Midpeninsula Regional
Open Space District

R-24-15
Meeting 24-03
January 24, 2024

AGENDA ITEM 9

AGENDA ITEM

Bear Creek Redwoods North Parking Area Existing Conditions, Site Opportunity and Constraints Analysis, and Conceptual Design Alternatives

GENERAL MANAGER'S RECOMMENDATION

Accept conceptual design alternative No. 2 for a new vehicle and horse trailer parking area at Bear Creek Redwoods Open Space Preserve, which is the Planning and Natural Resources Committee's preferred option, to proceed into environmental review and design development.

SUMMARY

Midpeninsula Regional Open Space District (District) staff have conducted technical studies and developed preliminary design alternatives for the Bear Creek Redwoods North Parking Area project (project), consistent with the Bear Creek Redwoods Preserve Plan (Preserve Plan). The planned new parking area will be located on an approximately 2.5-acre site on the south side of Bear Creek Road, northeast of the Bear Creek Stables driveway and approximately 0.5 miles from Highway 17 (see Attachment 1 for a map of the project area). The North Parking Area is envisioned to provide approximately 50 vehicle parking spaces, eight (8) horse trailer parking spaces, a restroom, and signage. On September 19, 2023, the Planning and Natural Resources Committee (PNR) received a presentation on the Existing Conditions, Site Opportunity and Constraints Analysis, and Conceptual Design Alternatives for the proposed Bear Creek Redwoods North Parking Area. The PNR recommended presenting both options along with a comprehensive comparison to the full Board, with an emphasis on the reasons the Committee preferred Alternative No. 2. If approved by the Board of Directors (Board), construction of the project can commence as early as Fiscal Year 2025-26 (FY26).

BACKGROUND

In January 2017, the Board approved the Bear Creek Redwoods Preserve Plan and certified the associated Environmental Impact Report (EIR). The Preserve Plan provides a long-term use and management plan for Bear Creek Redwoods Open Space Preserve (BCR, Preserve), including new improved visitor access facilities to be implemented in three phases over 20 years. As part of the planned improvements, the Preserve Plan identifies multiple parking areas, including the subject project site (North Parking Area[1]). The other parking areas are the Alma Parking Area, which opened to the public in 2019, and expansion of the existing Bear Creek Stables Parking

[1] The North Parking Area is a temporary name for reference in the Preserve Plan. Future naming of the parking area will undergo review by Board Committee for approval.

Area. While the Preserve Plan recommends parking for expanded public programming at the Bear Creek Stables, the Board decided in 2019 to maintain as status quo the level of public programming at the stables. As a result, the Bear Creek Stables repair plans, which are undergoing permitting, do include minor improvements to the stables parking area but with no substantial increase in vehicle spaces.

The North Parking Area project aims to achieve multiple Public Use and Facilities goals and objectives of the Preserve Plan, including the following:

1. **Public Use and Facilities Goal PU1:** Allow general public access and enhance low-intensity recreational opportunities in the Preserve.

   Public Use and Facilities Objective PU-1.5: Expand and improve Preserve parking capacity.

   Action Description 1.5c: North Parking Area - Construct new paved parking lot and visitor entrance driveway between BC01 and BC02, with a capacity for 40 to 50 vehicles and approximately 8 horse trailers. Install vault toilet, equestrian staging area, and bicycle rack(s).

   Public Use and Facilities Objective PU-1.6: Provide trail-related amenities.

2. **Public Use and Facilities Goal PU2:** Provide low-impact, high-value, site-sensitive interpretation and environmental education activities.

   Public Use and Facilities Objective PU-2.1: Ensure any new visitor access features are sited and designed to protect landscape visual character.

3. **Public Use and Facilities Goal PU5:** Actively involve the public in the use and management of the Preserve.

   Public Use and Facilities Objective PU-5.2: Encourage and engage the public and neighbors in future Plan amendments that affect the use and management of the Preserve.

As part of the EIR, cultural assessments, noise studies, construction analysis (cut/fill calculations), air quality calculations for construction equipment, and rare plant studies were completed early on for the North Parking Area. These studies have informed the development of conceptual design alternatives presented in detail below and in the attachments.

DISCUSSION

Project Prioritization

The intent of the project is to support public access to the Preserve and accommodate an increase in visitation with the upcoming opening of the BCR Phase II Trails, which are slated to open to public use in summer/fall 2024. As stated in the Preserve Plan, the project was intended to be constructed during Phase III of implementation. However, due to several factors (including heavy use of the Alma Parking Area and upcoming public opening of the Phase II Trails), the

Board determined as part of approval of the FY23 Budget and Action Plan that the North Parking Area should be expedited and completed as part of Phase II public improvements.

Existing Conditions

The 2.5-acre project site is located on the south side of Bear Creek Road, approximately 600 feet northeast of the Bear Creek Stables gate. The area was likely logged during the mid-1800s and is now an open meadow consisting largely of non-native grasses. The project site is currently open to equestrians by permit access only. There are no formal trails within the proposed parking area footprint, but trails and patrol roads are immediately adjacent. The location of the parking area was identified during preparation of the Preserve Plan because it is a relatively flat area accessible from Bear Creek Road, adjacent to the planned trail network, avoids impacts to sensitive plant communities, and requires minimal removal of trees. Existing conditions for resource areas are described further in Attachment 2 – Existing Conditions and Opportunities and Constraints Report.

Technical Studies

Traffic Study

Hexagon Traffic Consultants (Hexagon) completed a traffic study in 2016 during preparation of the Preserve Plan, which analyzed sight distances, design speeds, and potential traffic operation impacts related to the proposed North Parking Area. Because Bear Creek Road has varied grades and many curves, sight distance is limited along the stretch of road that runs adjacent to the North Parking Area site. A suitable driveway location was identified west of Camel Hill Vineyard, a private property located across from the project site. Proposed right-of-way improvements include the removal of one to two trees, preserve and traffic signage, and tree-trimming to maintain sight lines. The 2016 traffic study is included as part of Attachment 2 – Existing Conditions and Opportunities and Constraints Report.

Hexagon was retained in March 2023 to perform a supplemental traffic study to confirm the Preserve Plan 2016 sight distances, design speeds, and level of service, and resulting traffic study recommendations and provide any updates due to changes in conditions over the seven years since the initial study. The COVID-19 pandemic resulted in higher than predicted levels of preserve visitation that may have changed baseline traffic patterns. However, the 2016 study included conservative estimates of roadway levels of service, and the ultimate result of the 2016 traffic study is not expected to change. Unfortunately, the severe winter storms of 2023 led to major culvert failures along Bear Creek Road, causing the closure of both the road and the Preserve throughout the late winter, spring, and summer of 2023. As a result, Hexagon had to delay their collection of traffic data until Summer 2024, when peak road and Preserve use levels return to normal operational levels. When the traffic report is complete, the findings will further inform the design process.

Topographic Study

McKay & Somps (MSCE) was retained in February 2023 to prepare a topographic survey for the project site. The survey documented all pertinent existing information to support the design process. MSCE performed a record search for the parcel, located existing underground utilities, and collected site elevation data to accurately represent the topography in 1-foot contours. MSCE produced a preliminary base map containing all pertinent survey data, existing conditions,

property boundaries, and easements, included as part of Attachment 2 – Existing Conditions and Opportunities and Constraints Report.

Geotechnical Investigation

A detailed geotechnical study was conducted in the Fall of 2023. The geotechnical engineer completed site investigations and soil sampling analysis to provide precise site location recommendations for a vault toilet, pavement sections, retaining walls, slope stability, and stormwater treatment facilities. Future investigations are anticipated to include geologic trench studies, given the site's proximity to the San Andreas Fault and mapped landslides. Recommendations from the study are included as part of Attachment 2 – Existing Conditions and Opportunities and Constraints Report.

Botanical Resources Survey

Vollmar Natural Lands Consulting conducted a botanical resources survey in 2021, which determined that no special-status plant species are located on the project site. A supplemental botanical survey of the project area was completed in the Fall of 2023 by AECOM. Additional surveys will not be required as botanical survey results are valid for a period of 5 years.

Biological Resources Survey

California Natural Diversity Database (CNDDB) maps, and Midpen special status species GIS data show historical documentation of several special status species in the Bear Creek Redwoods Area. These include San Francisco dusky-footed woodrat, Townsend's big-eared bat, pallid bat, mountain lion, western pond turtle, California red-legged frog, foothill yellow-legged frog (presumed extirpated), California giant salamander, Santa Cruz black salamander and the Zayante band-winged grasshopper (presumed extirpated). All needed biological surveys of the project area will be undertaken in FY24 to determine if special status species, or potentially suitable habitat, is present. Surveys will also be conducted as needed for other protected species such as nesting birds and roosting bats. Survey methods and minimization of potential impacts will adhere to the Plan EIR. There are no mapped aquatic resources on site.

Cultural Resource Analysis

Basin Research Associates completed a cultural resources analysis in 2021 to support future development in the Phase II area of the Preserve, which includes the project site. No known cultural resources have been recorded within the project area. A supplemental cultural resources survey of the site will be conducted in FY24 or FY25 once the conceptual design is solidified.

Opportunities and Constraints

Opportunities and Constraints for the project have been developed by analyzing the results of the technical studies and identifying site conditions considered for development of the North Parking Area conceptual alternatives. Key opportunities and constraints are summarized below, and additional information is discussed in Attachment 2.

Natural Resources

The location of the planned parking area consists primarily of valley and foothill non-native grasslands and is mostly free of trees. However, there are oak trees present on the edges of the project area, and a small area (fewer than five individuals) of redstem springbeauty (a

representative locally rare plant) that should be avoided in final design. The parking area would encompass approximately two-acres of the non-native grassland habitat, and two oak trees would be removed to enhance line of sight for the proposed driveway location.

Cultural Resources

No known cultural resources have been recorded within the project area.

Public Access

The existing Alma College parking area currently provides the only public parking for the Preserve, which often fills early in the day during peak visitation. Adding approximately 50 additional parking spaces would assist in addressing visitation demand. The North Parking Area horse trailer parking spaces would also expand public equestrian access to the Preserve since there is no equestrian trailer parking at the Alma parking area and only two equestrian trailer parking spaces at the Stables are available by permit.

Local and Regional Connectivity

The North Parking Area would provide additional access to current and future regional trails, including numerous District public projects that are planned or underway, such as the Phase II Trails, Phase III Trails, the Northeast Trailhead, and the Highway 17 Crossings and Trail Connections Project.

Aesthetics

The project site is located in an open meadow area, and all or a portion of the parking area would be visible from Bear Creek Road. One or more of the conceptual design alternatives focus on minimizing visibility from Bear Creek Road by using existing stands of trees to screen the parking area.

Operations and Maintenance

The North Parking Area would provide additional visitor parking and site amenities that would need to be patrolled and maintained by District staff.

Public Engagement

District staff held virtual stakeholder group meetings and an in-person public workshop in Spring 2023 for the Multi-Use Trail and North Parking Area projects. The public engagement process is further detailed in Attachment 2.

General public feedback received on the North Parking Area Project during public engagement efforts and the September 19, 2023 PNR meeting includes the following:

Theme/Topic	**General Feedback/Comments**
Traffic	• Traffic impacts concerns to Highway 17 due to the proposed access improvements. • Concerns about higher speeds and more cars on Bear Creek Road.

Location	• Concerns about visual impacts to the meadow. • Some members of the public asked if the parking area could be located off Bear Creek Road in a flat clearing adjacent to Gate BC01 (see Figure 1), with access from the existing gate or from the proposed new driveway location. • A member of the public asked if the parking area could be located immediately east of the Alma Cultural Landscape in an open area known as the "ball field" (currently used by the District for equipment storage), with access from Highway 17 (through Gate BC12) via Alma College Road (see Figure 1).
Parking and Visitor Capacity	• Concerns that increasing parking capacity will lead to increased crowding at the preserve.
Amenities	• Equestrian users prefer pull-through trailer parking as opposed to reverse parking. • Tandem parking spaces for horse trailers can be more useful than side-by-side as horses are often tied to the sides of trailers. • Support for interpretive elements that highlight the estate period and cultural significance of the area. • Desire for signage denoting the parking area for equestrians as restricted to equestrian trailer parking.
General	• Concerns about the potential loss of natural habitat.
Fire Risk	• Concern that additional people and vehicles in the preserve could mean greater fire risk.
Security and Safety	• Concerns about privacy and safety for neighbors living close to the preserve because of increased public access.

While the flat area adjacent to Gate BC01 serves as intermittent parking for District use, it is not large enough to accommodate the North Parking Area, which is specified in the Preserve Plan to include 50 vehicle parking spaces and 8 trailer parking spaces. Additionally, engineering staff have determined that the line of sight on Bear Creek Road from BC01 does not meet safety criteria necessary for public access. Furthermore, accessing the area adjacent to Gate BC01 from Bear Creek Road at the proposed new driveway location would require paving and widening (to a width of 22 feet) approximately 0.25 miles of an existing service road through steep wooded terrain. This would require extensive grading, potentially retaining walls, the removal of many trees, and increased cost. An exhibit showing these constraints is included in Attachment 3 – BC01 Constraints.

Locating the planned parking area at the "ball field" east of Alma Cultural Landscape was deemed infeasible due to limited and unsafe access for vehicles from Alma College Road onto Highway 17.

Conceptual Design Alternatives

The conceptual design alternatives were informed by the Preserve Plan, existing conditions, technical studies, opportunities and constraints, and public input. The design alternatives strive to accommodate future visitation levels from hikers, equestrians, and bicyclists while minimizing neighbor and environmental resource impacts. Each option will meet requirements under the Americans with Disabilities Act (ADA). In this phase of the conceptual design process, details

such as the parking surface material and striping are not yet discussed until the District prepares detailed plans during the design development phase. The detailed design will be informed by the District's parking area design guidelines currently under development, which will guide the aesthetic character, use of materials, and overall look and feel of the parking area to promote a "sense of place" that is consistent with the natural open space setting and the special qualities of the Preserve. The parking area, in all configurations shown, is expected to have over 5,000 square feet of impervious area and thus be required to implement Low Impact Development (LID) measures in compliance with the Municipal Regional Stormwater Permit. Therefore, although not shown, each design has considered and will need to include on-site LID measures such as bio-swales, detention basins, or pervious pavements.

Furthermore, each design option uses the same driveway location on Bear Creek Road, as determined by the Traffic Engineer. The final driveway location may be refined during the encroachment permit process with Santa Clara County Department of Roads and Airports. Roadway signage may be required as part of the encroachment permit review process to alert drivers of the new preserve entrance. The conceptual design alternatives are included in Attachment 2 - Existing Conditions and Opportunities and Constraints Report and shown in Attachment 4 – Conceptual Design. The two alternatives are compared in Attachment 5 – Alternatives Comparison.

Alternative No. 1

This design alternative most closely resembles the Preserve Plan concept by accommodating all parking in one area. Alternative No. 1 provides approximately 50 passenger vehicle spaces and 8 equestrian spaces. This alternative is located on an existing sloping hill, with terraced parking aisles. The passenger vehicle spaces are in the upper aisle of parking, and the equestrian spaces are in a separate lower aisle of parking. To accommodate the topography, staff anticipate up to 1,000-linear feet of retaining walls, approximately 6-feet tall. The specifications for Alternative 1 are summarized in Table 1. The location of ADA facilities and the final alignment of an ADA path of travel will be developed in conjunction with the Bear Creek Multi-Use Trail design development. In the meantime, staff propose that ADA facilities, the trailhead, and connection to the trail network occur to the east of the parking area.

This alternative is visible from Bear Creek Road with little existing vegetative screening. This design alternative can accommodate Transportation Demand Management (TDM) strategies such as flexible parking, priority parking, and shuttle space either the upper or lower parking aisles, if pursued as a future TDM strategy for the Preserve.

Table 1 – Alternative 1 Summary

Parking Spaces	50 Cars / 8 Horse Trailers
Trees Removed	8
Grading	950 cubic yards (cy)
Retaining Walls	1,000 linear feet (lf)
Impervious Area	46,000 square feet (sf)
Estimated Cost	$3.56 million

Alternative No. 2 – *PNR and General Manager Preferred Option*

This design alternative proposes to move the parking area to a flatter area, closer to the tree line, with more visual barriers and greater separation from Bear Creek Road. The design provides approximately 49 passenger vehicle spaces and 6 equestrian trailer spaces. This alternative creates 2 smaller passenger vehicle parking areas, connected by a looped, one-way road. The equestrian areas are along the main looped road, separated from passenger vehicles. A main benefit of this design is that the need for retaining walls is significantly reduced to 55-linear feet due to siting the parking area on flatter topography. The specifications for Alternative 2 are summarized in Table 2. This design also places the parking area in closer proximity to the existing trail network. The location of ADA facilities and the final alignment of an ADA path of travel will be developed in conjunction with the Bear Creek Multi-Use Trail design development. In the meantime, staff propose that ADA facilities, the trailhead, and connection to the trail network occur in a central location to the parking facilities.

This alternative minimizes views of the parking area from Bear Creek Road. It is sited behind existing tree screening adjacent to the paved public road, minimizing the visibility to drivers and leaving the meadow between the paved road and the parking area mostly intact.

This design alternative can accommodate TDM strategies such as flexible and priority spaces in either parking areas. If a future shuttle service is contemplated for the preserve, a potential shuttle stop could be added at a later date.

Table 2 – Alternative 2 Summary

Parking Spaces	49 Cars / 6 Horse Trailers
Trees Removed	14
Grading	600 cy
Retaining Walls	55 lf
Impervious Area	41,000 sf
Estimated Cost	$1.85 million

FISCAL IMPACT

The recommended action has no immediate fiscal impact. The FY24 adopted budget includes $105,000 for the Bear Creek Redwoods North Parking Area project VP21-005 to complete technical studies through the end of June 2024. If approved by the Board, construction of the project can commence as early as Fiscal Year 2025-26 (FY26). Funding for construction will be recommended in future fiscal year budgets during the annual Budget and Action Plan process.

This project is not eligible for Measure AA funding given that the allocation for the preserve portfolio is fully spent or encumbered.

PRIOR BOARD AND COMMITTEE REVIEW

The Planning and Natural Resources Committee received a presentation on the Existing Conditions, Site Opportunity and Constraints Analysis and Conceptual Design Alternatives for the North Parking Area project on September 19, 2023. PNR recommended presenting both

options along with a comprehensive comparison to the full Board, with an emphasis on the reasons the Committee preferred Alternative No. 2.

TABLE 3 – Summary of PNR Committee Feedback (September 19, 2023)

THEME/TOPIC	PNR FEEDBACK/COMMENTS
Incorporation of public feedback	• Conceptual design Alternative No. 2 incorporates public comments requesting visual shielding and leaving the meadow intact.
Proposed Alternatives	• Support for conceptual design Alternative No. 2 because of its efficient use of space and the natural conditions, also best addresses public comments.
Visual Impacts	• Conceptual design Alternative No. 2 has fewer visual impacts.
Alternative Sites	• BC01 would not be an appropriate place for a parking area.
Equestrian Parking	• Six equestrian parking spots instead of 8 (associated with Alternative 2) would be adequate based on public input.

Additional agenda items related to the Bear Creek Redwoods North Parking Area project reviewed by the Board and Committees include:

- **September 28, 2016**: The Board held a Public Hearing to Receive Comments on the Preserve Plan Draft EIR. (R-16-117, Meeting Minutes)
- **January 25, 2017**: The Board took the following actions regarding the Preserve Plan: Adoption of a Resolution Certifying the Final EIR, Making Certain Findings of Fact, Approving a Statement of Overriding Considerations and a Mitigation Monitoring and Reporting Plan, and Approving the Bear Creek Redwoods Preserve Plan, including the Bear Creek Stables Site Plan and the Alma College Cultural Landscape Rehabilitation Plan. (R-17-15, Meeting Minutes)
- **May 22, 2019:** The Board approved an Award of Contract with Questa Engineering to complete the first phase of technical work (Assessment, Schematic Design, Technical Studies for Regulatory Permitting, and Biological/Cultural Services) for the Phase II Trails at Bear Creek Redwoods Open Space Preserve. **(**R-19-14, Meeting Minutes)
- **April 6, 2020:** The Board approved a contract amendment with Questa Engineering to complete the 2nd phase of technical work (Construction Documents, Permitting, Construction Administration, and As-Builts) for the Phase II Trails. (R-20-19, Meeting Minutes**)**
- **March 22, 2023:** The Board approved an award of contract for construction of the Bear Creek Redwoods Phase II Trails to Gordon N. Ball Inc. (R-23-31, Meeting Minutes)

- **September 19, 2023**: The Planning and Natural Resources Committee received a presentation on the North Parking Area and recommended forwarding both options to the full Board with preference for Alternative 2. (R-23-141, Meeting Minutes)

PUBLIC NOTICE

Public notice for the January 24, 2024 Board meeting was provided as required by the Brown Act. A notice was distributed to owners and tenants of all properties located within 500 feet of the project site and posted on the District's website. In addition, electronic public notices were sent to interested parties of the Preserve as well as general horseback access, bike access, regional trails, and hiking interested parties.

CEQA COMPLIANCE

An EIR was prepared for the Bear Creek Redwoods Preserve Plan to evaluate the potential environmental effects of implementing the Preserve Plan, including the proposed North Parking Area. Since the project was previously analyzed in the EIR, it is anticipated that the project would be covered and would follow applicable mitigation measures identified in the Mitigation Monitoring and Reporting Plan (MMRP). If it is determined after the conceptual design phase that specific project details were not previously analyzed that necessitate the need for minor additions or changes to the EIR, any additional CEQA review would occur prior to project implementation.

NEXT STEPS

Staff will begin detailed design of the Project following Board recommendation of the conceptual design alternative. As a separate project, District staff are currently preparing parking area design guidelines, anticipated for Board consideration in March/April 2024. The design of the North Parking Area Project will adhere to applicable parking design guidelines, as approved by the Board. The overall project schedule is summarized below:

Future Project Phases	Tentative Schedule
Design Development and CEQA Confirmation	FY2024
Plans Specifications & Estimates (PS&E), Secure Permits	FY2025
Bidding and Construction	FY2026
Parking Area opens to the public	FY2027

Attachments

1. Location map
2. Existing Conditions / Opportunities and Constraints Analysis Report
3. BC01 Constraints
4. Conceptual Design Alternatives
5. Alternatives Comparison

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Midpeninsula Regional Open Space District
(Midpen)
12/8/2023

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Attachment 1

Bridges

Feasible

Multi-use Alternative Alignment

Multiuse Trail
Equestrian Bypass
Trail - Proposed
Trail - Complete
Road
Parking Lot

PROPOSED NORTH PARKING AREA
NORTHEAST TRAILHEAD CONNECTOR
PATROL LINKS CENTRAL
STABLES LOOP
STABLES DRIVEWAY
Bear Creek Rd
Briggs Creek
Upper Lake Loop Trail
Alma Trail
Mobb Creek
ALMA COLLEGE LOOP
BEAR CREEK REDWOODS OPEN SPACE PRESERVE
BRIGGS CREEK TRAIL
Equestrian Bypass
New Bridge 100 LF
Old Santa Cruz Highway
17

Created By: bapple Path: G:\Projects\Bear_Creek_Redwoods\Phase II_Trails\BCR_MultiUseTrail_Alt1LS_20231213.mxd

EXISTING CONDITIONS & OPPORTUNITIES AND CONSTRAINTS

Table of Contents

1.0 Project Background and Goals

1.1 Project Summary

The Midpeninsula Regional Open Space District (District) has conducted technical studies and developed conceptual design alternatives for the Bear Creek Redwoods North Parking Area (project), consistent with the Bear Creek Redwoods Preserve Plan (Preserve Plan). The North Parking Area is expected to provide approximately 50 vehicle parking spaces, eight horse trailer parking spaces, a restroom, and interpretive signage. Construction of the project, pending approval from the Board of Directors (Board), may potentially begin as early as fiscal year (FY) 2026. The new parking area is planned to be located on an approximately 2.5-acre site within Bear Creek Redwoods Open Space Preserve (Preserve) on the south side of Bear Creek Road, northeast of the Bear Creek Stables driveway and approximately 0.5 miles from Highway 17.

