City of Sebastopol
Planning Department
7120 Bodega Avenue
Sebastopol, CA 95472
(707) 823-6167

MASTER PLANNING APPLICATION FORM

APPLICATION TYPE

☐ Administrative Permit Review	☐ Lot Line Adjustment/Merger	☐ Temporary Use Permit
☐ Alcohol Use Permit/ABC Transfer	☐ Preapplication Conference	☒ Tree Removal Permit
☐ Conditional Use Permit	☐ Preliminary Review	☐ Variance
☒ Design Review	☐ Sign Permit	☒ Other Tentative Map, SB 330, Density Bonus

This application includes the checklist(s) or supplement form(s) for the type of permit requested: ☒ Yes ☐ No

REVIEW/HEARING BODIES

☒ Staff/Admin ☒ Design Review/Tree Board ☒ Planning Commission ☒ City Council ☐ Other_____

APPLICATION FOR

Street Address: 8100 Valentine Ave, Sebastopol
Assessor's Parcel No(s): 004-510-054
Present Use of Property: Existing Religious Building
Zoning/General Plan Designation: R4 / MDR

APPLICANT INFORMATION

Property Owner Name: Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter Day Saints c/o Kim Black
Mailing Address: 50 E North Temple Stree Floor 12
Phone: ~~801-240-2159~~ 801.353.4642
City/State/ZIP: Salt Lake City, Utah 84150-0022
Email: ~~jeffrey.wayment@churchofjesuschrist.com~~ baranka@churchofjesuschrist.org
Signature: Kim Black
Date: 12/20/25

Authorized Agent/Applicant Name: Grupe Investment Company, Inc. - Rob Toste
Mailing Address: 3255 West March Ln, Suite 400
Phone: 209-473-6010
City/State/ZIP: Stockton, CA 95219
Email: rtoste@grupe.com
Signature:
Date: 12-18-25

Contact Name *(If different from above):*
Phone/Email:

PROJECT DESCRIPTION AND PERMITS REQUESTED (ATTACH ADDITIONAL PAGES IF NECESSARY)

Proposal for a Vesting Tentative Map, Density Bonus, SB 330, Design Review and Tree Removal Permit on 2.96 acres to create 20 lots with 39 units for condominium purposes.

CITY USE ONLY

Fill out upon receipt:		Action:		Action Date:
Application Date:		Staff/Admin:		Date:
Planning File #:		Planning Director:		Date:
Received By:		Design Review/Tree Board:		Date:
Fee(s):	$	Planning Commission:		Date:
Completeness Date:		City Council:		Date:

SITE DATA TABLE

See Vesting Tentative Map and Architectural Plans for information requested below for all lots.

If an item is not applicable to your project, please indicate "Not Applicable" or "N/A" in the appropriate box; do not leave cells blank.

SITE DATA TABLE	REQUIRED / ZONING STANDARD	EXISTING	PROPOSED
Zoning	N/A	R4	R4
Use	N/A	MDR	MDR
Lot Size		2.96	
Square Feet of Building/Structures *(if multiple structures include all separately)*			
Floor Area Ratio (F.A.R)	____.____FAR	____.____FAR	____.____FAR
Lot Coverage	20 % of lot _____sq. ft.	_____% of lot _____sq. ft.	_____% of lot _____sq. ft.
Parking			
Building Height	30 ft		
Number of Stories	2		
Building Setbacks – Primary			
Front	20 ft		
Secondary Front Yard (corner lots)	10 ft		
Side – Interior 5 ft	5 ft		
Rear	20 ft		
Building Setbacks – Accessory			
Front	20 ft		
Secondary Front Yard (corner lots)	10 ft		
Side – Interior	5 ft		
Rear	3 ft		
Special Setbacks *(if applicable)*			
Other (_____)			
Number of Residential Units	_____Dwelling Unit(s)	_____Dwelling Unit(s)	_____Dwelling Unit(s)
Residential Density	1 unit per_____ sq. ft.	1 unit per_____ sq. ft.	1 unit per_____ sq. ft.
Useable Open Space	_____sq. ft.	_____sq. ft.	_____sq. ft.
Grading	Grading should be minimized to the extent feasible to reflect existing topography and protect significant site features, including trees.	N/A	Total: _____ cu. yds Cut: _____ cu. yds. Fill: _____ cu. yds. Off-Haul: _____cu. yds
Impervious Surface Area	N/A	_____% of lot _____sq. ft.	_____% of lot _____sq. ft.
Pervious Surface Area	N/A	_____% of lot _____sq. ft.	_____% of lot _____sq. ft.

CONDITIONS OF APPLICATION

1. All Materials submitted in conjunction with this form shall be considered a part of this application.
2. This application will not be considered filed and processing may not be initiated until the Planning Department determines that the submittal is complete with all necessary information and is "accepted as complete." The City will notify the applicant of all application deficiencies no later than 30 days following application submittal.
3. The property owner authorizes the listed authorized agent(s)/contact(s) to appear before the City Council, Planning Commission, Design Review/Tree Board and Planning Director and to file applications, plans, and other information on the owner's behalf.
4. The Owner shall inform the Planning Department in writing of any changes.
5. **INDEMNIFICATION AGREEMENT:** As part of this application, applicant agrees to defend, indemnify, release and hold harmless the City, its agents, officers, attorneys, employees, boards, committees and commissions from any claim, action or proceeding brought against any of the foregoing individuals or entities, the purpose of which is to attack, set aside, void or annul the approval of this application or the adoption of the environmental document which accompanies it or otherwise arises out of or in connection with the City's action on this application. This indemnification shall include, but not be limited to, damages, costs, expenses, attorney fees or expert witness fees that may be asserted by any person or entity, including the applicant, arising out of or in connection with the City's action on this application, whether or not there is concurrent passive or active negligence on the part of the City.

   If, for any reason, any portion of this indemnification agreement is held to be void or unenforceable by a court of competent jurisdiction, the remainder of the agreement shall remain in full force and effect.

   NOTE: The purpose of the indemnification agreement is to allow the City to be held harmless in terms of potential legal costs and liabilities in conjunction with permit processing and approval.
6. **REPRODUCTION AND CIRCULATION OF PLANS:** I hereby authorize the Planning Department to reproduce plans and exhibits as necessary for the processing of this application. I understand that this may include circulating copies of the reduced plans for public inspection. Multiple signatures are required when plans are prepared by multiple professionals.
7. **NOTICE OF MAILING:** Email addresses will be used for sending out staff reports and agendas to applicants, their representatives, property owners, and others to be notified.
8. **DEPOSIT ACCOUNT INFORMATION:** Rather than flat fees, some applications require a 'Deposit'. The initial deposit amount is based on typical processing costs. However, each application is different and will experience different costs. The City staff and City consultant time, in addition to other permit processing costs, (i.e., legal advertisements and copying costs are charged against the application deposit). If charges exceed the initial deposit, the applicant will receive billing from the City's Finance department. If at the end of the application process, charges are less than the deposit, the City Finance department will refund the remaining monies. Deposit accounts will be held open for up to 90 days after action or withdrawal for the City to complete any miscellaneous clean up items and to account for all project related costs.
9. **NOTICE OF ORDINANCE/PLAN MODIFICATIONS:** Pursuant to Government Code Section 65945(a), please indicate, by checking the boxes below, if you would like to receive a notice from the City of any proposal to adopt or amend any of the following plans or ordinances if the City determines that the proposal is reasonably related to your request for a development permit:

   ☐ A general plan ☐ A specific plan

   ☐ An ordinance affecting building permits or grading permits ☐ A zoning ordinance

Certification

I, the undersigned owner of the subject property, have read this application for a development permit and agree with all of the above and certify that the information, drawings and specifications herewith submitted are true and correct to the best of my knowledge and belief and are submitted under penalty of perjury. I hereby grant members of the Planning Commission, Design Review Board and City Staff admittance to the subject property as necessary for processing of the project application.

Property Owner's Signature: The Church of Jesus Christ of Latter-day Saints, a Utah Corporation sole. Kim Blake **Date:** 12/20/25

I, the undersigned applicant, have read this application for a development permit and agree with all of the above and certify that the information, drawings and specifications herewith submitted are true and correct to the best of my knowledge and belief and are submitted under penalty of perjury.

Applicant's Signature: [signature] **Date:** 12-18-25

NOTE: It is the responsibility of the applicant and their representatives to be aware of and abide by City laws and policies. City staff, Boards, Commissions, and the City Council will review applications as required by law; however, the applicant has responsibility for determining and following applicable regulations.

Neighbor Notification

In the interest of being a good neighbor, it is highly recommended that you contact those homes or businesses directly adjacent to, or within the area of your project. Please inform them of the proposed project, including construction activity and possible impacts such as noise, traffic interruptions, dust, larger structures, tree removals, etc.

Many projects in Sebastopol are remodel projects which when initiated bring concern to neighboring property owners, residents, and businesses. Construction activities can be disruptive, and additions or new buildings can affect privacy, sunlight, or landscaping. Some of these concerns can be alleviated by neighbor-to-neighbor contacts early in the design and construction process.

It is a "good neighbor policy" to inform your neighbors so that they understand your project. This will enable you to begin your construction with the understanding of your neighbors and will help promote good neighborhood relationships.

Many times, development projects can have an adverse effect on the tranquility of neighborhoods and tarnish relationships along the way. If you should have questions about who to contact or need property owner information in your immediate vicinity, please contact the Building and Safety Department for information at (707) 823-8597, or the Planning Department at (707) 823-6167.

I have informed site neighbors of my proposed project: ☐ Yes ☒ No

If yes, or if you will inform neighbors in the future, please describe outreach efforts:

Website Required for Major Projects

Applicants for major development projects (which involves proposed development of **10,000 square feet of new floor area or greater, or 15 or more dwelling units/lots),** are required to create a project website in conjunction with submittal of an application for Planning approval (including but not limited to Subdivisions, Use Permits, Rezoning, and Design Review). Required information may be provided on an existing applicant web site.

The website address shall be provided as part of the application. The website shall be maintained and updated, as needed until final discretionary approvals are obtained for the project.

Such website shall include, at a minimum, the following information:

- √ Project description
- √ Contact information for the applicant, including address, phone number, and email address
- √ Map showing project location
- √ Photographs of project site
- √ Project plans and drawings

FOR- SALE MISSING MIDDLE SINGLE FAMILY HOME DEVLOPMENT AT SEBASTOPOL

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Updated May 21th 2026

PROJECT OVERVIEW

Grupe Investment Company Inc. (Grupe) is pleased to submit this application regarding a site redevelopment opportunity located at 8100 Valentine Ave, in Sebastopol California.

Since 1966 Grupe, based in Stockton, California (www.Grupe.com), is one of Californias most prolific developers, having developed many master-planned communities across the entire United States. In addition, Grupe is also known to be a best-in-class home builder and apartment developer.

This project is envisioned as a 20-lot, 39-home single-family residential subdivision to be developed on the Church of Latter-day Saints property located at 8100 Valentine Avenue (the "Project"). The Project is designed to provide residents of Sebastopol with a much-needed alternative to traditional, high-cost for-sale housing options.

Over the past five years, Sebastopol has experienced a severely limited supply of newly constructed for-sale homes, while the existing housing stock has seen steadily increasing prices. These pricing trends have become increasingly misaligned with the area's median household income, creating significant affordability challenges for many prospective buyers.

The Project seeks to directly address these issues by delivering attainable homeownership opportunities with a primary focus on the "missing middle" segment of the housing market, all **without the use of public subsidies**. By prioritizing thoughtful design and cost efficiency, the community will offer a lower-priced ownership option accessible to a broad range of residents, including young professionals, families, teachers, first responders, and empty nesters.

In addition to affordability, the Project has been carefully planned to foster a strong sense of community. Generous open spaces and shared areas are intentionally integrated into the site design to encourage resident interaction, engagement, and long-term neighborhood connectivity.

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BACKGROUND

Over the past 12 to 18 months, Grupe has been developing a new housing product line aligned with one of the company's core, mission-driven objectives: expanding attainable homeownership opportunities for the "missing middle" without reliance on public subsidies. This initiative has been made possible in part by leveraging recent state legislation (AB1033) and regulatory reforms that encourage the development and separate sale of accessory dwelling units (ADUs).

By reverse-engineering our site selection process to focus on municipalities that actively promote ADU construction and are experiencing affordability challenges for missing-middle households, Grupe was able to create a more efficient and streamlined underwriting approach. The City of Sebastopol emerged as a strong candidate under these criteria, and the timing aligned favorably when the subject property became available for redevelopment.

The site is currently owned by The Church of Jesus Christ of Latter-day Saints (LDS) and includes an existing religious facility that ceased operations approximately 18 months ago in preparation for the sale of the property. In the first quarter of 2025, the Church initiated a process to identify a qualified residential builder to acquire and redevelop the site. Based on Grupe's development experience and longstanding relationship with the LDS Church, Grupe was selected as the purchaser of the property.

General Site Details

The proposed project (final project name to be determined) is located at 8100 Valentine Avenue in Sebastopol, California (APN 008-510-054). The site consists of an approximately 2.96-acre parcel currently zoned R-4 (Medium-Density Residential), which allows a maximum density of 8.7 dwelling units per acre.

In its simplest form, the Project is planned as a 20-lot, single-family, for-sale residential community. In alignment with recent state legislation that promotes the construction and separate sale of accessory dwelling units (ADUs), 19 of the 20 lots will include a fully detached ADU located on the same parcel. This approach enables the Project to deliver a total of 39 homes across 20 individual lots, while remaining fully compliant with local zoning and state housing laws (further detail on the applicable regulations is provided below).

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The primary residences will be delivered in two floor plan sizes: twelve homes at approximately 1,640 square feet and eight homes at approximately 1,422 square feet. The detached ADUs will also be offered in two configurations, consisting of eight units at approximately 1,000 square feet and eleven units at approximately 748 square feet. With a density of approximately 6.76 lots per acre, the Project complies with the allowable density under the R-4 zoning designation. All inclusionary zoning requirements will be satisfied based solely on the primary dwelling units. The project is selecting 15% (3 units) of the units be inclusionary, affordable to households earning 120% or less of AMI.

Due to the unique design and layout of the community, the Project does not include attached garages within individual homes. Instead, parking is designed in a garden-style configuration, similar to a multifamily residential setting. The Project will provide a total of 83 parking stalls, resulting in an overall parking ratio of 2.13 spaces per home. Of these, 55 stalls (a ratio of 1.41) will be covered carport spaces. Additionally, the Project will provide one electric vehicle (EV) capable charging outlet location per home, located within the covered parking areas.

Through thoughtful site planning, the Project is able to offer both private and shared outdoor spaces. Each primary home will include a private backyard owned and maintained by the individual homeowner. In addition, the community will feature approximately 6,500 square feet of common open space designed to encourage resident interaction and gathering. These amenities include a redwood tree grove, dog park, large central green, and one designated community expression area distributed throughout the site.

To preserve the long-term quality, appearance, and functionality of the community, the Project will be developed as a private residential neighborhood governed by a homeowners association (HOA). The HOA will be responsible for the maintenance of common amenities, private streets and utilities, front yards and paseos, and the enforcement of the community's Covenants, Conditions, and Restrictions (CC&Rs).

A final distinguishing feature of the Project's design is the elimination of individual trash collection totes. Instead, a centralized trash enclosure will be provided for resident use, allowing for consolidated waste disposal and preventing the visual clutter commonly associated with individual trash bins throughout the community.

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SPECIFIC SITE DETAILS:

VEHICLE ACCESS, PARKING, CHARGING, AND SECONDARY EVACUATION ROUTE

Vehicular access to the Project will be provided through a single, clearly marked private entrance from Valentine Avenue, featuring project signage and accommodating full access movements, including left-in, left-out, right-in, and right-out. Upon entering the community, residents will have access to three distinct parking options: (1) conventional surface parking, (2) covered parking within carport structures, and (3) covered carport parking equipped with electric vehicle (EV) capable charging outlet locations.

Given the absence of attached garages in this product type, the parking strategy was intentionally designed to offer functional alternatives while ensuring that covered parking remains conveniently located near each residence throughout the site.

The Project will provide a total of 83 on-site parking spaces for future residents. This equates to a parking ratio of approximately 4.15 spaces per primary home (excluding on-street parking along Valentine Avenue) and approximately 2.13 spaces per home when including the accessory dwelling units. In addition, as part of the Project's forward-thinking and resident-focused design, each homeowner will be provided with at least one assigned covered parking space—totaling 39 assigned spaces—each equipped with an individual EV capable charging outlet location. Any remaining covered parking spaces will be made available to residents on a first-come, first-served basis.

Lastly, in response to community concerns and ongoing discussions with the local fire department, the project now includes a secondary emergency evacuation route along the western corridor. This route connects the end of the project's street to Valentine Avenue. The evacuation route will be provided through an intentional 12-foot-wide, unobstructed, drivable landscaped surface that can be used during emergency situations to allow residents to safely exit the community. The homeowner's association will maintain this 12-foot evacuation route to ensure it remains clear and that homeowner improvements do not obstruct its use during an emergency.

UTILITY INFRASTRUCTURE:

The Project site, which is currently developed with a religious facility, is located within a medium-density residential zoning district and is surrounded by an established, mature neighborhood. As a result, all major utility infrastructure is already available on or adjacent to the site. A detailed description of each utility service is provided below.

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Storm Drainage

An existing 12-inch municipal storm drain pipeline runs in a north–south direction along the eastern property line. This facility currently serves both the Project site in its existing condition and the surrounding neighborhood to the north, conveying stormwater south toward Valentine Avenue and into the City's broader storm drainage system.

Because the site has historically discharged stormwater into this system and was originally designed with this infrastructure in place, the Project will utilize the existing storm drain pipeline and its available capacity. Notably, the proposed development will reduce total impervious surface area from approximately 85,000 square feet under existing conditions to approximately 66,000 square feet, thereby creating additional capacity within the City's stormwater system.

The Project will be constructed in full compliance with current building codes and applicable water quality regulations. Stormwater treatment will be provided through two shallow water-quality basins located on-site: one at the bend in the private street and another along the Project's Valentine Avenue frontage. These facilities will collect and treat site-generated runoff prior to discharge into the existing 12-inch storm drain within the established utility easement.

Water

The project will be developed as a private, HOA-governed community, but it will include a public water distribution system. The proposed system will connect to an existing 6-inch municipal water main located in Valentine Avenue. A new 6-inch water main will be installed through the community's private street, extend to the hammerhead, continue along the walking path corridor, and reconnect to the Valentine Avenue main to form a looped system.

From this looped main, individual service laterals will supply 20 public water meters—one for each lot. Each lot will have a single metered water service that supplies both the primary residence and the accessory dwelling unit (ADU). The water meter for each lot will be held in the name of the HOA, which will handle monthly billing to homeowners. Usage will be allocated between the primary home and ADU through private submeters installed for each unit.

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Sewer

An existing 6-inch municipal sanitary sewer line runs north–south along the eastern property line, parallel to the existing storm drain pipeline. This sewer line currently serves both the surrounding neighborhood and the Project site in its existing condition. The proposed development will utilize this existing sewer infrastructure to serve all residential units.

The Project will include a public on-site sewer collection system consisting of a 6" sewer main within the private street feeding 4" individual water laterals to each lot. These service laterals are intended to serve both the main home and the accessory dwelling unit. (refer to the utility plan for additional details)

Dry Utilities

Dry utilities, including electrical, telecommunications, and related services, will be provided utilizing existing infrastructure along the Valentine Avenue frontage. Additional dry utility facilities will be located within the existing 25-foot utility easement along the eastern boundary of the site to support the proposed development.

Solid Waste

The Project will incorporate a centralized trash enclosure to serve all residents, eliminating the need for individual trash totes placed along internal streets. Solid waste service will be provided under a single contract managed by the HOA, with costs allocated to homeowners through monthly HOA dues. This approach supports a cleaner streetscape and more efficient waste management for the community. The projects preliminary trash enclosure design and trash truck turn around location has been reviewed and approved by the local trash service provider.

ARCHITECTURE:

In developing the architectural character of the Project, careful consideration was given to understanding the values and preferences of homeowners in Sebastopol when selecting a community in which to live. A central principle guiding the design approach is diversity—diversity in scale, form, architectural expression, materials, and visual character. This emphasis is intended to create a rich and varied neighborhood environment that feels organic, authentic, and reflective of the broader community fabric.

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To achieve this objective, the Project incorporates a diverse mix of residential product types and architectural styles. Specifically, the community will include four distinct floor plan options: a 1,640-square-foot two-story primary residence, a 1,422-square-foot two-story primary residence, a 1,000-square-foot single-story accessory dwelling unit (ADU), and a 749-square-foot single-story ADU. Within these plans, two architectural design styles are offered—Craftsman and Ranch, along with six curated exterior color palettes (refer to the design package for additional details).

This level of variation ensures that no two homes or locations within the community will appear identical, avoiding visual repetition and enhancing the overall sense of place. In addition, deliberate attention was given to the placement and distribution of each unit type throughout the site to promote variation in building massing and streetscape rhythm. The pairing of single-story ADUs with two-story primary residences naturally creates a layered and articulated architectural composition across the site, contributing to a dynamic and visually engaging neighborhood that balances scale, proportion, and cohesiveness.

LANDSCAPE AND AMENITIES:

The overall landscape concept for the Project is centered on creating a cohesive and thoughtfully designed outdoor environment that delivers high-quality landscaped spaces and meaningful amenities for residents and their guests. In developing this approach, careful attention was given to the existing character of the surrounding neighborhood, which is best described as a California Mediterranean–inspired landscape aesthetic. The proposed planting palette and landscape layout are designed to complement the established neighborhood context while incorporating low-maintenance strategies and modern water-conservation practices consistent with current sustainability standards.

A defining feature of the landscape design is the intentional and balanced integration of the site's existing mature redwood trees with new plantings. This approach allows the established natural elements of the site to blend seamlessly with the proposed development, creating a harmonious relationship between old and new. The result is a landscape that both respects the surrounding neighborhood and establishes a distinctive identity for the Project as a new residential community.

Given the Project's design and increased residential density, the creation of shared outdoor amenities that foster a sense of community was a key priority in the site planning process. To support this objective, the Project includes four distinct and usable

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common amenity spaces, each designed to serve a specific function and enhance the overall residential experience:

Central Green:
The Central Green is designed as a flexible, multi-purpose open space that encourages resident creativity and engagement. This area can accommodate a wide range of activities, including informal gatherings, community events, recreational play, or passive relaxation, allowing residents to shape the space based on their individual and collective interests.

Redwood Tree Grove:
Located in the northeast corner of the site, the Redwood Tree Grove is envisioned as a tranquil retreat that celebrates the site's mature redwood trees. This amenity provides a quiet, contemplative environment where residents can enjoy the natural beauty, shade, and serenity offered by the existing landscape.

Dog Park:
The Dog Park is situated near the bioretention area at the bend of the internal street and is specifically designed to serve the needs of pet-owning residents. This dedicated space allows dogs to run, play, and exercise in a safe and open environment, while helping to keep pet-related activities contained and compatible with other community uses. Its location ensures that the Central Green can be preserved for broader community activities when in use.

Community Expression Area:
Adjacent to the Central Green, the Community Expression Area is intended to be a flexible and evolving space shaped by the residents themselves. Once the homeowner's association (HOA) is established, and the community is fully occupied, residents will collectively determine the final use of this area. The applicant will provide seed funding to the HOA to support the future development of this amenity. Potential uses may include a community garden, children's play area, outdoor fitness space, or other resident-driven amenities. Reflective of Sebastopol's creative and expressive culture, this space is designed to empower residents to personalize their community while maintaining a cohesive and long-term landscape vision. The applicant will be providing seed money to the HOA to be used at a later date for this amenity.

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PROJECT CHALLENGES AND CONSTRAINTS:

The current Project design—including the configuration of residential units, community amenity areas, parking facilities, and private utility systems—is the result of several months of detailed analysis and coordination by the development team. As is common with many infill development sites within the City, the property is subject to multiple infrastructure-related constraints, including utility easements that influenced the overall site planning and layout.

Specifically, the eastern 25 feet of the site, extending in a north–south direction, is encumbered by a utility easement dedicated to storm drain and sanitary sewer conveyance. This condition presented a unique design challenge, as permanent structures are generally restricted from being constructed over utility infrastructure. In response, the Project team carefully integrated the easement area into the overall site plan by utilizing it for the primary entry roadway, parking areas, and expanded private backyard spaces for select residences. This approach allows the easement to remain fully functional while contributing positively to the Project's circulation, open space, and livability.

Another notable site constraint—which ultimately became a significant design asset—was the preservation of the existing mature redwood trees on the Property. The Project team intentionally designed the Project to retain these mature trees as a defining feature and amenity for the future community. Through thoughtful site planning and design refinements, the Project will use its best efforts to preserve 8 of the 15 onsite heritage trees that would otherwise be subject to removal under the City's permitting process, reflecting the Project's commitment to environmental stewardship and neighborhood character. However, despite these preservation efforts, and as discussed in greater detail in the Density Bonus section below, the Project is requesting a concession from the applicability of the City's tree ordinance in the event that unforeseen construction conditions or necessary modifications to the approved development plan require the removal of one or more heritage trees not currently identified for removal as part of the Project application.

At the time of this updated project description, the applicant understands that the City approved enabling language consistent with the intent of AB 1033 on February 19, 2026, allowing for the separate sale of Accessory Dwelling Units (ADUs). This approval makes the proposed project feasible. Without this provision, the separate sale of ADUs would not be permitted and the project would likely be infeasible. While this removes a significant barrier to the project's viability, the project must still proceed through the standard approval process. However, it includes an additional layer of complexity

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beyond a typical subdivision. Under AB 1033, the separate sale of ADUs would be implemented through a site condominium plan recorded on each lot. The project proposes the creation of 20 lots through approval of the Vesting Tentative Map (VTM). The site condominium plan cannot be recorded until construction is complete and a Certificate of Occupancy has been issued for the ADU on each lot. Only after this milestone can the condominium units be legally created and sold separately. This sequencing requirement introduces additional complexity to the project's construction schedule and sales strategy.

Entitlement Requests/Applications:

1) **SB330 Application:**
    a. This project is intended to be an SB330 application and thus a preliminary application is being submitted due to compliance with the Senate Bills requirements. A full application is also being submitted at the same time.

2) **Tentative Map Application:**
    a. All supporting materials is attached to this project description.

3) **Design Review Application:**
    a. All supporting material is attached to this project description
    b. This project description takes the place of the written statement within the checklist
4) **State Density Bonus Application:**
    a. Application attached in the entitlement package
    b. Site:
        a) 8100 Valentine Ave, Sebastopol California 95472
        b) 2.96 acres
        c) Zoned R4, allowing 8.7 lots per acre. The projects density and base density is 6.76 lots per acre (20 lots/2.96 acres).
    c. Eligibility:
        a) 17 market rate units in the base project
        b) 3 Affordable units (15% of total lot count to households earning 120% or less of AMI) The 15% is the percentage requirement for compliance with option A1 under section 17.250.050 of The City of Sebastopol's Inclusionary requirements
        c) The length of deed restriction shall be in perpetuity.

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d. Requested Density Bonus:
   a) The project will not be requesting any additional bonus units. The projects density will be the same as listed in section 2 of the sate density bonus application section above.

e. Concessions/Incentives:
   a) The project consists of (i) 17 market-rate, for-sale single family dwelling units, (ii) three for-sale single family dwelling units affordable to households earning 120 percent or less of AMI as required by Sebastopol Municipal Code section 17.250.050.A.1, and (iii) 19 accessory dwelling units intended for sale pursuant to AB 1033 and local ordinance. Because at least 10 percent of the units for sale will be affordable to persons and families of moderate income, the project is eligible for one (1) incentive or concession pursuant to Government Code section 65915(d)(2)(A). An incentive or concession includes any "reduction in site development standards" or "[o]ther regulatory incentives or concessions proposed by the developer" that result in identifiable and actual cost reductions to provide for affordable housing costs, pursuant to Government Code section 65915(k). Applicant requests the following concession:
      i) Incentive/Concession #1: Removal of Trees Pursuant to Tree Location Plan:
         (1) The applicant requests as a concession (whether considered as a "reduction in a site development standard" or "[o]ther regulatory" incentive or concession) the right to remove all of the onsite heritage trees identified in the Tree Inventory Report by Horticultural Associates submitted as a part of the project application as being necessary for construction of the improvements on the project site, notwithstanding any provision of Chapter 8.12 of the Sebastopol Municipal Code. This concession proposed by the applicant would result in identifiable and actual cost reductions to provide for affordable housing costs in the amount of approximately $1,125 (75X15), due to cost savings from the cost of replacement trees, in-lieu fee payment or implementation of an alternative. Alternatively, this item also qualifies as requested waiver of a development standard pursuant to 65915(e), because the trees identified on the Tree Location Plan physically preclude construction of the proposed development, which includes affordable housing.

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Additionally the waivers of development standards to be applied to the project (as of now)are as follows:

(a) Minimum lot area (for all lot locations)
  (i) The waiver allows for more density allowing the project to be financially feasible and allow smaller homes on smaller lots. Without it it would be physically impossible to fit the homes and ADU's on all of the lots.

(b) Minimum lot width (for all lot locations)
  (i) The waiver allows for more density allowing the project to be financially feasible and allow smaller homes on smaller lots. Without it it would be physically impossible to fit the homes and ADU's on all of the lots.

(c) Building height (for all building plans)
  (i) This waiver allows for the project to build single story ADU's that are above height limit with ceiling heights and roof pitches more consistent with todays market. Without some architectural style would not be able to be built in a way where the ADU feels like a regular single family home and does not align with todays market.

(d) Minimum yard set backs (for all categories within this section)
  (i) The waiver allows for more density allowing the project to be financially feasible and allows homes to be closer together and closer to the property lines. Without it, it would be physically impossible to fit the homes and ADU's on all of the lots.

(e) Maximum lot coverage
  (i) This waiver allows for more density, having less coverage means more buildable square footage on each lot. Without it it would be impossible to fit the ADU's and the homes on each lot.

(f) Special setbacks-mechanical equipment
  (i) This waiver allows for more density by providing less area between other property lines and mechanical equipment, without it, AC units would have to be placed in impractical places within homeowners back yards.

(g) Parking spaces shall be located on the same lot or parcel as the building or use that they are to serve, or located on an adjacent or contiguous lot under and easement appurtenant to the property to be served.

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(i) This waiver allows for more density by providing less area between the homes and the property lines and allows for parking to be efficiently aggregated in one location, parking will be located on an HOA owned lot.

(h) Minimum Parking Stall Depth of 19'

(i) The project is proposing 18' parking stalls and this waiver allows for more density by providing less land area attributable to parking space, and more land area attributable to housing units.

b) This section is covered in section (A) for the

c) State density bonus law for 15% of the project being affordable allows for a 10% density bonus (which the project is not using its bonus units)allows for 1 concession and unlimited development waivers for the moderate category.

5) Tree Removal Permit

1) Application and details attached to this project description
2) Tree replacement requirements will be addressed during construction drawings.

6) CEQA Request – Class 32 Infill Exemption

CEQA Guidelines Section 15332 identifies the Class 32 categorical exemption for projects that qualify as infill development. The applicant believes that project qualifies for the Class 32 infill exemption, and requests the City to consider the following when evaluating whether the project is eligible:

(a) The project is consistent with the applicable general plan designation and all applicable general plan policies, as well as with applicable zoning designation and regulations.

(i) The subject property has a General Plan land use designation of MDR and is zoned R4 which allows residential development by right. In addition, the base density, prior to addition of ADUs, is consistent with both the MDR and R4 zoning. Any development standard deviations achieved through waivers and concessions under the State Density Bonus law do not disqualify the proposed development project from application of the Class 32 exemption. (See Wollmer v. City of Berkeley) Similarly, ADUs do not count for purposes of density requirements, and the design of the project is otherwise consistent with

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state and City ADU regulations. (Gov't Code 66314(c); 66319). Therefore, the project is consistent with General Plan policies and zoning regulations.

(b) The proposed development occurs within city limits on a project site of no more than 5 acres, substantially surrounded by urban uses.
(i) The project site is located within the City of Sebastopol, is 2.96 acres in size, and is surrounded by urban uses.

(c) The project site has no value as habitat for endangered, rare or threatened species.
(i) The proposed project is a redevelopment of an existing church and an existing urbanized land use. It does not have value as habitat for endangered, rare or threatened species.

(d) Approval of the project will not result in any significant effects related to traffic, noise, air quality, or water quality.
(i) Traffic. Level of service (LOS) standards on new development are no longer relevant metrics for purposes of CEQA. (CEQA Guidelines Section 15064.3.) Instead, CEQA requires new development to evaluate vehicle miles traveled (VMT) impacts only. The Sebastopol General Plan previously analyzed LOS impacts only (see General Plan EIR Addendum Evaluation at p. 87). The Addendum to the City's most recent Housing Element concluded that so long as residential buildout capacity specified in the General Plan EIR was not exceeded, then there would be no new significant environmental impact due to VMT. (Id. at 88.) The buildout capacity analyzed in the General Plan EIR was 750 units (General Plan EIR Addendum Evaluation at p. 16). The applicant's project, when viewed cumulatively with other projects that have been permitted or for which applications have been submitted, does not cause the City to exceed 750 dwelling units. Therefore, no traffic study of VMT is necessary consistent with the General Plan EIR Addendum's threshold of significance for VMT for new dwelling unit development.
(ii) Stationary Noise Sources. The single-family detached residential dwellings and accessory dwelling units are not considered to be significant stationary sources of noise. Consistent with General Plan Policy N 1-3, the project is not expected to have a significant impact due to the project 's building location and the orientation of buildings, building design features, placement of noise-generating equipment

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away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant-features between noise sources and sensitive receptors, use of noise-reducing materials as required. The proposed project may result in stationary noise related to installation of HVAC systems, but HVAC noise is mitigated through project design features such as the installation of HVAC units in ways that will not exceed the City's noise ordinances. The City of Sebastopol's Municipal Code section 8.25.060.B.1 provides that noise levels in residential zones shall not exceed 55 dBA during the day and 45 dBA at night.

