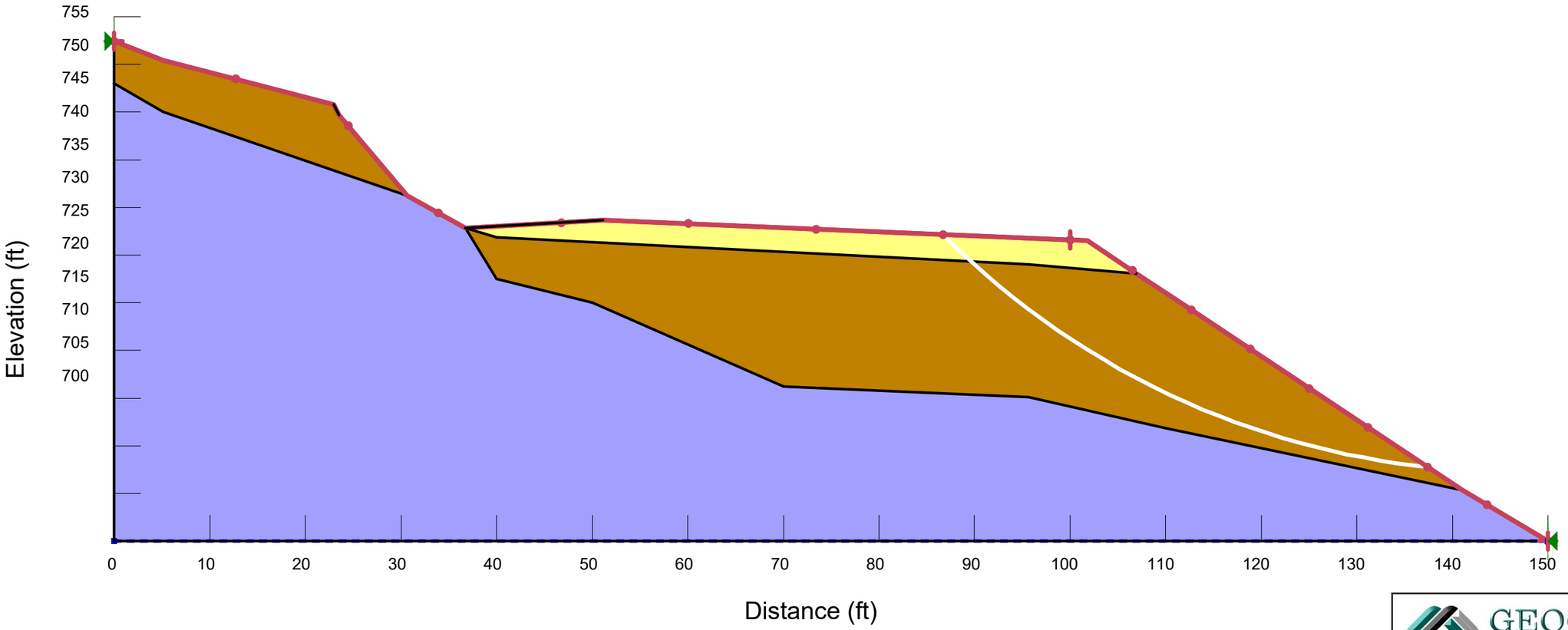
Willow Creek,
California

SLOPE STABILITY ANALYSIS (SEISMIC)

S2904-05-01	May 2025	Figure C2

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	125	50	35
	Galice Formation	Mohr-Coulomb	130	2,000	35
	Residual Soil	Mohr-Coulomb	120	1,000	30

4.1



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Willow Creek Community Services District Water Tank