1.2 Bear Creek Redwoods Preserve Plan

In January 2017, the Board approved the Preserve Plan and certified the associated Environmental Impact Report (EIR). The Preserve Plan provides a long-term use and management plan for the Preserve, including new improved visitor access facilities to be implemented in three phases over 20-years. As part of the planned improvements, the Preserve Plan identified three parking areas, including the subject project site (North Parking Area). The other two parking areas were the Alma Parking Area, which opened to the public in 2019, and expansion of the existing Bear Creek Stables Parking Area. While the Preserve Plan recommends additional parking for expanded public programming at the Bear Creek Stables as part of Phase II implementation, the Board decided in 2019 to maintain the current level of public programs at the stables, therefore no longer necessitating an expansion of parking for the stables site.

As part of the EIR, cultural assessments, noise studies, construction analysis (cut/fill calculations), air quality calculations for construction equipment, and rare plant studies were completed for the North Parking Area.

The visitor access improvements identified in the Preserve Plan are broken into three phases, which are summarized as follows:

Phase 1 (Years 1-3)

- Construct Alma Parking Area and at-grade pedestrian crossing of Bear Creek Road with a new 0.5-mile connector trail to the existing trail network in the western preserve (Completed).
- Open the western preserve to hiking and equestrian use and implement trail improvements (Completed).
- Improvements at Bear Creek Stables (In Progress).
- Cleanup and renovation at the Alma College Site (Completed).

Phase 2 (Years 4-10) – Current Phase

- Trail improvements in northeastern preserve area, including stream crossings and trail reroute (In Progress).

- Create northern segment of a new multi-use trail to connect Lexington County Park and Summit Area (In Progress).
- Improvements to Bear Creek Stables (Repair Project In Permitting).
- Complete structural stabilization at Alma Cultural Landscape (Completed).

Phase 3 (Years 11-20) – Future Phase

- Complete Summit Road trail connection.
- Construct North Parking Area (Initiated design).
- Construct trailer storage area between Alma College and Highway 17.
- Construct vehicle bridges and two pedestrian bridges.

As stated in the Preserve Plan, the project was intended to be constructed during Phase III of implementation. However, due to several factors, the Board determined as part of approval of the FY23 Budget and Action Plan that the North Parking Area should be expedited and completed as part of Phase II public improvements. These factors included the popularity of the Preserve since its opening in 2019 and associated demand for parking at the Alma Parking Area, which is regularly at capacity during weekends. In addition, the Phase II Trails are planned to be open to public access in the Spring of 2024, likely expanding the visitation levels for the Preserve. To support existing and future visitation levels, the Board reprioritized the North Parking Area from Phase III to Phase II of the Preserve Plan.

The project will achieve the following goals and objectives from the Preserve Plan:

1. Public Use and Facilities Goal PU1: Allow general public access and enhance low-intensity recreational opportunities in the Preserve.

   Public Use and Facilities Objective PU-1.5: Expand and improve Preserve parking capacity.

   Action Description 1.5c: North Parking Area - Construct new paved parking lot and visitor entrance driveway between BC01 and BC02, with a capacity for 40 to 50 vehicles and approximately 8 horse trailers. Install vault toilet, equestrian staging area, and bicycle rack(s).

   Public Use and Facilities Objective PU-1.6: Provide trail-related amenities.

2. Public Use and Facilities Goal PU2: Provide low-impact, high-value, site-sensitive interpretation and environmental education activities.

   Public Use and Facilities Objective PU-2.1: Ensure any new visitor access features are sited and designed to protect landscape visual character.

3. Public Use and Facilities Goal PU5: Actively involve the public in the use and management of the Preserve.

   Public Use and Facilities Objective PU-5.2: Encourage and engage the public and neighbors in future Plan amendments that affect the use and management of the Preserve.

1.3 Project Goals

The intent of the project is to alleviate parking congestion at the existing Alma Parking Area and accommodate visitation levels for the Preserve.

Goal 1: Improve public access and visitor experience using ecologically sensitive design, construction practices, and long-term maintenance and management.

Strategies:

- *Provide approximately 50 vehicle parking spaces and up to eight horse trailer parking spaces.*
- *Consider transportation demand management (TDM) strategies in the parking lot design.*
- *Use technical studies regarding traffic and topography during design of the parking lot to minimize its impact on the existing landscape and ensure the highest level of traffic safety is maintained during design.*
- *Coordinate with neighboring property owners.*

Goal 2: Support implementation of the Preserve Plan in coordination with other project efforts.

Strategies:

- *Collaborate with the Phase II Multi-Use Trails and Stables project teams to engage with the community and ensure the design meets public needs.*
- *Design parking area amenities to serve diverse needs of various trail users.*
- *Consider implications of parking area location and design on other projects and facilities within the Preserve.*

1.4 Program Elements

The project seeks to accommodate visitation levels for Preserve by providing a new parking area and trailhead leading to the Phase II trail network. The trailhead would have amenities typical to District preserves, including a vault restroom, interpretive elements, trailhead sign boards, boot brush, bike racks, and an equestrian mounting block. The parking area would accommodate approximately 50 vehicles and 8 horse trailers and will be designed to allow for implementation of future Transportation Demand Management (TDM) strategies (such as carpool parking, parking counters, etc.), if these are pursued at a later time.

1.5 Other Projects at Bear Creek Redwoods

The North Parking Area is occurring in parallel with several other projects at the Preserve to improve public access and implement the Preserve Plan. All of these projects will occur within the Phase II area of the Preserve and have similar stakeholder groups as the North Parking Area. The following projects are being considered in tandem:

- The **Phase II Trail Improvement** project began construction in Summer 2023 to improve existing trails, correct drainage failures and restore segments of creek channel in the northeast area of the preserve. Once complete, trails in this area will be open to public access – estimate in Spring 2024.
- The **Phase II Multi-Use Trail (Multi-Use Trail)** project will provide a route for hikers, bikers, and equestrians to traverse through the Preserve. It is currently in the planning stages.
- The **Northeast Trailhead** project will be located at the northeast corner of the Preserve, adjacent to the Bear Creek Road Highway 17 overpass. The goal of this project is to provide a trail connection to Lexington Reservoir County Park. The project is currently in permitting.

- The **Bear Creek Stables Repair** project involves ongoing facilities improvements at the Stables such as the installation of a new water line, removal of dilapidated structures, and the improvement of existing structures. The project is currently in permit review.

2.0 Existing Conditions

The 2.5-acres project site is located on the south side of Bear Creek Road, approximately 600 feet northeast of the Bear Creek Stables gate. The site was acquired when the District and the Peninsula Open Space Trust (POST) purchased the approximately 1,000-acres Arlie Land & Cattle parcel in 1999 (R-01-71). The area was likely logged during the mid-1800s and is now an open meadow consisting of non-native grasses. The project site is currently open to equestrians by permit access only. There are no formal trails within the project area, but trails and patrol roads are immediately adjacent. A disc line around much of the perimeter serves as a fuel break and service road for maintenance and patrol vehicles.

There are limited relatively flat locations within the Preserve that can accommodate a parking area of this size. The proposed location was identified in the Preserve Plan because it is a relatively flat area accessible from Bear Creek Road, adjacent to the planned trail network, avoids impacts to sensitive plant communities, and requires minimal removal of trees. The project location is shown in Figure 1. Existing conditions photos are included in Attachment 1

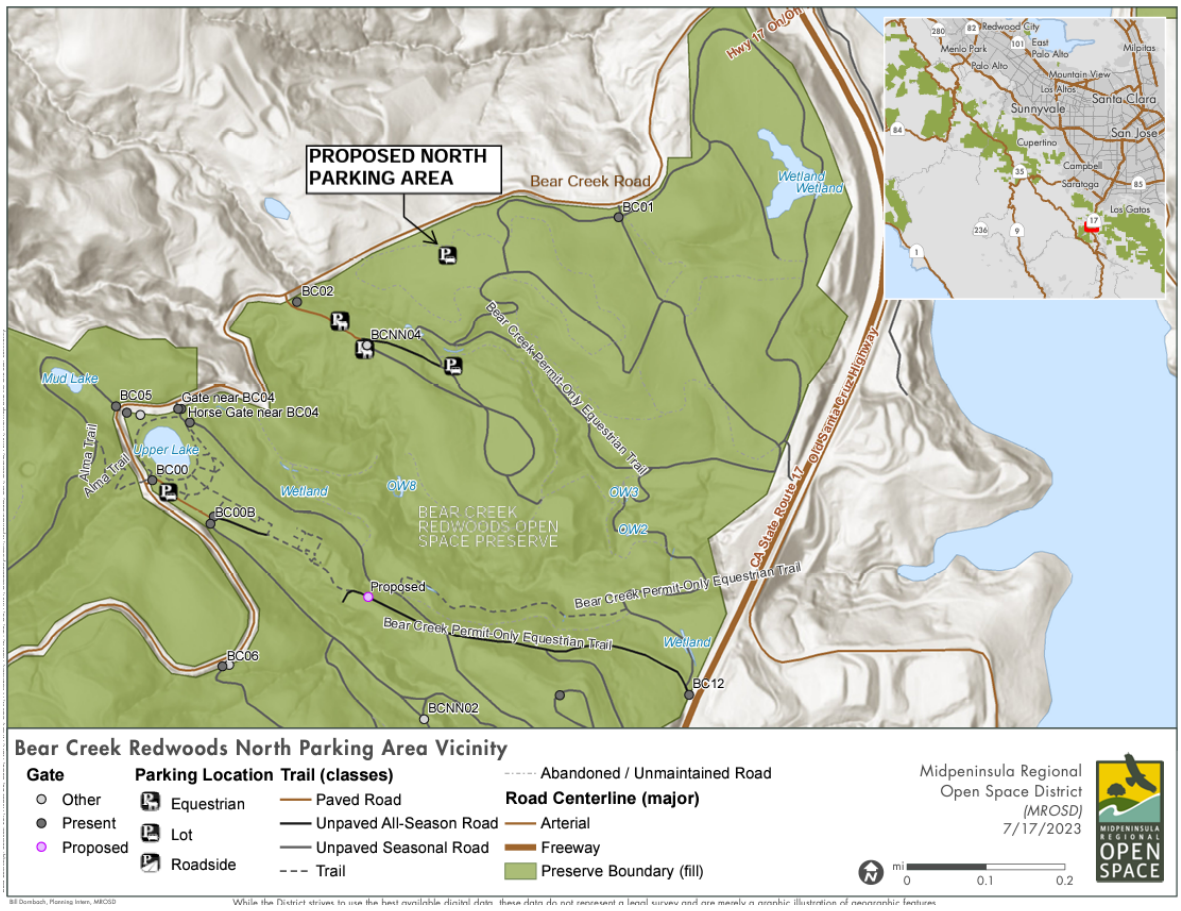


Figure 1 – Project Location Map

2.1 Natural Resources

The project area is located in a gently sloping, open meadow adjacent to Bear Creek Road. The most recent botanical resources survey of the project site was conducted in 2021 by Vollmar Natural Lands Consulting. The location of the planned parking area consists of valley and foothill grasslands. Among the grasses are slender wild oat, ripgut brome, hare barley and soft chess brome. No sensitive communities or locally rare plants were observed within the grasslands on the project site. Sensitive plant communities located on the edge of the project site include redwood forest and woodland and valley oak woodland and forest. See Attachment 2 (Appendix A-17) for a botanical resources map.

Valley and foothill grasslands support a variety of species, including deer mice, California ground squirrel, Botta's pocket gopher, black-tailed deer, coyote, bobcat, western fence lizard, California alligator lizard, and gopher snake. Bird species that use this habitat include western meadowlark, horned lark, American pipit, mourning dove, lesser goldfinch, barn swallow, red-tailed hawk, and red-shouldered hawk (H.T. Harvey & Associates 2006). According to CNDDB records, habitat onsite is not suitable for any special-status species. A full biological survey and supplemental botanical survey of the project area will be undertaken in FY24.

2.2 Public Access

The Phase I area (Alma Cultural Landscape and Western Zone of the Preserve) is currently open to hikers and equestrians. There are currently 6.1 miles of trails accessible to the public and 1.5 miles of trails accessible by permit. The existing Alma Parking Area has 52 parking spaces. There is an easy access trail that is 0.7 mile long located at Alma Cultural Landscape. Bikes are not allowed on any trails within the Preserve until the multi-use trail is implemented.

During peak periods (weekends, especially during spring and summer months), the Alma Parking Area often is at capacity and visitors have difficulty finding parking. Visitors have expressed concerns with this situation.

The Phase II area (northeastern zone) is currently only accessible to equestrians by permit. There are two horse trailer parking spaces that are open to the public located at Bear Creek Stables.

2.3 Local and Regional Connectivity

Trails within the Preserve are not currently connected to other local or regional trails; however, the Northeast Trailhead project will provide a connection to Lexington Reservoir County Park. Additionally, a trail connection to the Skyline-Summit Road area is planned in Phase III of the Preserve Plan.

2.4 Cultural Resources

Since 1970, more than 20 archaeological resource studies have been conducted over nearly 75% of the Preserve area, including a cultural resources study prepared in 2016 for the Bear Creek Redwoods Preserve Plan Environmental Impact Report (EIR). Most recently, in 2021 Basin Research Associates completed a cultural resources analysis to support the development for the Phase II area of the Preserve, which includes the project site. No known cultural resources have been recorded within the

project area. A supplemental cultural resources survey of the site will be conducted in FY24 once the conceptual design is solidified.

2.5 Aesthetics

The project site is located in a gently sloping open meadow that is visible from Bear Creek Road. The setting is rural and forested, consisting mainly of oak and redwood trees visible on the surrounding hillsides. Bear Creek Road is sparsely populated with single family residences. The meadow has views of the surrounding hills of the Lexington Basin, though the reservoir itself is not visible from the project site.

The project site is located approximately 0.6 mile from the Bear Creek Road exit off Highway 17. Highway 17 is an Eligible State Scenic Highway, but the project site is not visible from the Highway corridor. Bear Creek Road is listed as a "Local Road Needing Scenic Protection" under the Santa Clara County General Plan Regional Parks and Scenic Highways. The County of Santa Clara describes roads with this classification as "scenic roads which are not appropriate for recreational driving because they have no proposed public facilities, are of poor road quality, or are in remote areas with high fire hazards." Examples of roads appropriate for recreational driving include Highway 35 and Highway 9. Bear Creek Road does not have the same recreational qualities for pleasure driving but does have aesthetic features worthy of protections. The project would allow for recreational access to the Preserve and would minimize impacts to scenic resources where possible.

2.6 Operations and Maintenance

Land & Facilities staff maintain existing facilities and trails within the Preserve, which is also regularly patrolled by Rangers. The North Parking Area would be maintained and patrolled by the District. Bear Creek Road is a two-lane road immediately adjacent to the project site, owned and operated by Santa Clara County Department of Roads and Airports.

In the winter of 2023, Bear Creek Road experienced extensive storm damage resulting in a culvert failure south of the proposed parking area. The Preserve has been closed to the public since March of 2023 as a result. Repair work was completed in the late summer of 2023.

2.7 Geologic Setting

The project site lies in the tectonically active Coast Ranges geomorphic province, along the boundary of the North American and Pacific Tectonic Plates. This boundary creates an extensive fault system, known as the San Andreas Fault Zone, which bisects the Preserve. The area has been mapped as being underlain by Quaternary landslide deposits. Expansive clay soils are present at the site, which can be subject to extreme shrinkage and swelling due to ambient moisture fluctuations.

3.0 Technical Studies

3.1 Traffic Study

Hexagon Traffic Consultants (Hexagon) completed a traffic study in 2016 during preparation of the Preserve Plan, which analyzed sight distances, design speeds, and potential traffic operation impacts related to the North Parking Area, included as Attachment 3. Because Bear Creek Road has many grades and curves, sight distance is limited along the stretch of road that runs adjacent to the North Parking

Area. A suitable driveway location was identified west of Camel Hill Vineyard, a private property across from the Project site. Proposed right-of-way improvements associated with the proposed new parking area include the removal of one to two trees, Preserve and traffic signage, and tree-trimming to maintain sight lines.

Hexagon was retained in March 2023 to perform a supplemental traffic study to confirm the recommendations of the 2016 report. The report will re-visit sight distances, design speeds, and level of service. Bear Creek Road suffered culvert failures in Spring 2023, closing both the road and the Preserve. Therefore, data collection was put on hold until Summer 2023 when the road and Preserve once again experience peak (summer) operational levels. When the report is complete, the findings will further inform the design process.

3.2 Topographic Survey

McKay & Somps (MSCE) was retained in February 2023 to prepare a topographic survey for the project site. The survey documented all pertinent existing information to support the conceptual design process. MSCE performed a record search for the parcel, located existing underground utilities, and collected site elevation data to accurately represent the topography in one-foot contours. MSCE produced a preliminary base map containing all pertinent survey data, existing conditions, property boundaries, and easements. The topographic survey is included as Attachment 4.

3.3 Geotechnical Investigation

A detailed geotechnical study was conducted in the Fall of 2023. The geotechnical engineer completed site investigations and soil sampling analysis to provide recommendations for a vault toilet, pavement sections, retaining walls, slope stability, and stormwater treatment facilities. Future investigations are anticipated to include geologic trench studies, given the site proximity to the San Andreas Fault and mapped landslides. The Geotechnical Study is included as Attachment 5.

3.4 Botanical Resources Survey

Vollmar Natural Lands Consulting conducted a botanical resources survey in 2021, which determined that there are no special-status plant species located on the project site. There are oak trees, which constitute a sensitive plant community. There is a small area (fewer than five individuals) of redstem springbeauty (a representative locally rare plant) that will be avoided in final design. A biological survey and supplemental botanical survey of the project area will be undertaken in FY24. Approximately 2-acres of non-native grassland habitat would be replaced by the parking area. Two oak trees are anticipated to be removed to enhance line of sight from the proposed driveway location.

3.5 Biological Resources Survey

California Natural Diversity Database (CNDDB) maps of Bear Creek Redwoods included in the Preserve Plan did not determine the presence of suitable habitat at the project site for any special-status wildlife species. There are also no mapped aquatic resources on site. A biological survey of the project area will be undertaken in FY24**.**

3.6 Cultural Resource Analysis

Basin Research Associates completed a cultural resources analysis in 2021 to support future development in the Phase II area of the Preserve, which includes the project site. No known cultural

resources have been recorded within the project area. A supplemental cultural resources survey of the site will be conducted in FY24 once the conceptual design is solidified.

4.0 Opportunities and Constraints

This section describes opportunities and constraints for the Project site that were considered during the development of conceptual design alternatives. Opportunities and constraints are categorized by topic area (such as Natural Resources, Historic Resources or Public Access) and some attributes may be listed as both an opportunity and a constraint based on their relationship to the Project goals. The opportunities and constraints consider all applicable District, local, and regional policies and regulations.

4.1 District Mission and Preserve Plan Policies

Attribute	Opportunity (O) &/or Constraint (C)	Discussion
Preserve Plan	O	The planned parking area is consistent with the following Preserve Plan goals and objectives: Goal PU1; Obj PU-1.5 and 1.6; Goal PU2; Obj PU-2.1; Goal PU5; and Obj PU-5.2 as described in Section 1.2.

4.2 Natural Resources

Attribute	Opportunity (O) &/or Constraint (C)	Discussion
Biological Resources	C	One to two oak trees may need to be removed adjacent to Bear Creek Road in order to maintain the required driveway sight distances.
Biological Resources	O	The project site is in an area that is mostly free of trees, therefore extensive tree cutting and clearing would not be required.
Biological Resources	O	The project site is already fairly disturbed due to disc lines around the perimeter used for fire suppression and service road for maintenance and patrol vehicles.
Hydrology	C	Storm water runoff from a new impervious surface could cause hydrological issues; However, runoff would be infiltrated through site design measures (e.g., pervious concrete) and/or directed to stormwater treatment facilities such as detention basins.

4.3 Historical and Cultural Resources

Attribute	Opportunity (O) &/or Constraint (C)	Discussion
Cultural Resources	C*	BCR is known to have multiple culturally sensitive resources; however, there are no known sensitive resources within the project area.
Historic Resources	C*	BCR is known to have historic resources within the preserve, though no known resources exist within the project area.

**Potential constraint depending on additional future survey results.*

4.4 Public Access

Attribute	Opportunity (O) &/or Constraint (C)	Discussion
Parking/Public Access	O	The existing Alma Parking Area is often full during times of peak use. Adding approximately 50 parking spaces would better accommodate visitation levels and improve accessibility for the Preserve.
Public Access	O	Restroom amenities would support users of future regional connecting trails.
Equestrian Trailer Parking	O	Equestrian trailer parking is currently available to Bear Creek Stable boarders. Additionally, there are two trailer spaces available at the stables for the general public. The North Parking Area trailer parking spaces would expand public equestrian access.
User Conflict	C	If the Multi-Use Trail does not connect to the North Parking Area, bike usage will not be supported at this location.
Proximity to Adjacent Properties	C	One residence and one business are located on parcels adjacent to the project site.
Proximity to Adjacent Properties	C	It is possible that visitors would attempt to park on Bear Creek Road or in front of adjacent driveways if the parking area became full.

4.5 Local and Regional Connectivity

Attribute	Opportunity (O) &/or Constraint (C)	Discussion
Trail Amenities	O	The North Parking Area would provide additional access to current and future regional trails, such as the Phase II Trails, the Northeast Trailhead, and the Highway 17 Trail Crossing and Trail Connections Project.

4.6 Aesthetics

Attribute	Opportunities & Constraints	Discussion
Views from Bear Creek Road	C	The project site is located in an open meadow area, and all or a portion of the parking area would be visible from Bear Creek Road. One or more of the conceptual design alternatives focus on minimizing visibility from Bear Creek Road by using existing stands of trees to screen the parking area.
Views from Neighboring Residences	C	The parking area may be visible to some neighboring properties that can currently see the meadow.
Views from Parking Area	O	The parking area would have views of the Lexington Basin hills.

4.7 Operations and Maintenance

Attribute	Opportunities & Constraints	Discussion
Enforcement	C	The North Parking Area increases the amount of area to be patrolled.
Maintenance	C	The North Parking Area increases the amount of area and assets to be maintained.

5.0 Public and Stakeholder Engagement

5.1 Stakeholder Group Meetings

District staff held two focused stakeholder meetings for primary user groups (hikers, equestrians and bicyclists) in Spring 2023 for the Multi-Use Trail and North Parking Area projects. The project stakeholder sessions were combined to allow interested parties to contextualize interrelated projects. Members of the public who subscribe to the interested parties list for biking activities were invited to a meeting on March 21, 2023. Boarders from the Stables and members of the public subscribed to the interested parties list for equestrian activities were invited to a meeting on March 23, 2023. Staff presented the background, details on the project components, and how they are connected. After the presentation, attendees were assigned to breakout rooms with staff members to provide feedback and ask questions. The breakout groups were provided with a list of questions to help guide the discussions.

5.2 Public Workshop

District staff held one in-person public workshop for the Multi-Use Trail and North Parking Area projects at the Los Gatos Adult Recreation Center on April 6, 2023. Staff presented the background, details on the project components, and how they are connected. The public was then invited to visit stations for the North Parking Area and Multi-Use Trail that included poster boards and other information about the projects. District staff was available at each station to receive input and answer questions. Comments were recorded on flip charts, by sticky notes placed on poster boards, and by recording verbal comments on note pads.

5.3 Public Comments

District staff collected the following feedback during public and stakeholder meetings held in the Spring of 2023.

Theme/Topic	**General Feedback/Comments**
Traffic and Safety	• Concerns were expressed about traffic impacts to Highway 17 due to the proposed access improvements.
Location (see discussion below table)	• Concerns were expressed about visual impacts to the meadow. • Some members of the public asked if the parking area could be located off Bear Creek Road in a flat clearing adjacent to Gate BC01 (see Figure 1), with access from the existing gate or from Bear Creek Road at the driveway location currently planned for the project, which would then connect to the area near Gate BC01 via an existing unpaved service road.

