ADDENDUM TO THE BEAR CREEK REDWOODS PRESERVE PLAN ENVIRONMENTAL IMPACT REPORT

Bear Creek Redwoods North Parking Area

SCH# 2015062029

MIDPENINSULA REGIONAL OPEN SPACE

ADDENDUM TO THE BEAR CREEK REDWOODS PRESERVE PLAN ENVIRONMENTAL IMPACT REPORT

BEAR CREEK REDWOODS NORTH PARKING AREA
SCH# 2015062029

Lead Agency:
Midpeninsula Regional Open Space District
5050 El Camino Real
Los Altos, CA 94022

Contact: Mattea Ottoboni, AICP, Planner II
Phone: 650.772.3647

April 8, 2026

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 PURPOSE OF ADDENDUM 1
1.2 CRITERIA FOR PREPERATION OF AN ADDENDUM & CEQA DETERMINATION 1
2 PROJECT DESCRIPTION 3
2.1 BACKGROUND 3
2.2 NORTH PARKING AREA MODIFICATIONS 8
2.3 ACCESSIBLE TRAIL 9
3 ENVIRONMENTAL CONSEQUENCES OF PROPOSED PROJECT MODIFICATIONS 12
3.1 AESTHETICS 12
3.2 AGRICULTURE AND FORESTRY RESOURCES 13
3.3 AIR QUALITY 13
3.4 BIOLOGICAL RESOURCES 14
3.5 CULTURAL RESOURCES 15
3.6 GEOLOGY/SOILS 16
3.7 GREENHOUSE GAS EMISSIONS 17
3.8 HAZARDS AND HAZARDOUS MATERIALS 17
3.9 HYDROLOGY AND WATER QUALITY 17
3.10 LAND USE AND PLANNING 18
3.11 MINERAL RESOURCES 18
3.12 NOISE 18
3.13 POPULATION AND HOUSING 19
3.14 PUBLIC SERVICES 19
3.15 RECREATION 20
3.16 TRAFFIC AND TRANSPORTATION 20
3.17 UTILITIES AND SERVICE SYSTEMS 22
4 CONCLUSION 23

Figures

Figure 1 – Preserve Plan Concept 4
Figure 2 – Preferred Concept 6

Figure 3 – Accessible Trail……..10

Appendices

Appendix A – Mitigation Measures
Appendix B – Geotechnical Report
Appendix C – Traffic Report

ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
BAAQMD	Bay Area Air Quality Management District
BC	Bear Creek
BCR	Bear Creek Redwoods Open Space Preserve
Board of Directors	Board
CEQA	California Environmental Quality Act
CR	Cultural Resources
Dba	A Weighted Decibels
Dbh	Diameter at breast height
District	Midpeninsula Regional Open Space District
EIR	Environmental Impact Report
LCI	Office of Land Use and Climate Innovation
LOS	Level of Service
Preserve	Bear Creek Redwoods Open Space Preserve
Preserve Plan	Bear Creek Redwoods Preserve Plan
ROW	Right of Way
SB	Senate Bill
SCH	State Clearinghouse
VMT	Vehicle miles traveled

1 INTRODUCTION

1.1 PURPOSE OF ADDENDUM

This Addendum has been prepared by the Midpeninsula Regional Open Space District (District) as the Lead Agency, in conformance with the California Environmental Quality Act (CEQA), the CEQA Guidelines (Title 14, California Code of Regulations §15000 et seq.), and the regulations and policies of the District. In 2017, the District completed the Bear Creek Redwoods Preserve Plan (Preserve Plan) and certified the associated Environmental Impact Report (EIR). The Preserve Plan provides a long-term use and management plan for the Bear Creek Redwoods Open Space Preserve (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 new trails and parking areas, including the North Parking Area. The purpose of this Addendum is to evaluate whether proposed modifications to the North Parking Area would result in new significant environmental impacts or increase the severity of significant impacts previously identified in the Preserve Plan EIR.

1.2 CRITERIA FOR PREPERATION OF AN ADDENDUM & CEQA DETERMINATION

CEQA Statutes Section 21166 and CEQA Guidelines Sections 15162 and 15164 provide that an Addendum to a previously certified EIR can be prepared for a project if the criteria and conditions summarized below are satisfied:

- **No Substantial Project Changes:** There are no substantial changes proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

- **No Substantial Changes in Circumstances:** Substantial changes have not occurred with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

- **No Substantial New Information:** There is no new information of substantial importance which was not known or could not have been known at the time of the previous EIR that shows any of the following:
  a) The project will have one or more significant effects not discussed in the previous EIR;
  b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
  c) Mitigation measures or alternatives previously found not to be feasible would, in fact, be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternatives; or

d) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

This Addendum evaluates and documents the environmental impacts that might reasonably be anticipated to result from the proposed modifications associated with the North Parking Area. On the basis of the analysis provided in the following sections, the District has determined that: (i) the proposed changes would not result in new significant environmental impacts or a substantial increase in the severity of significant effects previously identified in the EIR; (ii) no substantial changes have occurred with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR; and (iii) there is no new information of substantial importance showing new significant environmental impacts or a substantial increase in the severity of significant effects or any changes to previously adopted mitigation measures. Therefore, the District has determined that an Addendum is appropriate.

2 PROJECT DESCRIPTION

2.1 BACKGROUND

The District acquired the 1,437-acre Preserve in 1999 through a partnership with Peninsula Open Space Trust. Between 2005 and 2016, District staff conducted extensive public engagement to gain input on its eventual plans to open the preserve to the public. In 2017 the District approved the Preserve Plan and certified the EIR to the Preserve Plan in accordance with CEQA. The Preserve Plan included construction and maintenance of parking areas and trails, rehabilitation and repurposing of the former Alma College Site, and renovation, continued operation, and expanded public access of the Bear Creek Stables. Actions in the Preserve Plan were broken out in three phases to be implemented over the course of 15 to 20 years. In accordance with Section 15161 of the State CEQA Guidelines, the Preserve Plan EIR is a project EIR, and examined the potential environmental effects of all phases of the project: design, construction, and operation.

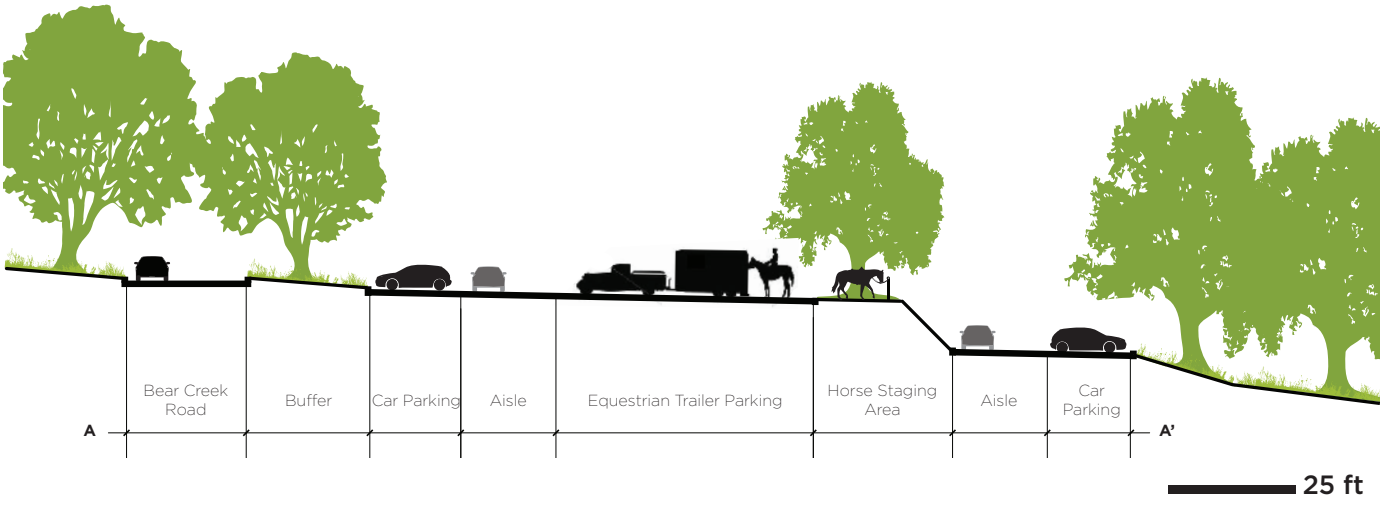
Implementation of the Preserve Plan began in 2017 and portions of the Preserve opened for low intensity public access in 2019, including the Alma Parking Area and approximately 6 miles of trails. In 2024, the District opened approximately 4.6 miles of additional new trails (referred to as Phase II trails) to the public in the northeastern section of the Preserve. These trails are located in the vicinity of the proposed North Parking Area and draw additional public use.

The North Parking Area (referred to as the Lower Parking Area in the Preserve Plan EIR) was identified in the Preserve Plan on the south side of Bear Creek Road, approximately 0.5-miles from the intersection with Highway 17 (to be referred to as the Preserve Plan Concept). The Preserve Plan called for locating a parking area between gates Bear Creek (BC)-01 and BC-02 to accommodate approximately 51 passenger vehicles and eight horse trailers (see Figure 1 – Preserve Plan Concept).

In 2023, District staff developed conceptual alternative designs for the North Parking Area that were informed by the Preserve Plan, existing conditions, technical studies, public input, and desired programmatic elements. An alternative to be implemented was then selected (to be referred to as the Preferred Concept) by the District Board of Directors in 2024 (see Figure 2 – Preferred Concept). The Preferred Concept is generally consistent with the size, capacity, and location of the Preserve Plan Concept but proposes some modifications and the addition of an Accessible Trail as part of the Phase II trail system (to be referred to as the Accessible Trail). The Preferred Concept and Accessible Trail are further described in the following subsection and are collectively referred to in this Addendum as the modified project.



~~**FIGURE 1A** North Parking Area Plan Diagram~~



~~**FIGURE 1B** North Parking Area Section~~

Figure 1 - Preserve Plan Concept

THIS PAGE IS INTENTIONALLY LEFT BLANK



Bear Creek North Parking Area

~~65% DESIGN~~

~~ATTACHMENT 1~~ **FIGURE 2** Preferred Concept

NOT TO SCALE

THIS PAGE IS INTENTIONALLY LEFT BLANK

2.2 NORTH PARKING AREA MODIFICATIONS

The proposed modifications to the Preserve Plan Concept for the North Parking Area include a change in shape of the parking area and a shift of a portion of the footprint approximately 270 feet to the east[1] into a flatter area that provides more visual screening from the roadway by existing trees. The Preferred Concept includes 44 vehicle spaces and six equestrian stalls; however, the design builds in programmatic flexibility by allowing the ability on a case-by-case basis to repurpose one or two of the equestrian stalls with up to nine angled standard parking stalls to support special events, or repurpose two parallel equestrian stalls for use by a shuttle or buses to support specific group programs at Bear Creek Stables. If the two equestrian stalls were repurposed, the Preferred Concept could accommodate a maximum of 57 spaces (53 parking spaces and four equestrian stalls). The Preferred Concept would require fewer retaining walls, and result in less impervious surface due to a smaller parking area footprint. Both concepts site the driveway in the same location to provide sufficient line of sight. Other elements in the modified project include electric vehicle (EV) charging infrastructure using existing utility connections, stormwater treatment facilities, picnic tables, a vault restroom, bike racks, an entrance sign, and interpretive signage. Table 1 summarizes differences between the Preserve Plan Concept and Preferred Concept for the North Parking Area.

Table 1 – Comparison of Preserve Plan Concept to Preferred Concept

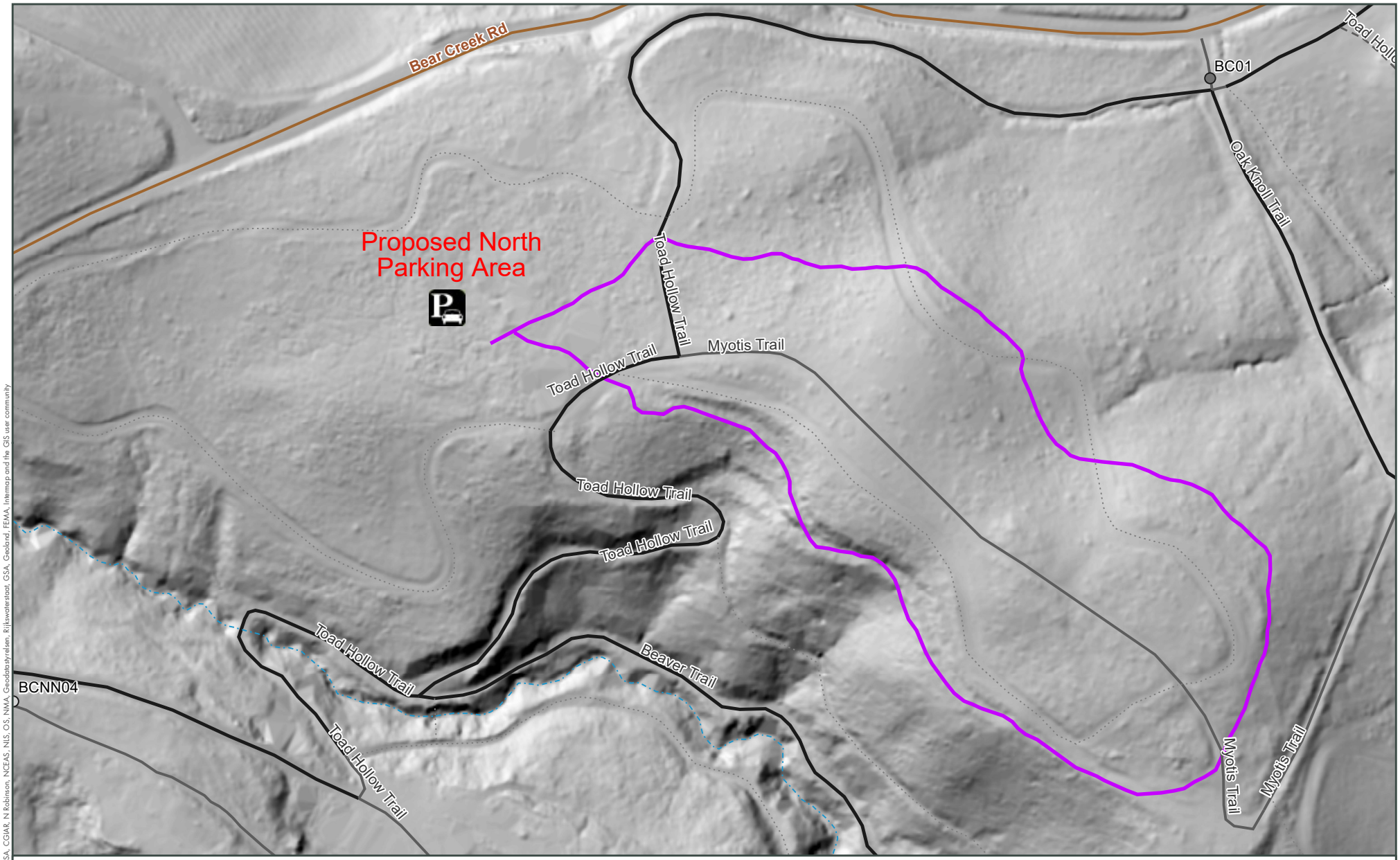
Component	Preserve Plan Concept	Preferred Concept
Parking Capacity	51 vehicles	44 to 53 vehicles
Horse Trailer Parking	8 reverse parking trailer spaces	4 to 6 pull-through trailer parking spaces
Total (potential) Parking Spaces	59 spaces	57 spaces (53 vehicles and 4 horse trailer parking spaces)
Approximate Retaining Wall Requirement	1,000 linear feet	185 linear feet
Approximate Impervious Surface	46,000 square feet	38,700 square feet
Total Tree Removal	8 trees	15 trees
Trees 6-11 inches diameter at breast height (dbh) to be Removed	Not specified at the time of concept plan	11 trees
Trees 12-15 Inches dbh to be Removed	Not specified at the time of concept plan	3 trees
Trees 16+ Inches dbh to be Removed	Not specified at the time of concept plan	1 tree

[1] The Preserve Plan Concept and Preferred Concept are different shapes and overlap in location. The Preferred Concept stretches further east than the Preserve Plan Concept.

2.3 ACCESSIBLE TRAIL

As an addition to the Preserve's existing Phase II trail network, the District proposes construction of a 0.5-mile accessible loop trail from the North Parking Area (See Figure 3 – Accessible Trail). This trail will follow the topography of the land to create a gently sloped path that would meet criteria for the District's Easy Access Trails. Easy-Access trails are built to accommodate wheelchairs, strollers, walkers and anyone desiring a less strenuous open space experience. Most District easy-access trails are at least four feet wide, have a grade generally not exceeding 5 percent, and a fairly uniform surface.

District trail crews would construct the Accessible Trail from the North Parking lot trailhead that would tie into the existing Phase II trail network. The trail would have a natural surface and would include a bench overlooking a viewpoint. The Preserve Plan EIR evaluated new trail construction and created flexibility to adjust the specific alignment of the planned trail network as needed.



~~BCR North Parking Lot Accessible Trail~~ Figure 3 - Accessible Trail

Proposed Accessible Trail

Existing Trails

Midpeninsula Regional Open Space District *(MROSD)* 9/20/2024

ft 0 145 290

Cody Fickes

Data Source(s): Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

THIS PAGE IS INTENTIONALLY LEFT BLANK

3 ENVIRONMENTAL CONSEQUENCES OF PROPOSED PROJECT MODIFICATIONS

The focus of this analysis is on the poten. al environmental impacts resulting from the modified project and whether there would be any difference in identified impacts or required mitigation measures from those identified in the Preserve Plan EIR.

The following analysis is used to: (1) compare the environmental impacts of the modified project with impacts evaluated in the Preserve Plan EIR; (2) to identify whether the modified project would result in new or more severe significant environmental impacts; and (3) to identify if there have been substantial changes with respect to the circumstances under which the revised project would be undertaken since the Preserve Plan EIR was adopted that would result in new or more severe significant environmental effects.

Mitigation measures are measures that would minimize, avoid, or eliminate a significant impact. The analysis contained herein evaluates each topic to identify whether additional mitigation measures beyond those identified in the Preserve Plan EIR would be warranted. As discussed for each topic in the following analysis, no new mitigation measures would be required for the modified project.

This analysis confirms that the modified project is consistent with the Preserve Plan EIR, and the modified project would not result in new or more severe significant effects and no new mitigation measures are required.

3.1 AESTHETICS

The Preserve Plan EIR concluded that the Preserve Plan would have less than significant impacts to aesthetic resources.

The Preferred Concept for the parking area would maintain similar visual character to the Preserve Plan Concept as the use would not change. The Preferred Concept would be located within the same general area as the Preserve Plan Concept but would be shifted approximately 270 feet to the east to allow more visual screening from Bear Creek Road, a local scenic road in Santa Clara County. Visual screening will be achieved through existing trees adjacent to the road and topography. The Preserve Plan Concept would result in the removal of two large oak trees adjacent to the entrance to the parking area. The Preferred Concept would result in removal of one less large oak tree adjacent to the parking area entrance. Overall, the Preferred Concept would result in the removal of approximately seven more trees compared to the Preserve Plan Concept, but the additional tree removals would be shielded from view from Bear Creek Road. In addition, no additional tree removal is proposed within view of SR 35 or Highway 17. No new sources of light or glare are included in the modified project. In addition, the Preferred Concept would be consistent with the District's Staging/Parking Area and Trailhead Design Standard

Guidelines, adopted by the District Board of Directors in 2024 to promote sense of place and reduce visual impacts of parking areas. These guidelines further the intent of the District's Resource Management Policy SA-1 (minimize evidence of human impacts within preserves) which is referenced in the Preserve Plan EIR, by incorporating the following values into parking area design: respect the natural landscape and cultural setting, establish a transition zone, exhibit a sense of place, and address sustainable practices.

The Accessible Trail would be constructed in accordance with all standards and requirements of other trails analyzed in the Preserve Plan EIR, and therefore, would not result in a substantial degradation of the visual quality or character of the site and would not have a substantial adverse effect on a scenic vista.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts on aesthetic resources and would not result in any new significant impacts.

3.2 AGRICULTURE AND FORESTRY RESOURCES

The Preserve Plan EIR concluded that implementation of the Preserve Plan would not result in significant environmental effects to agricultural and forestry resources. The modified project is located on the same parcel and would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use; conflict with existing zoning for agricultural use or a Williamson Act contract; or conflict with existing zoning for forest land, timberland, or timberland zoned Timberland Production. Therefore, no new significant impacts or increase in severity of impacts related to agriculture and forestry resources would occur.

3.3 AIR QUALITY

The Preserve Plan EIR determined that all air quality impacts associated with implementation of the Preserve Plan would result in less than significant impacts.

Construction of the Preferred Concept for the North Parking Area and the Accessible Trail would involve the same types of equipment, practices, and duration and intensity that were analyzed in the Preserve Plan EIR. Additionally, the total number of proposed parking spaces (combined vehicles and horse trailers) with the Preferred Concept would be slightly less than the Preserve Plan Concept, which would result in the same or lower long-term operating emissions.

The analysis in the Preserve Plan EIR identified diesel fumes from short-term construction as the potentially most impactful pollutant to sensitive receptors but noted that it has high dispersal and only affects receptors at close proximity. The distance to the nearest residential sensitive receptor from any part of the modified project would be 300 feet from the parking area. The

distance would decrease from approximately 400 feet from the Preserve Plan Concept to 300 feet for the Preferred Concept, but would still maintain sufficient distance to disperse contaminants and not result in more severe impacts to sensitive receptors. Consistent with the Preserve Plan Concept, levels of toxic air contaminants from project-related construction and operations would not result in an increase in health risk exposure at off-site sensitive receptors and any impacts would remain less than significant.

As identified in the Preserve Plan EIR, minor odors from the use of diesel equipment and the laying of asphalt would be intermittent and temporary, and would dissipate rapidly from the source with an increase in distance. Exposure of sensitive receptors to odors would still be less than significant with the Preferred Concept even with the decrease in distance to the nearest sensitive receptor due to the rapid dissipation of odors from construction activities. Consistent with the Preserve Plan Concept, the modified project would not result in any major sources of odor and impacts would remain less than significant.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts on air quality and would not result in new significant impacts.

3.4 BIOLOGICAL RESOURCES

The Preserve Plan EIR identified potentially significant impacts associated with bat colonies or special-status bats, loss of special status wildlife, loss of sensitive natural communities and fill of waters of the United States, and conflicts with local applicable policies protecting biological resources. The Preserve Plan EIR determined that all potential impacts would be reduced to less than significant levels with incorporation of mitigation.

The Preserve Plan EIR determined that impacts to special-status plants would be less than significant. Supplemental botanical surveys conducted since the completion of the Preserve Plan EIR identified Hickman's popcornflower (*Plagiobothrys chorisianus var. hickmanii*), a California Native Plant Society Rare Plant Rank 4.2 (limited distribution), in the vicinity of the Accessible Trail. However, project design would avoid any potential impacts to Hickman's popcornflower. Impacts to special-status plants would remain less than significant.

The Preserve Plan EIR identified Alma College as the primary habitat for bat species within the preserve which is not impacted by the Preferred Concept or Accessible Trail. However, removal of trees equal to or greater than 16 inches in diameter at breast height (dbh) would be potentially significant at any preserve location because they could provide roosting habitat for bats. The implementation of the Preferred Concept would involve removal of one tree over 16 inches dbh. However, Mitigation Measure 4.3-2 would be implemented as described in the Preserve Plan EIR to reduce impacts to bat colonies from any large tree removal to less-than-significant. The Preserve Plan EIR identified potentially significant impacts to nesting birds and ringtail due to the removal of trees greater than six inches dbh. The modified project would

result in the removal of 15 trees greater than six inches dbh. Mitigation Measures 4.3-3b and 4.3-3d would be implemented as described in the Preserve Plan EIR to reduce impacts to nesting birds and ringtail to less than significant.

The footprint of the proposed Preferred Concept is located approximately 270 ft. east of the Preserve Plan Concept and is not located within any mapped wetlands or waters, nor is the Accessible Trail. Therefore, the modified project would avoid impacts to aquatic species. As identified in the Preserve Plan EIR, Mitigation Measures 4.3-3b, 4.3-3c, and 4.3.-3d would be implemented, including pre-construction surveys, so that any impacts from the modified project to nesting birds, dusky-footed woodrat, and ringtail remain less-than-significant.

The Preferred Concept would result in the removal of approximately five total trees over 12 inches dbh with one 17-inch dbh oak tree within the road right-of-way (ROW). The Preserve Plan Concept would have removed two large oaks trees within the ROW. Consistent with Mitigation Measure 4.3-7 of the Preserve Plan EIR, the modified project will comply with the Santa Clara County Tree Preservation and Removal Ordinance to mitigate for the removal of all trees measuring 12 inches dbh or greater in areas zoned as Hillside and any heritage trees within road ROW. The Accessible Trail will be routed to avoid trees over 12 inches dbh. Therefore any impacts from tree removal for the modified project will be less than significant.

The modified project would not increase the potential for impacts to biological resources because the location of the proposed parking area and Accessible Trail are within the proposed areas analyzed in the Preserve Plan EIR. The modified project would implement all applicable Environmental Protection Measures and Mitigation Measures identified in the Preserve Plan EIR to ensure that impacts to biological resources would be less than significant or reduced to less than significant levels.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would avoid special status species and not increase the severity of previously identified impacts on biological resources and would not result in new significant impacts.

3.5 CULTURAL RESOURCES

The Preserve Plan EIR identified significant and unavoidable impacts to historic structures at the Alma College Complex, which is not associated with the modified project components. The modified project is located in the same general area as the Preserve Plan Concept and Phase II trails and will not impact the Alma College Cultural Landscape or result in the removal of known historic buildings. As such, this impact is not discussed further.

The Preserve Plan EIR identified that although unlikely, construction and excavation activities associated with project development could unearth previously undiscovered or unrecorded human remains, if they are present. However, the modified project would implement Mitigation

Measures 4.4-4 identified in the Preserve Plan EIR which would ensure that impacts to cultural resources would be reduced to a less-than-significant level.

Consistent with District Resource Management Policy Cultural Resources (CR)-2 and Environmental Protection Measures, a supplemental cultural resources assessment including a records search and a pedestrian survey was completed in July 2024 for the Preferred Concept. The cultural resources assessment included a records search for records within a half-mile radius of the project area from the Northwest Information Center of the California Historical Resource Information System. The information request results showed many previous studies and several documented resources in the vicinity. The study included an intensive pedestrian survey of the project area and no resources were noted. A pre-construction survey for cultural resources will be conducted after the area is mowed due to low ground visibility at the time of the 2024 survey. The modified project area is assessed to have low sensitivity for buried historic-age cultural resources based on negative desktop review and pedestrian survey and low sensitivity for buried prehistoric cultural resources. Monitoring during construction is not required. In the event of an unanticipated discovery, all work would be suspended within 100 feet of the find until a qualified archaeologist evaluates the discovery.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified significant impacts on cultural resources and would not result in new significant impacts.

3.6 GEOLOGY/SOILS

The Preserve Plan EIR identified less than significant impacts related to risks to people and structures from seismic hazards and construction-related erosion or soil hazards.

The entirety of BCR is located on a geotechnically unstable soil unit, and the modified project components are within areas studied in the Preserve Plan EIR. Environmental protection measures described in the Preserve Plan EIR recommend design-level geotechnical investigations before constructing new structures to prevent structural failure. A supplemental geotechnical study (Appendix B) prepared for the Preferred Concept has confirmed that impacts would be less than significant. Additionally, all structures included in the Preferred Concept will comply with the California Building Code.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts on geologic and soil resources and would not result in new significant impacts.

3.7 GREENHOUSE GAS EMISSIONS

The Preserve Plan EIR identified less than significant impacts associated with the generation of greenhouse gases or impacts of climate change on the project.

Construction of the modified project would not result in higher levels of greenhouse gas emissions than analyzed in the Preserve Plan EIR because the same type and scale of construction would occur. The Preferred Concept would also have a similar vehicle capacity during operation that would not generate more vehicle trips than was previously analyzed. The modified project would not be affected differently by climate change than what was analyzed in the Preserve Plan EIR due to the similarity in scope.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts on greenhouse gas emissions and would not result in new significant impacts.

3.8 HAZARDS AND HAZARDOUS MATERIALS

The Preserve Plan EIR identified potentially significant impacts associated with the creation of a significant hazard to the public or the environment through demolition of existing structures that contain materials such as asbestos, lead based paint, and heavy metals as well as during underground storage tank removal. None of these activities will be performed in connection with the modified project and so will not be discussed further. The Preserve Plan EIR identified less than significant impacts to all other issues related to hazards and hazardous materials, including those related to the Preserve Plan Concept.

The construction and operation of the modified project would not increase the risk of hazardous materials release or exposure to people or structures from what was studied in the Preserve Plan EIR due to the similar location, construction practices, and scope as well as commitment to compliance with all regulations and plans as identified in the Preserve Plan EIR. Impacts would remain less than significant.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to hazards and hazardous materials and would not result in new significant impacts.

3.9 HYDROLOGY AND WATER QUALITY

The Preserve Plan EIR identified a potentially significant impact associated with exposure of people or structures to significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. This impact is related to the dam at Aldercroft Creek, which is not located near or related to the modified project and will not be

discussed further. The Preserve Plan EIR identifies less than significant impacts associated with all other issues related to hydrology and water quality.

As consistent with the Preserve Plan EIR, construction of the modified project would include measures to prevent erosion and water quality impacts through implementation of a Stormwater Pollution Prevention Plan during construction and integration of stormwater treatment measures to treat stormwater runoff from impervious surfaces as required by the San Francisco Bay Area Municipal Regional Stormwater NPDES Permit. Environmental Protection Measure HYDRO-2 would also be implemented to prevent erosion for the Accessible Trail. The modified project would not require groundwater, consistent with the analysis in the Preserve Plan EIR for the Preserve Plan Concept.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to hydrology and water quality and would not result in new significant impacts.

3.10 LAND USE AND PLANNING

The Preserve Plan EIR identified less than significant impacts related to land use and planning.

The modified project is located in the same areas analyzed in the Preserve Plan EIR and would not change consistency with local plans or Williamson Act contracts as the use and location would not change.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to land use and planning and would not result in new significant impacts.

3.11 MINERAL RESOURCES

The Preserve Plan EIR concluded that there would be no impacts to mineral resources from implementation of the Preserve Plan. The modified project is within the same area, and similarly, there would be no new significant impacts or increase in severity of impacts to mineral resources.

3.12 NOISE

The Preserve Plan EIR identified less than significant impacts related to short term, long-term, and project-related noise.

The Preserve Plan EIR states that the North Parking Area would be the closest construction activity to sensitive receptors at 400 feet from residences and 150 feet from a commercial use.

The Preferred Concept shifts the footprint of the parking area slightly closer to sensitive receptors. With the shift in footprint, the Preferred Concept would be located approximately 300 feet from the nearest residence with a calculated maximum noise level of 74 A-weighted decibels (dba) during construction, which is below the threshold of 75 dba identified in the Preserve Plan EIR. The shifted and modified footprint of the parking area would not change the distance to the commercial use, and short-term noise levels would not change. The Preserve Plan EIR identified that noise levels could reach 75 dba for equipment used for trail construction at a distance of 126 feet. The nearest component of the Accessible Trail to sensitive receptors (residential) is approximately 400 feet, which would not experience noise exceeding the County's 75 dba threshold. Therefore, temporary noise impacts would remain less than significant for the modified project.

Vibration impacts for the types of equipment that would be used for construction of the Preferred Concept are typically felt at distances of 25 feet. The Preferred Concept would not result in construction activities within 25 feet of sensitive receptors as residences and recreational trails are located more than 25 feet from the construction location.

Operational noise levels from stationary noise sources would not change from the analysis of the Preserve Plan EIR because the scope and use would remain the same. The primary source of operational noise analyzed in the Preserve Plan EIR is traffic from increased vehicle trips associated with a new parking area. The Preferred Concept would have slightly less capacity for vehicles and horse trailers than the Preserve Plan Concept and would not change vehicle traffic generation rates and associated noise impacts as analyzed in the Preserve Plan EIR.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to noise and would not result in new significant impacts

3.13 POPULATION AND HOUSING

The Preserve Plan EIR analyzed potential impacts associated with population and housing and identified no impacts as a result of implementation of the Preserve Plan. The modified project includes the Preferred Concept parking area and Accessible Trail, which both uses were analyzed at the same intensity and location in the Preserve Plan EIR. Therefore, the modified project would not result in new significant impacts or increase the severity of impacts related to population and housing.

3.14 PUBLIC SERVICES

The Preserve Plan EIR concluded that implementation of the Preserve Plan would have no impacts to public services. The modified project would not increase the usage of the Bear Creek Redwoods Open Space Preserve from what was already analyzed in the Preserve Plan EIR, and

would not increase demand for school services, new park facilities, or other public facilities or services.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to public services and would not result in new significant impacts.

3.15 RECREATION

The Preserve Plan EIR identified that implementation of the Preserve Plan would have less than significant impacts related to recreation.

The impacts of adding parking and new trails to the Preserve and the associated increase in recreational users were analyzed in the Preserve Plan EIR. The Preserve Plan EIR concluded that parking and associated facilities such as restrooms onsite would appropriately serve new recreational visitors such that expanded recreational facilities in surrounding parks and open spaces would not be needed. The modified project would not increase the number of recreational users from what was analyzed in the Preserve Plan EIR.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to recreation and would not result in new significant impacts

3.16 TRAFFIC AND TRANSPORTATION

The Preserve Plan EIR identified that implementation of the Preserve Plan would have less than significant impacts related to traffic and transportation.

The Preferred Concept is consistent with the size, capacity, and location of the Preserve Plan Concept, and construction equipment and duration of construction would not differ from what was analyzed in the Preserve Plan EIR. Therefore, the modified project would result in less than significant impacts to a program, plan, ordinance, or policy addressing the circulation system.

Hexagon Transportation Consultants conducted an updated traffic study (Appendix C) in the Spring of 2024 to reconfirm traffic generation rates and safe line of sight for the driveway of the Preferred Concept. The proposed driveway location was confirmed to provide adequate line of sight with proposed tree and vegetation removal and confirmed that the Preferred Concept would not substantially increase hazards due to a design feature. Additionally, as stated in the Preserve Plan EIR, the driveway to the North Parking Area would be designed to accommodate emergency vehicle ingress and egress, which would improve emergency access to the Preserve.