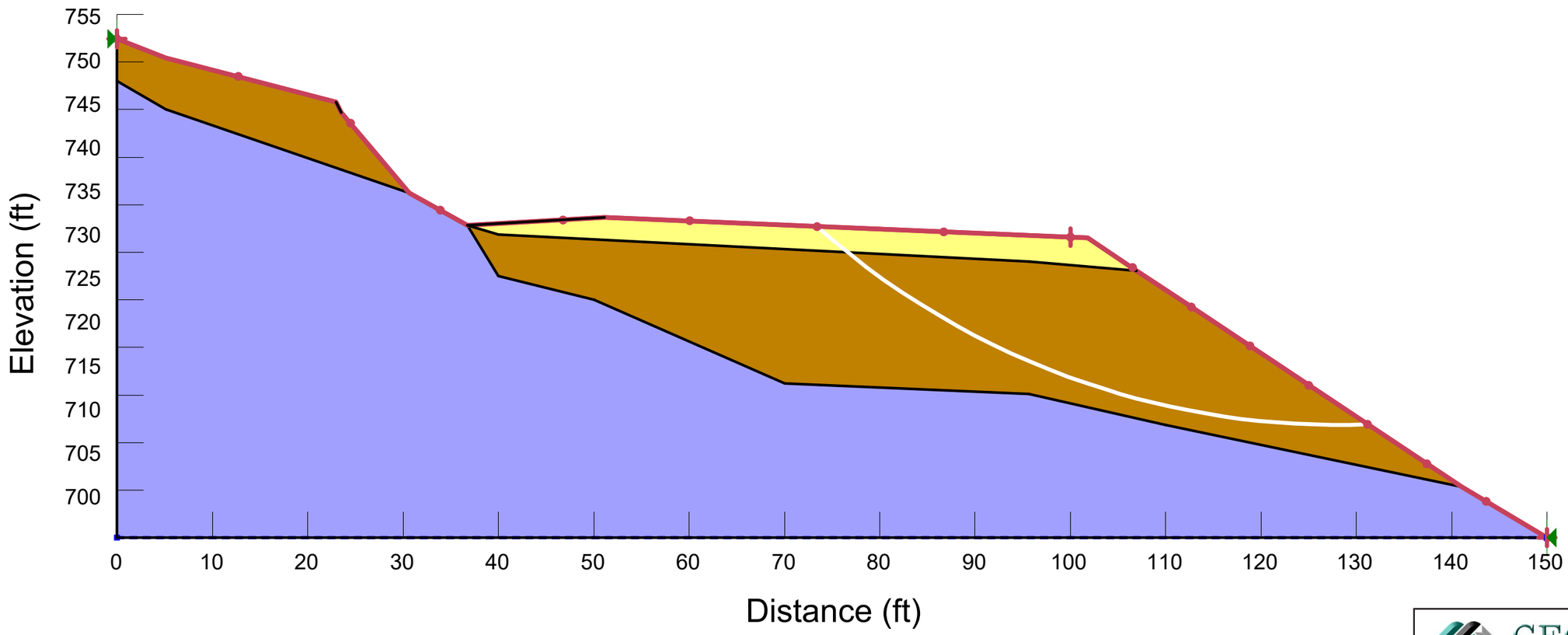
Willow Creek,
California

SLOPE STABILITY ANALYSIS 1.5:1 (STATIC)

S2904-05-01	May 2025	Figure C3

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	125	50	35
	Galice Formation	Mohr-Coulomb	130	2,000	35
	Residual Soil	Mohr-Coulomb	120	1,000	30

1.9



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Willow Creek Community Services District Water Tank

Willow Creek,
California

SLOPE STABILITY ANALYSIS 1.5:1 (SEISMIC)

S2904-05-01	May 2025	Figure C4

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Questions / Answers
Willow Creek Community Service District – Brannan Mountain Tank Project

Q) There are conflicting Bid Bond percentages in the specs. Please clarify if it is 5% or 10%.
A) 5%

Q) Can you share the Engineers Estimate?
A) Base Bid $2.4M, Alternate Bid $1.9M

Q) What permits will the contractor be required to secure?
A) None, but the contractor may need to be listed on the permits that are being obtained by the Owner. The owner is securing a Humboldt County Planning Permit and Encroachment Permit. Contractor to confirm with Owner that all permits have been obtained prior to beginning construction.

Q) Can you confirm 180 calendar or working days to complete the project?
A) 180 calendar days

Q) Is funding in place and what is the expected timeframe for payments?
A) Funding is secured for this project and has a defined maximum budget. Current drawdowns are taking 60 days, but this can sometimes increase to 90 days.

