



# HIGHWAY 17 BICYCLE AND PEDESTRIAN OVERCROSSING DRAFT FEASIBILITY STUDY



AUGUST 2020



PREPARED BY:



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## **ACKNOWLEDGEMENTS**

### *Town of Los Gatos Staff*

Ying Smith – Transportation and Mobility Manager

Lisa Petersen – Assistant Director/Town Engineer

Michelle Quinney – Special Projects Manager

Matt Morley – Director

### *Consultant Team*

Jaggi Bhandal – Project Civil Engineer, Project Manager, BKF Engineers

Natalina V. Bernardi – Project Civil Engineer, Principal, BKF Engineers

Mahvash Harms – Project Structural Engineer, Biggs Cardosa Associates

Carlos Vasquez – Project Structural Engineer, Biggs Cardosa Associates

Rick Phillips – Project Bridge Architect, RP Place

Randy Anderson – Project Multi-Modal Planner, Trailpeople

Demetri Loukas – Project Environmental Consultant, David J. Powers and Associates

Gary Parikh – Project Geotechnical Engineer, Parikh Consultants

## I. PROJECT DESCRIPTION

Connect Los Gatos is a program of bicycle and pedestrian projects that will connect and improve the Town's "backbone" network. The program's overall goal is to (1) expand and provide access to key community destination points, and (2) make it easier and safer to bike and walk in the Town. Six proposed projects are identified in the program to accomplish this goal:

1. Los Gatos Creek Trail Connector to Highway 9
- 2. Bicycle and Pedestrian Overcrossing over Highway 17**
3. Winchester Boulevard Complete Streets
4. Shannon Road Multi-Use Path
5. Kennedy Road Sidewalk and Class II Bike Lane
6. Highway 9/Massol Avenue Intersection Safety Improvements



As one of the six projects, this study evaluates how best to improve bicycle and pedestrian mobility across Highway 17 near the existing Blossom Hill Road Bridge. The general Project Study Area on Highway 17 is shown below.

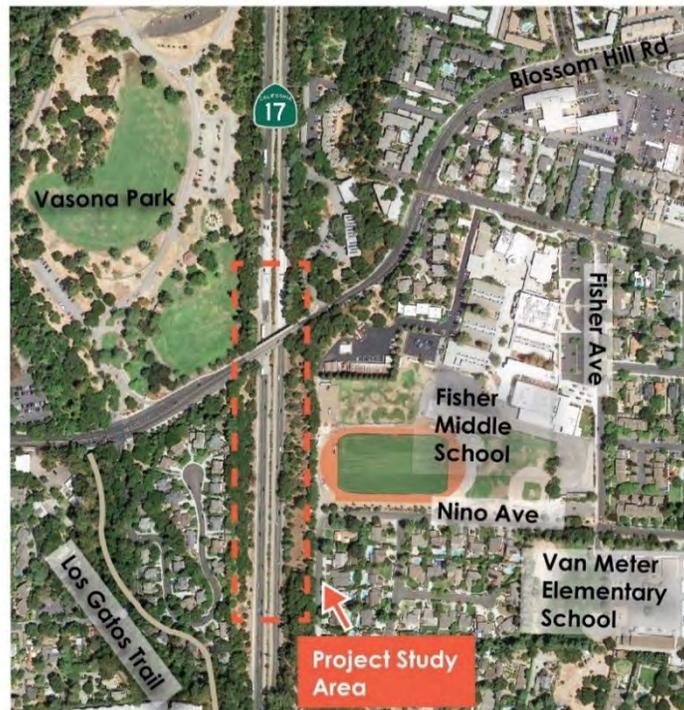


Figure 1 – Project Study Area



The goal of this study is to develop feasible alternatives and evaluate them based on the Project's purpose and need to enhance bicycle and pedestrian mobility across Highway 17, and assess the impacts of each alternative, to determine a preferred alternative to carry forward to final design. The preferred alternative is anticipated to best meet the needs of the Town while balancing user experience, conceptual cost, construction impacts, impacts to utilities and right of way, structural and geotechnical requirements, Caltrans standards, and favorable to the community. To ensure these criteria are considered, the study completes the following:

1. Assess existing bicycle and pedestrian facilities within the Town of Los Gatos
2. Analyze bicycle and pedestrian origin/destination patterns
3. Provide a contextual understanding of the existing conditions and previous planning efforts within the project study area
4. Present alternative alignments that address existing deficiencies
5. Map and evaluate impacts to existing utilities and right of way
6. Address and incorporate the feedback received from the community and Caltrans
7. Consider environmental impacts and mitigation measures
8. Analyze structural and geotechnical constraints
9. Envision potential aesthetic features and user experience enhancements
10. Develop conceptual project costs and delivery plan

In completing these items the study intends to recommend a preferred alignment for further engineering evaluation and design. Solely with the end goal of aiding the Town in its efforts to "Connect Los Gatos".