(iii) Construction Noise. With respect to noise, construction is anticipated to occur during permissible hours as defined in the city's municipal code. Construction noise is considered to be short term impact and would be considered significant if construction occurs outside the allowable times as described in SMC Section 8.25.060.B.6. In addition, construction projects will comply with General Plan Action N 1f of the General Plan. The demolition and grading phases of on-site construction activities will generate the highest temporary noise levels. The latest construction equipment on the site will be tractors, graders, scrapers, rollers, and dozers. The construction noise will occur during the allowable times and consistent with General Plan policies; thus, the impact is less than significant. (See General Plan at p. 6-2 "Compliance with the requirements outlined in Action N 1f shall be sufficient to reduce construction-related noise impacts to a less than significant level.")

(iv) Air Quality. Single-family detached residential dwellings and accessory dwelling units are not considered to be significant stationary sources of air emissions. Air quality impacts due to project implementation would be in the form of vehicle emissions during operation of the project and temporary impacts from fugitive dust, odors, and construction equipment emissions during horizontal improvements. The use of construction equipment results in localized exhaust emissions. Adherence to city and local Air Quality Management District requirements for demolition and construction would reduce particulate matter and diesel emissions to less than significant levels.

(v) Water Quality. The on-site residential development drainage management will be improved over current conditions, as shown by the Initial Storm Water Low Impact Development Submittal by Adobe Associates, Inc. dated Dec. 19. 2025 and the Drainage Analysis by

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Adobe Associates, Inc. dated Dec. 12, 2025, so that the project's will have a less than significant impact on water quality.

(e) The site can be adequately served by all required utilities and public services.

(i) The project is currently served by all required utilities (electricity, water, wastewater, storm water, solid waste) and public services (fire, police, schools). Additional project residents would have a negligible impact on utility and public service capacity given the size of the project, the payment of required fees, and the increased property tax revenue that will be generated by the project that can contribute to the costs of needed public services. The anticipated population growth due to project implementation is consistent with the growth anticipated. In the general plan and the city's housing element, based on its land use designation.

In addition, none of the exceptions identified in CEQA Guidelines 15300.2 apply to the City's use of a Class 32 exemption for the project:

(a) Cumulative Impact. There are no cumulative impacts of successive projects of the same type in the same place over time. The project is located in an area of the City where there has been little to no change in land use for years, and the project will not cause the City to exceed the overall threshold of 750 dwelling units established by the General Plan.

(b) Unusual Circumstances. There is no reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances. The proposed project is a residential subdivision located on land adjacent to other existing residential subdivisions.

(c) Scenic Highways. The project is not located within a highway officially designated as a State Scenic Highway.

(d) Hazardous Waste Sites. The project site is not included on any hazardous waste list compiled pursuant to section 65962.5 of the Government Code, as shown in the Phase I environmental site assessment prepared by Advanced Geo dated November 17th 2025.

(e) Historic Resources. The existing buildings on the project site do not appear on any historic register maintained by the City, the State of California or the U.S. government.

7) **BOLD Program Approval as Optional Financing Mechanism**:

a. The Applicant would also like to request the Bond Opportunities for Land Development (BOLD) Program be approved as an optional financing

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mechanism for the projects' development impact fees and other public project improvements. It is the applicants understanding that Sebastopol has recently joined the California Municipal Finance Authority (CMFA) and has allowed them to offer/facilitate the BOLD program on other projects within the city.

City of Sebastopol

TREE REMOVAL PERMIT

Application and Checklist

Planning File #: _____
Date Filed: _____
Total Fee Paid: $_____
Received by: _____
Date Application Deemed Complete: _____

PROJECT INFORMATION

ADDRESS: 8100 Valentine Ave, Sebastopol
ASSESSOR'S PARCEL #: 004-510-054
PARCEL AREA: 2.96 acres

APPLICANT OR AGENT:

Name: Grupe Investment Company, Inc.
Email Address: rtoste@grupe.com
Mailing Address: 3255 West March Ln, Suite 400
City, State, Zip: Stockton, CA 95219
Phone: 209-473-6010
Fax: _____
Business License #: _____
Signature: _____

Date: 12-18-25

OWNER OF PROPERTY, IF OTHER THAN APPLICANT:

Name: The Church of Jesus Christ of Latter-Day Saints
Email Address: jeffrey.wayment@churchofjesuschrist.com
Mailing Address: 50 E North Temple Street 12th floor
City, State, Zip: Salt Lake City, Utah 84150-0022
Phone: 801-240-2159
Fax: _____
Business License # _____
Signature: _____
I certify that this application is being made with my consent.

Date: _____

Location Key	Species of Tree	Diameter at 4 1/2 feet	Area where tree is to be removed from?	Reason for Removal	Proposed Replacement
A					
B					
C					
D					
	Example listed below:				
Sample	(Q. Lobata) Valley Oak	22.5"	Back Yard near existing house	Large areas of decay in main trunk	4-15 Gallon live oaks, 2 here and 2 in the front yard

****PLEASE SEE ARBORIST INVENTORY REPORT FOR ABOVE DETAILS****

City of Sebastopol

The submittal information shall be provided to the Planning Department. All submittal information shall be presented along with the Planning Application form, required fees, and any additional information required by the Planning Department before the application can be accepted as complete.

Upon receipt of this information the Planning Department has 30 days in which to determine if the application is complete. Once the application has been deemed complete, the project can be scheduled for the Tree Board, or be acted on administratively, as applicable. The Tree Board meets on the 1st and 3rd Wednesday of each month at Sebastopol City Hall, 7120 Bodega Avenue, Sebastopol, at 4:00 p.m.

The applicant and/or his representative must be present for any meetings. Failure to do so may result in the application being continued.

Size Limit: Plans should not be larger than 30" x 42" trimmed. All plans shall be folding into a 9" x 11" size. **Unfolded plans will not be accepted.**

Scale: The scale used on submittal plans shall generally be at 1/8" = 1'0" for the architectural plans, 1" = 20' for site engineering plans. Include north arrow, the scale and bar scale on all plans.

[X] 1. **Application Form**:.....(1)
Completed and signed by applicant and property owner.

[X] 2. **Fee**:.....(1)
As defined on the fee schedule listed on the Master Planning Application form. Checks should be made payable to the City of Sebastopol.

[X] 3. **Location Map**:.....(1)
Indicate the subject parcel(s) and adjacent streets on an 8 1/2" by 11" map.

[X] 4. **Written Statement**:.....(1)
Written statement providing a description of tree(s) proposed to be removed.

[X] 5. **Site Plans**:.....(1 set)
Clearly show the location of the tree(s) proposed to be removed on the property.

[X] 6. **Site Photographs**:.....(1 set)
Clearly show the views of and from the project, including neighboring development. Include a key map indicating where the pictures were taken from and in what direction they were taken. Label the pictures accordingly. It is often desirable to provide the City with a series of overlapping photographs of the surrounding neighborhood that show a panoramic view. Polaroids or digital photos on a CD are acceptable.

City of Sebastopol

INDEMNIFICATION AGREEMENT

" As part of this application, applicant agrees to defend, indemnify, release and hold harmless the City, its agents, officers, attorneys, employees, boards and commissions from any claim, action or proceeding brought against any of the foregoing individuals or entities, the purpose of which is to attack, set aside, void or annul the approval of this application or the adoption of the environmental document which accompanies it or otherwise arises out of or in connection with the City's action on this application. This indemnification shall include, but not be limited to, damages, costs, expenses, attorney fees or expert witness fees that may be asserted by any person or entity, including the applicant, arising out of or in connection with the City's action on this application, whether or not there is concurrent passive or active negligence on the part of the City. If, for any reason any portion of this indemnification agreement is held to be void or unenforceable by a court of competent jurisdiction, the remainder of the agreement shall remain in full force and effect."

Applicant's Signature _____ Date Signed 12-18-25 Planning File No. _____

NOTE: The purpose of the indemnification agreement is to allow the City to be held harmless in terms of potential legal costs and liabilities in conjunction with permit processing and approval.

NOTICE OF MAILING

Effective immediately, email addresses or facsimiles will be used for sending out staff reports and agendas to applicants, their representatives, property owners, and others to be notified if an email address or facsimile number is available.

Please sign and acknowledge you have been notified of the Notice of Mailing for applications and have provided an email address or fax number.

_____ Rob Toste

Signature Printed Name

PUBLIC NOTIFICATION OF TREE REMOVAL

Trees proposed for removal shall be marked by THE APPLICANT with a form prescribed by the City (attached). Notice of a Tree Removal Permit application shall be posted on the subject parcel on affected tree(s), and in at least two public places within 300 feet of the affected trees, at least ten (10) calendar days prior to the date of the Sebastopol Tree Board meeting at which the application will be considered, or acted on administratively, as applicable.

THIS IS TO CERTIFY THAT I, THE APPLICANT, AM RESPONSIBLE FOR POSTING THE TREE(S) PROPOSED FOR REMOVAL WITHIN 10 DAYS PRIOR TO THE PUBLIC HEARING, OR ADMINISTRATIVE ACTION, AS APPLICABLE. FAILURE TO POST THE PROPOSED TREE(S), AS REQUIRED, MAY RESULT IN THE APPLICATION BEING CONTINUED OR DENIED.

If you need help in posting the proposed tree(s), please contact the Planning Department at 707/823-6167.

Please sign and acknowledge you have been notified of the Posting of Tree(s) Requirement.

_____ Rob Toste

Signature Printed Name

City of Sebastopol

NOTICE OF REQUEST FOR APPROVAL TO REMOVE TREES

SPECIES: _____

ADDRESS: _____

DIAMETER AT BREAST HEIGHT (per tree): _____" d.b.h.

DATE POSTED: _____ (at least 10 days prior to Public Hearing or administrative action)

HEARING DATE: _____

****

An application has been submitted to the City of Sebastopol to remove a tree(s) protected under the City Tree Ordinance. The Ordinance allows removal in various circumstances. Anyone who wishes to make a comment on this matter may send a letter to the Sebastopol Planning Department at P.O. Box 1776, Sebastopol, CA, 95473, or contact the Sebastopol Planning Department at 707/823-6167.

****

IT IS A MISDEMEANOR TO DEFACE OR REMOVE THIS NOTICE.

City of Sebastopol

Density Bonus Application

Date: 12-18-25
File #: _____

For projects seeking a Density Bonus pursuant to State law, the following written information is required:

1. Completed **Density Bonus Application** form.

2. **Site**
   a. The location, acreage, residential density, and the maximum number of base units allowed under the Zoning and the Land Use Designation under the General Plan without the density bonus.

3. **Eligibility.** Provide the total number of the following:
   a. Market rate units in the Base Project;
   b. Affordable Housing units and their targeted income level or other provisions (e.g. land donation), which will demonstrate eligibility for a State density bonus under this Chapter; and
   c. Length of deed restriction proposed.

4. **Requested Density Bonus**.
   a. Calculations showing the maximum base density;
   b. Number of Density bonus units to be received, if any;
   c. Number or percentage of affordable units and the income level at which the units will be restricted to;
   d. Number of market rate units that will result from the granted density bonus;
   e. Resulting density, described in units per square foot; and

6. **Concessions/Incentives**
   a. Written description of the requested Concessions or Incentives/ any proposed waivers of development standards and why they are necessary for making the project physically possible.
   This requirement at the time of application does not prevent the applicant from substituting a different Incentive or Concession from what is initially proposed at a later phase of the application.
   b. Pro forma or other report demonstrating how the requested Concessions or Incentives result in identifiable and financially sufficient and actual cost reductions necessary to ensure the financial feasibility of the proposed affordable housing units shall be prepared. Information shall be sufficiently detailed to enable City staff to examine the conclusions reached by the Applicant.
   c. All requested incentives and concessions should not exceed the limits allowed by state law.

Density Bonus Applications will be processed concurrent to other entitlements.

City of Sebastopol

TENTATIVE MAP
Application Checklist

The submittal information shall be provided to the Planning Department. All submittal information shall be presented along with the Planning Application form, related fees, and any additional information required by the Planning Department before the application can be accepted as complete.

Upon receipt of this information the Planning Department has 30 days in which to determine if the application is complete. The necessary level of environmental review must then be determined and completed. After this, the project can be scheduled before the Planning Commission within 3 to 6 weeks and to the City Council thereafter. The Planning Commission meets on the second and fourth Tuesday of every month and the City Council meets on the first and third Tuesday of every month. The Planning Commission and City Council meet at the Sebastopol Youth Annex, 425 Johnson Street, Sebastopol, CA at 6:00 p.m. A notice will be mailed no later than 10 days before the scheduled hearing.

The applicant and/or his representative must be present for any meetings. Failure to do so may result in the application being continued.

Size Limit: Plans should not be larger than 30" x 42" trimmed.

Please fold all plans into packets with each packet containing one copy of each plan. The packets should not be larger than 9" x 11" in size. **Unfolded plans will not be accepted.**

Scale: The scale used on submittal plans shall generally be at a 1/8" = 1'0" for the architectural plans, 1" = 20' for site engineering plans. Include a north arrow, the scale and a bar scale on all plans.

		SUBMITTAL REQUIREMENTS	(# of copies)
☒	1.	Application Form: Completed and signed by applicant and property owner.	(1)
☒	2.	Deposit: As defined on the fee schedule listed on the Master Planning Application. Checks should be made payable to the City of Sebastopol. Total application costs are determined by the Planning Department with the final amount based on processing time spent by staff and consultants.	
☒	3.	Location Map: Indicate the subject parcel(s) and adjacent streets on an 8 1/2" by 11" map.	(1)
☒	4.	Written Statement: Statement should include a description of the proposed use(s), as well as a description of current uses and conditions. If, because of use permit approval, there will be multiple uses on the site, indicate the location and square footage of the different uses. Describe the project in detail, including a written description of each lot (area, dimensions, orientation) and proposed building envelope. State the reasons for the project, including the City's potential benefits and costs.	(1)
☒	5.	Environmental Assessment Form: . . . . . Added information such as traffic reports, noise studies or visual impact studies may be required by the Planning Department to complete the environmental review. (This item may not be required for a Minor Use Permit. Please check with the Planning Department).	(1)
☒	6.	Preliminary Title Report:	(2)

A preliminary title report, prepared within three months of filing application, including a complete legal description. (This item may not be required for a Minor Use Permit. Please check with the Planning Department).

☒ 7. Site Photographs: .... (1 set)
Clearly show the views of and from the project, including neighboring development. Include a key map indicating where the pictures were taken from and in what direction they were taken. Label the pictures accordingly. It is often desirable to provide the City with a series of overlapping photographs of the surrounding neighborhood that show a panoramic view. Polaroids or digital photos on a CD are acceptable.

☒ 8. Owner's Statement……1

a. Tract name and number.
b. Name and address of owner(s).
c. Name and address of subdivider.
d. Name, address and number of civil engineer.
e. Existing use of property.
f. Proposed use of property.
g. Type of street improvements proposed.
h. Drainage facilities proposed.
i. Utilities proposed.
j. Proposed street lighting.
k. Proposed tree planting.
l. Protective covenants to be recorded, if any.
m. Public areas proposed, if any.

☒ 9. Tentative Map..…..…. (15 sets)
(**MUST BE FOLDED)**

Tentative maps of the project shall be fully dimensioned and accurately drawn. The plans shall contain the following basic information unless the Planning or Engineering Departments determines that additional information is necessary to properly evaluate the project. Use as many sheets as necessary. You may combine information so long as the plans are easy to read. If details are not reviewed during the approval process, they will be subject to review and approval prior to issuance of building permits.

The tentative map must be prepared and signed by a licensed civil engineer, whose name, address and phone number must appear on the map.

Tentative maps shall include the following:

a. Scale should not exceed 1" = 100'.
b. Tract name and number.
c. North arrow and scale.
d. Boundary of tract to be subdivided. Area in acres of subdivision.
e. Names and addresses of owner, subdivider, engineer, and surveyor.
f. Site map/vicinity map.
g. Topography of the land with 1-foot contour lines for land with a slope of 5% or less and 2-foot contours for land over 5%. This contour interval may be increased for land with over 20% slope. Contours should be sufficient to show the slope of the project and the adjoining ground for at least 100 feet beyond the project boundaries. Show faults, flood zones and slide areas, high point, low point, and benchmark on City Datum.
h. Locations, names, width and approximate grades of all roads, streets, highways, and ways in proposed subdivision or proposed to be offered for dedication.
i. Location, names and existing width of all adjoining and contiguous highways, streets, and ways.

j. Existing and proposed utilities (sewer, water, street lighting, fire hydrants, etc). Indicate: location, type (example, sewer, water), size (example: diameter in inches), material, rough invert elevations and slopes (for sewer lines), provision of a clear delineation between proposed utilities intended to be public and those intended to be private.
k. Approximate lot layout and dimensions of each lot, lot numbers.
l. All existing buildings and structures on-site. Indicate whether to be removed or retained. For structures to remain, include their outside dimensions, location, use, setbacks, and distance between the buildings and to proposed streets and lot lines.
m. Existing wells and septic systems, noted as to whether to be removed or retained.
n. Identify all trees by species and indicate whether they are to be removed or saved. A Tree Protection Plan must also be submitted that is prepared by a registered arborist. The requirements for this Plan are shown in a separate checklist that can be obtained at the Planning Department.
o. Indicate water courses and open drainage channels: width to nearest foot, direction of flow, existing and proposed improvements, approximate boundaries of areas subject to inundation.
p. Indicate existing and proposed culverts and underground storm drainage: location, diameter in inches, approximate length, direction of flow, materials. Proposed storm drainage measures should direct flows to the nearest downstream facility.
q. Easements (with size, type, and public or private ownership called out), right-of-ways, trails, paths, utility poles, etc.
r. Areas proposed to be dedicated or reserved for parks, trails, schools, public, or quasi-public buildings, and other such uses.
s. Final map phasing boundaries should be indicated and a statement provided that sets forth the manner and phasing of the installation of subdivision improvements.

[X] 10. Preliminary Grading/Draining…….. (15 sets)
Preliminary grading/drainage plan clearly showing existing and proposed contours carried a minimum of 100 feet beyond the project boundaries. Show direction and path of existing and proposed drainage channels or facilities. Indicate building pad and finished elevations, retaining walls (with height and material specified). Appropriate cross sections shall be shown to indicate resultant slopes.

[X] 11. Preliminary Landscape Plans…… (15 sets)
A preliminary landscape plan shall be submitted showing major landscape structures such as fences, walls, walks, pools, and trellises with dimensions, paving material designations, and a proposed planting plan. Approval of a preliminary landscaping plan will be submitted prior to submittal of a final landscaping and automatic irrigation plan to be checked by the Design Review Board for conformance prior to issuance of a building permit.

The preliminary landscape plan should indicate the general plant pallet that is proposed, including a description of the type of plants, their rate of growth, size in 3-5 years, mature size, and container size at time of planting. Include both common and botanical names. Show the location of paths, fences and street furniture.

The plan must adhere to the City's Water Efficient Landscape Program (WELPO); see WELPO checklist available at the Planning Department.

[ ] 12. Reductions…… (1 set)
Include one 8 ½ " x 11" reproduction of each plan.

City of Sebastopol

ENVIRONMENTAL/INFORMATION ASSESSMENT FORM
Application Checklist

(To be completed by applicant)

The submittal information shall be provided to the Planning Department.

Date Filed: 12-18-25

General Information:

1. Name of developer or project sponsor: Grupe Investment Company, Inc.
   Address of developer or project sponsor: 3255 West March Ln, Suite 400, Stockton, CA 95219

2. Address of project: 8100 Valentine Ave, Sebastopol

   Assessor's Block and Lot Number: 004-510-054

3. Name of person to be contacted concerning this project:: Rob Toste
   Address of person to be contacted concerning this project: 3255 West March Ln, Ste. 400, Stockton, CA 95219
   Telephone Number of person to be contacted concerning this project: 209-473-6010

4. Indicate number of the permit application for the project to which this form pertains: TBD

5. List and describe any other related permits and other public approvals required for this project, including those required by City, Regional, State and Federal Agencies:

   Tentative map, density bonus, sb330, design review, tree removal permit

6. Existing Zoning District: R4 Existing General Plan Designation: MDR

7. Propose Use of Site (Project for which this form is filed):

Single Family subdivision comprised of 20 lots with 39 homes (19 ADU's). Of which a Vesting Tentative Map Applicaiton, Density bonus Application, SB330 Application, Design Review application, and Tree Removal Permit are all forms filed for the project

PROJECT DESCRIPTION:

8. Site Size: 2.96

9. Square Footage: 128,938

10. Number of floors of construction: single and double story construction

11. Amount of off-street parking: 85 stalls

12. Attach plans

13. Proposed scheduling

14. Associated project

15. Anticipated incremental development:

16. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected.

17. If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities.

18. If industrial, indicate type, estimated employment per shift, and loading facilities.

19. If institutional, indicate the major function, estimated employment per shift, estimated occupancy, loading facilities, and community benefits to be derived from the project.

20. If the project involves a variance, conditional use or rezoning application, state this and indicate clearly why the application is required.

Are the following items applicable to the project or its effects? Discuss below all items checked yes (attach additional sheets as necessary).

21.	Change in existing features of any bays, tidelands, beaches or hills, or substantial alternation of ground contour.	Yes ❑	No ☒
22.	Change in scenic views or vistas from existing residential areas or public lands or roads.	Yes ❑	No ☒
23.	Change in pattern, scale or character of general area of project.	Yes ❑	No ☒
24.	Significant amounts of solid waste or litter.	Yes ❑	No ☒
25.	Change in dust, ash, smoke, fumes or odors in vicinity.	Yes ❑	No ☒
26.	Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns.	Yes ❑	No ☒
27.	Substantial change in existing noise or vibration levels in the vicinity.	Yes ❑	No ☒
28.	Site on filled land or on slope of 10 percent or more.	Yes ❑	No ☒

30.	Substantial change in demand for municipal services (police, fire, water, sewage, etc).	Yes ☒	No ☐
31.	Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc).	Yes ☒	No ☐
32.	Relationship to a larger project or series of projects.	Yes ☐	No ☒

Environmental Setting:

33. Describe the project site as it exists before the project, including information on topography, soil stability, plants and animals, and any cultural, historical or scenic aspects. Describe any existing structures on the site, and the use of the structures. Attach photographs of the site. Clearly show the views of and from the project, including neighboring development. Include a key map indicating where the pictures were taken from and in what direction they were taken. Label the pictures accordingly. It is often desirable to provide the City with a series of overlapping photographs of the surrounding neighborhood that show a panoramic view. Polaroids or digital photos on a CD are acceptable.

34. Describe the surrounding properties, including information on plant and animals and any cultural historical, or scenic aspects. Indicate the type of land use (residential, commercial, etc), intensity of land use (one-family, apartment houses, shops, department stores, etc), and scale of development (height, frontage, set-back, rear yard, etc). Attach photographs of the site. Snapshots or Polaroid photos will be accepted.

	YES	NO
A. Does the Project involve any of the following?		
1. No change in the square footage to the existing structure?		X
2. An addition of more than 50% of square footage to the existing structure?		X
3. An addition of more than 2500 square feet to the existing structure?		X
4. An addition of more than 10,000 square feet to the existing structure?		X
5. Demolition of the existing structure?		
	YES	**NO**
B. Does the Project involve the replacement or reconstruction of existing structures or facilities at the site which:		
1. Will have substantially the same purpose and capacity as existing structures at the site?		X
2. Will result in an increase in square footage or capacity as compared to the existing structure?	X	
	YES	**NO**
C. Does the Project involve new construction of:		
1. 35 or more dwelling units?	X	
2. More than 15,000 square feet of commercial, industrial, governmental, or institutional floor area?		X
3. Stores, motels, offices, restaurants, and similar structures designed for an occupant load of more than 30 persons?		X
	YES	**NO**
D. Does the Project involve division of property into more than four parcels or consolidation of more than four parcels?	X	

	YES	NO
E. Will the Project require issuance of a Variance, Use Permit, Zoning Ordinance Amendment, Zoning Map Amendment, or General Plan Amendment?		X
	YES	NO
F. Will the Project result in a change in use at the site (for example: from residential to commercial or from office to restaurant?)		X
	YES	NO
G. Is this Project:		
1. Similar to the other projects for which you have received permits in the last two years in the City of Sebastopol?		X
2. Similar to other projects, which you are planning to develop within two years in the City of Sebastopol?		X
	YES	NO
H. Does the Project involve changes to an official City landmark?		X
	YES	NO
I. Does the Project involve use of disposal of potentially hazardous materials, such as toxic substances, flammables, or explosives?		X
	YES	NO
J. If the Project is located within 500 feet of a residential zone or noise-sensitive land uses, will the construction of the project involve the use of pile driving, night time track hauling, blasting, 24 hour pumping, or other equipment that creates high noise levels and or vibrations?		X
	YES	NO
K. Does the Project involve the construction, substantial remodel, or 50% or more addition to the following types of uses?		
Mobile home, amphitheater, concert hall, auditorium, meeting hall, hospital, church, library, school classrooms, or day care?		X

I certify that the information in this form is correct to the best of my knowledge.

Applicant Signature _____ 12-18-25 Date

Certification:

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information represented are true and correct to the best of my knowledge and belief.

Date: 12-18-25

Signature: _____

Printed Name: Rob Toste

For: Grupe Investment Company Inc.

SIEGFRIED

GEOTECHNICAL REPORT
PROPOSED VALENTINE AVENUE SUBDIVISION
SEBASTOPOL, CALIFORNIA

Prepared for The Grupe Company

December 5, 2025

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SIEGFRIED

December 5, 2025

Rob Toste
Senior Project Manager
The Grupe Company
3255 West March Lane
Stockton, CA 95219

RE: GEOTECHNICAL REPORT FOR
PROPOSED VALENTINE AVENUE SUBDIVISION
SEBASTOPOL, CA

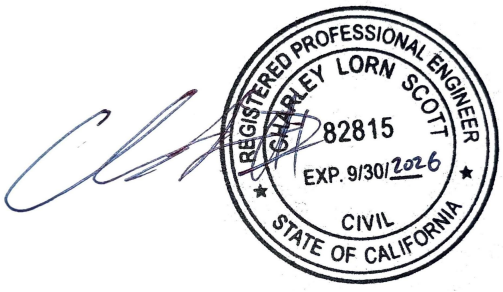
Dear Rob,

We have completed our geotechnical report for the new improvements planned for the proposed subdivision located at 8100 Valentine Avenue in Sebastopol, California. The purpose of our study was to explore the subsurface soil and groundwater conditions at the site to provide geotechnical engineering recommendations related to foundation design and earthwork construction.

Based on our study, the site conditions are suitable for design and construction of the subject project from a geotechnical engineering perspective. We encountered undocumented soil fill near the surface of the site. The presence of these soils and conditions could cause undesirable distress to foundations and slabs if not mitigated. We make specific design and construction recommendations to address the adverse effects of these conditions in the following report.

We appreciate the opportunity to collaborate with you on this project. If additional information is needed or if there are inquiries in this report, please do not hesitate to contact me.

Sincerely,





Charley Scott, PE
Senior Associate
SIEGFRIED

Bradford Quon, GE
Geotechnical Manager | Principal
SIEGFRIED

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PART 1. INTRODUCTION

We have completed our geotechnical report for the new improvements planned for the proposed subdivision located at 8100 Valentine Avenue in Sebastopol, California. The purpose of our study was to explore the subsurface soil and groundwater conditions at the site to provide geotechnical engineering recommendations related to foundation design and earthwork construction. The vicinity of the project is shown on Plate 1, Site Location Map.

1.1. PROJECT DESCRIPTION

The approximate 3± acre site will be converted to a residential subdivision comprised of 39 single family homes. The homes are single to two story and are wood framed (light-frame) construction. Bio retention areas are planned along the Valentine Avenue frontage and at discrete locations around the site. Asphalt paved driveways/parking stalls and concrete paved pavements and flatwork are planned. No basements are planned currently. The project will be designed and constructed in accordance with the 2025 California Building and Residential Codes. Minor cuts and fills up to 2 feet in vertical dimension are planned. The footprints of the homes are expected to be generally less than 1,500 sf in plan area. Other site improvements to the site generally consist of existing building demolition, light poles, and both above and underground utilities.

1.2. SCOPE OF SERVICES

Our authorized scope of services was outlined in our proposal dated October 15, 2025, and authorized with agreement between Siegfried Engineering Inc. and The Grupe Company dated October 22, 2025. The scope of services generally included the following:

- Field exploration consisting of a series of drilled borings to maximum of 30 feet below the ground surface (bgs).
- Geotechnical testing to evaluate relevant index properties, engineering parameters (i.e., strength), corrosivity, and R value.
- Geotechnical engineering analysis to formulate conclusions and recommendations related to foundation design and earthwork construction.

1.3. SITE CONDITIONS

The site is located at 8100 Valentine Drive in Sebastopol, California as shown on Plate 1. The site is bounded by single family residential homes on the north, east, and western perimeter of the site. Valentine Avenue forms the natural boundary as the southern perimeter of the site. The site is generally level with the high ground on the northwestern portion of the site at approximately elevation 199. The site descends to the southeast where the elevation near the proposed new entryway at Valentine Avenue is at approximately elevation 191. Atascadero Creek is located over 2,000 feet to the west of the site as shown on the Topographic Map, Plate 2.

The site is currently occupied by a church structure with asphalt paved parking around the building. The site has exterior flatwork and landscape around the building and the driveways. Large mature trees were located around the site, especially some that will be removed in the northern perimeter of the site. The current site conditions are shown on Plate 3.

1.4. AERIAL IMAGE REVIEW

We reviewed historic aerial images provided at https://historicaerials.com from 1952, 1961, 1965, 1968, 1971, 1982, 1983, 1993, 2005, 2009, 2010, 2012, 2014, 2016, 2018, 2020, and 2022.

- The images from 1952 and 1961 shows rows of trees or large vegetation on the site and the surrounding area utilized for agricultural purposes.
- The 1965 image shows in progress construction on the site to the west of the site.
- The 1968 image shows a residential area constructed to the west of the site
- The 1971 image shows a structure constructed on the site, Valentine Avenue to the south of the site and in progress construction to the south and east of the site.
- The 1982, 1983, and 1993 images show an addition constructed to the north side of the previous structure, a driveway around the onsite structure and more residential construction on the lots adjacent to the site.
- The 2005 through 2022 images show additional parking constructed onsite.

PART 2. ENGINEERING GEOLOGY AND SEISMIC HAZARDS (GEOHAZARDS)

2.1. SITE CHARACTERIZATION

2.1.1. Regional Geology

The Sebastopol area is in California's Coast Range (Northern) Geomorphic Province. The Coast Ranges trends northwest from the northwestern corner of the California/Oregon border to Point Concepcion in Santa Barbara County to the south. The Coast Range mountains and valleys are subparallel to the San Andreas Fault, which is more than 600 miles long, extending from Pt. Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. The Pacific Ocean is located to the west of the Coast Ranges.

CGS Note 36 describes the Coast Ranges as having a coastline that is uplifted, terraced, and wave cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields.

2.1.2. Local Geologic Conditions

Wagner and Gutierrez (2017) mapped the near surface deposits as Wilson Grove Formation (late Miocene to Pliocene), map symbol, Mwg. This formation is described as marine sandstone and conglomerate. Roblar tuff (Mrt) is interbedded with the upper part of the Wilson Grove. This formation is described by Delattre and Koehler (2008) as "…predominantly marine sandstone and pebbly sandstone. The soils are generally light gray to yellow-brown with orange and red iron-oxide staining and fine to very fine grained, well sorted, massive to poorly bedded and locally fossiliferous." The Geologic Map based on the Delattre and Koehler (2008) mapping is shown on Plate 4.

2.1.3. Web Soil Survey

The Soil Survey of Sonoma County, California maps the site as Goldridge fine sandy loam. The Goldridge fine sandy loam soils are characterized to be "moderately well drained with moderately high permeablilty."

2.1.4. Geologic Hazard Zones

Geologic ground failures can occur within earthquake hazard zones. The California Geological Survey (CGS) Earthquake Zones of Required Investigation (https://maps.conservation.ca.gov) indicates the parcels to be developed:

- The parcel is NOT WITHIN an Earthquake Fault Zone.
- The parcel is NOT WITHIN a Liquefaction Zone.
- The parcel is NOT WITHIN a Landslide Zone.

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2.2. GEOLOGIC HAZARDS

2.2.1. Expansive Soils

Expansive soils have the potential to impact the development where fluctuations in the moisture contents can cause unacceptable shrinkage and/or swell beneath buildings and/or flatwork. Controlling the moisture change will reduce this shrink-swell capability. Expansive soils are defined as having a Plasticity Index (PI) greater than 15 and an Expansion Index (EI) greater than 20. The near surface clay fill soils on the site were tested to have a PI of 15 and an EI of 9 indicating a very low potential for expansion, thus we consider the expansive soils **to not be a design consideration.**

2.2.2. Weak/Soft Compressible Soils

Weak and soft, compressible soils are identified as having a very soft consistency. Soft compressible soils were not encountered in the borings advanced for this study. On this basis, weak/soft compressive soils are **not a design consideration.**

2.2.3. Corrosive Soils

We tested a bulk sample of soil for pH, minimum resistivity, chloride and sulfate presence, redox potential, and sulfides. The results are summarized in Table 2.1.

Table 2.1: Soil Corrosivity

	ASTM G51	ASTM G187	ASTM D4327	ASTM D4327	ASTM G200	SM 4500-D	ASTM D4327
Sample Location	Soil pH	Min. Resistivity Ohm-cm	Chloride ppm (%)	Sulfate ppm (%)	Redox Potential (mv)	Sulfides (mg/kg)	Nitrate (mg/kg)
P-1 Bulk (2.5-4ft bgs)	7.1	6633	77.5 (0.0078%)	32.9 (0.0033%)	+ 178	2.37	2.7

ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Ammonium (mg/kg)	Lithium (mg/kg)	Sodium (mg/kg)	Potassium (mg/kg)	Magnesium (mg/kg)	Calcium (mg/kg)	Fluoride (mg/kg)	Phosphate (mg/kg)
2.9	ND	63.0	7.1	11.1	75.9	11.6	2.7

AWWA C105 sulfide: 0-3 mg/kg = Negative, 3-6 mg/kg = Trace, >6 mg/kg = Positive
ND = Not Detected

Caltrans notes that resistivity is an indicator of the possible presence of soluble salts. It is **not included as a parameter to define a corrosive area for structures** except for MSE walls. In general, the higher the resistivity, the lower the rate for corrosion. A minimum resistivity value for soil and/or water less than or equal to 1500 ohm-cm indicates the presence of high quantities of soluble salts and a higher propensity for corrosion.