Q) Will the project be required to comply with DBE?
A) The funding agreement states:

"The recipient shall comply with the Disadvantaged Business Enterprises (DBE) requirements in 40 CFR SS 33.301 for the Project and require its contractors and subcontractors on the Project to comply. 40 CFR SS 33.301 requires the use of good faith efforts to utilize DBE's whenever procuring construction, equipment, services, and supplies."

Q) An abandoned vehicle and an abandoned tent trailer were observed at the site walk. Will these need to be removed by the contractor?
A) Yes, the contractor shall remove and dispose of these vehicles in accordance with applicable laws.

Q) The water main tie in location is shown on drawing sheet C 8.0. What is the existing water main size and what is the material type?
A) We believe the existing water main to be 8" PVC C900.

Q) The connection to the existing water main tie is shown on drawing sheet C 8.0. Please provide a connection detail?
A) We will work with the contractor to make an appropriate tie in once the contractor exposes the existing waterline. Most likely, it will be a straight extension from where the existing line ends.

Q) Can we use DI fittings with gaskets or butt fusion for HDPE fittings and joining pipe?
A) HDPE fittings and joints can be either butt fusion welded (preferred) or mechanical joint with restraints (DI fittings).

Q) Do we need to use pipe restraints for HDPE?
A) Joint restraining devices for mechanical joints shall be EBBA Megalug 1100, or Star Pipe Products' Stargrip 3000 for ductile iron pipe; and EBAA Megalug 2000PV, or Star Pipe Products' Stargrip for HDPE pipe; or approved equal. Only ductile iron pipe shall be used when restraining push-on joints. Push-on restraints shall be US Pipe Field Lok Gaskets, or US Pipe TR FLEX Pipe, or approved equal. Outside-the-bell restraining devices and restrained pvc push-on joints will not be allowed. The pipe length from the restrained fitting or valve shall be a minimum of 18-feet, unless otherwise specified.

Q) Is the new HDPE pipe IPS size or DIPS?
A) HDPE to be Ductile Iron Pipe Size (DIPS)

Q) Is PVC C900 acceptable as an alternate to HDPE (Susan said yes)
A) Yes, PVC C900 will be accepted under valued engineering/ substitutions.

Q) Is there any existing AC pipe within the project area?
A) No, AC pipe is not believed to exist within the project area.

Q) The tank specification (Section 221200) references both AWWA D100 (welded steel) and AWWA D103 (bolted steel) standards. The bid form says to provide a welded steel tank. Please confirm if you want a welded steel tank or a bolted steel tank.
A) The contractor shall bid a Welded Steel Water Tank per the Bid Schedule.

Q) Are tank alternates allowed?
A) Tank alternates will be considered under value engineering / substitutions, but is not guaranteed to be approved.

Q) Can the higher allowable stress design of AWWA D100-21 Section 14 be used?
A) Yes, provided all design criteria are met from this section.

Q) The specification says the steel floor system shall be at a minimum the same thickness as the thickest wall panel. This is highly unusual for a welded tank. Should the floor be the minimum thickness required by AWWA D100-21 (1/4" thick)?
A) The floor thickness shall be per the tank manufacturer design and a minimum of ¼" thick per AWWA D100-21.

Q) The drawings indicate a water depth of 27' with an additional 5' to the eave of the roof. The calculated sloshing wave is over 10' meaning the wave will impede the roof. Can the shell height be increased to accommodate freeboard requirements of D100-21? Should the roof be designed to capture the sloshing wave?
A) 5' to the eave is a minim clearance value. The height can be increased to accommodate sloshing. Alternatively, the tank manufacturer may design baffles to reduce sloshing or the roof to capture the sloshing wave.

Q) The drawings indicate the concrete ring footing is to be designed by the tank manufacturer and the bottom of the footing is to be stepped as required. Are there minimum depth requirements and what are the stepping requirements?

A) No minimum. The Tank Manufacturer will decide the footing dimensions. Stepping is not required, and is only when necessary.

Q) The drawings indicate 1.5-feet beyond the tank shell to the outside of the tank ring footing. The specifications call for an allowable soil bearing capacity of 2000-psf. The weight of the water in the tank is about 1700-psf. Under seismic loading, there doesn't appear to be enough soil capacity to maintain the 1.5-feet outside the tank shell. Can the footing projection be increased? Can the soil capacity be re-evaluated and increased?