## II. PROJECT BACKGROUND AND EXISTING TRAVEL DEMAND

### A. EXISTING CONDITIONS

Within the project limits, Highway 17 is a 4-lane two directional divided highway. The lanes are generally 12-foot wide with a 36-foot unpaved median, 2-foot paved left- shoulders adjacent to the median, and 8-foot paved right shoulders. Highway 17 is a primary North-South Highway that runs through the Town of Los Gatos and splits the Town into East and West sides.

As shown in Figure 2, the Town has five east-west crossings over Highway 17. However, the Blossom Hill Road Bridge is the only crossing that provides east-west connectivity within the nearly 2-mile stretch between Highway 9 and Lark Avenue.



Figure 2-Existing Highway 17 Crossings

As currently configured, Blossom Hill Road is signalized at the Roberts Road West/Vasona Park Road intersection and at the Roberts Road East intersection. The corridor is a primary truck route within the Town of Los Gatos with a 35 mph posted speed limit. Blossom Hill Road varies in width, from approximately 78-feet wide near the Roberts Road West intersection to approximately 56-feet wide at the Roberts Road East intersection. The corridor’s cross section configuration varies slightly along the east and west side of Highway 17.

The Blossom Hill Road/Roberts Road West intersection includes the following at each approach:

- Westbound – 12.5-foot right turn lane, 7-foot bike lane with 5-foot buffer, and 11-foot through lane
- Eastbound – 11-foot through lane, 10-foot buffer, and 10.5-foot bike lane

The Blossom Hill Road/Roberts Road East intersection includes the following at each approach:

- Westbound – 11-foot through lane, and 6-foot bike lane with 3-foot buffer
- Eastbound – 10-foot right and left turn lanes, 11-foot through lane, and 5-foot bike lane

The existing Blossom Hill Road Bridge does not provide Class II bike lanes and is a current gap in the Town’s existing bike network. Existing bicycle facilities are provided east and west of existing structure, which include a Class II bike lane on the west and a mix of Class II and Class IV bike lanes on the east. On the west side, the bike lane extends along Blossom Hill Road, from the bridge approach to Winchester Boulevard. On the east side, the bike lanes extend along Blossom Hill Road, from the bridge approach to Los Gatos Boulevard.

The existing Blossom Hill Road Bridge was built in 1959 and currently provides two 10.5-foot travel lanes, 5-foot wide sidewalks on each side, and shoulders of 4 feet on the south side and 5 feet on the north side. These shoulders do not meet the Town’s standards for Class II bike lanes.

Caltrans’ minimum vertical clearance requirement for vehicular overcrossings above the freeway is 16’-6”. Although minor improvements have occurred since its construction, the existing Blossom Hill Road Bridge does not meet the Caltrans minimum vertical clearance standards as it only provides 15’-2” vertical clearance over Highway 17.