The Caltrans Corrosion Guidelines, Version 3.2 dated May 2021 considers a site to be corrosive if one or more of the following conditions exist:

Chloride concentration is 500 ppm or greater, sulfate concentration is 1500 ppm or greater, or the pH is 5.5 or less.

For cast iron alloy pipes, the American Water Works Association (AWWA) developed a numerical soil corrosivity scale to identify the severity by assigning points for different variables such as the resistivity, pH, Redox Potential, Sulfides, and Moisture. The AWWA C-105-point standard is reproduced for reference in Table 2.2.

Table 2.2: Corrosivity Scale by AWWA[1] C-105-18 Standard

Soil Parameter Resistivity (ohm-cm)	Assigned Points		Soil Parameter pH	Assigned Points		Soil Parameter Sulfides	Assigned Points
<1,500	10		0-2	5		Positive	3.5
≥1,500 – 1,800	8		2-4	3		Trace	2
>1,800 – 2,100	5		4-6.5	0		Negative	0
>2,100 – 2,500	2		6.5-7.5	0			
>2,500 – 3,000	1		7.5-8.5	0			
>3000	0		>8.5	3			
Soil Parameter Redox Potential	Assigned Points		Soil Parameter - Moisture			Assigned Points	
>100	0		Poor drainage, continuously wet			2	
50-100	3.5		Fair drainage, generally moist			1	
0-50	4		Good drainage, generally dry			0	
<0	5						

[1]American Water Works Association (AWWA)

Based on the corrosivity test performed and our assumption of "Fair drainage, generally moist" conditions, we assign a point value of less than 10. When total points on the AWWA scale are at least 10, the soil is classified as corrosive to cast and ductile iron pipes and use of cathodic protection is often recommended.

Based on the Caltrans methodology and AWWA C105, the site evaluated is **not considered corrosive.**

The results provided were based on a single sample tested on the site. Other soil on the site may be corrosive. We do not practice Corrosion Engineering and a complete assessment of the corrosion potential of the site soil was not within our scope. For long term, specific corrosion control design recommendations, we recommend a California-registered Corrosion Engineer evaluate the corrosion potential of the soil on buried concrete structures, steel pipe coated with cement mortar, and ferrous metals.

2.2.4. Flooding

The FEMA Flood Insurance Rate Map (FIRM) Map Number 06097C0715E indicates the entire parcel to be developed is mapped as an area of minimal flood hazard, Zone X. The site is not located within a special flood hazard area subject to inundation by the 1% annual chance flood. The potential for flooding is **not a design consideration for this project.**

2.2.5. Radon-222 gas

Radon is produced naturally as Radon-222 in gas form. Radon is a byproduct of the natural decay of uranium that is present in small quantities in several rock types such as granitic rocks of the Sierra Nevada and sediment derived rocks in the Sacramento Valley. Radon is soluble and can be transported in groundwater. When water-containing radon is exposed to air (by pumping or through a tap), radon can diffuse into the air where it can be inhaled.

The U.S. Environmental Protection Agency (EPA) (https://www.epa.gov/sites/default/files/2018-12/documents/radon-zones-map.pdf) lists Sonoma County in Zone 3, the lowest potential radon hazard (less than 2 pCi/L) (U.S. EPA, n.d.). **Based on the zone assignment, we conclude that naturally occurring radon would not be considered a health hazard for this project.**

2.2.6. Naturally Occurring Asbestos

Naturally Occurring Asbestos (NOA) is hazardous to humans. Asbestos included six regulated naturally occurring minerals (actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite). In California, asbestos minerals are most associated with ultramafic rocks and their derivatives, including Serpentine rock. Ultramafic rock are igneous rocks composed mainly of iron-magnesium silicates minerals hat crystallize deep in the earth's interior. By the time they are exposed at the Earth's surface, ultramafic rocks have typically undergone metamorphism, a process in which the mineralogy or the rock changes in response to the changing chemical and physical conditions. Asbestos is classified as a known human cancer-causing substance by local, State, and Federal health agencies and is known to cause chronic respiratory diseases. Asbestos fibers may be released into the air because of activities which disturb NOA-containing rocks or soils. Asbestos minerals can fragment into small fibers that readily suspend in the air and are of a size visible only under a microscope. Breathing these small fiber fragments may result in an increased risk of respiratory disease or cancer in exposed individuals.

The Department of Toxic Substances Control (DTSC) has developed the Interim Guidance, Naturally Occurring Asbestos at School Sites, revised 9/24/2004. The guidance document provides a four-step process to assist school districts and their consultants in conducting environmental assessments, investigations, and response actions (if needed) at new or expanding school sites with potential NOA. Step 1 is the potential identification of NOA through the performance of a Phase I Environmental Site Assessment (Phase I ESA). If NOA is potentially identified, environmental sampling and analysis will be needed as part of the development of a Preliminary Environmental Assessment (PEA.) The guidance document continues to a mitigation phase and long-term operation and maintenance of the site.

Based on the review of the geologic maps, no ultramafic rocks are mapped near the property. We conclude that NOA is **not a design consideration.**

2.2.7. Hydrocollapse

Hydrocollapse occurs when loose, dry, sandy soils become saturated and settle. These materials are typically located in arid climates where wind and temperature have the greatest impact. The collapsible soil is prevalent in the Southern California area and in high desert areas. Dry and loose granular soils were not encountered at the site; thus, we **consider a low potential for hydrocollapse and not to be a design consideration.**

2.3. SEISMIC HAZARDS

2.3.1. Historical Seismicity

The site is located within a moderate seismic region with many of the active faults located as close as about 10 miles from the project site. The California Earthquake Authority also notes there is a 76% likelihood of one or more M7.0+ earthquakes affecting Northern California in a 30 year-period, beginning in 2014.

The Unified States Geological Survey (USGS) Earthquake Hazard Toolbox maintains an interactive online portal at https://earthquake.usgs.gov/nshmp to disaggregate the nearest earthquake faults that contribute the most towards the earthquake hazard. The interactive tool models the National Seismic Hazard Map for the Conterminous US (2018). For this site, the disaggregate earthquake has a Mode (largest m-r-ε_o) magnitude (M) of 7.7 occurring at a radius of 18.84 km

(11.71 miles) west of the site. Table 2.3 provides the faults modeled that pose a significant contribution to the seismic hazard, distance from the site, and the magnitude it can generate.

Table 2.3: Faults, distance from site, and magnitude			
Fault Name (UCERF[1] Fault Model 3.1)	Distance, km (miles)	Direction from Site	Magnitude (M)
San Andreas (North Coast)	19.63 (12.20)	West	7.86
Rodgers Creek - Healdsburg	13.98 (8.69)	East	7.30
Maacama (1)	20.97 (13.03)	East	7.40
Maacama (2)	23.39 (14.53)	East	7.42
Fault Name (UCERF Fault Model 3.2)	Distance, km (miles)	Direction from Site	Magnitude (M)
San Andreas (North Coast)	19.63 (12.20)	West	7.87
Rodgers Creek - Healdsburg	13.98 (8.69)	East	7.30
Maacama (1)	20.97 (13.03)	East	7.39

[1]UCERF is the third Uniform California Earthquake Rupture Forecast that provides authoritative estimates of the magnitude, location, and likelihood of earthquake fault rupture throughout the state.

We note that other faults in the region not listed in this table may also generate strong seismic shaking at the project site. Plate 4 shows the Regional Faults located in the vicinity of the site.

2.3.2. Fault Rupture

Fault rupture is a failure mechanism where the surface of the earth breaks along a fault. An active fault is defined as a fault that has ruptured in the last 11,000 years. There are no known active faults that trend and align towards the project site and the site is not located within an Alquist-Priolo Earthquake Fault Zone (formerly known as a Special Studies Zone). Therefore, we consider the potential for fault rupture at the site is negligible and **not a design consideration.**

2.3.3. Strong Ground Motion

For seismic design, mapped based spectral accelerations may be used provided the allowable exceptions are implemented in the project.

2.3.4. Liquefaction

Liquefaction is a phenomenon when saturated loose granular sand and silt lose their strength and fail during a seismic event. The granular soils that can liquefy are typically clean and poorly graded. Liquefiable soils are typically found in Holocene-age deposits, which are less than 11,700 years old. Non-to low plastic silts and clays can also lose strength during an earthquake event. The consequences of liquefaction can be severe and include ground failure and subsidence, structural damage to buildings and infrastructure, and flooding and groundwater movement. The liquefaction related phenomena are defined into three groups as flow liquefaction, cyclic liquefaction, and cyclic softening.

- **Flow liquefaction** is a sudden and catastrophic loss of strength in the soil. It typically occurs with saturated, loose contractive sands under static loading may be triggered by an earthquake when the static stress is greater than the post-liquefaction strength of the soil. The soil will suddenly flow like a fluid and will occur generally resulting in large displacements.

- **Cyclic liquefaction**, or triggering of liquefaction, is a temporary loss of effective stress and strength due to earthquake shaking, but may not lead to large movements as in flow liquefaction. Like flow liquefaction, cyclic liquefaction is common in saturated, loose, granular soils. The cyclic shear strains cause pore water pressure to build up which reduces the effective stress until the soil almost behaves as a liquid. Cyclic liquefaction may cause settlement, tilting, or lateral spreading on gentle sloping or flat ground, or ground manifestations or ejection of surficial sediment (i.e. sand boils). The magnitude of lateral spreading can range from inches to feet and are usually prevalent in the direction of a free face along gentle slopes or near bodies of water especially near riverbanks, lakes, or coastal areas. Impacts from lateral spreading can range from damage to structures, instability of slopes, or disruption to utilities.

- **Cyclic softening** is the progressive degradation of strength in cohesive soils (or low plasticity clay and silt) under an earthquake without the full pore water pressure build up. This is common with clay and silt soils with low plasticity and low strength. The strain accumulation leads to a structure breakdown in the clay matrix, causing reduced stiffness and strength. Cyclic softening is not as sudden as flow liquefaction, but can still result in permanent deformation, slope movement, or bearing failure.

The site is not mapped in a liquefaction zone by CGS, thus we consider the potential for liquefaction at the site is **negligible and not a design consideration.**

2.3.5. Landsliding and Slope Stability

Landslides tend to occur in weak soil and rock on sloping terrain. The parcel to be improved is relatively level across the site, thus we consider the potential for landslides and slope instability is negligible and **not a design consideration.**

2.3.6. Tsunami and Seiche Inundation

A tsunami is a wave, or series of waves, generated by an earthquake, landslide, volcanic eruption, or even large meteor hitting the ocean. The sea floor experiences significant upward movement resulting in a rise of water at the ocean surface. The mound water moves away from the center in all directions as a tsunami (CGS, Note 55). The site is not located within a tsunami hazard area mapped by the California Geologic Survey. We conclude the risk of tsunami is negligible and **not a design consideration.**

A seiche is a temporary disturbance or oscillation in the water level of a lake or partial enclosed body of water, especially one caused by changes in atmospheric pressure. Detention basins exist approximately 950 feet away from the site. We conclude the risk of seiche is negligible and **not a design consideration**.

2.4. GEOLOGIC AND SEISMIC HAZARD SUMMARY

Table 2.4: Geologic and Seismic Hazards Summary		
Geologic or Seismic Hazard	Findings	Design or Construction Consideration
Geologic Hazards		
Expansive Soils	Not Encountered	No
Weak Compressible Soils	Not Encountered	No
Corrosive Soils	Not Encountered	No
Flooding	Area of Minimal Flood Hazard, Zone X	No
Radon-222 gas	EPA Zone 3	No
Naturally Occurring Asbestos	Not encountered	No
Hydrocollapse	Not encountered	No
Seismic Hazards		
Historical Seismicity	Active seismic area	**Yes**
Fault Rupture	None	No
Strong Ground Motion	Active seismic area	**Yes**
Liquefaction	Not within liquefaction zone per CGS	No
Landsliding and Slope Stability	Not encountered	No
Tsunami and Seiche	Not encountered	No
Other Hazards	None	No

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PART 3. FIELD EXPLORATION AND LABORATORY TESTING

3.1. GENERAL

Prior to initiating our field exploration, the planned exploration locations were checked for underground utilities by contacting Underground Service Alert (USA) which located underground and aboveground utilities within the vicinity of our proposed explorations. Based on the planned depths of the explorations and review of the available data regarding depth to groundwater, a drilling permit with the County of Sonoma Permit and Resource Management Department was required.

The soil borings were advanced on November 14, 2025. The locations of the soil borings are shown on Plate 6.

3.2. BORINGS

Borings

Four (4) soil borings identified as Borings B-1, B-2, B-3, and B-4 were drilled to depths of between approximately 16½ and 31½ feet bgs to assess subsurface conditions and one (1) boring identified as Boring B-5 was drilled to approximately 2½ feet bgs for pavement design. The borings were performed using a truck-mounted CME 75 drill rig equipped with 4½ inch outer diameter solid-stem augers. One (1) boring identified as P-1 was advanced with a hand auger to approximately 4¼ feet bgs and utilized to perform percolation testing.

Samples were collected from the borings using split barrel soil samplers advanced using an automatic 140-pound hammer free-falling 30 inches. The samplers utilized were either the Modified California sampler with a nominal outside diameter of 3 inches or standard penetration test sampler (i.e., SPT), without liners, with a nominal outside diameter of 2½ inches. The number of blows required to drive the samplers for the 18-inch sample interval was recorded on the Boring logs. The sum of the blow counts for the final 12 inches of driving is recorded as the “N Value”. The N Values reported are raw values obtained in the field and are not corrected for overburden, rod length, bore diameter, and hammer energy effects. Relatively undisturbed bulk samples were collected at select depths from the bores and transported to our laboratory for further analysis and geotechnical testing. The borings were backfilled with cement grout upon completion.

The boring logs are presented in Appendix A. The locations of the borings advanced for this study and others referenced are shown on Plate 6.

3.3. SHEAR WAVE VELOCITY TESTING

Siegfried Engineering’s geophysical site evaluation included subsurface seismic imaging and earthquake ground shaking potential evaluation using Terēan’s VsSurf ReMi™ seismic data processing software. Seismic surveys were performed to determine the seismic site class per ASCE 7-22 using the weighted-average soil shear wave velocity for the upper 100 feet (Vs100). The survey was performed by recording active and/or ambient (passive) seismic sources. The seismic recording array for this survey consisted of 24, 4.5 Hz geophones at 10 ft spacing for a total survey length of approximately 230 ft. Noise was generated by a hammer impact, walking or driving a vehicle along the survey line during data acquisition while ambient noise was generated from traffic along the nearby roads. The seismic data was acquired using a ReMiDAQ™ 4-24 channel seismograph, while data was processed using Terēan's ReMi™ software (terean.com/products).

The line surveyed indicated the following indicate a weighted-average soil shear wave velocity of the upper 100 feet, $\overline{v}_s$, of 994 ft/s. This results in a designation of a seismic Site Class D according to Table ASCE 7-22, 20.2-1.

The locations of the geophysical survey line advanced for this study is shown on Plate 6. Site Classification data is presented in Appendix B.

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3.4. LABORATORY TESTING

Laboratory testing was performed to quantify and evaluate the geotechnical characteristics of the soil samples obtained at the site. The following laboratory tests were performed on selected samples from the borings:

- Moisture Content (ASTM D 2216)
- Dry Density (ASTM D 2937)
- Atterberg Limits (ASTM D 4318)
- Particle Size Distribution (ASTM D 6913)
- Expansion Index (ASTM D 4829)
- Unconfined Compressive Strength (ASTM D 2166)
- R-Value (CT301)
- pH (ASTM G51)
- Electrical Resistivity (ASTM G187)
- Sulfate, Chloride, Nitrate, Fluoride, and Phosphate Content (ASTM D4327)
- Redox Potential (ASTM G 200)
- Sulfides (4500-D)
- Ammonium, Lithium, Sodium, Potassium, Magnesium, and Calcium Content (ASTM D6919)

Tests were performed by Siegfried, CTS (Rocklin), and Project X Corrosion Engineering.

The results of the tests performed above are discussed in the Subsurface Conditions section of the report (Section 4.1). They are also presented on the boring logs provided in Appendix A, and as summaries and reports provided in Appendix C.

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PART 4. FINDINGS

4.1. SUBSURFACE CONDITIONS

The field exploration encountered asphalt concrete, aggregate base, undocumented soil fill and sandstone associated with the Wilson Grove Formation.

4.1.1. Existing Pavement Section

At the time of the study the surface of the site at the boring locations were paved with asphalt concrete over a layer of aggregate base. The existing asphalt concrete (AC) pavement ranged from approximately 3 to 4 inches thick. The AC was underlain by approximately 8 to 9 inches of aggregate baserock (AB).

4.1.2. Undocumented Fill

Undocumented soil fill was observed near the northwest side of the site in Borings B-1 and P-1 to a depth of approximately 2¼ feet bgs. The undocumented soil fill observed consisted generally of clayey gravel with sand.

4.1.3. Wilson Grove Formation, late Miocene to Pliocene (Geologic Map Symbol, Mwg)

The near surface soils underlying the pavement sections and undocumented fill included native soils comprised of alternating layers of clayey sand and silty sand to the maximum depths explored at approximately 31½ feet bgs. Loose silty sand was identified at approximately elevation 185, 178, 183, and 180 for Borings B-1 through B-4 respectively. The near surface clayey sand was tested to have a liquid limit (LL) of 30, a plasticity index (PI) of 15, an expansion index (EI) of 9, and unconfined compressive strength ranging from 2793 to 6350 psf.

Refer to the boring logs in Appendix A for additional detail description.

4.2. GROUNDWATER CONDITIONS

Static groundwater was encountered in Boring B-1 at approximately 22 feet bgs, Boring B-2 at approximately 24 feet bgs, and Boring B-4 at approximately 24 feet bgs during drilling of the bores advanced for the project. Immediately after completion of drilling at Boring B-4 the groundwater rose to approximately 14 feet bgs prior to grouting. The boreholes were required to be backfilled after drilling in accordance with the local drilling permits, so it is possible the groundwater levels were not at equilibrium

Variations in groundwater levels may occur due to variations in ground surface topography, subsurface geologic conditions and structure, seasonal rainfall, local irrigation practices, new construction, and/or other factors beyond our control.

The California Department of Water Resources maintains a database of groundwater levels from well sites drilled in the vicinity for the Sustainable Groundwater Management Act (SGMA). The website https://storymaps.arcgis.com lists the following wells in proximity to the site with the corresponding depth to groundwater.

Table 4.1: Groundwater Levels from DWR Wells						
Well Site	**Distance and Direction**	**Ground Elevation (ft)**	**Measured Depth to Water (ft)**	**Last Measurement Date**	**Measured Depth to Seasonal High Groundwater (ft)**	**Date of Seasonal High Groundwater Measurement**
384111N1228448W001	Mile N	183.48	15.11	10/8/2025	0.2	04/18/2006
383734N1227910W001	Mile SE	95.519	37.53	10/8/2025	30.33	04/02/2025

Based on the groundwater levels encountered during this study and the data reviewed from the available DWR wells, groundwater is not expected in the upper 10 feet of the surface. The published data suggest major fluctuations in the measured depth to groundwater occur when taking measurements at various times of the year. Therefore, we consider shallow ground water **to not be a design and construction consideration unless excavations or utilities are expected at a depth approaching 10 feet.**

PART 5. CONCLUSIONS

Based on our understanding of the project and our findings, we conclude the project is feasible for design and construction from a geotechnical engineering perspective. Based on our findings, we conclude the following items should be addressed during design and construction:

5.1. UNDOCUMENTED FILL

The presence of undocumented soil fill from prior grading activity at the site may cause undesirable settlement unless they are mitigated. We recommend that loose soils (undocumented soil fill) as encountered in Borings B-1 and P-1 be recompacted to provide an engineered fill for foundation support. Soils identified as loose native, undisturbed native, or undocumented fill may be reused as engineered fill provided they are clean and free of deleterious material and debris, and moisture conditioned and recompacted as recommended in this report.

- The building footprints and foundations should be supported on firm native soils or compacted engineered fill. Where undocumented fills are recompacted, we recommend the recompaction extend laterally at least 5 feet beyond the footprint of the building. Refer to Section 6.9 through 6.11 for earthwork criteria.
- For lightly loaded, nonstructural elements such as trash enclosures, exterior flatwork, and pavements overexcavation is not necessary. However, the contractor should adhere to the grading requirements presented in the earthwork section of this report.

5.2. BUILDING LOAD CONDITIONS

For this report, we assumed column and wall loads of 50 kips and 5 kips per foot, respectively. A structural or post-tensioned mat foundation is not considered necessary for the anticipated building loads and soil conditions but may be considered as an optional enhancement if the owner desires additional stiffness to further limit differential movements. The footprints of the residential homes should not be within the dripline of the large mature trees that remain onsite.

5.3. OTHER CONCLUSIONS

Based on the review of the existing available groundwater elevation data and that obtained from this study, we conclude that groundwater is not likely to impact design unless deep utilities are installed with excavations approaching approximately 10 feet in depth.

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PART 6. RECOMMENDATIONS

6.1. SHALLOW SPREAD FOUNDATIONS

6.1.1. Allowable Design Criteria

Shallow spread foundations may be incorporated for structure when designed according to the following parameters presented in Table 6.1.

Table 6.1: Shallow Foundation Design Criteria

Criteria	Variable	Design Criteria	Comments
Minimum Continuous Foundations Depth	D	12 inches	Note 1
Minimum Spread Foundations Depth	D	12 inches	Note 1
Minimum Width	B	12 inches	
Allowable Bearing Capacity	q_a	1,500 psf	Note 2 and 3
Estimated Static Settlement	S_{static}	1 inch	
Estimated Differential Settlement	S_{diff}	½ inch	
Allowable Passive Pressure	P_p	260 pcf	Note 5
Allowable Friction Factor	μ	0.42	Note 5

[1]Depth of footing is measured from the lowest ground elevation to the base of the footing and does not include under slab materials (i.e., capillary break gravel and sand, or aggregate base).
[2]Allowable bearing capacity may be increased at a rate of 20 percent for each additional foot of embedment to a maximum of three times the designated value. The allowable bearing capacity is a net value so the weight of the foundation extending below grade may be disregarded when computing dead loads. The allowable bearing capacity is based on a factor of safety of 3 and is applicable to dead plus live load combinations. This value may be increased by 1/3 for short-term loading due to wind or seismic forces.
[3]Based on footings bearing over a recompacted engineered fill or firm native soil for the main structure. Footings for non-structural uses such as for signs or trash enclosures, etc., do not require overexcavation but instead recompaction underneath footings per this report.
[4]Total settlement is anticipated to occur rapidly and should be essentially complete following initial application of the loads.
[5]Passive pressure and friction factor are allowable values based on a safety factor of 1.5. The upper 1 foot of soil should be neglected for passive pressure, unless it is confined by exterior slabs, slabs on grade, or pavements. The structural engineer should evaluate if additional safety factors are applicable.

6.1.2. Lateral Resistance

Resistance to lateral loads may be provided from frictional forces between the bottom of the footing and the underlying soils, and by passive soil resistance against the sides of the foundations. If moisture barriers or other substances are placed beneath footings, the coefficient of friction can be significantly lower. The passive pressure should be neglected to a depth of 1 foot where the ground adjacent to the foundation is not covered by a slab or pavement. Passive pressure and friction parameters presented in Table 6.1 are allowable with a safety factor of 1.5 applied for cohesionless soils. The appropriate factor of safety should be determined by the project Structural Engineer. For cohesionless soils, when friction and passive pressure are combined, reduce passive pressure by 50 percent to reflect the displacement required to reach the passive condition.

6.1.3. Seismic Ties

As outlined in CBC 1809.13, where a structure is assigned to Seismic Design Category D, E, or F, individual spread footings founded as Site Class E or F shall be interconnected by ties. Unless it is demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade, ties shall be capable of carrying, in tension or compression, a force equal to the lesser of the product of the larger footing design gravity load times the seismic coefficient, S_{DS}, divided by 10 and 25 percent of the smaller footing design gravity load. Site Class E or F soils were not encountered at the site, therefore seismic ties are not required.

6.1.4. Construction Considerations

Foundation excavations should be firm, neat, and clean of debris, loose or soft soil, or water prior to placing any reinforcement. All footings excavations should be observed by the project Geotechnical Engineer or their designated representative just prior to placing reinforcing steel or concrete to verify the recommendations presented herein are implemented during construction.

Additionally, footings may experience an overall loss of bearing capacity or an increased potential for settlement when located near existing or future utility trenches. Further, stress imposed by the footings on the utility lines may cause cracking, collapse, and/or a loss of serviceability. To reduce this risk, open or backfilled trenches parallel with a footing shall not be below a plane having a downward slope of 2 horizontal to 1 vertical (2:1) slope from a line 9 inches above the bottom edge of the footing and not closer than 18 inches from the face of the footing. When pipes cross under footings, the footings shall be specially designed. This may require encasement of the pipe with lean concrete. Pipe sleeves shall be provided where pipes cross through footings or footing walls and sleeve clearances shall provide for possible footing settlement but not less than 1 inch all around the pipe.

Where it is necessary for to construct utilities parallel and adjacent to the foundations that are within the foundation zone of influence defined above and the foundation has been loaded, the following strategies may generally be implemented in the field with these conditions:

1. When pipes cross under footings, the footings shall be specially designed. This may require encasement of the pipe with lean concrete. Pipe sleeves shall be provided where pipes cross through footings or footing walls and sleeve clearances shall provide for possible footing settlement but not less than 1 inch all around the pipe.
2. When pipes are parallel to footings, the contractor should limit the amount of open excavation so that the excavation, installation of bedding, pipe, and backfill are completely backfilled with controlled low strength material (CLSM) above the zone of influence at the end of the shift.
3. When pipes are parallel to footings, and the contractor does not plan on limiting the amount of open excavation the excavation shall be shored utilizing appropriate surcharges from the foundation being potentially undermined. This may depend on localized conditions such as the dimensions away from the footing and the depth below the footing. The shoring and methods used is the responsibility of the Contractor and should be design by a licensed professional.

Site specific conditions in addition to those noted above may be required during design. If this is the case, the GEOR shall be notified to address and comment accordingly.

6.2. DRILLED PIER FOUNDATIONS

6.2.1. Axial Capacity

Where needed, specifically for light pole design, cast-in drilled hole concrete piers having a minimum diameter of 18 inches can be used. For axial capacity, the piers may be designed using the following values:

Table 6.2: Axial Capacity for Drilled Piers

Depth from top of pier (ft)	Soil Type	Average Friction Angle, ϕ (sands)	Average Undrained Shear Strength (clay) (psf)	Allowable Unit Skin Friction (psf)
0-10	Sand	32	---	300

The upper 24 inches of the shaft should be neglected in the determination of the frictional component of the axial capacity. The frictional capacity of the pier was based on a safety factor of 2.5.

The allowable uplift capacity may be taken as 250 psf plus the weight of the pier. The uplift capacity of the pier was based on a safety factor of 3.

6.2.2. Estimated Settlement

We estimate that the proposed structure, designed and constructed as recommended herein, will undergo total settlements of up to approximately 1 inch. Differential settlements are typically less than about one-half of the total settlement.

6.2.3. Lateral Resistance

The depth of drilled piers required to resist lateral loads may be determined using the design criteria established in Section 1807.3.2 of the 2025 California Building Code. For areas where no lateral constraint is provided at the ground surface, such as by rigid floor or pavement, the nonconstrained formula (Equation 18-1) may be used. For areas where lateral constraint is provided at the ground surface, such as by rigid floor or pavement, the constrained formula (Equation 18-2 or 18-3) may be used. The allowable lateral bearing pressure of 150 psf/ft may be used in determining the required depth.

6.2.4. Construction Considerations

Foundation excavations should be firm, neat, plumb, and clean of debris, loose or soft soil, or water prior to placing any reinforcement. All pier excavations should be observed by the project Geotechnical Engineer's representative just prior to placing reinforcing steel or concrete to verify the recommendations presented herein are implemented during construction. The inspections should also verify immediately that excessive sloughing and/or caving has not reduced the required hole depth. This may be accomplished by using a weighted tape measure or similar measuring device. Steel reinforcement should be placed the same day the concrete will be placed. Additionally, drilled pier excavations should be scheduled to allow concrete in each pier to set overnight before drilling adjacent holes that are closer than 4 diameters center to center.

Concrete used for drilled pier construction should be discharged vertically into the drilled holes to reduce aggregate segregation. The pier concrete should not be allowed to free fall against the steel reinforcement or sides of the excavation. Sufficient space should be provided in the pier reinforcement cage during fabrication to allow insertion of a pump hose or

tremie tube for concrete placement. The pier reinforcement cage should be installed, and the concrete pumped and vibrated during placement immediately after drilling is completed.

To develop the skin friction values, concrete used for drilled pier construction should have a slump of 4 to 6 inches for dry placement methods or at least 8 inches if slurry drilling is used. The concrete mix should be designed by a registered design professional to include admixtures and/or water cement ratios to achieve the recommended slumps. We do not recommend adding water to achieve slump.

If slurry methods are used for pier construction, tremie concrete should be performed in accordance with American Concrete Institute (ACI) 204R requirements. The tremie pipe should be rigid and remain several feet below the surface of the in-place concrete at all times. This will allow for a seal to be formed between the water or slurry and the fresh concrete. The upper concrete seal will likely be contaminated with water and should be pumped out until fresh concrete is exposed at the top of the pier.

If casing is considered, it should be removed from the hole as concrete is being placed. The bottom of the casing should be maintained at least 5 feet below the top of the concrete during casing withdrawal and concrete placement operations.

Additionally, footings may experience an overall loss of bearing capacity or an increased potential for settlement when located near existing or future utility trenches. Further, stresses imposed by the footings on the utility lines may cause cracking, collapse, and/or a loss of serviceability. To reduce this risk, footings should be extended below a 2 horizontal to 1 vertical, 2(h) to 1(v), plane projected upward from the closest bottom corner of the trench. Foundation excavations within clay soils that are left exposed for extended periods of time may shrink and result in cracking at the surface. They should be kept moist to seal the cracks prior to placing reinforcing steel and concrete.

6.3. RETAINING WALLS

We recommend retaining structures be designed for active pressures (i.e., cantilever conditions) or at-rest pressure if it is braced at the top (as in a roof connection) presented in Table 6.3.

6.3.1. Active and At-Rest Pressure

Table 6.3: Lateral Earth Pressures

Condition	Lateral Earth Pressure Equivalent Fluid Density (pcf)	Drained Case[1,3]	Undrained Case[2,3]
Active Case	σ_a	37	80
At – Rest Case	σ_o	56	89
Seismic Increment	P_{AE}	14 x H^2 (psf)	

[1]Drained case assumes fully drained conditions and level backfill. Undrained cases assume hydrostatic conditions.
[2]Undrained cases assume hydrostatic conditions based on buoyant density of soil.
[3]Lateral earth pressures are presented as ultimate.

No additional surcharge stresses were included in the pressures noted above. Surcharge pressures will depend on the load conditions (i.e., equipment and construction loads such as material or soil stockpiles, and distance from wall where load is applied, etc.) If specific surcharge pressures need to be considered, additional analysis will be required with the load conditions given.

In general, walls subject to surcharge loads should be designed for an additional uniform lateral load pressure equal to one-third the anticipated surcharge loads for unrestrained walls and one-half the anticipated surcharge loads for restrained walls. The project engineer should be consulted with to confirm applicable values.

6.3.2. Seismic Design for Retaining Walls

Section 1807.2.2 of the 2025 California Building Code notes for structures assigned to Seismic Design Category D, E or F, the design of retaining wall supporting more than 6 feet of backfill height shall incorporate the additional seismic lateral earth pressure.

Under seismic conditions, the active incremental seismic force along the face of a retaining wall should be added to the static active pressures, and can be calculated as follows:

$$\Delta P = 14 \times H^2$$

H is the design height of the wall (in feet) and ΔP is the active incremental seismic force in pounds per foot of wall. This force has a horizontal direction and should be applied at 0.6 x H from the base of the wall.

6.3.3. Wall Drainage

Where retaining walls are designed to be drained, drainage may be provided using a 4-inch-diameter perforated pipe embedded in Caltrans Class 2 permeable material, or free-draining gravel surrounded by synthetic filter fabric. The thickness of the drain blanket should be at least 12 inches. As an alternative, prefabricated synthetic wall drain panels can be used. The drain blanket should extend from the bottom of the wall to about one foot below the finished grades at the top of the wall. The upper one foot of wall backfill should consist of onsite compacted clayey soils. Drainage should be collected by a perforated pipe and directed to an outlet approved by the Civil Engineer. Subdrain pipe, drain blanket and synthetic filter fabric should meet the minimum requirements presented herein. Clay soils should not be incorporated into retaining wall fills.

6.4. SEISMIC DESIGN CRITERIA

The structural engineer should confirm the design of the proposed improvements is in accordance with the requirements of governing jurisdictions and applicable building codes in addition to the appropriate values to use for this structure. Map-based design criteria presented in this section are based on entering the site coordinates (latitude and longitude), the risk category, and the Site Class. The measured shear wave velocity for the upper 100 feet of soil profile, $\overline{v}_s$, is 994 ft/s and corresponds to Site Class D per the ASCE 7-22 guidelines. Table 6.5 presents the seismic design parameters for the site in accordance with the 2025 CBC/ASCE 7-22 criteria and the ASCE Hazard Tool accessed on November 22, 2025.