	• A member of the public asked if the parking area could be located immediately east of the Alma Cultural Landscape in an open area known as the "ball field" (currently used for equipment storage), with access from Highway 17 (through gate BC12) via Alma College Road (see Figure 1).
Parking and Visitor Capacity	• Concerns were expressed that increasing parking capacity will lead to increased crowding at the preserve.
Amenities	• Equestrian users would prefer pull-through trailer parking as opposed to reverse parking. • Support for interpretive elements that highlight the estate period and cultural significance of the area.
Natural Resources	• Concerns were expressed about loss of natural habitat.

While the flat area adjacent to Gate BC01 serves as intermittent parking for District use, it is not large enough to accommodate the North Parking Area as planned. Additionally, engineering staff have determined that the line of sight on Bear Creek Road from BC01 does not meet safety criteria necessary for a public access point. Furthermore, accessing the area adjacent to Gate BC01 from Bear Creek Road at the driveway location currently planned for the project would require paving and widening (to a width of 22 feet) approximately 0.25 mile of an existing service road through steep wooded terrain.

Locating the planned parking area at the "ball field" east of Alma Cultural Landscape was deemed infeasible due to limited and unsafe access for vehicles from Alma College Road onto Highway 17.

5.4 Prior Board and Committee Meetings

To date, the North Parking Area project has not yet been brought before the District's Planning and Natural Resources Committee or Board of Directors as a standalone project. However, the project was presented to Board committees and Board of Directors during the Preserve Plan process. Additionally, as part of the Board's approval of the FY23 Budget and Action Plan, the North Parking Area timeline was accelerated.

6.0 Figures

Figure 1: Project Location Map

7.0 Attachments

Attachment 1: Existing Conditions Photos

Attachment 2: Vollmar 2021 Botanical Survey

Attachment 3: Hexagon 2016 Traffic Study

Attachment 4: MSCE Topographic Survey

Attachment 5: Geotechnical Study

Attachment 1 - Existing Conditions Photos

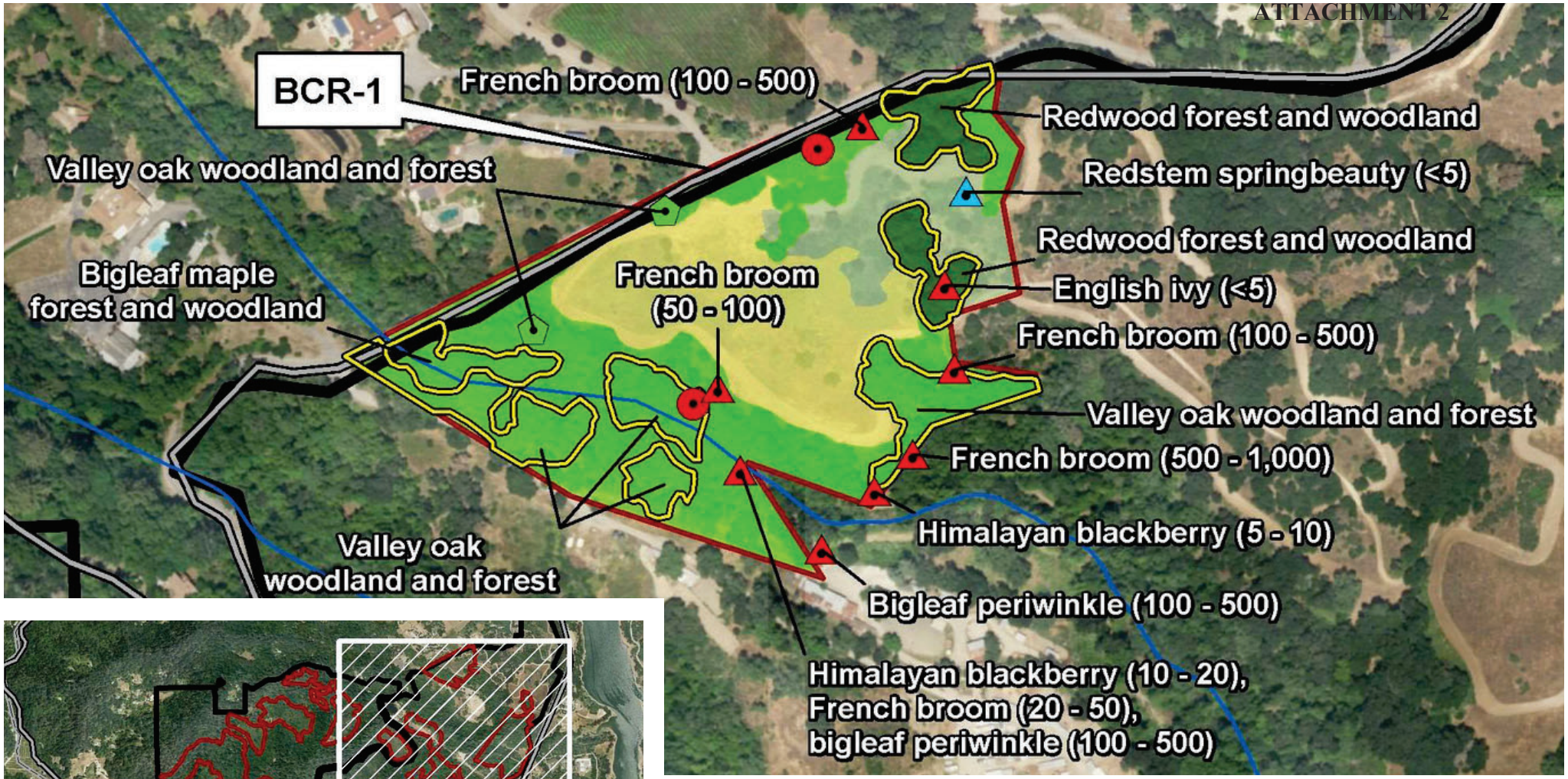
Northeast facing view of project site.

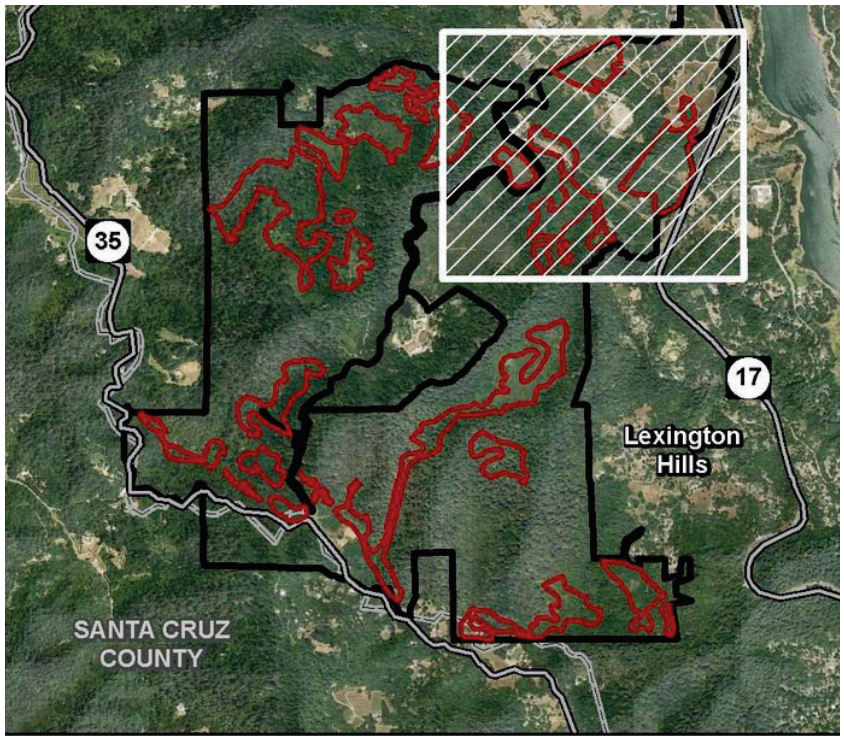
South facing view of project site parallel to Bear Creek Road.

East facing view of project site from edge of Bear Creek Road including existing disc.

South facing view of parking area.

Attachment 2 - Vollmar 2021 Botanical Survey





Legend

- Representative Invasive Weed*
- Representative Locally Rare Plant*
- Sensitive Plant Community**
- Representative Likely Sudden Oak Death
- Representative Likely Sudden Oak Death/ Representative Invasive Weed*
- Other Feature (see map label)
- Stream
- Selected Highway or Road

* Map label indicates population range
** Shrub community or tree community with area less than 0.25 ac., but may be contiguous with larger community beyond the study area

Notes: 1. MROSD plant community data has been edited in some areas and reclassified to match CNPS classes.
2. Some points appear to be located outside of the survey area. This is due to a discrepancy between the mapped survey area and the actual feature (e.g. a trail) on aerial imagery.

- Survey Area (see map label)
- Bear Creek Redwoods Open Space
- Sensitive Plant Community (VNLC)

Plant Communities

- Developed or Major Road
- Valley and Foothill Grassland
- Coastal Scrub
- Cismontane Woodland
- Riparian Forest
- Broadleaved Upland Forest
- North Coast Coniferous Forest

Attachment 3 - Hexagon 2016 Traffic Study

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: September 2, 2016

To: Lisa Bankosh, Midpeninsula Regional Open Space District

From: Gary Black

Subject: Bear Creek Redwoods Traffic Study

Hexagon Transportation Consultants, Inc. has completed a traffic study of the Bear Creek Redwoods Open Space Preserve, which is located along Bear Creek Road in the Santa Cruz Mountains (see Figure1). The study includes an analysis of potential driveway and crosswalk locations. Driveway(s) and a crosswalk are to be installed on Bear Creek Road to serve a potential parking lot and allow public access into the preserve. The Preserve currently does not allow public access, so the addition of parking and access will increase visitation to the Preserve. As Bear Creek Road is hilly and winding with limited sight distance in many locations, potential driveway locations must be carefully studied. Figure 2 shows the existing gates into the Preserve and the two potential driveway locations studied in this memo.

This study also identifies any potential traffic operation impacts related to the addition of parking and access to the Preserve.

The study evaluates the traffic impacts of the project on the operation of two unsignalized intersections and two roadway segments in the vicinity of the project site during the weekday AM and PM peak periods of traffic as well as the Saturday peak hour. Santa Clara County does not have any standards to define impacts or mitigation for unsignalized intersections or roadway segments. Therefore, the operations analysis does not draw any conclusions relative to impacts under the California Environmental Quality Act (CEQA). The study intersections and roadway segments are identified below.

Study Intersections

1. SR 17 Southbound Ramps and Bear Creek Road (All-way stop)
2. SR 17 Northbound Ramps and Bear Creek Road (Two-way stop)

Study Road Segments

1. Bear Creek Road west of Camel Hill Vineyard Driveway
2. Bear Creek Road west of Alma College Road

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours as well as for the Saturday peak hour. The AM peak hour of adjacent street traffic is generally between 7:00 and 9:00 AM, and the PM peak hour of adjacent street traffic is typically between 4:00 and 6:00 PM. It is during these periods on an average weekday that the most congested traffic conditions occur. The Saturday peak hour was analyzed since it is generally the day that the Preserve would generate the greatest amount of traffic.

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing traffic volumes were obtained from 2015 manual turning-movement counts. The new intersection count data and roadway tube counts are included in Appendix A.

Scenario 2: *Existing Plus Project Conditions.* Existing plus project peak hour traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the project. Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects the project would have on existing traffic conditions.

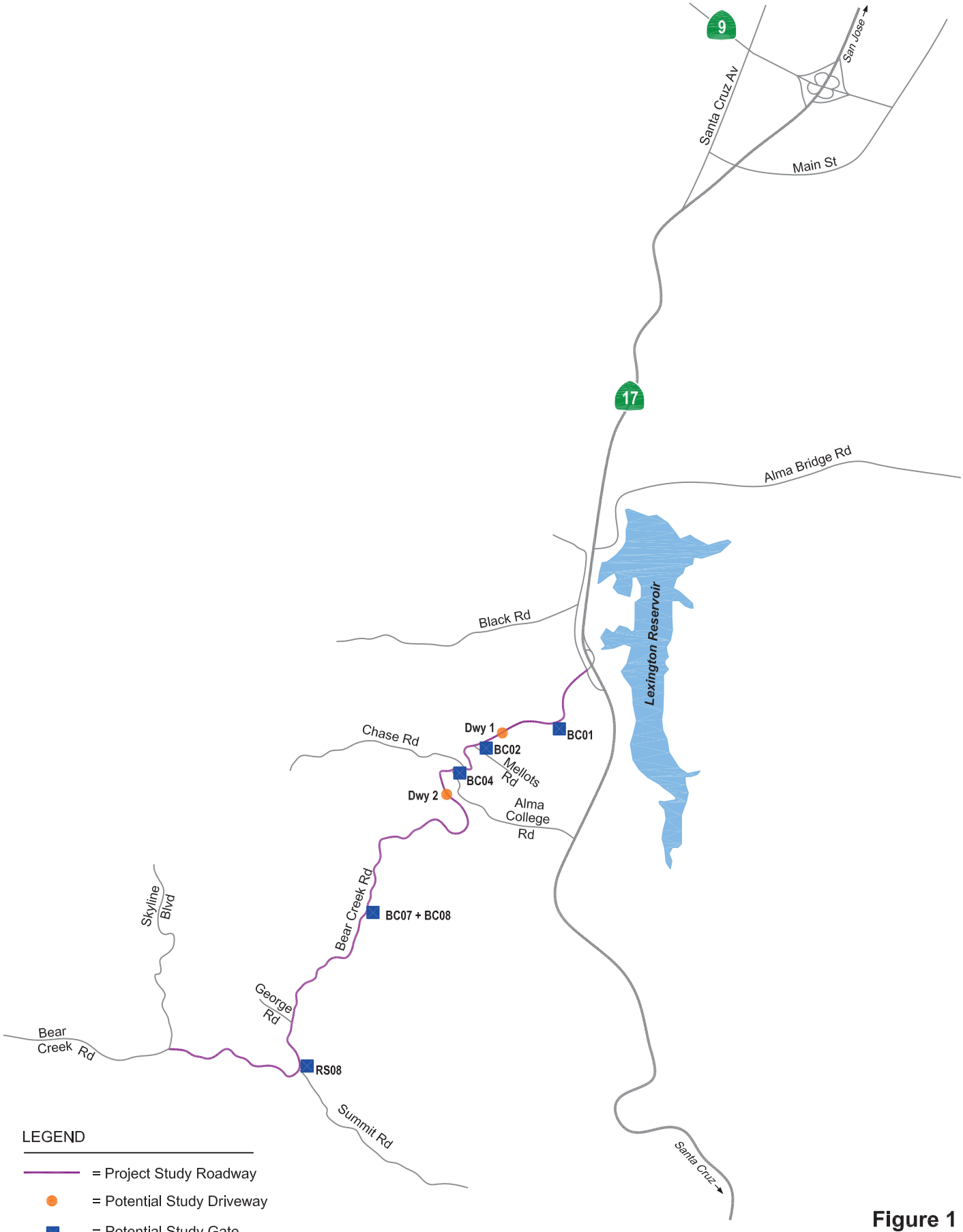


Figure 1
Project Study Area

Figure 2
Potential Driveway Locations (Zoomed)

Scenario 3: *Future Plus Project Conditions.* Future plus project traffic volumes were estimated by applying a general growth factor (for 15 years) to the existing peak-hour volumes and adding the project trips.

Both of the study intersections are unsignalized. Neither Santa Clara County nor Caltrans have standards to evaluate the intersection level of service for unsignalized intersections. Therefore, this analysis includes an operational analysis of vehicle queuing and delay based on principles and methodologies from the 2010 *Highway Capacity Manual*.

Existing Bear Creek Road Traffic

Bear Creek Road is a two-lane county road through the Santa Cruz Mountains. It carries a relatively modest amount of commute traffic during the weekdays to and from mountain residences, and it carries recreational traffic on weekends. Bear Creek Road is winding and steep in places. Passing is not allowed in the project vicinity. There were no speed limit signs observed in the project vicinity, so the sight distance analysis is based on observed speeds.

Hexagon conducted traffic and speed counts on Bear Creek Road near the two best locations for potential driveways for 24 hours on February 26, 2015, a typical weekday and on June 20, 2015, a Saturday. The total volume on the weekday was about 3,590 vehicles west of Camel Hill Vineyards driveway (Driveway 1 on Figure 2) and about 3,410 west of Alma College Road (Driveway 2 on Figure 2). The highest volume occurred during the typical AM commute hour (7 AM to 8 AM) when there were 326 vehicles counted in the peak direction (eastbound) west of Camel Hill Vineyards. The PM peak hour at the same location (5 PM to 6PM) saw 240 vehicles in the peak direction (westbound).

The total volume on June 20, 2015 (Saturday) was about 3,190 vehicles west of Camel Hill Vineyards driveway (Driveway 1 on Figure 2) and about 3,070 west of Alma College Road (Driveway 2 on Figure 2). The total volumes on Saturday are about 10% lower compared to the traffic on a typical weekday. The highest volume on Saturday occurred during the late afternoon between 5:00 PM and 6:00 PM when there were 147 vehicles counted towards the Santa Cruz direction (westbound) west of Camel Hill Vineyards.

According to the *2010 Highway Capacity Manual* (HCM), the capacity of a two-lane highway is a maximum of 3,200 vehicles per hour. That figure must be adjusted for terrain. The HCM suggests that the capacity should be reduced by one-third in mountainous areas. Thus, the capacity of Bear Creek Rd is about 2,100 vehicles per hour, or 1,050 vehicles per hour per lane. As the existing AM peak hour volume for the peak direction is 326 and the existing Saturday peak hour volume for the peak direction is 147, it can be concluded that Bear Creek Rd is currently operating well below its maximum capacity.

Hexagon also measured speed along with traffic volume. The 85th percentile speeds and suggested design speeds are summarized in the following table. Hexagon has been made aware of comments from people familiar with Bear Creek Road that speeds are higher during commute hours, especially in the morning when people are trying to get to work. The speed data (included in the Appendix) support this observation. Speeds were higher in the morning commute period for traffic going toward Highway 17, which is downhill near Alma College Road (Gate 4). On a 24-hour basis the 85th percentile speed at this location was 36 miles per hour (mph). However, between 6-7 AM the 85th percentile speed was 39 mph, and between 7-8 AM the 85th percentile speed was 38 mph. Nevertheless, for all of these cases the proper design speed is 40 mph based on the standards specified in the Manual on Uniform Traffic Control Devices (MUTCD), which is what was used for the sight distance calculations.

Table 1
Measured Speeds and Suggested Design Speeds at Potential Driveway Locations

	Location	Toward Santa Cruz		Toward SR17	
		85th percentile speed	Design speed	85th percentile speed	Design speed
Weekday	1	38 mph	40 mph	29 mph	30 mph
	2	28 mph	30 mph	36 mph	40 mph

Existing Intersection Level of Service

The study also analyzed the traffic impacts of the project on the two unsignalized intersections at the Bear Creek Road/SR 17 interchange during the weekday AM and PM peak periods of traffic and during the Saturday peak hour. Existing weekday AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hour traffic volumes and Saturday peak hour traffic volumes (1:00-2:00PM) were obtained from new manual turning-movement counts (see Figure 3).

The results of the intersection level of service analysis show that the intersection of the SR 17 southbound ramps and Bear Creek Road is operating at acceptable levels of service. The intersection of the SR 17 northbound ramps and Bear Creek Road is operating at level of service B during the weekday PM peak hour and the Saturday peak hour. However, during the weekday AM peak hour, the calculation shows that traffic is experiencing long delays. Field observations show that the poor level of service is caused by the ramp meter at the SR 17 northbound on-ramp. Traffic backs up from the on-ramp, onto Bear Creek Road, through the adjacent off-ramp intersection, and up the hill. Traffic also backs up on Old Santa Cruz Highway. Although a stop sign does not exist for traffic on Bear Creek Road, drivers are stopping at Old Santa Cruz Highway and letting other vehicles on to the ramp in an alternating fashion, as if a stop sign were present.

Table 2
Existing Intersection Level of Service

Study Number	Intersection	Peak Hour	Count Date	Avg. Delay (sec.)	LOS
1	SR 17 Southbound Ramps & Bear Creek Road	AM	06/23/15	9.7	A
	(All-way Stop)	PM	06/23/15	10.5	B
		Saturday	06/20/15	9.0	A
2	SR 17 Northbound Ramps & Bear Creek Road	AM	06/23/15	**53.3**	**F**
	(Unsignalized)	PM	06/23/15	11.6	B
		Saturday	06/20/15	13.7	B

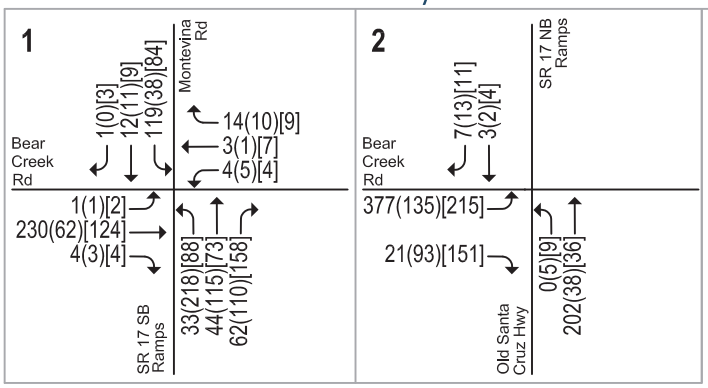


Figure 3
Existing Traffic Volumes

Trip Generation

The method for calculating the number of trips generated by the proposed project involved using daily visitation counts from similar Preserves: the Fremont Older Preserve, and the Windy Hill Preserve.

A conservative trip generation estimate would come from the Fremont Older Preserve. This Preserve, located close to the Town of Cupertino, gets both regular neighbor use as well as weekend/day trip destination use. Fremont Older is open to hiking, biking, and equestrian use throughout the Preserve, as well as dogs. Trail counts were conducted in 2007 and 2010 for two consecutive weeks in Fremont Older Preserve. The counts show an average daily visitation of 522. Since the Bear Creek Redwoods Open Space Preserve will have no dog access and only limited biking, it will likely get less use.

Another less conservative (but maybe more accurate) comparator is the Windy Hill Preserve, which is close to Woodside and Portola valley, has only one through trail open to bikes, and is open to hiking and equestrian use. It is also open to dogs and gets a lot of regular dog walkers. The study shows that Windy Hill has an average of 341 visitors per day.

The Bear Creek Redwoods Open Space Preserve would not permit dogs and would include only one trail open to bicycles. Comparing the size and uses of the Bear Creek Redwoods Preserve with the two Preserves discussed above, a conservative estimate would be an average of 500 daily visitors on weekends. This calculates to 1,000 daily person trips, one trip in and one trip out for each visitor. Trips generated on weekdays were assumed to be 40 percent of the weekend trip generation. This percentage is based on a comparison and average between weekday and weekend trip generation for various park land uses in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. The park land use categories include City Park, County Park, Regional Park, Beach Park, and National Monument. After applying a reasonable assumption of 1.5 people per car, the Preserve is expected to generate an average of 267 and 667 daily vehicle trips on weekdays and weekends, respectively. The peak hour trips generally would be 15% of the average daily traffic, which would result in 40 trips during each of the weekday AM and PM peak hours and 100 trips during the Saturday peak hour. It is further assumed that there will be roughly a 60%/40% in/out split in the morning and the reverse in the afternoon on weekdays. On weekends, the in/out split is expected to be nearly equal with 48% in and 52% out.

Special Events

The Preserve is being proposed as a potential special-event venue making use of the existing Alma College buildings. Weddings or other special events would accommodate up to 250 guests. Also, at the Bear Creek Stables site, which is within the Preserve, it is anticipated that there would be one or two large events per year on weekends with up to 250 people. To provide the most conservative analysis, a worst-case scenario was studied with large events hosted (total up to 500 guests) at both sites on the same weekend. It is extremely unlikely that simultaneous events would occur, but the results are presented for informational purposes. It is assumed that the large events would have an average vehicle occupancy of two persons per car. Thus, the large events would generate up to 500 daily trips. Adding in the regular park users brings the total to 1,167 added daily vehicle trips.