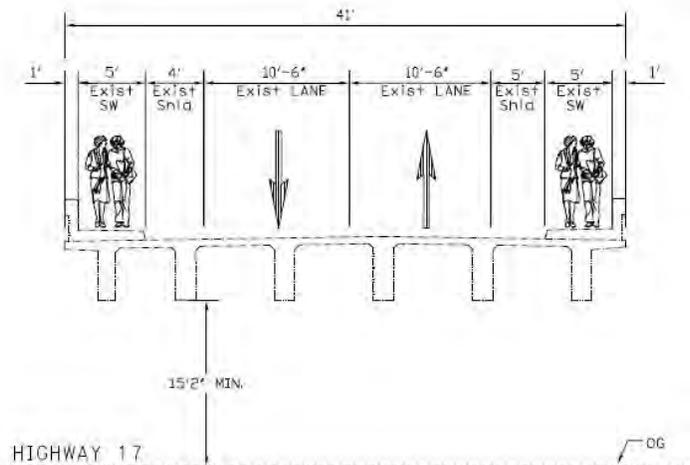


Figure 3 - Existing Blossom Hill Road Bridge

## B. SAFE ROUTES TO SCHOOL

The Fisher Middle School “Walk and Roll” Map illustrated in Figure 4, is a safe routes to school map prepared as part of the Los Gatos Safe Route to School Study (2018). This map identifies main routes for students walking to and from the school, which emphasizes the importance of the existing Blossom Hill Road Bridge and the Los Gatos Creek Trail as connections for students living to the west of Highway 17.