Table 6.4: Seismic Design Criteria per 2025 CBC and ASCE 7-22[1]	
Seismic Parameter	**Value**
Latitude 38.402734° Longitude -122.842217°	---
Measured $\overline{v}_s$ is 994 ft/s and corresponds to Site Class D	D
Risk Category	II
Peak Ground Acceleration, PGA_M	0.53g
Mapped MCE_R Spectral Response Acceleration at 0.2-second period, S_s	1.5g
Mapped MCE_R Spectral Response Acceleration at 1.0-second period, S_1	0.6g
Site-Adjusted MCE_R Spectral Acceleration at 0.2-second period, S_{MS}	1.62g
Site-Adjusted MCE_R Spectral Acceleration at 1.0-second period, S_{M1}	1.53g
Design Spectral Response Acceleration at 0.2-second period, S_{DS}	1.08g
Design Spectral Response Acceleration at 1.0-second period, S_{D1}	1.02g
Seismic Design Category for Short Period Response Acceleration	D
Seismic Design Category for 1-s Period Response Acceleration	D
Long-period transition, T_L	12 sec
Short-period transition, $T_S = S_{D1}/S_{DS}$	0.94sec

[1]A site-specific response spectra and ground motion study was not performed for this study. The structural engineer should confirm the appropriate values for use on the project during foundation design. If a site-specific hazard analysis is required, please contact our firm.

6.5. CORROSIVITY

For cast iron alloy pipes, the American Water Works Association (AWWA) developed a numerical soil corrosivity scale to identify the severity by assigning points for different variables such as the resistivity, pH, Redox Potential, Sulfides, and Moisture. When total points on the AWWA scale are at least 10, the soil is classified as corrosive to cast and ductile iron pipes and use of cathodic protection is often recommended. The soil at the site resulted in a total point value of less than 10 and is not considered corrosive to ductile iron pipes.

The American Concrete Institute (ACI) 318 code, Table 19.3.2.1 is reproduced in Table 6.5 and indicates the requirements for concrete by exposure class. Refer to the commentary in the ACI reference for additional comments and notes included in the table.

Table 6.5: Soil Corrosivity American Concrete Institute 318 Code						
Exposure Class	Maximum w/cm	Minimum f'c, psi	Cementitious Materials - Types			Calcium Chloride Admixture
			ASTM C150	ASTM C595	ASTM C1157	
S0	N/A	2500	N. T. R.[1]	N. T. R.	N. T. R.	N. R.[2]
S1	0.50	4000	II	Types with (MS) designation	MS	N. R.
S2	0.45	4500	V	Types with (HS) designation	HS	Not permitted
S3 – Option 1	0.45	4500	V plus pozzolan or slag cement	Types with (HS) designation plus pozzolan or slag cement	HS plus pozzolan or slag cement	Not permitted
S3 – Option 2	0.40	5000	V	Types with (HS) designation	HS	Not permitted

[1] N. T. R. – No Type Restriction
[2] N. R. – No Restriction

Based on the testing performed, the soils evaluated would classify as a Class "S0" where there are no type restrictions for the cementitious materials used.

6.6. INTERIOR SLAB-ON-GRADE

Per the 2025 California Residential Code, interior slabs-on-grade for residential construction should be a minimum of 3½ inches and verified by the designer. *The slab-on-grade thickness may need to be increased depending on anchorage requirements.* The slab-on-grade may be designed with a subgrade modulus of *100 pci* assuming an engineered fill pad. Moisture barriers should be considered if moisture sensitive floor coverings, coatings, underlayments, adhesives, moisture sensitive goods, humidity-controlled environments, or climate-cooled environments are initially anticipated, or intended in the future. If a moisture barrier is to be laid to protect floor finishes, we recommend the permeance as tested before and after mandatory conditioning be less than 0.01 perms, be a flexible membrane at least 10 mils thick, such as Stego® Wrap, complying with ASTM E 1745-97 "Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs", and be placed in accordance with ASTM E 1643-98 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs". A layer of crushed rock at least 4 inches thick should underlie the vapor retarding membrane. The rock shall be clean, crushed, and free-draining having a nominal 1-inch maximum size with less than 3 percent passing the No. 200 sieve.

6.7. EXTERIOR FLATWORK

Exterior flatwork for pedestrian traffic should be at least 4 inches thick. The flatwork should be underlain by a base with thickness by at least 4 inches or whichever thickness is required in the local jurisdiction. The base materials should be placed over a subgrade prepared in accordance with the recommendations of this report. For shrinkage control, we recommend the slabs be reinforced with minimum No. 4 bars at 18 inch-centers, both ways, centered on "dobies" or similar supports at middepth throughout the slab, and, due to the expansive site soils, bars should continue through joints. However, the slabs should not be pinned to the building walls. The civil engineer should determine the final slab thickness, reinforcing, and joint spacing based upon the anticipated loads.

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6.8. FLEXIBLE AND RIGID PAVEMENTS

6.8.1. Flexible (Asphalt Concrete) Pavements

Conventional Type A Hot Mix Asphalt (HMA) and Aggregate Baserock (AB) that comply with Caltrans Standard Specifications can be used in combination to form asphalt concrete (AC) pavement sections. Depending on the contractors means and methods, the existing AC and underlying AB may be pulverized and blended to meet Aggregate Subbase (ASB) requirements. This would allow for reuse of the exiting pavement section as an aggregate subbase while reducing the amount of import AB needed for the pavement section. With a design Resistance "R" Value of 30 and Traffic Index (TI) of 4, 5, 6, 7, and 8 the pavement sections are presented in Table 6.8 for combinations of AC over AB, AC over ASB, and AC over AB over ASB.

Table 6.6: Recommended Flexible (Asphalt Concrete) Pavement Sections

Traffic Index[1]	Asphalt Concrete (in)	Class 2 Aggregate Base R=78 (in)	Aggregate Subbase[2] R=60 (in)	Total Section (in)
5	3	6	---	9
5	4	---	5	9
5	3	5	5	13
6	3 1/2	8	---	11 1/2
6	5 1/2	---	5	10 1/2
6	3 1/2	5	5	13 1/2
7	4	10	---	14
7	6 1/2	---	5	11 1/2
7	4	5	5	14
8	5	11	---	16
8	7 1/2	---	6	13 1/2
8	5	5	6	16

[1]Pavement sections presented are applicable for the Traffic Index shown which should be verified by the Civil Engineer.

[2]ASB thickness assumes existing onsite asphalt and aggregate base are blended to create an ASB layer meeting Cal Trans requirements.

If adverse conditions are encountered during the preparation of subgrade materials, special construction methods may need to be employed. Subgrade materials should be processed to a minimum depth of 12 inches below the Class II aggregate base and compacted to a minimum 95 percent of ASTM D1557 laboratory maximum dry density at or near the optimum moisture content. Class II Aggregate Base material should be compacted to 95 percent of ASTM D1557 laboratory maximum dry density at or near optimum moisture content. The base should meet the quality requirements outlined in Section 26 of the Caltrans Standard Specifications.

The pavement section is intended as a minimum. Positive site drainage should always be maintained. Water should not be allowed to pond or seep into the ground. If the average daily traffic (ADT) increases beyond that intended, as reflected by

the assumed traffic designation, increased maintenance could be required for the pavement section. The project Civil Engineer should determine the Traffic Index appropriate for the project.

6.8.2. Rigid (Portland Cement Concrete) Pavements

Where rigidity of pavement is desired for areas designed for high volume vehicular traffic, heavy maintenance or equipment traffic, entry driveways or trash enclosure slabs, we recommend using Portland cement concrete paving. The rigid concrete pavement section presented in Table 6.7 is based on a composite subgrade modulus of 200 pci. The composite subgrade modulus considers a specified thickness of aggregate base over a compacted native subgrade. The concrete thickness is based on a minimum concrete modulus of rupture of 550 psi. In addition, the driveway slabs should be designed with thickened edges at least twice the slab thickness. The design, applicable section, and thickness of rigid pavement slabs should be confirmed by the design professional.

Table 6.7: Recommended Rigid (Portland Cement Concrete) Pavement Sections

Traffic Category	ACI 330 Classification	Trucks per day[1]	Rigid Concrete[2] (in)	Class 2 Aggregate Base[3] (in)	Total Section (in)	Max Joint[4] Spacing (ft)
Car Parking / Driveways	A	1	4	4	8	10
Entrance and Truck Service Lanes	B	10	4½	4	8½	10
Buses	C	5	7	4	11	15
Heavy Duty Trucks	D	1	4½	4	8½	10
Garbage or Fire Truck Lanes	E	1	6¼	4	10¼	12½

[1]Trucks are defined as vehicles with at least six vehicles and excludes panel trucks, pickup trucks, and other four wheeled vehicles
[2]Concrete thickness is based on 20-year design life WITH concrete curb and gutter or concrete shoulders. Add one inch thickness to concrete if based on 20-year design life WITHOUT concrete curb and gutter or concrete shoulders. A minimum concrete modulus of rupture of 550 psi (compressive strength equivalent to at least 3,700 psi) is assumed.
[3]Based on a firm and unyielding subgrade where the upper 8 inches are moisture conditioned and compacted as recommended in this report for pavement subgrade. Tensar InterAx 750 geogrid can be used to reinforce unstable areas if they area encountered.
[4]Dowels are not recommended unless rigid concrete pavement is greater than 6 inches

6.8.3. Construction Considerations for Pavements

Additional requirements and/or assumptions for pavements are outlined below:

- Baserock materials used should comply with the requirements outlined in Section 26 of the State Standard Specifications. We strongly recommend that baserock be a virgin, crushed aggregate product.
- Baserock should be firm and stable prior to placing asphalt and compacted to a minimum of 95 percent based on the ASTM D 1557 test method.
- Subgrade beneath paved areas shall be compacted to a minimum of 95 percent based on the ASTM D 1557 test method.
- Proof rolling of subgrade and of baserock with fully loaded water truck, or equivalent, should be performed under observation of our field representatives to detect for any instabilities of pavement subgrade and baserock following final grading. Proof rolling of subgrade should occur immediately (i.e., less than 24 hours) before placement of baserock. Baserock should be proofrolled immediately prior to placement of tack coat.
- Subgrade preparation is performed as outlined in the Earthwork sections of this report.

6.9. EARTHWORK

6.9.1. Site Preparation

Prior to any site grading, the existing structure, concrete slabs, foundations, and surficial deleterious materials from previous use should be demolished and removed outside of the construction limits. The depth of removals should expose undisturbed native soils. These materials should not be incorporated into any structural fills. Vegetation and organics within grading limits should be stripped and removed offsite. The stripping should be performed to provide a subgrade with organic content less than 3 percent of organics and to the satisfaction of the geotechnical representative. Trees and their root foundation should be removed entirely. No measurements were made on the root layers but based on the growth of the trees, it is anticipated that excavation and removal of the trees will create large void spaces and disturb the existing ground. The cavities created by complete removals of the root balls from the brush and trees should be replaced with compacted engineered fill.

Site preparation will require recompaction of undocumented soil fills present near boring B-1. The preliminary grading plan indicates minor cuts down to 2 feet and fills up to 2½ feet are required achieve the desired pad grades. To reduce the potential for differential settlement of slabs, the building pads should consist of engineered fill such that the entire footprint and 3 feet laterally beyond are processed as engineered fill for the upper 12 inches. This may require overexcavation and recompaction in pads that have cuts and fills. Pads should avoid being partially within cut and partially as fill.

Other site preparation considerations include:

- Once the existing church is abandoned and demolished, the existing foundations and underground piping and material should be completely removed to expose firm native soil, then backfilled with moisture conditioned engineered fill.
- Roots larger than ¼ inch within the grading plan should be completely removed upon consultation with the project Arborist, Landscape Architect, and/or geotechnical engineer.

6.9.2. Site Grading

Prior to placing any fills, the exposed subgrade should be scarified 12 inches, moisture conditioned and mechanically compacted. Once the exposed subgrade is moisture conditioned and compacted, the new fill meeting the requirements of in this report should be moisture conditioned and placed horizontally in 8-inch maximum lifts, then compacted. Moisture content and the level of compaction will vary according to the definable feature. Adjacent to structures, thinner lifts may be required based on the equipment and means/methods used in the field. The acceptance criteria are presented in Section 6.11.

6.9.3. Engineered Fill

Imported engineered fill may be used and should be free of organic or other deleterious debris, non-plastic, and less than 3 inches in maximum dimension. Onsite soil may be used as engineered fill material provided it is free of deleterious matter and any concrete rubble or debris generated from demolition activities, and they are moisture conditioned and compacted as recommended in this report. Expansive soils should not be allowed within the upper 12 inches of building pads. Specific requirements for engineered fill including the applicable test procedures to verify suitability are presented in Table 6.8.

Table 6.8: Materials for Engineered Fill (Imported)		
Gradation		
Sieve Size	Percent Passing	Test Procedures
3 inches	100	ASTM[1] D6913 or ASTM D1140
¾ inch	80-100	ASTM[1] D6913 or ASTM D1140
No. 4	40-70	ASTM[1] D6913 or ASTM D1140
No. 200	More than 10	ASTM[1] D6913 or ASTM D1140
Test	Criteria	Test Procedure
Liquid Limit	Less than 40	ASTM D4318
Plasticity Index	Less than 15	ASTM D4318
Swell Test	Less than 4%	
Organic Content	Less than 3%	ASTM D2974
Expansion Index	Less than 20	ASTM D4829
Sand Equivalent	Greater than 10	CT[2]217

Notes
[1] ASTM = American Society for Testing and Materials Standards
[2] CT = California Test Method

If fill is to be imported from off-site, it should meet the requirements of engineered fill above and be non-corrosive and free of deleterious material. Any imported fill should be sampled by the project Geotechnical Engineer prior to being imported to evaluate its suitability for its intended use and to perform confirmatory testing listed above, if necessary.

6.9.4. Insufficient or Excessive Moisture for Suitable Bond

If the top contact surfaces of the partially filled sections do not meet the specified moisture range are tested to be dry (insufficient moisture) or wet (excessive moisture), they should be addressed by the following:

- Dry material should be scarified or disked to a minimum of 6 inches, moisture conditioned, and recompacted.
- Wet material should be scarified and aerated, moisture conditioned to within the applicable moisture content range, and recompacted.

6.9.5. Wet Soils and/or Unstable Soil Conditions

The in-situ moisture content of the site soil may increase after extended periods of rainfall or when excavations are extending near the groundwater elevations. These conditions may create saturated soils that maybe present challenges for achieving the desired level of compaction. When wet soils are encountered, they should be remediated by aeration, removing and replacing with drier material, and/or chemically treated with lime or cement combinations. Alternative materials such as controlled density fill (CDF) or controlled low strength material (CLSM), etc, maybe used subject as an alternative to engineered fill for the conditions noted and the approval of the project GEOR. We should be contacted if these conditions are encountered.

6.10. EXCAVATIONS

6.10.1. Temporary Excavations and Excavatability

Pipelines, excavation, and earthwork following removal of paving and/or flatwork within trench zones can be performed with the typical conventional excavating and filling machines generally in use for such projects. Soil on trench walls or bottoms should not be allowed to dessicate (dry out) or become saturated due to inclement weather. Ultimately, it is the Contractor's responsibility for implementing means and methods to protect exposed soil on the trench walls or bottom of excavations. If materials become saturated and cause sliding, toppling, subsidence and bulging, or heaving or squeezing conditions as defined by OSHA, remedial actions will be required to address the conditions. The Contractor and/or Geotechnical Engineer, or his representative shall periodically review the near-surface and subsurface materials when the conditions are encountered. As the site has variable materials, excavations should be addressed on an individual basis to meet the requirements established by OSHA. Temporary excavations may require shoring to meet these requirements.

Our borings were able to advance to the depth using a CME 75 drill rig. No oversize materials were generated during drilling operations. We conclude and anticipate that the earth materials are rippable with conventional heavy duty grading equipment and no oversize materials are expected.

6.10.2. General Considerations for Temporary Shoring (if needed)

During construction, the Contractor is responsible for maintaining safe excavations in accordance with OSHA guidelines. Where temporary shoring and internal bracing is used, it should be designed by a registered design professional experienced in shoring design.

A monitoring program should be implemented by the Contractor and set on existing permanent benchmarks or survey points as well as the installed shoring system to evaluate if any movement is occurring as the excavation continues. The instrumentation used, monitoring program workplan, and readings of survey points should be documented, submitted, and reviewed by the project team.

6.10.3. Bedding and Backfill Materials for Utility Trenches

Trench bedding and backfill should meet the meet stricter requirements outlined in the local jurisdictional requirements and the recommendations presented herein.

Trench backfills generally fall within two categories typically characterized as pipe zone backfill and trench zone backfill. The pipe zone backfill refers to the material in the immediate vicinity of the pipe and is often termed "shading". Trench zone backfill refers to the material between the pipe zone backfill and the finished subgrade.

We do not recommend using coarse-grained sand and/or gravel for either pipe or trench zone backfill unless they are separated from the native soils by a non-woven geotextile fabric equivalent to Mirafi® 140N. This is due to the potential for soil migration into the comparatively large void spaces in these types of materials which will, over time, result in ground settlement.

6.10.4. Pipe Zone Materials

Pipe zone backfill should be placed loosely and then thoroughly tamped by hand-working the soil beneath the pipe's spring line using shovels and by walking on three-inch loose lifts. It should extend to at least one foot above the crown of the pipe.

We generally recommend against ponding or jetting or using mechanical compactors to densify pipe-zone backfill but requests for use in specific situations may be referred to the geotechnical engineer for consideration.

Piping with sensitive coatings should be designed to ensure that the outside dimension of the insulation or other coating is buried deeply enough below the road's subgrade elevation and covered with appropriate thickness of shading that will protect the coating from construction damage. Pipes and their insulation should be located deeper than a foot below top of road subgrade/ underside of aggregate base course zone to minimize the possibility of insulation and pipe damage and/or corrosion when the road subgrade is scarified prior to compaction. Conflicts between these recommendations and the backfill requirements of pipe manufacturers should be referred to the project civil engineer for resolution.

Pipes should be encapsulated with clean sand at least 6 inches in each direction from the bottom of the trench to over the pipe.

6.10.5. Trench Zone Materials

The trench zone should be backfilled with onsite soil placed and compacted as recommended for engineered fill. As stated above, pipe manufacturers or design professionals may require special backfill materials. We recommend that the geotechnical engineer be included in the consideration of alternate backfill materials. Mechanical compaction is recommended; ponding or jetting of backfill should be avoided.

Based on the materials encountered during our investigation and the results of the laboratory test program performed on selected samples, the native materials appear to be suitable for use as backfill materials in the trench areas. However, consideration should be given if earthwork activities occur during the wet winter or early spring seasons where it is possible that moisture conditions could increase prior to trench excavations or earthwork which could render the materials difficult to compact. Consideration should be given for drying, mixing, and/or importing drier material or chemically treating the soil to facilitate compaction and meeting the requirements of engineered fill herein.

6.10.6. Protection of Existing Foundations and Buried Utilities

Where excavations are made next to foundations or buried utilities, the excavations should not be allowed to encroach to within a line projected downward at a slope of 2 horizontal to 1 vertical from a point 9 inches above the bottom of the foundation as outlined in CBC 1809.14. Each case may be specific, but the registered design professional shall determine the requirements for support and protection of the existing foundation and prepare site-specific plans, details, and sequence of work. Typical support means and methods may include underpinning, bracing, excavation retention systems, or other means. Where pipes cross under footings or encroach within the near surface of fills, the footings shall be specially designed. The existing utilities shall be protected. Pipe sleeves shall be provided where pipes cross through footings or footing walls and sleeve clearances shall provide for possible footing settlement but not less than 1 inch all around the pipe.

6.11. COMPACTION AND MOISTURE CONDITIONING SUMMARY

Site subgrade prior to placing fill, engineered fill and trench backfill, and pavement section materials meeting the criteria presented above should be placed in uniform, horizontal, loose lifts not exceeding 8 inches, and moisture conditioned and mechanically compacted as noted in Table 6.9. Jetting should not be allowed.

Table 6.9: Compaction and Moisture Conditioning Summary		
Area to be Compacted	**Minimum Relative Compaction (RC) [1, 3]**	**Moisture Content[2] Required**
Non-Expansive Engineered fill (Import)	≥95%	0 to 3% > optimum moisture
Subgrade prior to placing fill	≥95%	0 to 3% > optimum moisture
Expansive soils (in place compaction, if encountered)	≥90%	Min 3% > optimum moisture
Trench backfill[4]	≥90%	Min 3% > optimum moisture
Upper 12 inches of Trench backfill in paved areas	≥95%	0 to 3% > optimum moisture
Upper 12 inches of pavement subgrade	≥95%	0 to 3% > optimum moisture
Aggregate Baserock	≥95%	No moisture requirement

[1]Minimum relative compaction is a ratio of the in place dry density and the maximum dry density determined by the ASTM D1557 test method. The level of effort required will depend on the equipment used and the loose lift thickness
[2]Moisture content is determined by ASTM D1557 for optimum moisture content and D6938 for field determination by nuclear gauge. **Moisture content shall be maintained in its tested state until it is covered with the next lift of engineered fill, aggregate base, or flatwork. It shall not be allowed to dessicate or dry to below the moisture content requirements shown.**
[3]In place dry density and moisture content can be determined by (ASTM D6938 or D8167).
[4]Fills greater than 5 feet should be compacted to a minimum of 95 percent for the entire depth.

6.12. DRAINAGE

To minimize moisture intrusion into foundation and slab subgrades, we recommend the ground surface slope away from the building pad and pavement areas in accordance with jurisdictional and/or local Building Code requirements toward the appropriate drop inlets or other surface drainage devices. These grades should be maintained for the life of the project. Building pads should also be designed such that the lowest adjacent grade surrounding the building is at or below the elevation of the building pad surface (at or below the bottom of the capillary break material beneath the floor slab. Landscaping after construction should not promote ponding of water adjacent to the structures.

6.13. INFILTRATION BASIN

We performed general percolation tests in shallow hand auger borings to depth of about 4¼ feet bgs at the approximate location shown on Plate 6. We then converted the measured values to infiltration rates based on the Porchet method. The test was performed in the limiting layer of clayey sand. A safety factor of 3 was used.

Table 6.10: Infiltration Rate			
Test ID	**General Location**	**Infiltration Rate (in/hr)**	**Infiltration Rate (gal/sf/day)**
P-1	Northwest corner existing grass area	0.25	3.67

6.14. SOILS SPECIAL INSPECTION

Special inspection and tests of soils should be performed per Table 1705.6 of the 2025 California Building Code at a minimum. Specifically, these requirements include the special inspector to:

1. Periodically verify materials below shallow foundations are adequate to achieve the design bearing capacity.
2. Periodically verify excavations are extended to proper depth and have reached proper material.
3. Periodically perform classification and testing of compacted fill materials.

4. Continuously verify use of proper materials, densities and lift thicknesses during placement and compaction of fill.
5. Periodically inspect subgrade and verify the site has been prepared properly prior to placement of compacted fill.

As a guide, the areas noted should be tested at the minimum frequencies below or modified accordingly to the project geotechnical engineer during construction. It is essential the project geotechnical engineer be engaged early in the project and to attend any pre-construction (preparatory) meetings related to earthwork and/or foundation construction.

Table 6.11: Minimum Testing Summary

Area to be Compacted	Min. Frequency of In-Place Density / Moisture Content
Non-Expansive Engineered fill (Import)	1 per 600 cy or lift
Subgrade prior to placing fill	1 per 5,000 sf
Expansive soils (in place compaction, if encountered)	1 per 600 cy or lift
Trench backfill	1 per 50 to 100 lf of trench per lift
Upper 12 inches of Trench backfill in paved areas	1 per 50 to 100 lf of trench per lift
Lime Treatment as Engineered Fill (if used)	1 per 10,000 sf, or additional as needed
Lime Treatment as Pavement Subgrade (if used)	1 per 10,000 sf, or additional as needed
Upper 12 inches of pavement subgrade	1 per 5,000 sf
Aggregate Baserock	1 per 5,000 sf
Hot Mix Asphalt (HMA) compaction	1 per 50 tons placed

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PART 7. ADDITIONAL SERVICES

7.1. MODIFICATIONS TO THE GEOTECHNICAL ENGINEERING REPORT

The building layout, load conditions, and/or design elevations were based on correspondence with the project team during preparation of this report. If the building layout, load conditions, and/or design elevations exceed what was initially assumed and stated in this report, additional services and fee may be required to review the updated information and to perform additional analysis as necessary for the new design concepts. An Addendum to this report may be prepared and submitted to document the findings and provide updated recommendations, if needed.

7.2. PLAN AND SPECIFICATIONS REVIEW

It is essential that we perform a general review of the plans and specifications to evaluate if the recommendations contained in this report were properly interpreted and incorporated into the project documents. We will not be responsible for any misinterpretation of our recommendations if we are not retained to perform this task.

7.3. GEOTECHNICAL ENGINEER OF RECORD DURING CONSTRUCTION PHASE

To maintain consistency between the geotechnical design recommendations and field implementation, we recommend that our firm continue to serve as the Geotechnical Engineer of Record (GEOR) during the construction phase through project closeout. This would include review and response to RFI and geotechnical related submittals, and providing earthwork observation and testing, utility trench backfill verification, and foundation subgrade inspections to confirm consistency with the conditions anticipated in our report. Our continued involvement helps reduce the risk of misinterpretation, supports compliance with applicable standards, and ensures that field modifications or unexpected conditions are appropriately evaluated by the original design geotechnical engineer. A separate proposal can be submitted for this request. This is also a recommended practice promoted by the California Geotechnical Engineering Association (CalGeo).

PART 8. LIMITATIONS

We based our conclusions and recommendations based on our understanding of the proposed project development and improvements, data derived from our field explorations and laboratory testing, interpretations of available published data, and our geotechnical engineering analysis. The reported locations of the field explorations were determined by pacing from available landmarks; survey of the field explorations was not included in this scope. It is possible that actual subsurface conditions can vary between points of exploration. Similarly, changes in the conditions of a property due to natural processes or the human works on this or adjacent properties, site configurations, or load conditions may vary from what we have assumed during our analysis. If this is found to be the case, we should be notified and requested to review the changes and provide modifications to our conclusions and recommendations if needed. We prepared this report in general accordance with the generally accepted geotechnical engineering practice as it exists in the project vicinity at the time the work was performed. No warranty, express or implied, is made.

This report may be used by the Client and its design consultants, for the purpose stated for this project site for up to two years from the date of this report. The recommendations contained in this report must be verified during construction by representatives of our firm. If construction is delayed, or if land use, or other factors modify the site and subsurface conditions, additional field work may be needed (i.e., additional borings and/or laboratory testing) and an updated report issued. Additionally, an updated report may be needed within the period noted above, or the next California Building Code update, whichever occurs first. We shall be released from any liability resulting from misuse of the report by the authorized party. The Client agrees to defend, indemnify, and hold harmless Siegfried from any claim or liability associated with such unauthorized use or non-compliance with the requirements outlined herein.

Additional discussion is presented in the Important Information about this Geotechnical Engineering Report presented in Appendix D.

RISK ADVISORY FOR GEOR CONTINUITY

To maintain design intent and comply with California Business and Professions Code (BPC) and California Code of Regulations (CCR) requirements, Siegfried should serve as the Geotechnical Engineer of Record (GEOR) during construction. Engaging with a different GEOR without formal transfer may result in misinterpretation, liability gaps, and regulatory non-compliance. Risks are minimized when the design GEOR provides construction-phase services to verify the recommendations made in this report were implemented. If another GEOR is retained, that engineer should formally accept this report, carry appropriate liability insurance, and clearly define responsibilities. Coordination between design and construction geotechnical professionals is essential for project performance.

PART 9. REFERENCES

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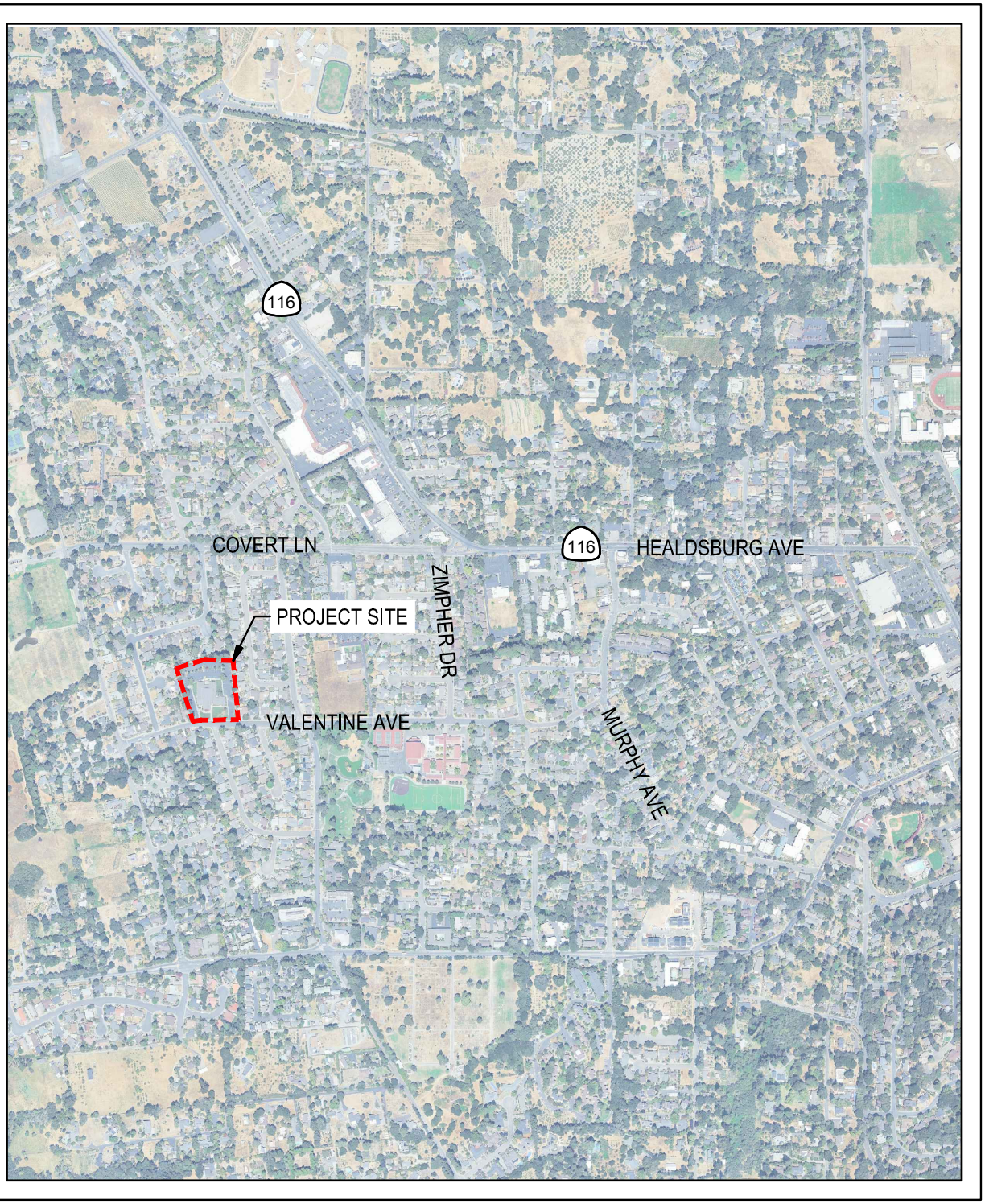
PLATES

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SOURCE: GOOGLE EARTH 2025

SITE LOCATION MAP

VALENTINE SUBDIVISION

8100 VALENTINE AVE, SEBASTOPOL, CA 95472

DATE	10/29/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

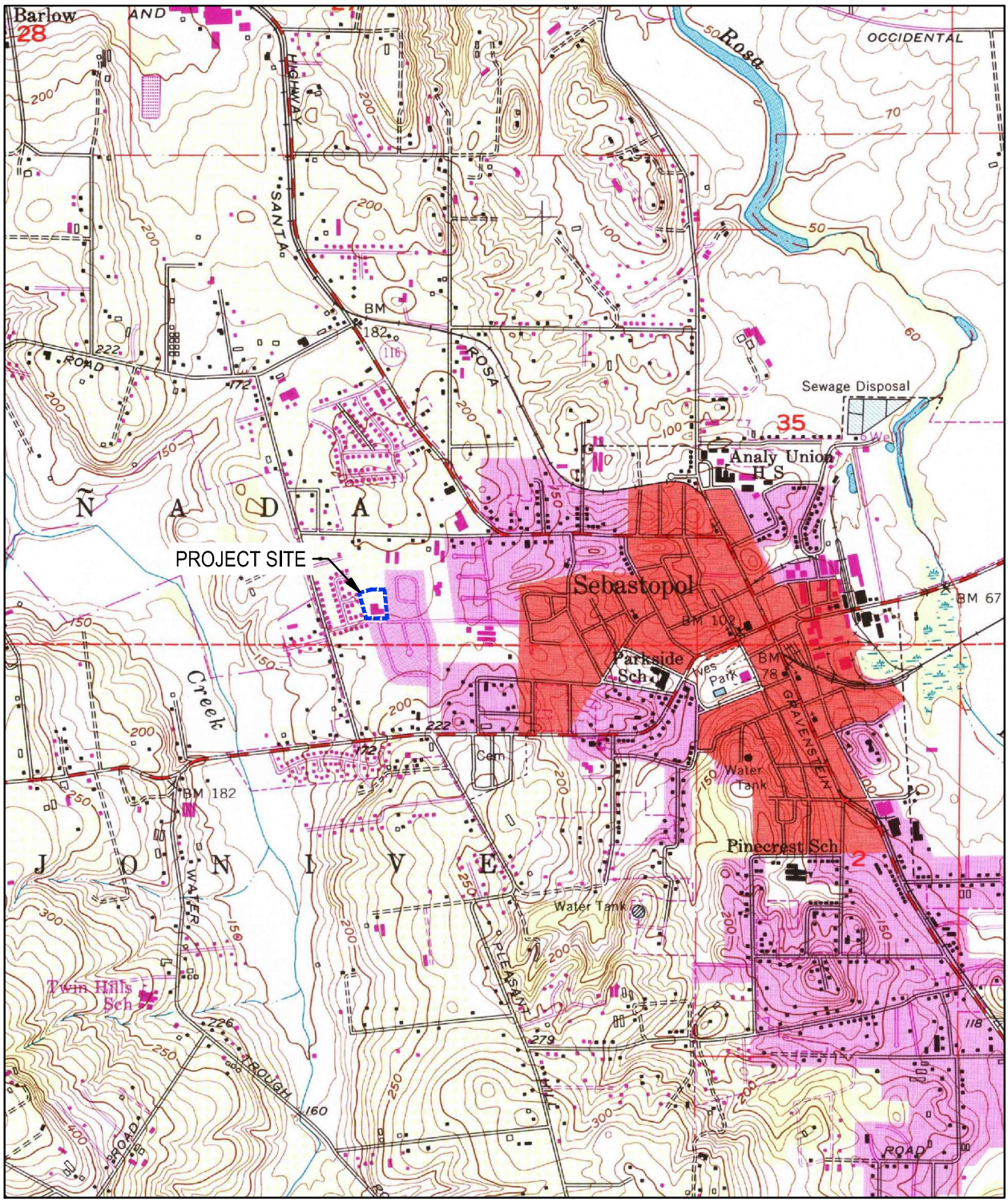
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- SURVEYING
- PLANNING
- ATHLETIC FACILITY DESIGN
- GEOTECHNICAL

SCALE: 1" = 1000'

PLATE 1

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 1 – SITE LOCATION MAP.DWG 10/29/2025 4:36 PM



SOURCE: USGS, SEBASTOPOL, CALIF., NE/4 SEBASTOPOL 15' QUADRANGLE, 1954 PHOTOREVISED 1980.