A) The footing projection can be increased inward as much as needed. The outwork projection should be minimized as much as possible to maintain clearance around the tank. The soil capacity will not be re-evaluated or increased.

Q) The 4' square center column footing will be too small to meet the allowable soil bearing capacity with the large loads being applied to the column. Can the center column footing width be increased as needed?

A) Yes, the center column should be increased as needed to meet the design of the manufacturer. The foundation depicted is for representation only.

Q) On drawing sheet C 9.0 the existing Willow Towers Water Storage Tank is shown. Is there any work required at that tank ? Demo ? Please provide direction.

A) No work is anticipated for Willow Towers. This information is being provided so that the Brannan Mountain Tank Project can be integrated with the existing Willow Towers. This project is effectively an expansion of the Willow Towers, but located across town.

Q) Please provide finish grade elevations around the ring wall foundation. Our concern is that the ringwall; per section A-A on sheet C 5.0 on the North side is both deeper and taller than the South. This will create additional form work for ringwall placement.

A) The footing shall be deepened only as necessary to maintain the minimum depth required by the tank manufacturer. It is feasible to construct the foundation without stepping the footing. Steps are a tool that can be used to minimize concrete, but often increase labor and forming costs. The grade around the tank shall be graded to promote positive drainage away from the tank footing. We will field adjust accordingly.

Q) What are the dimensions of the 409,000-gallon tank for the alternate bid items?

A) Approximately 51' Diameter. The designed footing elevation and water level will remain the same with both tank options. This is because the Brannan Mountain Tank is being integrated with the Existing Willow Tower Tank.

Q) If the alternate tank is awarded, all inlet, outlet and overflow piping will remain the same as per drawings/design. Please confirm?

A) Yes, the piping size will remain the same.

Q) Do you mind if a door sheet gets cut into the tank for lifts? This will make the process more efficient for coating and welding.
A) The installation of a door sheet would be acceptable, but is not required by the owner.

Q) Sheet C6.0 shows the tank overflow and drain profile. Can 3"- 6" crushed rock be used for the RSP in lieu of the 3"- 8" cobble shown on the plans?
A) Yes, Crushed rock may be substituted for cobble rock in this application.

Q) Details on sheet D 4.0 call out different depths for concrete post depending on fence height. The fence height is not given on sheet D 4.0 and on other plan sheets. What is the height of the fence?
A) 6' tall fence.

Q) Details on sheet D 4.0 require the depth of fence post in concrete for fence fabric 5'-0" and over to be 3'-0" If the fence is 6'-0" or 8'-0" in height the fence post in concrete is to be 3'-0" The fence is to be placed in the MSE wall as per section A-A on sheet C 5.0 of the drawings? The MSE baskets are 3'-0" tall and deep (3' x 3'). A 3'-0" fence post in the MSE gabion baskets will not work. Please provide direction.
A) Field adjustments will be made to devise an agreeable solution.

Q) Is the geo report available?
A) The draft version can be found at this address:
https://www.willowcreekcsd.com/advertisement-for-bids-brannan-mt-water-tank/
The approved report will be provided as soon as it is available.

Q) On sheet C 10.0 straw mulch note 1 requires native grass straw to be used. This will not be available. Please consider an alternate?
A) Straw shall be certified weed free. Seed shall be a native seed blend mix.

Q) Detail 1 on sheet C 6.0 the note calls out seed and straw slopes. On drawing sheet C 5.0 the placement of the MSE is shown. Will seed and straw be required on the slope above the MSE wall. Please confirm?
A) Only disturbed soil requires seed and straw.

Q) Sheet C7.0 has a MSE wall system shown. Can a Hilfiker Wiretruss system be used in lieu of the gabion wall?
A) Yes, A Wiretruss wall will be considered under valued engineering / substitution.

Q) Is the site balanced? if not, is there a designated spoils disposal site.
A) The site soils are not balanced. The contractor will need to secure a disposal site for excess generated soils.