On September 27, 2013, SB 743 was signed into law, starting a process that changed transportation impact analysis as part of CEQA compliance. SB 743 removes automobile vehicle delay (Level of Service) and other similar measures of vehicular capacity or traffic congestion from CEQA transportation analysis. Rather, as of July 1, 2020, vehicle miles traveled (VMT) are now used as a basis for determining significant transportation impacts in California.

The updated Traffic Study conducted trip generation counts at the existing Bear Creek Redwoods Alma Parking Area to obtain an existing trip generation rate per parking space for the Preferred Concept. The traffic study conservatively assumed the North Parking Area could accommodate 58 parking spaces (50 vehicle stalls and eight equestrian spaces). The Preferred Concept would include 44 vehicle spaces and six equestrian stalls. The design builds in programmatic flexibility by allowing the ability on a case-by-case basis to repurpose one or two of the equestrian stalls with up to nine angled standard parking stalls to support special events, or repurpose two parallel equestrian stalls for use by a shuttle or buses to support specific group programs at Bear Creek Stables. If the two equestrian stalls were repurposed, the Preferred Concept could accommodate a maximum of 57 spaces (53 parking spaces and four equestrian stalls). Based on the generation rates from the existing Alma Parking Area, the project is expected to generate a total of six vehicle trips (six inbound and 0 outbound) during the weekday AM peak hour, 16 vehicle trips (10 inbound and six outbound) during the weekday PM peak hour, and 46 vehicle trips (19 inbound and 27 outbound) during the Saturday peak hour.

According to the State of California Governor's Office of Planning and Research (now the Office of Land Use and Climate Innovation or LCI) Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory), dated December 2018; residential, office, and retail projects tend to have the greatest influence on VMT. Open Space uses are not in alignment with the type of project that was the focus of SB 743. SB 743 was intended to reduce greenhouse gas emissions by promoting infill development, which is not in conflict with the modified project or the Preserve Plan as a whole. Since the project serves specific recreational uses, those who choose to travel to the parking area and the Preserve would likely make a similar trip anyway to visit one of the surrounding Open Space Preserves or County Parks.

In addition, according to the screening threshold for small projects, defined in the LCI's Technical Advisory, "projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact." As the modified project is a recreational use and expected to generate less than 100 average daily trips, in accordance with the Technical Advisory, impacts related to CEQA Guidelines section 15064.3, subdivision (b) can be assumed to be less than significant with implementation of the modified project.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to traffic and transportation and would not result in new significant impacts

3.17 UTILITIES AND SERVICE SYSTEMS

The Preserve Plan EIR identifies less than significant impacts related to utilities and service systems.

The Preferred Concept and Accessible Trail would not require any potable water or solid waste disposal systems. No trash cans would be provided for the parking area, consistent with the District's other parking facilities. Trail users would be expected to "pack-in, pack-out" their waste, as consistent with the analysis in the Preserve Plan EIR. No change in impacts would occur.

Based on the information in the Preserve Plan EIR and this environmental analysis, the modified project would not increase the severity of previously identified impacts relating to utilities and service systems and would not result in new significant impacts.

4 CONCLUSION

The proposed modified project including shifting a portion of the footprint approximately 270 feet to the east into a flatter area, modifying the shape of the North Parking Area and constructing a 0.5-mile Accessible Trail in BCR would not alter any of the conclusions of the Preserve Plan EIR. No significant environmental effects or a substantial increase in the severity of previously identified significant effects would result. The modifications also would not affect any of the mitigation measures, including their feasibility or implementation. As discussed in previous sections, none of the conditions listed in section 15162 of the CEQA Guidelines exist for the project modification described herein. Therefore, pursuant to section 15164 of the CEQA Guidelines, the differences between the approved project described in the Preserve Plan EIR and the modified project as currently proposed and described in this addendum are minor and this addendum provides sufficient environmental documentation.

APPENDIX A – MITIGATION MEASURES

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

Aesthetics

AES-1: Trail alignments and their associated facilities will be sited and designed to be in harmony with surrounding natural and cultural settings and to retain natural appearances and values.

AES-2: Trail alignments across the face of open hillsides and near the top of ridgelines will be sited to avoid creating new, permanent, noticeably visible lines on the existing landscape when viewed from points looking up at or perpendicular to the trail. Conditions to be considered when siting trails include, but are not limited to, avoiding excessive cuts in slopes that could not be effectively revegetated, and presence of native soil to support revegetation.

AES-3: Screening berms, perimeter planting, and parking area trees that provide a canopy will be used at staging areas to visually buffer views into the staging area from sensitive viewpoints.

AES-4: New lighting proposed at Bear Creek Stables will have light shields and other devices to ensure that no new light or glare will impact sensitive receptors .

Air Quality

AQ-1: MROSD will require its contractors to comply with the following measures from BAAQMD's Best Management Practices to reduce impacts from fugitive dust and other construction-related emissions:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered a minimum of two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site will be covered.
- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads will be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR). Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.

Biological Resources

BIO-1: Biological resource assessments will be conducted prior to implementation of Preserve Plan elements. Assessments will be conducted by a qualified biologist and will include surveys for sensitive habitats and special-status species in the appropriate seasons. These assessments will include recommendations to align potential trails and facilities to avoid impacts to sensitive habitats, special-status species, and heritage and significant trees. If any trail alignment may affect such resources, MROSD will consult with the appropriate agencies (e.g., CDFW, USFWS, NMFS) to ensure that impacts will be avoided or mitigation is adequate.

BIO-2: MROSD will protect sensitive habitat areas and other areas where special-status species may be adversely affected when planning trails, pipelines, and other facilities. To the maximum extent feasible, trail alignments and other improvements will avoid impacts to sensitive habitats, including habitats for special-status plants and animals. All improvements will be evaluated on a case-by-case basis by a qualified biologist to identify impact avoidance measures or mitigation measures for biotic impacts. Consideration will be given to:

- Relocating trails, bridges, culverts, or other improvements
- Periodic closures
- Revegetation prescriptions
- Buffer plantings
- Discrete barrier fencing that accommodates wildlife passage

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

- Other appropriate measures

Removal of native vegetation will be avoided to the extent possible. The appropriate resource agencies will be contacted regarding any trail alignments, pipeline alignments, or other improvements that may impact sensitive habitats, special-status species, or their habitat. Plant replacement will be native to the area and suitable for the site conditions.

BIO-3: Existing access routes will be used wherever suitable to minimize impacts of new construction in special-status species habitats. Realignments will be implemented where necessary to avoid adverse impacts on resources.

BIO-4: Trail design will include barriers to control trail use and prevent environmental damage as needed. Barriers may include fences, vegetation, stiles, and/or fallen trees or branches.

BIO-5: When adjacent to a waterway or riparian zone, trails will generally be set back from the top of bank or from the outside edge of the riparian zone, whichever is greater, except where topographic, resource management, or other constraints or management objectives make such a setback not feasible or undesirable. Riparian setbacks may be adjusted on a case-by-case basis based upon advice of a qualified biologist and with the concurrence of reviewing agencies, where applicable.

BIO-7: Revegetation and/or enhancement will be undertaken where any sensitive habitat or special-status species habitat will be disturbed or destroyed by facility construction. Revegetation work will be implemented prior to or concurrently with the development. The design of an appropriate revegetation program will fully compensate for the lost habitat, with no net loss of habitat functions and values. Mitigation will be based on in-kind replacement of impacted habitat with habitat of equal or better biotic value. The revegetation program will be designed by a qualified biologist or ecologist and submitted to the appropriate regulatory or trustee agency for approval. Native plant materials suited to the site will be utilized in all mitigation work.

BIO-8: Existing native vegetation will only be removed as necessary to accommodate the trail clearing width. The minimum horizontal clearing width from physical obstructions varies based on the type of trail but should be no less than 2 feet from the outer limits of the trail tread and will be determined on a case by case basis to protect special natural features. Maximum vertical distance from overhanging branches will be 12 feet on trails open to equestrian or bicycle use. Maximum vertical distance from overhanging branches will be 8 feet on hiking trails. Clearing will be determined on a case-by-case basis to protect special natural features.

BIO-9: Good pruning practices should be followed when vegetation growth must be cleared. Ground cover plants and low shrubs should not be cleared beyond the original construction standard. The construction standard will be defined as the trail tread width plus 1-2 feet from each side of the edge of the trail tread. Noxious plants will be controlled along trails and the edges of staging areas in a timely manner and in accordance with MROSD's Integrated Pest Management Program (IPMP) protocol.

BIO-10: The potential for the introduction and spread of invasive species during construction or use of the Preserve will be minimized by MROSD. In addition to compliance with the IPMP, the following measures will be implemented as needed:

- Require that contractors ensure equipment used during construction is free of mud or seed-bearing material before entering the Preserve.
- Fill material, mulch, seeds, and straw material used during construction should be weed-free, and certified weed-free materials will be used whenever possible.
- Conduct periodic monitoring of trails to ensure early detection and eradication of any invasive weed species brought in by trail users. Any populations detected during annual monitoring should be treated and eradicated as soon as possible after detection, preferably before seeds set.

BIO-11: In special-status species habitat areas, trail use levels will be limited as appropriate to ensure protection of resources. Techniques for limiting use may include, but are not limited to:

- Physical access controls
- Seasonal or intermittent closures

BIO-12: Trails or other facilities may need to be closed during seasonal periods critical to special-status species, where overuse threatens resource values, or for other reasons to protect biological resources. Where a trail or surrounding habitat warrants special notice limiting trail use, the trail will be clearly designated and should be equipped with use signs and appropriate barriers to discourage unauthorized use. Missing or damaged signs, gates, fences, and barriers will be will be repaired or replaced as soon as possible. Closure notices will include the reason(s) for the closure, an estimate of how long the facility will be closed, and a

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

telephone number to call for further information.

BIO-13: Periodic monitoring of known sensitive habitats adjacent to trails or other facilities will be conducted to determine if unacceptable soil compaction or other adverse impacts are occurring. If monitoring reveals that undesirable soil compaction or impact to a sensitive habitat is occurring, barriers or other appropriate measures (such as trail rerouting) will be employed as needed to discourage off-trail use. Brush or other aesthetically acceptable barriers can be used to cover illegal trails, abandoned trails, or shortcuts to discourage use until natural vegetation returns.

BIO-14: Should sensitive habitat be impacted such that it necessitates permanently closing a trail or staging area, discing and replanting or other appropriate techniques will be used to restore the area to a natural condition and sufficiently block the trail with barriers to effectively prohibit use. Management will include monitoring the site to ensure that it returns to a natural condition without the intrusion of invasive exotic plants. Management will also include design elements, maintenance, and monitoring to ensure that erosion is minimized. Construction and maintenance of trails will require the trimming and/or removal of vegetation along the trail route and staging areas.

BIO-15: Periodic monitoring for special-status amphibians and reptiles should be conducted to determine if habitat enhancements have been successful in attracting the species to the Preserve. If species are found within the Preserve, ongoing monitoring should be conducted and any facilities, recreational uses, or maintenance activities that are adversely affecting the species should be evaluated and be removed, relocated, or otherwise modified in coordination with CDFW and/or USFWS (as applicable to the species identified) to avoid further impacts to the species.

Cultural Resources

CUL-1: The Preserve Plan's Implementation Table includes actions to reduce impacts to cultural resources. Actions 1.1a through 1.1c and actions 1.2a through 1.2d are designed to reduce impacts to known and unknown cultural resources. Several of the known cultural resources on the site have not been evaluated. The following measure provides additional direction for implementing the previously identified Actions.

Once the precise locations of trails and other proposed facilities have been finalized and before commencement of earth-disturbing activities for construction of these facilities, MROSD shall identify and evaluate all historic-era and prehistoric archaeological resources and historic-era structures identified below in Tables CUL-1 and CUL-2 that could potentially be impacted by the project. Resources will be evaluated and recorded on standard DPR Primary Record forms (Form DPR 523) in accordance with NRHP/CRHR criteria. MROSD will include an evaluation on the DPR if such information is available or prepare a separate evaluation report which contains a determination of eligibility/ineligibility to the NRHP and/or CRHR. The evaluation report shall be completed by a qualified archaeologist who meets the Secretary of the Interior's professional qualifications for Archaeology and submitted to MROSD.

If resources eligible for inclusion in the NRHP or CRHR are identified, MROSD shall hire a qualified archaeologist to prepare a tiered plan to prioritize avoidance of resources. This includes consideration of both construction-related effects and effects from increased visitor use in an area. Avoidance measures may include, but are not limited to, the following: site testing to confirm the boundary of a significant resource, relocating the proposed facility farther from the resource(s) if necessary (including appropriate buffers to discourage visitor-related effects), implementing specific construction techniques (such as temporary fencing or flagging and construction worker training) to ensure avoidance, and construction monitoring in sensitive areas to prevent disturbance of currently unknown subsurface resources.

If re-designing or relocating proposed facilities to avoid impacts is infeasible, appropriate impact minimization measures will be outlined in the archaeological resource evaluation report or data recovery report. Any data recovery (if needed) will be completed by a qualified archaeologist who meets the Secretary of the Interior's professional qualifications. Mitigation, or data recovery, typically involves additional archival research, field excavation, photo documentation, mapping, and/or monitoring. Any avoidance and data recovery measures shall be developed in consultation with the archeologist or historian (depending on the type of resource) and finalized in consultation with MROSD to confirm the effectiveness of the measures. Tables CUL-1 and CUL-2 below identify specific mitigation treatments for each of the unevaluated archaeological resources and historic-era structures on the site. These treatments would be implemented if the archaeological resource evaluation report and/or historic resources evaluation report indicated that the proposed project could potentially adversely affect the resource and the resource is determined to be eligible for listing in the NRHP or the CRHR.

Table CUL-1 Treatment for Unevaluated Historical Resources

Primary No./ Trinomial	Name/Description	Preserve Plan Action	Treatment (if eligible for listing on NRHP or CRHR and eligibility is found to be potentially affected)
P-43-001131	Pharmacy Complex. A roof-like wooden structure associated with a	Clean up as necessary for public safety.	If the historic evaluation report determines that this structure is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the

Appendix D	Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures		
	concrete and stone pier structure.		report will establish specific treatment measures to ensure clean-up does not adversely affect the resource's eligibility. This may include requiring restrictions on clean-up activities or avoidance of the structure by identifying alternate public safety measures (such as exclusion fencing).
P-43-001222	Iona School/ BCR THP #5. School grounds, leveled pads, a fenced yard with wooden retaining wall, and one concrete building.	Clean up as necessary for public safety.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restrictions on clean-up activities or avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
P-43-001226	Grape Processing Shed/BCR THP #10. A wooden shed with corrugated metal roof.	Clean up as necessary for public safety.	If the historic evaluation report determines that this resource is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restrictions on clean-up activities or avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing).
P-44-000403	Highway 35. Highway 35, post mile 0.02 to 17.12.	Preserve and Protect	If the historic evaluation report determines that this resource is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
n/a (undocumented)	Pump House. Pump House North end of the lower lake.	Clean up as necessary for public safety.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restrictions on clean-up activities of avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a (undocumented)	Small Dam. Historic waster system dams associated with Flood/Tevis Estate	Clean up as necessary for public safety.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restriction on clean-up activities or avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a (undocumented)	Big Dam. Historic waster system	Preserve and Protect;	If the historic evaluation report determines that one or more of these features is individually

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

	dams associated with Flood/Tevis Estate	implement protective or safety improvements if necessary.	eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restrictions on clean-up activities or avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a (undocumented)	Smallest Dam. Historic waster system dams associated with Flood/Tevis Estate	Clean up as necessary for public safety.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring restrictions on clean-up activities or avoidance of the feature(s) by identifying alternate public safety measures (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a (undocumented)	Cistern. Concrete Reservoir/Cistern associated with Flood/Tevis Estate.	Preserve and Protect; implement protective or safety improvements if necessary.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring no clean-up activities and avoidance of the feature(s) with alternate public safety measures that avoid effects to the feature(s) (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a	Tea House. Tea house chimney	Clean up as necessary for public safety.	If the historic evaluation report determines that one or more of these features is individually eligible for listing on the NRHP or CRHR, or is a contributing element to the Alma College Cultural Land scape, the report will establish specific measures to ensure clean-up does not adversely affect the resources' eligibility. This may include requiring no clean-up activities and avoidance of the feature(s) with alternate public safety measures that avoid effects to the feature(s) (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.

Table CUL-2 Treatment for Unevaluated Archaeological Resources

Primary No./ Trinomial	Name/Description	Preserve Plan Action	Treatment (if resource is found to be adversely affected and eligible)
P-43-000088/ CA-SCL-71/H	Five sandstone bedrock outcrops and boulders containing 58 cupules and	Preserve and protect bedrock outcrops and boulders. Clean	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure

Appendix D	Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures		
	19th century debris with a former pond,	up historic-era debris as necessary for public safety.	preservation and protection treatments do not adversely affect the resources' eligibility. This may include requiring avoidance of features, restrictions placed on clean-up activities, or data recovery.
P-43-000375/ CA-SCL-369/H	BCR THP#1 and #12. Historic period brick fireplace and rock foundation with refuse deposit and prehistoric bedrock milling outcrop.	Preserve and protect prehistoric features. Clean up historic-era features as necessary for public safety.	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility. This may include requiring avoidance of features, restrictions placed on clean-up activities, or data recovery.
P-43-001132	Paired Stone Walls. Two stacked stone walls that may be associated with a former late 1800s logging camp.	Preserve and Protect; implement protective or safety improvements if necessary	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the structure (such as exclusion fencing).
P-43-001223	Rock Cribbing/BCR THP #7. The remains of a dry-laid rock abutment constructed north-south over a tributary of Webb Creek.	Preserve and Protect	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
P-43-001225	Water Tank and Flume of Webb Creek/BCR THP #9. A wooden water tank and the remains of a pipe/flume water conveyance system.	Clean up as necessary for public safety.	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the feature(s) (such as exclusion fencing).
P-43-001227	BCR THP #14. Mining and residential features including a mine adit, dry-laid rock retaining wall, earthen ditch, palm trees, and a scatter of blue stucco.	Clean up as necessary for public safety.	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the feature(s) (such exclusion as fencing).
P-43-000376/ CA-SCL-370	Bedrock Mortars/ BCR THP #13. Two milling features exhibiting nine cups on a sandstone boulders and possible rock shelter.	Preserve and Protect	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
P-43-000643/ CA-SCL-760	Bedrock Mortars/ Resource Area 1. Two sandstone boulders each containing one bedrock mortar, used in an historic period landscape design element. Mortars were likely moved from another location as no prehistoric deposit identified in	Per the Alma College Rehabilitation Plan, re-use boulders as part of visitor entrance design	No treatment required, MROSD will prepare a memo to file documenting the specific location where the mortars are moved.

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

	shovel tests by Clark 1994..		
P-43-001521	Bedrock Mortar. Possible bedrock mortar on a sandstone outcrop.	Preserve and Protect	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
P-43-001522	Bedrock Mortar. Four bedrock mortars embedded in a sandstone outcrop.	Preserve and Protect	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
P-43-002020/ CA-SCL-875	Hollow Log Mortar. Two bedrock mortars on one slab of exposed sandstone.	Preserve and Protect	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.
n/a	Laundry Site. Remnant Development site - pad and possible laundry associated with Flood/Tevis Estate. Old creek crossing and old road.	Clean up as necessary for public safety.	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the feature(s) (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a	Village. 20th century village remnants, associated with Flood/Tevis Estate, Alma College	Clean up as necessary for public safety.	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery and the report may identify alternate public safety improvements that do not affect the feature(s) (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a	Dump. 20th century dump, associated with Flood/Tevis Estate, Alma College	Clean up as necessary for public safety.	If the archaeological evaluation report determines that one or more of these features are eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the feature(s) (such as exclusion fencing). If the report determines that the structure is a significant contributing element of the Alma College cultural landscape, the resource will be included in the Preservation Maintenance or Monitoring Plan.
n/a	House Site/ Unknown/18. Reported location of a house site, possibly demolished. Flat with vinca in the vicinity	Clean up as necessary for public safety.	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

			safety improvements that do not affect the feature(s) (such as exclusion fencing).
n/a	Tea House. Tea house chimney	Clean up as necessary for public safety.	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will identify specific measures to ensure that preservation, as well as any safety improvements do not adversely affect the resources' eligibility. This may include requiring avoidance of the feature(s) or data recovery. The report may identify alternate public safety improvements that do not affect the feature(s) (such as exclusion fencing).
n/a	Resource Location #2. Midden, SCR and Chert core.	Preserve and Protect	If the archaeological evaluation report determines that this feature is eligible for listing on the NRHP or CRHR, the report will establish specific measures to ensure preservation and protection treatments do not adversely affect the resources' eligibility.

CUL-2: Before commencement of earth-disturbing activities in areas likely to contain unknown prehistoric-era archaeological resources, MROSD will coordinate with the Ohlone tribe representatives in order to hire a tribal site monitor from the Ohlone tribe. The tribal monitor must be on site for all earth-disturbing construction and pre-construction activities. In the event that no such Native American monitor is available, persons who represent tribal governments and/or organizations in the locale in which resources could be affected shall be consulted by MROSD. If Native American archaeological, ethnographic, or spiritual resources are discovered, all identification and treatment of the resources shall be conducted by a qualified archaeologist and Native American representatives who are approved by the local Native American community as scholars of the cultural traditions.

In the event that any cultural resources are exposed during construction, work at the location of the find will halt immediately within 10 meters (30 feet) of the find. A reasonable effort will be made by the District and archaeologist to avoid or minimize harm to the discovery until significance is determined and an appropriate treatment can be identified and implemented. Methods to protect finds include fencing, covering the resources with protective material and culturally sterile soil or plywood. If vandalism is a threat, 24-hour security shall be provided. During this evaluation period, construction operations outside of the find location can continue preferably with an archaeologist monitoring any subsurface excavations.

If the resource cannot be avoided, the archaeologist will develop an appropriate Action Plan for treatment within 48 hours to minimize or mitigate the adverse effects. The District will not proceed with construction activities that could affect the discovery until the Action Plan has been reviewed and approved. The treatment effort required to mitigate the inadvertent exposure of significant cultural resources will be guided by a research design appropriate to the discovery and potential research data inherent in the resource in association with suitable archaeological field techniques and analytical strategies. The recovery effort will be detailed in a professional report in accordance with current archaeological standards. Any non-grave associated artifacts will be curated with an appropriate repository.

Geology, Soils, and Seismicity

GEO-1: Where soft or seasonally-wet soils underlie an existing or proposed trail, the weak subgrade will be re-compacted or removed. Standard protocol will be to apply aggregate surfacing and draining the road to an inboard ditch. If necessary, base rock will be separated from native soils with geotextile fabric to prevent compaction of the rock into the soft substrate. Inboard ditches or insloped roads segments (which prevent flow from bank seeps from discharging onto the running surface of the road and result in a slightly elevated and somewhat drier trail tread) will be installed in chronically wet areas. Roads and trails will be drained to ditch relief culverts or rocked dips.

GEO-2: Where existing roads are to remain open, but are not presently passible due to past fill failures, residual perched and unstable fill material will be excavated and road or stream runoff delivered to the failure site will be corrected. The road will be widened by either cutting into the bank or reconstructing the outside edge of the fill prism. Where slopes are steep, retaining walls will be used to support the fill. The method of treatment for fill failures will be dependent on the stability of the residual fill material, the cause of the failure (e.g., diverted runoff), and the remaining road width.

GEO-3: During the winter (November through March), MROSD will limit patrol and maintenance vehicle access on seasonal roads and trails; ATVs will be substituted wherever feasible.

GEO-4: Erosion control measures will be implemented on sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Temporary soils stabilization measures may include: scheduling limitations during the rainy season; preservation of existing vegetation; application of hydraulic mulch to disturbed areas outside of the stream channel; use of geotextiles, plastic coves, and erosion control mats; instillation of silt fences; and use of fiber rolls along the slope contour above the high water level to intercept runoff. Prior to the start of the winter storm season, these sites will be inspected to confirm that erosion control techniques are still effective.

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

GEO-5: Trails or other facilities will be closed for construction or repair, or when another hazardous condition exists (e.g., landslide during flooding or extremely wet weather) that renders trail use especially hazardous, or where adjacent land uses may present unsafe conditions that could affect open space users. Where use limitations or closures are in place, the area will be clearly designated and will be equipped with use signs and appropriate barriers to discourage unauthorized use. Missing or damaged signs, gates, fences, and barriers will be will be repaired or replaced as soon as possible. Closure notices will include the reason(s) for the closure, an estimate of how long the facility will be closed, and a telephone number to call for further information.

GEO-6: A design-level geotechnical investigation will be completed by MROSD before constructing any new structures on the Preserve to identify engineering methods to reduce the potential for structural failure due to geological hazards. Typical measures include: excavation and removal of the expansive soil materials and replacement with non-expansive fill; placement of a layer of non-expansive fill, which may vary in thickness from 12- to 24- inches, above the expansive soil in areas where concrete flatwork or foundations will be constructed; moisture conditioning or lime treating expansive soil; constructing foundations below the zone of seasonal moisture change or capable of withstanding or not being adversely effected by seasonal shrink-swell; and specific control of surface runoff and installation of subsurface drainage elements. The evaluation will also include excavation of fault trenches to show that potential building sites are free from active or potentially active faulting. All buildings will be designed in a manner that reflects the geologic hazards on the site, and will be consistent with applicable building codes.

Hazards and Hazardous Materials

HAZ-1: MROSD will conduct demolition in accordance with applicable regulations. Specific actions will include the following:

Asbestos. Before demolition, all structures would be tested for the presence of asbestos-containing materials. Any asbestos would be removed and disposed of by an accredited contractor in compliance with federal, state, and local regulations (including the Toxic Substances Control Act and the National Emission Standard for Hazardous Air Pollutants). Compliance with these regulations would result in the safe disposal of asbestos-containing materials.

Title 8 of the California Code of Regulations (CCR), Section 1529 "Asbestos" is enforced by Cal OSHA and sets very strict exposure limits for employees engaged in abatement and remediation activities and requires employers to perform an initial exposure assessment as well as daily monitoring of employee exposure. Section 1529 also includes a list of specific compliance measures including (but not limited to) vacuum cleaners with HEPA filters, wet methods, ventilation systems with HEPA filters, isolation/containment of asbestos dust-generating areas, as well as prohibitions against use of compressed air to remove asbestos without a ventilation system, dry sweeping/shoveling of asbestos, and use of high-speed abrasive disc saws without proper point of cut ventilators.

Demolition of any structures containing asbestos would also be subject to BAAQMD Regulation 11, Rule 2, which prohibits visible emissions of asbestos. BAAQMD's Rule 2 requires wet methods or use of HEPA filter-fitted ventilation systems, use of leak-tight chutes for getting materials to the ground, use of plastic barriers and HEPA filter-fitted ventilation systems to contain areas being stripped. Rule 2 also requires an asbestos survey, including materials sampling and lab testing, to be performed by a qualified consultant before abatement activities to determine the category of asbestos. Specific disposal methods are also required under Rule 2.

MROSD will provide written documentation to the County that asbestos testing and abatement, as appropriate, has occurred in compliance with applicable federal, state, and local laws.

- **Lead-based paint or other coatings.** A survey for indicators of lead-based coatings would be conducted before demolition to further characterize the presence of lead on the project site. For the purposes of compliance with Cal/OSHA regulations, all coated surfaces would be assumed to potentially contain lead. There is also a potential for soil contamination because of deposition of deteriorated (i.e., flaked, peeled, chipped) lead-based paint adjacent to structures where lead-based exterior paints were used. Loose or peeling paint may be classified as a hazardous waste if concentrations exceed total threshold limits. Cal/OSHA regulations require air monitoring, special work practices, and respiratory protection during demolition where even small amounts of lead have been detected. MROSD will provide written documentation to the County that lead-based paint testing and abatement, as appropriate, has been completed in accordance with applicable state and local laws and regulations. Abatement will include the removal of lead contaminated soil (considered soil with lead concentrations greater than 400 parts per million in areas where children are likely to be present).
- **Heavy metals and PCBs.** Spent florescent light bulbs and ballasts, thermostats, and other electrical equipment may contain heavy metals, such as mercury, or PCBs. If concentrations of these materials exceed regulatory standards, they would be handled as hazardous waste in accordance with hazardous waste regulations.

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

HAZ-2: MROSD will create defensible space and use low-ignition vegetation. Specific actions will include:

- Vegetation within 100 feet of structures at Bear Creek Stables and the former Alma College site will be maintained annually for defensible space.
- Low ignition fuels, such as grasses, will be planted adjacent to trail heads and staging areas, and will be mowed annually as soon as 30 percent of the light ground fuel is cured.
- MROSD will coordinate with Santa Clara County to implement vegetation management along Bear Creek Road.

HAZ-3: In order to reduce fire ignition risk, MROSD will require the following measures for all maintenance and construction activities within the Preserve:

- All equipment to be used during construction and maintenance activities must have an approved spark arrestor.
- Grass and fuels around construction sites where construction vehicles are allowed to be parked will be cut or reduced.
- Mechanical construction equipment that can cause an ignition will not be used when the National Weather Service issues a Red Flag Warning for the San Francisco Bay Area.
- Hired contractors will be required to:
  - Provide water to suppress potential fires caused by the work performed.
  - Remind workers that smoking is prohibited within the Preserve.
  - Maintain working ABC fire extinguishers on all vehicles in the work area.

To further limit potential ignition sources, MROSD will prohibit smoking and use of fireworks in the Preserve. Signage will be provided that describes prohibited uses and warns against fire hazards. Prohibitions will be enforced through periodic patrols by MROSD staff.

HAZ-4: A wildland fire hazard assessment will be prepared for the Preserve to identify wildland fuel loads, inventory critical resources at risk, assess relative fire hazards, and develop recommendations for wildland fuels management. The preparation of a wildland fire management plan will provide a science-based analysis aimed at identifying fuel and fire management actions that support and augment current operations and projects. These actions will be prioritized to best allocate limited resources.

HAZ-5: MROSD will coordinate with appropriate agencies, such as Santa Clara County and the California Department of Forestry to formalize mutual aid agreements.

HAZ-6: Where compatible with other trail characteristics, planners will locate trail alignments and access points to allow trails to also serve as emergency access routes for patrol or emergency medical transport. In addition, the following design features will be incorporated: graveled trailheads with 10-foot radiuses; entrance and road shoulders designed to discourage parking during closure and to facilitate emergency access; and gates that are at least 12 feet wide and constructed of heavy materials with a protected locking system for MROSD and fire access.

HYDRO-1: MROSD will maintain the trails to reduce concentrate runoff and focal points where substantial erosion could occur. The use of water bars, trail cover, and trail edge protection will be used in areas of steep slopes and heavy traffic to maintain trail integrity.

- Trails and roads will also be maintained according to MROSD standard practices to prevent erosion and sedimentation. These practices include:
- Routine (annual) cleaning of existing drainage facilities such as culverts, water bars, and drain dips to remove any accumulated material.
- Installation of minor drainage improvements such as water bars to channel surface flow from trails to natural drainage systems.
- Installation and maintenance of small dissipating structures in locations where outflows or channelization could cause erosion.
- Installation of fence and gate barriers to prevent off-trail access and shortcuts.
- Volunteer trail reporting to identify potential trail erosion.
- Seeding and revegetation of eroding slopes.
- Seasonal and temporary trail closure to allow revegetation and maintenance.

Appendix D Bear Creek Redwoods Open Space Preserve Plan — Environmental Protection Measures

- Use of good pruning practices for vegetation alongside the trails, and not clearing beyond 3 feet from the edge of the trail.

Hydrology and Water Quality

HYDRO-2: Where trails are actively eroding, MROSD will implement the following measures as soon as feasible:

- repair and stabilize head cuts of actively eroding gullies and install rock to prevent further erosion;
- slope existing roads to the outside edge to allow sheet runoff;
- install rolling waterbars to more effectively drain road surfaces;
- install rip-rap or other impact reducing mechanisms at the outfall of each waterbar and/or culvert; and
- install filter berms to collect sediments and reduce cutting energy.

HYDRO-3: Storm water quality best management practices (BMPs) will be implemented to reduce potential water quality impacts. BMPs include:

- Flow of runoff from drainage structures will be directed to vegetated areas, away from creeks and drainages as is practical.
- Conduct any trail maintenance work during low flow periods
- Use erosion and sediment control measures to minimize water quality impacts and ensure no sediment at heavily traveled trails flows into creeks. These measures include:
  - Silt Fences
  - Straw Bale Barriers
  - Brush or Rock Filters
  - Storm Drain Inlet Protection
  - Sediment Traps
  - Sediment Basins
  - Erosion Control Blankets and Mats
  - The District will prevent erosion on steep slopes by using erosion control material according to manufacturer's specifications.
- If soil is to be stockpiled for any reason at creeksides, no run-off will be allowed to flow back to the creek.

HYDRO-4: Where existing or proposed roads and trails are located within 50 to 75 feet of a watercourse, they will be rocked to minimize the amount of erosion and consequent sediment delivered to the surface water.

HYDRO-5: New equestrian trails will not be constructed parallel to creeks in the Preserve. Where equestrian trails must cross streams or major drainages in water supply watersheds, the trail will be sited perpendicular to the stream (to the extent allowed by topography and vegetation) through the 300-foot buffer zone (150 feet on each side).

HYDRO-6: Rusted and undersized culverts will be replaced with culverts capable of accommodating flood events consistent with County and MROSD standards. "Critical dips" (i.e., dips located at the crossing that will allow runoff to be directed over the road surface and back to the stream channel) will be installed at each crossing to prevent stream flow from being diverted down the road in the event the culvert plugs and the stream overtops the road. As necessary based on site conditions, the fill embankment below the culvert may be armored with rock revetment.

HYDRO-7: Where roads or trails will be decommissioned as part of the Preserve Plan, culverts and fill will be removed by MROSD.

HYDRO-8: Where high levels of recreational use is anticipated, existing earth fords will be replaced with rock fords, culverts, or bridges. Work will be completed by MROSD prior to opening the area to expanded use.