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 2 – TOPOGRAPHIC MAP.DWG 11/19/2025 4:57 PM

TOPOGRAPHIC MAP

VALENTINE SUBDIVISION

8100 VALENTINE AVE, SEBASTOPOL, CA 95472

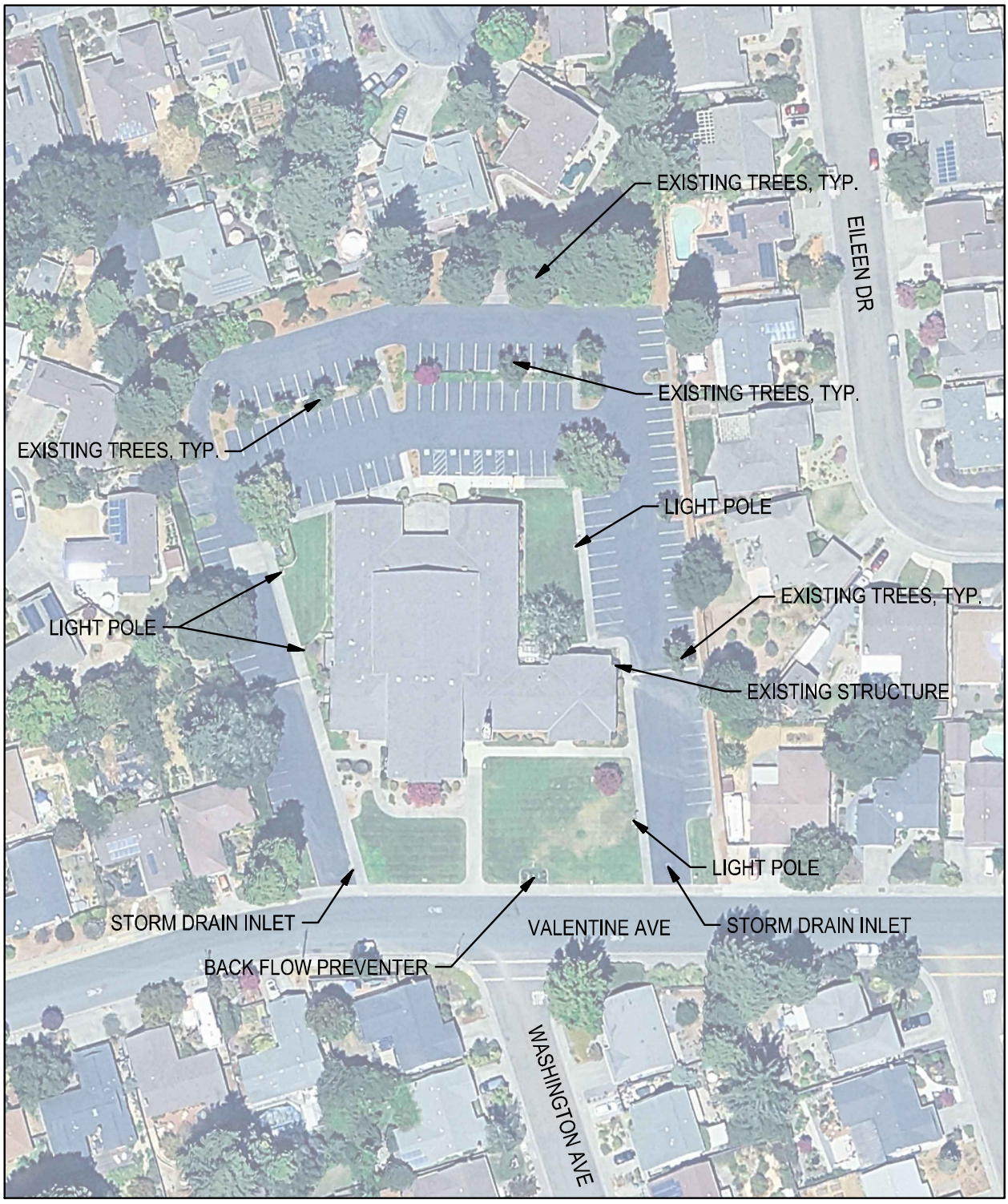
DATE	11/19/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

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SCALE: 1" = 2000'

PLATE 2

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 3 - SITE CONDITIONS MAP.DWG 12/3/2025 9:17 AM



SITE CONDITIONS MAP

VALENTINE SUBDIVISION

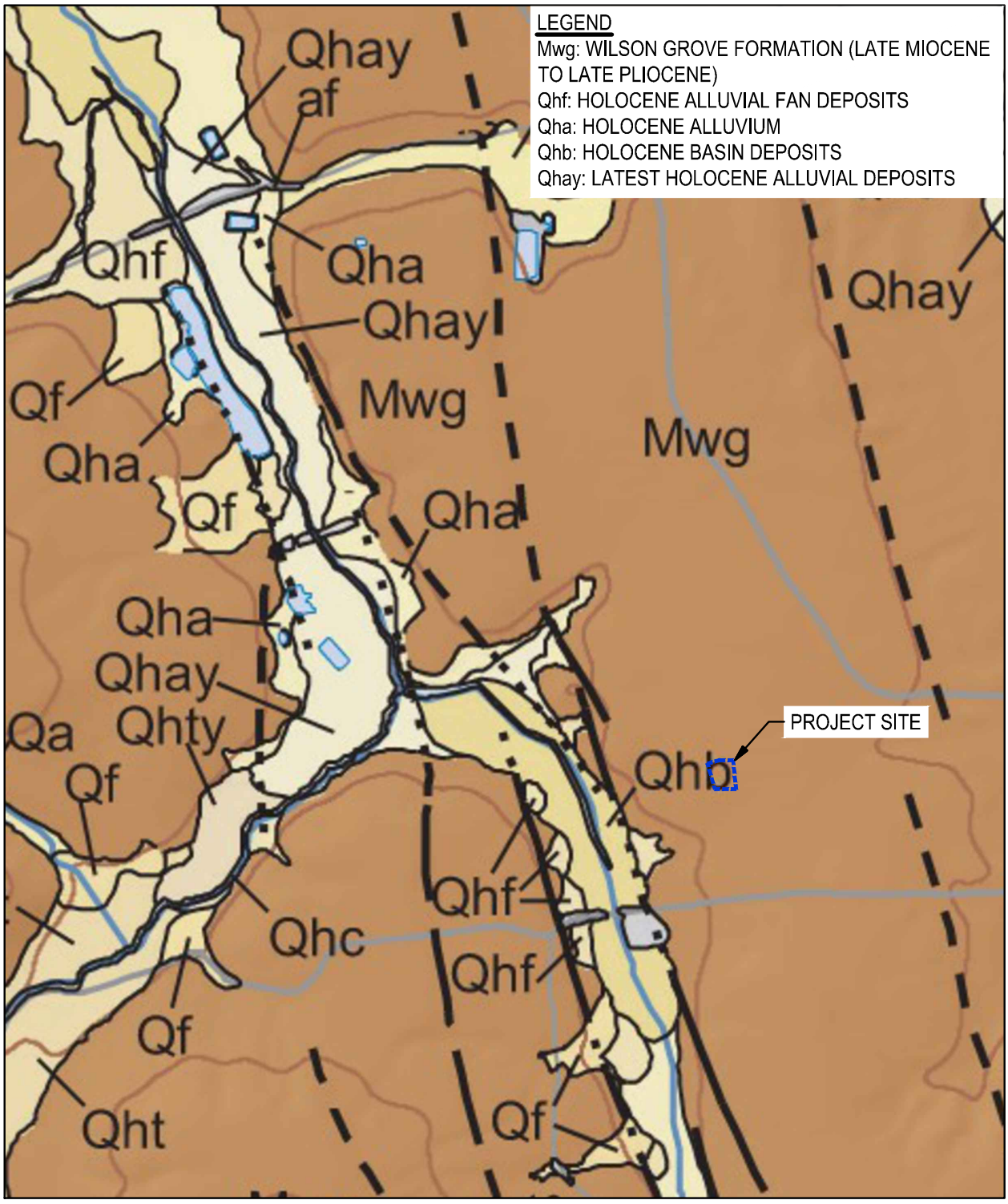
8100 VALENTINE AVE, SEBASTOPOL, CA 95472

DATE	12/03/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

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SCALE: 1" = 100'

PLATE 3



SOURCE: CGS, GEOLOGIC MAP OF THE SEBASTOPOL 7.5' QUADRANGLE. DELATTRE, KOEHLER, GUTIERREZ, 2008.

GEOLOGIC MAP

VALENTINE SUBDIVISION

8100 VALENTINE AVE, SEBASTOPOL, CA 95472

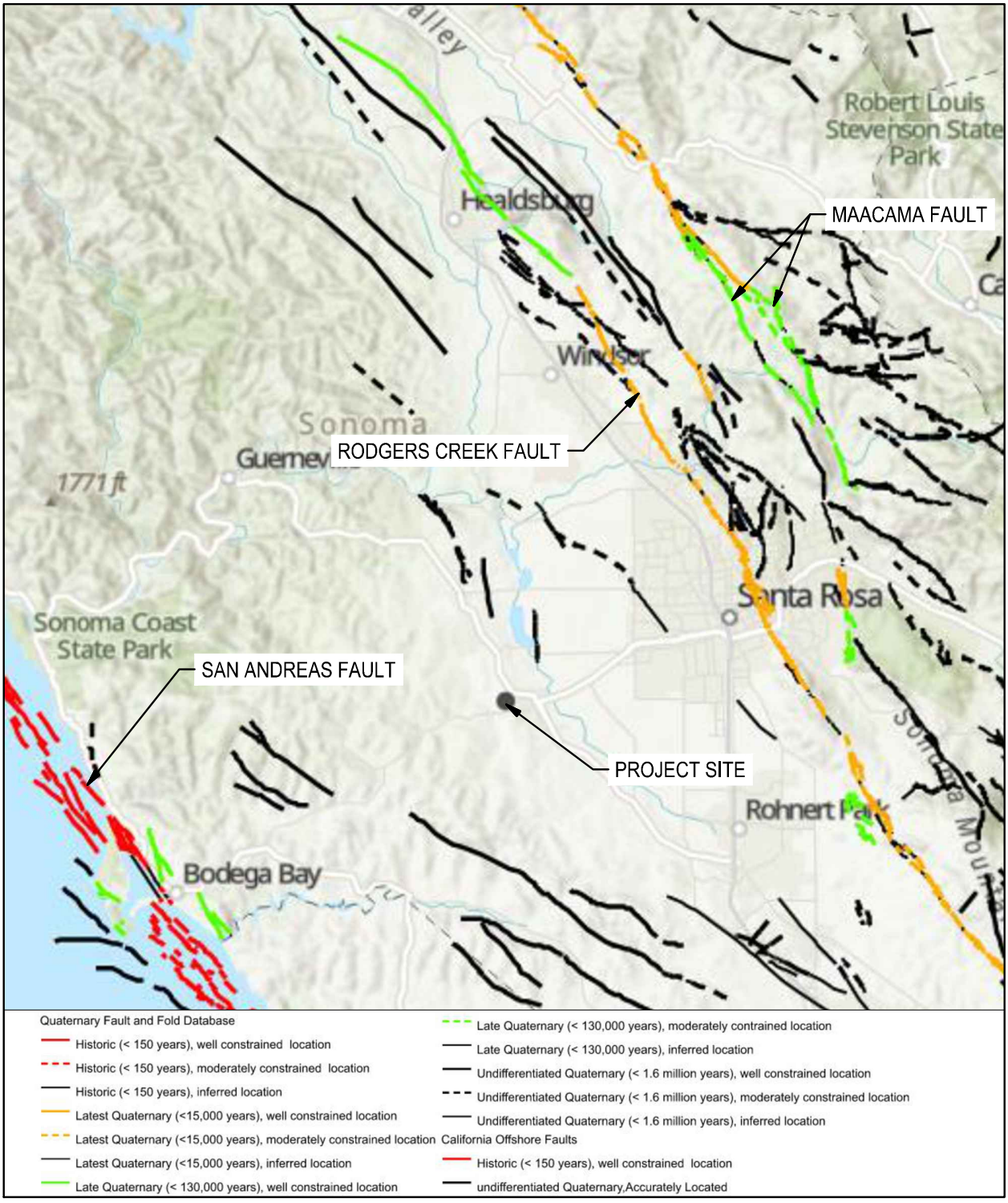
DATE	12/03/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

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SCALE: 1" = 2000'

PLATE 4

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 4 - GEOLOGIC MAP.DWG 12/3/2025 9:38 AM



SOURCE: USGS, U.S. QUATERNARY FAULTS

FAULT MAP

VALENTINE SUBDIVISION

8100 VALENTINE AVE, SEBASTOPOL, CA 95472

DATE	11/19/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

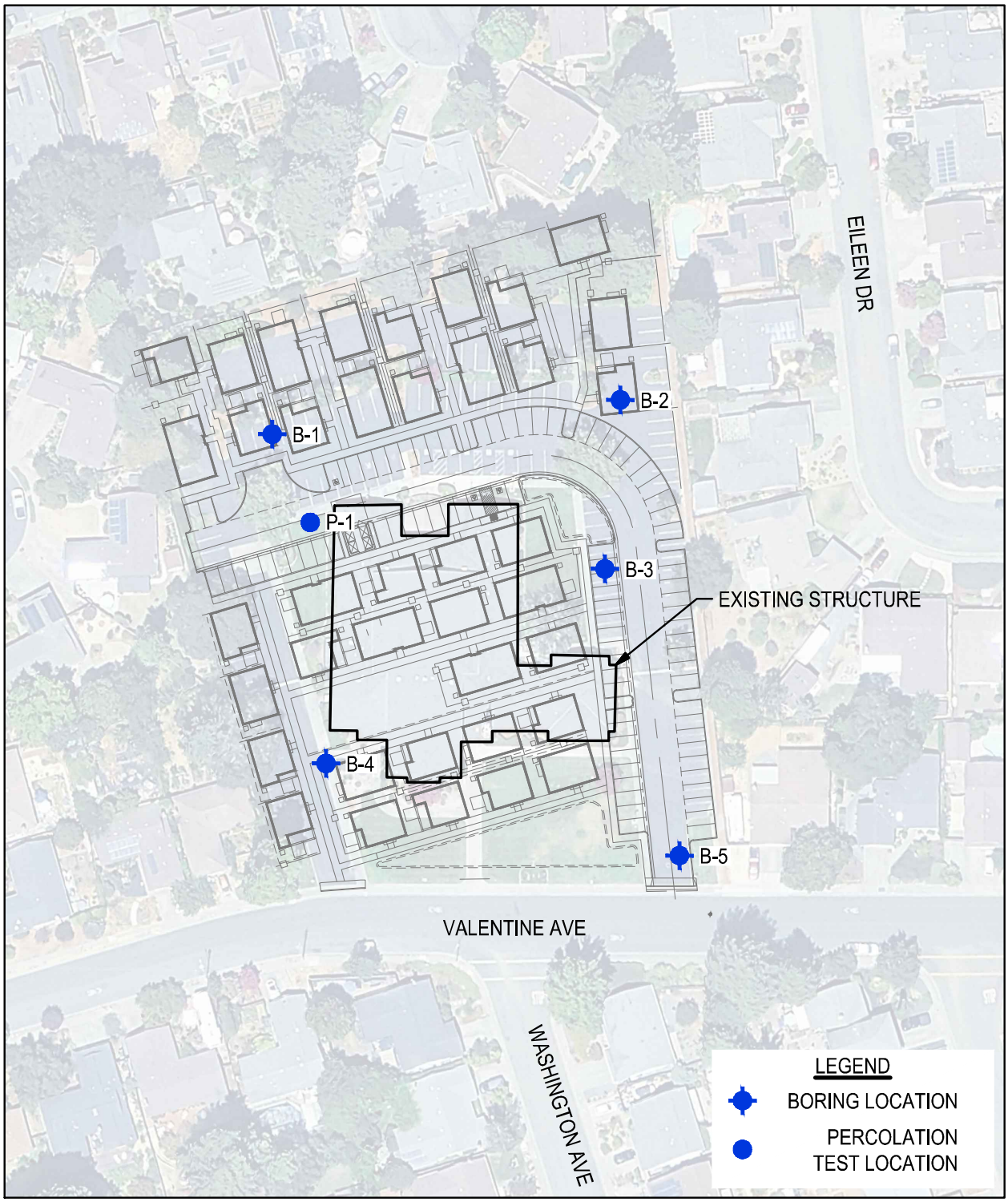
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SCALE: 1" = 25000'

PLATE 5

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 5 - FAULT MAP.DWG 11/19/2025 5:42 PM

F:\25PROJECTS\25249 VALENTINE AVENUE SUBDIVISION\PLANS AND GRAPHICS\EXHIBITS\GEOTECH\25249 PLATE 6 - EXPLORATION LOCATION MAP.DWG 12/3/2025 10:11 AM



EXPLORATION LOCATION MAP

VALENTINE SUBDIVISION

8100 VALENTINE AVE, SEBASTOPOL, CA 95472

DATE	12/03/25
DESIGN	BLQ
DRAWN	AA
JOB NO.	25249

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SCALE: 1" = 100'

PLATE 6

APPENDIX A
FIELD EXPLORATION

Project Name: Valentine Avenue Subdivision
Project Location: 8100 Valentine Ave, Sebastopol, CA 95472
Project Number: 25249-5101

Log of Soil Boring: B-1

Coordinates: 38.403100, -122.842600	Drilling Company: Hanlon Drilling	Equipment Used: CME-75
Surface Elevation: 200 ft	Drill Operator: Dillon Hanlon	Method: Auger
Boring Diameter: 4 in	Logged By: Raymond Teel	Hammer Type: Auto
Boring Depth: 26.5 ft	Checked By: Charley Scott, PE	Hammer Weight: 140 lbs
▽ At time of drilling: 22 ft	Date Started: 11/14/2025	Hammer Drop: 30 in
▼ After Drilling: N/A	Date Completed: 11/14/2025	Remarks:

Elevation (ft)	Depth (ft)	Visual Classification and Remarks	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
		0.3 3 1/2" ASPHALT.							
		1.0 9" AGGREGATE BASE.							
		UNDOCUMENTED SOIL FILL: clayey GRAVEL with sand (**GC**): medium dense; dark brown; low plasticity.		15-11-10 (21)					
		2.3 Clayey SAND (**SC**): medium dense; light yellowish brown; moist; low plasticity fines.	1C			16.2		63	37
			2C	7-11-15 (26)	111.0	15.3		60	40
		Light brown with orange mottling.							
195	5		3C	8-9-13 (22)	106.4	14.4		72	28
		7.0 Silty SAND (**SM**): light gray; moist; non plastic fines.		6-10-13 (23)					
		9.5 Clayey SAND (**SC**): medium dense; light brown; moist; low to medium plasticity fines.		6-7-10 (17)					
190	10	11.3 Silty SAND (**SM**): medium dense; light brown with orange mottling; moist; low plasticity fines.							
		Loose; light gray with orange and light red mottling; moist to wet; non plastic fines.							
185	15		6C	3-4-5 (9)	91.9	29.5			

Drilling Method Graphic	Elevation (ft)	Depth (ft)	Graphic Log	Visual Classification and Remarks	Sample Graphic	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
				Light gray.								
	180	20		Light gray with orange and light red mottling.			3-4-6 (10)					
				Light gray.								
	175	25				8	2-3-6 (9)		27.1			
				26.5								

Total Depth at 26.5 ft.

Project Name: Valentine Avenue Subdivision
Project Location: 8100 Valentine Ave, Sebastopol, CA 95472
Project Number: 25249-5101

Log of Soil Boring: B-2

Coordinates: 38.403170, -122.841710	Drilling Company: Hanlon Drilling	Equipment Used: CME-75
Surface Elevation: 203 ft	Drill Operator: Dillon Hanlon	Method: Auger
Boring Diameter: 4 in	Logged By: Raymond Teel	Hammer Type: Auto
Boring Depth: 31.5 ft	Checked By: Charley Scott, PE	Hammer Weight: 140 lbs
▽ At time of drilling: 24 ft	Date Started: 11/14/2025	Hammer Drop: 30 in
▼ After Drilling: N/A	Date Completed: 11/14/2025	Remarks:

Elevation (ft)	Depth (ft)	Visual Classification and Remarks	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
	0.3	3 1/2" ASPHALT.							
	1.0	9" AGGREGATE BASE.							
		Silty SAND (**SM**): medium dense; light brown; moist; non plastic fines.		7-6-5 (11)					
200			1C		107.0	11.5	3	77	20
		Light gray with orange mottling.		6-8-13 (21)					
			2C		114.6	14.1			
	4.5								
	5	Clayey SAND (**SC**): medium dense; light gray with orange mottling; moist; low to medium plasticity fines.		6-10-13 (23)					
			3C		115.1	11.9			
	7.0								
195		Silty SAND (**SM**): dense; light gray with orange mottling; moist; low plasticity fines.		12-15-17 (32)					
	9.5								
	10	Clayey SAND (**SC**): medium dense; light gray with orange mottling; moist; low to medium plasticity fines. Gravel in sample and shoe.		13-12-10 (22)					
190									
	13.3								
		Silty SAND (**SM**): medium dense; light gray with orange mottling; moist to wet; non plastic fines.							
	15			4-5-7 (12)					
			6C		96.8	26.3	0	78	22

Drilling Method Graphic	Elevation (ft)	Depth (ft)	Graphic Log	Visual Classification and Remarks	Sample Graphic	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
	185	20				7	3-5-7 (12)		25.3			
	180			Loose; light grayish brown.								
		25				8	2-3-4 (7)		29.5			
	175			Medium dense.								
		30				9	5-9-14 (23)		25.4			
				31.5								

Total Depth at 31.5 ft.

Project Name: Valentine Avenue Subdivision
Project Location: 8100 Valentine Ave, Sebastopol, CA 95472
Project Number: 25249-5101

Log of Soil Boring: B-3

Coordinates: 38.402860, -122.841770	Drilling Company: Hanlon Drilling	Equipment Used: CME-75
Surface Elevation: 198 ft	Drill Operator: Dillon Hanlon	Method: Auger
Boring Diameter: 4 in	Logged By: Raymond Teel	Hammer Type: Auto
Boring Depth: 16.5 ft	Checked By: Charley Scott, PE	Hammer Weight: 140 lbs
▽ At time of drilling: N/A	Date Started: 11/14/2025	Hammer Drop: 30 in
▼ After Drilling: N/A	Date Completed: 11/14/2025	Remarks:

Elevation (ft)	Depth (ft)	Visual Classification and Remarks	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
	0.3	3" ASPHALT.							
	1.0	9" AGGREGATE BASE.							
		Silty SAND (**SM**): medium dense; brown; moist; non plastic fines.	1C	9-6-5 (11)	108.8	10.4	1	79	20
	2.5								
195		Clayey SAND (**SC**): medium dense; light gray with orange mottling; moist; low plasticity fines.	2C	5-8-14 (22)	109.5	17.5			
	5		3C	7-10-14 (24)	110.1	16.5			
	7.0								
190		Silty SAND (**SM**): medium dense; light gray with orange mottling; moist; low plasticity fines.		7-9-12 (21)					
	10		5C	6-7-9 (16)	104.8	19.8			
185		Loose; light gray with pink mottling.							
	15			2-3-5 (8)					
	16.5								

Total Depth at 16.5 ft.

Project Name: Valentine Avenue Subdivision
Project Location: 8100 Valentine Ave, Sebastopol, CA 95472
Project Number: 25249-5101

Log of Soil Boring: B-4

Coordinates: 38.402490, -122.842480	Drilling Company: Hanlon Drilling	Equipment Used: CME-75
Surface Elevation: 200 ft	Drill Operator: Dillon Hanlon	Method: Auger
Boring Diameter: 4 in	Logged By: Raymond Teel	Hammer Type: Auto
Boring Depth: 26.5 ft	Checked By: Charley Scott, PE	Hammer Weight: 140 lbs
▼ After Drilling: 14 ft	Date Started: 11/14/2025	Hammer Drop: 30 in
▽ At time of Drilling: 24 ft	Date Completed: 11/14/2025	Remarks:

Elevation (ft)	Depth (ft)	Visual Classification and Remarks	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
		0.3 3" ASPHALT.							
		1.0 9" AGGREGATE BASE.							
		Silty SAND (**SM**): medium dense; light brown; moist; non plastic fines.		8-9-11 (20)					
		1.8 Clayey SAND (**SC**): medium dense; light brown with orange mottling; moist; low plasticity fines.	1C		110.1	16.2	0	66	34
			2C	7-11-16 (27)	113.1	15.5	0	69	31
		4.5 Silty SAND (**SM**): medium dense; light brown with orange mottling; moist; non plastic fines.							
195	5		3C	8-9-12 (21)	110.1	16.5			
			4C	7-9-10 (19)	106.5	18.3			
190	10			4-5-6 (11)					
		▼ Light gray.							
185	15			3-6-9 (15)					

Drilling Method Graphic	Elevation (ft)	Depth (ft)	Graphic Log	Visual Classification and Remarks	Sample Graphic	Sample ID	Blow Counts (N-Value)	Dry Density (PCF)	Moisture Content (%)	% Gravel	% Sand	% Fines
				Loose.								
	180	20				7	2-4-1 (5)		25.6			
				Medium dense; wet.								
	175	25				8	5-8-9 (17)		28.1			
				26.5								

Total Depth at 26.5 ft.

Project Name: Valentine Avenue Subdivision
Project Location: 8100 Valentine Ave, Sebastopol, CA 95472
Project Number: 25249-5101

Log of Soil Boring: B-5

Coordinates: 38.402350, -122.841640	Drilling Company: Hanlon Drilling	Equipment Used: CME-75
Surface Elevation: 194 ft	Drill Operator: Dillon Hanlon	Method: Auger
Boring Diameter: 4 in	Logged By: Raymond Teel	Hammer Type: Auto
Boring Depth: 2.5 ft	Checked By: Charley Scott, PE	Hammer Weight: 140 lbs
▽ At time of drilling: N/A	Date Started: 11/14/2025	Hammer Drop: 30 in
▼ After Drilling: N/A	Date Completed: 11/14/2025	Remarks:

Drilling Method Graphic	Elevation (ft)	Depth (ft)	Graphic Log	Visual Classification and Remarks
		0.3		4" ASPHALT.
		1.0		8" AGGREGATE BASE.
				Silty SAND (**SM**): brown; moist; non plastic fines.
		2.5		

Total Depth at 2.5 ft.

SOIL CLASSIFICATION CHART PER ASTM D2488

PRIMARY DIVISIONS			SECONDARY DIVISIONS	
			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVEL more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly-graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly-graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly-graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction retained on No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly-graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly-graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly-graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	SILT and CLAY liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic CLAY
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above 'A'-line)	organic CLAY
			OH (plots below 'A'-line)	organic SILT
	Highly Organic Soils		PT	Peat

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SAMPLER GRAPHIC SYMBOLS

- Modified California Sampler - 3.0 in. OD

- Standard Penetration Test (SPT)

- Shelby Tube

DRILLING METHOD SYMBOLS

- Auger Drilling

- Rotary Drilling

WATER LEVEL SYMBOLS

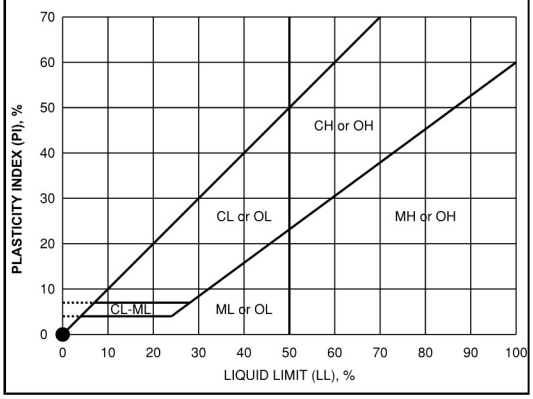
- First Water Level Reading (during drilling)

- Static Water Level Reading (after drilling)

GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

PLASTICITY CHART



APPENDIX B
SITE CLASS DETERMINATION

STOCKTON
3428 Brookside Rd.
Stockton, CA 95219
t: 209.943.2021

SAN JOSE
84 W. Santa Clara St., #700
San Jose, CA 95113
t: 408.754.2021

SACRAMENTO
1164 National Drive, #20
Sacramento, CA 95834
t: 916.520.2777

MODESTO
101 Sycamore Ave, #100
Modesto, CA 95354
t: 209.762.3580

25249_Valentine_Subdivision_Line1_WE_10ftShear-Wave Velocity Report
25249_Valentine_Subdivision_Line1Terēan VsSurf ReMi™ 2.1 Software

Array Location

Datum:	WGS84
Site Name:	**25249_Valentine_Subdivision_Line1_WE_10ft**
Center:	-122.84226000000001, 38.403085
Geophone 1:	-122.84265, 38.40304
Geophone24:	-122.84187, 38.40313

Results

Vs100:	**994 ft/s**
IBC Site Class:	D
IBC Version:	IBC 2018
ASCE:	ASCE 7-22
Depth:	**115 ft**

Survey Parameters

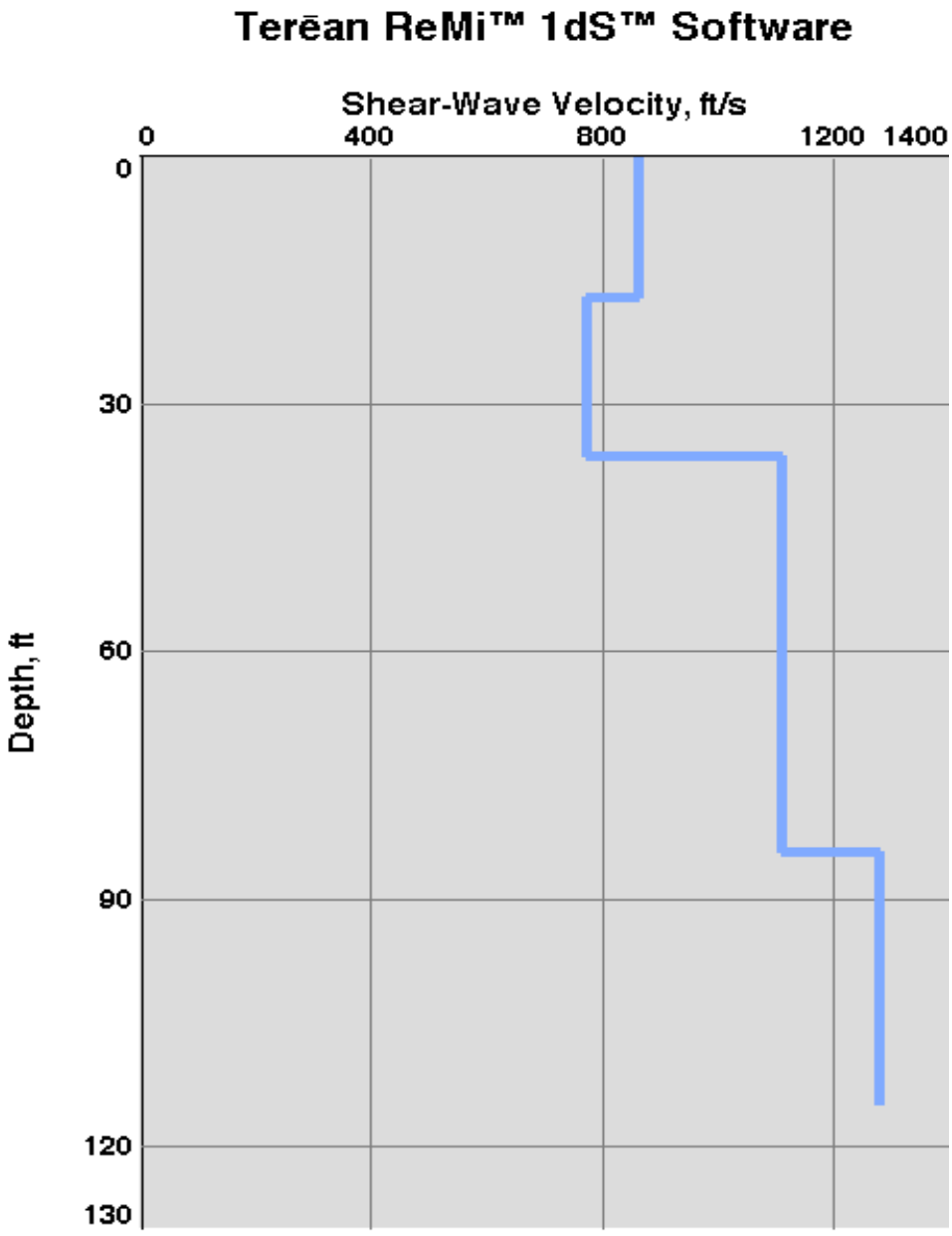
Geophone Count:	24
Geophone Spacing:	10 ft
Array Length:	230 ft
Survey Date:	November 11, 2025
Performed By:	Siegfried Engineering
Analysis By:	aaguilera
Analysis Date:	Thu Nov 13 10:13:16 PST 2025

Narrative

SHEAR WAVE VELOCITIES AND SEISMIC SITE CLASS
Siegfried Engineering's geophysical site evaluation included subsurface seismic imaging and earthquake ground shaking potential evaluation using Terēan's VsSurf ReMi™ seismic data processing software. Seismic surveys were performed to determine depth to bedrock and the seismic site class per IBC 2018 and ASCE 7-22 using the weighted-average soil shear wave velocity for the upper 100 feet (Vs100). The surveys were performed by recording active and/or ambient (passive) seismic sources. The seismic recording array for these surveys consisted of 24, 4.5 Hz geophones at 10 ft spacing, for a total survey length of 230 feet. Noise generated by hammer hits along the survey line during data acquisition while ambient noise was generated from traffic along the nearby roads. The seismic data were acquired using a ReMiDAQ™ 4-24 channel seismograph, while data was processed using Terēan's ReMi™ software (terean.com/products). Survey results indicate a weighted-average soil shear wave velocity of the upper 100 feet (Vs100) of 994 ft/s. This results in a designation of a Seismic Site Class D according to Table ASCE 7-22.