It is assumed that the guests for a wedding or other special event hosted at the Alma College site would arrive within one hour. The regular Preserve visitors (hikers) and the Bear Creek Stable users would arrive or leave spread throughout the day with 10% during any particular hour. It is expected that there would be 342 peak hour trips during weekend peak hour with 294 inbound trips and 48 outbound trips (see Table 3).

Table 3
Anticipated Project Trip Generation

Trip Generation Estimates for Bear Creek Redwoods Open Space Preserve

	Weekdays							Saturdays			
	Daily	AM Peak Hour			PM Peak Hour /b/			Daily	Peak Hour /e/		
Land Use	Trips	In /c/	Out /c/	Total	In /c/	Out /c/	Total	Trips	In /f/	Out /f/	Total
Bear Creek Redwoods Preserve /a/	267	23	17	40	18	22	40	667	48	52	100
Weekend with Special Events /d/											
Bear Creek Redwoods Preserve								1,167	294	48	342

Notes:
/a/ Rate based on trips generated by three similar Preserves; Rate of one and half persons per vehicle was assumed to convert visitors to vehicle trips. Weekday trips were assumed to be 40% of weekend trips.
/b/ AM and PM peak hour trips were assumed to each to be 15% of the daily volumes.
/c/ Percentage based on ITE Trip Generation Rate for Regional Park (Land Use Type: 417)
/d/ Weekend trips with special events were assumed including average daily regular visitors to the Preserve, trips generated by the special events with 250 guests at the Bear Creek Stables site and wedding events with 250 guests at the Alma College buildings. Rate of two persons per vehicle was assumed for the special events guests.
/e/ Weekend peak hour trips were assumed to include 10% of the average daily regular visitors, 10% of the Bear Creek Stable users, and 100% of the wedding guests.
/f/ Percentage based on ITE Trip Generation Rate for Regional Park for Saturday Peak hour were used for regular visitors and Bear Creek Stable users. It is assumed that the 250 guests for wedding will arrive within the peak hour.

Roadway Traffic Analysis

The peak hour for the Preserve trip generation on weekdays would be in the late afternoon, after work. At the hour of 5-6 PM the weekday volume on Bear Creek Road is 197 vehicles westbound and 67 vehicles eastbound. Based on the above trip generation estimates, the Preserve is expected to add 18 westbound vehicles and 22 eastbound vehicles during the early afternoon time period. Considering that the total capacity of a lane is 1,050 as described previously, Bear Creek Road would still be operating well below its capacity after the completion of the project.

The weekend peak hour for the Preserve would be in the late afternoon. At the hour of 5:00 - 6:00 PM the volume on Bear Creek Road is 114 vehicles eastbound and 147 vehicles westbound. Under the worst-case scenario with two special events at the same time, the traffic generated by the Preserve would add 294 westbound vehicles and 48 eastbound vehicles during the peak hour. The total traffic on Bear Creek Road could reach 162 vehicles eastbound and 441 vehicles westbound. The peak direction volume would be less than 50% of the total capacity of the road. Therefore, Bear Creek Road would still be operating well below its capacity even under the worst-case scenario with the project

Existing Plus Project Intersection Level of Service Analysis

The trip distribution pattern for the project was developed based on existing travel patterns on the surrounding roadway system and the locations of complementary land uses. The peak hour vehicle trips generated by the

project were assigned to the roadway network in accordance with the trip distribution pattern. Figure 4 shows the project trip assignment at the study intersections. The project trips were added to existing traffic volumes to obtain existing plus project traffic volumes (see Figure 5).

The results of the intersection level of service analysis under existing plus project conditions show that the intersection of the SR 17 southbound ramps and Bear Creek Road would operate at an acceptable level of service during the weekday AM and PM peak hours and the Saturday peak hour (see Table 4).

During the weekday PM peak hour and Saturday peak hour, the intersection of the SR 17 northbound ramps/Bear Creek Road would operate at level of service B under existing plus project conditions. During the weekday AM peak hour the intersection operates at LOS F. The project could increase the delay for traffic at the on ramp. The delay increase would be minor and probably not noticeable to motorists. Since the delay is caused by the ramp meter at the northbound SR17 on-ramp, there are no feasible improvements that could be done. The meter already allows two vehicles per green. Any increase in metering rate would flood SR17 with vehicles, which would defeat the purpose of the ramp meter. There is ample queuing space on Old Santa Cruz Highway and Bear Creek Road for vehicles waiting to get on the freeway so the queuing does not disrupt intersection operations or create unsafe conditions.

Table 4
Existing Plus Project Intersection Level of Service

Study Number	Intersection	Peak Hour	Existing Avg. Delay (sec.)	Existing LOS	Existing + Project Avg. Delay (sec.)	Existing + Project LOS
1	SR 17 Southbound Ramps & Bear Creek Road	AM	9.7	A	10.0	B
	(All-way Stop)	PM	10.5	B	11.0	B
		Saturday	9.0	A	14.5	B
2	SR 17 Northbound Ramps & Bear Creek Road	AM	**53.3**	**F**	**61.8**	**F**
	(Unsignalized)	PM	11.6	B	11.8	B
		Saturday	13.7	B	14.9	B

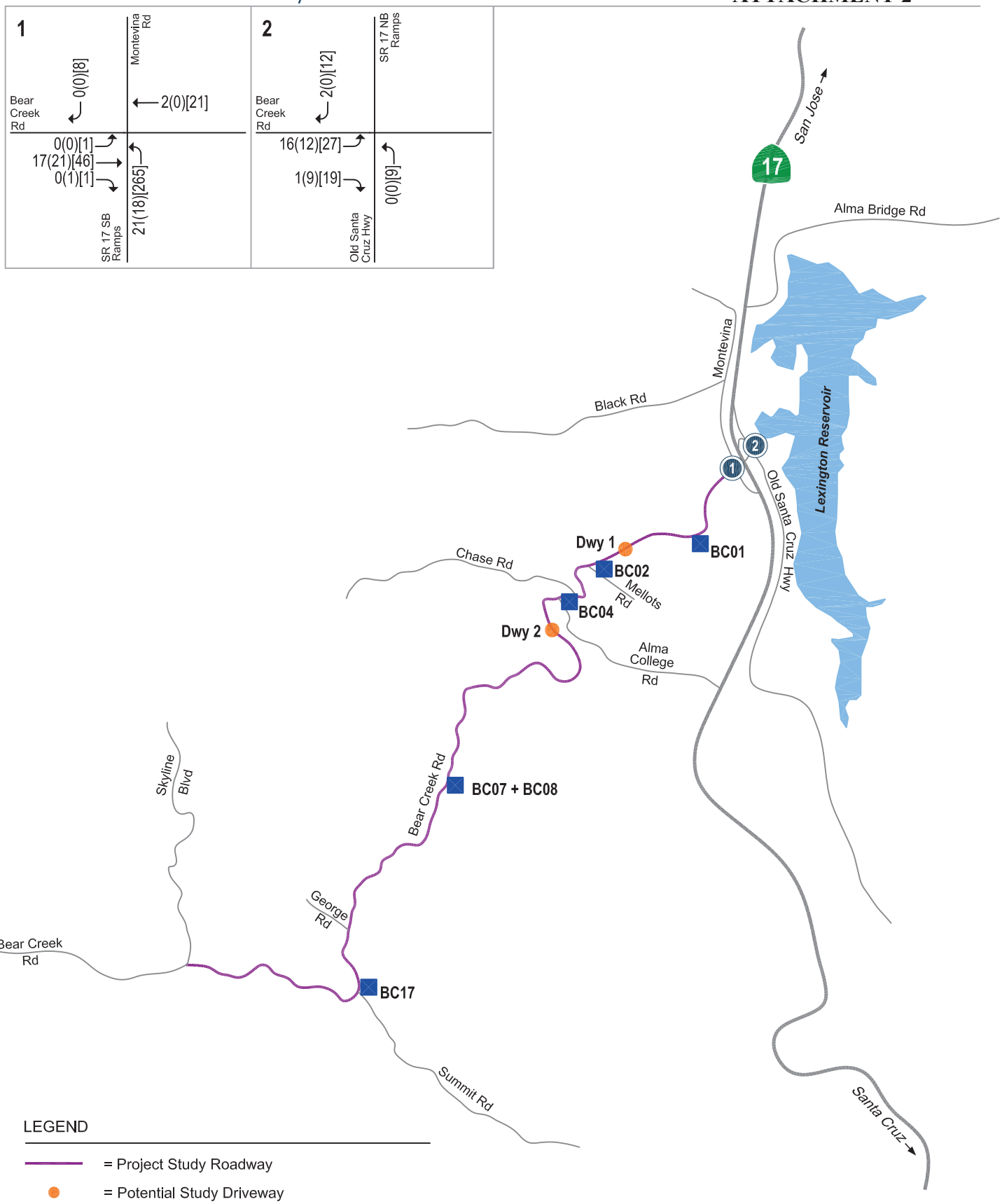


Figure 4
Project Trip Assignment

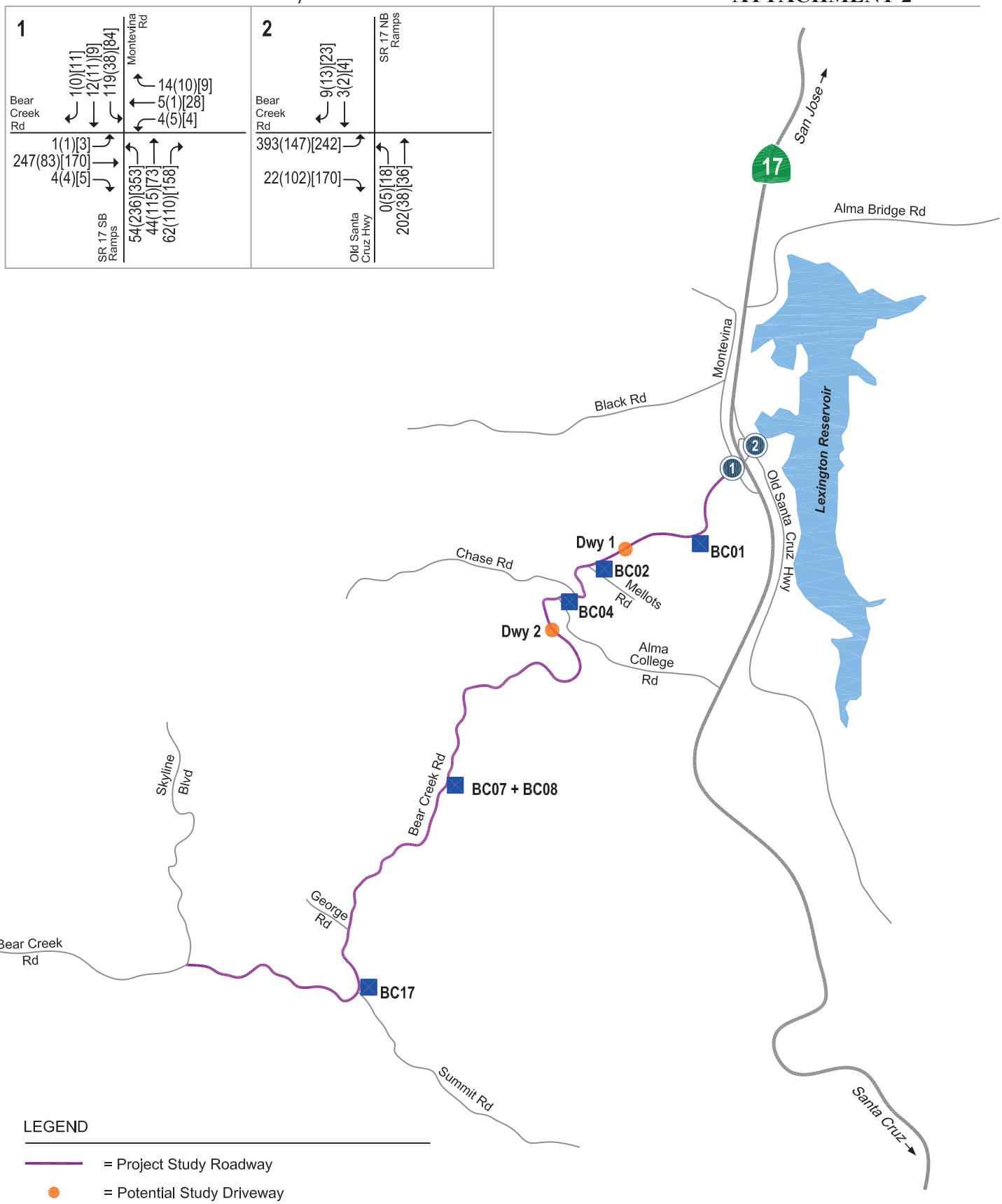


Figure 5
Existing Plus Project Traffic Volumes

Future Plus Project Intersection Level of Service Analysis

It is expected that buildout of the project will take 15 years. Future plus project traffic volumes were estimated by applying a general growth factor of 1% per year for 15 years to the existing peak-hour volumes and adding the project trips (see Figure 6). The results show that both study intersections would operate at acceptable levels of service during the weekday PM peak hour and the weekend peak hour. During weekday PM peak hour and Saturday peak hour, the intersection of the SR 17 northbound ramps/Bear Creek Road would operate at level of service B under future plus project conditions. During the weekday AM peak hour, the intersection already operates at LOS F, and queues would increase with the assumed future growth, without the project. The project could increase the delay for the on-ramp. The delay increase due to the project would be minor and probably not noticeable to motorists.

Since the delay is caused by the ramp meter at the northbound SR17 on-ramp, there are no feasible improvements that could be done. The meter already allows two vehicles per green. Any increase in metering rate would flood SR17 with vehicles, which would defeat the purpose of the ramp meter. There is ample queuing space on Old Santa Cruz Highway and Bear Creek Road for vehicles waiting to get on the freeway so the queuing does not disrupt intersection operations or create unsafe conditions.

Table 4
Future Plus Project Intersection Level of Service

Study Number	Intersection	Peak Hour	Future Plus Project Avg. Delay (sec.)	Future Plus Project LOS
1	SR 17 Southbound Ramps & Bear Creek Road	AM	10.8	B
	(All-way Stop)	PM	12.4	B
		Saturday	16.2	B
2	SR 17 Northbound Ramps & Bear Creek Road	AM	**166.6**	**F**
	(Unsignalized)	PM	12.5	B
		Saturday	16.7	C

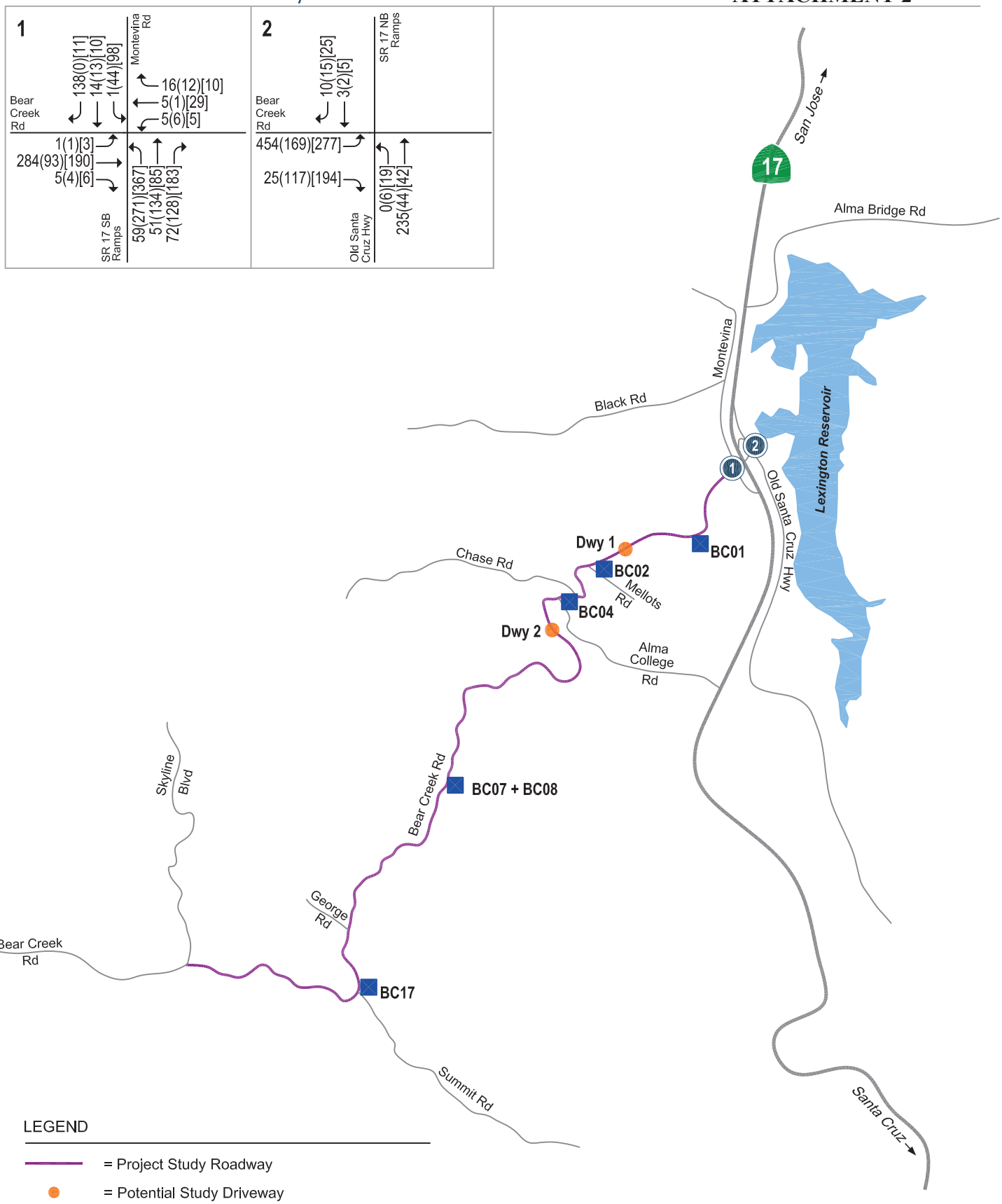


Figure 6
Future Plus Project Traffic Volumes

Driveway Sight Distance Analysis

The most important factor in adequate and safe driveway operations is the sight distance. In California, the *Caltrans Highway Design Manual* is the primary reference used to determine sight distance requirements. Since Bear Creek Road has many grades and curves, sight distance is limited in several locations.

Two potential driveway locations were identified that would provide adequate sight distance for a new driveway. The first is located in between gates BC01 and BC02 just west of the Camel Hill Vineyard entrance. The second location, about 800 feet west of gate BC04, was also considered for a driveway and crosswalk because the Open Space District owns land on both sides of the road.

At the first driveway location near Camel Hill Vineyard, sight distance could be over 450 feet for all potential turning movements (e.g. left turn in, left turn out, right turn out) if existing vegetation were removed. The tree located by the first utility pole west of the Camel Hill Vineyard entrance would need to be removed. The next tree to the west might also require removal depending on the view after other vegetation is removed (See Figures 7 and 8).

At the existing gate BC04, sight distance to the west is inadequate, so a new driveway location is necessary. A potential driveway location was found west of Alma College Rd that could achieve sight distance of about 400 feet to the east (or north) and a sight distance of more than 400 feet to the west (or south) with the removal of trees and vegetation (See Figures 9 and 10).

The actual and required stopping sight distances for the potential driveways are shown in Table 5. The required sight distances are based on the Caltrans *Highway Design Manual*, table 201.1. Section 201.3 specifies a 20% increase in stopping sight distance on a sustained downgrade of over 3%. According to this table, driveways at the potential locations would provide adequate sight distance.

The Open Space District owns land on both sides of the road near gate BC04 but only owns land on one side of the road near Camel Hill Vineyard. Therefore, a crosswalk would only be appropriate at the potential driveway location studied near gate BC04. At this location, sight distance is adequate with the trees removed as specified above, and there are flat landing areas on both sides of the road that could be used for the crossing.

Table 5
Sight Distance Analysis

Location	WB design speed	WB road grade	WB required sight distance	WB actual sight distance	EB Design speed	EB road grade	EB required sight distance	EB actual sight distance
west of Camel Hill Vineyard	40 mph	insignificant	300 ft	> 450 ft	30 mph	insignificant	200 ft	> 450 ft
west of Alma College Rd	30 mph	insignificant	200 ft	400 ft	40 mph	4%	360 ft	> 400 ft

Because some people coming to the site would be unfamiliar with its location, adequate signage should be provided in advance of the driveway. Signage should be based on the 2014 California Manual of Uniform Traffic Control Devices (CAMUTCD). Though no signage is specifically required by the CAMUTCD at this location, Hexagon recommends a G72 (CA) style sign at least 200 feet from the driveway in each direction, with “Bear Creek Redwoods Open Space Preserve” or similar text. The sign placements must not obscure sight lines from the driveway.

The Open Space District should consider additional signage to improve the visibility of any crosswalk installed on Bear Creek Road. The signage could include “crosswalk ahead” signs and could also include pedestrian activated rectangular rapid flashing beacons (RRFB). Beacons would probably need to be hard-wired to a power source because solar power could be limited by the tree cover.

Sample G72 (CA) guide sign
(actual sign text will be different)

Other Existing Gates

Some other gates were observed on Bear Creek Road. Gates BC07 and BC08 next to the Presentation Center do not provide adequate sight distance for a driveway. Gate BC17 at the intersection of Bear Creek Road and Summit Road provides adequate sight distance and could be used as-is (see Figure 11).

The Open Space District plans to develop a multi-use trail on the west side of Bear Creek Road with a trail head at the intersection with Summit Road. Parking for the trail head would be on the east side of Bear Creek Road so there would need to be a way for trail users to cross the road. Hexagon considered the possibility of a pedestrian crosswalk across Bear Creek Road at the intersection with Summit Road. However, this location has poor sight distance so a crosswalk would be problematic. In order to create a safe crossing, it would be necessary to add stop signs on Bear Creek Road. The addition of stop signs would take some engineering design because of the poor sight distance. It would also take Caltrans approval because the intersection is under Caltrans jurisdiction (State Highway 35).

Conclusions

The proposed Bear Creek Redwoods Open Space Preserve will not create traffic impacts to Bear Creek Road. Bear Creek Road is operating well below its capacity and would continue to do so with the modest project traffic added during regular weekday/weekends as well as under the worst-case scenario. The two proposed driveway locations can provide adequate sight distance as long as the proposed tree and vegetation removals are carried out. A crosswalk would be feasible near gate BC04 adjacent to the potential driveway location.

The intersection of the SR17 southbound ramps and Bear Creek road will operate well during weekdays with the modest project traffic added and during weekends with the heaviest traffic if there were to be two large events at the Preserve on the same day. The intersection level of service calculation shows that northbound traffic at the intersection of the SR17 Northbound ramps and Bear Creek Road faces long delays due to the ramp meter at the freeway on-ramp. The project would add some traffic to the on-ramp, but probably wouldn't result in a noticeable change in delay. There are no feasible improvements to reduce the delay and queuing. There is ample room for the queuing, and it doesn't cause other operational problems or safety issues.