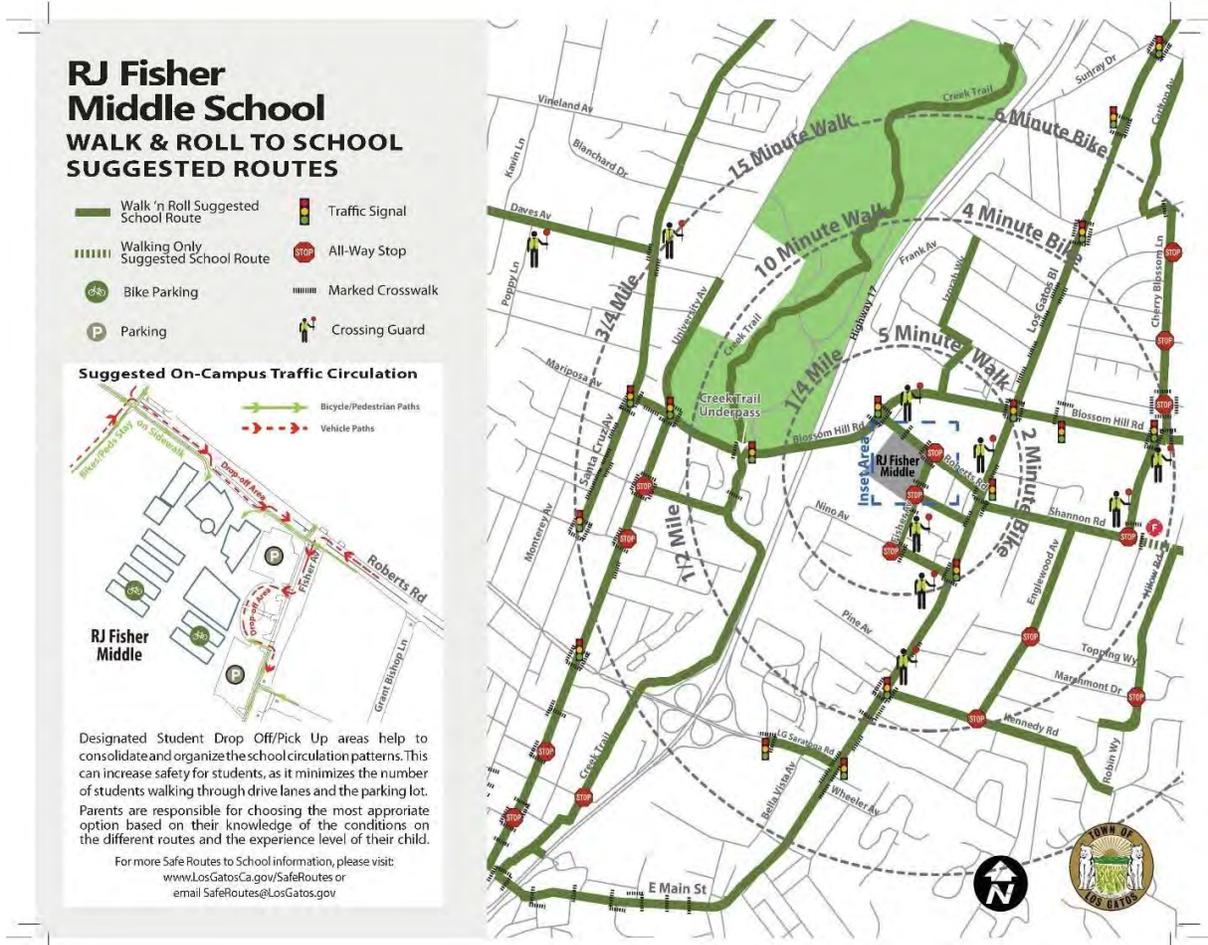


Figure 4 - Fisher Middle School Safe Route to School Map

## C. EXISTING PEDESTRIAN AND BICYCLE VOLUMES

The Town has collected pedestrian and bicycle counts in recent years (Table 1). The latest counts were conducted on March 12, 2020 and March 13, 2020 between the hours of 7 am to 9 am in the morning and 2 pm to 4 pm in the afternoon. The raw data collected is included in Appendix XIV.A for reference. The results indicate that peak hour volumes occur



*Photo 1. Directional Traffic (North Side of Blossom Hill Road)*

between 7:45 am and 8:45 am in the morning and between 2:30 pm and 3:30 pm in the afternoon. These peak volumes directly correlate to bicyclists and pedestrians commuting to and from school, which is apparent by the directional traffic seen during these times as shown in Photo 1 and Table 1 below.

In analyzing the data from the counts, a major directional increase during the afternoon occurs for both bike and pedestrian users, as these counts approximately double from the morning peak hour to the afternoon peak hour. The major increase in pedestrian users in the afternoon is seen on the south side of the bridge, and for bicyclists a substantial increase in usage occurs on the north side of the bridge. As shown in Photo 1, pedestrian users tend to walk on the south side of the bridge heading westbound, while bicyclists use the north side of the bridge to head westbound. This usage pattern is consistent with school walking/biking trips observed at other locations.



Location	Peak AM Hourly Traffic - Pedestrian	Peak PM Hourly Traffic - Pedestrian	Peak AM Hourly Traffic - Bicyclists	Peak PM Hourly Traffic - Bicyclists	Year
Blossom Hill Road Bridge- Weekday	87	174	46	84	2020
Los Gatos Creek Trail Access Points at Roberts Road - to Los Gatos Creek Trail – Weekday	13	9	20	11	2019
Los Gatos Creek Trail Access Points at Roberts Road - to Los Gatos Creek Trail – Weekend	27	6	10	9	2019
Los Gatos Creek Trail Access Points at Roberts Road - Northward to Blossom Hill Road – Weekday	7	7	21	16	2019
Los Gatos Creek Trail Access Points at Roberts Road - Northward to Blossom Hill Road – Weekend	93	40	33	24	2019
Los Gatos Creek Trail Access Points at Roberts Road -Southward to University Ave – Weekday	8	9	7	7	2019
Los Gatos Creek Trail Access Points at Roberts Road -Southward to University Ave - Weekend	70	30	30	35	2019
Blossom Hill Road and Roberts Road West – Northward to Vasona County park - Weekday	0	1	2	3	2016
Blossom Hill Road and Roberts Road West – Southward to Roberts Road - Weekday	11	4	80	10	2016
Blossom Hill Road and Roberts Road West – East of Highway 17 - Weekday	5	4	20	18	2016
Blossom Hill Road and Roberts Road West – Westward to University Avenue - Weekday	48	31	9	4	2016

Table 1 – Bicycle and Pedestrian Counts

## D. EXISTING LAND USE

This section of the study highlights the surrounding land use and illustrates the importance of the existing Blossom Hill Road Bridge as a connection for the Town of Los Gatos.

### Residential Areas

The land use pattern surrounding the alternative connections is primarily residential, as shown in Figure 5. A significant amount of Medium Density Residential development is located just to the east of the crossing, with High Density Residential just beyond a half mile from the crossing. Similarly, the west side of the crossing features areas of Middle Density Residential, and a significant amount of High Density Residential just to the south.

The Residential Land Use Map below was generated for this project using 2010 Census Data. Population density within the project location is as follows:

- 16,793 people live within the 1-mile buffer of project location.
- 4,437 people live within the 0.5-mile buffer of project location.



Figure 5 - Residential Land Use Map

**Public Facilities**

Vasona Lake County Park is located northwest of the crossing. This is a very popular regional park with recreational trails, many individual and group picnic areas, watercraft, and a popular miniature railroad ride. The Town’s Oak Meadow Park is west of Vasona Park along Blossom Hill Road and is another popular destination.