Q) Drawing sheet C 5.0 shows the over grading sections, stepped excavations and engineered fill. Section 312300-2.2 A of the specification is the gradation for engineered fill. Is this the material gradation requirement for engineered fill as shown on sheet C 5.0. The import

material for engineered fill is as given on sheet 312300-3? In conclusion, no native material can be used for engineered fill. Please confirm?

A) We anticipate using the competent native material as fill material. Non-competent material will be placed in non-engineered fill areas or removed from the site.

Q) Drawing sheet C 8.0 shows the waterline plan and profile. The waterline crosses the paved section of the access road. The note states, " replace (E) paving as required after waterline installation. See trench details on Sheet D 2.0. Consider adding a bid item to replace all the pavement there. The contractor will likely have to pay start up fees at the asphalt plant for the 4 tons of hot mix asphalt. The area to be replaced is 720 S.F. 13 tons @ 3" thick. Please consider?

A) The price to replace asphalt due to trenching activities shall be incidental to the price for waterline trenching.

Q) On drawing sheet C 6.0 the access road clearance details are shown. There the access road details as per county standards. Will modifications to the existing gate be required?

A) We do not anticipate any changes to the existing gate. If the gate needs to be removed for deliveries, then the contractor shall replace it upon completion.

Q) Can trees along the access road be trimmed and one tree removed to accommodate concrete truck access? Please clarify.

A) Yes, the contractor is expected to trim trees and create the necessary clearances for receiving deliveries. A minimum vegetation clearing detail can be found on sheet C 6.0.

Q) Some trees will need to be removed. Is there a disposal site for the generated debris?

A) The WCCSD will accept logs suitable for firewood to be delivered to the WCCSD Office. All slash and brush must be hauled to an approved disposal site.

Q) Bid item 34000-02 is 12" CMP culvert pipe. The pay quantity is 50 L.F. however; the scaled quantity is 122 L.F. Please confirm?

A) Bid item will be paid by the actual linear feet installed and not by the quantity listed in the schedule. Drawing shows two possible locations for the drain. One is 50-feet the other is 122-feet. The actual location of the drain will be field located as agreed upon by the project manager and contractor.

Q) Is the Owner going to provide QA/QC?

A) Yes, the WCCSD and its project manager will conduct frequent inspections and conduct testing as necessary. Contractor to coordinate the inspections and testing.

Q) Can the owner provide disinfection testing?

A) Yes, the WCCSD can provide the first disinfection test. If the test fails disinfection, it is the contractor's responsibility to re-disinfect and re-test at their expense and no additional cost to the project.

Q) I see mention of nesting bird surveys can you elaborate?

A) Nesting bird surveys may be required depending on time of year. If surveys are required, the contractor shall coordinate with the owner or owner's representative to schedule nesting bird surveys. The cost for the first bird survey will be paid for by the owner. The cost for re-surveys, if needed, shall be paid for by the contractor at no additional cost to the project. Below is the language from the publicly available environmental document:

"A pre-construction survey for special-status species should be performed by a qualified biologist. If any listed species or special-status species are detected, construction should be delayed, and the appropriate wildlife agency (CDFW and/or USFWS) should be consulted and project impacts and mitigation reassessed. If construction activities would occur during the nesting season (usually March to September), a pre-construction survey for the presence of special-status bird species or any nesting bird species should be conducted by a qualified biologist within 500 feet of proposed construction areas. If active nests are identified in these areas, CDFW and/or USFWS should be consulted to develop measures to avoid "take" of active nests prior to the initiation of any construction activities. Avoidance measures may include establishment of a buffer zone using construction fencing or the postponement of vegetation removal until after the nesting season, or until after a qualified biologist has determined the young have fledged and are independent of the nest site."