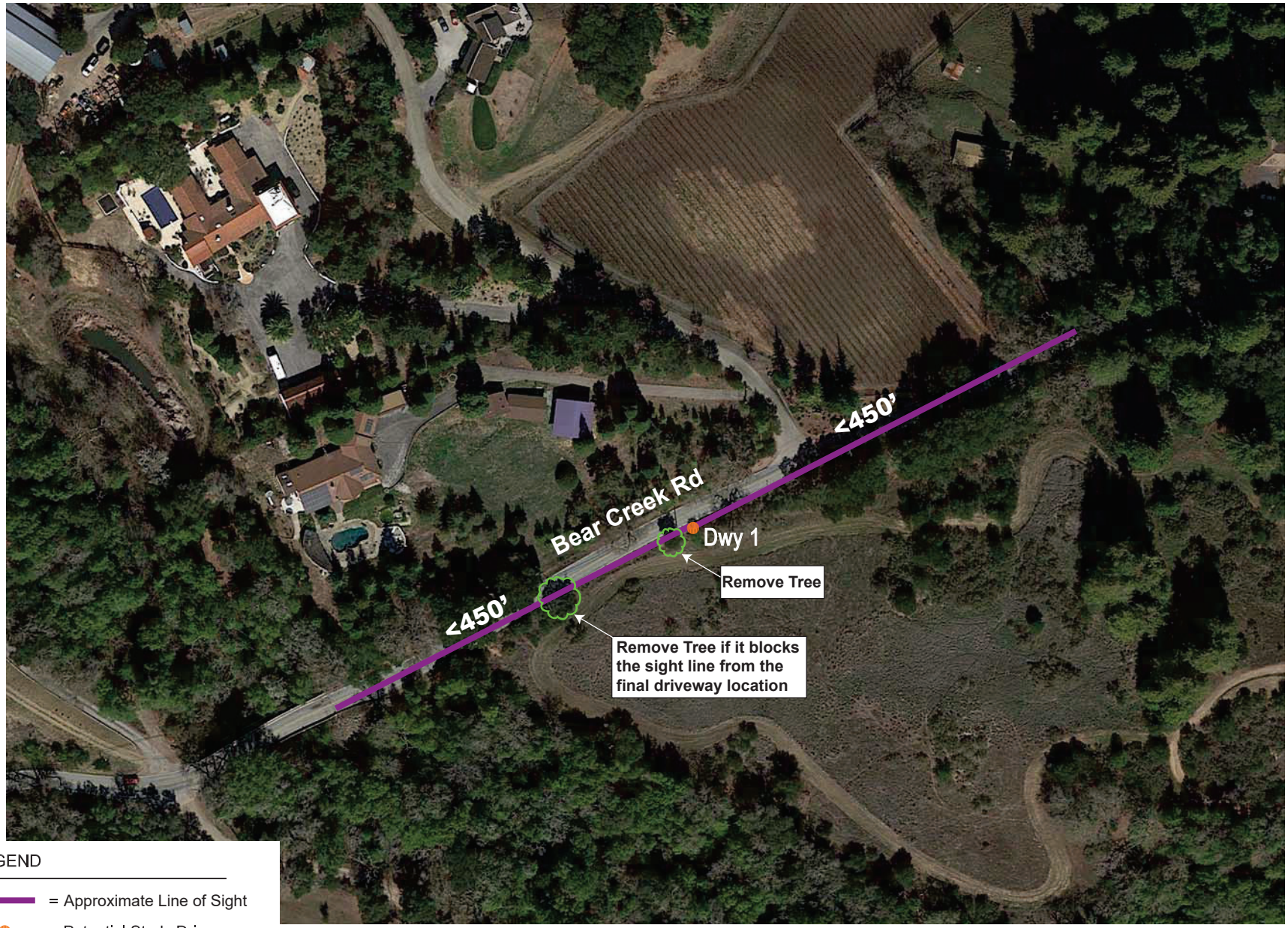


Figure 7
Driveway 1 Sight Distance

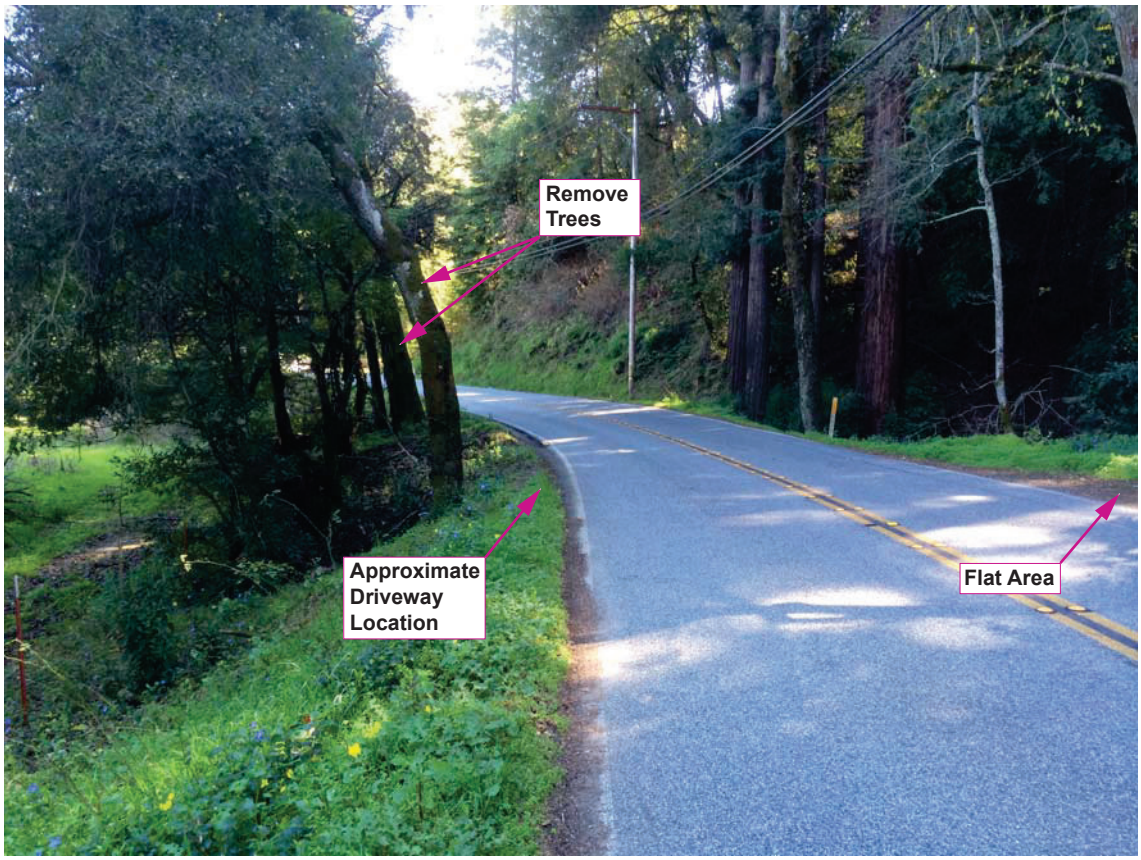
Looking West

Looking East

Figure 8
Views from Driveway 1 Location (approximate)

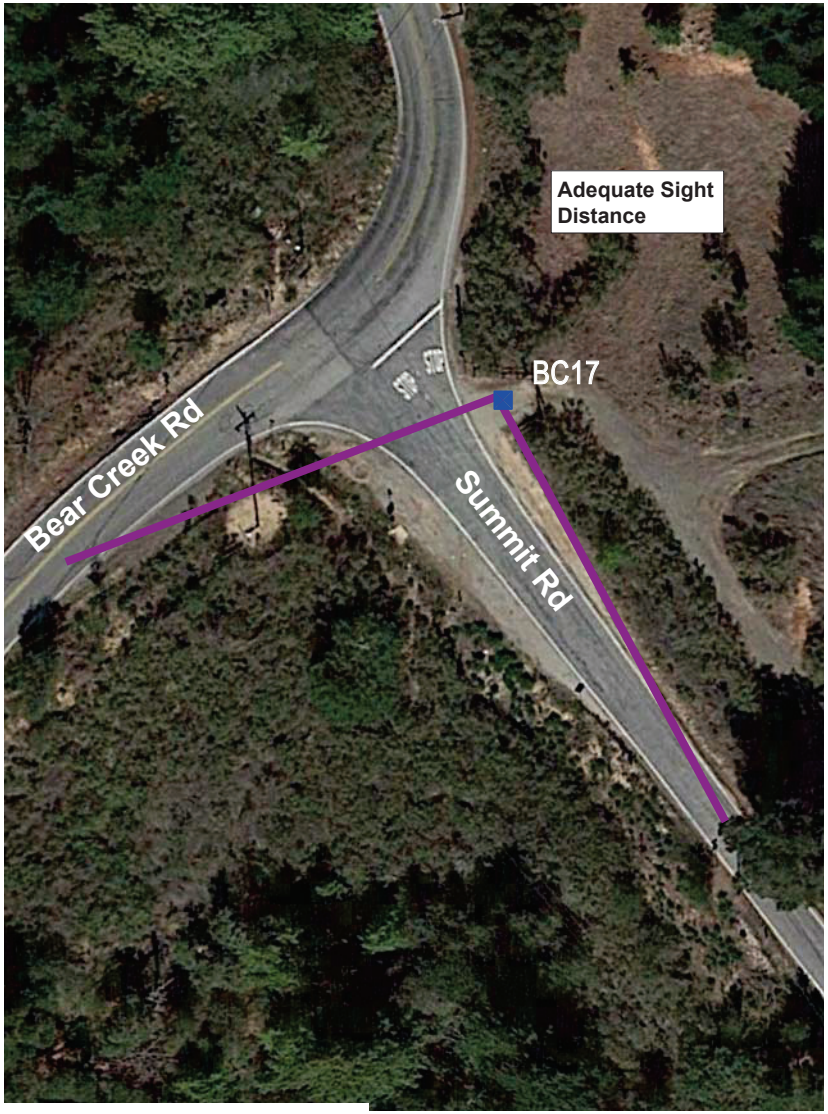
Figure 9
Driveway 2 Sight Distance

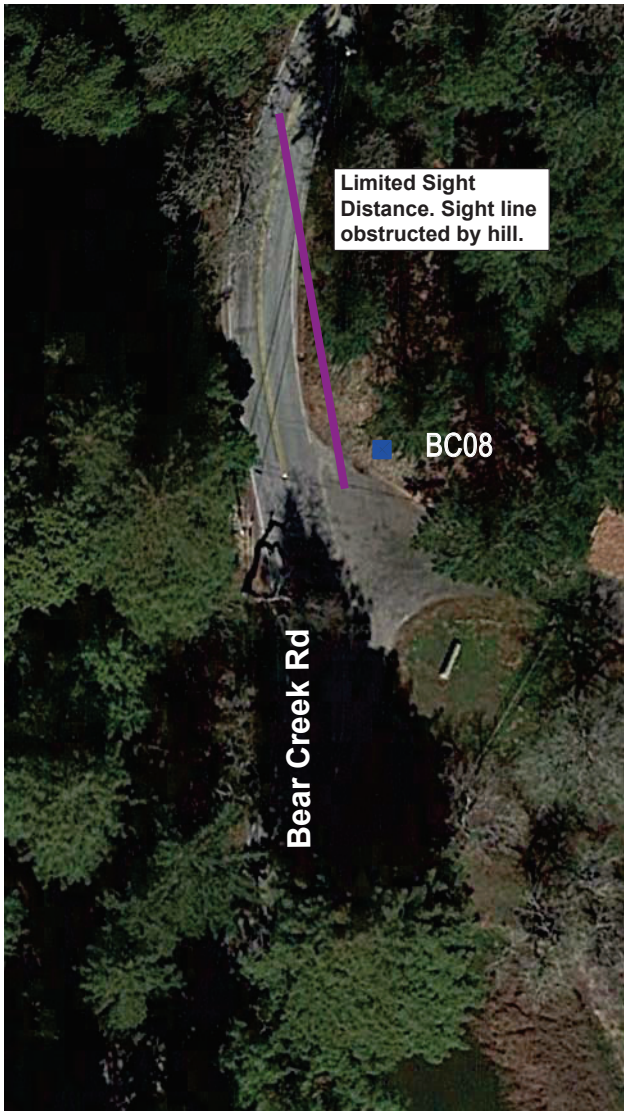
Looking South



Looking North

Figure 10
Views from Driveway 2 Location (approximate)





LEGEND

= Approximate Line of Sight

= Potential Study Driveway

= Potential Study Gate

Figure 11
Sight Distance for BC17 and BC08

Attachment 4 - MSCE Topographic Survey

VP21-005 NORTH PARKING AREA

BEAR CREEK REDWOODS OPEN SPACE PRESERVE

September 19, 2023

ATTACHMENT 2

Not to scale

EXISTING CONDITIONS

GEOTECHNICAL INVESTIGATION
For
PROPOSED BEAR CREEK REDWOODS NORTH PARKING AREA
Midpeninsula Regional Open Space District
Bear Creek Road
Los Gatos, California
APN: 544-320-01

Prepared for
SCOTT REEVES

Prepared by
HARO, KASUNICH AND ASSOCIATES, INC.
Geotechnical & Coastal Engineers
Project No. LG12342
October 2023

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. LG12342
31 October 2023

SCOTT REEVES
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, California 94002

Subject: Geotechnical Investigation

Reference: Proposed Bear Creek Redwoods North Parking Area
Bear Creek Road
Los Gatos, California
APN: 544-320-01

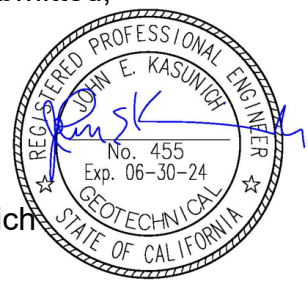
Dear Scott Reeves:

In accordance with your authorization, Haro Kasunich and Associates, Inc. (HKA) has performed a Geotechnical Investigation for the proposed parking lot development at the referenced site. The proposed project involves the construction of terraced paved parking for up to 50 passenger vehicles and 8 equestrian vehicles, control of surface and subsurface drainage, and retaining walls for the terraced parking areas.

The results of our investigation indicate the proposed parking lot improvements at the referenced site are feasible from a geotechnical perspective, provided the geotechnical criteria and recommendations presented in this report are closely followed in the development of project plans and specifications.

If you have any questions concerning the data, conclusions, or recommendations presented in this report, please call our office.

Respectfully Submitted,



Thayara Almeida
Staff Engineer

John E. Kasunich
P.E., G.E. 455

HARO, KASUNICH & ASSOCIATES, INC.

TA/JK/jk
Copies: 1 via email: Scott Reeves (sreeves@openspace.org)

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the proposed parking lot development at Bear Creek Road (APN: 544-320-01) in Los Gatos, California.

Purpose and Scope

The purpose of our investigation was to explore and evaluate the surface and subsurface conditions at the project site and develop geotechnical design criteria and recommendations for a terraced parking lot, pavement design, control of surface and subsurface drainage and retaining walls. The specific scope of our services was as follows:

1. Preliminary site reconnaissance, review of information in our files pertinent to the site and vicinity, and review of online information at the Santa Clara County GIS Website regarding the site and region. Review files provided by the client.

2. Coordinate field exploration, mark exploratory boring locations and coordinate buried public utility locations with Underground Service Alert (USA) as required by law prior to drilling, and schedule the drilling company.

3. Field Investigation consisting of exploration of subsurface conditions at the site with four (4) borings drilled with a tractor-mounted, solid-stem auger drilling equipment to depths of 21.5 feet. Soil samples obtained were sealed and returned to the laboratory for testing.

4. Laboratory testing of soil samples to determine pertinent engineering properties. Moisture content and dry density testing of selected samples were performed to evaluate the consistency of the in-situ soils. Grain size analysis was performed to aid in soil classification. A Saturated Direct shear test was performed to evaluate soil strength parameters and assist in foundation design. An Atterberg Limit (Plasticity Index) test was performed to evaluate the expansion potential of the in-situ clay soils. An R-Value test was performed on a bulk sample collected within the upper 1 to 3 feet below ground surface to aid in pavement design.

5. Engineering evaluation of the field and laboratory data to develop geotechnical design criteria and recommendations for site grading, retaining wall lateral pressures, site drainage and pavement design.

6. Preparation of this report with graphics presenting our findings, conclusions and recommendations.

Site Location and Conditions

The project site is located approximately 0.6 miles up Bear Creek Road from the Highway 17 exit. The site has a gentle surface gradient descending from north to south off Bear Creek Road. Gradients steepen beyond the western boundary of the project area, descending into a natural creek drainage (Figure 1). The site is presently a closed open space area with tall grasses, bushes and trees with a vehicle maintenance road on the perimeter of the proposed parking lot.

Project Description

HKA understands the proposed project scope consists of constructing a paved terraced parking lot for up to 50 passenger vehicles and 8 equestrian vehicles, and retaining walls for the terraced parking areas. The parking area will be roughly 2-acres in size and will extend towards the south about 300 feet from Bear Creek Road. Surface and sub-surface drainage will be controlled.

As the project is in the initial planning phase, some of the recommendations in this report are general in nature. Haro Kasunich and Associates (HKA) should be given the opportunity for a geotechnical review of the final project plans prior to submittal. The review will allow us the opportunity to determine if our geotechnical criteria and recommendations were properly interpreted and implemented; and determine if this report is adequate for the final project design.

Field Exploration

Subsurface conditions were investigated on 10 August 2023. The approximate locations of the test borings are indicated on the Boring Site Plan (Figure 3 in Appendix A). The borings

were advanced using 6-inch diameter continuous solid flight-auger equipment mounted on a tractor.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0 inch outside diameter (O.D.) Modified California Sampler (MC) or the 2.0-inch O.D. Standard Penetration Test Sampler (SPT).

The penetration resistance blow counts noted on the boring logs were obtained as the sampler was dynamically driven into the in-situ soil. The process was performed by dropping a 140-pound hammer from a 30-inch free fall distance, driving the sampler 6 to 18 inches, and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs represent the accumulated number of blows that were required to drive the sampler the last 12 inches.

The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2487). The Key to Logs, (Figure 7) and Boring Logs (Figures 8-11), are included in the Appendix of this report.

The Boring Logs denote subsurface conditions at the locations and time observed, and it is not warranted that they are representative of subsurface conditions at other locations or times. Subsurface conditions at other locations may differ from those encountered at the explored locations. Stratification lines shown on the logs represent the approximate boundaries between soil types. The actual transitions may be gradual.

Laboratory Testing

Soil samples obtained from the borings at selected depths were taken to our laboratory for further examination and laboratory testing. The laboratory testing program was directed toward determining pertinent engineering properties of soil underlying the project site.
In-situ moisture percentages and dry unit weights were recorded for select samples. The strength parameters of the underlying earth materials were determined from field penetration resistance of the in-situ soil and saturated direct shear test. Grain size analysis

tests were performed to aid in soil classification. An Atterberg Limit (Plasticity Index) test was performed to evaluate the expansion potential of the in-situ clay soils. An R-Value test was performed on a bulk sample collected within the upper 1 to 3 feet below ground surface to aid in pavement design.

The results of the laboratory testing can be found in Appendix A (Figures 12-17), and they also appear on the Logs of Test Boring opposite the sample tested.

Subsurface Conditions

Based on the results of our subsurface investigation and laboratory testing overall, the native earth materials on the site consist of loose to medium dense sandy clay/clayey sand/silty sand in the upper 5 feet, underlain by silty clay/sandy clay/fat clay to the depths explored of 21.5 feet below ground surface (bgs).

The soil in Boring B-1 consisted of medium dense sandy clay with root traces to a depth of 5.0 feet bgs, over stiff sandy clay soils to a depth of 10.0 feet bgs, underlain by very stiff sandy fat clay to the depth explored of 21.5 feet bgs.

The soil in Boring B-2 consisted of loose to medium dense clayey sand with root traces to a depth of 5.0 feet bgs, over medium dense silty clay soils to a depth of 10.0 feet bgs, underlain by very stiff sandy fat clay to the depth explored of 21.5 feet bgs.

The soil in Boring B-3 consisted of loose to medium dense silty sand with root traces to a depth of 5.0 feet bgs, over loose silty clayey sand soils to a depth of 6.5 feet bgs, underlain by very stiff silty clay to the depth explored of 21.5 feet bgs.

The soil in Boring B-4 consisted of firm to stiff sandy clay with root traces to a depth of 6.0 feet bgs, over very stiff clay/fat clay soils to the depth explored of 21.5 feet bgs.

Groundwater

Groundwater was not encountered in any of our borings. It should be noted that groundwater levels may fluctuate due to seasonal wet weather considerations, variations in rainfall, or other factors not evident during our investigation. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes to the conditions observed or inferred from our investigation.

Site Geology

A review of the *Geologic Map of the Los Gatos Quadrangle, Santa Clara & Santa Cruz Counties, California* (Dibblee, 2005) indicates the site is mapped as underlain by Qls: Landslide Rubble (Holocene/Pleistocene) – rubble derived from rocks upslope, bounded by fs: Franciscan Assemblage (Jurassic and Cretaceous) – gray claystone and siltstone, and Tsl: San Lorenzo Formation (Miocene/Oligocene) – clay shale or claystone with thin layers of fine-grained sandstone. The native soils encountered below 5 feet deep, within our borings at the site were typical of the mapped Franciscan Assemblage and San Lorenzo Formation. A regional geologic map is included in Appendix A (see Figure 2).

Seismicity

The site is located in the seismically active Santa Cruz Mountains area and situated in a complex setting relative to geological hazards. The site is mapped within a 1/8th mile buffer from a County fault rupture hazard zone, a County landslide hazard zone, a State seismic hazard zone and a State earthquake zone. The State earthquake zone is only mapped in the far west end of the site close to Briggs Creek. The fault alignment is the San Andreas Fault in this area. Therefore, the risk of ground rupture occurring across the site is high. To address these mapped hazards a licensed geologist will need to perform a site study, likely including backhoe trenching and exploratory borings. A fault study was not warranted for this scope of work. The owner of the project would need to retain the services of a Certified Engineering Geologist (C.E.G.) to conduct a fault investigation for this project. We can provide recommendations for local geologists if needed. Below is a general discussion about the regional faults and is not a substitution for a site-specific fault investigation.

The known active faults nearest to the site are the San Andreas Fault Zone, located within the 1/8-mile buffer zone of the project, the Butano Fault Zone, which passes approximately 2.4 miles to the southwest, the Zayante-Vergeles Fault Zone, which passes approximately 5.6 miles to the southwest, the Berrocal Fault Zone, which passes approximately 2 miles to the northeast.

This site, as all sites in Santa Cruz Mountains, could be affected by an earthquake with an epicenter on any one of the active or potentially active faults of the area. At present, it is not possible to predict when or where movement will occur on these or any other faults. However, based on historic records and the general seismicity of this region, it is probable that this site will be shaken by at least one moderate to major earthquake and by numerous minor earthquakes during the next 50 years. Should a moderate to major earthquake occur with an epicenter location close to the property, ground shaking at the site would be severe. Seismic hazards could include liquefaction related ground effects such as ground settlement, sand boils, lateral spreading, and ground rupture, in addition to strong ground shaking.