The Los Gatos Creek Trail approaches from the southwest side of Highway 17 and does not have an efficient connection across to other public facilities such as Fisher Middle School on the east side of Highway 17.

Per the School District map in Figure 6, the two nearby elementary schools do not have attendance areas that cross Highway 17. Blossom Hill Elementary School to the northeast of the crossing study area has a small attendance area to the west of Highway 17, but its access route is Lark Avenue. Fisher Middle School is located just to the southeast of the crossing, and serves the entire School District boundary, as does Los Gatos High School to the south.

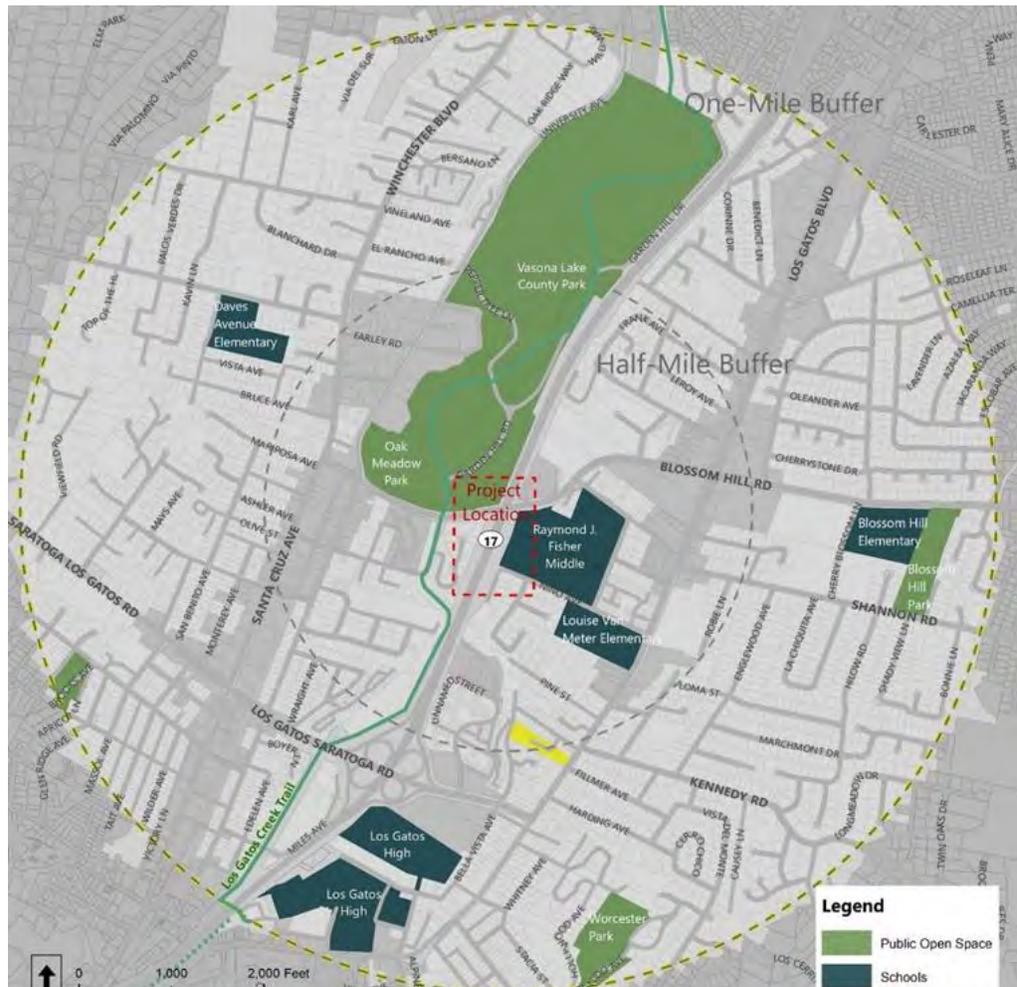


Figure 6 – School Location Map

### Commercial Areas/Employment Centers

This connection is located between two key business districts; one on Los Gatos Boulevard (a more conventional shopping district featuring chain stores) and the other on Santa Cruz Avenue leading south to downtown Los Gatos (a more unique district featuring local businesses and restaurants). This crossing of Highway 17 is the most direct way for pedestrians and bicyclists to commute between these two areas, which are one mile apart. Both for shopping purposes and for access to employment, the Highway 17 crossing is a key connection.