APPENDIX B – GEOTECHNICAL REPORT

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
1st Revised: 29 May 2024

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. LG12342
31 October 2023
1st Revised: 29 May 2024

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

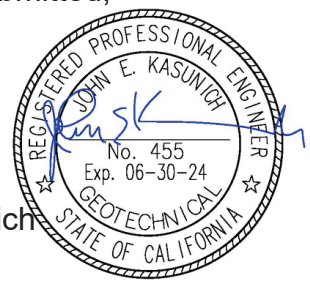
Dear Scott Reeves:

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 1
Introduction 1
Purpose and Scope 1
Site Location and Conditions 2
Project Description 2
Field Exploration 3
Laboratory Testing 4
Subsurface Conditions 4
Groundwater 5
Site Geology 5
Seismicity 5
Geotechnical Related Seismicity 6
Geologic Hazards 7
Building Codes 8

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS 9
Pavement - Structural Section Design Considerations 11
Pavement Design 11
Site Grading 13
Concrete Slabs on Grade 14
Retaining Walls 16
Utility Trenches 17
Site Drainage 18
Erosion Control 18
Plan Review, Construction Observation, and Testing 18

LIMITATIONS AND UNIFORMITY OF CONDITIONS 19

APPENDIX
Site Vicinity Map ..... Figure 1
Regional Geologic Map ..... Figure 2
Boring Site Plan ..... Figure 3
Cross Section AA' ..... Figure 4
Cross Section BB' ..... Figure 4
Cross Section CC' ..... Figure 5
Key to Logs ..... Figure 6
Logs of Test Borings ..... Figure 7-10
Laboratory Test Results ..... Figures 11 - 16

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. Based on our experience with jobs in fault zones in this area, we believe a Certified

Engineering Geologist (C.E.G.) to conduct a fault investigation for this project is not required, since the scope of this job is a parking lot with no habitable structures. 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

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

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 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

---

not been increased. Item 2 does not apply to Site Class D, D (default).

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

Site Vicinity Map (Figure 1)

Regional Geologic Map (Figure 2)

Boring Site Plan (Figure 3)

Cross Section AA' (Figure 4)

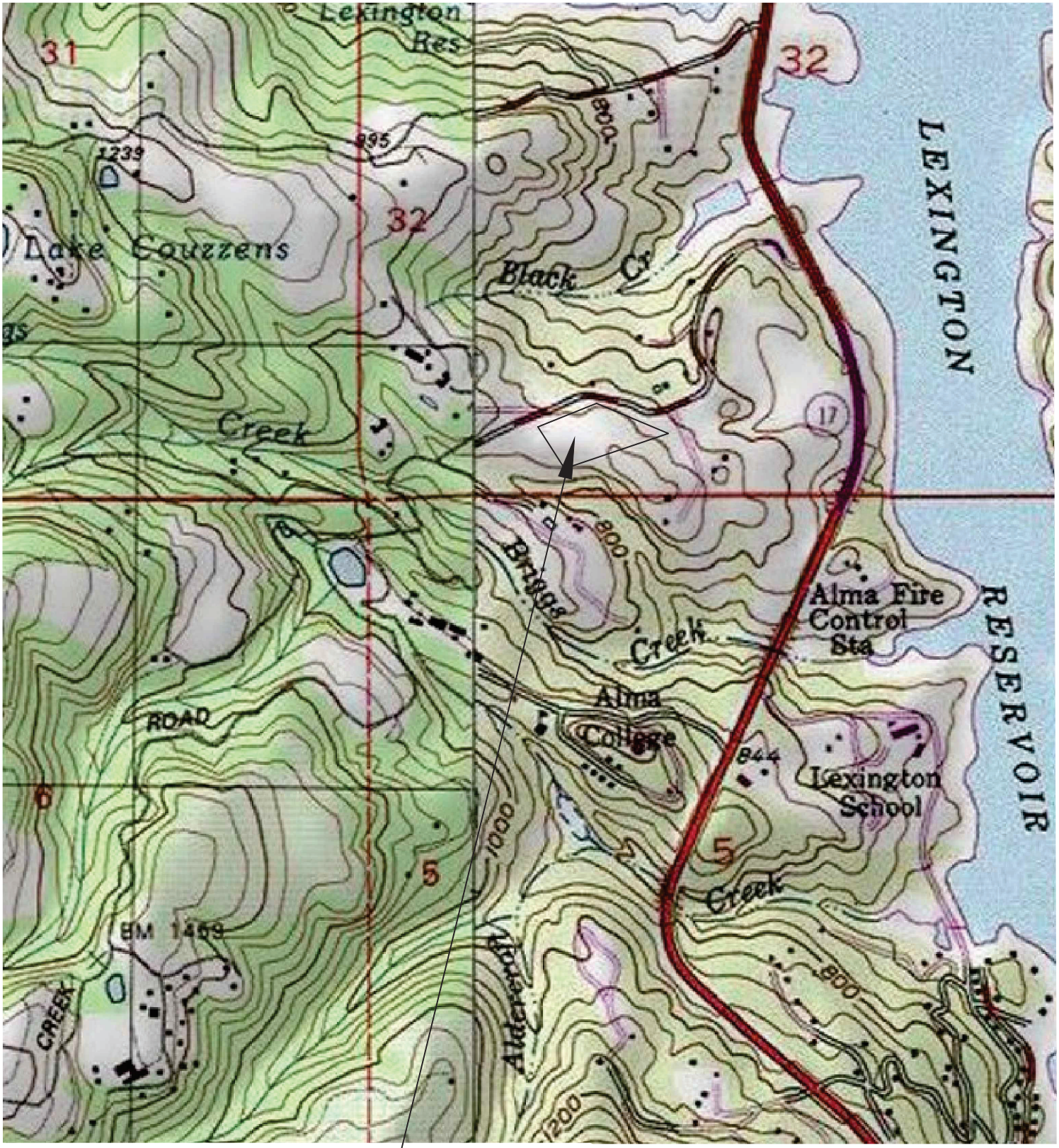
Cross Section BB' (Figure 4)

Cross Section CC' (Figure 5)

Key to Logs (Figure 6)

Logs of Test Borings (Figure 7-10)

Laboratory Test Results (Figures 11-16)



SITE LOCATION

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

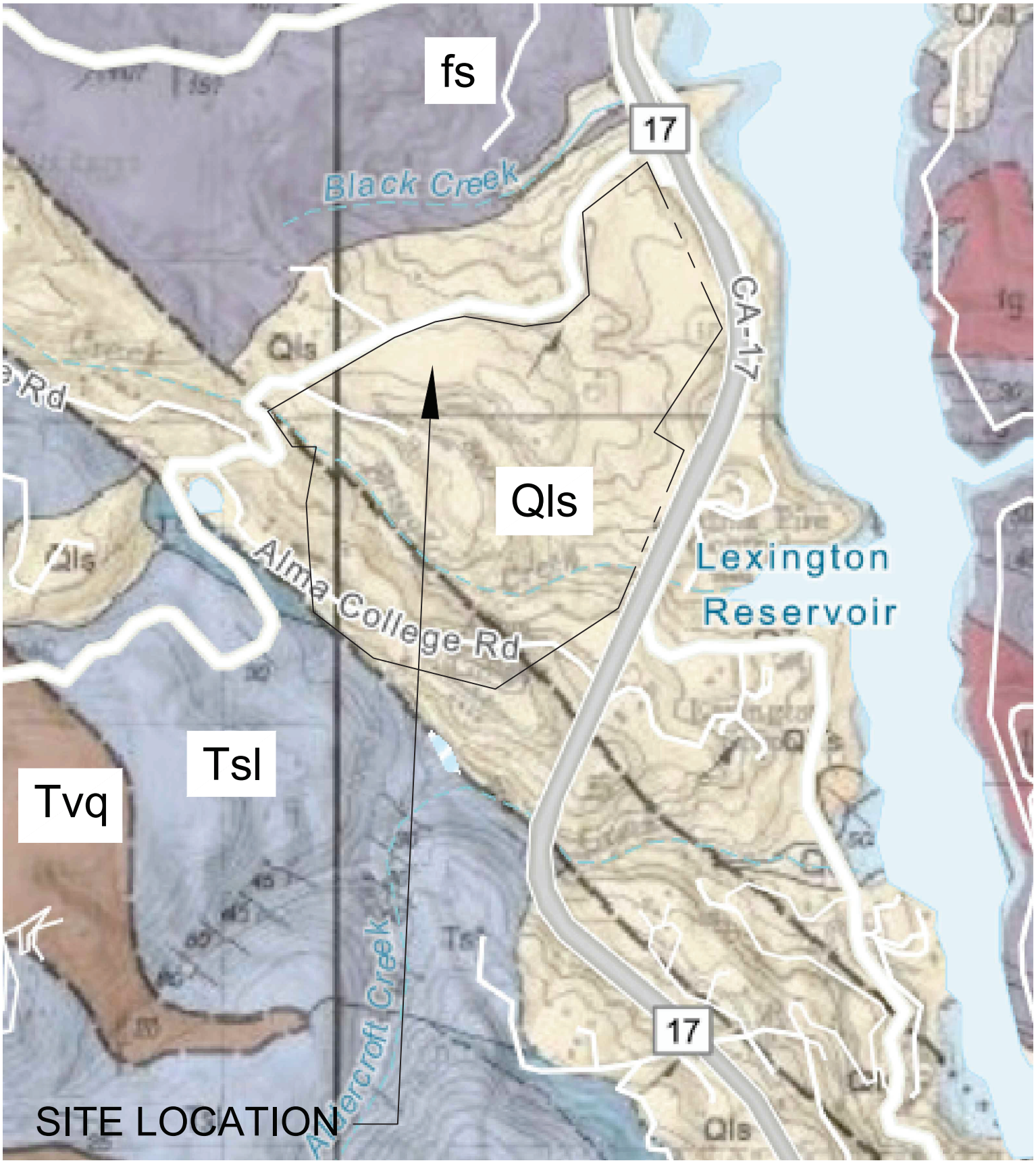
SITE VICINITY MAP
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

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

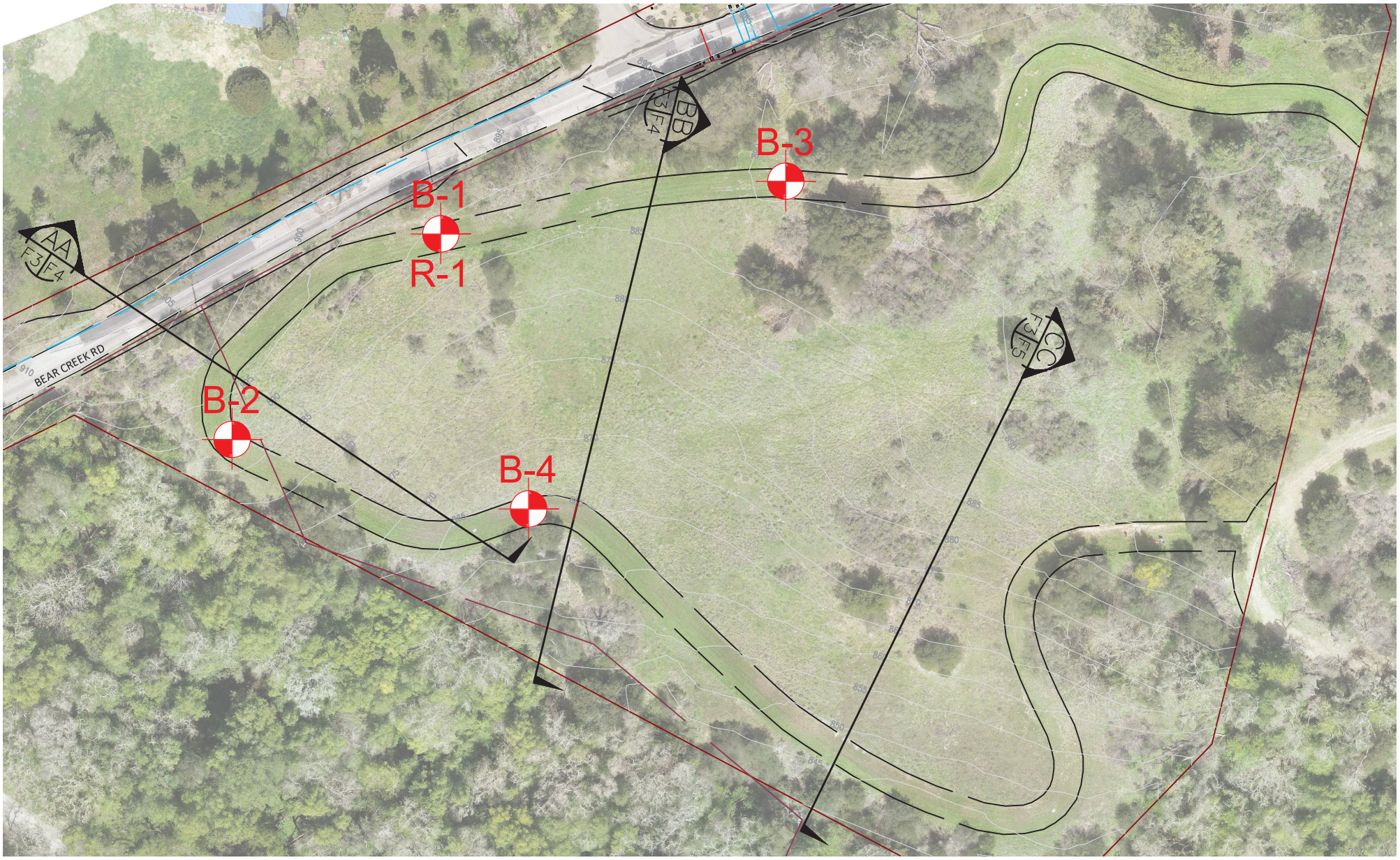
REGIONAL GEOLOGIC MAP
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

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

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

FIGURE NO. 2

SHEET NO.



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'

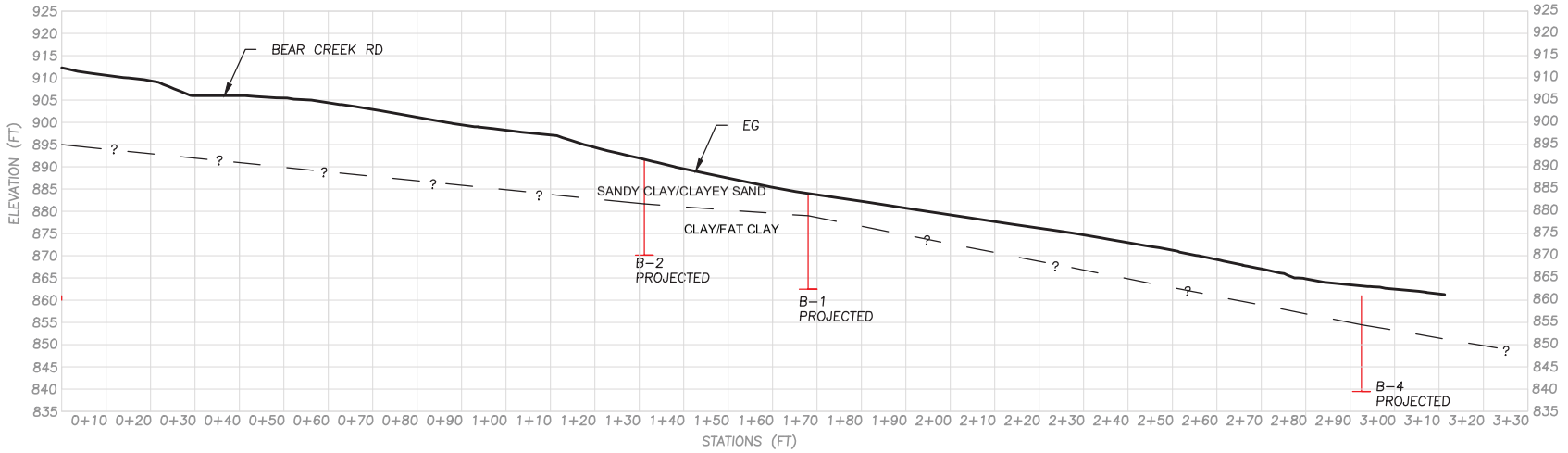
BORING SITE PLAN
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

SCALE:	1" = 20'
DRAWN BY:	TA
DATE:	SEPT. 2023
REVISED:	
JOB NO.	LG12342

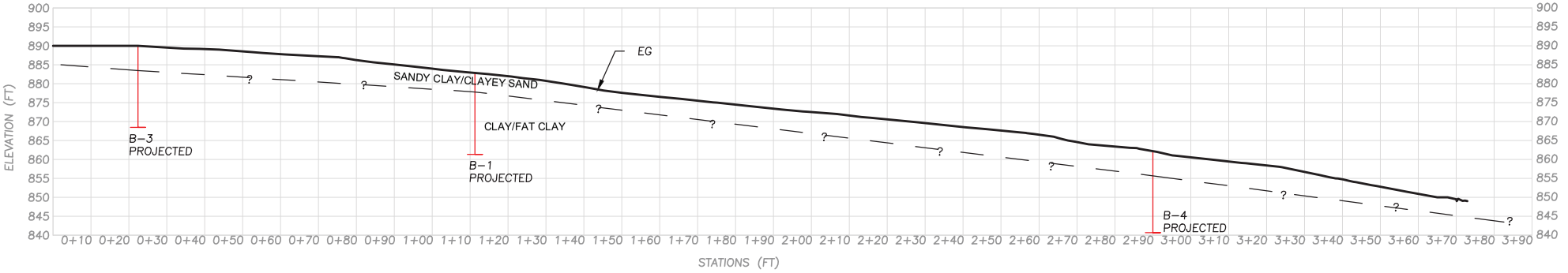
HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 3

SHEET NO.



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'

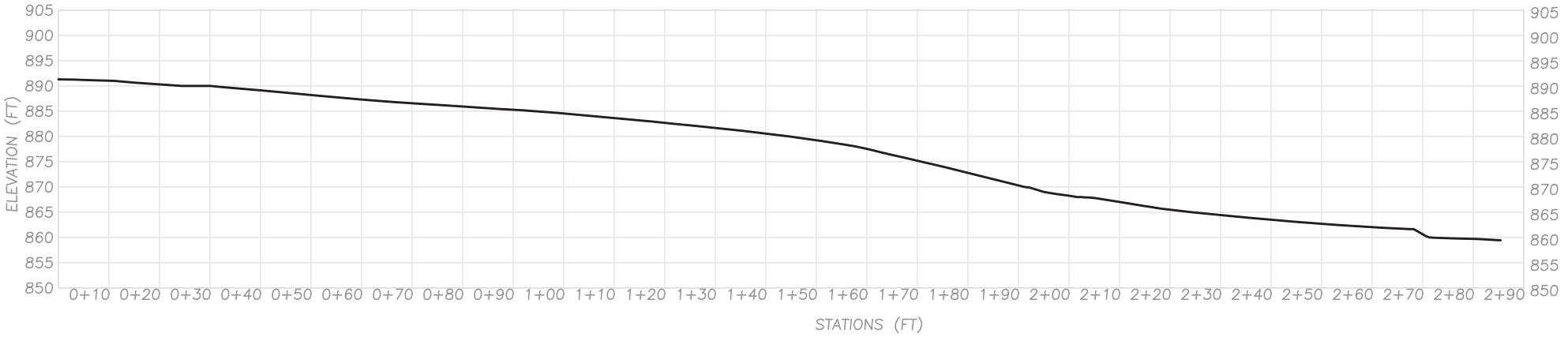
CROSS SECTION AA'
BEAR CREEK REDWOODS NORTH PARKING AREA
LOS GATOS, CALIFORNIA
APN: 544-32-001

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

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

FIGURE NO. 4

SHEET NO.



CROSS SECTION CC'
SCALE: 1" = 40'
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:	
JOB NO.	LG12342

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

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.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				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

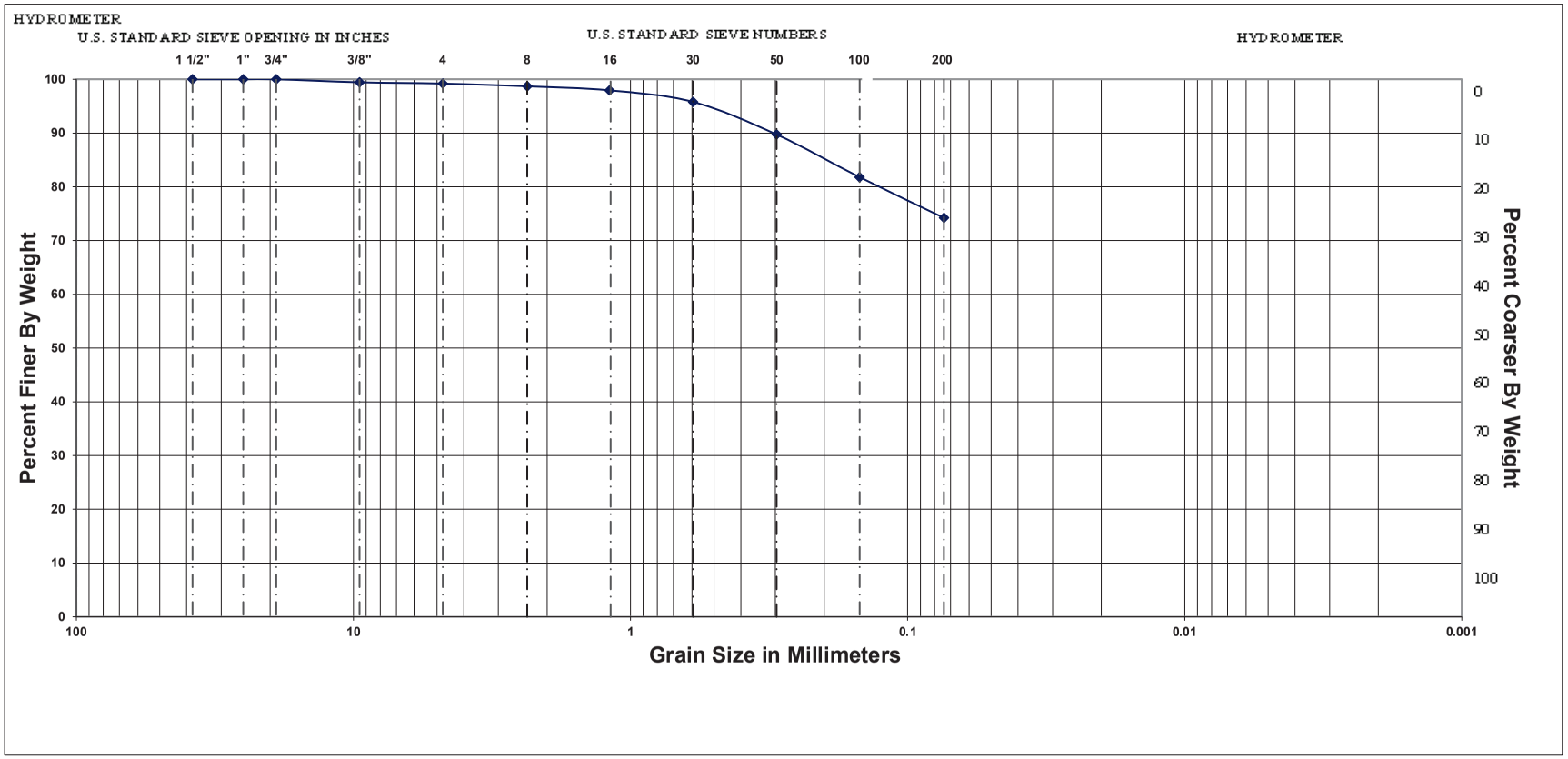
LOGGED BY TA **DATE DRILLED** 8-10-2023 **BORING DIAMETER** 6" **BORING NO.** B-4

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	-

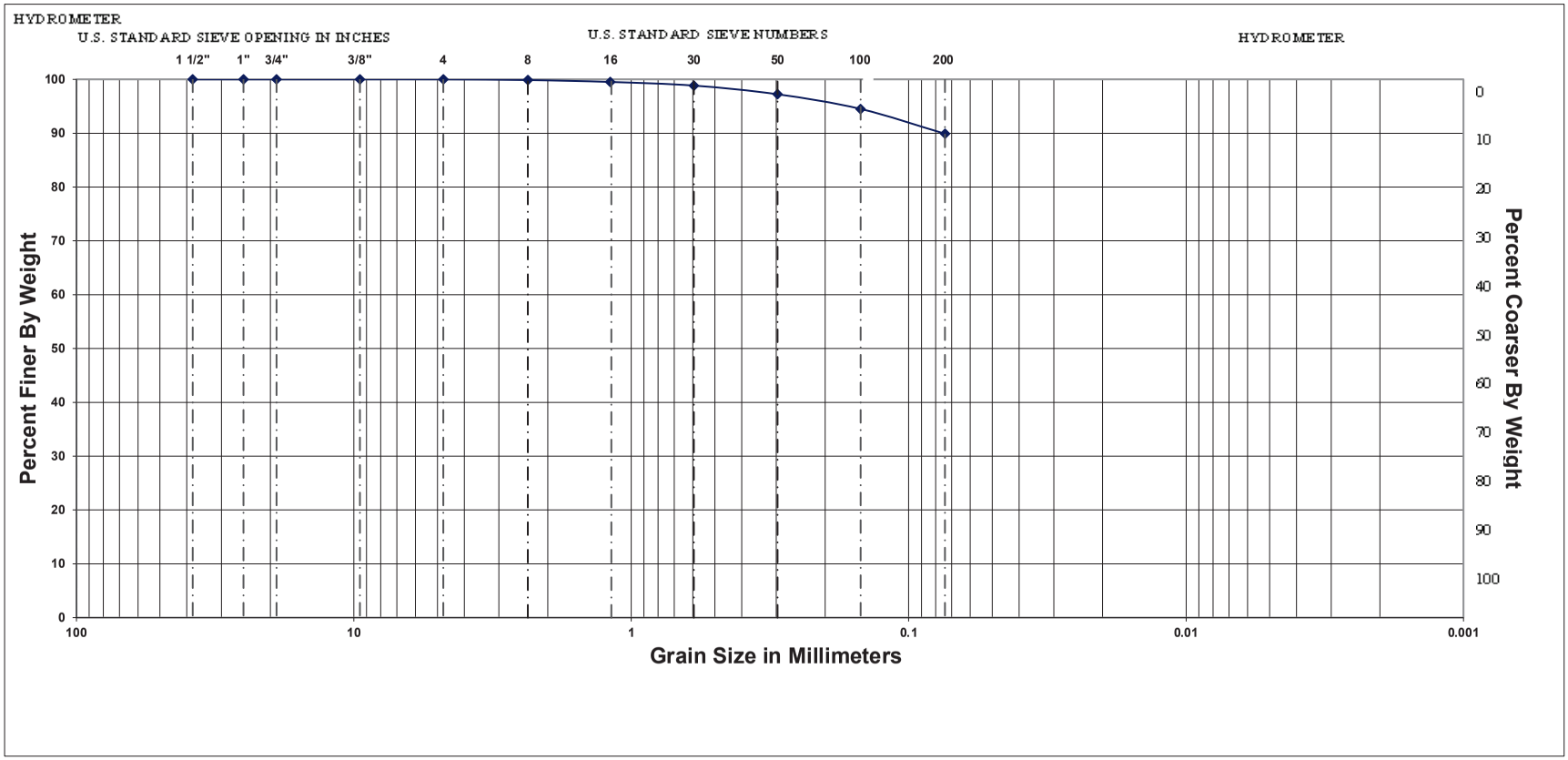
HKA Project No: 12342
Sample No: 2-4
Date: August 28, 2023

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

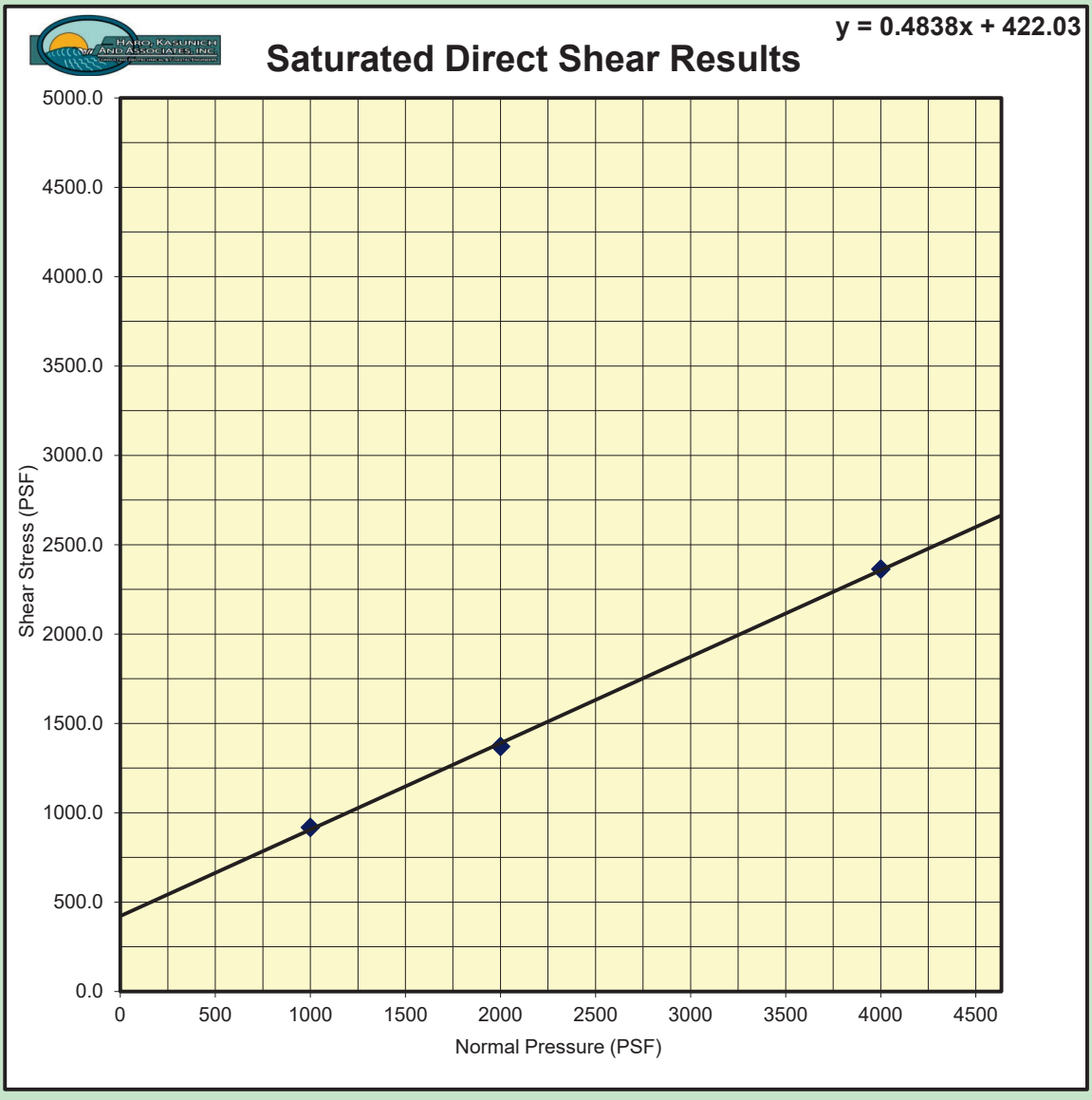


Figure No. 14

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

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

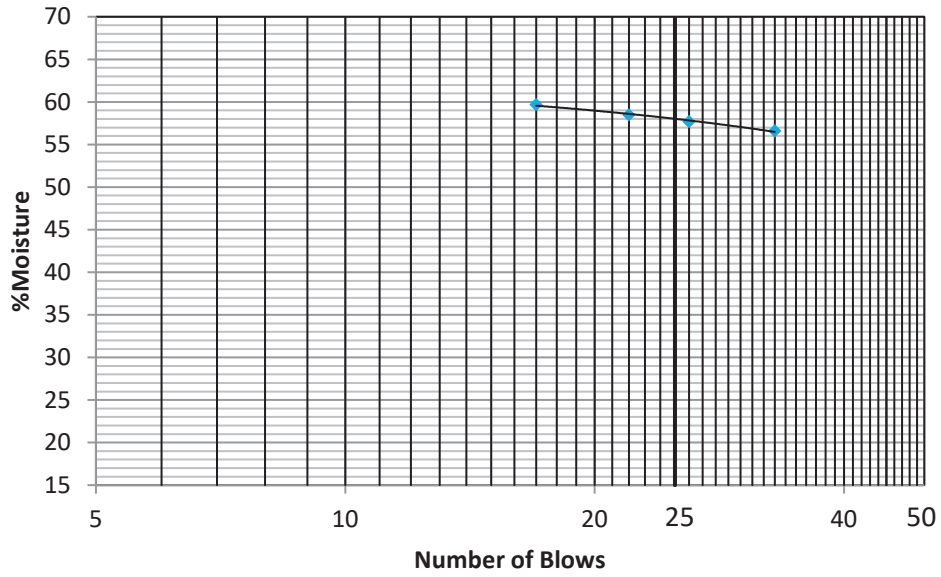
File N◦	12342
Sample N◦	2-5
Date:	8/28/2023
By:	MA

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**

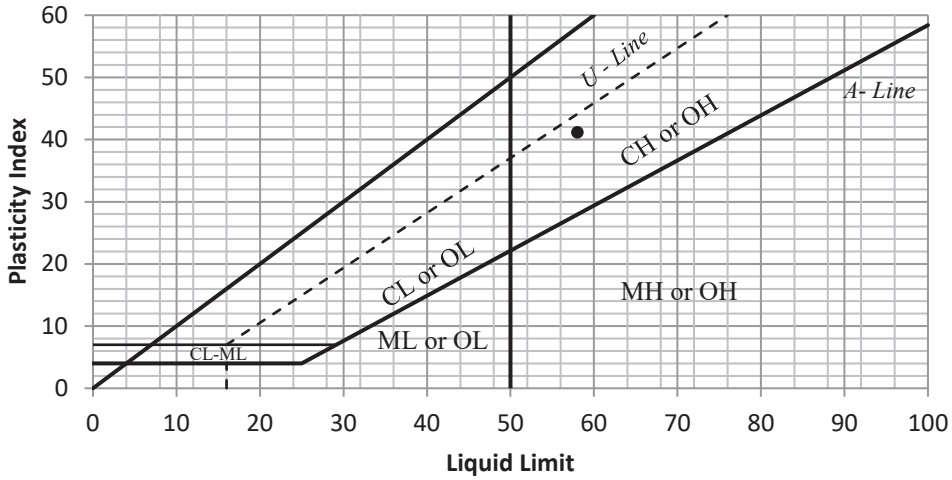


Figure No. 15

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		

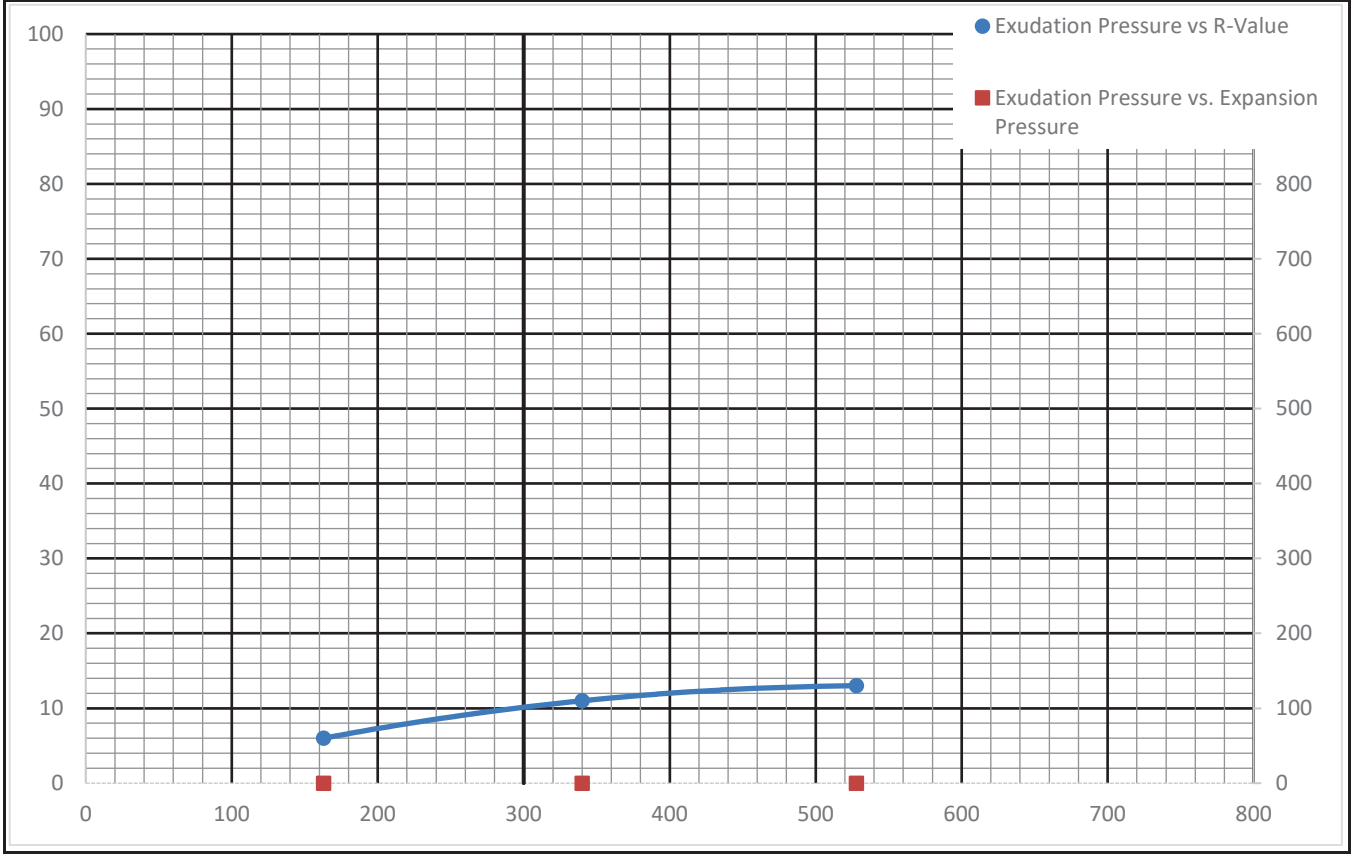


Figure No. 16

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. LG12342
28 March 2024

ALEX HARKER
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, California 94002

Subject: Supplemental Subsurface Investigation

Reference: Proposed Bear Creek Redwoods North Parking Area
Midpeninsula Regional Open Space District
Bear Creek Road
Los Gatos, California
APN: 544-320-01

Dear Alex:

Per your request, HKA has conducted two additional subsurface explorations at the new footprint of the Bear Creek Redwoods Open Space Preserve parking lot.