25249_Valentine_Subdivision_Line1_WE_10ftShear-Wave Velocity Report
25249_Valentine_Subdivision_Line1Terēan VsSurf ReMi™ 2.1 Software

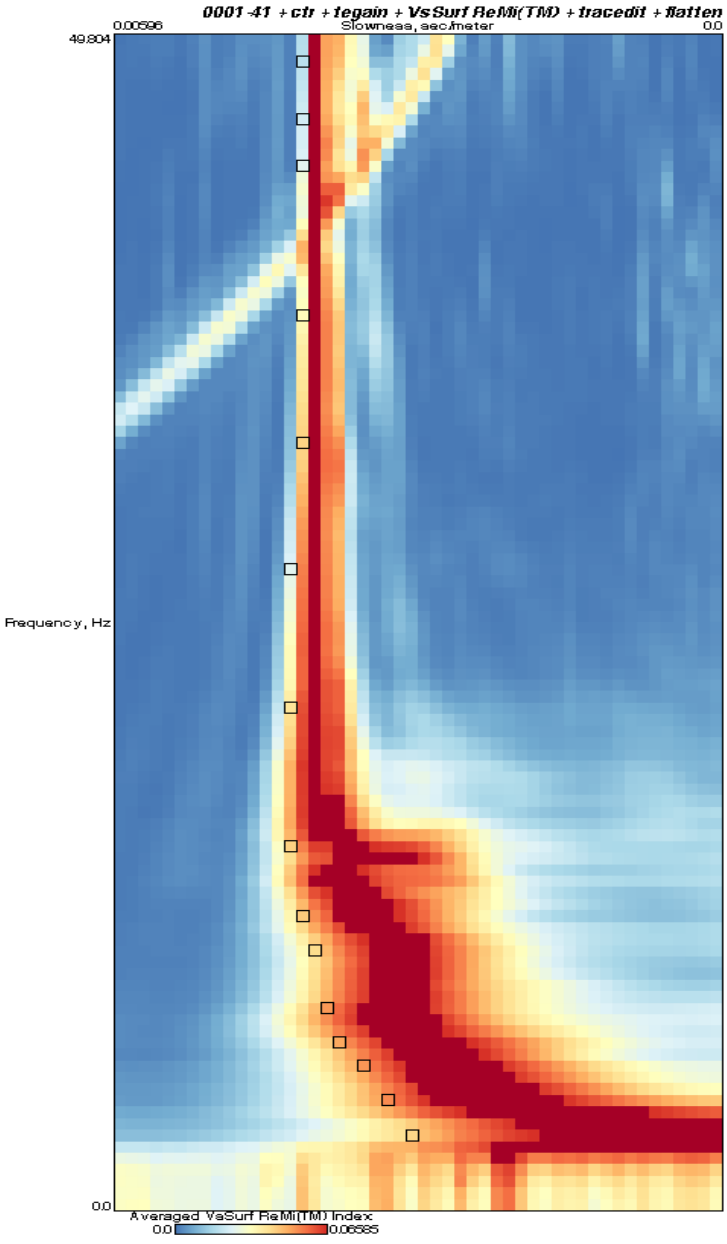
Depth (ft)	Vs (ft/s)
0.0	863
16.9	863
16.9	773
36.2	773
36.2	1,109
84.2	1,109
84.2	1,278
412.3	1,278



25249_Valentine_Subdivision_Line1_WE_10ftShear-Wave Velocity Report
25249_Valentine_Subdivision_Line1Terēan VsSurf ReMi™ 2.1 Software

Frequency (Hz)	Slowness (s/m)
48.828	0.00417
46.386	0.00417
44.433	0.00417
38.085	0.00417
32.714	0.00417
27.343	0.00429
21.484	0.00429
15.625	0.00429
12.695	0.00417
11.230	0.00405
8.789	0.00393
7.324	0.00381
6.348	0.00357
4.883	0.00334
3.418	0.00310

Seismic File:	0001.sgy
Pre-Processing:	ctr + tegain
Surveyed Geophones:	No
Max Frequency, Hz:	50
Min Velocity, m/s:	168



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APPENDIX C
LABORATORY TESTING

STOCKTON
3428 Brookside Rd.
Stockton, CA 95219
t: 209.943.2021

SAN JOSE
84 W. Santa Clara St., #700
San Jose, CA 95113
t: 408.754.2021

SACRAMENTO
1164 National Drive, #20
Sacramento, CA 95834
t: 916.520.2777

MODESTO
101 Sycamore Ave, #100
Modesto, CA 95354
t: 209.762.3580

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Geotechnical Materials Testing Summary

Tested in General Accordance with ASTM D1140, D2487, D2974, D4318, D6913, and D7263.

Project Name: Valentine Avenue Subdivision

Project Number: 25249-5101

Project Location: 8100 Valentine Ave, Sebastopol, CA 95472

					ASTM D2216	ASTM D7263		ASTM D4318		ASTM D1140/D6913			ASTM D2487	
Sample Date	Location ID	Depth Top (ft)	Depth Base (ft)	Color	Moisture (%)	Wet Density (pcf)	Dry Density (pcf)	Liquid Limit	Plasticity Index	Gravel (%)	Sand (%)	Fines (%)	USCS Group Symbol	USCS Description
11/14/2025	B-1 1C	2.0	2.5	Light Yellowish Brown	16.2	---	---	---	---	0	63	37	---	---
11/14/2025	B-1 2C	3.5	4.0	Light Brown with Orange Mottling	15.3	128.0	111.0	---	---	0	60	40	---	---
11/14/2025	B-1 3C	6.0	6.5	Light Brown with Orange Mottling	14.4	121.6	106.4	---	---	0	72	28	---	---
11/14/2025	B-1 6C	16.0	16.5	Light Gray with Orange and Light Red Mottling	29.5	118.9	91.9	---	---	---	---	---	---	---
11/14/2025	B-1 8	25.0	26.5	Light Gray	27.1	---	---	---	---	---	---	---	---	---
11/14/2025	B-2 1C	2.0	2.5	Light Brown	11.5	119.3	107.0	---	---	3	77	20	---	---
11/14/2025	B-2 2C	3.5	4.0	Light Gray with Orange Mottling	14.1	130.8	114.6	---	---	---	---	---	---	---
11/14/2025	B-2 3C	6.0	6.5	Light Gray with Orange Mottling	11.9	128.8	115.1	---	---	---	---	---	---	---
11/14/2025	B-2 6C	16.0	16.5	Light Gray with Orange Mottling	26.3	122.3	96.8	---	---	0	78	22	---	---
11/14/2025	B-2 7	20.0	21.5	Light Gray with Orange Mottling	25.3	---	---	---	---	---	---	---	---	---
11/14/2025	B-2 8	25.0	26.5	Light Grayish Brown	29.5	---	---	---	---	---	---	---	---	---
11/14/2025	B-2 9	30.0	31.5	Light Grayish Brown	25.4	---	---	---	---	---	---	---	---	---
11/14/2025	B-3 1C	2.0	2.5	Brown	10.4	120.1	108.8	---	---	1	79	20	---	---
11/14/2025	B-3 2C	3.5	4.0	Light Gray with Orange Mottling	17.5	128.8	109.5	---	---	---	---	---	---	---
11/14/2025	B-3 3C	6.0	6.5	Light Gray with Orange Mottling	16.5	128.3	110.1	---	---	---	---	---	---	---
11/14/2025	B-3 5C	11.0	11.5	Light Gray with Orange Mottling	19.8	125.5	104.8	---	---	---	---	---	---	---
11/14/2025	B-4 1C	2.0	2.5	Light Brown with Orange Mottling	16.2	127.9	110.1	---	---	0	66	34	---	---
11/14/2025	B-4 2C	3.5	4.0	Light Brown with Orange Mottling	15.5	130.6	113.1	---	---	0	69	31	---	---
11/14/2025	B-4 3C	6.0	6.5	Light Brown with Orange Mottling	16.5	128.3	110.1	---	---	---	---	---	---	---
11/14/2025	B-4 4C	8.5	9.0	Light Brown with Orange Mottling	18.3	126.0	106.5	---	---	---	---	---	---	---

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Geotechnical Materials Testing Summary

Tested in General Accordance with ASTM D1140, D2487, D2974, D4318, D6913, and D7263.

Project Name: Valentine Avenue Subdivision

Project Number: 25249-5101

Project Location: 8100 Valentine Ave, Sebastopol, CA 95472

					ASTM D2216	ASTM D7263		ASTM D4318		ASTM D1140/D6913			ASTM D2487	
Sample Date	Location ID	Depth Top (ft)	Depth Base (ft)	Color	Moisture (%)	Wet Density (pcf)	Dry Density (pcf)	Liquid Limit	Plasticity Index	Gravel (%)	Sand (%)	Fines (%)	USCS Group Symbol	USCS Description
11/14/2025	B-4 7	20.0	21.5	Light Gray	25.6	---	---	---	---	---	---	---	---	---
11/14/2025	B-4 8	25.0	26.5	Light Gray	28.1	---	---	---	---	---	---	---	---	---
11/14/2025	B-5 Bulk	0.0	2.5	Brown	9.0	---	---	NP	NP	3	81	16	SM	Silty Sand
11/11/2025	P-1 Bulk	0.0	5.0	Light Brown	18.2	---	---	---	---	2	64	34	---	---
11/11/2025	NE Corner of Grass Area Bulk	2.3	5.0	Light Brown	20.0	---	---	30	15	2	64	34	SC	Clayey Sand

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Expansion Index

Test Performed in General Accordance with ASTM D4829

Project Name:	Valentine Avenue Subdivision	**Client:**	The Grupe Company
Project Number	25249-5101	**Sample Location/ID**	NE Corner of Grass Area / Bulk
Date Sampled:	11/11/2025	**Sampled by:**	Alejandro Aguilera, EIT
Date Tested:	11/19/2025	**Description:**	Clayey Sand

Expansion Index (EI)	**9**
Molding Water Content (%)	12.0
Final Water Content (%)	23.6

Expansion Index determined by adjusting water content to achieve a degree of saturation of 48-52%.

Classification of Potentially Expansive Soil

Expansion Index, EI	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Tested by:	Raymond Teel	Reviewed by:	Charley Scott, PE
Title:	Geotechnical Technician	Title:	Senior Associate Engineer
Date:	11/19/2025	Date:	11/25/2025

Limitations: Testing results presented are for samples collected by Siegfried Engineering staff at the times and location(s) shown. Pursuant to applicable building codes or specifications, the results presented in this report are for the items listed herein and for exclusive use of the Client and the registered design professional in responsible charge. The results apply only to the samples tested and are not to be considered as a guarantee or warranty, express or implied.

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Stockton, CA 95219	San Jose, CA 95113	Sacramento, CA 95834	Modesto, CA 95354
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UNCONFINED COMPRESSIVE STRENGTH

ASTM D-2166

Client / Project Name: The Grupe Company

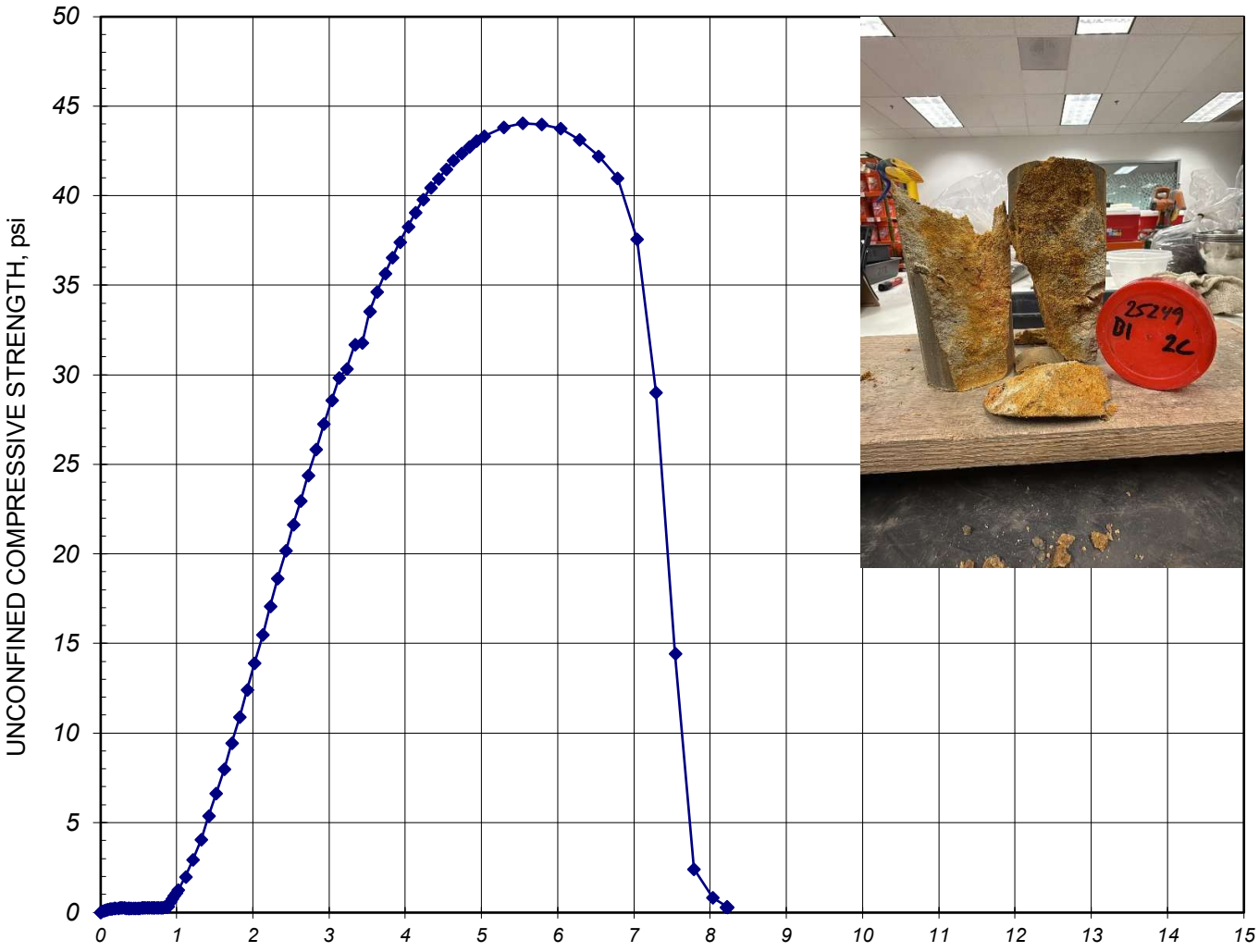
Project No: 25249

Lab Log: **B-1 2C**

Project Name: Valentine Avenue Subdivision

Sample ID: B-1 2C

Report Date: November 24, 2025



Test No.	Initial Water Content %	Initial Dry Density pcf	Description	UNCONFINED COMPRESSIVE STRENGTH q_u, psi	UNCONFINED COMPRESSIVE STRENGTH shear, psi
1	15.3	111	Light Brown with Orange Mottling Clayey Sand	**44.1**	**22.1**

* Water content determined on total sample after test.

NOTE:

Sample Diameter = 2.4 in.

Sample Height = 5.9 in.

Height / Dia. Ratio = 2.5

Strain Rate: 0.06 in./ min.

Strain Rate: 1.0 % / min.

Test Date : November 20, 2025

This testing is based upon accepted industry practice as well as the test method listed. These results apply only to the samples supplied and tested for the above referenced job.

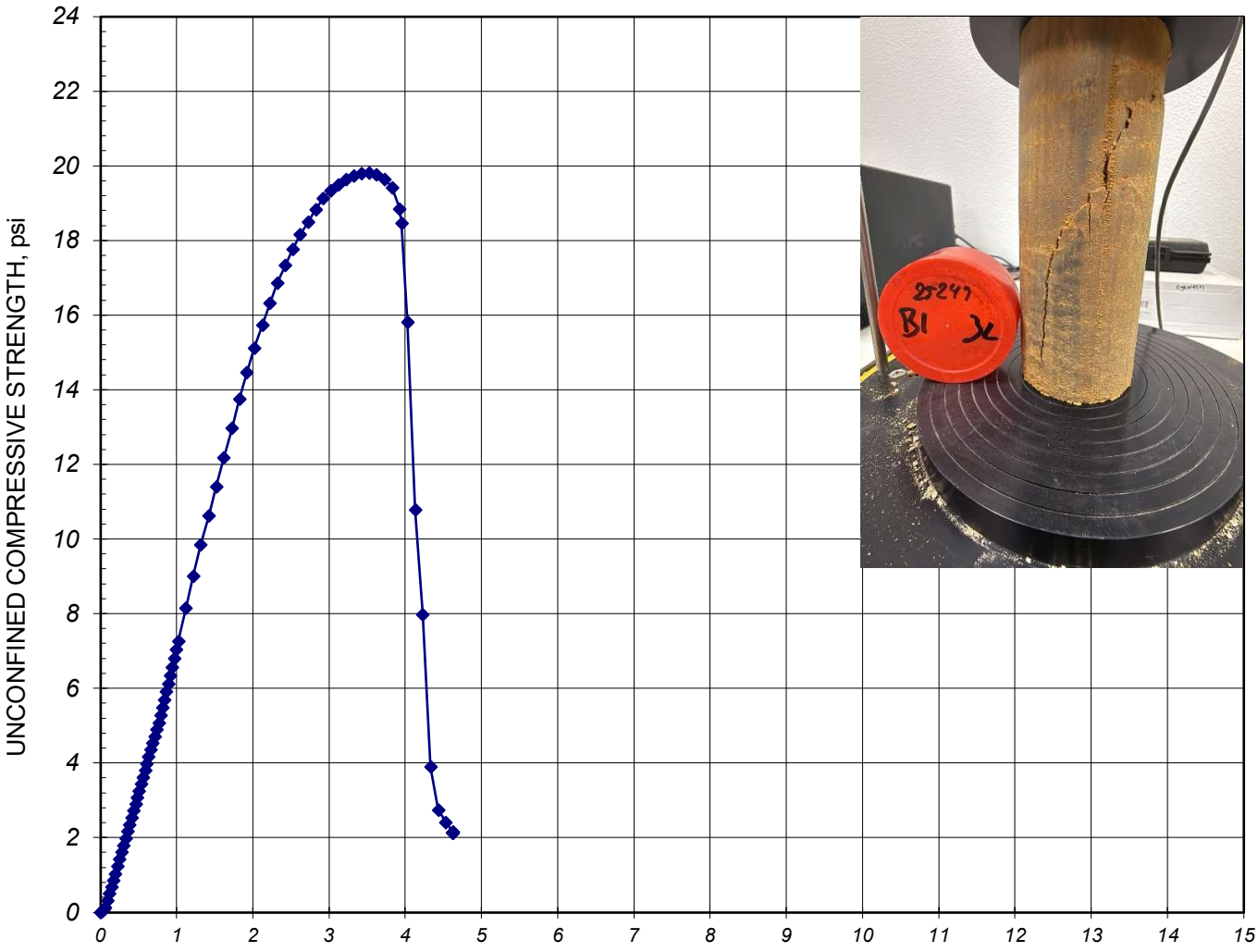
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UNCONFINED COMPRESSIVE STRENGTH

ASTM D-2166

Client / Project Name:	Project No:	Lab Log:
The Grupe Company	25249	B-1 3C

Project Name:	Sample ID	Report Date:
Valentine Avenue Subdivision	B-1 3C	November 24, 2025



Test No.	Initial Water Content %	Initial Dry Density pcf	Description	UNCONFINED COMPRESSIVE STRENGTH q_u, psi	UNCONFINED COMPRESSIVE STRENGTH shear, psi
1	14.4	106	Light Brown with Orange Mottling Clayey Sand	**19.8**	**9.9**

* Water content determined on total sample after test.

NOTE:

Sample Diameter = 2.4 in.
Sample Height = 6.0 in.
Height / Dia. Ratio = 2.5

Strain Rate: 0.06 in./ min.
Strain Rate: 1.0 % / min.
Test Date : November 20, 2025

This testing is based upon accepted industry practice as well as the test method listed. These results apply only to the samples supplied and tested for the above referenced job.

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UNCONFINED COMPRESSIVE STRENGTH

ASTM D-2166

Client / Project Name: The Grupe Company

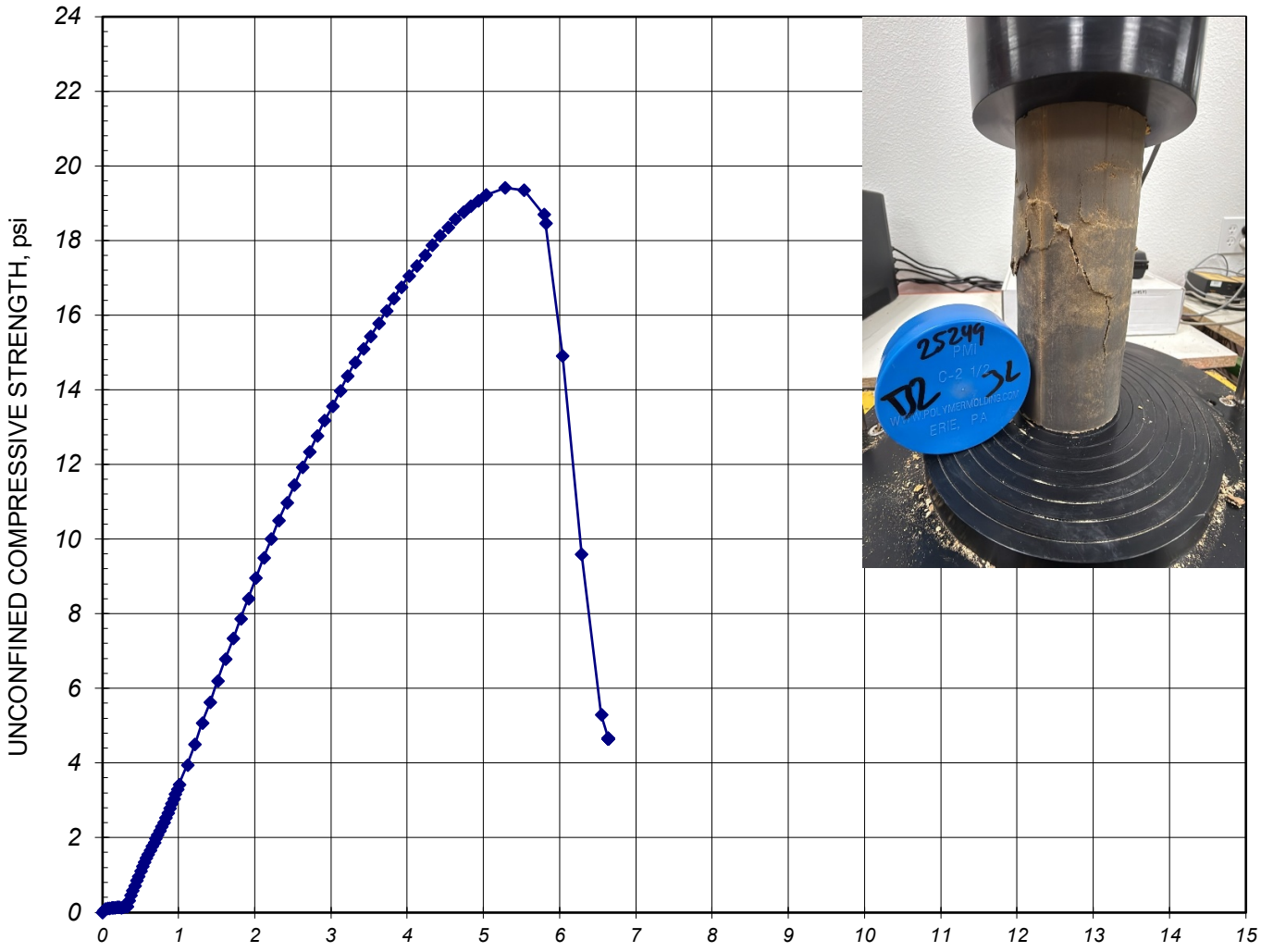
Project No: 25249

Lab Log: **B-2 3C**

Project Name: Valentine Avenue Subdivision

Sample ID: B-2 3C

Report Date: November 24, 2025



Test No.	Initial Water Content %	Initial Dry Density pcf	Description	UNCONFINED COMPRESSIVE STRENGTH q_u, psi	UNCONFINED COMPRESSIVE STRENGTH shear, psi
1	11.9	115	Light Gray with Orange Mottling Clayey Sand	**19.4**	**9.7**

* Water content determined on total sample after test.

NOTE:

Sample Diameter = 2.4 in.

Sample Height = 6.0 in.

Height / Dia. Ratio = 2.5

Strain Rate: 0.06 in./ min.

Strain Rate: 1.0 % / min.

Test Date : November 20, 2025

This testing is based upon accepted industry practice as well as the test method listed. These results apply only to the samples supplied and tested for the above referenced job.

CONSTRUCTION TESTING SERVICES

TESTING
INSPECTION
ENGINEERING

4400 Yankee Hill Road, Rocklin, CA 95677

Agenda Item Number 7

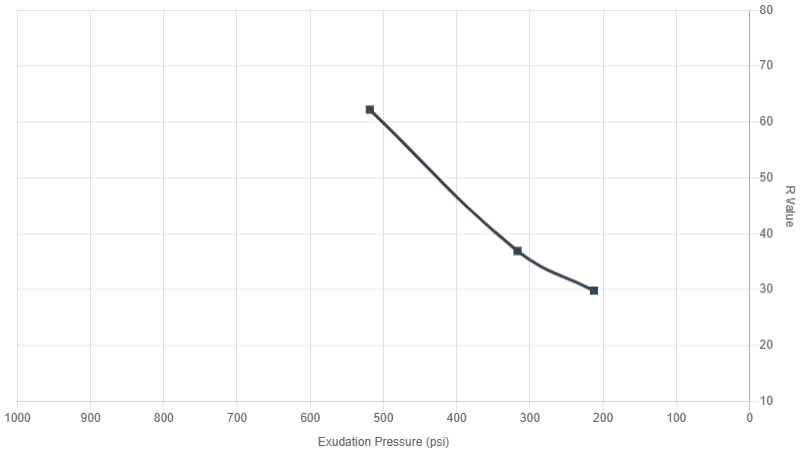
Determining the Resistance "R" Value of Treated and Untreated Bases, Subbases, and Basement Soils

Project Name: Siegfried - Valentine Avenue Subdivision **Place of Sampling :** 25249-5101 **Permit # :** N/A Lab Permit

Project No.:22157 **Sampled by:** Contractor **Report Date:** 11/20/2025

Client: Siegfried Engineering, Inc. **Date of Sampling:** 11/12/2025 **Lab Log No.:** 301253

Date Received:	11/12/2025	Tested by:	Cory Blue
Material Type:	Soil	Date Tested:	11/18/2025
Source:	Native	Date Disposed:	12/19/2025
Sample ID:	P-1	Material Description:	Clayey Sand



Specimen	Dry Density (pcf)	Moisture Content %)	Exudation Pressure (psi)	R Value	Expansion Pressure (psf)
A	109.0	15.2	519	62	155
B	109.0	15.8	317	37	54
C	0.0	16.4	212	30	0
R-Value at 300 psi : 36					

Remarks:
Received Sample Condition: Acceptable and/or Satisfactory

Reviewed by: Amy Reeves, Staff Engineer

11/20/2025
Date

ASTM Standards Used: CT 301

Testing was performed by qualifed personnel in accordance with generally accepted industry practice, material testing consultants procedures and the above reference standards. This report is applicable only to the items listed herein. The test performed and in this report are not intended to be considered as any guarantee or warranty of suitability for service or fitness of use of items tested and it should not be relied on as such. The report has been prepared for the exclusive use of the client and any partial or whole reproduction without the consent of the client is prohibited.

Agenda Item Number 7
City Council Meeting Packet for October 28, 2025

Results Only Soil Testing for Valentine Avenue Subdivision

November 24, 2025

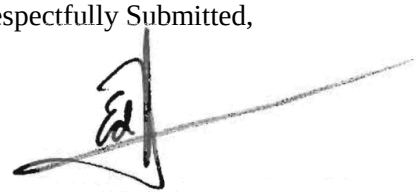
Prepared for:

Raymond Teel
Siegfried Engineering Inc.
1164 National Drive
Sacramento, CA 95834
rteel@siegfriedeng.com

Project X Job#: S251124C
Client Job or PO#: 25249-5101

Prepared by:
M. Williams

Respectfully Submitted,



Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com



Soil Analysis Lab Results

Client: Siegfried Engineering Inc.
Job Name: Valentine Avenue Subdivision
Client Job Number: 25249-5101
Project X Job Number: S251124C
November 24, 2025

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{2-}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ω-cm)	(Ω-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
P-1 Bulk	2.5-4	32.9	0.0033	77.5	0.0078	7,370	6,633	7.1	178	2.37	2.7	2.9	ND	63.0	7.1	11.1	75.9	11.6	2.7

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

For AWWA 105C: 0-3mg/kg sulfide = Negative; 3-6mg/kg = trace; >6mg/kg = Positive

Note: Sometimes a bad sulfate hit is a contaminated spot. Typical fertilizers are Potassium chloride, ammonium sulfate or ammonium sulfate nitrate (ASN). So this is another reason why testing full corrosion series is good because we then have the data to see if those other ingredients are present meaning the soil sample is just fertilizer-contaminated soil. This can happen often when the soil samples collected are simply surface scoops. This is why it's best to dig in a foot, throw away the top and test the deeper stuff. Dairy farms are also notorious for these items.

If one sample pops up much more corrosive than all others, we would recommend collecting more samples surrounding the problem sample location to determine if the peak is isolated to it. This allows us to conclude it was a contaminated sample and able to declare it an outlier.

Try out our new online forms: SOIL CORROSIVITY & THERMAL RESISTIVITY LAB REQUEST FORM & IN-SITU WENNER 4 PIN QUOTE REQUEST FORM

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APPENDIX D
IMPORTANT INFORMATION ABOUT THIS GEOTECHICAL ENGINEERING REPORT

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t: 916.520.2777

MODESTO
101 Sycamore Ave, #100
Modesto, CA 95354
t: 209.762.3580

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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End of Report

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civil engineering | land surveying | wastewater
1220 N. Dutton Ave., Santa Rosa, CA 95401
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Website: www.adobeinc.com

"A Service You Can Count On!"

Rob Toste
The Grupe Company
3255 West March Lane, Suite 400
Stockton, CA 95219
(209) 473 – 6010

April 15, 2026
JN 25213

Valentine Avenue Development Water Analysis
8100 Valentine Avenue, Sebastopol CA

Dear Rob,
The proposed project on 8100 Valentine Avenue has been assessed for total domestic water demand in gallons per minute (GPM) for the 39 residential unit development based upon the assumption that each will have 4 bedrooms and 3 bathrooms. A 6" water main is proposed with 1.5" water laterals and 1" water meters to individual lots containing two residential units each.

Calculations

Peak Water demand for the residential units was estimated using the Hunter's Curve. Using Table 6-5 and Chart A-2 from the California Plumbing Code (CPC), water supply fixture units (WSFU) were assigned to each fixture as shown in **Table 1: Fixture Count**. The total WSFU for this development of 39 residential units is **1,248 WSFU**. Using the Hunter's Curve, the approximate total load is **220 GPM** and each lateral will service 2 residential units with an approximate load of **30 GPM**, per the CPC.

Table 1: Fixture Count

Fixture Type	Count per home	WSFU Value	Total WSFU per home
Water Closet	3	2.5	7.5
Lavatory Faucet	3	1.0	3.0
Bathtub/Shower	3	4.0	12.0
Kitchen Faucet	1	1.5	1.5
Dishwasher	1	1.5	1.5
Clothes Washer	1	4.0	4.0
Hose Bibb	1	2.5	2.5
		Total Per Residence:	**32.0 WSFU**

Conclusion

Based on the calculations, this project will service **220 GPM** of domestic water demand for the entire site and **30 GPM** to each lot. The 6" water main can safely handle the proposed water demand within recommended velocity limits. The 1.5" schedule 40 PVC laterals will provide a peak velocity of **4.66 ft/s** and a typical 1" meter can support up to 50 GPM. The system is proposing to loop the water service, thereby reducing overall pressure loss within the system.