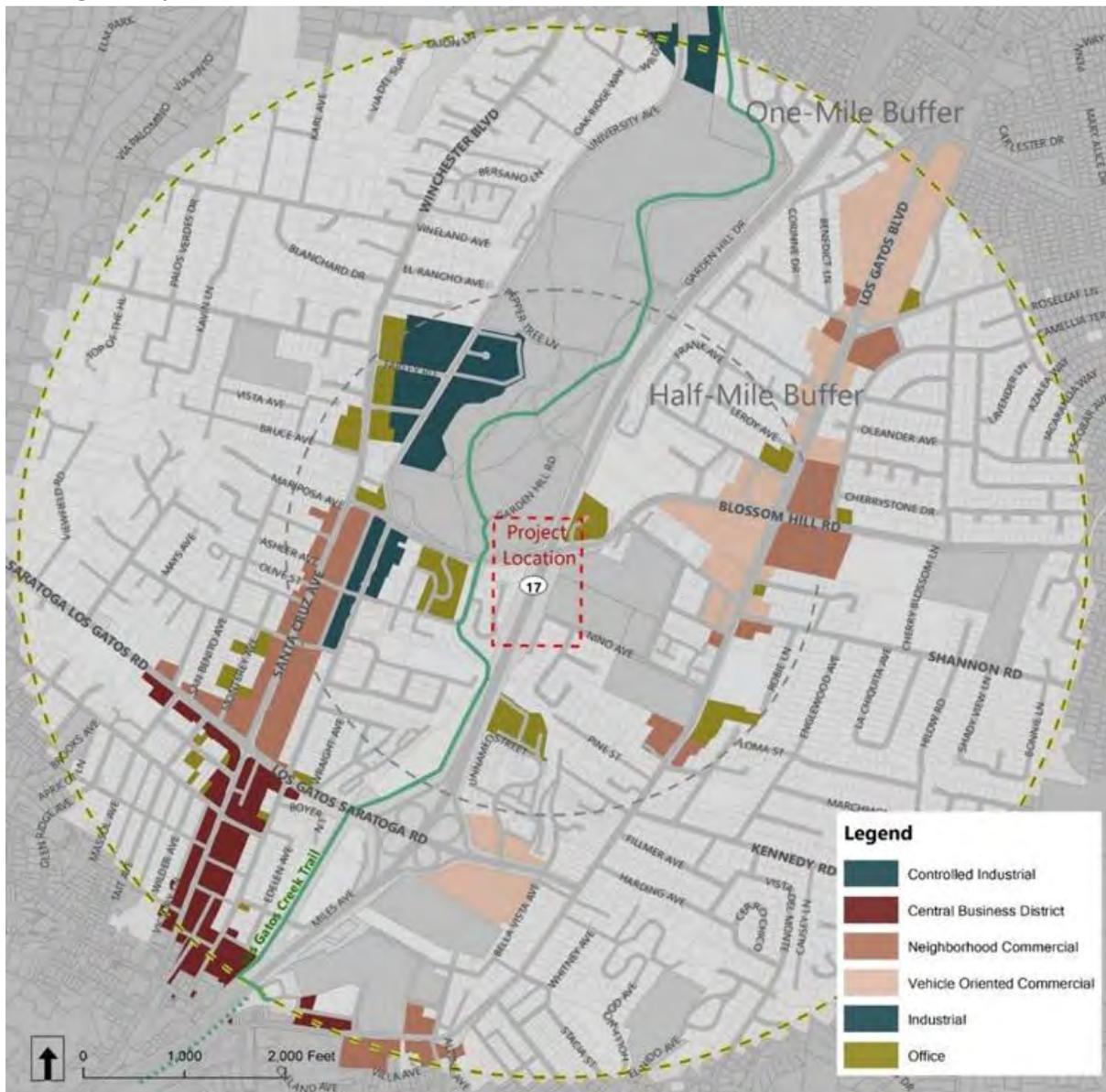


Figure 7 - Commercial Land Use Map

The 2010 Census data was reviewed for this project to determine the employment levels within the limits of the project. The employment densities are as follows:

- 7,745 jobs are located within the 1- mile buffer of project area.
- 4,437 jobs are located within the 0.5- mile buffer of project area.