Geotechnical Related Seismicity

The improvements should be designed in conformance with the most current California Building Code (2022 CBC), effective 1 January 2023. For seismic design, the soil properties at the site are classified as **Site Class "D"** based on definitions presented in Section 1613.2.2 in the 2022 CBC which refers to Chapter 20 of ASCE 7-16. The longitude and latitude were determined using a satellite image generated by Google Earth. These coordinates were taken from the approximate middle of the area of the proposed improvements:

Latitude = 37.186087°, Longitude = -122.000338°

The coordinates listed above were used as inputs in the OSHPD seismic design maps created by California Office of Statewide Health Planning and Development (OSHPD) to determine the ground motion associated with the maximum considered earthquake (MCE) S_M and the reduced ground motion for design S_D. The results are as follows:

Site Class D

S_S= 2.422 g

S_1= 1.015 g

S_{MS}= 2.422 g

S_{M1}= 1.726 g

refer to section 11.4.8 ASCE7-16 for site specific ground motions and exceptions[1]

S_{DS}= 1.615 g

S_{D1}= 1.150 g

refer to section 11.4.8 ASCE7-16 for site specific ground motions and exceptions[1]

A maximum considered earthquake geometric mean (MCEG) peak ground acceleration (PGA) was estimated using Figure 22-9 of the ASCE Standard 7-16. The mapped PGA was 1.035 g, and the site coefficient F_{PGA} for Site Class D is 1.1. The MCE_G peak ground acceleration adjusted for Site Class effects is $PGA_M = F_{PGA} * PGA$

$PGA_M = 1.1 * 1.035\ g = 1.139\ g$

Geologic Hazards

Liquefaction Potential and Lateral Spreading

During an earthquake, seismic waves travel through the earth and vibrate the ground. In cohesionless, granular material having low relative density (loose to medium dense sands for example), this vibration can disturb the particle framework leading to increased compaction of the material and reduction of pore space between the framework grains. If the sediment is saturated, water occupying the pore spaces resists this compaction and exerts pore pressure that reduces the contact stress between the sediment grains. With continued shaking, transfer of intergranular stress to pore water can generate pore pressures great enough to cause the sediment to lose its strength and change from a solid

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1 "See requirements for site-specific ground motions in Section 11.4.8 of ASCE 7. [OSHPD 1R, 2 & 5] The values of F_V shall only be used for calculation of T_S, determination of Seismic Design Category, linear interpolation for intermediate values of S_1, and when taking the exceptions under Items 1 and 2 of Section 11.4.8 for the calculation of S_{D1}." 2022 CBC, TABLE 1613.2.3(2)

"Where the simplified design procedure of ASCE 7, Section 12.14 is used, the value of Fa shall be determined in accordance with ASCE 7, Section 12.14.8.1, and the values of F_V, S_{MS} and S_{M1} need not be determined." 2022 CBC 1613.2.3

2 EXCEPTION: A ground motion hazard analysis is not required where the value of the parameter S_{M1} determined by Eq. (11.4-2) is increased by 50% for all applications of S_{M1} in this Standard. The resulting value of the parameter S_{D1} determined by Eq. (11.4-4) shall be used for all applications of S_{D1} in this Standard." ASCE7-16, Supplement 3, 11.4.8, Item 1. Note: The values of S_{M1} and S_{D1} above have not been increased. Item 2 does not apply to Site Class D, D (default).

state to a liquefied state. This mechanical transformation termed liquefaction can cause various kinds of ground failure at or near the ground surface. The liquefaction process typically occurs at depths less than 50 feet below the ground surface. Liquefaction can occur at deeper intervals, given the right conditions, however ground manifestations have been found to be relatively minor.

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as a stream or river channel or an embankment. Lateral spreading can also occur on sloping ground. Typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

The site is mapped as having **LOW** liquefaction potential on the Santa Cruz GIS application. Based on the results of our subsurface exploration for the site, no groundwater was encountered in any of our exploratory borings, we estimate there is a low potential for liquefaction or lateral spreading to occur at the project site.

Dynamic Compaction

Dynamic compaction is seismically induced settlement of soil above the groundwater elevation by vibration such as from earthquakes. Dynamic compaction typically occurs in near-surface loose granular soils. Dynamic compaction can occur with or without structural loads on the soil. Based on the presence of near-surface clayey layers and the lack of ground water, we estimate minor potential dynamic compaction (less than ¼ inches) provided foundation preparation recommendations are followed.

Slope Instability

The project site has a gentle surface gradient descending from north to south off Bear Creek Road. Gradients steepen beyond the western boundary of the project area, descending into a natural creek drainage. Slope stability analysis was beyond the scope of work of this project.

Immediate Settlement

Based upon Standard Penetration Testing at the site and our recommended allowable bearing capacities, total and differential immediate construction settlements for the project are anticipated to be on the order of 1 inch for both. This is in addition to potential dynamic compaction as a result of a nearby major earthquake discussed above.

Building Codes

Project design and construction should conform to the following current building codes:

-2022 California Building Code (CBC); and

-2022 Green Building Standards Code (CAL Green)

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The results of our investigation indicate that the proposed development is feasible from a geotechnical standpoint provided the criteria and recommendations presented in this report are closely followed during design and construction of the project.

Geotechnical considerations at the referenced site include providing firm uniform support for the improvements, proper control of surface runoff and the potential for strong seismic shaking.

The site gently slopes southeast, and the native earth materials encountered consist of consist of layers of loose to medium dense sandy clay/clayey sand/silty sand on the upper 5 feet, underlain by layers of silty clay/sandy clay/fat clay to the depths explored of 21.5 feet (bgs). To provide uniform support for the new parking lot and improvements, we recommend removing and recompacting on-site loose topsoil encountered on the top 3.0 feet.

For pavement design, the calculations should use the California R-Value of the subgrade soils of a minimum 10. We considered applicable a Traffic Indices (TI) for this project, TI = 6 for auto traffic and TI = 7.5 for truck traffic.

The project site will experience strong seismic shaking in the design life. We recommend the structure be designed and constructed in conformance with the most current California Building Code (2022 CBC) seismic design standards.

Site drainage is important to the long-term performance of the project. Plans should include provisions for positive gradients away from wall foundations so surface runoff is **not** permitted to pond on the pavement and adjacent to wall foundations. Bare slopes should be well vegetated to be protected from stormwater runoff erosion. Surface runoff should be directed away from wall foundations at a minimum gradient of 5 percent for a minimum horizontal distance of 10 feet. Concentrated runoff should be diverted from improvements

and slopes by lined ground swales or solid pipes to suitable discharge locations.

The following recommendations should be used as guidelines for preparing project plans and specifications:

Pavement - Structural Section Design Considerations

The pavement design for the proposed parking lot relies heavily upon the soil subgrade supporting the pavement structural section. The findings from the field investigation indicate the upper 3 feet bgs of subgrade soils are relatively loose. Thus, the supporting layer of subsoil needs to be improved to create a uniform well compacted subgrade layer upon which to place the structural section, as well as to allow construction operations to proceed. To provide adequate support of the pavements the upper 36 inches of subgrade should be removed and replaced as an engineered fill. The structural section design is based upon the results of the R-value test.

Pavement Design

One R-Value test was performed on near surface soil spoils taken from our boring B-1. R-Value test results at this site indicate an R-Value of 10 (sandy clay). Variation of soil may occur during mass grading. Based on the test results, the following design considerations are valid for the pavement design:

- Large semi-trucks will be able to use the paved area, including equestrian vehicles, firetrucks and garbage trucks.
- A 20-year design life per highway design manual is acceptable.

HKA made additional design considerations as follows:

In calculating this pavement section, we have assumed Traffic Indices (TI) that are generally assigned when considering certain types of traffic patterns.

Traffic volume and equivalent axle loads that exceed the assumed TI could be destructive to the pavement, resulting in an accelerated rate of deterioration and the need for

increased maintenance. If more precise TI are required, they should be calculated by a Traffic Engineer, based on the anticipated axle loads and vehicle volume, and submitted to us for further recommendations.

Table 3. Recommended Pavement Sections

Anticipated Traffic Use	Assigned R-Value	Assumed Traffic Index	Minimum Pavement Section (in)		
			AC	Class II Aggregate Baserock	Aggregate Subbase
Auto Traffic	10	6.0	3.0 2.5	6.0 14.0	--
Auto and Truck Traffic	10	7.5	4.2	6.0	--

To have the selected pavement sections perform to their greatest efficiency, it is especially important that the following items be considered:

a. Remove the upper 30 inches, scarify and moisture condition, or dry back as needed, the bottom of the subexcavation a minimum 6-inches and compact to a minimum relative compaction of 90 percent, at a moisture content which is about 2 to 4 percent above laboratory optimum value. Place engineered fill in 8-inch compacted layers back up to subgrade elevation. The upper 8 inches of subgrade should be compacted to a minimum 95 percent relative compaction.
b. Provide sufficient gradient to prevent ponding of water.
c. Use only quality materials of the type and thickness (minimum) specified. Aggregate base rock (R=78 minimum) must meet

CALTRANS Standard Specifications for Class 2 Untreated Aggregate Base (Section 26). Aggregate subbase (R=50 minimum), if required, must meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Subbase, (Section 25).

d. Compact the baserock and subbase materials uniformly to a minimum relative compaction of 95 percent.

e. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits.

f. Maintenance should be undertaken on a routine basis.

g. HKA should test the aggregate baserock layer prior to paving

Site Grading

1. The geotechnical engineer should be notified **at least four (4) working days** prior to any site clearing or grading operation so that the work in the field can be coordinated with the grading contractor and arrangements for testing and observation services can be made. The recommendations of this report presume the geotechnical engineer or representative will perform the required testing and observation services during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557-10.

3. Areas to be graded should be cleared of any remaining obstructions including loose and saturated soil, trees not designated to remain, grass, shrubs or other unsuitable material. Existing depressions or voids created during site clearing should be backfilled with engineered fill.

4. Cleared areas should then be stripped of organic-laden topsoil. The stripping depth is estimated to be 2 to 4 inches. Actual depth of stripping should be determined in the field by the geotechnical engineer. Strippings should be wasted off-site or stockpiled for use in landscape areas if desired.

5. After the site has been cleared and stripped, the exposed subgrade is to be sub excavated 30 inches. The bottom of excavation and areas to receive engineered fill should be scarified to a depth of 6 inches, moisture conditioned (or allowed to dry as necessary) to 2 to 4 percent above optimum moisture and compacted to a minimum of 90 percent relative compaction.

6. After stabilization of the bottom of the subexcavation, engineered fill should be placed in thin lifts not exceeding 8 inches in loose thickness; moisture conditioned to slightly above optimum moisture and compacted to a minimum of 90 percent relative compaction. The upper 8 inches of pavement section subgrades should be compacted to at least 95 percent relative compaction at slightly above optimum moisture. The aggregate base below pavements should likewise be compacted to a minimum of 95 percent relative compaction at slightly above optimum moisture.

7. If grading is performed during or shortly after the rainy season, the grading contractor may encounter compaction difficulty (i.e., pumping action and/or the bringing of free water to the surface). If compaction cannot be achieved after adjusting the soil moisture content, it may be necessary to stabilize the subgrade soil with angular crushed rock. The bridging material should be a coarse granular mixture of rock having a maximum size of about 8 inches. It is anticipated that quarry-run or crusher-run materials will be satisfactory. The material should be well graded between the largest and smallest particle size, with no more than 12 percent passing the # 200 sieve.

8. Fat clayey soils were encountered at depths of approximately 10 feet bgs. As long as these soils are not reused, on-site soils <u>are suitable</u> for use as engineered fill. Engineered fill at the project site should:
    a. Be free of wood, organic debris, and other deleterious materials.
    b. Not contain rocks or clods greater than 2.5 inches in any dimension.
    c. Not contain more than 25 percent of fines passing the #200 sieve.

d. Have a Sand Equivalent greater than 18.
e. Have a Plasticity Index less than 15.
f. Have an R-Value of not less than 10.
g. Be approved by HKA. Contractor should submit samples of import material or utility trench backfill to the geotechnical engineer for compliance testing a minimum of 4 days before it is delivered to the site.

9. Following grading, exposed soil should be planted as soon as possible with erosion-resistant vegetation.

10. After the earthwork operations have been completed and the geotechnical engineer has finished observation of the work, no further earthwork operations shall be performed without the direct observation and approval of the geotechnical engineer.

Concrete Slabs-on-Grade

11. Concrete slabs should be constructed on properly water conditioned and compacted soil subgrades. Slab subgrades should be prepared and compacted as recommended in the section above entitled “Site Grading.” Prior to placement of concrete the subgrade should be proof rolled and thoroughly pre-moistened.

12. We recommend that consideration be given to a minimum slab thickness of 5 inches and steel reinforcement necessary to address temperature and shrinkage considerations. It is recommended that rebar in lieu of wire mesh be used for slab reinforcement. The steel reinforcement should be held firmly in the vertical center of the slab during placement and finishing of the concrete with pre-cast concrete dobies.

Retaining Walls

13. For design of fully drained retaining walls up to 10 feet high, the following wall design criteria may be used:

a. Active earth pressure for walls allowed to yield (up to ½ percent of wall height) is that exerted by an equivalent fluid weight of 45 pcf for a level backslope and 60 pcf for a 2:1 backslope.

b. To account for seismic loading, depending on the critical nature of the structure, a horizontal line load surcharge equal to $20H^2$ pounds per linear foot of wall may be assumed to act at 0.6H above the base of the wall (where H is the height of the wall in feet).

c. In addition, the walls must be designed for any adjacent live or dead loads which will exert a force on the wall (structures or traffic).

14. Retaining wall footings should have their bottoms scarified and moisture adjusted to near optimum moisture content and compacted to a minimum 90 percent relative compaction. Site retaining wall foundations should be designed for an allowable bearing capacity of 2,500 psf plus one-third increase for wind and seismic loads provided they are embedded into and founded on on-site soil.

15. The bottoms of new footings should not be located below an imaginary plane projected downwards at a 2:1 (H:V) slope gradient below the bottoms of existing or new footings.

16. The above lateral pressures are provided assuming the walls are fully drained to prevent development of hydrostatic pressure behind the walls.
    a. Drainage materials behind walls should consist of Class 2 permeable material and can be used without a filter fabric, complying with Section 68-2.02F (2) of Caltrans Standard Specifications, latest edition, or an approved equivalent.
    b. The drainage material should be at least 12 inches thick and extend from the base of the wall to within 12 inches of the top of the backfill.
    c. The top 12 inches of backfill behind the wall should be relatively impermeable

native soil compacted in place to prevent stormwater from entering wall back drains. A layer of filter fabric (Mirafi 140N or equivalent) should separate the subdrain material.

d. A 4-inch diameter perforated pipe should be placed (holes down) about 2 inches above the bottom of the wall and be tied to a suitable drain outlet. The outlet should discharge away from structures and slopes in a controlled manner.

17. Lateral loads on spread footings may be designed for a passive resistance acting along the face of the footings. Where footings are poured neat against firm native soil, an equivalent fluid pressure of 250 pcf acting along the face of the footings is considered applicable. The top 12 inches of soil should be neglected when computing passive resistance.

Utility Trenches

18. Utility trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all Cal/OSHA and local safety requirements and codes dealing with excavations and trenches.

19. Utility trenches should not extend below an imaginary line sloping down and away at a 1½:1 (H: V) slope from the bottom outside edge of all foundations. The structural design professional should coordinate this requirement with the utility layout plans for the project.

20. Trenches should be backfilled with granular-type material and uniformly compacted by mechanical means to the relative compaction required by Santa Clara County, but not less than 95 percent relative compaction under paved areas and 90 percent relative compaction elsewhere. The relative compaction is based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Test Procedure D1557-10.

21. We strongly recommend placing a 3-foot-long concrete plug in each trench where the trench passes under exterior foundations. Care should be taken not to damage utility lines.

22. Trenches should be capped with a minimum of 12 inches of relatively impermeable soil.

Site Drainage

23. A drainage plan to handle surface runoff will be an important part of the development for this site. Site drainage should be adequately controlled both during and after construction. It will be vital that surface drainage is collected and controlled to an appropriate discharge location.

24. Runoff should be conveyed via buried solid pipe to suitable discharge points away from all foundations and improvements.

25. Surface discharge piping (e.g., downspout pipes or catch basin pipes) and subsurface discharge piping (e.g., retaining wall back drains/curtain drainpipes) must be kept separate and independent from each other.

26. Drainage plans should include provisions for positive gradients away from the adjacent slopes and wall foundations so that surface runoff is **not** permitted to pond on pavements or adjacent to wall foundations. Surface runoff should be directed away from the improvements at minimum gradients of 2 to 5 percent for a minimum horizontal distance of 10 feet. Concentrated runoff should be conveyed via buried solid pipe to suitable discharge locations.

27. We recommend raised curbs be considered along the boundaries of adjacent slopes to direct water to appropriate storm drain inlets.

28. Irrigation activities at the site should be done in a controlled and reasonable manner.

Planter areas should not be sited adjacent to walls; otherwise, measures should be implemented to contain irrigation water and prevent it from seeping into walls and under foundations.

29. The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent damage to these structures. Landscaping should be planned accordingly.

30. Drainage patterns approved at the time of finished grading should be maintained throughout the life of proposed structures.

Erosion Control

31. All bare soil and cut and fill slopes should be seeded and mulched immediately after grading with barley, rye, grass, and crimson clover or otherwise provided with erosion control measures.

32. Erosion control measures must be maintained during construction. Refer to construction time frame constraints and requirements in the Santa Clara County Erosion Control Ordinances.

Plan Review, Construction Observation, and Testing

33. Haro, Kasunich and Associates must be provided with an opportunity to review project plans prior to construction to evaluate if our recommendations have been properly interpreted and implemented. We should also provide earthwork observation and testing services during construction. This allows us to confirm anticipated soil conditions and evaluate conformance with our recommendations and project plans. If we do not review the plans or provide observation and testing services, we assume no responsibility for misinterpretation of our recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption the soil

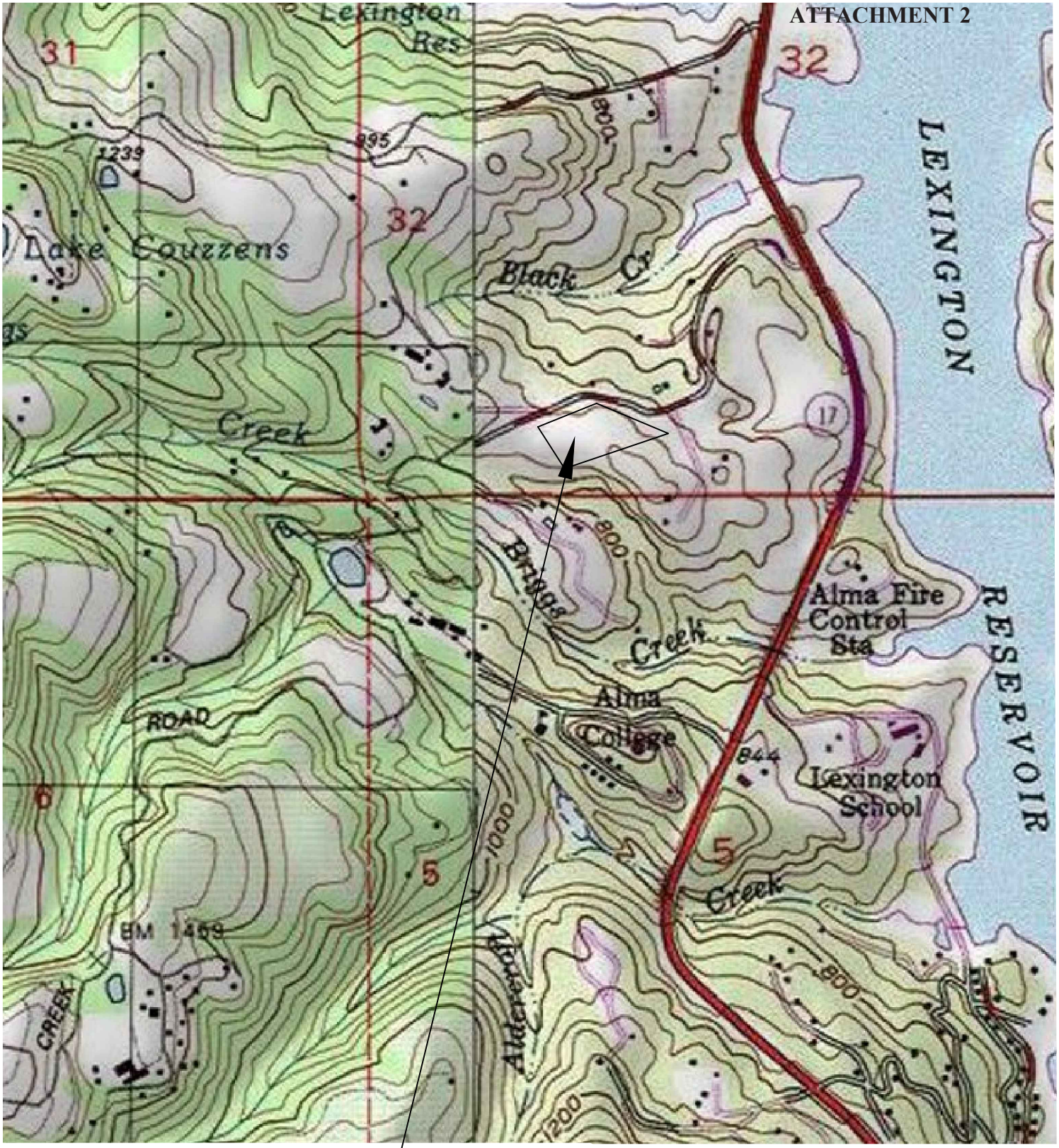
conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so supplemental recommendations can be given.

2. This report is issued with the understanding it is the responsibility of the owner, or their representative, to ensure the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX

ATTACHMENT 2



SITE LOCATION

FROM:
BLACK CREEK TOPO MAP IN SANTA CLARA COUNTY, CALIFORNIA

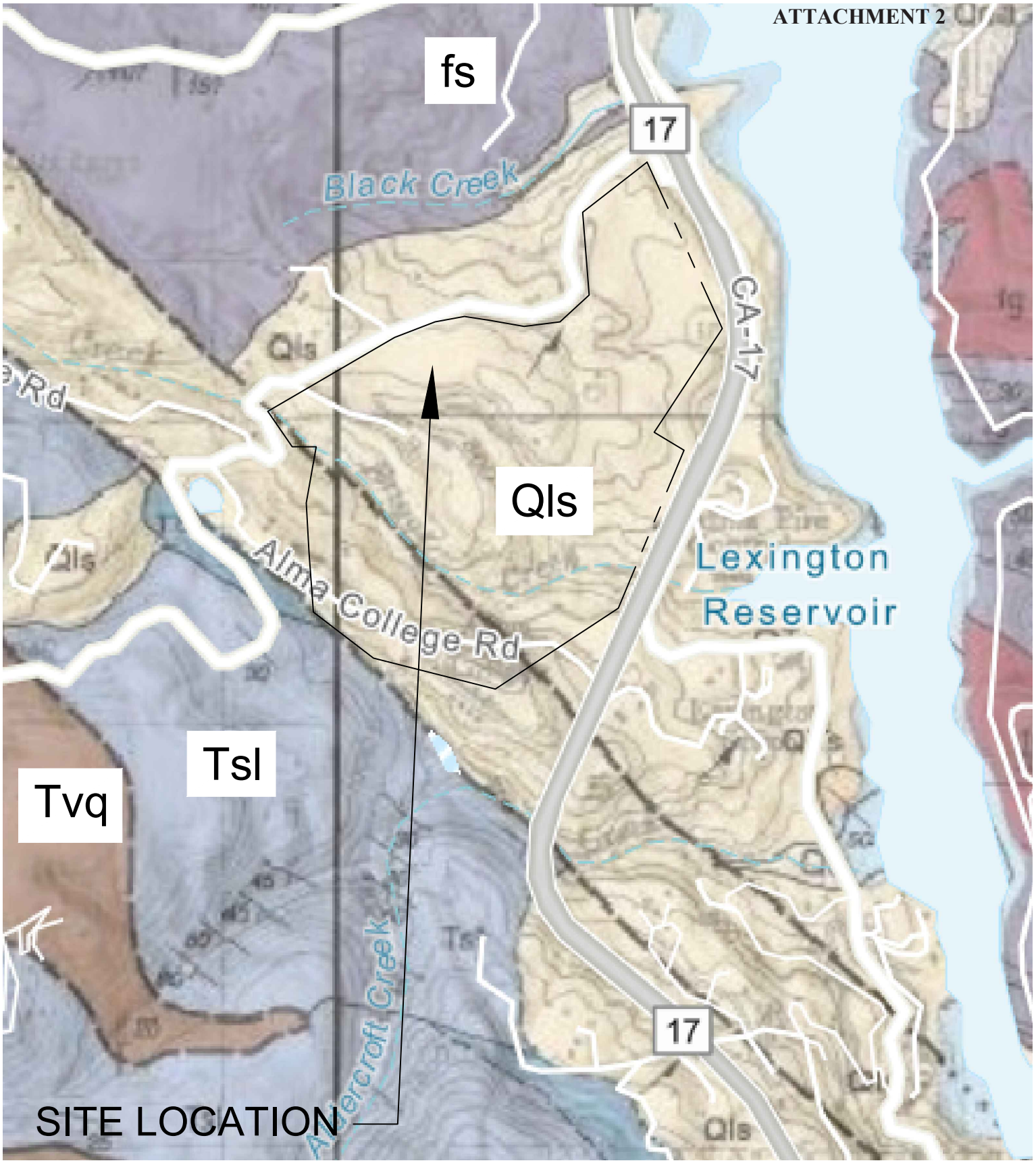
SITE VICINITY MAP
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	NTS
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
JOB NO.	LG12342

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 1

SHEET NO.