Sincerely,

Casey Talbot

Casey R. Talbot, P.E.
Associate Principal
ctalbot@adobeinc.com

REGISTERED PROFESSIONAL ENGINEER
CASEY RHEA TALBOT
No. C91962
Exp.3/31/2027
CIVIL
STATE OF CALIFORNIA

Inch	mm
½	15
¾	20
1	25

TABLE 6-5
WATER SUPPLY FIXTURE UNITS (WSFU) AND MINIMUM FIXTURE BRANCH PIPE SIZES[3]

APPLIANCES, APPURTENANCES OR FIXTURES[2]	MINIMUM FIXTURE BRANCH PIPE SIZE[1,4]	PRIVATE	PUBLIC	ASSEMBLY[6]
Bathtub or Combination Bath/Shower (fill)	½	4.0	4.0	
¾" Bathtub Fill Valve	¾	10.0	10.0	
Bidet	½	1.0		
Clothes washer	½	4.0	4.0	
Dental Unit, cuspidor	½		1.0	
Dishwasher	½	1.5	1.5	
Drinking Fountain or Water Cooler	½	0.5	0.5	0.75
Hose Bibb	½	2.5	2.5	
Hose Bibb, each additional[8]	½	1.0	1.0	
Lavatory	½	1.0	1.0	1.0
Lawn Sprinkler, each head[5]		1.0	1.0	
Mobile Home, each (minimum)[9]		12.0		
Sinks				
Bar	½	1.0	2.0	
Clinic Faucet	½		3.0	
Clinic Flushometer Valve with or without faucet	1		8.0	
Kitchen	½	1.5	1.5	
Laundry	½	1.5	1.5	
Service or Mop Basin	½	1.5	3.0	
Washup, each set of faucets	½		2.0	
Shower, per head	½	2.0	2.0	
Urinal, 1.0 GPF Flushometer Valve	¾	See Footnote[7]		
Urinal, greater than 1.0 GPF Flushometer Valve	¾	See Footnote[7]		
Urinal, flush tank	½	2.0	2.0	3.0
Wash Fountain, circular spray	¾		4.0	
Water Closet, 1.6 GPF Gravity Tank	½	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Tank	½	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Valve	1	See Footnote[7]		
Water Closet, greater than 1.6 GPF Gravity Tank	½	3.0	5.5	7.0
Water Closet, greater than 1.6 GPF Flushometer Valve	1	See Footnote[7]		

Notes:

1 Size of the cold branch pipe, or both the hot and cold branch pipes.

2 Appliances, Appurtenances or Fixtures not included in this Table may be sized by reference to fixtures having a similar flow rate and frequency of use.

3 The listed fixture unit values represent their load on their cold water service. The separate cold water and hot water fixture unit value for fixtures having both hot and cold water connections may each be taken as three-quarter (¾) of the listed total value of the fixture.

4 The listed minimum supply branch pipe sizes for individual fixtures are the nominal (I.D.) pipe size.

5 For fixtures or supply connections likely to impose continuous flow demands, determine the required flow in gallons per minute (GPM), and add it separately to the demand (in GPM) for the distribution system or portions thereof.

6 Assembly [Public Use (See Table 4-1)].

7 When sizing flushometer systems, see Section 610.10.

8 Reduced fixture unit loading for additional hose bibbs is to be used only when sizing total building demand and for pipe sizing when more than one (1) hose bibb is supplied by a segment of water-distributing pipe. The fixture branch to each hose bibb shall be sized on the basis of two and one-half (2.5) fixture units.

9 ***[HCD 2]*** *For water supply fixture unit values related to mobilehome parks in all parts of the State of California, see California Code of Regulations, Title 25, Division 1, Chapter 2, Article 5, Section 1278. For water supply fixture unit values related to special occupancy parks in all parts of the State of California, see California Code of Regulations, Title 25, Division 1, Chapter 2.2, Article 5, Section 2278.*

CHART A-2
ESTIMATE CURVES FOR DEMAND LOAD

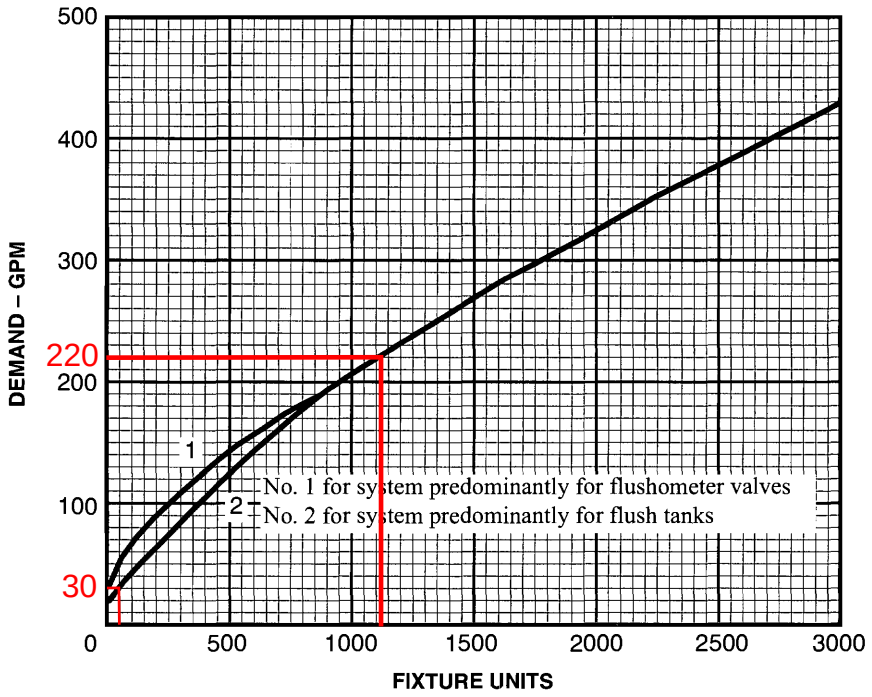
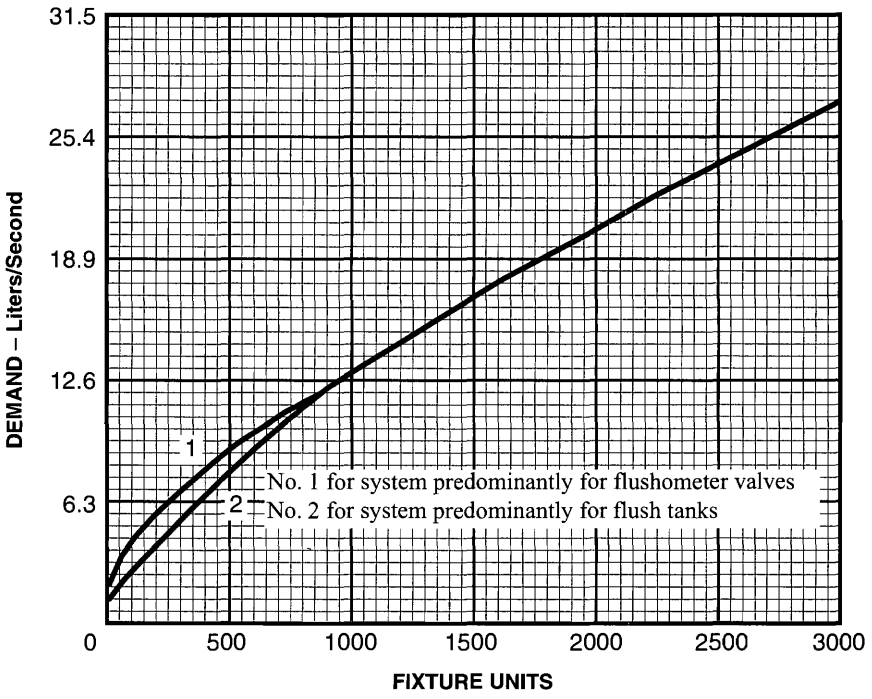


CHART A-2 (Metric)
ESTIMATE CURVES FOR DEMAND LOAD



Preliminary Sewer Capacity Study

For

Valentine Avenue Development

8100 Valentine Avenue
Sebastopol, CA
APN 004-510-054

JN 25213
May 19, 2026

Prepared for:

Grupe Investment Company, Inc.
3255 West March Lane, Suite 400
Stockton, CA 95219
Phone: (209) 473 - 6010



Casey Rhea Talbot, RCE 91962

My license expires 03/31/2027



Prepared by:

adobe associates, inc.
civil engineering | land surveying | wastewater
1220 N. Dutton Ave., Santa Rosa, CA 95401
P. (707) 541-2300 F. (707) 541-2301
Website: www.adobeinc.com

Prepared By: KM
Checked By: CT

Table of Contents

1. **Project Description**
2. **Sanitary Sewer Study**
3. **Conclusion**

Appendices

I. **Sanitary Sewer Calculations**

Preliminary Sewer Capacity Study
Narrative

1 Project Description

The Valentine Avenue project is located at 8100 Valentine Avenue in Sebastopol, California. The project proposes to construct 39 residential units, an asphalt driveway, associated hardscaping and landscaping, and required Low Impact Development (LID) features. This project proposes a 6" sanitary sewer main on site that will connect to the existing 6" sanitary sewer within the 25' utility easement per 928 O.R. 444.

The purpose of this study is to demonstrate that a 6" sanitary sewer main has adequate capacity for the sewer flows from this development. This analysis has been solely based upon the size of the proposed main, slope, and number of parcels connected and does not include hydraulic modeling due to the limited available information.

2 Sanitary Sewer Study

Wastewater generation rates are computed and presented in **Appendix I: Sanitary Sewer Calculations**. The equation for the design flow and related peak factors and values were taken from the City of Santa Rosa "Sanitary Sewer Standard Specifications". Peak hour demand is 3.42 times the Average Day Demand. Based on a total estimated population of 127 persons, the peak flow from the proposed development is 57,991 gallons per day (gpd) or 0.090 cubic feet per second (cfs), inclusive of infiltration and inflow.

3 Conclusion

The sewer analysis demonstrates that the sanitary sewer mains will have adequate capacity to handle the peak use of the proposed development and shows the total estimated sewer flow from this development.

Appendix I

Sanitary Sewer Calculations

Sewer Peak Flow Calculations

Project: Valentine Avenue Development
Job No: 25213

Date: 5/19/2026
By: KM

Q_D = Design Flow (GPD)
$Q_{90\%}$ = Max Design Capacity

Sewer Contribution According to Zoning and Use

Zoning Area Type R-4

	People Per Unit	Total Units	Total Persons
Single Family	3.25	39	127

Q_D - Total Design Peak Flow (Single-Family Dwelling Sewer)		
Single Family Dwelling # of Occupants	127	Persons
Wastewater Flow per Capita	125	Gal/Day/Persons
Peaking Factor	3.42	Gal/Day
Total Design Peak Dry Weather Flow, Q_D	54,198	Gal/Day
Inflow & Infiltration (7%)	3,794	Gal/Day
Total Design Peak Wet Weather Flow, Q_D	57,991	Gal/Day
	0.090	ft^3/sec

$Q_{90\%}$ - Max Design Capacity		
Total Design Peak Wet Weather Flow, Q_D	**57,991**	Gal/Day
	0.090	ft^3/sec
6" Sewer Main Capacity		
Q (6", s=0.0050 , 90% depth) =	295,993	Gal/Day
$Q_{90\%}$	0.458	ft^3/sec

T:\2025 PROJECTS\25213\Reports\Utilities\Sewer\[25213-Sewer Capacity Analysis.xlsx]Sewer Peak Flow

Received 5/21/2026

Fire Flow Study

For

Valentine Avenue Development
8100 Valentine Avenue
Sebastopol, California
APN 004-510-054

JN 25213
April 15, 2026

Prepared for:

Grupe Investment Company, inc
3255 West March Lane, Suite 400
Stockton, California 95219
Phone: (209) 473 – 6010





Casey Rhea Talbot, RCE 91962
My license expires 03/31/2027

Prepared by:

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Website: www.adobeinc.com

Prepared By: KM
Checked By: CT

Table of Contents

1. **Project Description**
2. **Water Use Study**
   - ***2.1 Existing Water System***
   - ***2.2 Proposed Water System***
   - ***2.3 Fire Protection Study***
3. **Conclusion**

Appendices

I. Fire Water Exhibits

Fire Flow Study
Narrative

1 Project Description

This project is located at 8100 Valentine Avenue in Sebastopol, California. The overall project site is approximately 2.98 acres. The existing site contains an existing building, AC driveway, parking, and associated hardscaping and landscaping. This project proposes 39 new residential buildings, AC driveway, parking, and associated hardscaping and landscaping. A new 6" public water main is proposed to service the site and will connect to the existing 6" water main underneath Valentine Avenue. Four hydrants are proposed with 6" laterals. This study will assess the proposed fire hydrants and system for adequate capacity to meet the fire flow requirements per the 2022 California Fire Code (CFC).

2 Water Use Study

2.1 Existing Water System

Water supply is provided by the City of Sebastopol distribution system. There is an existing 6" water main running along Valentine Avenue which this project will connect to, see **Fire Flow Exhibit** in **Appendix I**.

A recent fire flow test was conducted by the City of Sebastopol for existing hydrants #06-30 tested 05/09/2024, see attached **Hydrant Flow Test**. The measured static pressure was 65 pounds per square inch (psi), with a residual pressure of 56 psi at a test flow of 1,256 gallons per minute (gpm).

2.2 Proposed Water System

This project proposes to construct four new fire hydrants located on site to be serviced by a 6" water main and 6" fire laterals. The specifications of the pipe network used in the model are found on **Table 1: Equivalent Pipe Length**.

Table 1: Equivalent Pipe Length

Label	Diameter (in)	Length (User Defined) (ft)	Minor Loss Equivalent Length (ft)	Total Length (ft)	Material	Hazen-Williams (C)
Ex Pipe-1	6	83	0	83	PVC C900	150
Ex Pipe-2	6	126	18	144	PVC C900	150
Ex Pipe-3	6	31	0	31	PVC C900	150
Ex Pipe-4	6	21	19	40	PVC C900	150
Ex Pipe-5	6	37	19	56	PVC C900	150
Pipe-1	6	30	19	49	PVC C900	150
Pipe-2	6	158	10	168	PVC C900	150
Pipe-3	6	21	34	55	PVC C900	150
Pipe-4	6	184	28	212	PVC C900	150
Pipe-5	6	11	19	30	PVC C900	150
Pipe-6	6	209	51	260	PVC C900	150
Pipe-7	6	25	34	59	PVC C900	150
Pipe-8	6	266	20	286	PVC C900	150

2.3 Fire Protection

According to the 2022 CFC, Appendix B Table B105-1, this project will require a total fire flow of 1,500 gpm at a residential pressure of 20 psi at the proposed hydrant. Modeling of the proposed fire water system was performed using public domain pipe distribution system modeling software (EPANET 2.2). The proposed pipe network is shown in **Appendix I: Fire Flow Exhibits**. The model calibration and fire flow scenario is described below.

Model Calibration – Existing test flow rate of Fire Hydrant "3412"

The flow rate measured in the existing hydrants near the project site, given by the City of Sebastopol, were modeled and run independently to mimic existing conditions for accuracy. Residual pressures in the model were representative of the hydrant flow test.

Fire Flow Scenario – Required flow rate to meet 2022 CFC standards

Proposed fire hydrants were analyzed with the required total flow rate of 1,500 gpm to determine the residual pressure and maximum velocity within the model.

3 Results

The demand, static pressure, residual pressure, and maximum velocity are shown in **Table 2: Water Demand Nodes**. The proposed fire hydrants are shown to have sufficient residual pressure.

Table 2: Water demand nodes, Residual Pressures, and Velocities from the Fire Flow Scenarios.

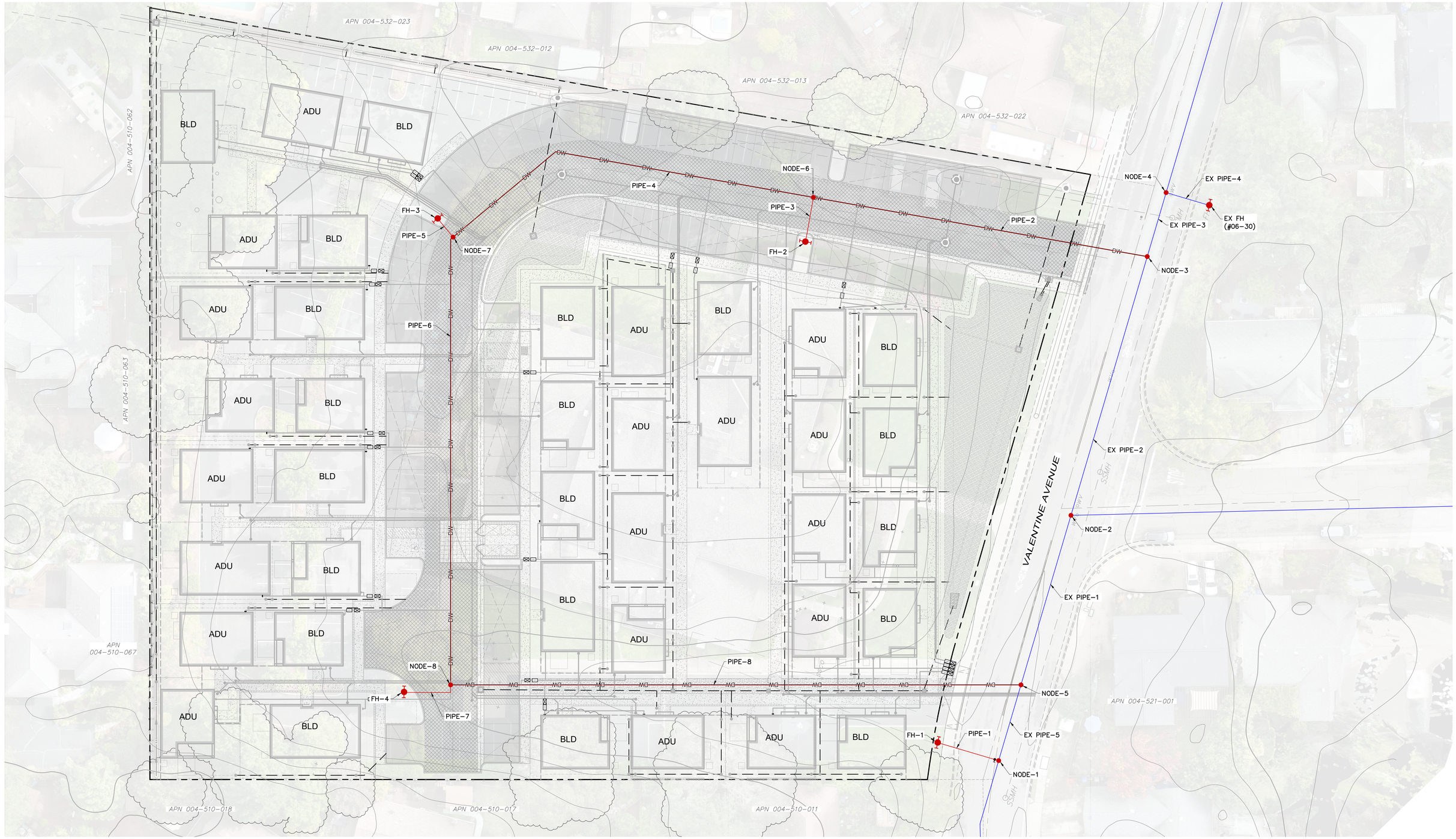
Water Demand Nodes						
Label	**Elevation** (ft)	**Demand** (gpm)	**Static System Pressure** (psi)	**Residual Pressure** (psi)	**Maximum System Velocity** (ft/s)	**Satisfies Fire Flow Constraints?**
#06-30	194	1,256	65	58	-	-
FH-1	195	1,500	65	53	10.28	TRUE
FH-2	197	1,500	64	50	11.39	TRUE
FH-3	199	1,500	63	49	9.23	TRUE
FH-4	199	1,500	63	48	10.23	TRUE

4 Conclusion

The proposed fire hydrants have been designed to meet the 2022 CFC. The onsite fire protection system, as designed, will provide the required fire flow at required residual pressures.

Appendix I

Fire Flow Exhibit



LEGEND:

- JUNCTION NODE
- FIRE HYDRANT NODE
- 6" PROPOSED WATER PIPE
- 6" EX WATER PIPE

20' 10' 0 10' 20' 40' 60'

Graphic Scale: 1" = 20'

April 14, 2026

FIRE FLOW EXHIBIT

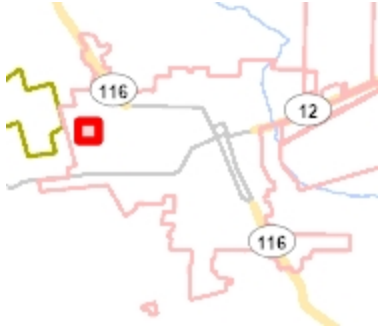
VESTING TENTATIVE MAP VALENTINE AVENUE
8100 Valentine Avenue, Sebastopol, CA
APN 004-510-054

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"A Service You Can Count On!"

T:\2025 PROJECTS\25213\dwg\Adobe-Design\Const Docs\Exhibits\25213-Fire Exhibit.dwg, Kai Murata, 4/14/2026 3:45:17 PM

8100 Valentine Ave - Hyd. 06-30 Hyd. Flow Test





Hyd. - (06-30) Tested- 5/9/24
Static Pressure - 65 psi
Residual Pressure - 58 psi
Flow Pressure - 56 psi
Test Outlet Flow - 1256 gpm
Available Hyd. Flow - 3430 gpm

11/5/2025

Scale 1: 1,200

0 Miles 0.02



PHOTOMETRIC STUDY

SCALE: 1"=20'-0"

NORTH

Radean Arm Mount

LED Area Luminaire

Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA: 0.75 ft² (0.05 m²)

Length:
L1 24" (61cm)
L2 30" (60.96 cm)

Width: 24" (61cm)

Height: 4" (10.2cm)

Weight (max): 29lbs (13.15Kg)

Introduction

The RADEAN arm mount luminaire is the perfect choice for pedestrian applications where daytime aesthetics and visual comfort are needed. Adding architectural flair to any space, the RADEAN's low-profile shape and smooth curves blend in while adding a touch of elegance.

Perfect for campuses, parks, pedestrian malls, courtyards and pathways, the RADEAN arm mount is the Architect's choice to provide beautiful aesthetics both day and night.

Ordering Information

EXAMPLE: RAD1 LED P3 30K SYM MVOLT RPA PE DNAXD

RAD1 LED

Series	Performance package	Color temperature	Distribution	Voltage	Mounting
RAD1 LED	P1 3,000 Lumens P2 5,000 Lumens P3 7,000 Lumens P4 11,000 Lumens P5 16,000 Lumens	27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	SYM Symmetric type V ASY Asymmetric type IV PATH Pathway type III	MVOLT[1] 277[1] 120[1] 347 208[1] 480 240[1]	SPA Square pole mounting (includes adapter) RPA Round pole mounting WBA Wall bracket

Control options	Other options	Finish (required)
Shipped installed NLTAIR2 nLight AIR 2.0 enabled[2] PE Button photocell[3] FAO Field adjustable output[4] DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately)	SF Single Fuse[5] DF Double Fuse[5] L90 Left rotated optics R90 Right rotated optics **Shipped separately** HS Houseside shield[5]	DDBXD Dark bronze DBLBXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBTXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories Ordered and shipped separately.

RADHS Houseside shield (shield is white)

For more control options, visit DTL and ROAM online.

NOTES
1. 2700K and 3500K may require extended lead-times.
2. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
3. Shipped with NLTAIR2 PIR or NLTAIR2 PIR9 sensor for external nLight Air network. Does not include occupancy sensor. For more information refer to DSNCR pole mount sensor.
4. DMG not available with NLTAIR2 or FAO.
5. Also available as a separate accessory; see Accessories information. Shield is field installable in 45° increments.

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FIXTURE TYPE S1, S2

CONTRACTOR SELECT

LITHONIA LIGHTING

Catalog Number
Notes
Type

Contractor Select™

CNY LED ALO

Canopy Luminaire
Adjustable+Switchable+Photocell
+Occupancy Sensor

The Lithonia Lighting CNY LED ALO canopy luminaire is a versatile, energy-efficient solution for surface-mount applications for walkways, overhangs, and parking garages. Adjustable switch panel easily changes lumen output, color temperature, integrated photocell, and integrated motion sensor. The low profile frosted lens creates a visually comfortable illumination and even distribution.



FEATURES:
- 3 power levels deliver 5,000 - 10,000 lumens.
- Switchable CCT (30K/40K/50K) offers warm, cool, and daylight in a single fixture
- Integrated On/Off photocell
- Integrated occupancy sensor can be turned on, off, or set to 10% dim
- Install by surface mount, junction box, or pendant mount
- IK08 Impact resistant polycarbonate frosted lens
- IP65 rated, die cast aluminum housing

Adjustable Lumen Output ALO · Switchable CCT SWW2 · Integrated Photocell · Integrated Motion Sensor · 65 IP RATED · LEI · SBC · LOCATION · 5 YEAR

Catalog Number	Adjustable Lumen Output ALO			Switchable CCT SWW2	Photocell Operation	Occupancy Sensor	Input Voltage	CRS	Finish
CNY LED ALO SWW2 UVOLT PE PIR DDB M2	5,000 Lumens	7,500 Lumens	10,000 Lumens	Switchable 3000K, 4000K,5000K	Included Standard, Selectable On/Off	Included Standard, Selectable On/Off/10% Dim	120-347V	80CRI	Dark Bronze
CNY LED ALO SWW2 UVOLT PE PIR WH M2	5,000 Lumens	7,500 Lumens	10,000 Lumens	Switchable 3000K, 4000K,5000K	Included Standard, Selectable On/Off	Included Standard, Selectable On/Off/10% Dim	120-347V	80CRI	White

CNY Stock Options

Catalog Number	UPC	CU Code	Number of fixtures per pallet	Traditional Replacement
CNY LED ALO SWW2 UVOLT PE PIR DDB M2	609978949041	*1844928	180	Up to 250W HID
CNY LED ALO SWW2 UVOLT PE PIR WH M2	609978949115	*1844936	180	Up to 250W HID

Lumen Output:
Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of configurations shown within the tolerances described within LM-79.

Lumen Output	Input Wattage	CCT/80CRI	Delivered Lumens	Lumens Per Watt
5,000	34	3000K	4781	139
		4000K	4794	141
		5000K	4777	140
7,500	52	3000K	7169	133
		4000K	7455	144
		5000K	7291	137
10,000	75	3000K	9564	123
		4000K	9894	136
		5000K	9529	125

Accessories: *Order as separate catalog number.*

CNYBCP DDB — 14 Inch x 14 Inch Beauty Cover Plate
CNYEB E7WC M12 — Field installable emergency battery, 7W, UVOLT compatible, Minimum operating temp of 0°C

FIXTURE TYPE A

NOTES THIS SHEET:

1. S1: RAD1-LED-P5-40K-ASY-HS
2. S2: RAD1-LED-P5-40K-PATH-HS
3. A: CNY-LED-ALO-SWW2-UVOLT-PE-PIR-DDB-M2

HCS Engineering
50 years
4512 Feather River Dr #F, Stockton, CA 95219
209-478-8270 | www.hcs-eng.com
☒ Richard C. Smith, PE richard@hcs-eng.com
☐ Bhupendra Patel, PE bhupendra@hcs-eng.com

PROJECT # 2026.054

REGISTERED PROFESSIONAL ENGINEER · RICHARD C. SMITH · No. E14303 Exp. 6-30-25 · ELECTRICAL · STATE OF CALIFORNIA

STAMP

No.	Description	Date	By
–	–	–	–

VESTING TENATIVE

8100 VALENTINE AVENUE
SEBASTOPOL, CA

PHOTOMETRIC STUDY

Project number	2026.054
Date	MARCH XX, 2026
Drawn by	CM & LM
Checked by	RCS

E1.0

Scale AS NOTED

FILE: C:\Users\12093\Box\HCS\2026\0-100\2026.054 sebastopol photometric\E1.0.dwg Aug 28, 2026 - 8:39am 12093

Received 5/21/2026
Agenda Item Number 7

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture

TREE INVENTORY REPORT

8100 Valentine Avenue
Sebastopol, CA

Prepared for:

The Grupe Company
3255 West March Lane , Ste. 400
Stockton, CA 95219

Prepared by:

John C. Meserve
International Society of Arboriculture
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ

December 5, 2025

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

December 5, 2025

Rob Toste
The Grupe Company
3255 West March Lane
Ste. 400
Stockton, CA 95219

Re: Completed Tree Inventory Report, 8100 Valentine Avenue, Sebastopol

Rob,

Attached you will find our completed *Tree Inventory Report* for the above noted proposed residential project site in Sebastopol. A total of 46 trees, of which 19 are protected native trees, have been included in this study.

Each tree in this report was evaluated and documented for species, size, health, and structural condition. We have also provided our estimate of the potential development impact on each tree, as well as specific recommendations for preservation or removal. The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees. Also included are a *Tree Fencing Detail, Tree Pruning Standards*, and *Tree Preservation Guidelines.*

This report is intended to be a basic inventory of trees present at this site. We evaluated trees using a Level 2 Basic Visual Assessment following International Society of Arboriculture Best Management Practices. This study is based on our observations as they existed at the time of our inspections. Our opinions are given based on observations made using generally accepted professional judgement, but because trees are living organisms and subject to change, damage, and disease our observations and recommendations are valid only on the date observations took place. No guarantee, warranty, representation, or opinion is made regarding the length of the validity of the observations and recommendations contained in this study. As a result you may not rely on this study except for representing the observations and recommendations that were made on the date of our inspections. We recommend that the trees included in this study be regularly evaluated to document any changes that do occur over time.

No other trees were included in this report, and if other trees need to be included it is your responsibility to provide that direction to us.

~ Voice 707-935-3911 Fax 707-935-7103 ~

EXISTING SITE CONDITION SUMMARY

The project site consists of an existing church property.

EXISTING TREE SUMMARY

Species that are native to the site include Coast Live Oak and Valley Oak.

Species that are native to California, but not to this site, include Coast Redwood and Western Red Cedar.

Ornamental species that are present include Crepe Myrtle, Flowering Cherry, Flowering Pear, European Birch, Chinese Pistache, London Plane, and Eastern Redbud.

PROTECTED NATIVE TREES

The Sebastopol Tree Ordinance defines Protected Native Trees as 20" in trunk diameter or larger on single family or duplex properties. At this site 19 trees including Coast Redwood, Valley Oak, and Coast Live Oak meet these criteria. Of these trees 7 will require removal and 12 can be retained. Removed trees will require mitigation.