A Regional Geologic Map, Figure 1 has been included as an attachment to this letter. The site is geologically mapped as being 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.

On 6 March 2024 two (2) supplemental exploratory borings were drilled to the depths of 4.5 feet deep using a 3-inch diameter hand auger and two (2) Dynamic Cone Penetrometers (DCP) tests were advanced to a depth of 3 feet bgs next to each borehole, in the approximate location of the proposed parking lot. The approximate locations of the test borings are indicated on the Boring Site Plan, (See Figure 2 in the Attachments).

The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM

D2487). Figure 3, Key to Logs, was used to depict the subsoil profile for the respective Boring Logs. The Boring Logs are presented in Figures 4 and 5.

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. Stratification lines shown on the logs represent the approximate boundaries between soil types; actual transitions may be gradual.

The strength characteristics of the in-situ soil were determined by the Kessler DCP single-mass Hammer and quick-connect drive rod. Blow counts were obtained by dropping a 10.1-pound single mass hammer through a 22.6-inches free fall. The 0.79-inch diameter cone and drive rod are driven into the subsurface soil 36-inches and the number of blows is recorded for each 2-inch interval of penetration. The penetration per blow is then used to estimate the bearing capacity of the in-situ soils based on the US Army Corps of Engineers (*Measurements of the In Situ Strength of Soils by the Dynamic Cone Penetrometer, 1984*) and Portland Concrete Association (*Design of Concrete Airport Pavement, Portland Cement Association*). See Figures 7 and 8.

The subsurface materials encountered in borings B-5 and B-6 consisted of dark brown sandy clay interbedded with clayey sand soils underlain by brown/gray, sandy clay soils. The soil increased in density with depth. Sample B-5 collected at a depth of 2 feet was taken back to our laboratory and washed through a No. 200 sieve, and it consisted of 67% fines. The results of the sieve analyses can be seen in Figure 6 and they also appear on the "Logs of Test Boring" opposite the sample tested.

The native soils encountered at depths of 4.5 feet deep in our supplemental borings were consistent with our previous soil investigation and matched the mapped geologic unit fs: Franciscan Assemblage and Tsl: San Lorenzo Formation. The bearing capacity of the in-situ soils based on our DCP tests also positively verified the strength parameter presented in our initial geotechnical investigation dated 31 October 2023.

This supplemental letter is not a stand-alone document and should be used only in conjunction with the referenced report. The conclusions and recommendations

presented in the referenced report are still valid. They may be used for the design and construction of the referenced project. The "Limitations and Uniformity of Conditions," section of the referenced report applies to this letter.

If you have any questions concerning this addendum letter, please contact our office.

Respectfully Submitted,
HARO, KASUNICH AND ASSOCIATES, INC.



Thayara Almeida
Staff Engineer



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

TA/jk

Copies: 1 via email: Alex Harker (aharker@openspace.org)

ATTACHMENTS

Boring Site Plan – Figure 1

Regional Geologic Site Map – Figure 2

Key to Logs – Figure 3

Logs of Test Borings Figures 4 - 5

Sieve Analysis – Figures 6

DCP Test Results – Figures 7 - 8



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:	MAR. 2024
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.



	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

NOTES:
1. CONCEPTUAL PARKING LOT SKETCH PROVIDED BY MIDPENINSULA OPEN SPACE DISTRICT, DATED SEPTEMBER 19, 2023.

KEY: B-X = APPROXIMATE LOCATION OF SOIL BORING

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

SCALE:	NTS
DRAWN BY:	TA
DATE:	MAR. 2024
REVISED:	
JOB NO.	LG12342

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

FIGURE NO. 2

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.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				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:	MAR. 2024
REVISED:	
JOB NO.	LG12342

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

FIGURE NO. 3

SHEET NO.

Bear Creek Road Parking
Midpeninsula Open Space District

PROJECT NO. LG12342.2

LOGGED BY JD **DATE DRILLED** 3-6-2024 **BORING DIAMETER** 3' **BORING NO.** HA-5

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			Brown/orange Sandy CLAY, moist, firm, roots	CL-CH					
	B-5 (B)		No roots below 1.5'					24	(B-5 @ 2 ft) Grain Size Analysis
			Difficult hand auger, density increases with depth						Gravel = 5%
	B-6 (B)		Brown/grey Sandy CLAY, moist, stiff						Sand = 28%
5			Boring terminated at 4.5 feet.						Fines = 67%
10									
15									
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 4

File: H:\PROJECTS\12000s\12342 folder, Bear Creek Rd;Midpeninsula Open Space Dist\12342.2 Supplemental Letter\Appendix\12342.1 HA logs 5 & 6 DRAFT 3-12-24.log Date: 3/27/2024

Bear Creek Road Parking
Midpeninsula Open Space District

PROJECT NO. LG12342.2

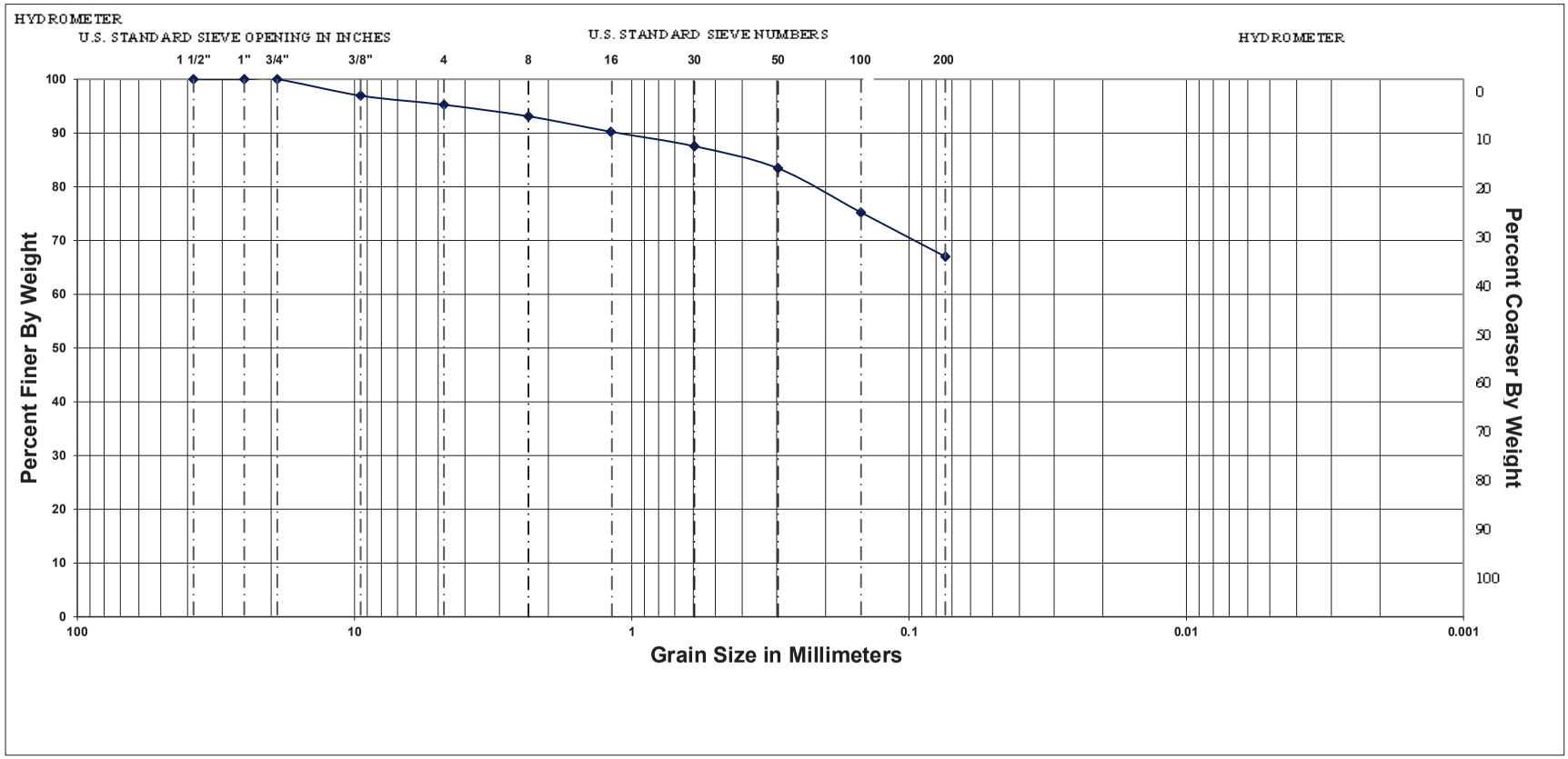
LOGGED BY JD **DATE DRILLED** 3-6-2024 **BORING DIAMETER** 3' **BORING NO.** HA-6

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	B-6 (B)		Dark brown Clayey SAND, moist, soft, roots No roots below 12" Difficult hand auger density increases with depth	SC					
5	B-6 (B)		Brown/gray Sandy CLAY, moist, stiff Hand auger terminated at 4.5 feet.	CL					
10									
15									
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 5

File: H:\PROJECTS\12000s\12342 folder, Bear Creek Rd;Midpeninsula Open Space Dist\12342.2 Supplemental Letter\Appendix\12342.1 HA logs 5 & 6 DRAFT 3-12-24.log Date: 3/27/2024



Gravel Content:	**4.7%**
Sand Content:	**28.3%**
Fines Content	**67.0%**
Cumulative Sum	**100.0%**

Sample Description: Beige Sandy CLAY
Group Symbol: CL-CH

D60	
D30	
D10	
Cu	
Cc	

HKA Project No: 12342.2
Sample No: B-5 @ 2'
Date: March 19, 2024

GRAIN SIZE ANALYSIS

Bear Creek Rd. Mid Pen

Figure No. 6

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

DCP TEST DATA

Project: *LG12342 - Bear Creek Parking Lot* **Date:** 6-Mar-24

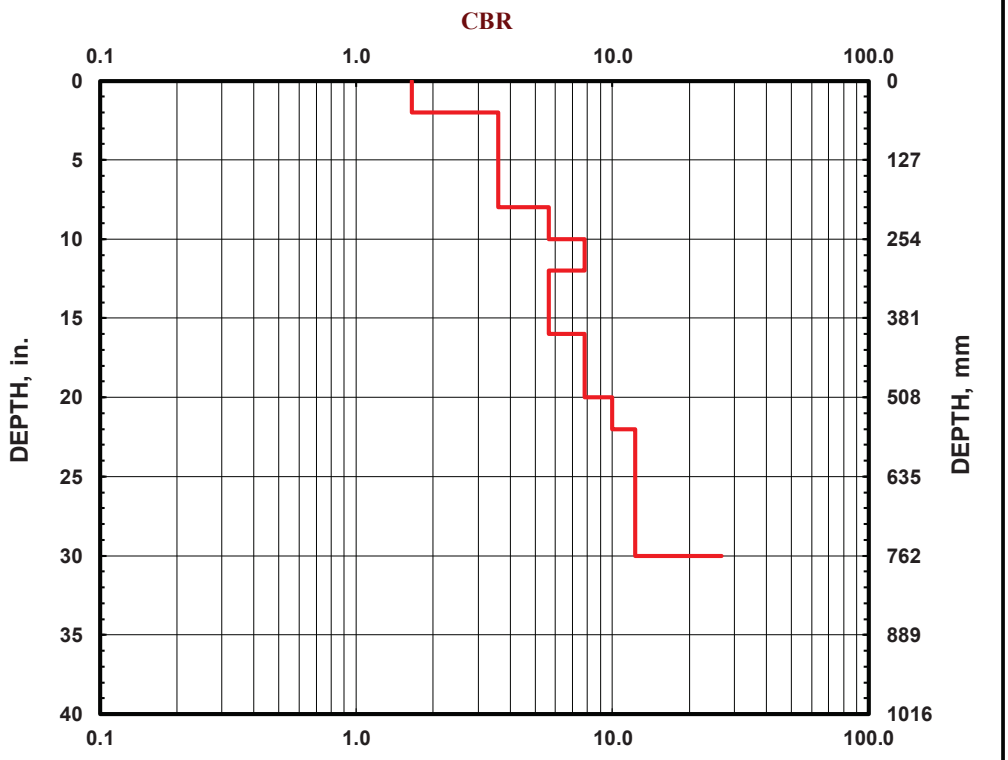
Location: B-5 **Soil Type(s):** CL-CH

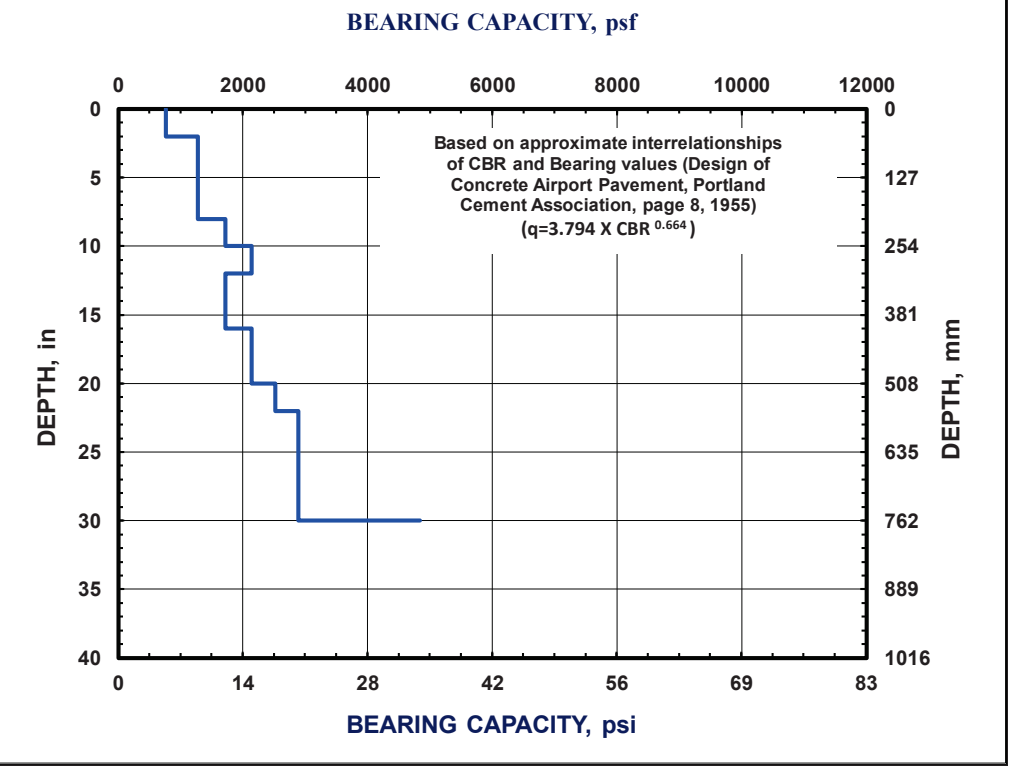
Hammer
- (●) 10.1 lbs.
- ( ) 17.6 lbs.
- ( ) Both hammers used

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

Soil Type
- ( ) CH
- (●) CL
- ( ) All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	50.8	2
2	101.6	2
2	152.4	2
2	203.2	2
3	254	2
4	304.8	2
3	355.6	2
3	406.4	2
4	457.2	2
4	508	2
5	558.8	2
6	609.6	2
6	660.4	2
6	711.2	2
6	762	2





DCP TEST DATA

Project: *LG12342 - Bear Creek Parking Lot* **Date:** 6-Mar-24

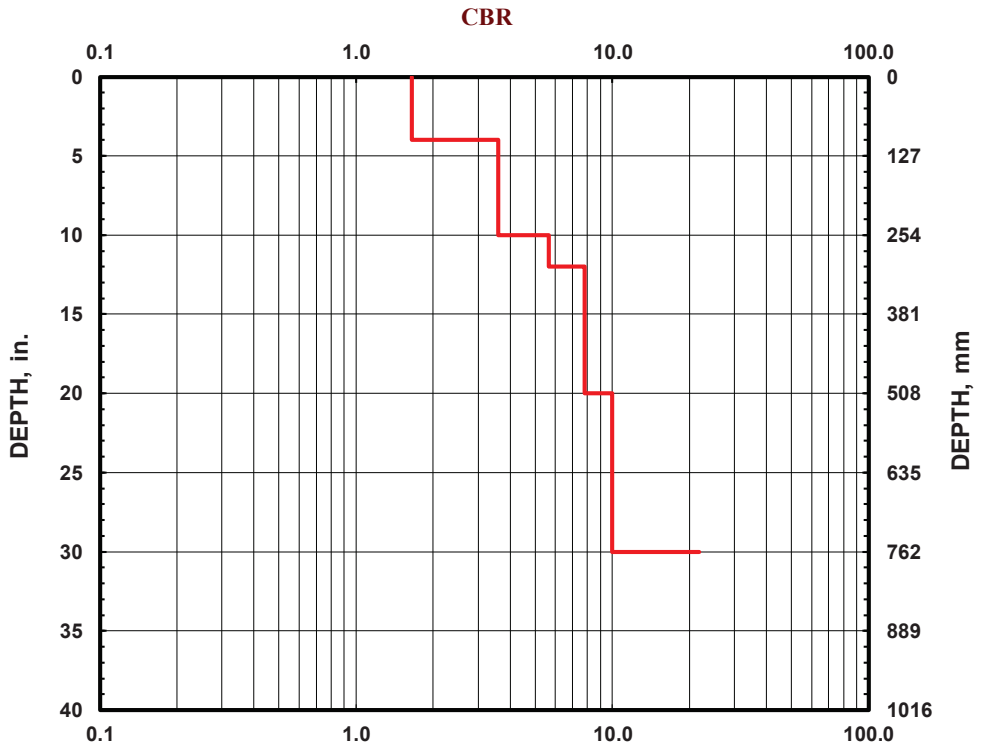
Location: B-6 **Soil Type(s):** CL

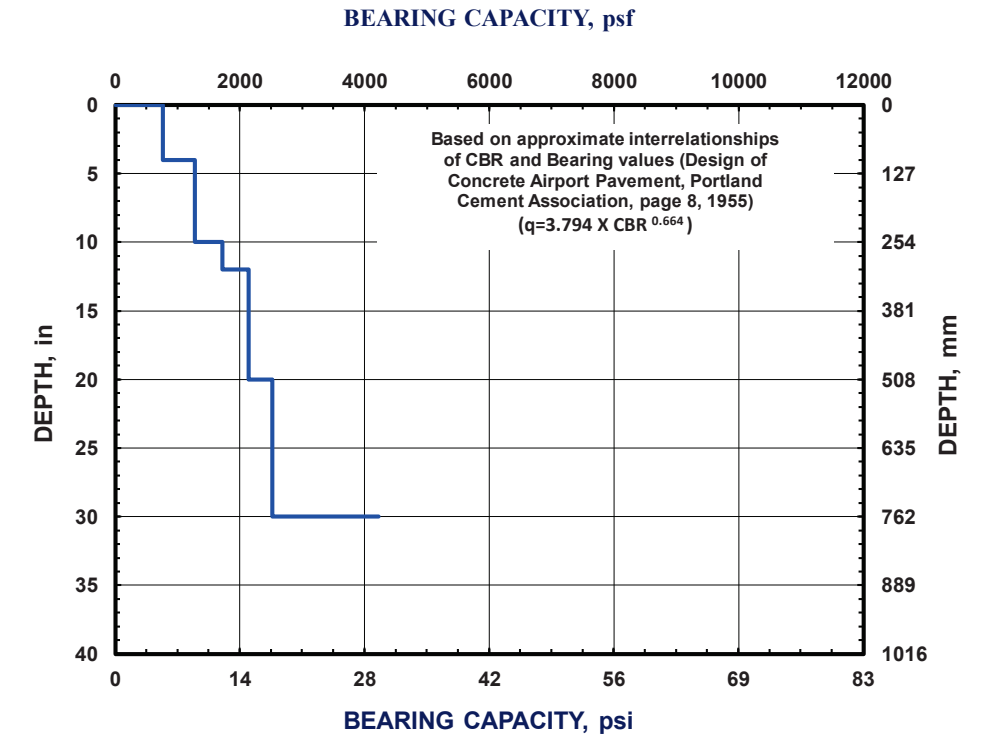
Hammer
- (●) 10.1 lbs.
- ( ) 17.6 lbs.
- ( ) Both hammers used

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

Soil Type
- ( ) CH
- (●) CL
- ( ) All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	2
1	50.8	2
1	101.6	2
1	152.4	2
2	203.2	2
2	254	2
0	304.8	2
3	355.6	2
4	406.4	2
4	457.2	2
4	508	2
4	558.8	2
5	609.6	2
5	660.4	2
5	711.2	2
5	762	2





Project No. SCL12342.3
5 September 2024

ALEX HARKER
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, California 94002

Subject: Geotechnical Memorandum: Double-Ring Infiltration Testing

Reference: Proposed Percolation Tests for New Stormwater Design and Permeable Pavers
Bear Creek Road
Los Gatos, California
APN: 544-320-01

Dear Mrs. Harker:

Haro Kasunich and Associates, Inc. (HKA) prepared this letter to provide the results of the infiltration testing performed just north of the proposed equestrian gathering area, southwest of our boring B-6, at Bear Creek Road (Figure 1). The scope of work performed included one (1) double ring infiltrometer test, one (1) 12" x 12" percolation pit next to the double ring infiltrometer, engineering calculations, preparation of graphics, and submittal of this letter presenting our results. Our original geotechnical report is entitled "*Geotechnical Investigation for Proposed Bear Creek Redwoods North Parking Area, Midpeninsula Regional Open Space District, in Los Gatos, California",* dated 31 October 2023, first revised on 29 May 2024, and *"Supplemental Subsurface Investigation",* dated 28 March 2024.

HKA dug with a shovel a shallow 12" x 12" percolation pit adjacent to the location of the double-ring infiltrometer test. This test pit was only used for ease of observing the rate of water percolating into the soil. In general, the surficial soils encountered in the test pit consisted of dark-brown clayey sand, with roots. Based on our previous soil investigations, the soils in the area appear relatively homogenous and predominantly clayey.

A review of the Santa Clara County GIS website indicates the site and vicinity are mapped as Qls: Landslide rubble over fs: Franciscan Assemblage.

Infiltration Rate

The infiltration rates were determined using a double-ring infiltrometer in accordance with ASTM D3385. The double-ring infiltrometer test consists of driving two open cylinders (rings) into the surface soils at the test locations, filling the rings with water and recording the rate of infiltration of the water. The results of the infiltration testing can be found on Figures 2 and 3. In summary, we obtained a final infiltration rate = 0.250 inches per hour

for the inner and 0.312 inches per hour for the outer ring. We recommend designing the systems for an infiltration rate = 190 min/inch, based on the trend of the outer ring results.

Should you have any questions, please call our office.

Respectfully Submitted,
HARO, KASUNICH & ASSOCIATES, INC.

Thayara Almeida
Staff Engineer

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

REGISTERED PROFESSIONAL ENGINEER
JOHN E. KASUNICH
No. 455
Exp. 06-30-26
GEOTECHNICAL
STATE OF CALIFORNIA

TA/jk
Copies: 1 PDF to Alex Harker (aharker@openspace.org)



	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

*vious areas over 1 acre require hydromodification

NOTES:
1. CONCEPTUAL PARKING LOT SKETCH PROVIDED BY MIDPENINSULA OPEN SPACE DISTRICT, DATED SEPTEMBER 19, 2023.

KEY: B-X = APPROXIMATE LOCATION OF SOIL BORING

IT-X = APPROXIMATE LOCATION OF DOUBLE RING INFILTRATION TEST

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

SCALE:	NTS
DRAWN BY:	TA
DATE:	AUGUST 2024
REVISED:	
JOB NO.	SC12342

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

FIGURE NO. 1

SHEET NO.

Project Identification:	Bear Creek Rd 08-06-24
Test Location:	Southwest of Boring B-6
Liquid Used:	Water
pH:	
Tested By:	JRG/TA
ASTM Method:	D3385-09

Constants:	Area (cm^2)	Depth of Liquid (cm)	Penetration (cm)	Liquid Containers No.	Liquid Containers Vol (cm^2/cm)
Inner Ring	730.6	12.7	7.6	1	N/A
Annular Space	2188.0	12.7	12.7	2	N/A

Trial No.		Date 2024	Elapsed Time hr:min	Interval Duration (min)	Flow Readings: Inner Ring Reading (cm)	Inner Ring Flow (cm^3)	Annular Space Reading (cm)	Annular Space Flow (cm^3)	Liquid Temp degrees C	Incremental Infiltration Rate: Inner cm/hr	Incremental Infiltration Rate: Annular cm/hr	Notes
	S	8-Jul	0:00	15	12.70		12.70		14			
1	E	8-Jul	0:15		10.98	1260.3	10.98	3774.3	14	6.900	6.900	
	S	8-Jul	0:15	15	12.70		12.70		14			
2	E	8-Jul	0:30		12.07	463.9	11.75	2084.1	14	2.540	3.810	
	S	8-Jul	0:30	15	12.70		12.70		14			
3	E	8-Jul	0:45		12.30	290.0	12.07	1389.4	14	1.588	2.540	
	S	8-Jul	0:45	15	12.70		12.70		14			
4	E	8-Jul	1:00		12.30	290.0	12.22	1041.9	14	1.588	1.905	
	S	8-Jul	1:00	30	12.70		12.70		14			
5	E	8-Jul	1:30		12.22	347.9	12.07	1389.4	14	0.952	1.270	
	S	8-Jul	1:30	30	12.70		12.70		14			
6	E	8-Jul	2:00		12.30	290.0	12.22	1042.0	14	0.794	0.952	
	S	8-Jul	2:00	60	12.70		12.70		14			
7	E	8-Jul	3:00		12.07	463.9	11.59	2431.3	14	0.635	1.111	
	S	8-Jul	3:00	60	12.70		12.70		14			
8	E	8-Jul	4:00		12.07	463.9	11.75	2084.1	14	0.635	0.952	
	S	8-Jul	4:00	60	12.70		12.70		14			
9	E	8-Jul	5:00		12.07	463.9	11.75	2084.1	14	0.635	0.952	
	S	8-Jul	5:00	60	12.70		12.70		14			
10	E	8-Jul	6:00		12.07	463.9	11.91	1736.6	14	0.635	0.794	

Inner:	0.635	cm/hr =	1.76E-04	cm/sec	0.250	in/hr	4	<--hr/in.	240	min/in.	
Outer:	0.794	cm/hr =	2.20E-04	cm/sec	0.312	in/hr	3.2	<--hr/in.	192.0	min/in.	

Figure No.: 2

Haro Kasunich and Associates
Coastal and Geotechnical Engineers

Prepared by Thayara Almeida
8/30/2024

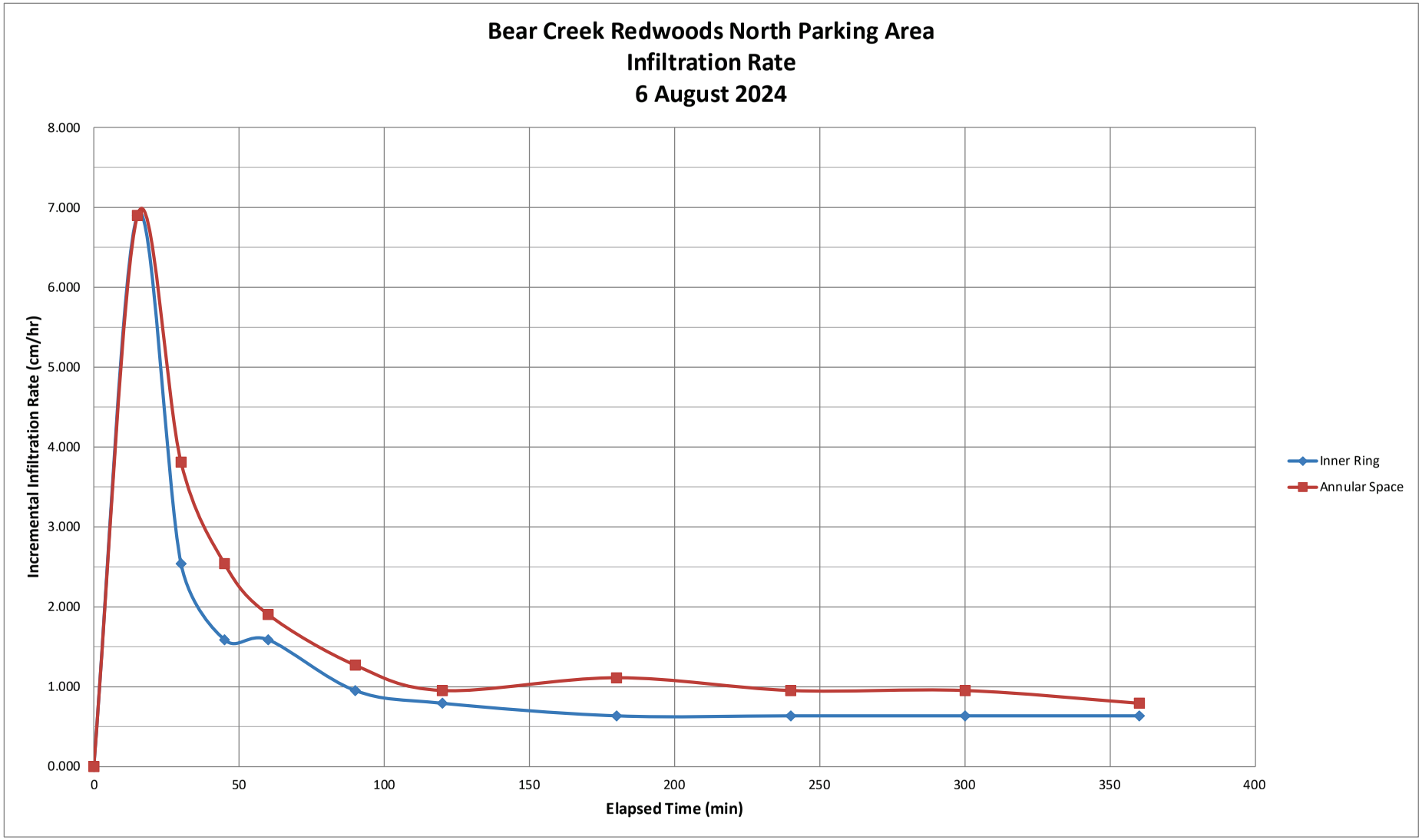


Figure No.: 3

Haro Kasunich and Associates
Coastal and Geotechnical Engineers

Prepared by Thayara Almeida
8/30/2024

APPENDIX C – TRAFFIC REPORT

Hexagon Transportation Consultants, Inc.