Figure 8 shows the distribution of jobs levels by block per the 2010 Census. The red circles on the map are located in the center of their corresponding census block. The size of the circle reflects the total number of jobs located in that specific census block. The larger the circle's size, the more jobs are located around that area. Of the 7,745 jobs located within 1-mile distance of the project area, the majority of them are service sector jobs, including Retail Trade, Professional, Scientific, and Technical Services, Educational Services, Health Care and Social Assistance, as well as Accommodation and Food Services.

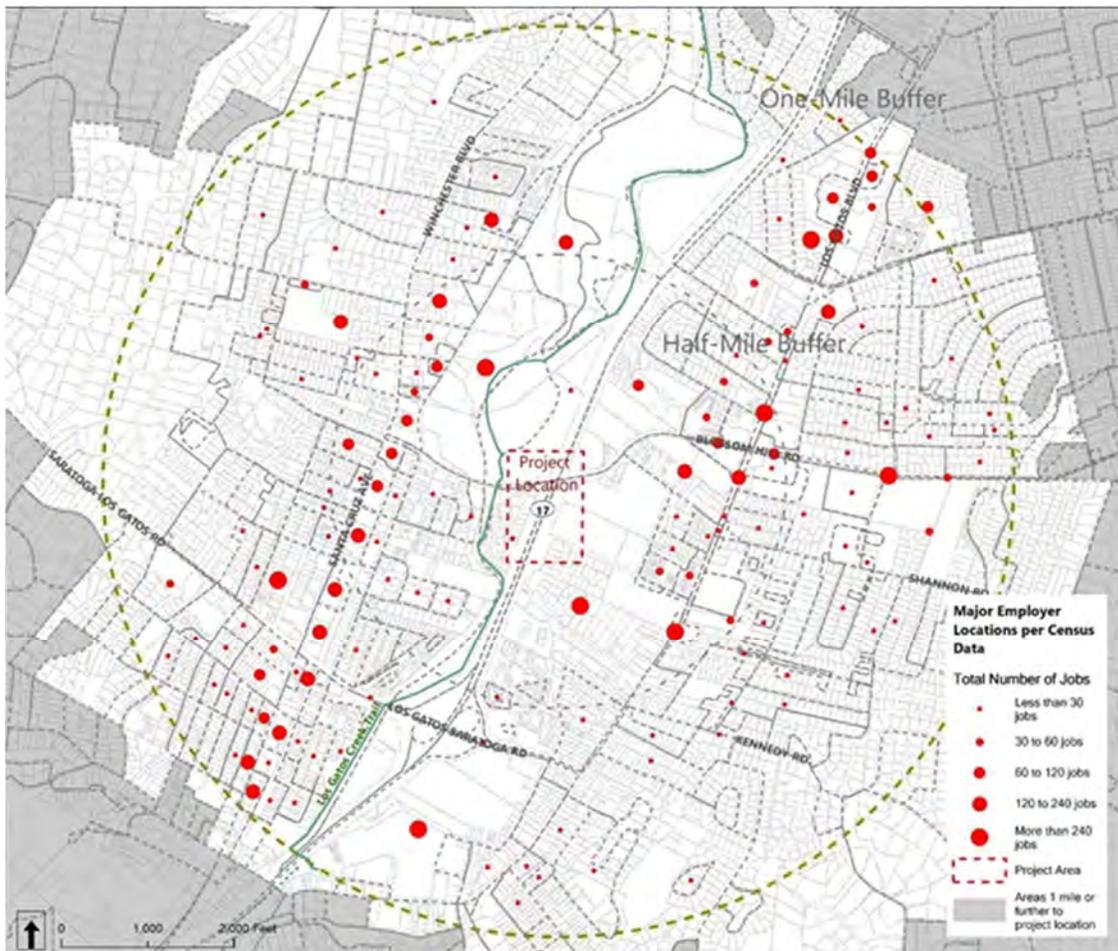


Figure 8- Major Employer Locations

## Land Use Analysis

Thousands of people live within a one mile radius of the project location and commute to school and work using the existing Blossom Hill Road Bridge; therefore, the Los Gatos community would greatly benefit from an enhanced bicycle and pedestrian connection across Highway 17. Additional studies of the existing bicycle and pedestrian network and safety is further evaluated in Section II.E.