KEY:

- Qls: LANDSLIDE RUBBLE (HOLOCENE/PLEISTOCENE)
- fs: FRANCISCAN ASSEMBLAGE (JURASSIC AND CRETACEOUS)
- Tvq: VAQUEROS FORMATION (MIOCENE)
- Tsl: SAN LORENZO FORMATION (MIOCENE/OLIGOCENE)

FROM:
GEOLOGIC MAP OF THE LOS GATOS QUADRANGLE, SANTA CLARA & SANTA CRUZ COUNTIES, CALIFORNIA
COMPILED BY
THOMAS W. DIBBLEE, JR.
DIBBLEE GEOLOGICAL FOUNDATION
2005

REGIONAL GEOLOGIC MAP
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	NTS
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
JOB NO.	LG12342

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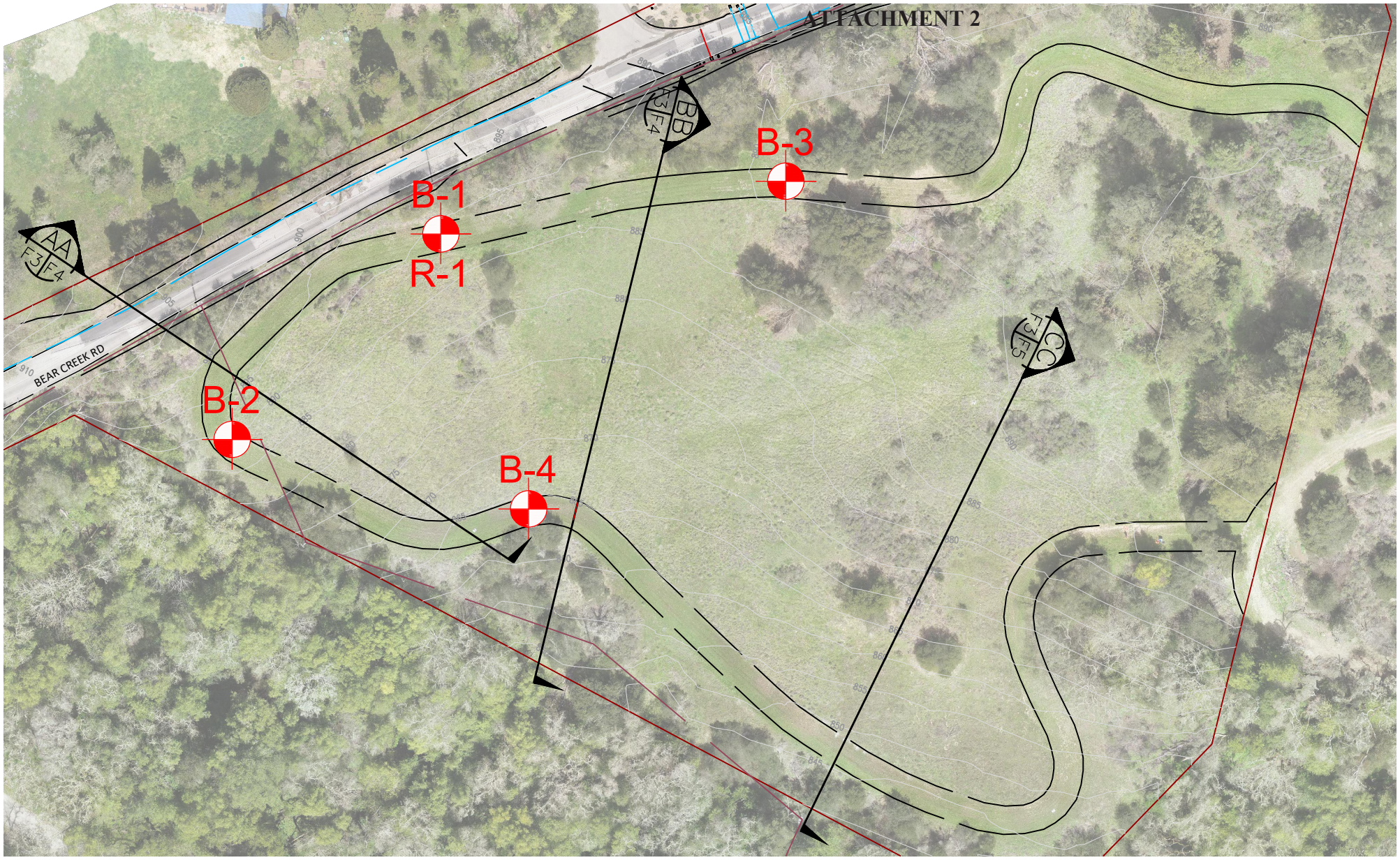
FIGURE NO. 2

SHEET NO.

ATTACHMENT 2



NOTES:
1. TOPOGRAPHIC MAP PROVIDED BY MIDPENINSULA OPEN SPACE DISTRICT, NOT DATED.

KEY: B-X = SOIL BORING LOCATION

R-X = R-VALEU SAMPLE LOCATION (FROM BORING SPOILS)

0 20' 40'

SCALE: 1" = 20'

BORING SITE PLAN
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	1" = 20'
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
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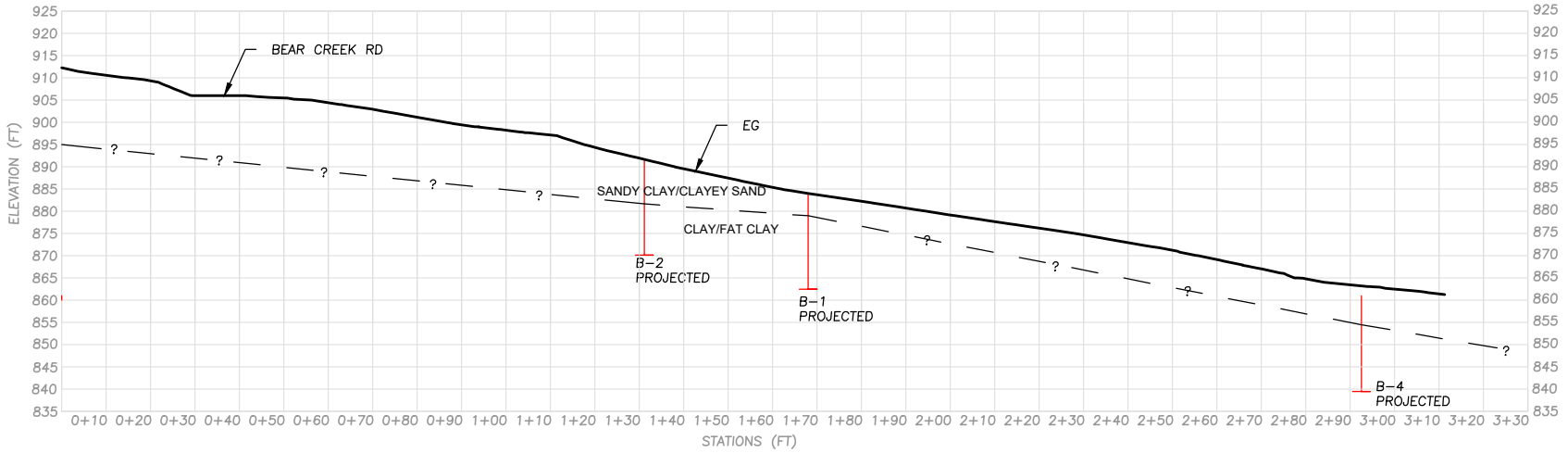
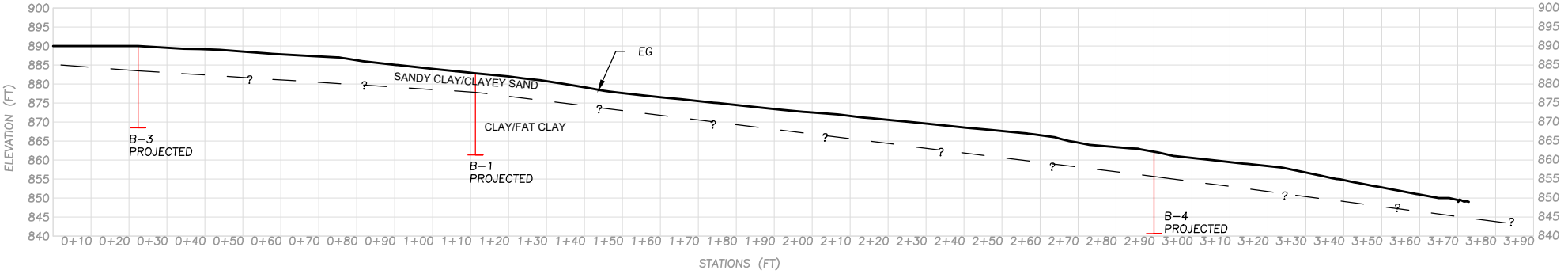
FIGURE NO. 3

SHEET NO.

ATTACHMENT 2



CROSS SECTION
SCALE: 1" = 40'
AA
F3/F4



CROSS SECTION
SCALE: 1" = 40'
BB
F3/F4

NOTES:
1. CROSS SECTION FROM TOPOGRAPHIC MAP PROVIDED BY MIDPENISULA REGIONAL SPACE DISTRICT, NOT DATED.

0 30' 60'

SCALE: 1" = 40'

CROSS SECTION AA'
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	1" = 40'
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
JOB NO.	LG12342

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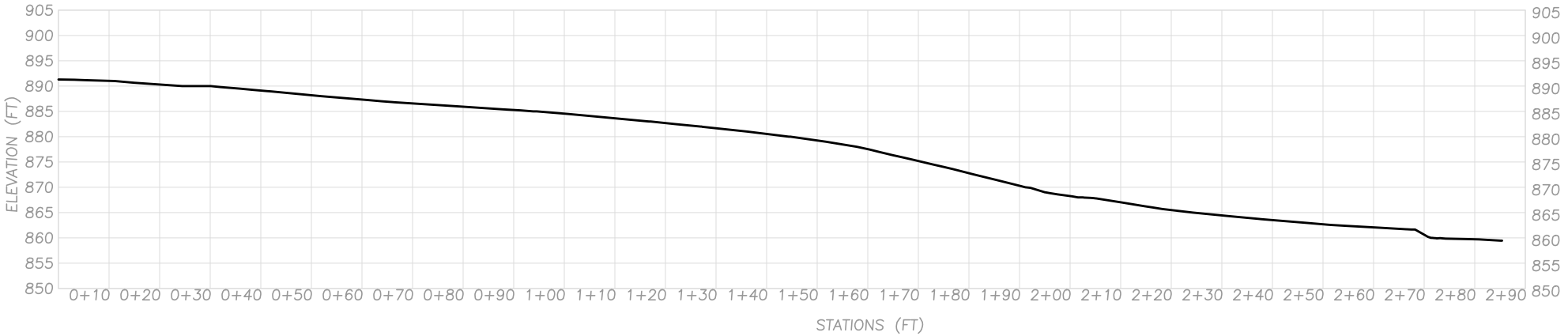
FIGURE NO. 4

SHEET NO.

ATTACHMENT 2



CROSS SECTION
SCALE: 1" = 40'

CC'
F3 F5

0 30' 60'

SCALE: 1" = 30'

NOTES:
1. CROSS SECTION FROM TOPOGRAPHIC MAP PROVIDED BY MIDPENISULA REGIONAL SPACE DISTRICT, NOT DATED.

CROSS SECTION CC'
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	1" = 30'
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
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FIGURE NO. 5

SHEET NO.

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRADED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
		GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES.
	SAND — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTYRES, NON-PLASTIC FINES.
			SC	CLAYEY SANDS, SAND-CLAY MIXTYRES, PLASTIC FINES.
FINE GRADED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50%		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY.
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS.

U.S. STANDARD SERIES SIEVE — GRAIN SIZES — CLEAR SQUARE SIEVE OPENINGS

200 40 10 4 3/4" 2" 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS PER FOOT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

SAMPLING METHOD

STANDARD PENETRATION TEST	T	▨
MODIFIED CALIFORNIA	MC	▥
PITCHER BARREL	P	▩
SHELBY TUBE	S	▮
BULK	B	◢

WATER

FINAL	▽
INITIAL	▼
WATER LEVEL DESIGNATION	

*Number of blows of 140 lb hammer falling 30 inches to drive a 2" O.D. (1 3/8" I.D.) split spoon sampler (ASTM D-1586).

**Unconfined compressive strength in tons/ft2 as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

KEY TO LOGS
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	NTS
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
JOB NO.	LG12342

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 6

SHEET NO.

Bear Creek Road
Mid Peninsula Open Space

PROJECT NO. SC12342

LOGGED BY TA **DATE DRILLED** 8-10-2023 **BORING DIAMETER** 6" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	1-1-2 (MC)		Dark brown, Sandy CLAY (fine to medium grains), dry, stiff, trace roots	CL-CH	17		86	11	
	1-2 (T)		Dark brown, CLAY with SAND, dry, medium dense	CL-CH	12			20	Gravel: 1%, Sand: 25%, Fines: 74%
5	1-3-1 (MC)		Olive yellow with grey mottling traces, Sandy CLAY, dry, stiff	CL	20		103	18	Phi: 26 degrees, C = 422 psf
	1-4 (T)		Same Drilling got stiffer	CL	14				
10	1-5 (T)		Brown, Sandy FAT CLAY, damp, very stiff	CH	19				
15	1-6 (T)		Same material, but grey color	CH	25				
20	1-7 (T)		Same	CH	22				
			Boring terminated at 21.5 feet. No groundwater.						
25									
30									
35									

File: H:\SuperLog4\12342 Bear Creek Rd DRAFT.log Date: 8/31/2023

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 7

Bear Creek Road
Mid Peninsula Open Space

PROJECT NO. SC12342

LOGGED BY TA **DATE DRILLED** 8-10-2023 **BORING DIAMETER** 6" **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	2-1-1 (MC)		Dark brown, transition to yellow brown, Clayey SAND, fine to medium grained, dry, loose, trace roots	SC	13		94	9	
	2 (T)		Same, but medium dense	SC	16				
5	2-3-1 (MC)		Yellow brown with white mottling, fine to medium grained, Silty CLAY, dry, medium dense	CL-ML	23				
	2-4 (T)		Same	CL-ML	23			11	Gravel: 4%, Sand: 40%, Fines: 56%
10	2-5 (T)		Grey with mottling, Sandy FAT CLAY, damp, very stiff	CH	26			21	LL: 58, PL: 17, PI:42
15	2-6-2 (MC)		Grey, Sandy FAT CLAY, damp, very stiff	CH	45				
20	2-7 (T)		Grey, Sandy CLAY with medium to fine grained layers of gray SAND, damp, very stiff	CL	29				
			Boring terminated at 21.5 feet. No groundwater.						
25									
30									
35									

File: H:\SuperLog4\12342 Bear Creek Rd DRAFT.log Date: 8/31/2023

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 8

Bear Creek Road
Mid Peninsula Open Space

PROJECT NO. SC12342

LOGGED BY TA **DATE DRILLED** 8-10-2023 **BORING DIAMETER** 6" **BORING NO.** B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	3-1-1 (MC)		Brown, fine grained, Silty SAND, dry, loose	SM	16		103	6	
	3-2 (T)		Yellow brown with mottling and trace roots, fine grained Silty SAND, dry, medium dense	SM	18				
5	3-3-1 (MC)		Same color, silty Clayey SAND, dry, loose	SC-SM	14				
	3-4 (T)		Yellow brown with grey mottling, Silty CLAY, dry, very stiff	CL	20				
10	3-5 (T)		Olive yellow	CL	18				
15	3-6 (T)		Same	CL	30				
20	3-7 (T)		Same	CL	27				
			Boring terminated at 21.5 feet. No groundwater.						
25									
30									
35									

File: H:\SuperLog4\12342 Bear Creek Rd DRAFT.log Date: 8/31/2023

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 9

Bear Creek Road
Mid Peninsula Open Space

PROJECT NO. SC12342

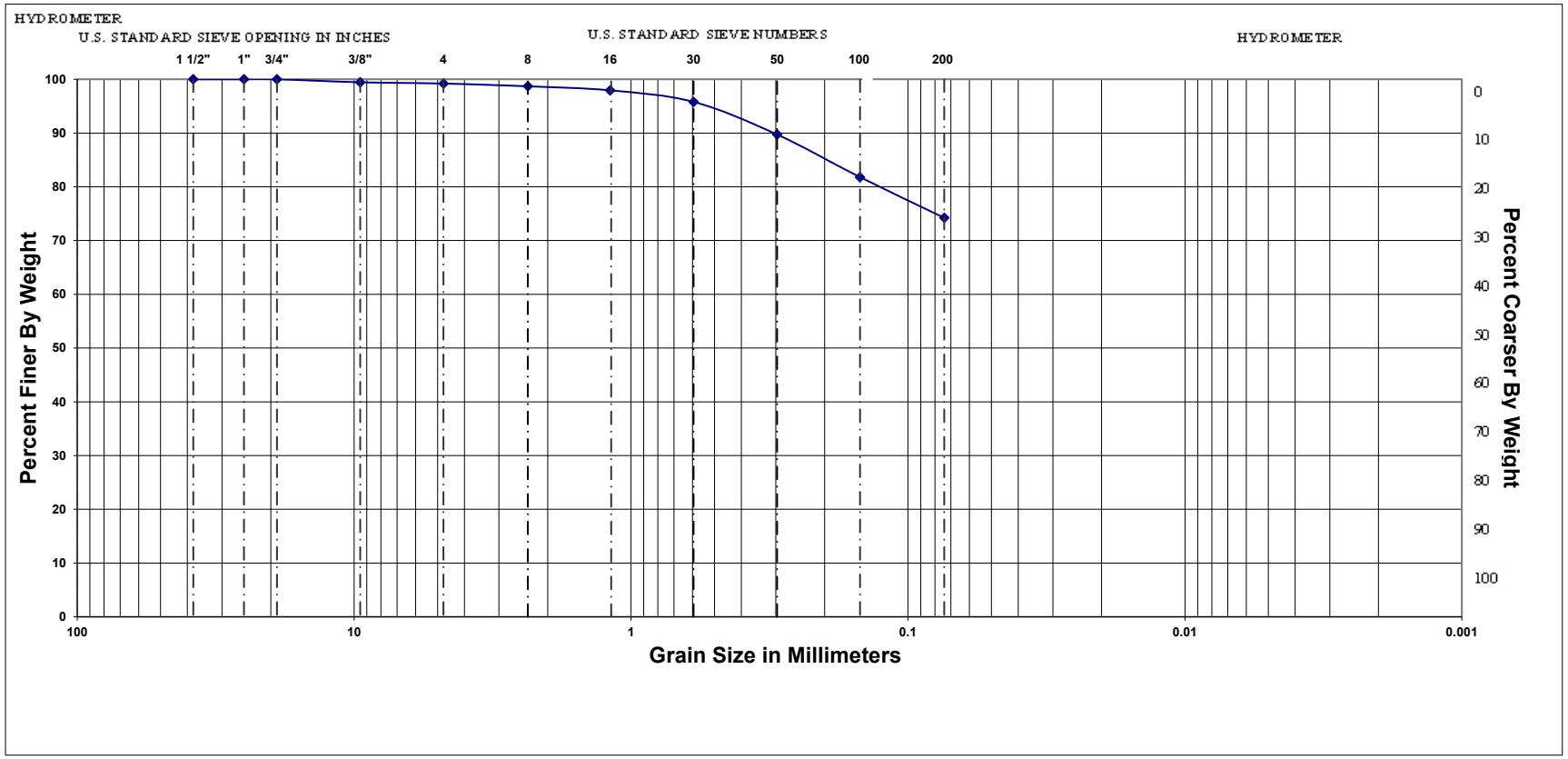
LOGGED BY TA **DATE DRILLED** 8-10-2023 **BORING DIAMETER** 6" **BORING NO.** B-4

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			8" dark brown, loose topsoil						
	4-1-1 (MC)		Grey with yellow mottling and trace roots, Sandy CLAY, damp, firm	CL	15				
	4-2 (T)		Same material, no roots, stiff	CL	13				
5	4-3-1 (MC)		Grey with yellow mottling, Sandy CLAY, damp, stiff	CL	26		97	19	
	4-4 (T)		Same, but last 6" transition to yellow (mottle), CLAY, damp, very stiff, trace roots	CL-CH	20			22	Gravel: 0%, Sand: 10%, Fines: 90%
10	4-5 (T)		Grey CLAY with yellow (mottled) fine to medium grained Silty layers, damp, very stiff	CL-CH	19				
15	4-6 (T)		Grey, FAT CLAY, damp, stiff	CL-CH	12				
20	4-7 (T)		Very stiff	CL-CH	27				
			Boring terminated at 21.5 feet. No groundwater.						
25									
30									
35									

File: H:\SuperLog4\12342 Bear Creek Rd DRAFT.log Date: 8/31/2023

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 10



Gravel Content: 0.8%
Sand Content: 25.0%
Fines Content 74.2%
Cumulative Sum 100.0%

Sample Description: Mottled Dk Brown/Rust Brown CLAY w/ sand
Group Symbol: CL-CH

D60	
D30	
D10	
Cu	-
Cc	-

HKA Project No: 12342
Sample No: 1-2
Date: August 28, 2023

GRAIN SIZE ANALYSIS

Mid Peninsula Open Space

Figure No. 11

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS
116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202

Gravel Content: 3.6%
Sand Content: 39.6%
Fines Content 56.8%
Cumulative Sum 100.0%

Sample Description: Yellow Brown Sandy SILTY-CLAY
Group Symbol: CL-ML

D60	
D30	
D10	
Cu	-
Cc	-

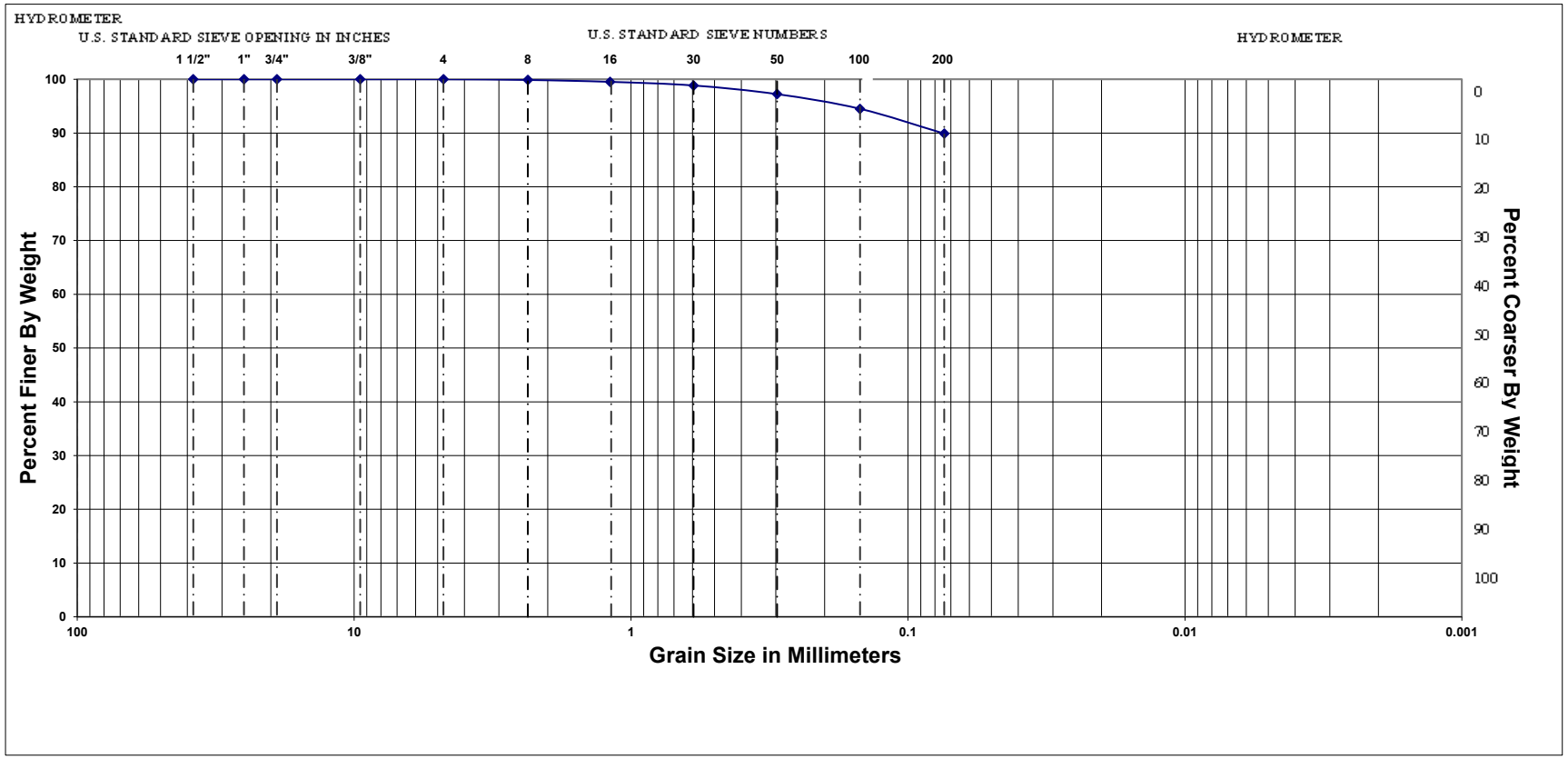
HKA Project No: 12342
Sample No: 2-4
Date: August 28, 2023