Memorandum

Date: June 27, 2024

To: Mr. Zachary Alexander, Midpeninsula Regional Open Space District

From: Gary Black, Katie Riutta

Subject: Traffic Study for the Bear Creek Redwoods Open Space Preserve North Parking Area

Hexagon Transportation Consultants, Inc. has completed a traffic study for the proposed north parking area for the Bear Creek Redwoods Open Space Preserve, which is located along Bear Creek Road in the Santa Cruz Mountains (see Figure 1). Hexagon prepared a traffic study in 2016 for the Preserve, and a parking lot subsequently was built near Alma College. Midpen seeks to build a second parking lot for the Preserve, which would be northeast of the existing Alma Parking Area and would accommodate approximately 50 stalls and 8 equestrian spaces, for a total of 58 parking spaces. The exact number of parking spaces may be lower than 58 spaces, in which case this analysis would represent a conservative approach. The existing parking lot does not accommodate horse trailer parking. The new parking lot would support increased visitation to the Preserve, so the 2016 traffic study needs to be updated to reflect the added traffic. The site plan is shown on Figure 2).

As Bear Creek Road is hilly and winding with limited sight distance in many locations, potential new driveway locations must be carefully studied. Figure 1 shows the proposed driveway location studied in this memo. The study evaluates the effects of project traffic on the operation of two unsignalized intersections and one roadway segment in the vicinity of the project site during the weekday AM and PM peak periods of traffic as well as the Saturday peak hour. The study intersections and roadway segment are identified below.

Study Intersections

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

Study Road Segments

1. Bear Creek Road east of Mellots 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 AM and 9:00 AM, and the PM peak hour of adjacent street traffic is typically between 4:00 PM 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. The busiest Saturday time period was assumed to occur between 1:00 PM and 3:00 PM.

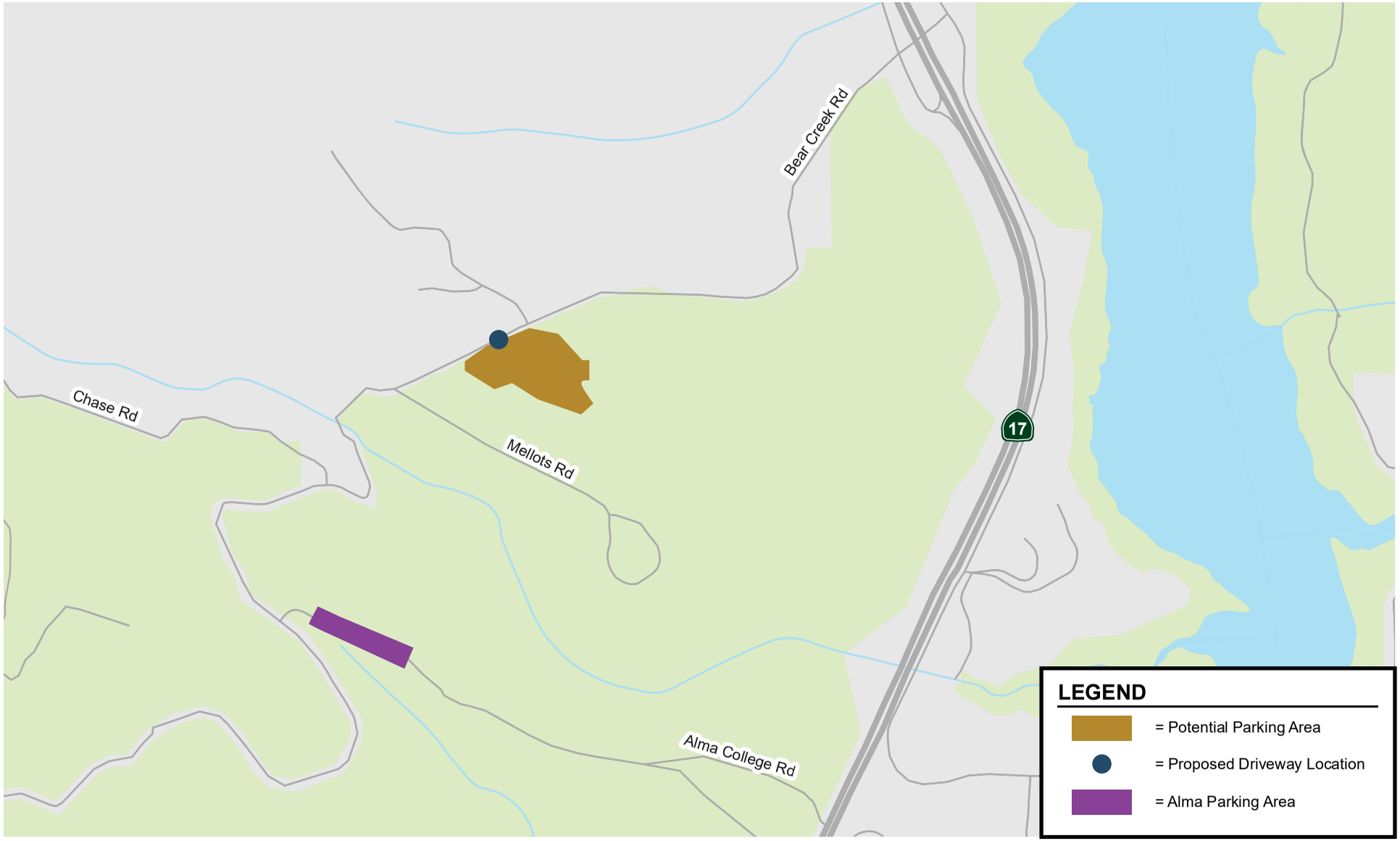


Figure 1
Project Study Area



Figure 2
Site Plan

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing traffic volumes were obtained from 2024 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.

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 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.

Hexagon conducted traffic volume and speed counts on Bear Creek Road near the proposed driveway location for 24 hours on May 22, 2024, a typical weekday. The total volume was about 3,222 vehicles between Mellots Road and the Camel Hill Vineyards driveway. The highest volume occurred between 2:00 PM and 3:00 PM when there were a total of 423 vehicles, with 303 vehicles counted in the eastbound direction. During the AM peak hour at the same location (7:00 AM to 8:00 AM), there were a total of 249 vehicles, with 199 vehicles traveling eastbound. During the PM peak hour (5:00 PM to 6:00 PM), there were a total of 205 vehicles, with 146 vehicles traveling westbound.

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 Road is about 2,100 vehicles per hour, or 1,050 vehicles per hour per lane. As the existing weekday peak-hour volume for the peak direction is 303 vehicles, it can be concluded that Bear Creek Road is currently operating well below its maximum capacity.

The speed data (included in Appendix A) show that speeds were higher during the morning commute period for traffic going toward Highway 17, with the highest speeds occurring between 5:00 AM and 6:00 AM. On a 24-hour basis, the 85th percentile speed at this location was about 31 miles per hour (mph) for both directions. This means that 85 percent of the vehicles traveling along Bear Creek Road are traveling at 31 mph or less. This is consistent with the posted speed limit in the project vicinity of 25 mph, which corresponds to a design speed of 30 mph. Therefore, a design speed of 30 mph was used for the sight distance calculations later in this report.

Existing Intersection Level of Service

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The study intersections were analyzed during the weekday AM and PM peak periods of traffic and during the Saturday peak period. Existing weekday AM (7:00 - 9:00 AM) and PM (4:00 - 6:00 PM) peak-hour traffic volumes and Saturday (1:00 - 3:00 PM) peak-hour traffic volumes were obtained from new manual turning-movement counts (see Figure 3).

The results of the intersection level of service analysis are summarized in Table 1 and show that both study intersections are operating at acceptable levels of service during all peak hours. The level of service calculations are provided in Appendix B.

Table 1
Existing Intersection Level of Service

Study Number	Intersection	Peak Hour	Count Date	Existing Conditions Avg. Delay (sec)[1]	LOS
1	SR 17 SB Ramps & Bear Creek Road (All-way Stop)	AM	05/22/24	10.1	B
		PM	05/22/24	9.6	A
		Saturday	05/25/24	8.9	A
2	SR 17 NB Ramps & Bear Creek Road (Two-way Stop)	AM	05/22/24	31.9	D
		PM	05/22/24	13.4	B
		Saturday	05/25/24	13.7	B

Note:
[1] Delays are based on average delay for all-way stop controlled intersections and the worst approach for two-way stop controlled intersections.

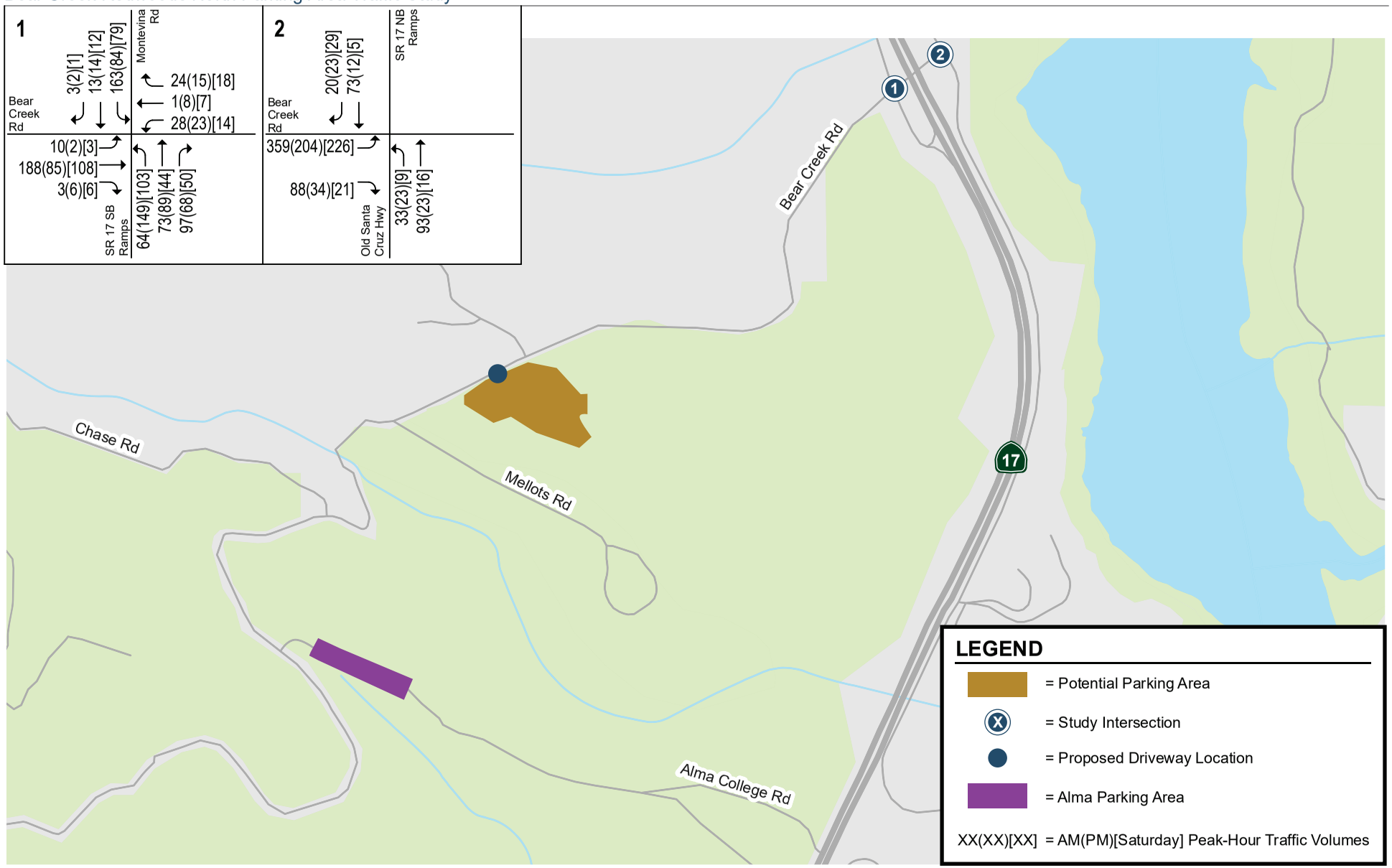


Figure 3
Existing Traffic Volumes

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining this project's trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM, PM, and Saturday peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Trip generation counts were conducted at the Bear Creek Redwoods Alma Parking Area driveway to obtain the existing trip generation rate per parking space. The Alma Parking Area has 53 parking spaces. The driveway counts were conducted during the AM, PM, and Saturday peak periods on Wednesday, May 22, 2024, and on Saturday, May 25, 2024. During the weekday AM peak hour, which occurred from 7:15 - 8:15 AM, the Alma Parking Area generated a total of 6 vehicle trips (6 inbound and 0 outbound). During the weekday PM peak hour, which occurred from 4:15 - 5:15 PM, the Alma Parking Area generated a total of 15 trips (9 inbound and 6 outbound). During the Saturday peak hour, which occurred from 1:30 - 2:30 PM, the Alma Parking Area generated a total of 42 vehicle trips (17 inbound and 25 outbound).

The proposed project trip generation rates were calculated based on the existing trips per parking space. Based on these rates, the project is expected to generate a total of 6 vehicle trips (6 inbound and 0 outbound) during the AM peak hour, 16 vehicle trips (10 inbound and 6 outbound) during the PM peak hour, and 46 vehicle trips (19 inbound and 27 outbound) during the Saturday peak hour. A summary of the project trip generation is shown in Table 2.

Trip Distribution and Assignment

The trip distribution pattern for the proposed project was estimated using the trip distribution in the 2016 traffic study, which was developed based on existing travel patterns on the surrounding roadway system and the locations of complementary land uses. Most project trips were assigned to and from north SR 17, some were assigned to and from south SR 17, and a small percentage was assigned to the nearby streets of Montevina Road and Old Santa Cruz Highway. The peak-hour trips generated by the proposed project were assigned to the roadway system based on the directions of approach and departure, the roadway network connections, and the location of the project driveway. The project trip assignment is shown on Figure 4.

Table 2
Project Trip Generation

			AM Peak Hour					PM Peak Hour					Saturday Peak Hour				
Land Use	**Size**	**Unit**	**Rate**	**% in**	**In**	**Out**	**Total**	**Rate**	**% in**	**In**	**Out**	**Total**	**Rate**	**% in**	**In**	**Out**	**Total**
Existing Trip Generation Counts [1]																	
Alma Parking Area	53	spaces	0.11	100%	6	0	6	0.28	60%	9	6	15	0.79	40%	17	25	42
Proposed Project Trip Generation [2]																	
North Parking Area	58	spaces	0.11	100%	6	0	6	0.28	60%	10	6	16	0.79	40%	19	27	46

Notes:

[1] Peak hour trips are from trip generation counts conducted at the Alma Parking Area driveway on Wednesday, May 22, 2024 and on Saturday, May 25, 2024. The AM peak hour occurred from 7:15 - 8:15 AM, the PM peak hour occurred from 4:15 - 5:15 PM, and the Saturday peak hour occurred from 1:30 - 2:30 PM.

[2] The proposed project trip rates are calculated based on the existing trips per parking space.

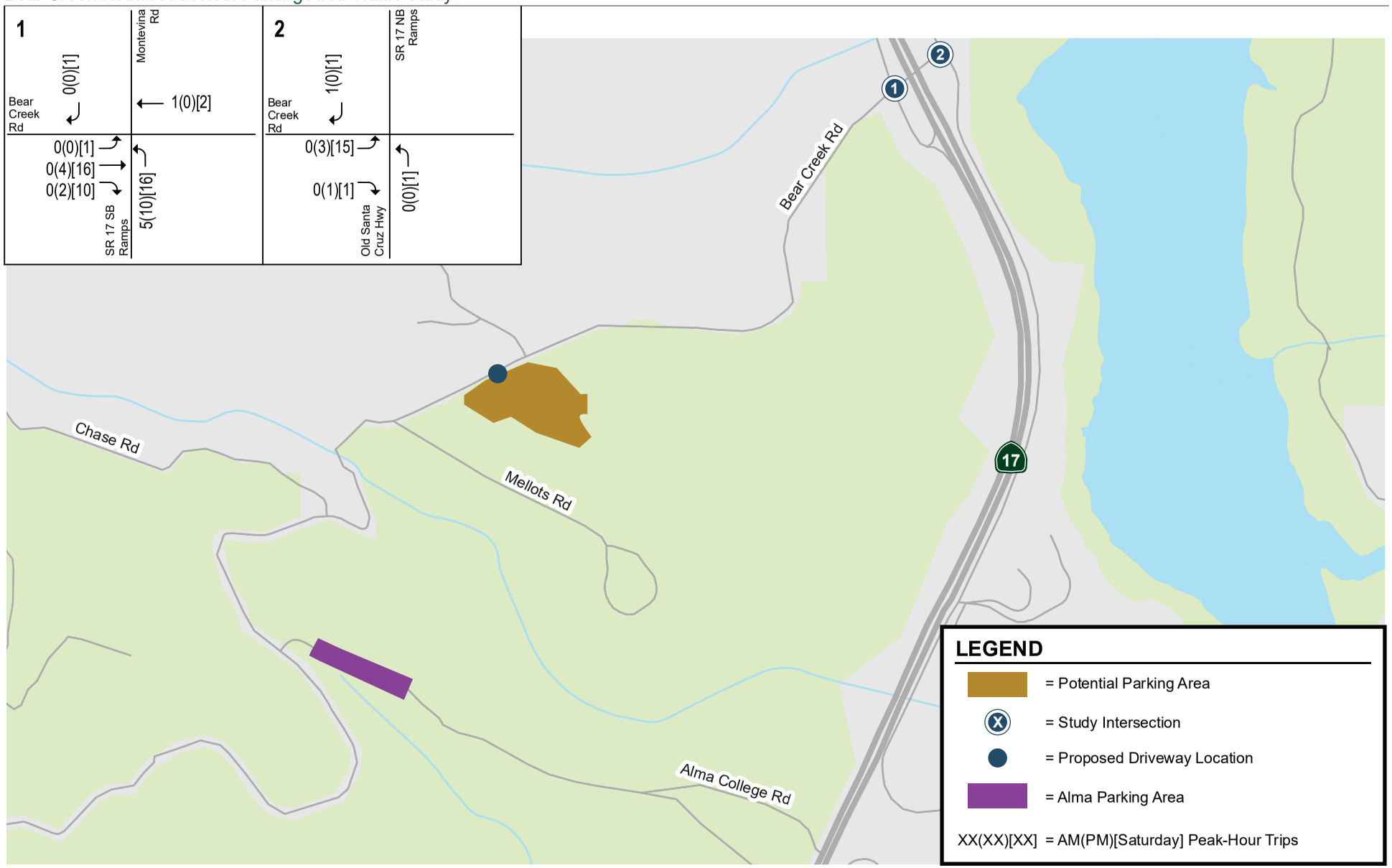


Figure 4
Project Trip Assignment

NORTH
Not to Scale

Roadway Traffic Analysis

Based on the 24-hour traffic volume counts conducted along Bear Creek Road near the proposed driveway location on May 22, 2024, the peak hour for the Preserve trip generation on weekdays would be in the afternoon, between 2:00 PM and 3:00 PM. During the PM peak hour of 4:00 – 5:00 PM discussed above, the weekday volume on Bear Creek Road is 142 vehicles westbound and 65 vehicles eastbound. Based on the above trip generation estimates, the Preserve is expected to add 10 westbound vehicles and 6 eastbound vehicles during the PM peak hour. 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.

Existing Plus Project Intersection Level of Service Analysis

Existing plus project peak-hour traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the project (see Figure 5). Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects the project would have on existing traffic conditions.

The results of the intersection level of service analysis under existing plus project conditions show that both study intersections would operate at an acceptable level of service during the weekday AM and PM peak hours and the Saturday peak hour (see Table 3). The level of service calculations are provided in Appendix B.

Table 3
Existing Plus Project Intersection Level of Service

Study Number	Intersection	Peak Hour	Existing Conditions			
			No Project		Plus Project	
			Avg. Delay (sec)[1]	LOS	Avg. Delay (sec)[1]	LOS
1	SR 17 SB Ramps & Bear Creek Road (All-way Stop)	AM	10.1	B	10.2	B
		PM	9.6	A	9.8	A
		Saturday	8.9	A	9.2	A
2	SR 17 NB Ramps & Bear Creek Road (Two-way Stop)	AM	31.9	D	31.9	D
		PM	13.4	B	13.5	B
		Saturday	13.7	B	14.2	B

Note:
[1] Delays are based on average delay for all-way stop controlled intersections and the worst approach for two-way stop controlled intersections.

Bold indicates a substandard level of service.

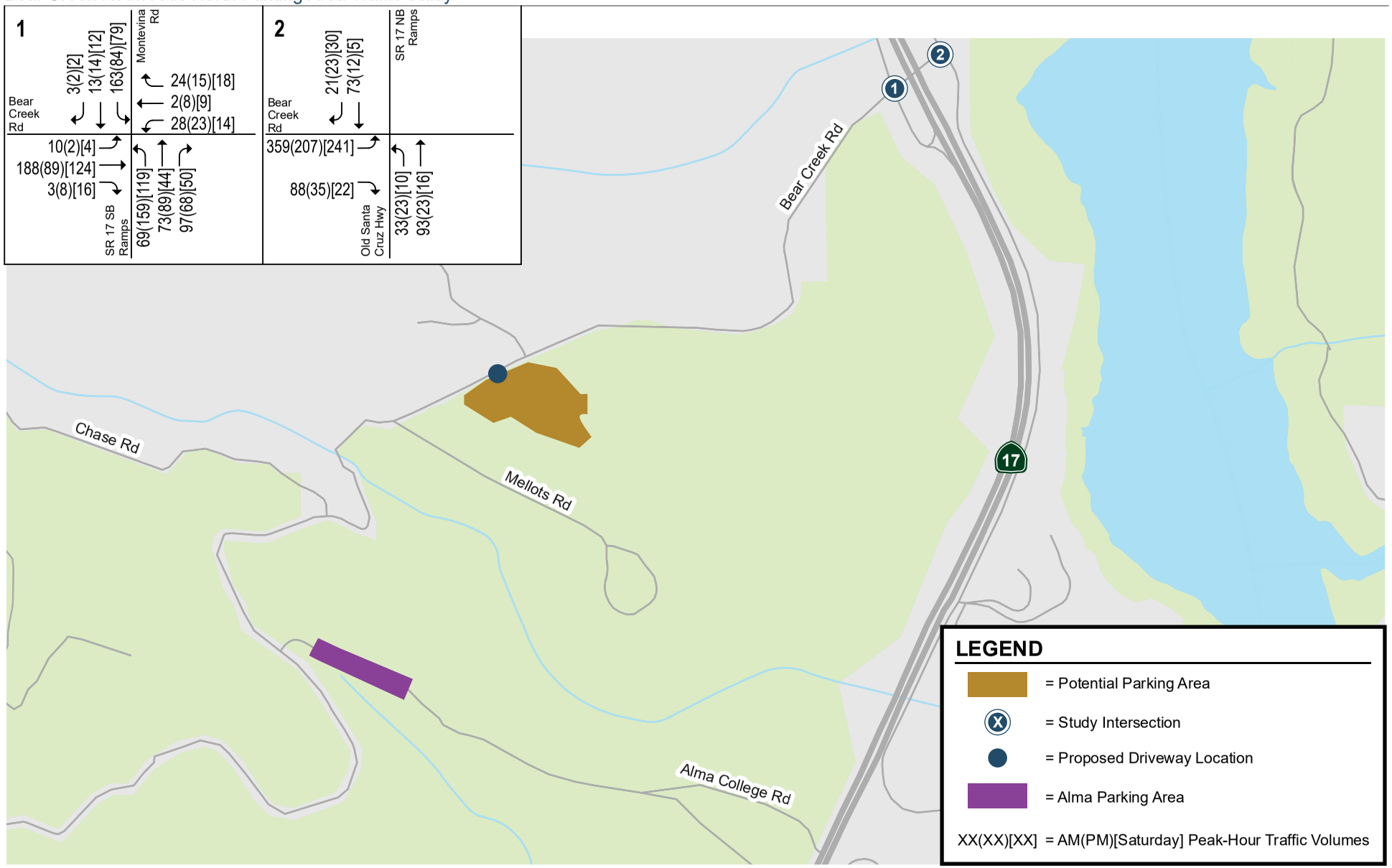


Figure 5
Existing Plus Project Traffic Volumes

Future Plus Project Intersection Level of Service Analysis

Future conditions were assumed to be in 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 (see Appendix B). During the weekday PM peak hour and Saturday peak hour, the intersection of the SR 17 Northbound Ramps & Bear Creek Road would operate at LOS B and C, respectively, under future plus project conditions. During the weekday AM peak hour, the intersection operates at LOS D under existing conditions and would continue to operate at LOS D under existing plus project conditions for the northbound left-through movement. Under future plus project conditions, the delay would increase, and the intersection would operate at LOS F based on the northbound left-through movement due to the assumed future growth. There were no project trips assumed for the northbound approach during the AM peak hour. Therefore, the project would not contribute to the increase in delay at this intersection. There is ample room for any queuing along Old Santa Cruz Highway so the queuing would 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)[1]	LOS
1	SR 17 SB Ramps & Bear Creek Road (All-way Stop)	AM	11.0	B
		PM	10.5	B
		Saturday	9.6	A
2	SR 17 NB Ramps & Bear Creek Road (Two-way Stop)	AM	**61.4**	**F**
		PM	14.9	B
		Saturday	15.6	C

Note:
[1] Delays are based on average delay for all-way stop controlled intersections and the worst approach for two-way stop controlled intersections.

Bold indicates a substandard level of service.

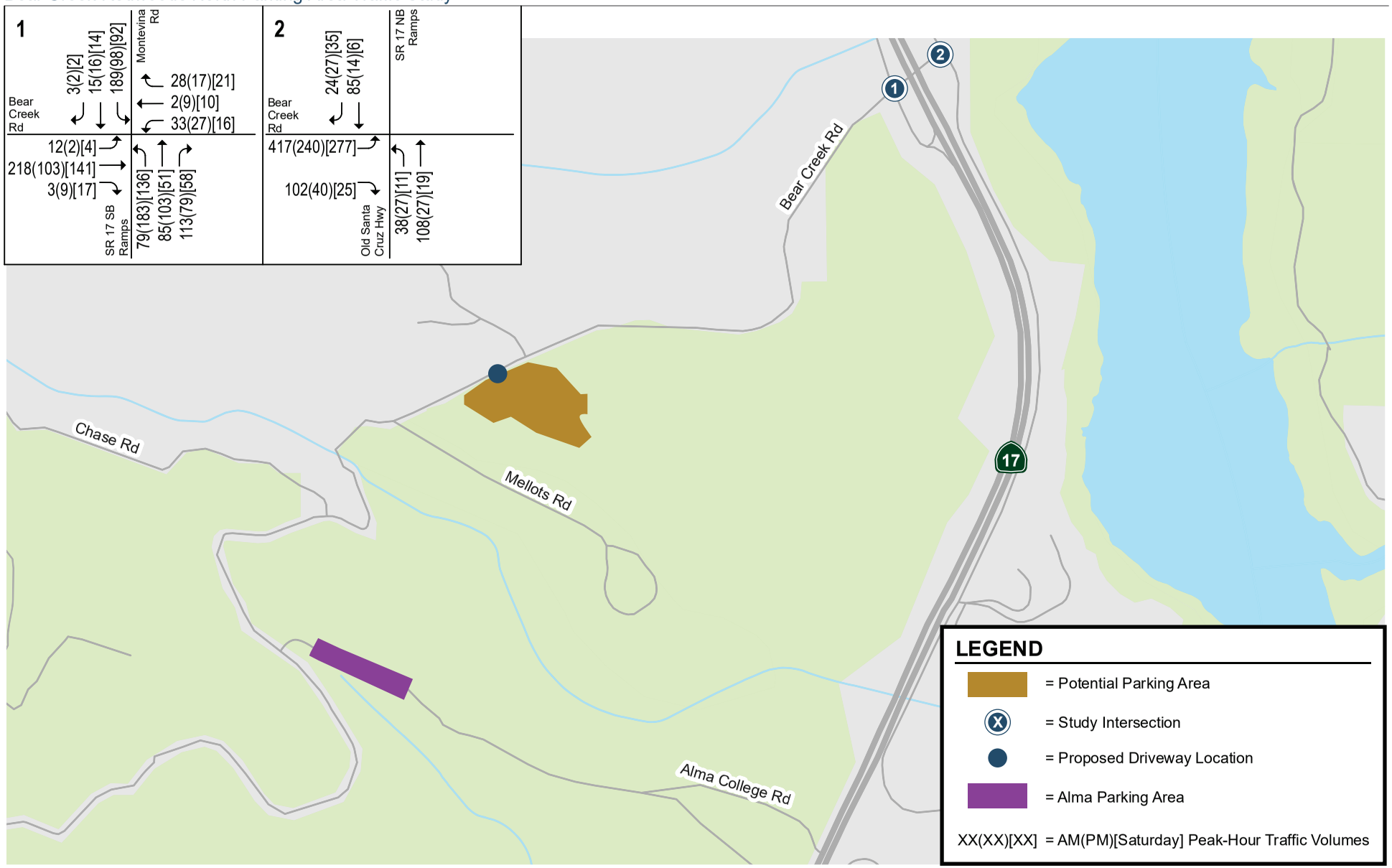


Figure 6
Future Plus Project Traffic Volumes

Driveway Sight Distance Analysis

The most important factor in adequate and safe driveway operations is the sight distance. Driveway approaches should be free and clear of any obstruction to optimize sight distance, thereby ensuring that vehicles at the driveway can see roadway users traveling on Bear Creek Road. Landscaping and signage surrounding the proposed driveway should be located in such a way to ensure an unobstructed view for drivers entering Bear Creek Road. Providing the appropriate sight distance reduces the likelihood of a collision and provides drivers with the ability to locate sufficient gaps in traffic.

The minimum acceptable sight distance is based on the recommended stopping sight distance in the Caltrans *Highway Design Manual*, Table 201.1. The proposed driveway would allow all movements, thus vehicles entering Bear Creek Road from the proposed driveway will need to have adequate sight distance in both directions. Sight distance requirements vary depending on roadway speeds. Bear Creek Road has a posted speed limit of 25 mph, which corresponds to a design speed of 30 mph. In addition, traffic speed data collected near the proposed driveway location on a typical weekday shows that the 85th percentile speed was about 31 mph. Therefore, the Caltrans stopping sight distance is 200 feet (based on a design speed of 30 mph). Thus, a driver must be able to see 200 feet in both directions on Bear Creek Road to locate a sufficient gap to turn out from the proposed driveway.

The proposed driveway location is located between Mellots Road and the Camel Hill Vineyard entrance. Hexagon conducted field observations at this location to evaluate the stopping sight distance. It was determined that the proposed driveway location would have sight distance of 475 feet to the west, which is associated with a design speed between 50-55 mph, and 525 feet to the east, which is associated with a design speed between 55-60 mph, if some existing vegetation were removed. There is a tree located within the Clear Sight Triangle that would obstruct the view of drivers stopped at the proposed driveway looking east. Visibility could be improved by removing the tree directly east of the proposed driveway (next to the utility pole) and trimming any vegetation that exceeds 42 inches, which is the typical height of the driver's eyes above the pavement surface. If the existing vegetation is removed/maintained, the project driveway would provide adequate sight distance according to Caltrans' recommendations. The sight distance analysis is summarized in Table 5. The view from the proposed driveway looking east and west is shown on Figure 7.

Table 5
Sight Distance Analysis

Location on Bear Creek Road	Road Grade	Design Speed	Required Sight Distance	Actual Sight Distance	Associated Design Speed
Proposed Driveway Location Looking West	insignificant	30 mph	200 ft	475 ft	50-55 mph
Proposed Driveway Location Looking East	insignificant	30 mph	200 ft	525 ft	55-60 mph

Looking West



Looking East



Figure 7
Views from Proposed Driveway Location (approximate)

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.



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

Collision Analysis

Collision data for Bear Creek Road between the Open Space Preserve Alma Parking Area and about 500 feet east of the proposed driveway were obtained from County of Santa Clara staff via the University of California, Berkeley's Transportation Injury Mapping System (TIMS), which provides access to the Statewide Integrated Traffic Records System (SWITRS). The collision data was analyzed to determine if any trends or patterns are evident that should be addressed. Data from 1/17/2017 to 12/31/2024 was obtained from the SWITRS database, with the disclaimer that data from 2022 and later is provisional and subject to change. The results show that there were a total of nine collisions along that corridor from 2017 through 2022, including three sideswipes, four hit objects, one head-on, and one rear-end collision. Three of the hit-object collisions involved drivers under the influence. Five of the collisions occurred during the daylight and four occurred at night. Two of the collisions resulted in injury, including a hit-object collision where the driver was under the influence and the head-on collision where a driver heading east passed another driver and collided with a westbound vehicle. All collisions occurred near a curved section of roadway and no collisions occurred directly adjacent to the proposed driveway location. Three collisions occurred in 2017, one in 2018, two in 2019, two in 2020, and one in 2022. The Alma Parking Area was constructed in 2020. The rate of collisions has not substantially changed in the last few years and there are no clear trends that could be addressed with infrastructure improvements. The collision data is provided in Appendix C.

Conclusions

The proposed Bear Creek Redwoods North Parking Area would not create adverse traffic effects to Bear Creek Road. Bear Creek Road is currently operating well below its capacity and would continue to do so with the modest project traffic added during regular weekdays/weekends. The proposed driveway location can provide adequate sight distance as long as the proposed tree and vegetation removals are carried out.

The intersection of the SR 17 Southbound Ramps & Bear Creek Road are expected to operate well during weekdays and weekends with the modest project traffic added. The intersection level of service calculation shows that northbound traffic at the intersection of the SR 17 Northbound Ramps & Bear Creek Road would face long delays under future plus project conditions, and the intersection would operate at LOS F. There were no project trips assumed for the northbound approach during the AM peak hour. Therefore, the project would not contribute to the increase in delay at this intersection. There is ample room for any queuing along Old Santa Cruz Highway so the queuing would not disrupt intersection operations or create unsafe conditions.