Please feel free to contact me if you have questions regarding this report, or if further discussion about any tree issue is required.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ



TREE INVENTORY CHART

TREE INVENTORY
8100 Valentine Avenue
Sebastopol, CA

Tree #	Species	Common Name	Trunk Diameter Inches (dbh @ 4.5")	Height (± feet)	Radius (± feet)	Health (1 - 5)	Structure (1 - 4)	Protected Native Tree >20"	Expected Impact	Recommendations
10	*Lagerstroemia indica*	Crepe Myrtle	5.5	14	12	4	3	No	3	2
11	*Pyrus calleryana*	Flowering Pear	11.5	30	15	4	3	No	3	2
12	*Quercus agrifolia*	Coast Live Oak	14.5	35	18	4	3	No	3	2
13	*Quercus agrifolia*	Coast Live Oak	13	35	18	4	3	No	3	2
14	*Quercus agrifolia*	Coast Live Oak	14.5	40	20	4	3	No	3	2
15	*Pyrus calleryana*	Flowering Pear	12	25	12	4	3	No	3	2
16	*Betula alba*	European Birch	19	35	20	4	3	No	3	2
17	*Platanus acerifolia*	London Plane	16.5	35	24	4	3	No	3	2
18	*Pyrus calleryana*	Flowering Pear	12.5	15	12	4	3	No	3	2
19	*Pyrus calleryana*	Flowering Pear	18	21	12	4	3	No	3	2
20	*Sequoia sempervirens*	Coast Redwood	36	70	16	4	3	Yes	2	1, 6, 7, 8, 11

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Tree #	Species	Common Name	Trunk Diameter Inches (dbh @ 4.5")	Height (± feet)	Radius (± feet)	Health (1 - 5)	Structure (1 - 4)	Protected Native Tree >20"	Expected Impact	Recommendations
21	*Sequoia sempervirens*	Coast Redwood	40	70	16	4	3	Yes	2	1, 6, 7, 8, 11
22	*Sequoia sempervirens*	Coast Redwood	40	70	16	4	3	Yes	2	1, 6, 7, 8, 11
23	*Sequoia sempervirens*	Coast Redwood	32	70	16	4	3	Yes	3	2
24	*Sequoia sempervirens*	Coast Redwood	26	70	16	4	3	Yes	2	1, 6, 7, 8, 12
25	*Sequoia sempervirens*	Coast Redwood	23	70	16	4	3	Yes	2	1, 6, 7, 8, 10, 12
26	*Sequoia sempervirens*	Coast Redwood	33	70	16	4	3	Yes	2	1, 6, 7, 8, 10, 12
27	*Sequoia sempervirens*	Coast Redwood	15	70	16	4	3	No	2	1, 6, 7, 8, 12
28	*Sequoia sempervirens*	Coast Redwood	34	70	16	4	3	Yes	3	2
29	*Sequoia sempervirens*	Coast Redwood	31	70	16	4	3	Yes	3	2
30	*Sequoia sempervirens*	Coast Redwood	31	70	16	4	3	Yes	3	2
31	*Sequoia sempervirens*	Coast Redwood	33	70	16	4	3	Yes	3	2

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TREE INVENTORY
8100 Valentine Avenue
Sebastopol, CA

Tree #	Species	Common Name	Trunk Diameter Inches (dbh @ 4.5")	Height (± feet)	Radius (± feet)	Health (1 - 5)	Structure (1 - 4)	Protected Native Tree >20"	Expected Impact	Recommendations
32	*Sequoia sempervirens*	Coast Redwood	44	70	16	4	3	Yes	2	1, 6, 7, 8, 10, 12
33	*Pyrus calleryana*	Flowering Pear	14	16	14	4	3	No	3	2
34	*Pyrus calleryana*	Flowering Pear	18	25	15	4	3	No	3	2
35	*Lagerstroemia indica*	Crepe Myrtle	5	12	8	4	3	No	3	2
36	*Pyrus calleryana*	Flowering Pear	17	20	12	4	3	No	3	2
37	*Pyrus calleryana*	Flowering Pear	15.5	20	12	4	3	No	3	2
38	*Pyrus calleryana*	Flowering Pear	10	15	12	4	3	No	3	2
39	*Pyrus calleryana*	Flowering Pear	15	20	12	4	3	No	3	2
40	*Sequoia sempervirens*	Coast Redwood	40	70	16	4	3	Yes	2	1, 6, 7, 8, 10, 12
41	*Sequoia sempervirens*	Coast Redwood	35	70	16	4	3	Yes	3	2
42	*Quercus agrifolia*	Coast Live Oak	14.5	40	20	4	3	No	3	2

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Tree #	Species	Common Name	Trunk Diameter Inches (dbh @ 4.5")	Height (± feet)	Radius (± feet)	Health (1 - 5)	Structure (1 - 4)	Protected Native Tree >20"	Expected Impact	Recommendations
43	*Myrica california*	California Wax Myrtle	5+4+3+1+1	12	12	4	3	No	3	2
44	*Pyrus calleryana*	Flowering Pear	12	25	10	4	3	No	3	2
45	*Pistache chinensis*	Chinese Pistache	10	25	14	4	3	No	3	2
46	*Pistache chinensis*	Chinese Pistache	10	25	14	4	3	No	3	2
47	*Sequoia sempervirens*	Coast Redwood	37	70	16	4	3	Yes	3	1, 6, 7. 8. 10, 12
48	*Sequoia sempervirens*	Coast Redwood	24	70	16	4	3	Yes	3	1, 6, 7. 8. 10, 12
49	*Prunus serrulata*	Flowering Cherry	5+8	22	12	4	3	No	3	2
50	*Platanus acerifolia*	London Plane	16.5	35	25	4	3	No	3	2
51	*Prunus serrulata*	Flowering Cherry	8	10	6	4	3	No	3	2
52	*Quercus lobata*	Valley Oak	32	40	35	4	3	Yes	2	1, 6, 7. 8. 10, 12
53	*Quercus agrifolia*	Coast Live Oak	36	45	30	2.5	3	Yes	3	2

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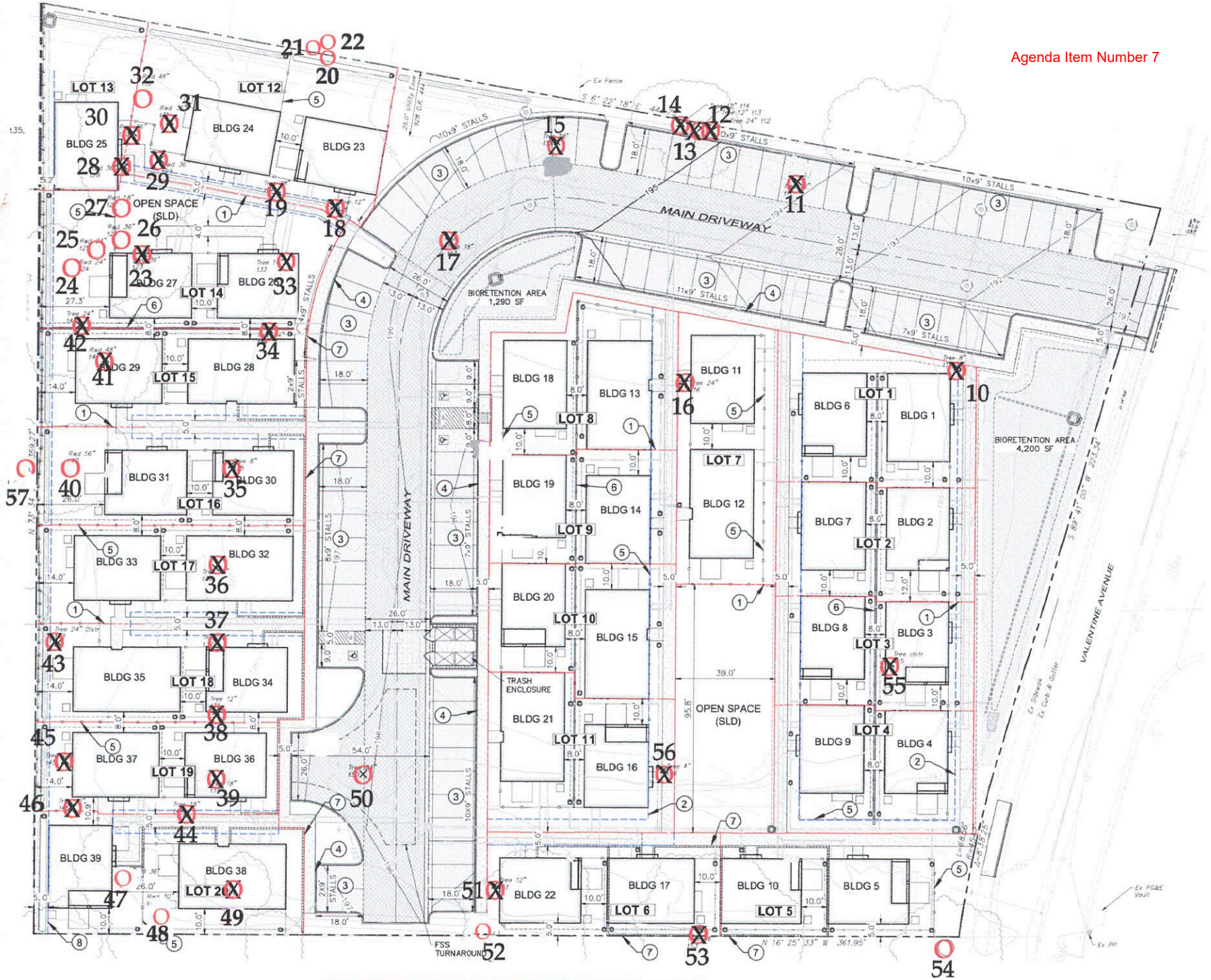
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Tree #	Species	Common Name	Trunk Diameter Inches (dbh @ 4.5")	Height (± feet)	Radius (± feet)	Health (1 - 5)	Structure (1 - 4)	Protected Native Tree >20"	Expected Impact	Recommendations
54	*Thuja plicata*	Western Red Cedar	48+48	70	18	4	3	No	2	1, 6, 7, 8, 11, 12
55	*Lagerstroemia indica*	Crepe Myrtle	multiple <5"	20	12	4	3	No	3	2
56	*Cercis canadensis*	Eastern Redbud	2+2+2	10	6	4	3	No	3	2
57	*Sequoia sempervirens*	Coast Redwood	±40	70	16	4	3	Yes	1	1, 6, 7. 8. 11, 12

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TREE LOCATION PLAN



TREE LOCATION AND NUMBERING PLAN
8100 Valentine Avenue

KEY TO TREE INVENTORY CHART

KEY TO TREE INVENTORY CHART
8100 Valentine Avenue
Sebastopol, CA

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level. The *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured or estimated, in inches, to document its diameter, at 4.5 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

(5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.

(4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.

(3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.

(2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.

(1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

(4) Good structure - minor structural problems may be present which do not require corrective action.

(3) Moderate structure - normal, typical structural issues which can be corrected with pruning.

(2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.

(1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

Construction Impacts

Considering the proximity of construction activities, type of activities, tree species, and tree condition - the following ratings are used to estimate the amount of impact on tree health and stability. Most trees will tolerate a (1) rating, many trees could tolerate a (2) rating with careful consideration and mitigation, but trees with a (3) rating are poor candidates for preservation.

(4) Impacts are unknown at this time and will depend on the location of improvements inside the illustrated building envelope.

(3) A significant impact on long term tree integrity can be expected as a result of proposed development.

(2) A moderate impact on long term tree integrity can be expected as a result of proposed development.

(1) A minor impact on long term tree integrity can be expected as a result of proposed development.

Recommendations

Recommendations are provided for removal or preservation. For those being preserved, protection measures and mitigation procedures to offset impacts and improve tree health are provided.

(1) Preservation appears to be possible.

(2) Removal is required due to significant development impacts.

(3) Removal is required due to poor health or hazardous structure.

(4) Removal is required due to significant development impacts and poor existing condition.

(5) Removal is recommended due to poor species characteristics.

(6) Install temporary protective fencing at the edge of the dripline, or edge of approved construction, prior to beginning grading or construction. Maintain fencing in place for duration of all construction activity in the area.

(7) Maintain existing grade within the fenced portion of the dripline. Route drainage swales and all underground work outside the dripline.

(8) Place a 4" layer of chipped bark mulch over the soil surface within the fenced dripline prior to installing temporary fencing. Maintain this layer of mulch throughout construction.

(9) Prune to clean the canopy, per International Society of Arboriculture pruning standards.

(10) Prune to provide clearance for adjacent improvements, per International Society of Arboriculture pruning standards.

(11) This trunk is located off site, but the canopy overhangs the project site.

(12) Excavation may be required within the TPZ and the dripline for development. Excavation within the TPZ of any type must adhere to the following guidelines:

All roots encountered that are 2 inches or larger in diameter must be cleanly cut as they are encountered by excavating equipment.

Roots may not be ripped from the ground and then trimmed. They must be trimmed as encountered and this will require the use of a ground man working with a suitable power tool.

Pruned and exposed roots greater than 2 inches in diameter must be protected from desiccation if left exposed for more than 24 hours. Cover cut roots with heavy cloth, burlap, used carpeting, or similar material that has been soaked in water, until trench or excavation has been backfilled.

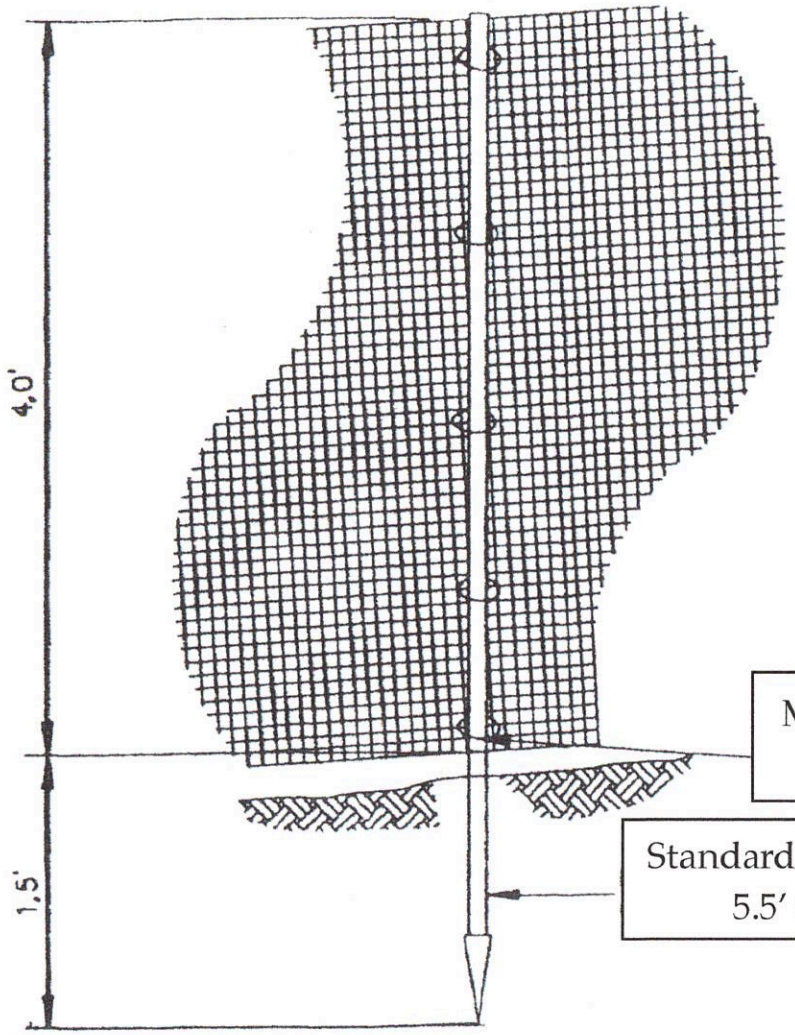
If excavation impacts more than 20% of the defined TPZ then supplemental irrigation may be required to offset loss of roots. Excavation in this case should be directed by the project arborist who will determine whether excavation is required, when, and how.

Any excavation within the defined TPZ will require that the tree be monitored on a monthly basis by the project arborist for the duration of construction and for one year beyond completion of construction. Monitoring may determine other mitigation measures that may be required to offset root loss or damage.

(13) This tree is not a protected species and is exempt from preservation or mitigation based on the Tree Ordinance.

(14) No numbered tag was placed on this tree

TREE FENCING DETAIL



NOTE
Metal Wire Tree Protection Fencing

Minimum 4-ft high steel welded wire fencing with mesh size 2-in x 4-in, or arborist approved wire fence substitute. Cut and shape as needed for sloping terrain

Metal tie wire, flip tie, or equivalent, 5 per post

Standard farm quality metal 'T' post, 5.5' tall, placed 8' on center

METAL WIRE TREE PROTECTION FENCING

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TREE PRESERVATION GUIDELINES

TREE PRESERVATION GUIDELINES

8100 Valentine Avenue
Sebastopol, CA

INTRODUCTION

Great care must be exercised when development is proposed in the vicinity of established trees of any type. The trees present at this site require specialized protection techniques during all construction activities to minimize negative impact on their long term health and vigor. The area immediately beneath and around canopy driplines is especially critical, and the specifications that follow are established to protect short and long term tree integrity. The purpose of this specification is therefore to define the procedures that must be followed during any and all phases of development in the immediate vicinity of designated protected trees.

Established, mature trees respond in a number of different ways to the disruption of their natural conditions. Change of grade within the root system area or near the root collar, damage to the bark of the trunk, soil compaction above the root system, root system reduction or damage, or alteration of summer soil moisture levels may individually or collectively cause physiological stress leading to tree decline and death. The individual impacts of these activities may cause trees to immediately exhibit symptoms and begin to decline, but more commonly the decline process takes many years, with symptoms appearing slowly and over a period of time. Trees may not begin to show obvious signs of decline from the negative impacts of construction until many years after construction is completed. It is not appropriate to wait for symptoms to appear, as this may be too late to correct the conditions at fault and to halt decline.

It is therefore critical to the long-term health of all protected trees that a defined protection program be established before beginning any construction activity where protected trees are found. Once incorporated at the design level, it is mandatory that developers, contractors, and construction personnel understand the critical importance of these guidelines, and the potential penalties that will be levied if they are not fully incorporated at every stage of development.

The following specifications are meant to be utilized by project managers and those supervising any construction in the vicinity of protected trees including grading contractors, underground contractors, all equipment operators, construction personnel, and landscape contractors. Questions which arise, or interpretation of specifications as they apply to specific site activities, must be referred to the project arborist as they occur.

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TREE PROTECTION ZONE

1. The canopy dripline is illustrated on the Improvement Plans and represents the area around each tree, or group of trees, which must be protected at all times with tree protection fencing.

2. No encroachment into the dripline is allowed at any time without approval from the project arborist, and unauthorized entry may be subject to civil action and penalties.

3. The dripline will be designated by the project arborist at a location determined to be adequate to ensure long term tree viability and health. This is to occur prior to installation of fencing and in conjunction with the fencing contractor

TREE PROTECTION FENCING

1. Prior to initiating any construction activity on a construction project, including demolition or grading, temporary protective fencing shall be installed at each site tree, or group of trees. Fencing shall be located at the dripline designated by the project arborist and generally illustrated on the Improvement Plans.

2. Fencing shall be minimum 4' height at all locations, and shall form a continuous barrier without entry points around all individual trees, or groups of trees. Barrier type fencing is recommended, but any fencing system that adequately prevents entry will be considered for approval by the project arborist. The use of post and cable fencing is not acceptable, however.

3. Fencing shall be installed tightly between steel fence posts (standard quality farm 'T' posts work well) placed no more than 8 feet on center. Fencing shall be attached to each post at 5 locations with plastic electrical ties, metal tie wire, or flip ties. See attached fencing detail.

4. Fencing shall serve as a barrier to prevent encroachment of any type by construction activities, equipment, materials storage, or personnel.

5. All encroachment into the fenced dripline must be approved and supervised by the project arborist. Approved dripline encroachment may require additional mitigation or protection measures that will be determined by the project arborist at the time of the request.

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6. Contractors and subcontractors shall direct all equipment and personnel to remain outside the fenced area at all times until project is complete, and shall instruct personnel and sub-contractors as to the purpose and importance of fencing and preservation.

7. Fencing shall be upright and functional at all times from start to completion of project. Fencing shall remain in place and not be moved or removed until all construction activities at the site are completed.

TREE PRUNING AND TREATMENTS

1. All recommendations for pruning or other treatments must be completed prior to acceptance of the project. It is strongly recommended that pruning be completed prior to the start of grading to facilitate optimum logistics and access.

2. All pruning shall be conducted in conformance with International Society of Arboriculture pruning standards, and all pruning must occur by, or under the direct supervision of, an arborist certified by the International Society of Arboriculture.

GRADING AND TRENCHING

1. Any construction activity that necessitates soil excavation in the vicinity of preserved trees shall be avoided where possible, or be appropriately mitigated under the guidance of the project arborist. All contractors must be aware at all times that specific protection measures are defined, and non conformance may generate stop-work orders.

2. The designated dripline is defined around all site trees to be preserved. Fences protect the designated areas. No grading or trenching is to occur within this defined area unless so designated by the Improvement Plan, and where designated shall occur under the direct supervision of the project arborist.

3. Trenching should be routed around the dripline. Where trenching has been designated within the dripline, utilization of underground technology to bore, tunnel or excavate with high-pressure air or water will be specified. Hand digging will be generally discouraged unless site conditions restrict the use of alternate technology.

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4. All roots greater than one inch in diameter shall be cleanly hand-cut as they are encountered in any trench or during any grading activity. The tearing of roots by equipment shall not be allowed. Mitigation treatment of pruned roots shall be specified by the project arborist as determined by the degree of root pruning, location of root pruning, and potential exposure to desiccation. No pruning paints or sealants shall be used on cut roots.

5. Where significant roots are encountered mitigation measures such as supplemental irrigation and/or organic mulches may be specified by the project arborist to offset the reduction of root system capacity.

6. Retaining walls are effective at holding grade changes outside the area of the dripline and are recommended where necessary. Retaining walls shall be constructed in post and beam or drilled pier construction styles where they are necessary near or within a dripline.

7. Grade changes outside the dripline, or those necessary in conjunction with retaining walls, shall be designed so that drainage water of any type or source is not diverted toward or around the root crown in any manner. Grade shall drain away from root crown at a minimum of 2%. If grading toward the root collar is unavoidable, appropriate surface and/or subsurface drain facilities shall be installed so that water is effectively diverted away from root collar area.

8. Grade reduction within the designated dripline shall be generally discouraged, and where approved, shall be conducted only after careful consideration and coordination with the project arborist.

9. Foundations of all types within the dripline shall be constructed using design techniques that eliminate the need for trenching into natural grade. These techniques might include drilled piers, grade beams, bridges, or cantilevered structures. Building footprints should generally be outside the dripline whenever possible.

DRAINAGE

The location and density of native trees may be directly associated with the presence of naturally occurring water, especially ephemeral waterways. Project design, especially drainage components, should take into consideration that these trees may begin a slow decline if this naturally present association with water is changed or eliminated.

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TREE DAMAGE

1. Any form of tree damage which occurs during the demolition, grading, or construction process shall be evaluated by the project arborist. Specific mitigation measures will be developed to compensate for or correct the damage. Fines and penalties may also be levied.

2. Measures may include, but are not limited to, the following:

- pruning to remove damaged limbs or wood
- bark scoring to remove damaged bark and promote callous formation
- alleviation of compaction by lightly scarifying the soil surface
- installation of a specific mulching material
- supplemental irrigation during the growing season for up to 5 years
- treatment with specific amendments intended to promote health, vigor, or root growth
- vertical mulching or soil fracturing to promote root growth
- periodic post-construction monitoring at the developer's expense
- tree replacement, or payment of the established appraised value, if the damage is so severe that long term survival is not expected.

3. Any tree that is significantly damaged and whose survivability is threatened, due to negligence by any contractor, shall be appraised using the Trunk Formula Method provided in the 9th Edition of the Guide For Plant Appraisal. This appraisal value will be the basis for any fines levied on the offending contractor.

MULCHING

1. Trees will benefit from the application of a 4 inch layer of chipped bark mulch over the soil surface within the Tree Protection Zone. Ideal mulch material is a chipped bark containing a wide range of particle sizes. Bark mulches composed of shredded redwood, bark screened for uniformity of size, dyed bark, or chipped lumber will not function as beneficially. All trees that are expected to be

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impacted in any way by project activities shall have mulch placed prior to the installation of protection fencing.

2. Mulch should be generated from existing site trees that are removed or pruned as part of the project. Much brought onto the site from an outside source must be from trees that are verified to be free of the Sudden Oak Death pathogen *Phytophtora ramorum*.

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TREE PRUNING STANDARDS

PRUNING STANDARDS

Purpose:

Trees and other woody plants respond in specific and predictable ways to pruning and other maintenance practices. Careful study of these responses has led to pruning practices which best preserve and enhance the beauty, structural integrity, and functional value of trees.

In an effort to promote practices which encourage the preservation of tree structure and health, the W.C. ISA Certification Committee has established the following Standards of Pruning for Certified Arborists. The Standards are presented as working guidelines, recognizing that trees are individually unique in form and structure, and that their pruning needs may not always fit strict rules. The Certified Arborist must take responsibility for special pruning practices that vary greatly from these Standards.

I. Pruning Techniques

A. A thinning cut removes a branch at its point of attachment or shortens it to a lateral large enough to assume the terminal role. Thinning opens up a tree, reduces weight on heavy limbs, can reduce a tree's height, distributes ensuing invigoration throughout a tree and helps retain the tree's natural shape. Thinning cuts are therefore preferred in tree pruning.

When shortening a branch or leader, the lateral to which it is cut should be at least one-half the diameter of the cut being made. Removal of a branch or leader back to a sufficiently large lateral is often called "drop crotching."

B. A heading cut removes a branch to a stub, a bud or a lateral branch not large enough to assume the terminal role. Heading cuts should seldom be used because vigorous, weakly attached upright sprouts are forced just below such cuts, and the tree's natural form is altered. In some situations, branch stubs die or produce only weak sprouts.

C. When removing a live branch, pruning cuts should be made in branch tissue just outside the branch bark ridge and collar, which are trunk tissue. *(Figure 1)* If no collar is visible, the angle of the cut should approximate the angle formed by the branch bark ridge and the trunk. *(Figure 2)*

D. When removing a dead branch, the final cut should be made outside the collar of live callus tissue. If the collar has grown out along the branch stub, only the dead stub should be removed, the live collar should remain intact, and uninjured. *(Figure 3)*

E. When reducing the length of a branch or the height of a leader, the final cut should be made just beyond (without violating) the branch bark ridge of the branch being cut to. The cut should approximately bisect the angle formed by the branch bark ridge and an imaginary line perpendicular to the trunk or branch cut. *(Figure 4)*

F. A goal of structural pruning is to maintain the size of lateral branches to less than three-fourths the diameter of the parent branch or trunk. If the branch is codominant or close to the size of the parent branch, thin the branch's foliage by 15% to 25%, particularly near the terminal. Thin the parent branch less, if at all. This will allow the parent branch to grow at a faster rate, will reduce the weight of the lateral branch, slow its total growth, and develop a stronger branch attachment. If this does not appear appropriate, the branch should be completely removed or shortened to a large lateral. *(Figure 5)*

G. On large-growing trees, except whorl-branching conifers, branches that are more than one-third the diameter of the trunk should be spaced along the trunk at least 18 inches apart, on center. If this is not possible because of the present size of the tree, such branches should have their foliage thinned 15% to 25%, particularly near their terminals. *(Figure 6)*

H. Pruning cuts should be clean and smooth with the bark at the edge of the cut firmly attached to the wood.

I. Large or heavy branches that cannot be thrown clear, should be lowered on ropes to prevent injury to the tree or other property.

J. Wound dressings and tree paints have not been shown to be effective in preventing or reducing decay. They are therefore not recommended for routine use when pruning.

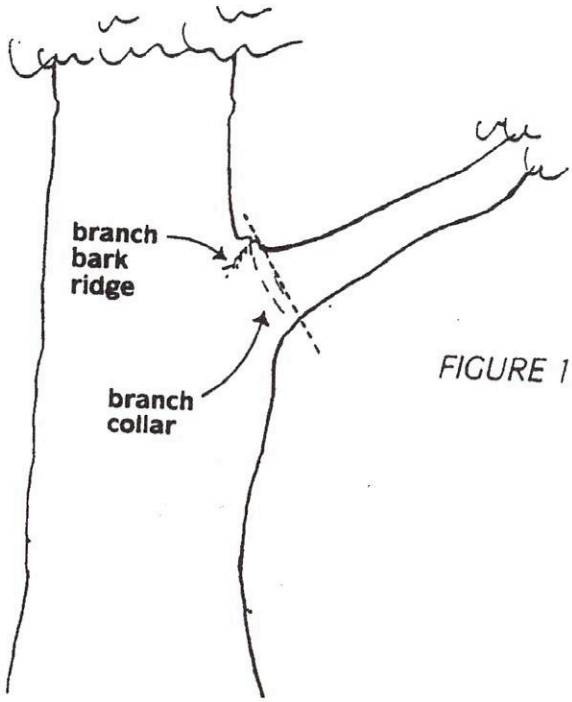


FIGURE 1. *When removing a branch, the final cut should be just outside the branch bark ridge and collar.*

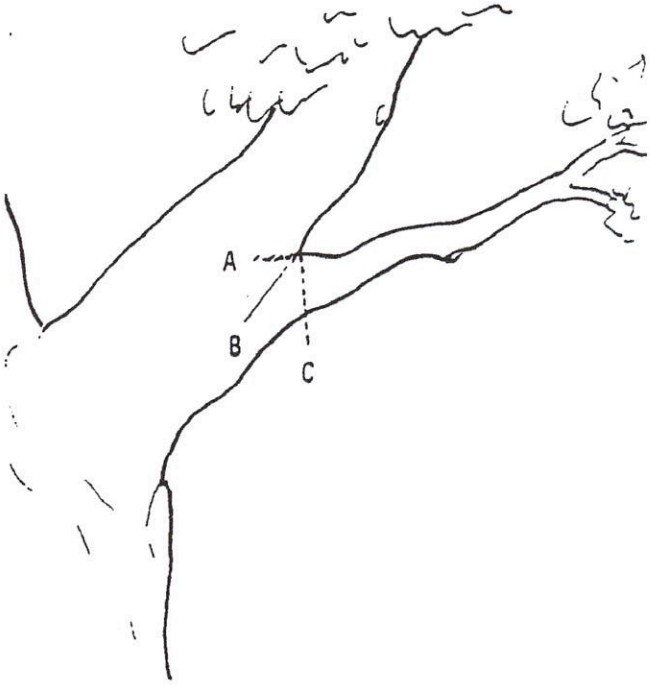


FIGURE 2. *In removing a limb without a branch collar, the angle of the final cut to the branch bark ridge should approximate the angle the branch bark ridge forms with the limb. Angle AB should equal Angle BC.*

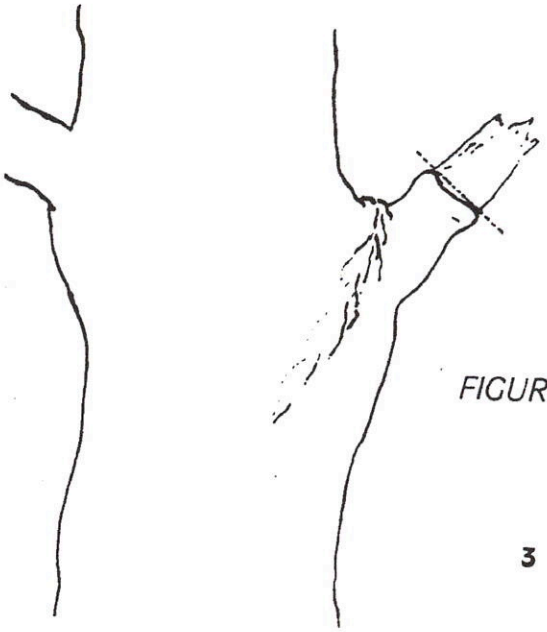


FIGURE 3. *When removing a dead branch, cut outside the callus tissue that has begun to form around the branch.*

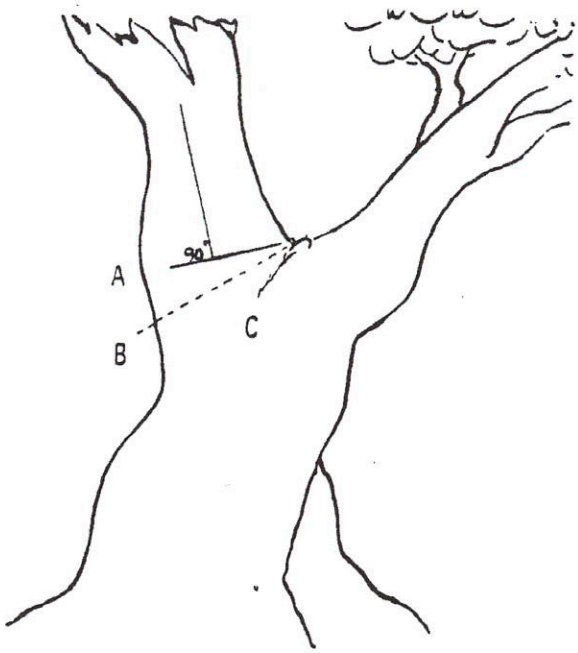


FIGURE 4. *In removing the end of a limb to a large lateral branch, the final cut is made along a line that bisects the angle between the branch bark ridge and a line perpendicular to the limb being removed. Angle AB is equal to Angle BC.*



FIGURE 5. *A tree with limbs tending to be equal-sized, or codominant. Limbs marked B are greater than ¾ the size of the parent limb A. Thin the foliage of branch B more than branch A to slow its growth and develop a stronger branch attachment.*

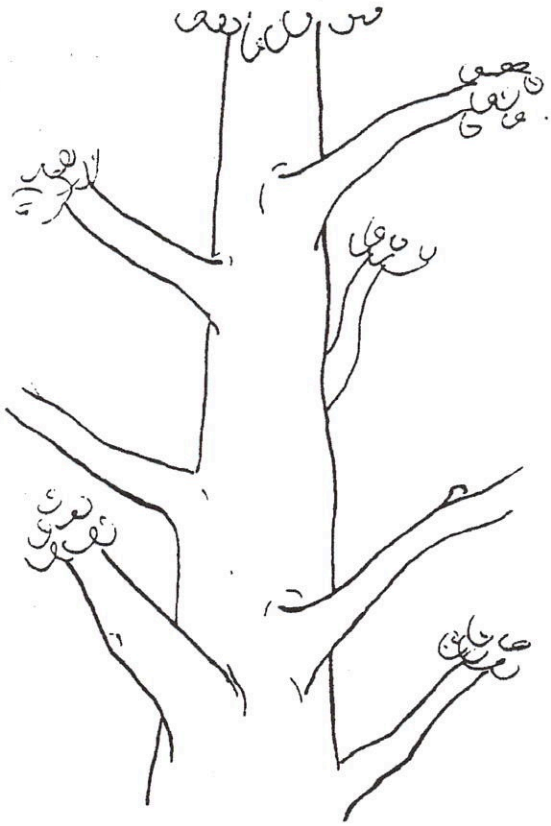


FIGURE 6. *Major branches should be well spaced both along and around the stem.*

II. Types of Pruning — Mature Trees

A. CROWN CLEANING

Crown cleaning or cleaning out is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches and watersprouts from a tree crown.

B. CROWN THINNING

Crown thinning includes crown cleaning and the selective removal of branches to increase light penetration and air movement into the crown. Increased light and air stimulates and maintains interior foliage, which in turn improves branch taper and strength. Thinning reduces the wind-sail effect of the crown and the weight of heavy limbs. Thinning the crown can emphasize the structural beauty of trunk and branches as well as improve the growth of plants beneath the tree by increasing light penetration. When thinning the crown of mature trees, seldom should more than one-third of the live foliage be removed.

At least one-half of the foliage should be on branches that arise in the lower two-thirds of the trees. Likewise, when thinning laterals from a limb, an effort should be made to retain inner lateral branches and leave the same distribution of foliage along the branch. Trees and branches so pruned will have stress more evenly distributed throughout the tree or along a branch.

An effect known as "lion's-tailing" results from pruning out the inside lateral branches. Lion's-tailing, by removing all the inner foliage, displaces the weight to the ends of the branches and may result in sunburned branches, water-sprouts, weakened branch structure and limb breakage.

C. CROWN REDUCTION

Crown reduction is used to reduce the height and/or spread of a tree. Thinning cuts are most effective in maintaining the structural integrity and natural form of a tree and in delaying the time when it will need to be pruned again. The lateral to which a branch or trunk is cut should be at least one-half the diameter of the cut being made.

D. CROWN RESTORATION

Crown restoration can improve the structure and appearance of trees that have been topped or severely pruned using heading cuts. One to three sprouts on main branch stubs should be selected to reform a more natural appearing crown. Selected vigorous sprouts may need to be thinned to a lateral, or even headed, to control length growth in order to ensure adequate attachment for the size of the sprout. Restoration may require several prunings over a number of years.

II. Types of Pruning — Mature Trees *(continued)*

E. CROWN RAISING

Crown raising removes the lower branches of a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas. It is important that a tree have at least one-half of its foliage on branches that originate in the lower two-thirds of its crown to ensure a well-formed, tapered structure and to uniformly distribute stress within a tree.

When pruning for view, it is preferable to develop "windows" through the foliage of the tree, rather than to severely raise or reduce the crown.

III. Size of Pruning Cuts

Each of the Pruning Techniques (Section I) and Types of Pruning (Section II) can be done to different levels of detail or refinement. The removal of many small branches rather than a few large branches will require more time, but will produce a less-pruned appearance, will force fewer watersprouts and will help to maintain the vitality and structure of the tree. Designating the maximum size (base diameter) that any occasional undesirable branch may be left within the tree crown, such as ½", 1" or 2" branch diameter, will establish the degree of pruning desired.

IV. Climbing Techniques

A. Climbing and pruning practices should not injure the tree except for the pruning cuts.

B. Climbing spurs or gaffs should not be used when pruning a tree, unless the branches are more than throw-line distance apart. In such cases, the spurs should be removed once the climber is tied in.

C. Spurs may be used to reach an injured climber and when removing a tree.

D. Rope injury to thin barked trees from loading out heavy limbs should be avoided by installing a block in the tree to carry the load. This technique may also be used to reduce injury to a crotch from the climber's line.