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Willow Creek Community Services District
135 Willow Way
Willow Creek, CA 95573
530.629.2136

PREBID CONFERENCE
BRANNAN MTN. WATER TANK PROJECT
SIGN-IN SHEET

5/14/2025
10:00 AM PST

POINT OF CONTACT COMPANY	ADDRESS	TELEPHONE EMAIL
Frank Masten Trinity Valley Consulting Engineers	67 Walnut Way Willow Creek, CA 95573	530.629.3000 frank@tvce.biz
Stewart Engineering Roger Ellicock	PO Box 990010 Redding CA 96099	RELLICOCK@SBCGLOBAL.NET
Loren Turner	5211 Boyd Rd Arcata Ca.	707 825-6566
Peter Lackey McCullough Construction	57 Aldergrove RD Arcata CA	530-440-8750 Peter@mccullyconstructioninc.com
Rylee Brown Damon Brown R Brown Construction	18 China Creek RD Willow Creek	530-629-3702 rbrown@rbrownconstruction.net
Todd Wright Brian Redding Whitson	3167 Hwy 96 Willow Creek, CA	530.629.2324 whitson@clearcloud.net
MARK O'BRIEN	1050 LINDA WAY SPARKS, NV	775-219-6340 Mobrien@resourcedevelopmentco.com
MIKE WIEBELHAUS ALLEN GILL CONST.	22099 PALO WAY PALO CEDRO, CA. 96073	530 604-5951 mikew@allengillconstruction.com
Ken Wahlund Wahlund Construction	P.O Box 6496 Eureka Ca. 95502	(707) 499-4131 Ryan Wahlund ryan@wahlcon.com

PRE-BID CONFERENCE MEETING MINUTES

Project No.: 209.19
Project Name: WCCSD – Brannan Mtn. Water Tank Project
Date/Time: Wednesday, May 14, 2016 @ 10:00 am PST
Location: 135 Willow Road, Willow Creek, CA 95573

A. Introductions/Sign-in Sheet

B. Engineer's Estimate

Base Bid: $2.4M
Alternate Bid: $1.9M

C. Project Description and Scope of Work

1. Section 004100: Bid Schedule
2. Section 011000: Summary of Work
3. Site Grading, Utilities, Water Treatment

D. Work and Services by others

1. Must provide list of Subcontractors and Major Suppliers Under Section 004336

E. Bid Addendum

1. Questions will be accepted until Friday, May 16th, 2025 @ 10:00 am (PST).
2. Addenda will be issued Friday, May 16th, 2025 @ 4:00 pm (PST).

F. Bid Opening

1. Friday, May 23rd, 2025 @ 2:00 pm PST at WCCSD Office
2. Electronic submittals to susan@willowcreekcsd.com

G. Completion Time

1. 180 Working Days
2. Start/Finish Dates to be established under the Notice to Proceed
3. Construction Schedule Section 013200
4. Liquidated Damages: 2,500.00 per day

H. Obtaining Plans and Specifications

1. Humboldt Exchange
2. Send request to tvce@tvce.biz
3. Hardcopies at cost of production

I. Complete Bid

1. 004000 Bid Form
2. 004100 Bid Schedule
3. 004300 Bid Security
4. 004336 Subcontractor Schedule
5. 004500 Bidder's Qualifications
6. 004519 Non-Collusive Affidavit
7. 009100 Addenda Acknowledgement

J. Bid Security

1. No less than 5% of total Bid

2. Acceptable Forms: Certified Check, Bank Draft, US Government Bond, Bid Bond

K. Scheduling

1. Construction
    a) Tentative Construction Schedule
        a. Initial & update with each Invoice
    b) Initial Mobilization to site

L. General Safety Requirements

1. Personnel Protective Equipment (PPE)
2. Safety Plan (Company)
3. Daily Safe Plan of Action Reports (reserved)
4. Weekly Tool Box Meeting (recommended)

M. Special Considerations

1. Water system is currently in use and must remain so during construction
2. Residential Zone, proximity to existing homes
3. Tracking material from site onto existing paved roads
4. Alternate Contractor Use and Occupancy of Site
5. Coordination with the Willow Creek Community Services District

N. Staging, Access, Parking, Use of facilities

1. Material placement in designated zones,
2. Parking in designated areas,
3. Equipment placement when not in use,

O. Clean up, Protection of Site, and Environmental Considerations

1. Temporary Protection, Barricades, Gates, Staging areas
2. Ingress / Egress to site and building
3. Air Quality (Odor, Noise, Dust Control)

P. Insurance

1. 007200 Special Provisions, Section 36
2. General Liability, Worker's Comp., Automobile

Q. Prevailing Wage

1. Section 002100
2. The highest of federal or state wage shall apply.

R. Questions / Site Tour

1. See attached questions and answers