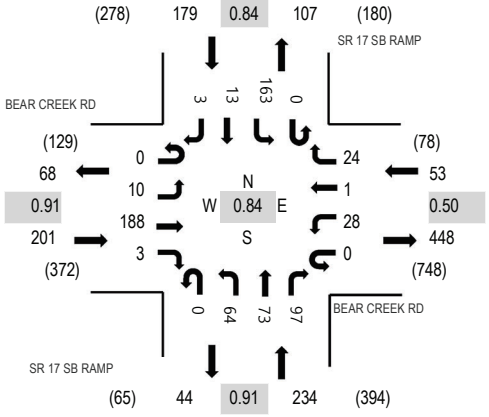
Appendix A

Traffic Counts

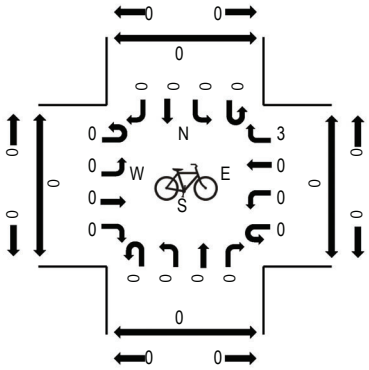
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 SR 17 SB RAMP & BEAR CREEK RD AM
Date: Wednesday, May 22, 2024
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

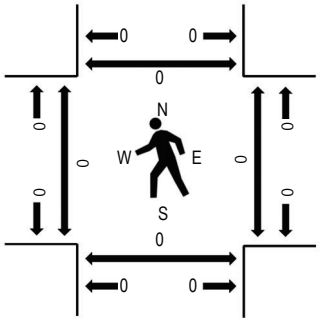
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 SB RAMP Northbound				SR 17 SB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	51	0	0	0	1	3	0	11	9	11	0	20	4	0	110	535	0	0	0	0
7:15 AM	0	0	47	0	0	1	0	4	0	9	11	13	0	23	2	0	110	623	0	0	0	0
7:30 AM	0	1	51	1	0	2	0	4	0	21	27	12	0	27	1	0	147	667	0	0	0	0
7:45 AM	0	2	50	1	0	5	0	6	0	16	12	21	0	49	6	0	168	646	0	0	0	0
8:00 AM	0	6	51	1	0	21	1	5	0	14	20	30	0	46	1	2	198	587	0	0	0	0
8:15 AM	0	1	36	0	0	0	0	9	0	13	14	34	0	41	5	1	154		0	0	0	0
8:30 AM	0	0	36	0	0	4	1	2	0	20	17	12	0	28	4	2	126		0	0	0	0
8:45 AM	0	0	37	0	0	4	1	4	0	16	23	8	0	14	2	0	109		0	0	0	0

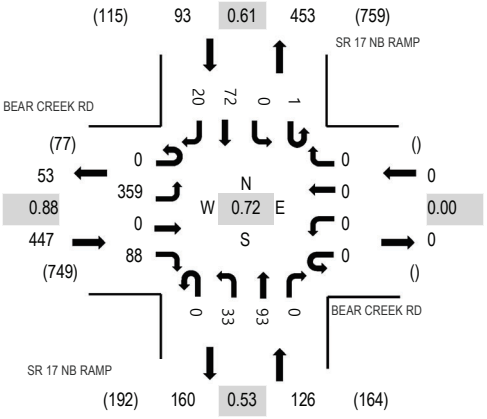
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Lights	0	10	187	3	0	28	1	21	0	59	71	93	0	161	11	3	648
Mediums	0	0	1	0	0	0	0	3	0	5	2	3	0	2	2	0	18
Total	0	10	188	3	0	28	1	24	0	64	73	97	0	163	13	3	667

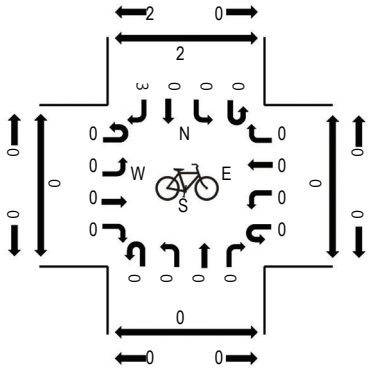
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 SR 17 NB RAMP & BEAR CREEK RD AM
Date: Wednesday, May 22, 2024
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

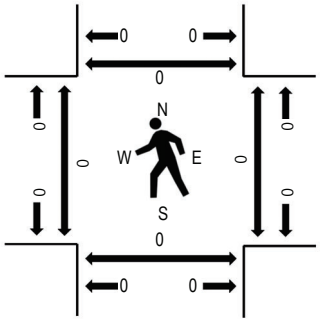
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 NB RAMP Northbound				SR 17 NB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	76	0	7	0	0	0	0	0	0	4	0	0	0	0	3	90	469	0	0	0	0
7:15 AM	0	78	0	5	0	0	0	0	0	2	3	0	0	0	4	3	95	609	0	1	1	0
7:30 AM	0	81	0	9	0	0	0	0	0	2	3	0	1	0	5	4	105	666	0	0	0	0
7:45 AM	0	101	0	18	0	0	0	0	0	5	17	0	0	0	31	7	179	663	0	0	0	0
8:00 AM	0	97	0	30	0	0	0	0	0	23	43	0	0	0	34	3	230	559	0	0	0	0
8:15 AM	0	80	0	31	0	0	0	0	0	3	30	0	0	0	2	6	152		0	0	0	0
8:30 AM	0	68	0	8	0	0	0	0	0	3	15	0	0	0	3	5	102		0	0	0	0
8:45 AM	0	56	0	4	0	0	0	0	0	5	6	0	0	0	1	3	75		0	0	0	0

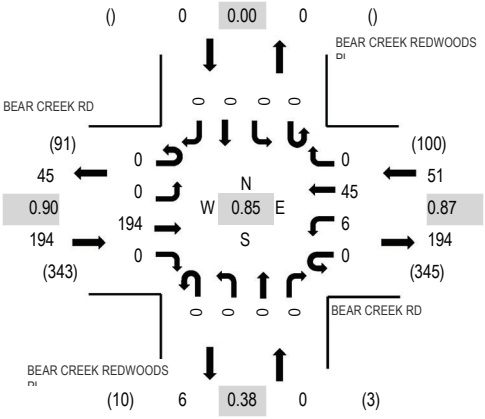
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Lights	0	355	0	85	0	0	0	0	0	31	93	0	1	0	72	19	656
Mediums	0	3	0	3	0	0	0	0	0	2	0	0	0	0	0	1	9
Total	0	359	0	88	0	0	0	0	0	33	93	0	1	0	72	20	666

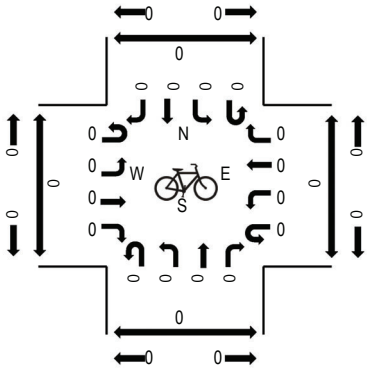
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 BEAR CREEK REDWOODS PL & BEAR CREEK RD AM
Date: Wednesday, May 22, 2024
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

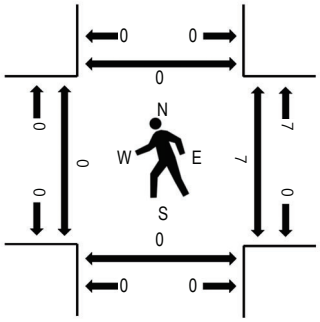
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				BEAR CREEK REDWOODS PL Northbound				BEAR CREEK REDWOODS PL Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	49	0	0	2	6	0	0	0	0	0	0	0	0	0	57	244	0	0	0	0
7:15 AM	0	0	48	0	0	0	7	0	0	0	0	0	0	0	0	0	55	245	0	2	0	0
7:30 AM	0	0	47	0	0	1	12	0	0	0	0	0	0	0	0	0	60	239	0	0	0	0
7:45 AM	0	0	55	0	0	0	17	0	0	0	0	0	0	0	0	0	72	227	0	1	0	0
8:00 AM	0	0	44	0	0	5	9	0	0	0	0	0	0	0	0	0	58	202	0	4	0	0
8:15 AM	0	0	38	0	0	0	11	0	0	0	0	0	0	0	0	0	49		0	1	0	0
8:30 AM	0	0	30	0	0	1	16	0	0	1	0	0	0	0	0	0	48		0	1	0	0
8:45 AM	0	0	32	0	0	1	12	0	0	0	0	2	0	0	0	0	47		0	1	0	0

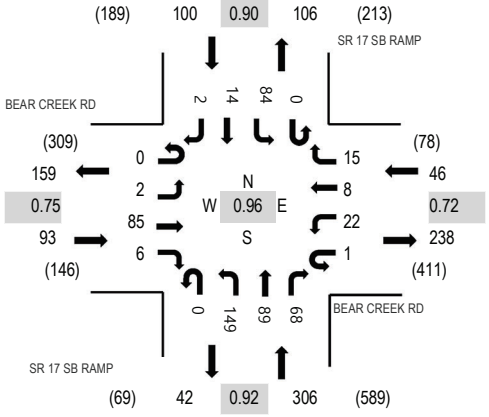
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	194	0	0	6	41	0	0	0	0	0	0	0	0	0	241
Mediums	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Total	0	0	194	0	0	6	45	0	0	0	0	0	0	0	0	0	245

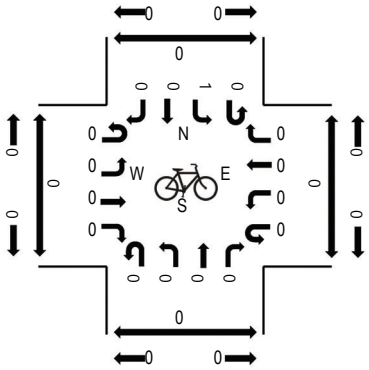
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 SR 17 SB RAMP & BEAR CREEK RD PM
Date: Wednesday, May 22, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

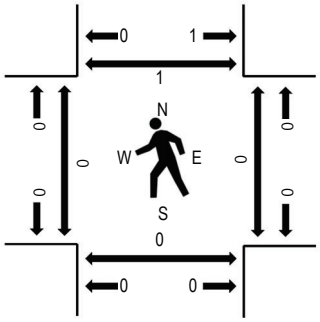
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 SB RAMP Northbound				SR 17 SB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	14	1	0	3	1	6	0	33	17	18	0	15	5	0	113	516	0	0	0	0
4:15 PM	0	0	20	2	1	4	1	5	0	35	30	16	0	16	4	2	136	545	0	0	0	0
4:30 PM	0	0	16	3	0	3	2	3	0	34	24	16	0	23	3	0	127	536	0	0	0	0
4:45 PM	0	0	20	1	0	6	3	2	0	42	18	23	0	21	4	0	140	517	0	0	0	0
5:00 PM	0	2	29	0	0	9	2	5	0	38	17	13	0	24	3	0	142	486	0	0	0	1
5:15 PM	0	0	13	0	0	2	0	4	1	42	26	9	0	22	6	2	127		0	0	0	1
5:30 PM	0	2	10	0	0	0	1	4	0	39	22	11	0	18	1	0	108		0	0	0	0
5:45 PM	0	0	12	1	0	4	0	7	0	31	19	15	0	16	3	1	109		0	0	0	0

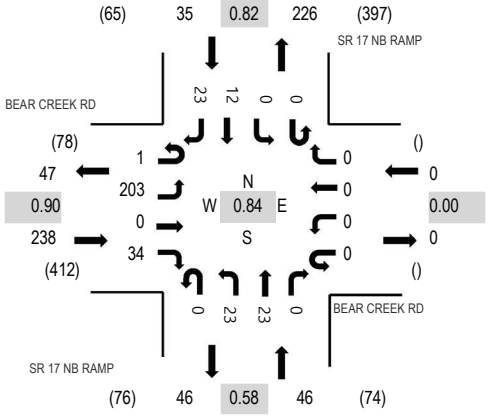
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	2	85	6	1	22	8	15	0	149	89	66	0	83	10	2	538
Mediums	0	0	0	0	0	0	0	0	0	0	0	2	0	1	4	0	7
Total	0	2	85	6	1	22	8	15	0	149	89	68	0	84	14	2	545

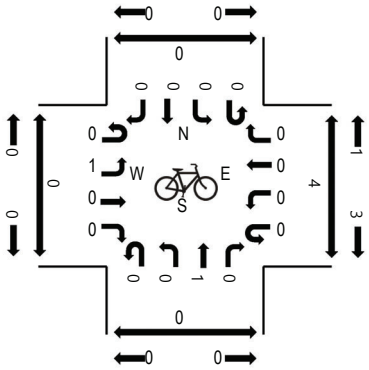
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 SR 17 NB RAMP & BEAR CREEK RD PM
Date: Wednesday, May 22, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

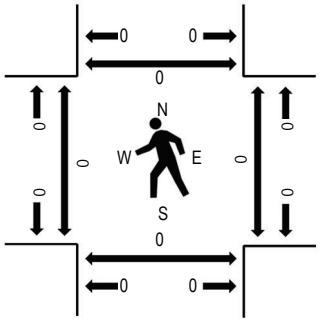
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 NB RAMP Northbound				SR 17 NB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	40	0	8	0	0	0	0	0	2	7	0	0	0	1	8	66	290	0	0	0	0
4:15 PM	1	43	0	9	0	0	0	0	0	4	4	0	0	0	0	6	67	319	0	0	0	0
4:30 PM	0	50	0	5	0	0	0	0	0	4	4	0	0	0	4	5	72	310	0	0	0	0
4:45 PM	0	53	0	11	0	0	0	0	0	5	5	0	0	0	6	5	85	287	0	0	0	0
5:00 PM	0	57	0	9	0	0	0	0	0	10	10	0	0	0	2	7	95	261	0	0	0	0
5:15 PM	0	41	0	3	0	0	0	0	0	0	7	0	0	0	1	6	58		0	0	0	0
5:30 PM	0	32	0	6	0	0	0	0	0	0	3	0	0	0	2	6	49		0	0	0	0
5:45 PM	0	37	0	7	0	0	0	0	0	5	4	0	0	0	2	4	59		0	0	1	0

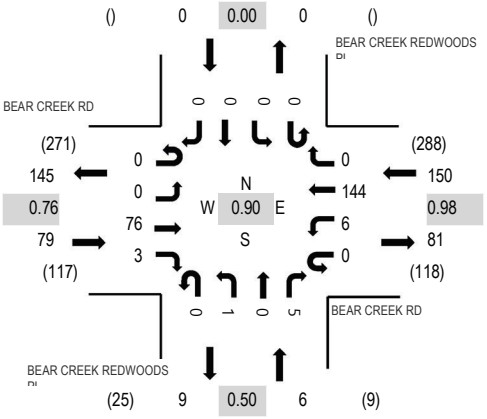
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	1	200	0	34	0	0	0	0	0	23	23	0	0	0	11	23	315
Mediums	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4
Total	1	203	0	34	0	0	0	0	0	23	23	0	0	0	12	23	319

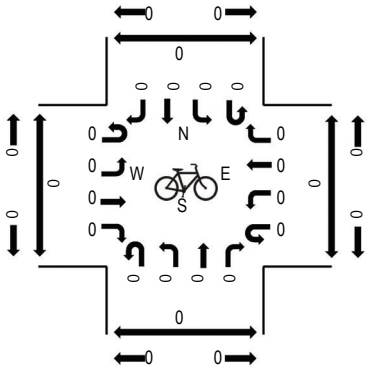
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 BEAR CREEK REDWOODS PL & BEAR CREEK RD PM
Date: Wednesday, May 22, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

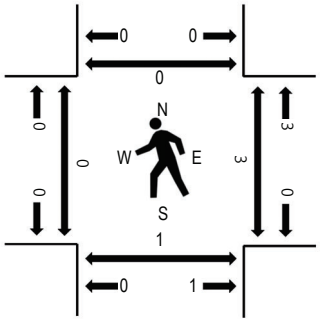
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				BEAR CREEK REDWOODS PL Northbound				BEAR CREEK REDWOODS PL Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	10	0	0	0	29	0	0	2	0	0	0	0	0	0	41	211	0	3	1	0
4:15 PM	0	0	16	1	0	1	37	0	0	1	0	3	0	0	0	0	59	235	0	0	0	0
4:30 PM	0	0	17	1	0	0	33	0	0	0	0	1	0	0	0	0	52	225	0	0	0	0
4:45 PM	0	0	17	1	0	1	39	0	0	0	0	1	0	0	0	0	59	223	0	0	0	0
5:00 PM	0	0	26	0	0	4	35	0	0	0	0	0	0	0	0	0	65	203	0	3	1	0
5:15 PM	0	0	8	1	0	2	37	0	0	1	0	0	0	0	0	0	49		0	2	0	0
5:30 PM	0	0	11	0	0	5	34	0	0	0	0	0	0	0	0	0	50		0	0	0	0
5:45 PM	0	0	8	0	0	8	23	0	0	0	0	0	0	0	0	0	39		0	2	0	0

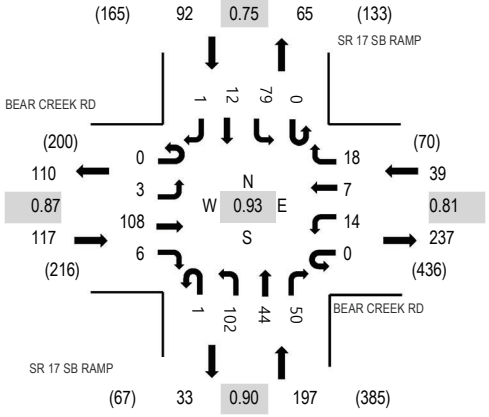
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	76	3	0	6	143	0	0	1	0	5	0	0	0	0	234
Mediums	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	76	3	0	6	144	0	0	1	0	5	0	0	0	0	235

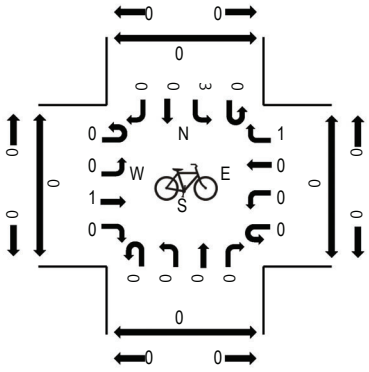
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 SR 17 SB RAMP & BEAR CREEK RD Noon
Date: Saturday, May 25, 2024
Peak Hour: 01:30 PM - 02:30 PM
Peak 15-Minutes: 02:00 PM - 02:15 PM

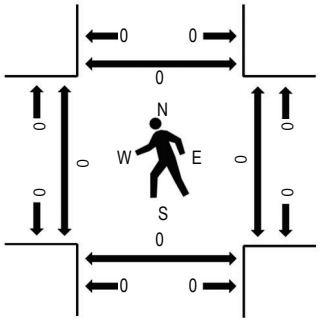
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 SB RAMP Northbound				SR 17 SB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
1:00 PM	0	0	20	0	0	4	0	2	0	19	13	12	0	21	4	0	95	400	0	0	0	0
1:15 PM	0	1	25	1	0	4	1	2	1	24	17	13	0	6	3	0	98	424	0	0	0	0
1:30 PM	0	0	21	0	0	4	1	5	0	25	13	12	0	14	4	0	99	445	0	0	0	0
1:45 PM	0	2	28	1	0	4	1	6	1	25	10	10	0	19	1	0	108	440	0	0	0	0
2:00 PM	0	1	30	4	0	1	1	4	0	25	9	13	0	25	5	1	119	436	0	0	0	0
2:15 PM	0	0	29	1	0	5	4	3	0	27	12	15	0	21	2	0	119		0	0	0	0
2:30 PM	0	0	25	1	0	6	1	2	0	18	9	13	0	18	1	0	94		0	0	0	1
2:45 PM	0	1	20	5	0	3	1	5	0	26	16	7	0	19	1	0	104		0	0	0	0

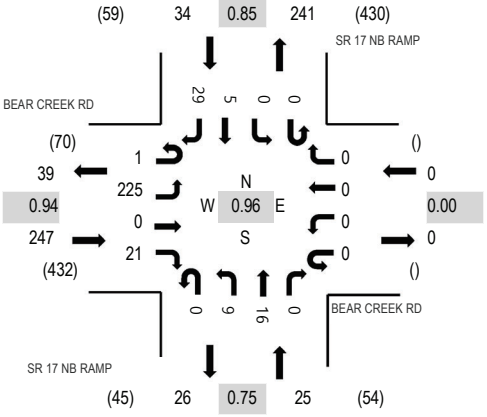
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	3	108	5	0	14	7	18	1	101	43	49	0	76	11	1	437
Mediums	0	0	0	1	0	0	0	0	0	1	1	1	0	3	1	0	8
Total	0	3	108	6	0	14	7	18	1	102	44	50	0	79	12	1	445

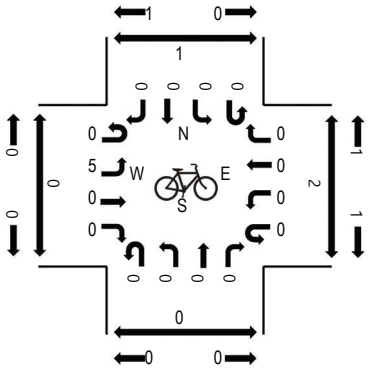
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 SR 17 NB RAMP & BEAR CREEK RD Noon
Date: Saturday, May 25, 2024
Peak Hour: 01:45 PM - 02:45 PM
Peak 15-Minutes: 02:15 PM - 02:30 PM

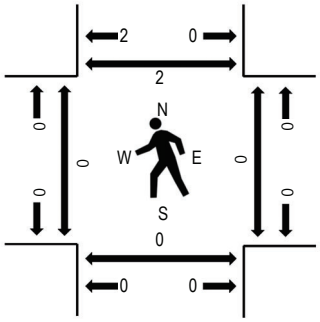
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				SR 17 NB RAMP Northbound				SR 17 NB RAMP Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
1:00 PM	1	48	0	2	0	0	0	0	0	1	7	0	0	0	1	4	64	257	0	0	0	0
1:15 PM	0	40	0	6	0	0	0	0	0	2	4	0	0	0	1	5	58	270	0	0	0	0
1:30 PM	0	43	0	3	0	0	0	0	0	3	3	0	0	0	1	7	60	292	0	0	0	0
1:45 PM	0	55	0	3	0	0	0	0	0	2	5	0	0	0	1	9	75	306	0	0	0	0
2:00 PM	0	59	0	7	0	0	0	0	0	0	5	0	0	0	0	6	77	288	0	0	0	0
2:15 PM	1	61	0	4	0	0	0	0	0	2	2	0	0	0	1	9	80		0	0	0	0
2:30 PM	0	50	0	7	0	0	0	0	0	5	4	0	0	0	3	5	74		0	0	0	2
2:45 PM	0	38	0	4	0	0	0	0	0	3	6	0	0	0	1	5	57		2	0	0	0

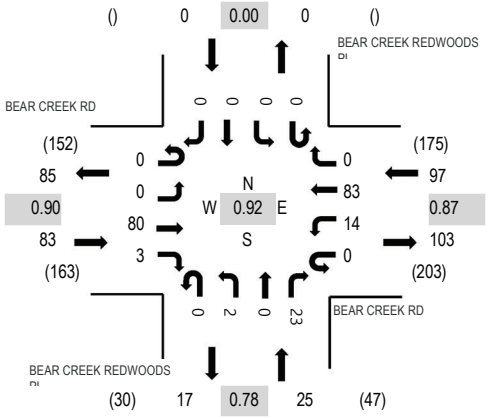
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	1	222	0	20	0	0	0	0	0	9	16	0	0	0	5	29	302
Mediums	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	1	225	0	21	0	0	0	0	0	9	16	0	0	0	5	29	306

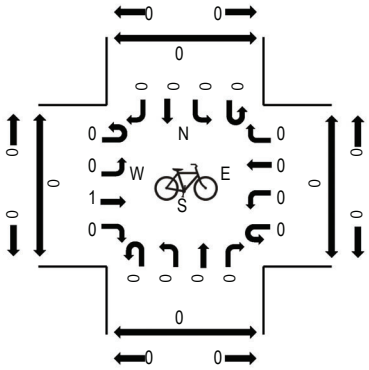
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 BEAR CREEK REDWOODS PL & BEAR CREEK RD Noon
Date: Saturday, May 25, 2024
Peak Hour: 01:30 PM - 02:30 PM
Peak 15-Minutes: 01:45 PM - 02:00 PM

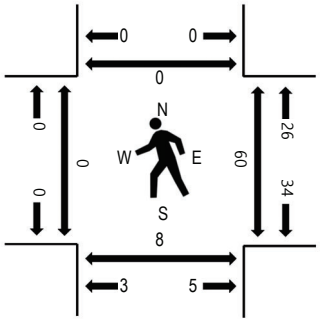
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BEAR CREEK RD Eastbound				BEAR CREEK RD Westbound				BEAR CREEK REDWOODS PL Northbound				BEAR CREEK REDWOODS PL Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
1:00 PM	0	0	18	0	0	2	14	0	0	1	0	3	0	0	0	0	38	193	0	35	0	0
1:15 PM	0	0	19	0	0	4	18	0	0	0	0	9	0	0	0	0	50	200	0	26	2	0
1:30 PM	0	0	14	1	0	3	23	0	0	1	0	7	0	0	0	0	49	205	0	24	2	0
1:45 PM	0	0	21	0	0	4	21	0	0	1	0	9	0	0	0	0	56	205	0	19	0	0
2:00 PM	0	0	23	1	0	0	18	0	0	0	0	3	0	0	0	0	45	192	0	2	0	0
2:15 PM	0	0	22	1	0	7	21	0	0	0	0	4	0	0	0	0	55		0	15	6	0
2:30 PM	0	0	26	0	0	5	16	0	0	1	0	1	0	0	0	0	49		0	31	7	0
2:45 PM	0	0	17	0	0	2	17	0	0	0	0	7	0	0	0	0	43		0	3	3	0

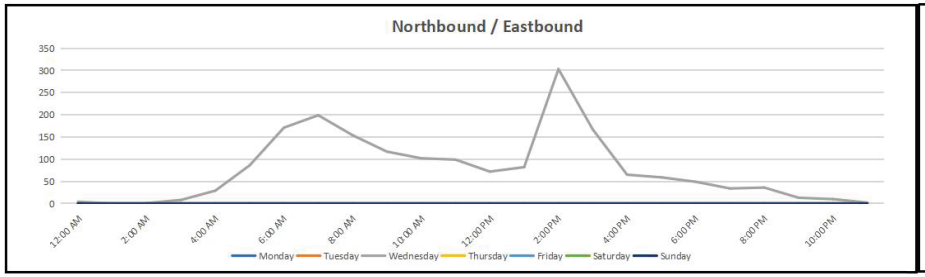
Peak Rolling Hour Flow Rates

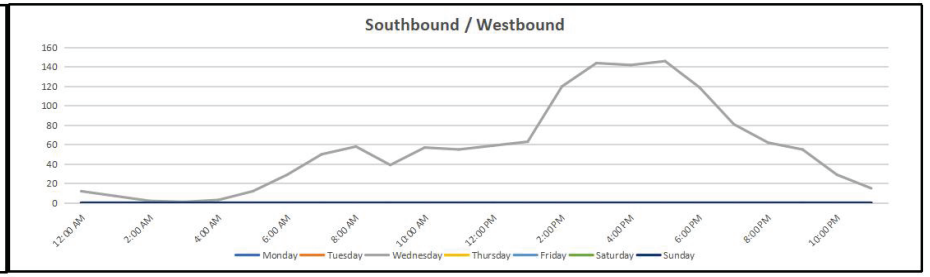
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	80	3	0	14	83	0	0	2	0	23	0	0	0	0	205
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	80	3	0	14	83	0	0	2	0	23	0	0	0	0	205

Vehicle Volume Report - Hourly

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Time	Monday 5/27/24			Tuesday 5/28/24			Wednesday 5/22/24			Thursday 5/23/24			Friday 5/24/24			Saturday 5/25/24			Sunday 5/26/24			3 Day Avg Tue-Thu		5 Day Avg Mon-Fri		7 Day Avg Mon-Sun	
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	EB	WB	EB	WB
12:00 AM	-	-	-	-	-	-	4	12	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 AM	-	-	-	-	-	-	0	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 AM	-	-	-	-	-	-	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 AM	-	-	-	-	-	-	8	1	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 AM	-	-	-	-	-	-	29	3	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 AM	-	-	-	-	-	-	86	12	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM	-	-	-	-	-	-	171	29	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	-	-	-	-	-	-	199	50	249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 AM	-	-	-	-	-	-	154	58	212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 AM	-	-	-	-	-	-	117	39	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	-	-	-	-	-	-	102	57	159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	-	-	-	-	-	-	99	55	154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	-	-	-	-	-	-	72	59	131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 PM	-	-	-	-	-	-	82	63	145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	-	-	-	-	-	-	303	120	423	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	-	-	-	-	-	-	167	144	311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	-	-	-	-	-	-	65	142	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 PM	-	-	-	-	-	-	59	146	205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 PM	-	-	-	-	-	-	49	119	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 PM	-	-	-	-	-	-	34	81	115	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 PM	-	-	-	-	-	-	36	62	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 PM	-	-	-	-	-	-	13	55	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 PM	-	-	-	-	-	-	10	29	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 PM	-	-	-	-	-	-	2	15	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 9:00 AM	-	-	-	-	-	-	**524**	**137**	**661**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM - 6:00 PM	-	-	-	-	-	-	**291**	**432**	**723**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 7:00 PM	-	-	-	-	-	-	**1639**	**1081**	**2720**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 AM - 12:00 AM	-	-	-	-	-	-	**1862**	**1360**	**3222**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percent	-	-	-	-	-	-	***57.8%***	***42.2%***	***100.0%***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AM Peak	-	-		-	-		7:00 AM	8:00 AM		-	-		-	-		-	-		-	-							
PM Peak	-	-		-	-		2:00 PM	3:00 PM		-	-		-	-		-	-		-	-							





Vehicle Classification Report - Hourly

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Eastbound	1862	29	1758	69	1	3	2	0	0	0	0	0	0	0
Percent	*100.0%*	*1.6%*	*94.4%*	*3.7%*	*0.1%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Westbound	1360	30	1280	42	2	3	3	0	0	0	0	0	0	0
Percent	*100.0%*	*2.2%*	*94.1%*	*3.1%*	*0.1%*	*0.2%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total	3222	59	3038	111	3	6	5	0	0	0	0	0	0	0
Percent	*100.0%*	*1.8%*	*94.3%*	*3.4%*	*0.1%*	*0.2%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Vehicle Classification Report (Eastbound - 05/22/2024)

Wednesday		Eastbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
5/22/24														
12:00 AM	4	0	4	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	8	0	8	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	29	1	24	4	0	0	0	0	0	0	0	0	0	0
5:00 AM	86	2	79	5	0	0	0	0	0	0	0	0	0	0
6:00 AM	171	1	163	7	0	0	0	0	0	0	0	0	0	0
7:00 AM	199	3	192	4	0	0	0	0	0	0	0	0	0	0
8:00 AM	154	5	146	3	0	0	0	0	0	0	0	0	0	0
9:00 AM	117	3	110	4	0	0	0	0	0	0	0	0	0	0
10:00 AM	102	1	99	2	0	0	0	0	0	0	0	0	0	0
11:00 AM	99	0	94	5	0	0	0	0	0	0	0	0	0	0
12:00 PM	72	1	68	3	0	0	0	0	0	0	0	0	0	0
1:00 PM	82	2	77	3	0	0	0	0	0	0	0	0	0	0
2:00 PM	303	1	289	12	0	0	1	0	0	0	0	0	0	0
3:00 PM	167	3	155	6	1	2	0	0	0	0	0	0	0	0
4:00 PM	65	1	62	2	0	0	0	0	0	0	0	0	0	0
5:00 PM	59	1	55	3	0	0	0	0	0	0	0	0	0	0
6:00 PM	49	0	46	2	0	0	1	0	0	0	0	0	0	0
7:00 PM	34	2	31	0	0	1	0	0	0	0	0	0	0	0
8:00 PM	36	2	31	3	0	0	0	0	0	0	0	0	0	0
9:00 PM	13	0	12	1	0	0	0	0	0	0	0	0	0	0
10:00 PM	10	0	10	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	2	0	2	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	524	9	501	14	0	0	0	0	0	0	0	0	0	0
3:00 PM - 6:00 PM	291	5	272	11	1	2	0	0	0	0	0	0	0	0
6:00 AM - 7:00 PM	1639	22	1556	56	1	2	2	0	0	0	0	0	0	0
12:00 AM - 12:00 AM	1862	29	1758	69	1	3	2	0	0	0	0	0	0	0
Percent	*100%*	*1.6%*	*94.4%*	*3.7%*	*0.1%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Vehicle Classification Report (Westbound - 05/22/2024)

Wednesday		Westbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
5/22/24														
12:00 AM	12	1	11	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	7	1	6	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	2	0	1	1	0	0	0	0	0	0	0	0	0	0
3:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	3	0	3	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	12	0	11	1	0	0	0	0	0	0	0	0	0	0
6:00 AM	29	1	25	2	0	0	1	0	0	0	0	0	0	0
7:00 AM	50	0	44	5	0	1	0	0	0	0	0	0	0	0
8:00 AM	58	0	55	2	0	0	1	0	0	0	0	0	0	0
9:00 AM	39	1	34	3	1	0	0	0	0	0	0	0	0	0
10:00 AM	57	1	52	3	1	0	0	0	0	0	0	0	0	0
11:00 AM	55	0	53	2	0	0	0	0	0	0	0	0	0	0
12:00 PM	59	1	56	2	0	0	0	0	0	0	0	0	0	0
1:00 PM	63	2	57	3	0	1	0	0	0	0	0	0	0	0
2:00 PM	120	3	114	3	0	0	0	0	0	0	0	0	0	0
3:00 PM	144	3	137	2	0	1	1	0	0	0	0	0	0	0
4:00 PM	142	5	136	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	146	3	137	6	0	0	0	0	0	0	0	0	0	0
6:00 PM	119	0	118	1	0	0	0	0	0	0	0	0	0	0
7:00 PM	81	1	78	2	0	0	0	0	0	0	0	0	0	0
8:00 PM	62	3	58	1	0	0	0	0	0	0	0	0	0	0
9:00 PM	55	4	50	1	0	0	0	0	0	0	0	0	0	0
10:00 PM	29	0	29	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	15	0	14	1	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	137	1	124	9	0	1	2	0	0	0	0	0	0	0
3:00 PM - 6:00 PM	432	11	410	9	0	1	1	0	0	0	0	0	0	0
6:00 AM - 7:00 PM	1081	20	1018	35	2	3	3	0	0	0	0	0	0	0
12:00 AM - 12:00 AM	1360	30	1280	42	2	3	3	0	0	0	0	0	0	0
Percent	*100%*	*2.2%*	*94.1%*	*3.1%*	*0.1%*	*0.2%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Vehicle Speed Report - Hourly