GRAIN SIZE ANALYSIS

Mid Peninsula Open Space

Figure No. 12

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS
116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202



Gravel Content: 0.0%
Sand Content: 10.1%
Fines Content 89.9%
Cumulative Sum 100.0%

Sample Description: Mottled Orange Brown/Gray CLAY
Group Symbol: CL-CH

D60	
D30	
D10	
Cu	-
Cc	-

HKA Project No: 12342
Sample No: 4-4
Date: August 28, 2023

GRAIN SIZE ANALYSIS

Mid Peninsula Open Space

Figure No. 13

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS
116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202

Saturated Direct Shear

Project Name:	Mid Peninsula Open Space
Project #:	12342
Sample #:	1-3-1
Description:	Mottled Tan/Orange Brown/Brown Sandy CLAY
Tested By:	MA
Date Tested:	8/25/2023

Test Number	1	2	3	4
Normal Pressure (PSF)	1000	2000	4000	-
Max Shear Stress	29.4	43.9	75.7	-
Shear Stress (PSF)	918.2	1371.0	2363.3	-

Equation of Trendline	
Intercept	Slope
422.03	0.4838

*Manually Enter from Trendline Equation

C (PSF)	PHI
422	26

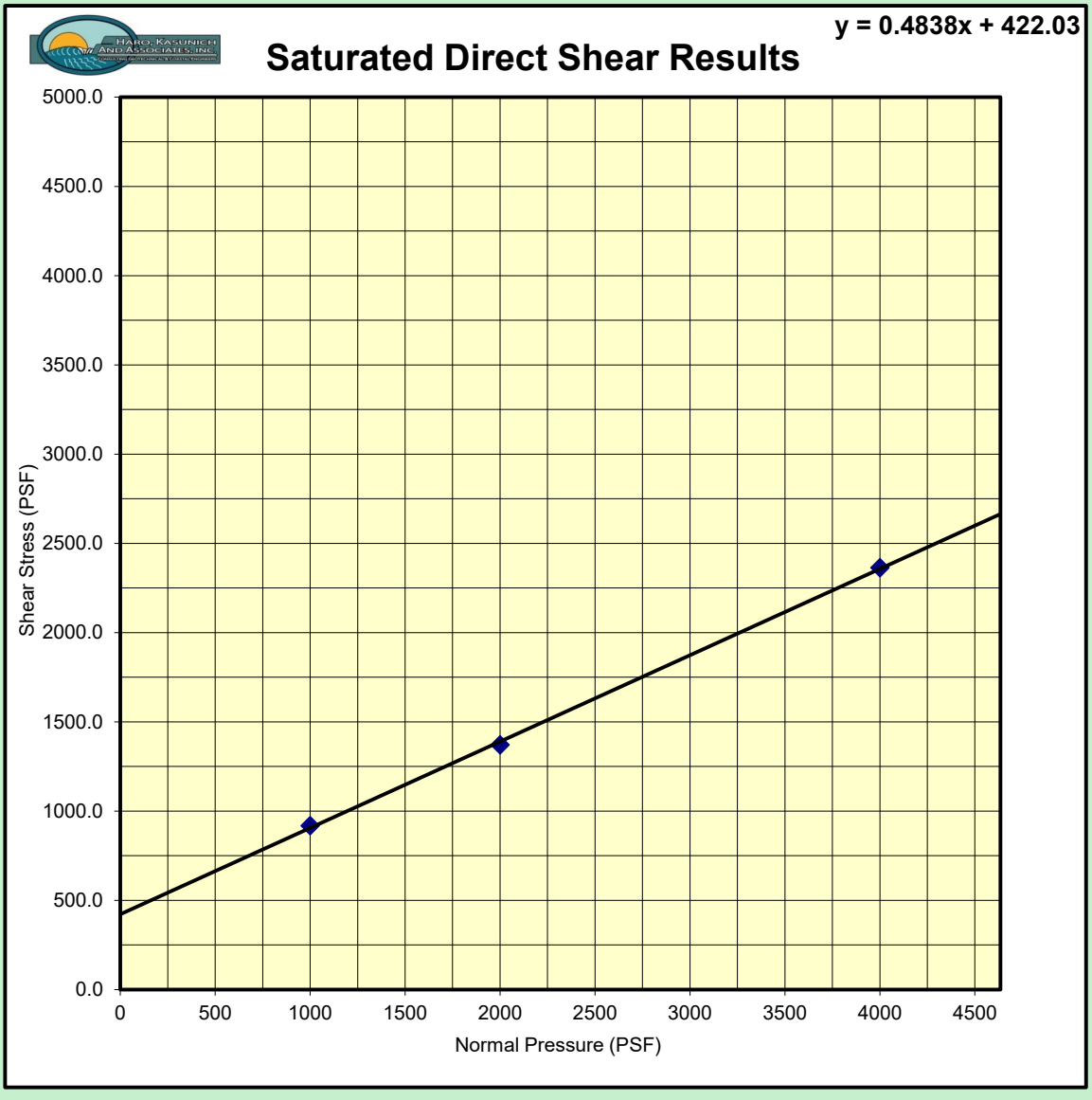


Figure No. 14

Liquid Limit:	58.02
Plastic Limit:	16.86
Plasticity Index:	41.2

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

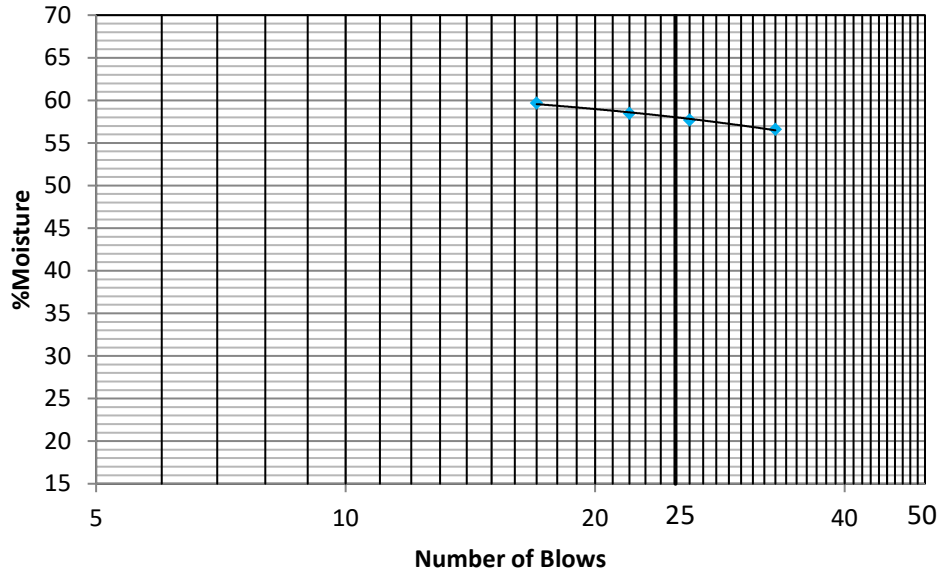
File N◦	12342
Sample N◦	2-5
Date:	8/28/2023
By:	MA

42

Job Name:	Mid Peninsula Open Space

	PLASTIC LIMIT			
Determination	1	2	3	4
Tare N◦	P4	P12		
Gross Wet WT.	19.84	19.89		
GrossDry WT.	18.97	19.00		
Tare WT.	13.73	13.80		
NET DRY WT.	5.24	5.20	0.00	0.00
WT. OF Water	0.87	0.89	0.00	0.00
% Moisture	16.60	17.12	-	-

	LIQUID LIMIT			
	NUMBER OF BLOWS			
17	22	26	33	
CR	SA	U2	\	
12.55	12.87	12.29	12.59	
10.58	10.80	10.45	10.66	
7.28	7.26	7.26	7.25	
3.30	3.54	3.19	3.41	
1.97	2.07	1.84	1.93	
59.70	58.47	57.68	56.60	



Sample #	2-5
Ht. of Sample	Bag
Tare	440
Gross Wet Wt	1100.4
Gross Dry Wt.	980.3
Tare Wt.	414.6
Net Dry Wt.	565.7
Wt. Of Water	120.1
% Moisture	21.2%
Dry Density	-

SOIL DESCRIPTION

Mottled Lt Brown/Orange Brown/Gray Sandy (CH) Fat CLAY

Group Symbol	**CH**

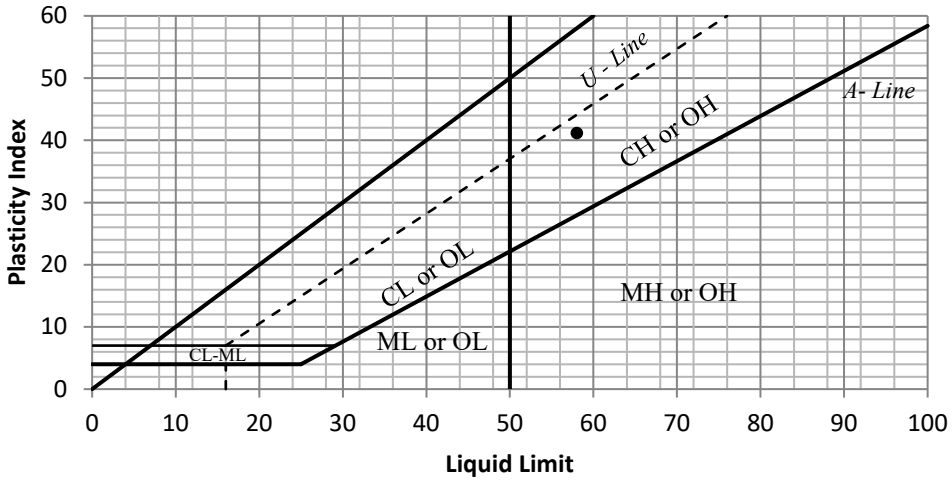


Figure No. 15

R-Value
CTM 301

CTL Job No.:	032-518	Boring:		Reduced By:	RU
Client:	Haro, Kasunich & Associates	Sample:	B-1	Checked By:	PJ
Project Number:	12342	Depth:		Date:	8/30/2023
Project Name:	Mid Peninsula Open Space (Bear Creek Rd.)		**R-Value**		**10**
Soil Description:	Dark Yellowish Brown Sandy CLAY				
Remarks:			**Expansion Pressure**		**0**

Specimen Designation	A	B	C	D	E
Compactor Foot Pressure (psi)	110	70	40		
Exudation Pressure (psi)	528	340	163		
Exudation Load (lbf)	6635	4273	2048		
Height After Compaction (in)	2.52	2.50	2.77		
Expansion Pressure (psf)	0	0	0		
Stabilometer @ 2000	130	135	146		
Turns Displacement	3.80	3.80	3.92		
R-value	13	11	6		
Corrected R-Value	13	11	6		
Moisture Content (%)	21.8	24.7	27.5		
Wet Density (pcf)	125.8	125.9	118.3		
Dry Density (pcf)	103.3	101.0	92.8		

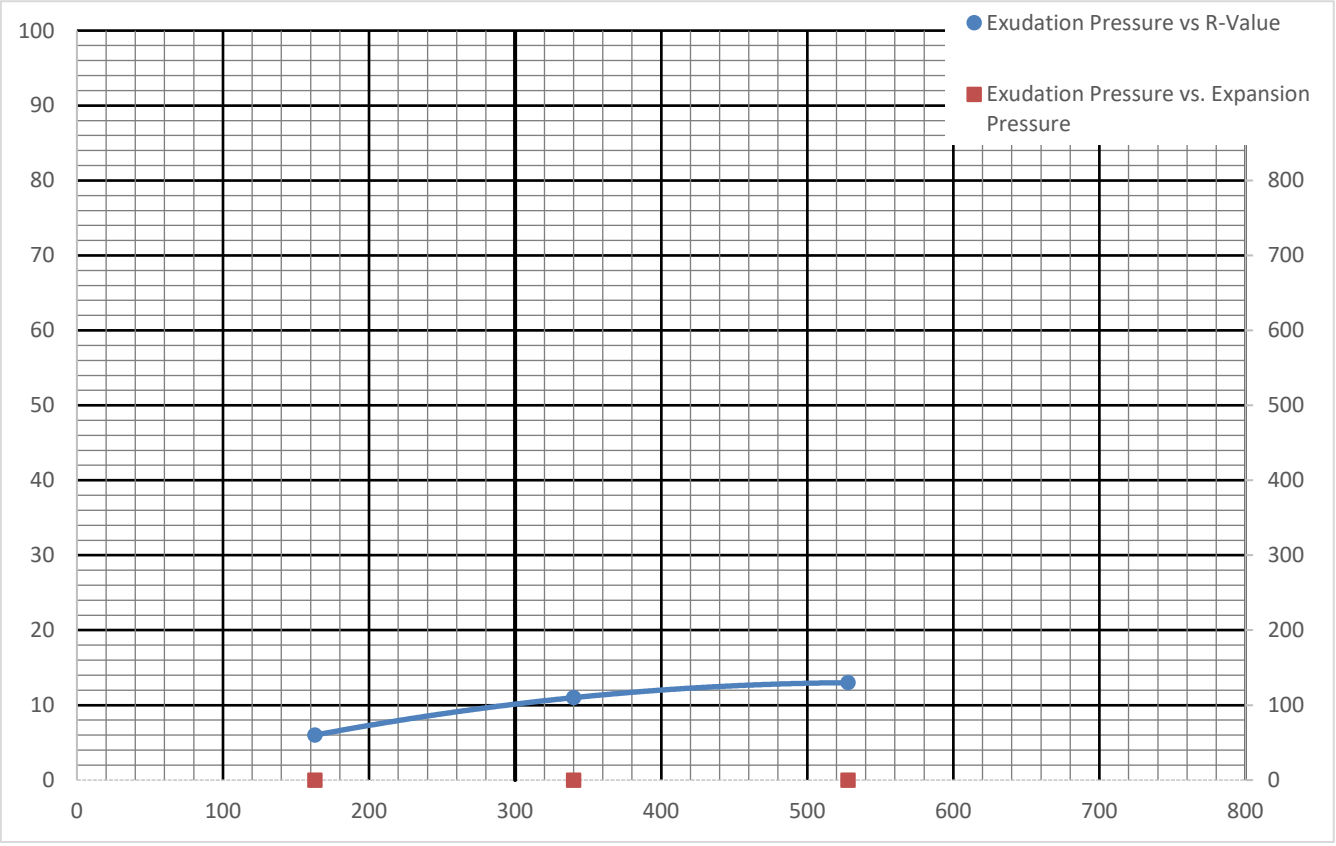


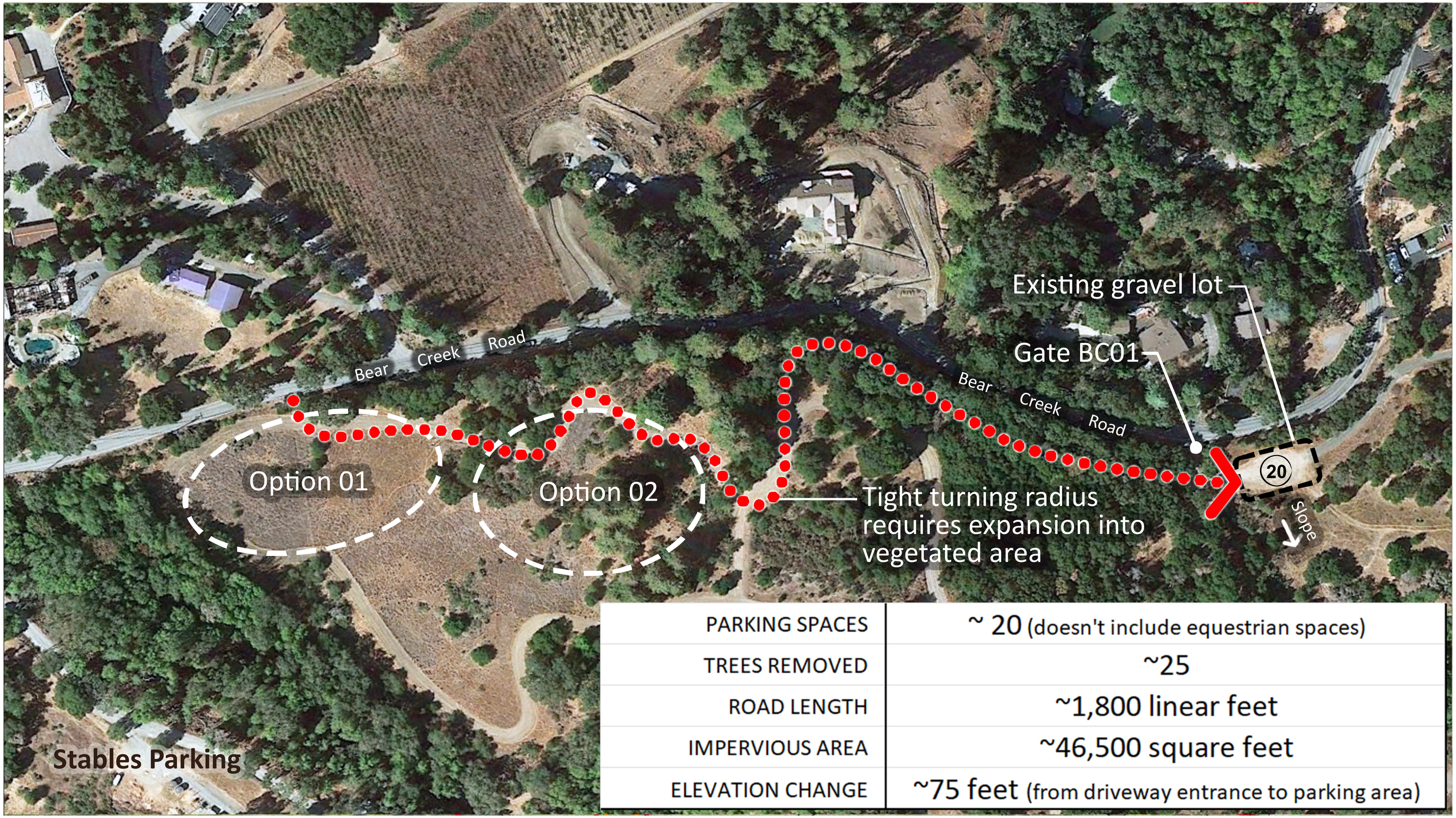
Figure No. 16

VP21-005 NORTH PARKING AREA

BEAR CREEK REDWOODS OPEN SPACE PRESERVE

January 24, 2024

Not to scale



PARKING SPACES	~ 20 (doesn't include equestrian spaces)
TREES REMOVED	~25
ROAD LENGTH	~1,800 linear feet
IMPERVIOUS AREA	~46,500 square feet
ELEVATION CHANGE	~75 feet (from driveway entrance to parking area)

FEASABILITY ANALYSIS AT GATE BC01

ATTACHMENT 4

VP21-005 NORTH PARKING AREA

BEAR CREEK REDWOODS OPEN SPACE PRESERVE

September 19, 2023

Not to scale

	1	2
PARKING SPACES	50 cars / 8 equestrians	49 cars / 6 equestrians
TREES REMOVED	8	14
GRADING WORK	950 cy	600 cy
RETAINING WALLS	1,000 lf	55 lf
IMPERVIOUS AREA	46,000* sf	41,000 sf

Impervious areas over 1 acre require hydromodification

CONCEPTUAL DESIGN ALTERNATIVE 1

ATTACHMENT 4

VP21-005 NORTH PARKING AREA

BEAR CREEK REDWOODS OPEN SPACE PRESERVE

September 19, 2023

Not to scale

	1	2
PARKING SPACES	50 cars / 8 equestrians	49 cars / 6 equestrians
TREES REMOVED	8	14
GRADING WORK	950 cy	600 cy
RETAINING WALLS	1,000 lf	55 lf
IMPERVIOUS AREA	46,000* sf	41,000 sf

Impervious areas over 1 acre require hydromodification

CONCEPTUAL DESIGN ALTERNATIVE 2

Attachment 5: Parking Area Design Alternatives Comparison

	Value vs. Cost*	Minimizing Impact to Site	Integration of TDMs	Alignment with Project Goals & Policies	Alignment with Public Comments **
Option 1	◑	◑	◑	◕	◑
	Provides moderate value for the overall cost by adding 50 standard vehicle parking spaces and providing designated equestrian spaces. Higher costs relative to Option 2 due to retaining walls.	Project would require approximately 950 cubic yards of grading, 46,000 square feet of impervious area, and removal of approximately eight trees. Impacts to visual resources, visible from roadway.	Minor modifications of parking area would be required to incorporate priority parking, such as restriping and/or addition of signage. Some equestrian parking spaces could be redesignated for buses (if shuttles are pursued in the future).	Implements public use and facilities goals, objectives, and actions identified in the Preserve Plan. Moderate impacts to visual resources, including the construction of retaining walls (Resource Management Goal Scenic Aesthetic).	Supports public interest in providing pull through equestrian parking. Parking area would result in visual degradation to the existing meadow.
Option 2	●	◕	◕	●	◕
	Provides high value for the overall cost by providing 49 parking spaces and designated equestrian spaces with fewer retaining walls and grading necessary relative to Option 1.	Project would require approximately 600 cubic yards of grading, 41,000 square feet of impervious surface, and removal of approximately 14 trees. Results in minimal impacts to visual resources by using natural topography and vegetative screening to shield parking area.	Two satellite lots would allow for separation of visitors by TDM measures, such as carpooling or pre-booked parking. Some equestrian parking spaces could be redesignated for buses (if shuttles are pursued in the future).	Implements public use and facilities goals, objectives, and actions identified in the Preserve Plan. Low visual impacts, better aligns with Resource Management Goal for Scenic Aesthetic.	Supports public interest in providing pull through equestrian parking, shielding the parking area from public view along Bear Creek Road, and preserving aesthetic value of the existing meadow.

*Analyzes the value of each option based on preliminary cost estimates and estimated increase in total standard vehicle parking spaces.

**Public comments were received during stakeholder and community meetings held in spring of 2023.

● Strongest alignment with criteria

◕ Stronger alignment with criteria

◔ Weaker alignment with criteria

◑ Medium alignment with criteria

○ Weakest alignment with criteria