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Total Study Speed Summary		
	Eastbound	**Westbound**
Average Speed	26.8 mph	27.0 mph
50th Percentile	26.6 mph	26.9 mph
85th Percentile	30.5 mph	31.0 mph
95th Percentile	33.3 mph	33.6 mph

Speed Range (MPH) - Total Study																					
	Total	**0-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85-90**	**90-95**	**95-100**	**100+**
Eastbound	1862	0	0	57	552	925	277	42	4	4	0	1	0	0	0	0	0	0	0	0	0
Percent	*100.0%*	*0.0%*	*0.0%*	*3.1%*	*29.6%*	*49.7%*	*14.9%*	*2.3%*	*0.2%*	*0.2%*	*0.0%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Westbound	1360	1	5	56	344	661	246	35	9	3	0	0	0	0	0	0	0	0	0	0	0
Percent	*100.0%*	*0.1%*	*0.4%*	*4.1%*	*25.3%*	*48.6%*	*18.1%*	*2.6%*	*0.7%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total	3222	1	5	113	896	1586	523	77	13	7	0	1	0	0	0	0	0	0	0	0	0
Percent	*100.0%*	*0.0%*	*0.2%*	*3.5%*	*27.8%*	*49.2%*	*16.2%*	*2.4%*	*0.4%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Vehicle Speed Report (Eastbound - 05/22/2024)

Wednesday	Eastbound																				
5/22/24	Total	0-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100+
12:00 AM	4	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	8	0	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	29	0	0	1	7	9	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	86	0	0	1	4	45	20	12	1	2	0	1	0	0	0	0	0	0	0	0	0
6:00 AM	171	0	0	0	27	83	53	8	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	199	0	0	1	15	129	51	3	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	154	0	0	2	25	96	28	3	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	117	0	0	2	27	68	19	0	1	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	102	0	0	2	34	56	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	99	0	0	5	29	48	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	72	0	0	5	22	36	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	82	0	0	1	25	43	11	1	0	1	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	303	0	0	13	145	130	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	167	0	0	12	74	66	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	65	0	0	1	28	26	9	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	59	0	0	2	25	27	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	49	0	0	3	19	21	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	34	0	0	2	14	11	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	36	0	0	4	16	13	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	13	0	0	0	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	10	0	0	0	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	**524**	**0**	**0**	**3**	**67**	**308**	**132**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3:00 PM - 6:00 PM	**291**	**0**	**0**	**15**	**127**	**119**	**25**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6:00 AM - 7:00 PM	**1639**	**0**	**0**	**49**	**495**	**829**	**238**	**25**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
12:00 AM - 12:00 AM	**1862**	**0**	**0**	**57**	**552**	**925**	**277**	**42**	**4**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Percent	***100%***	***0.0%***	***0.0%***	***3.1%***	***29.6%***	***49.7%***	***14.9%***	***2.3%***	***0.2%***	***0.2%***	***0.0%***	***0.1%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***
50th Percentile	**26.6 mph**																				
85th Percentile	**30.5 mph**																				
95th Percentile	**33.3 mph**																				

Site Description: Bear Creek Rd E.O Mellots Rd
Site Number: 4
Start Date: 05/22/2024
End Date: 05/22/2024

Vehicle Speed Report (Westbound - 05/22/2024)

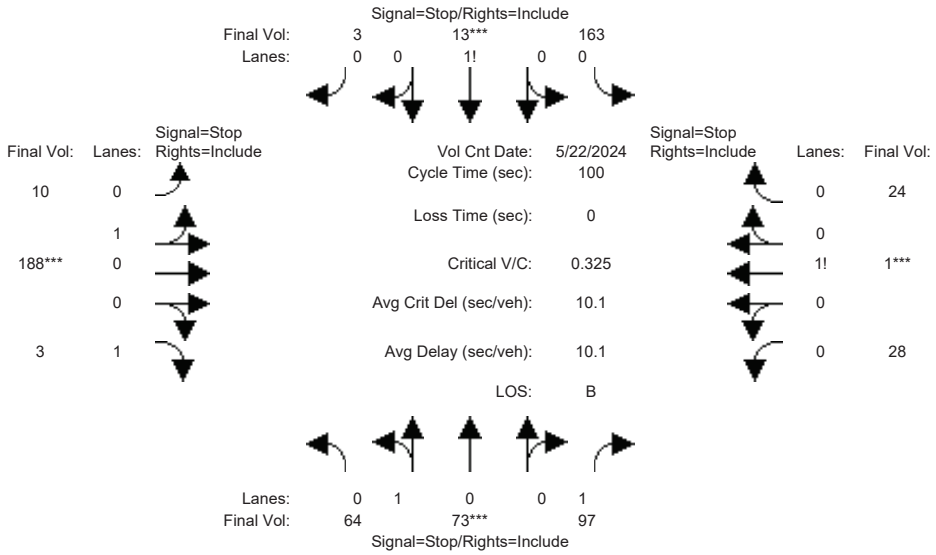
Wednesday	Westbound																				
5/22/24	Total	0-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100+
12:00 AM	12	0	0	0	2	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	7	0	0	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	12	0	0	1	3	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	29	1	0	1	6	17	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	50	0	0	3	17	22	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	58	0	0	5	25	26	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	39	0	0	3	15	14	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	57	0	0	0	20	28	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	55	0	0	5	24	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	59	0	1	2	20	26	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	63	0	1	2	13	32	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	120	0	0	5	25	55	33	2	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	144	0	0	7	22	88	25	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	142	0	1	3	31	70	33	3	1	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	146	0	1	2	33	72	29	5	3	1	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	119	0	0	6	19	67	23	4	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	81	0	1	2	18	34	22	3	0	1	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	62	0	0	2	17	29	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	55	0	0	4	15	22	9	4	0	1	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	29	0	0	1	8	14	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	15	0	0	1	6	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	**137**	**1**	**0**	**9**	**48**	**65**	**12**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3:00 PM - 6:00 PM	**432**	**0**	**2**	**12**	**86**	**230**	**87**	**9**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6:00 AM - 7:00 PM	**1081**	**1**	**4**	**44**	**270**	**537**	**195**	**22**	**7**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
12:00 AM - 12:00 AM	**1360**	**1**	**5**	**56**	**344**	**661**	**246**	**35**	**9**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Percent	***100%***	***0.1%***	***0.4%***	***4.1%***	***25.3%***	***48.6%***	***18.1%***	***2.6%***	***0.7%***	***0.2%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***
50th Percentile	**26.9 mph**																				
85th Percentile	**31.0 mph**																				
95th Percentile	**33.6 mph**																				

Appendix B

Level of Service Calculations

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module: >> Count Date: 22 May 2024 <<												
Base Vol:	64	73	97	163	13	3	10	188	3	28	1	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	73	97	163	13	3	10	188	3	28	1	24
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	73	97	163	13	3	10	188	3	28	1	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	64	73	97	163	13	3	10	188	3	28	1	24
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	64	73	97	163	13	3	10	188	3	28	1	24
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	64	73	97	163	13	3	10	188	3	28	1	24
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.47	0.53	1.00	0.91	0.07	0.02	0.05	0.95	1.00	0.53	0.02	0.45
Final Sat.:	287	327	729	557	44	10	31	578	691	311	11	266
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.13	0.29	0.29	0.29	0.33	0.33	0.00	0.09	0.09	0.09
Crit Moves:		****			****			****			****	
Delay/Veh:	9.9	9.9	8.1	10.9	10.9	10.9	10.9	10.9	7.6	9.2	9.2	9.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.9	9.9	8.1	10.9	10.9	10.9	10.9	10.9	7.6	9.2	9.2	9.2
LOS by Move:	A	A	A	B	B	B	B	B	A	A	A	A
ApproachDel:		9.2			10.9			10.8			9.2	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.2			10.9			10.8			9.2	
LOS by Appr:		A			B			B			A	
AllWayAvgQ:	0.3	0.3	0.1	0.4	0.4	0.4	0.4	0.4	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0 1!	0 0	0 1	0	0 1	0	0 1!	0 0
Initial Vol:	64	73	97	163	13	3	10	188	3	28	1	24

Major Street Volume: 413
Minor Approach Volume: 201
Minor Approach Volume Threshold: 754

SIGNAL WARRANT DISCLAIMER

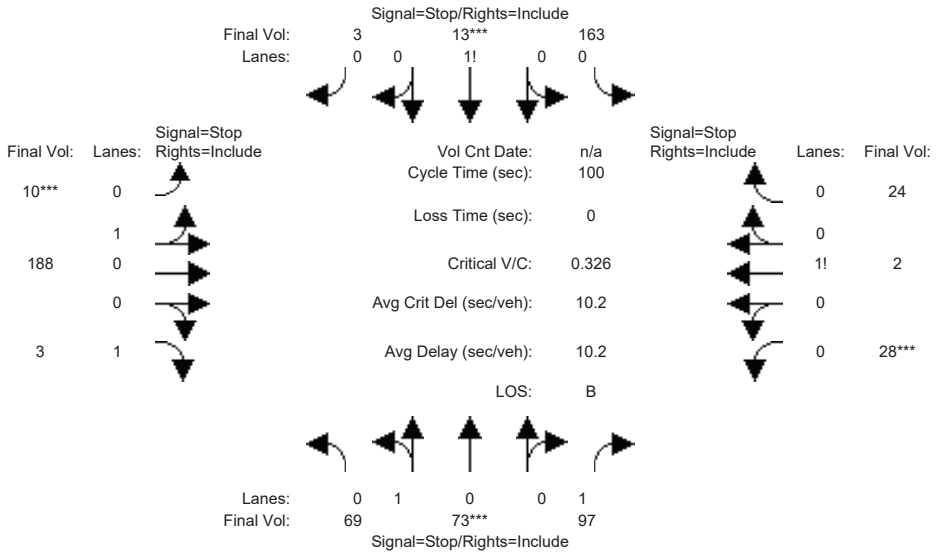
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing + Project AM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	69	73	97	163	13	3	10	188	3	28	2	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	69	73	97	163	13	3	10	188	3	28	2	24
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	69	73	97	163	13	3	10	188	3	28	2	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	69	73	97	163	13	3	10	188	3	28	2	24
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	73	97	163	13	3	10	188	3	28	2	24
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	73	97	163	13	3	10	188	3	28	2	24
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.49	0.51	1.00	0.91	0.07	0.02	0.05	0.95	1.00	0.52	0.04	0.44
Final Sat.:	298	315	729	555	44	10	31	576	689	304	22	260
Capacity Analysis Module:												
Vol/Sat:	0.23	0.23	0.13	0.29	0.29	0.29	0.33	0.33	0.00	0.09	0.09	0.09
Crit Moves:		****			****			****			****	
Delay/Veh:	10.0	10.0	8.1	10.9	10.9	10.9	10.9	10.9	7.7	9.3	9.3	9.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.0	10.0	8.1	10.9	10.9	10.9	10.9	10.9	7.7	9.3	9.3	9.3
LOS by Move:	A	A	A	B	B	B	B	B	A	A	A	A
ApproachDel:		9.2			10.9			10.9			9.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.2			10.9			10.9			9.3	
LOS by Appr:		A			B			B			A	
AllWayAvgQ:	0.3	0.3	0.1	0.4	0.4	0.4	0.4	0.4	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0 1!	0 0	0 1	0	0 1	0	0 1!	0 0
Initial Vol:	69	73	97	163	13	3	10	188	3	28	2	24

Major Street Volume: 418
Minor Approach Volume: 201
Minor Approach Volume Threshold: 749

SIGNAL WARRANT DISCLAIMER

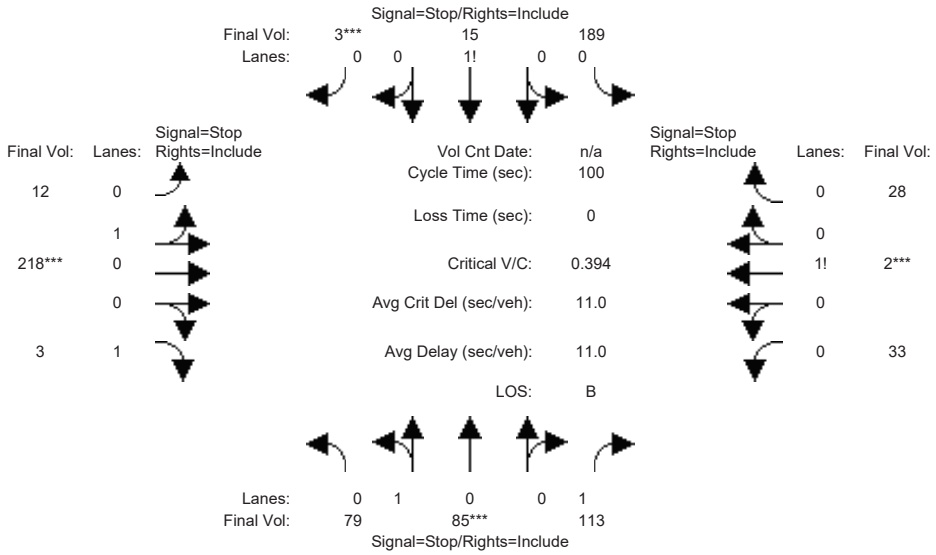
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Future + Project AM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	79	85	113	189	15	3	12	218	3	33	2	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	79	85	113	189	15	3	12	218	3	33	2	28
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	79	85	113	189	15	3	12	218	3	33	2	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	79	85	113	189	15	3	12	218	3	33	2	28
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	79	85	113	189	15	3	12	218	3	33	2	28
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	79	85	113	189	15	3	12	218	3	33	2	28
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.48	0.52	1.00	0.92	0.07	0.01	0.05	0.95	1.00	0.53	0.03	0.44
Final Sat.:	284	306	697	536	43	9	30	554	660	290	18	246
Capacity Analysis Module:												
Vol/Sat:	0.28	0.28	0.16	0.35	0.35	0.35	0.39	0.39	0.00	0.11	0.11	0.11
Crit Moves:	****					****		****			****	
Delay/Veh:	10.7	10.7	8.5	11.9	11.9	11.9	12.1	12.1	7.9	9.7	9.7	9.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.7	10.7	8.5	11.9	11.9	11.9	12.1	12.1	7.9	9.7	9.7	9.7
LOS by Move:	B	B	A	B	B	B	B	B	A	A	A	A
ApproachDel:	9.8			11.9			12.0			9.7		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.8			11.9			12.0			9.7		
LOS by Appr:	A			B			B			A		
AllWayAvgQ:	0.3	0.3	0.2	0.5	0.5	0.5	0.6	0.6	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0 1!	0 0	0 1	0	0 1	0	0 1!	0 0
Initial Vol:	79	85	113	189	15	3	12	218	3	33	2	28

Major Street Volume: 484
Minor Approach Volume: 233
Minor Approach Volume Threshold: 686

SIGNAL WARRANT DISCLAIMER

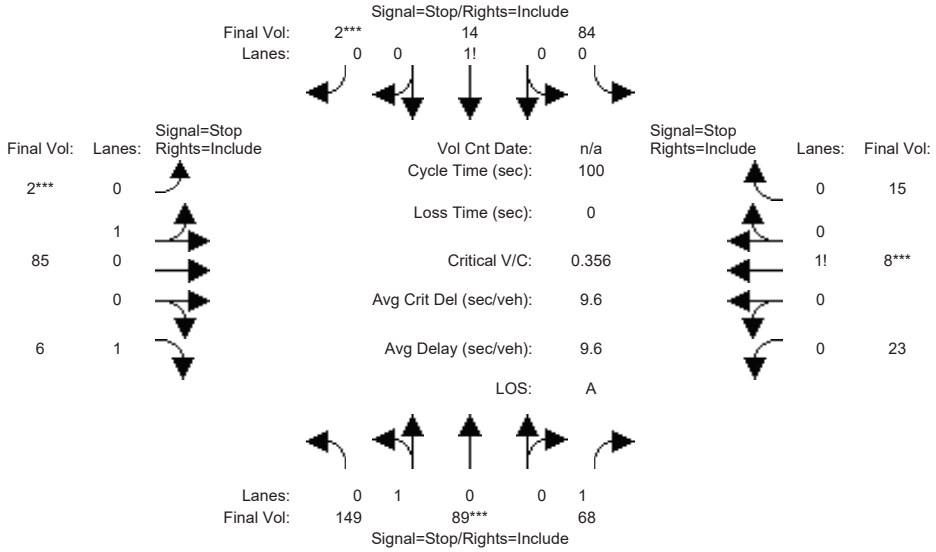
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	149	89	68	84	14	2	2	85	6	23	8	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	149	89	68	84	14	2	2	85	6	23	8	15
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	149	89	68	84	14	2	2	85	6	23	8	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	149	89	68	84	14	2	2	85	6	23	8	15
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	149	89	68	84	14	2	2	85	6	23	8	15
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	149	89	68	84	14	2	2	85	6	23	8	15
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.63	0.37	1.00	0.84	0.14	0.02	0.02	0.98	1.00	0.50	0.17	0.33
Final Sat.:	418	250	822	546	91	13	14	598	695	306	107	200
Capacity Analysis Module:												
Vol/Sat:	0.36	0.36	0.08	0.15	0.15	0.15	0.14	0.14	0.01	0.08	0.08	0.08
Crit Moves:		****				****	****				****	
Delay/Veh:	10.8	10.8	7.4	9.3	9.3	9.3	9.1	9.1	7.6	8.9	8.9	8.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.8	10.8	7.4	9.3	9.3	9.3	9.1	9.1	7.6	8.9	8.9	8.9
LOS by Move:	B	B	A	A	A	A	A	A	A	A	A	A
ApproachDel:		10.0			9.3			9.0			8.9	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		10.0			9.3			9.0			8.9	
LOS by Appr:		B			A			A			A	
AllWayAvgQ:	0.5	0.5	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0 1!	0 0	0 1	0	0 1	0	0 1!	0 0
Initial Vol:	149	89	68	84	14	2	2	85	6	23	8	15

Major Street Volume: 406
Minor Approach Volume: 93
Minor Approach Volume Threshold: 762

SIGNAL WARRANT DISCLAIMER

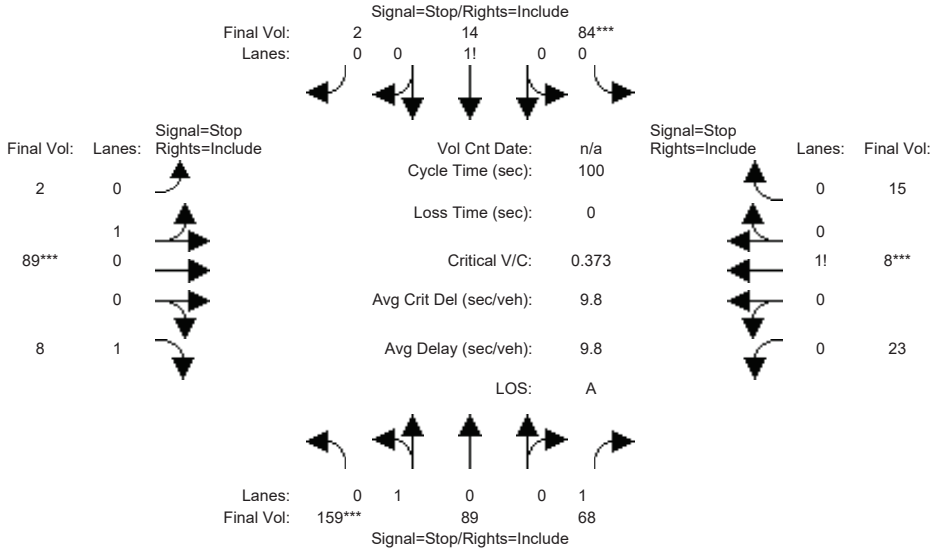
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing + Project PM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	159	89	68	84	14	2	2	89	8	23	8	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	159	89	68	84	14	2	2	89	8	23	8	15
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	159	89	68	84	14	2	2	89	8	23	8	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	159	89	68	84	14	2	2	89	8	23	8	15
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	159	89	68	84	14	2	2	89	8	23	8	15
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	159	89	68	84	14	2	2	89	8	23	8	15
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.64	0.36	1.00	0.84	0.14	0.02	0.02	0.98	1.00	0.50	0.17	0.33
Final Sat.:	427	239	818	542	90	13	13	595	691	304	106	198
Capacity Analysis Module:												
Vol/Sat:	0.37	0.37	0.08	0.15	0.15	0.15	0.15	0.15	0.01	0.08	0.08	0.08
Crit Moves:	****			****				****			****	
Delay/Veh:	11.1	11.1	7.4	9.4	9.4	9.4	9.2	9.2	7.6	9.0	9.0	9.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.1	11.1	7.4	9.4	9.4	9.4	9.2	9.2	7.6	9.0	9.0	9.0
LOS by Move:	B	B	A	A	A	A	A	A	A	A	A	A
ApproachDel:	10.3			9.4			9.1			9.0		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.3			9.4			9.1			9.0		
LOS by Appr:	B			A			A			A		
AllWayAvgQ:	0.6	0.6	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

 Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0 0	1! 0	0	0 1	0	0 1	0 0	1! 0	0
Initial Vol:	159	89	68	84	14	2	2	89	8	23	8	15

Major Street Volume: 416
Minor Approach Volume: 99
Minor Approach Volume Threshold: 751

SIGNAL WARRANT DISCLAIMER

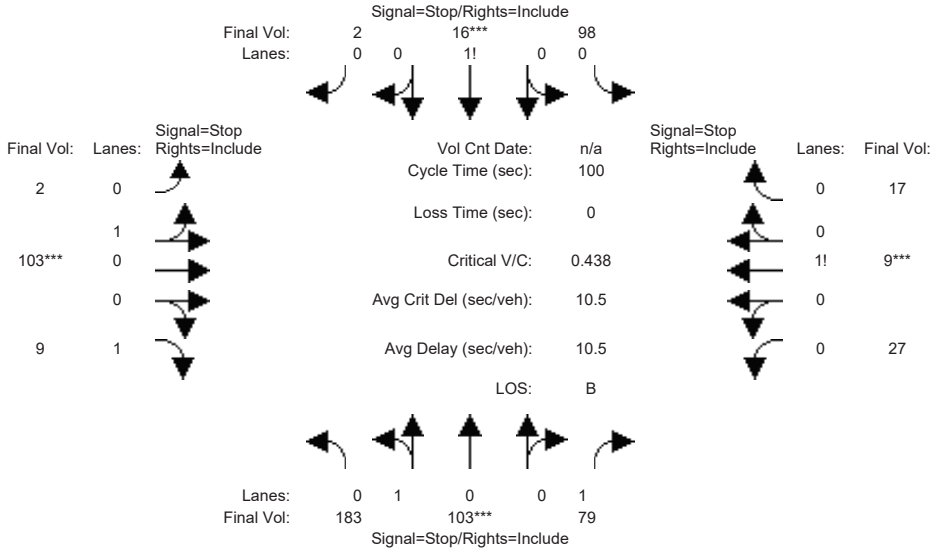
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Future + Project PM

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	183	103	79	98	16	2	2	103	9	27	9	17
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	183	103	79	98	16	2	2	103	9	27	9	17
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	183	103	79	98	16	2	2	103	9	27	9	17
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	183	103	79	98	16	2	2	103	9	27	9	17
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	183	103	79	98	16	2	2	103	9	27	9	17
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	183	103	79	98	16	2	2	103	9	27	9	17
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.64	0.36	1.00	0.84	0.14	0.02	0.02	0.98	1.00	0.51	0.17	0.32
Final Sat.:	418	235	799	530	87	11	11	576	662	297	99	187
Capacity Analysis Module:												
Vol/Sat:	0.44	0.44	0.10	0.18	0.18	0.18	0.18	0.18	0.01	0.09	0.09	0.09
Crit Moves:		****			****			****			****	
Delay/Veh:	12.1	12.1	7.6	9.8	9.8	9.8	9.6	9.6	7.8	9.3	9.3	9.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.1	12.1	7.6	9.8	9.8	9.8	9.6	9.6	7.8	9.3	9.3	9.3
LOS by Move:	B	B	A	A	A	A	A	A	A	A	A	A
ApproachDel:		11.1			9.8			9.5			9.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.1			9.8			9.5			9.3	
LOS by Appr:		B			A			A			A	
AllWayAvgQ:	0.7	0.7	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0	1! 0	0	0 1	0	0	0	1! 0
Initial Vol:	183	103	79	98	16	2	2	103	9	27	9	17

Major Street Volume: 481
Minor Approach Volume: 114
Minor Approach Volume Threshold: 689

SIGNAL WARRANT DISCLAIMER

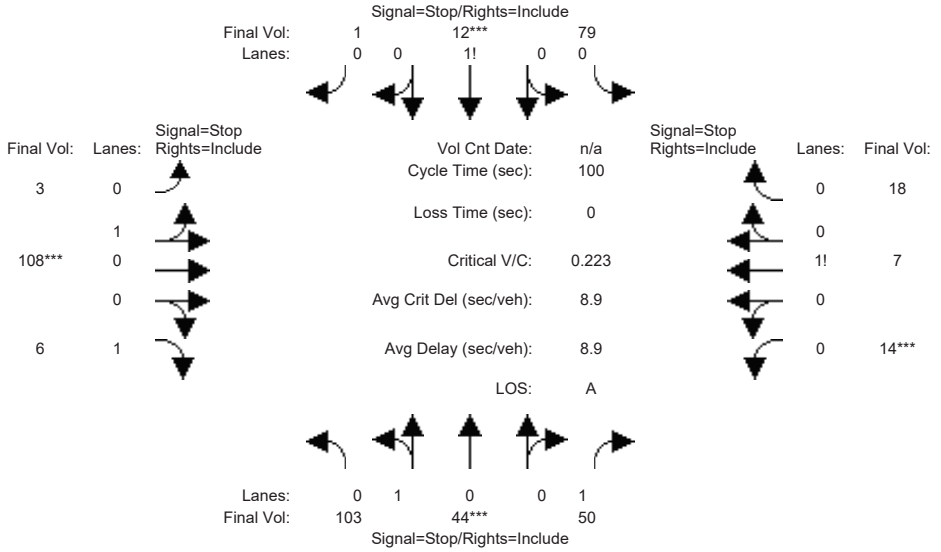
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing Saturday

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	103	44	50	79	12	1	3	108	6	14	7	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	103	44	50	79	12	1	3	108	6	14	7	18
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	103	44	50	79	12	1	3	108	6	14	7	18
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	103	44	50	79	12	1	3	108	6	14	7	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	103	44	50	79	12	1	3	108	6	14	7	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	103	44	50	79	12	1	3	108	6	14	7	18
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.70	0.30	1.00	0.86	0.13	0.01	0.03	0.97	1.00	0.36	0.18	0.46
Final Sat.:	461	197	814	566	86	7	18	637	751	238	119	305
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.06	0.14	0.14	0.14	0.17	0.17	0.01	0.06	0.06	0.06
Crit Moves:		****			****			****			****	
Delay/Veh:	9.5	9.5	7.3	9.1	9.1	9.1	9.0	9.0	7.3	8.5	8.5	8.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.5	9.5	7.3	9.1	9.1	9.1	9.0	9.0	7.3	8.5	8.5	8.5
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		9.0			9.1			8.9			8.5	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.0			9.1			8.9			8.5	
LOS by Appr:		A			A			A			A	
AllWayAvgQ:	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 1	0	0 1	0	0 1!	0 0	0 1	0	0 1	0	0 1!	0 0
Initial Vol:	103	44	50	79	12	1	3	108	6	14	7	18

Major Street Volume: 289
Minor Approach Volume: 117
Minor Approach Volume Threshold: 908

SIGNAL WARRANT DISCLAIMER

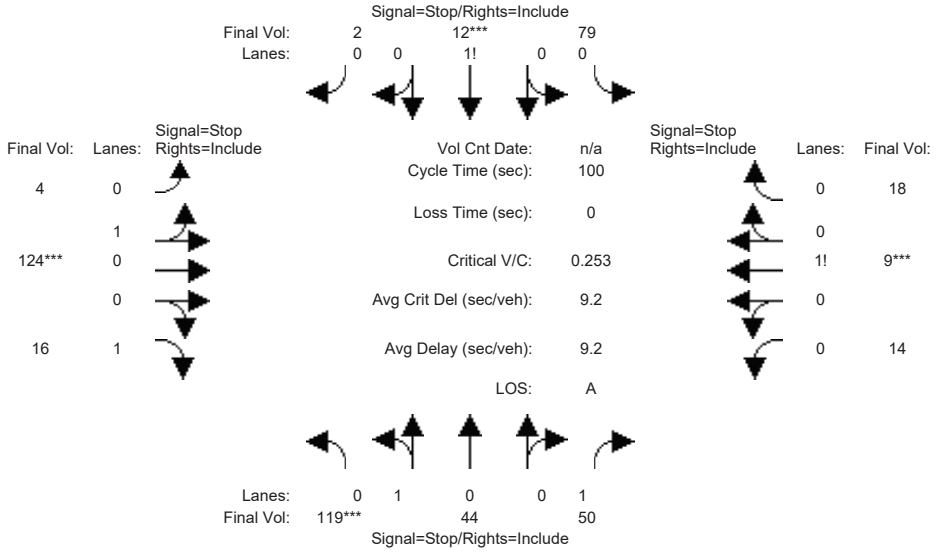
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing + Project Saturday

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	119	44	50	79	12	2	4	124	16	14	9	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	119	44	50	79	12	2	4	124	16	14	9	18
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	119	44	50	79	12	2	4	124	16	14	9	18
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	119	44	50	79	12	2	4	124	16	14	9	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	44	50	79	12	2	4	124	16	14	9	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	119	44	50	79	12	2	4	124	16	14	9	18
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	0.85	0.13	0.02	0.03	0.97	1.00	0.34	0.22	0.44
Final Sat.:	471	174	796	548	83	14	20	627	740	221	142	284
Capacity Analysis Module:												
Vol/Sat:	0.25	0.25	0.06	0.14	0.14	0.14	0.20	0.20	0.02	0.06	0.06	0.06
Crit Moves:	****				****			****			****	
Delay/Veh:	9.9	9.9	7.4	9.3	9.3	9.3	9.3	9.3	7.4	8.6	8.6	8.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.9	9.9	7.4	9.3	9.3	9.3	9.3	9.3	7.4	8.6	8.6	8.6
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	9.3			9.3			9.1			8.6		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.3			9.3			9.1			8.6		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

 Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Stop Sign				Stop Sign			
Lanes:	0	1	0	0 1	0	0	1!	0 0	0	1	0	0 1	0	0	1!	0 0
Initial Vol:	119		44	50	79		12	2	4		124	16	14		9	18

Major Street Volume: 306
Minor Approach Volume: 144
Minor Approach Volume Threshold: 883

SIGNAL WARRANT DISCLAIMER

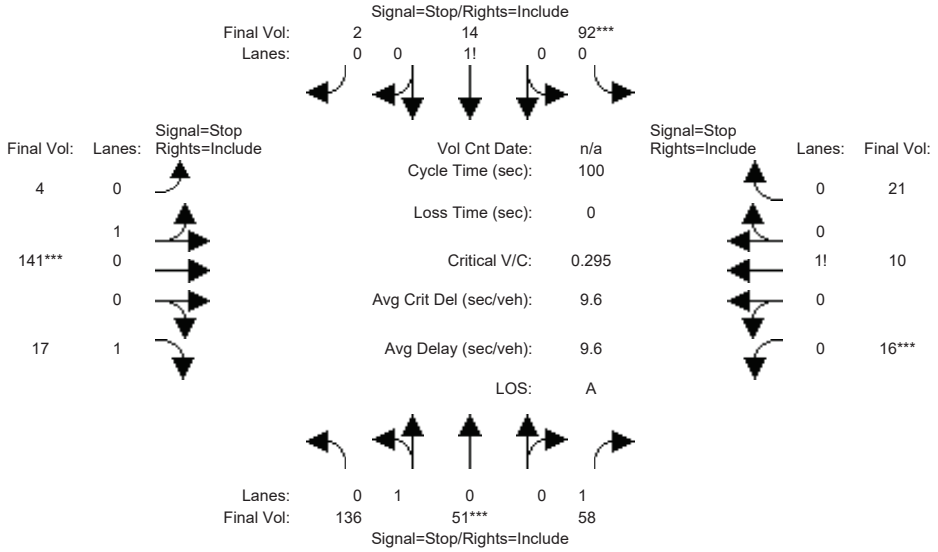
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Future + Project Saturday

Intersection #1: SR 17 SB Ramps & Bear Creek Rd



Street Name:	SR 17 SB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	136	51	58	92	14	2	4	141	17	16	10	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	136	51	58	92	14	2	4	141	17	16	10	21
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	136	51	58	92	14	2	4	141	17	16	10	21
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	136	51	58	92	14	2	4	141	17	16	10	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	136	51	58	92	14	2	4	141	17	16	10	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	136	51	58	92	14	2	4	141	17	16	10	21
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	0.85	0.13	0.02	0.03	0.97	1.00	0.34	0.21	0.45
Final Sat.:	460	173	777	536	82	12	17	612	716	213	133	279
Capacity Analysis Module:												
Vol/Sat:	0.30	0.30	0.07	0.17	0.17	0.17	0.23	0.23	0.02	0.08	0.08	0.08
Crit Moves:		****		****				****		****		
Delay/Veh:	10.5	10.5	7.5	9.6	9.6	9.6	9.7	9.7	7.6	8.8	8.8	8.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.5	10.5	7.5	9.6	9.6	9.6	9.7	9.7	7.6	8.8	8.8	8.8
LOS by Move:	B	B	A	A	A	A	A	A	A	A	A	A
ApproachDel:	9.8			9.6			9.5			8.8		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.8			9.6			9.5			8.8		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.4	0.4	0.1	0.2	0.2	0.2	0.3	0.3	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #1 SR 17 SB Ramps & Bear Creek Rd

****

Copyright (c) 2008 Dowling Associates, Inc.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Stop Sign				Stop Sign			
Lanes:	0	1	0	0 1	0	0	1!	0 0	0	1	0	0 1	0	0	1!	0 0
Initial Vol:	136		51	58	92		14	2	4	141		17	16		10	21

Major Street Volume: 353
Minor Approach Volume: 162
Minor Approach Volume Threshold: 822

SIGNAL WARRANT DISCLAIMER

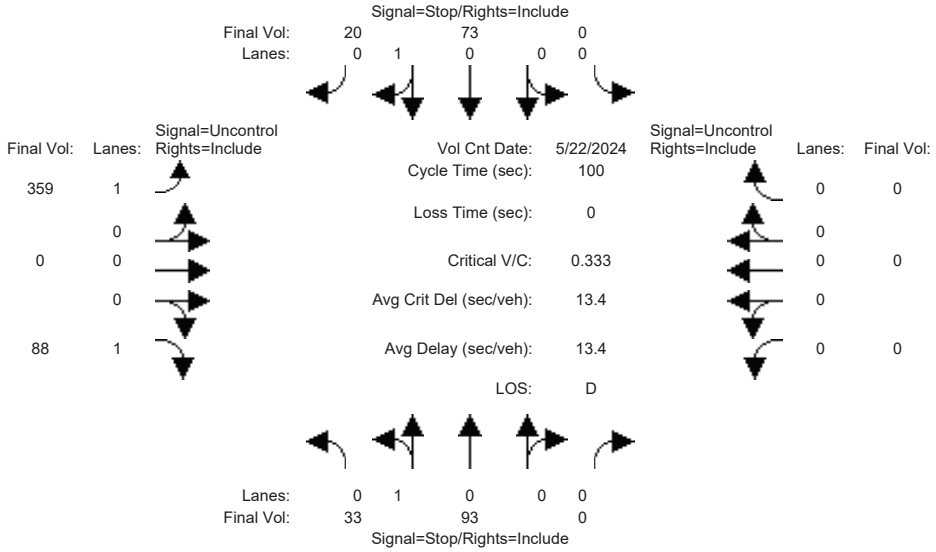
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module: >> Count Date: 22 May 2024 <<												
Base Vol:	33	93	0	0	73	20	359	0	88	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	33	93	0	0	73	20	359	0	88	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	33	93	0	0	73	20	359	0	88	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	33	93	0	0	73	20	359	0	88	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	33	93	0	0	73	20	359	0	88	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	755	718	xxxxx	xxxx	806	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	328	357	xxxxx	xxxx	318	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	209	279	xxxxx	xxxx	248	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.16	0.33	xxxx	xxxx	0.29	0.02	0.22	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.8	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	256	xxxx	xxxxx	xxxx	xxxx	298	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	2.5	xxxx	xxxxx	xxxxx	xxxx	1.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	31.9	xxxx	xxxxx	xxxxx	xxxx	22.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	D	*	*	*	*	C	*	*	*	*	*	*
ApproachDel:	31.9			22.5			xxxxxx			xxxxxx		
ApproachLOS:	D			C			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	33	93	0	0	73	20	359	0	88	0	0	0
ApproachDel:	31.9			22.5			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=126]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=666]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=93]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=666]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	33	93	0	0	73	20	359	0	88	0	0	0

Major Street Volume: 447
Minor Approach Volume: 126
Minor Approach Volume Threshold: 562

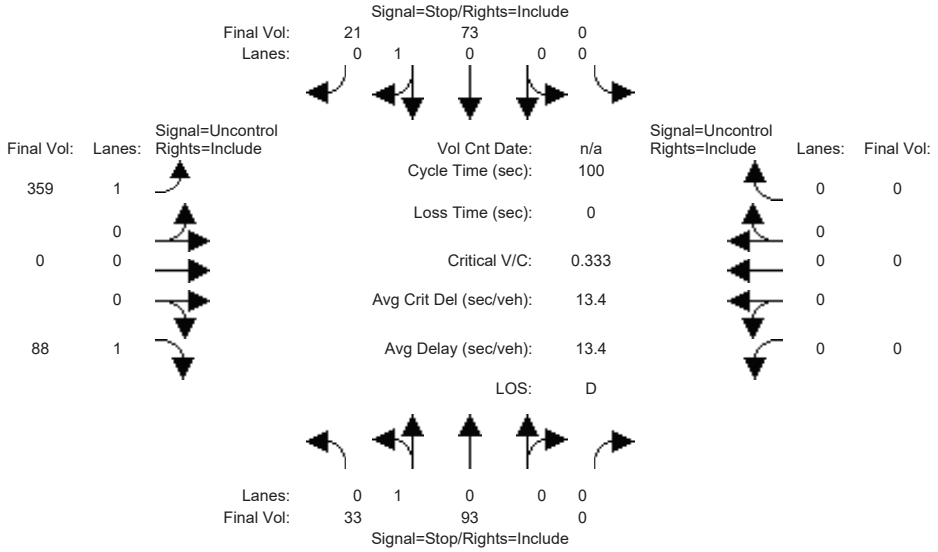
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project AM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	33	93	0	0	73	21	359	0	88	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	33	93	0	0	73	21	359	0	88	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	33	93	0	0	73	21	359	0	88	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	33	93	0	0	73	21	359	0	88	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	33	93	0	0	73	21	359	0	88	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	755	718	xxxxx	xxxx	806	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	328	357	xxxxx	xxxx	318	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	208	279	xxxxx	xxxx	248	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.16	0.33	xxxx	xxxx	0.29	0.02	0.22	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.8	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	256	xxxx	xxxxx	xxxx	xxxx	300	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	2.5	xxxx	xxxxx	xxxxx	xxxx	1.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	31.9	xxxx	xxxxx	xxxxx	xxxx	22.4	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	D	*	*	*	*	C	*	*	*	*	*	*
ApproachDel:	31.9			22.4			xxxxxx			xxxxxx		
ApproachLOS:	D			C			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	33	93	0	0	73	21	359	0	88	0	0	0
ApproachDel:	31.9			22.4			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=126]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=667]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=94]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=667]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	33	93	0	0	73	21	359	0	88	0	0	0

Major Street Volume: 447
Minor Approach Volume: 126
Minor Approach Volume Threshold: 562

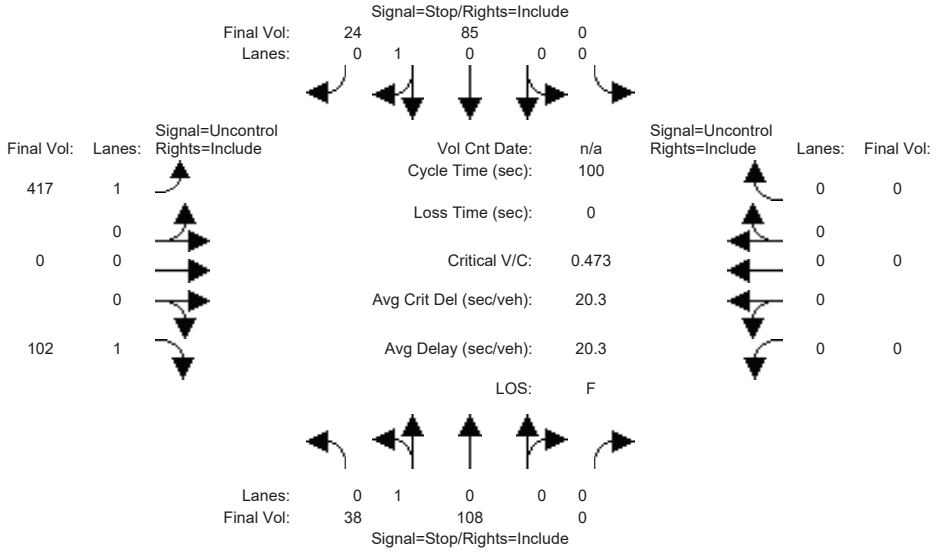
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

 Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Future + Project AM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	38	108	0	0	85	24	417	0	102	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	38	108	0	0	85	24	417	0	102	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	38	108	0	0	85	24	417	0	102	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	38	108	0	0	85	24	417	0	102	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	38	108	0	0	85	24	417	0	102	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	877	834	xxxxx	xxxx	936	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	271	306	xxxxx	xxxx	267	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	145	228	xxxxx	xxxx	199	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.26	0.47	xxxx	xxxx	0.43	0.02	0.25	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	198	xxxx	xxxxx	xxxx	xxxx	243	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	4.8	xxxx	xxxxx	xxxxx	xxxx	2.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	61.4	xxxx	xxxxx	xxxxx	xxxx	31.4	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	F	*	*	*	*	D	*	*	*	*	*	*
ApproachDel:	61.4			31.4			xxxxxx			xxxxxx		
ApproachLOS:	F			D			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	38	108	0	0	85	24	417	0	102	0	0	0
ApproachDel:	61.4			31.4			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=2.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=146]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=774]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=109]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=774]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	38	108	0	0	85	24	417	0	102	0	0	0

Major Street Volume: 519
Minor Approach Volume: 146
Minor Approach Volume Threshold: 511

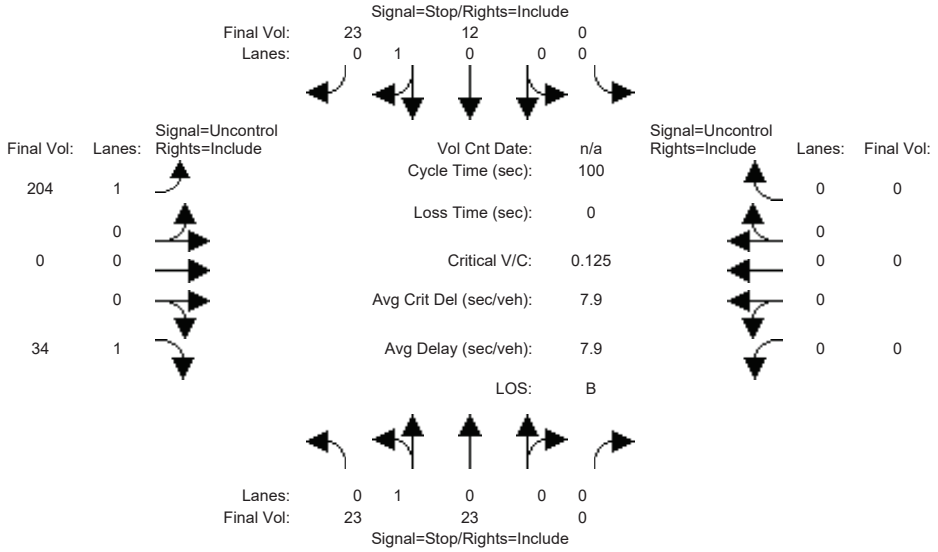
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	23	23	0	0	12	23	204	0	34	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	23	0	0	12	23	204	0	34	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	23	0	0	12	23	204	0	34	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	23	0	0	12	23	204	0	34	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	23	23	0	0	12	23	204	0	34	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	414	408	xxxxx	xxxx	442	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	552	536	xxxxx	xxxx	513	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	479	469	xxxxx	xxxx	449	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.05	0.05	xxxx	xxxx	0.03	0.02	0.12	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	474	xxxx	xxxxx	xxxx	xxxx	732	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.3	xxxx	xxxxx	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	13.4	xxxx	xxxxx	xxxxx	xxxx	10.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B	*	*	*	*	B	*	*	*	*	*	*
ApproachDel:	13.4			10.2			xxxxxx			xxxxxx		
ApproachLOS:	B			B			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	23	23	0	0	12	23	204	0	34	0	0	0
ApproachDel:	13.4			10.2			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=319]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=35]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=319]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0	0 0	0	0	0 1 0	1	0	0 0 1	0	0	0 0 0
Initial Vol:	23	23	0	0	12	23	204	0	34	0	0	0

Major Street Volume: 238
Minor Approach Volume: 46
Minor Approach Volume Threshold: 779

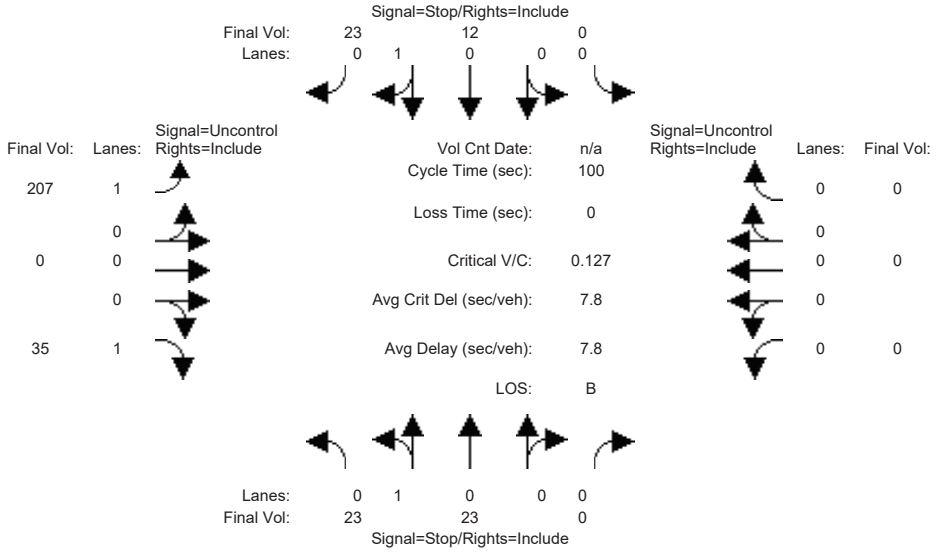
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project PM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Volume Module:												
Base Vol:	23	23	0	0	12	23	207	0	35	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	23	0	0	12	23	207	0	35	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	23	0	0	12	23	207	0	35	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	23	0	0	12	23	207	0	35	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	23	23	0	0	12	23	207	0	35	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	420	414	xxxxx	xxxx	449	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	547	532	xxxxx	xxxx	508	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	474	464	xxxxx	xxxx	444	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.05	0.05	xxxx	xxxx	0.03	0.02	0.13	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	469	xxxx	xxxxx	xxxx	xxxx	727	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.3	xxxx	xxxxx	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	13.5	xxxx	xxxxx	xxxxx	xxxx	10.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B	*	*	*	*	B	*	*	*	*	*	*
ApproachDel:	13.5			10.2			xxxxxx			xxxxxx		
ApproachLOS:	B			B			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	23	23	0	0	12	23	207	0	35	0	0	0
ApproachDel:	13.5			10.2			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=323]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=35]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=323]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	23	23	0	0	12	23	207	0	35	0	0	0

Major Street Volume: 242
Minor Approach Volume: 46
Minor Approach Volume Threshold: 774

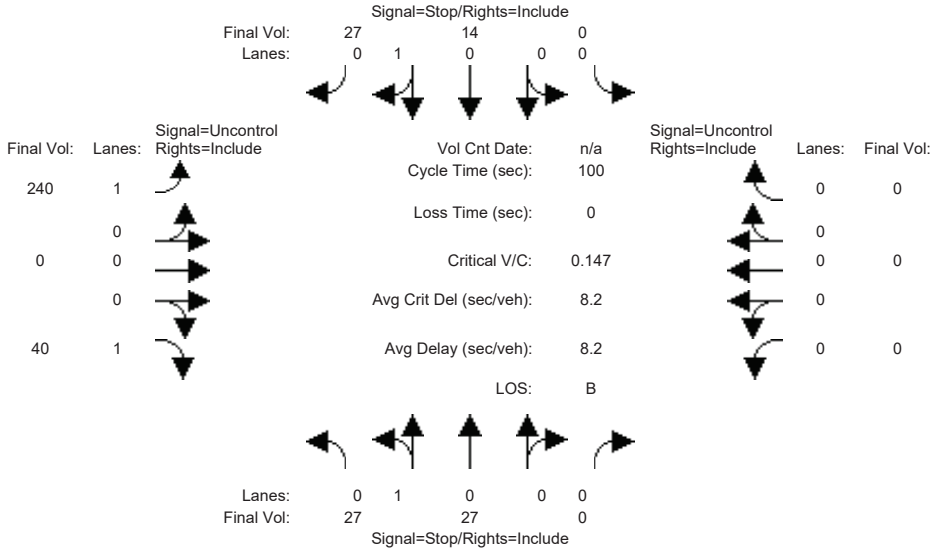
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

 Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Future + Project PM

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	27	27	0	0	14	27	240	0	40	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	27	0	0	14	27	240	0	40	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	27	0	0	14	27	240	0	40	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	27	0	0	14	27	240	0	40	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	27	27	0	0	14	27	240	0	40	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	487	480	xxxxx	xxxx	520	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	494	488	xxxxx	xxxx	463	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	416	417	xxxxx	xxxx	395	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.06	0.06	xxxx	xxxx	0.04	0.02	0.15	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.5	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	416	xxxx	xxxxx	xxxx	xxxx	682	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.4	xxxx	xxxxx	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	14.9	xxxx	xxxxx	xxxxx	xxxx	10.6	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B	*	*	*	*	B	*	*	*	*	*	*
ApproachDel:	14.9			10.6			xxxxxx			xxxxxx		
ApproachLOS:	B			B			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	27	27	0	0	14	27	240	0	40	0	0	0
ApproachDel:	14.9			10.6			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=54]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=375]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=375]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	27	27	0	0	14	27	240	0	40	0	0	0

Major Street Volume: 280
Minor Approach Volume: 54
Minor Approach Volume Threshold: 723

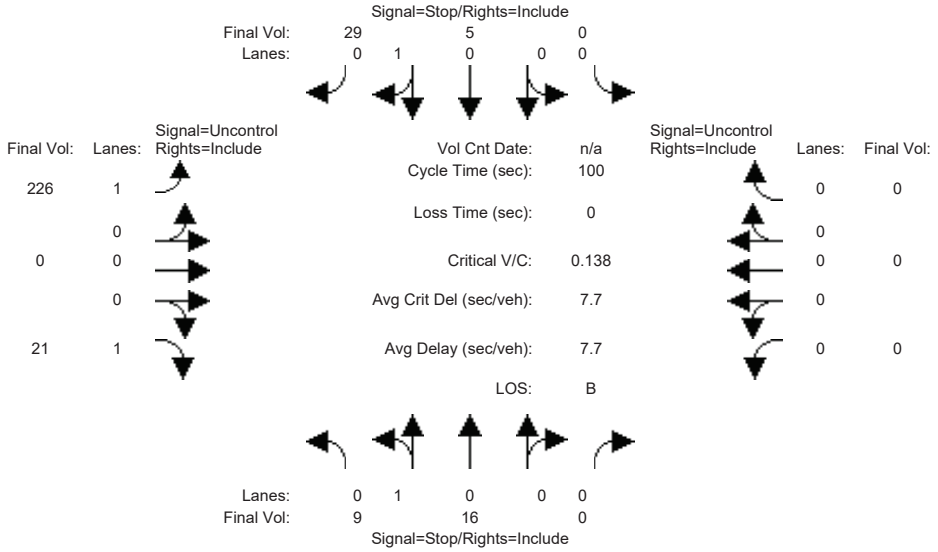
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing Saturday

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	9	16	0	0	5	29	226	0	21	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	9	16	0	0	5	29	226	0	21	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	9	16	0	0	5	29	226	0	21	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	9	16	0	0	5	29	226	0	21	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	9	16	0	0	5	29	226	0	21	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	455	452	xxxxx	xxxx	473	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	519	506	xxxxx	xxxx	493	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	448	436	xxxxx	xxxx	425	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.02	0.04	xxxx	xxxx	0.01	0.03	0.14	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.5	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	440	xxxx	xxxxx	xxxx	xxxx	886	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.2	xxxx	xxxxx	xxxxx	xxxx	0.1	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	13.7	xxxx	xxxxx	xxxxx	xxxx	9.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B	*	*	*	*	A	*	*	*	*	*	*
ApproachDel:	13.7			9.2			xxxxxx			xxxxxx		
ApproachLOS:	B			A			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	9	16	0	0	5	29	226	0	21	0	0	0
ApproachDel:	13.7			9.2			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=25]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=306]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=34]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=306]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	9	16	0	0	5	29	226	0	21	0	0	0

Major Street Volume: 247
Minor Approach Volume: 34
Minor Approach Volume Threshold: 767

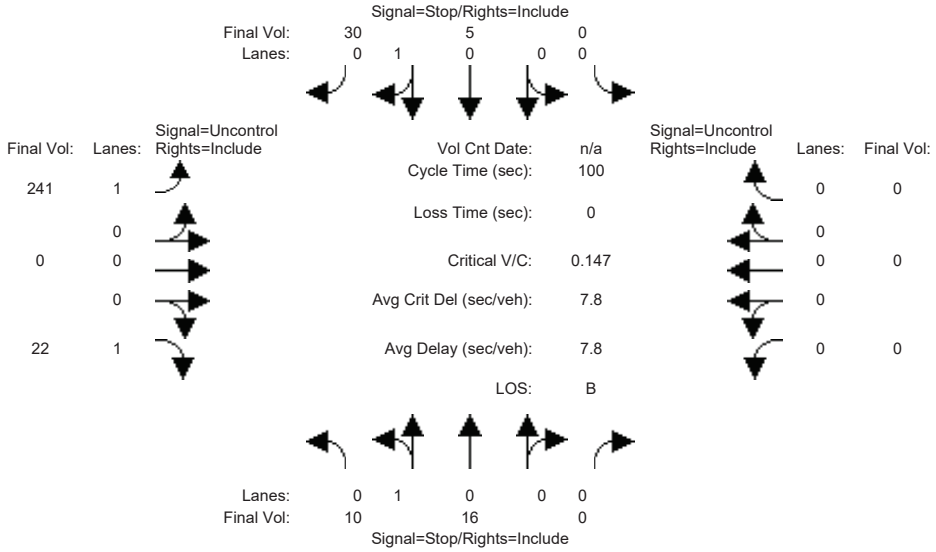
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project Saturday

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	10	16	0	0	5	30	241	0	22	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	16	0	0	5	30	241	0	22	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	16	0	0	5	30	241	0	22	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	16	0	0	5	30	241	0	22	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	10	16	0	0	5	30	241	0	22	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	485	482	xxxxx	xxxx	504	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	496	487	xxxxx	xxxx	473	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	424	415	xxxxx	xxxx	403	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.02	0.04	xxxx	xxxx	0.01	0.03	0.15	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.5	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	418	xxxx	xxxxx	xxxx	xxxx	877	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.2	xxxx	xxxxx	xxxxx	xxxx	0.1	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	14.2	xxxx	xxxxx	xxxxx	xxxx	9.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	B	*	*	*	*	A	*	*	*	*	*	*
ApproachDel:	14.2			9.3			xxxxxx			xxxxxx		
ApproachLOS:	B			A			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	10	16	0	0	5	30	241	0	22	0	0	0
ApproachDel:	14.2			9.3			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=26]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=324]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=35]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=324]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	10	16	0	0	5	30	241	0	22	0	0	0

Major Street Volume: 263
Minor Approach Volume: 35
Minor Approach Volume Threshold: 745

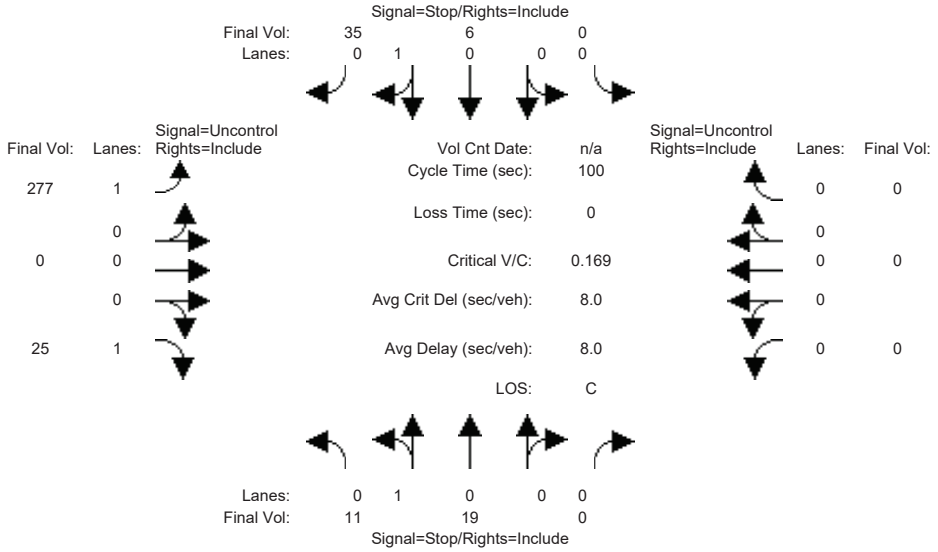
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Future + Project Saturday

Intersection #2: SR 17 NB Ramps & Bear Creek Rd



Street Name:	SR 17 NB Ramps						Bear Creek Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	11	19	0	0	6	35	277	0	25	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	11	19	0	0	6	35	277	0	25	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	11	19	0	0	6	35	277	0	25	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	11	19	0	0	6	35	277	0	25	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	11	19	0	0	6	35	277	0	25	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	557	554	xxxxx	xxxx	579	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	444	443	xxxxx	xxxx	429	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	369	368	xxxxx	xxxx	356	1091	1636	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.03	0.05	xxxx	xxxx	0.02	0.03	0.17	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.6	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	369	xxxx	xxxxx	xxxx	xxxx	838	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.3	xxxx	xxxxx	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	15.6	xxxx	xxxxx	xxxxx	xxxx	9.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	C	*	*	*	*	A	*	*	*	*	*	*
ApproachDel:	15.6			9.5			xxxxxx			xxxxxx		
ApproachLOS:	C			A			*			*		

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Copyright (c) 2008 Dowling Associates, Inc.

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	11	19	0	0	6	35	277	0	25	0	0	0
ApproachDel:	15.6			9.5			xxxxxx			xxxxxx		

Approach[northbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=30]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=373]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

Approach[southbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=373]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #2 SR 17 NB Ramps & Bear Creek Rd

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Lanes:	0 1	0 0	0	0 0	0 1	0	1 0	0 0	1	0 0	0 0	0
Initial Vol:	11	19	0	0	6	35	277	0	25	0	0	0

Major Street Volume: 302
Minor Approach Volume: 41
Minor Approach Volume Threshold: 697

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Copyright (c) 2008 Dowling Associates, Inc.

Appendix C

Collision Data

Santa Clara County
Roads and Airports

From 1/1/2017 to 12/31/2024

Total Collisions: 4

Injury Collisions: 2

Fatal Collisions: 0

Collision Summary Report

06/04/24

BEAR CREEK RD

90557122	**9/23/2017**	**11:00**	Saturday	BEAR CREEK RD - ALMA TRUCK RD		45'	Direction: West	Daylight	Clear	Pty at Fault:1	
	Sideswipe		Other Motor Vehicle	Improper Turning	22107		Hit & Run: Misde	Property Damage Only	# Inj: 0	# Killed: 0	
Party 1	Driver	South	Other Unsafe Turning	Not Sta	Age:	0 -		Unknown Hit and Run Vehicle Involvem	No Injury		
Veh Type: Not Stated			Sobriety: Impairment Not Kno	Assoc Factor: Not Stated		Unknown		Not Stated			
Party 2	Parked Vehicle	South	Stopped in Road	Not Sta	Age:	2018 KENWO		Pickups & Panels	No Injury		
Veh Type: Pickup Truck			Sobriety: HNBD	Assoc Factor: Not Stated		Not Stated		Not Stated			
91074246	**9/9/2019**	**22:50**	Monday	BEAR CREEK RD - RT 17		5280'	Direction: West	Dark - No Street	Clear	Pty at Fault:1	
	Hit Object		Fixed Object	Driving Under Influence	23152A		Hit & Run: No	Property Damage Only	# Inj: 0	# Killed: 0	
Party 1	Driver	West	Other Unsafe Turning	Male	Age: 43	2018 BUIC		Sport Utility Vehicle	No Injury		
Veh Type: Passenger Car			Sobriety: HBD Under Influence	Assoc Factor: Not Stated		Air Bag Deployed		Not Stated			
91165721	**1/3/2020**	**00:40**	Friday	BEAR CREEK RD - CHASE RD		615'	Direction: West	Dark - No Street	Clear	Pty at Fault:1	
	Hit Object		Fixed Object	Driving Under Influence	23152A		Hit & Run: No	Other Visible Injury	# Inj: 1	# Killed: 0	
Party 1	Driver	West	Other Unsafe Turning	Male	Age: 31	2015 FIAT		Passenger Car, Station Wagon, Jeep	No Injury		
Veh Type: Passenger Car			Sobriety: HBD Under Influence	Assoc Factor: Not Stated		Air Bag Not Deployed		Not Stated			
9340-2022-01354	**4/19/2022**	**08:15**	Tuesday	BEAR CREEK RD - CHASE RD		1056'	Direction: West	Daylight	Raining	Pty at Fault:	
	Head-On		Wrong Side of Road		21460A		Hit & Run: No	Severe Injury	# Inj: 2	# Killed: 0	
Party 1	Driver	East	Passing Other Vehicle	Female	Age: 17	2002 FORD		Passenger Car, Station Wagon, Jeep			
Veh Type: Passenger Car			Sobriety: HNBD	Assoc Factor: Not Stated		Air Bag Deployed		Not Stated			
Party 2	Driver	West	Proceeding Straight	Male	Age: 29	2020 NISS		Passenger Car, Station Wagon, Jeep			
Veh Type: Passenger Car			Sobriety: HNBD	Assoc Factor: Not Stated		Air Bag Deployed		Not Stated			
Party 3	Driver	East	Proceeding Straight	Female	Age: 31	2020 FORD		Sport Utility Vehicle			
Veh Type: Passenger Car			Sobriety: HNBD	Assoc Factor: Not Stated		Air Bag Not Deployed		Not Stated			

Settings for Query:

Street: BEAR CREEK RD
Note that when a street is selected, the results return all collisions with that steet as a primary road and all collisions with that street as a secondary road with a distance of 0'.
City: Santa Clara County
In Polygon Areas: (Bear Creek Redwood Preserve)

Data used to produce this report is sourced from SWITRS and the most recent data year is considered Provisional

Sorted By: Date and Time

Santa Clara County
Roads and Airports

From 1/1/2017 to 12/31/2024

Total Collisions: 5
Injury Collisions: 0
Fatal Collisions: 0

Collision Summary Report

6/20/24

90482818	**6/14/2017**	**15:00**	Wednesday	BEAR CREEK RD - CHASE RD		290'	Direction: East	Daylight	Clear	Pty at Fault:1	
In Area: Bear Creek Road near Proposed Driveway	Sideswipe	Other Motor Vehicle	Wrong Side of Road	21460A	Hit & Run: No	Property Damage Only	# Inj: 0	# Killed: 0			
Party 1	Driver	East	Crossed Into Opposing Lane - Unplanned	Female	Age: 50						
Veh Type: Passenger Car	Sobriety: HNBD	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							
Party 2	Driver	West	Proceeding Straight	Female	Age: 73						
Veh Type: Passenger Car	Sobriety: HNBD	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							
90528497	**8/14/2017**	**14:30**	Monday	BEAR CREEK RD - CHASE RD		40'	Direction: East	Daylight	Clear	Pty at Fault:1	
In Area: Bear Creek Road near Proposed Driveway	Rear-End	Other Motor Vehicle	Unsafe Starting or Backing	22106	Hit & Run: No	Property Damage Only	# Inj: 0	# Killed: 0			
Party 1	Driver	East	Backing	Male	Age: 18						
Veh Type: Passenger Car	Sobriety: HNBD	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							
Party 2	Driver	West	Slowing/Stopping	Female	Age: 55						
Veh Type: Passenger Car	Sobriety: HNBD	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							
90752516	**6/19/2018**	**22:20**	Tuesday	BEAR CREEK RD - MELLOTS RD		50'	Direction: West	Dark - No Street Li	Clear	Pty at Fault:1	
In Area: Bear Creek Road near Proposed Driveway	Hit Object	Other Object	Driving Under Influence	23152A	Hit & Run: No	Property Damage Only	# Inj: 0	# Killed: 0			
Party 1	Driver	West	Other Unsafe Turning	Male	Age: 33						
Veh Type: Passenger Car	Sobriety: HBD Under Influence	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							
91097385	**10/4/2019**	**22:00**	Friday	BEAR CREEK RD - RT 17		4000'	Direction: West	Dark - No Street Li	Clear	Pty at Fault:1	
In Area: Bear Creek Road near Proposed Driveway	Hit Object	Fixed Object	Improper Turning	22107	Hit & Run: Misde	Property Damage Only	# Inj: 0	# Killed: 0			
Party 1	Driver	West	Other	Not State	Age:						
Veh Type: Passenger Car	Sobriety: Impairment Not Kno	Assoc Factor: Not Stated	Air Bag Deployed	Not Stated							
91193907	**2/18/2020**	**08:30**	Tuesday	BEAR CREEK RD - CHASE RD		60'	Direction: East	Daylight	Clear	Pty at Fault:1	
In Area: Bear Creek Road near Proposed Driveway	Sideswipe	Other Motor Vehicle	Unsafe Starting or Backing	22106	Hit & Run: Misde	Property Damage Only	# Inj: 0	# Killed: 0			
Party 1	Driver	West	Backing	Not State	Age:						
Veh Type: Not Stated	Sobriety: Impairment Not Kno	Assoc Factor: Not Stated	Unknown	Not Stated							
Party 2	Driver	West	Stopped in Road	Male	Age: 85						
Veh Type: Passenger Car	Sobriety: HNBD	Assoc Factor: Not Stated	Air Bag Not Deployed	Not Stated							

Settings for Query:

Street: BEAR CREEK RD
Note that when a street is selected, the results return all collisions with that steet as a primary road and all collisions with that street as a secondary road with a distance of 0'.
City: Santa Clara County
In Polygon Areas: (Bear Creek Road near Proposed Driveway)

Data used to produce this report is sourced from SWITRS and the most recent data year is considered Provisional

Sorted By: Date and Time