## E. BICYCLE AND PEDESTRIAN NETWORK AND SAFETY

### Bicycle Network and Safety

The bicycle network map (Figure 9) highlights the lack of connectivity at the Highway 17 crossing. Access to the Los Gatos Creek Trail multi-use path on the west side of Highway 17 from the east is limited by the lack of a safe crossing of Highway 17.

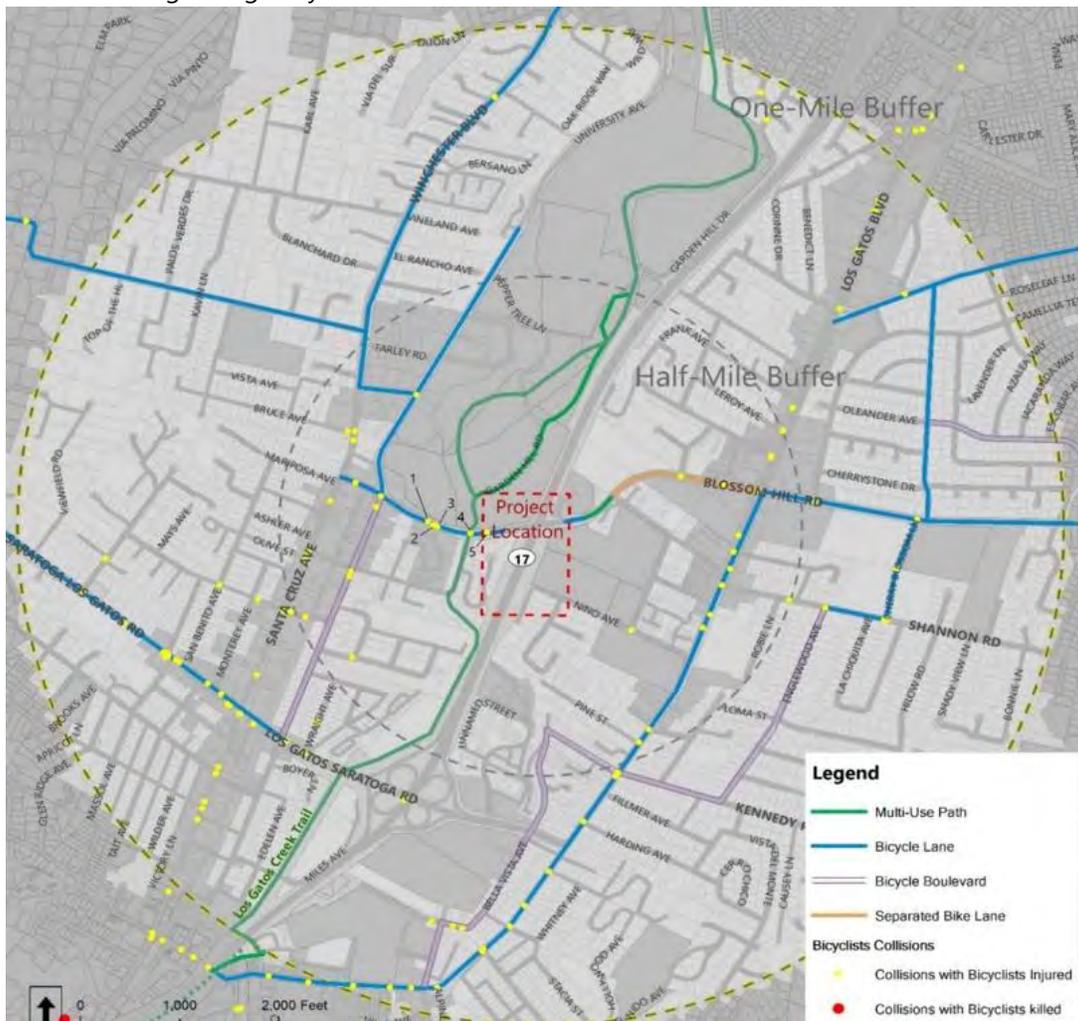


Figure 9 – Bicycle Network and Collision Map



Network connectivity is an essential component for increasing the ridership within a bicycle network, and a short, but dangerous gap (i.e. narrow shoulders with fast moving traffic) like the existing Blossom Hill Road Bridge can deter all but the most experienced cyclists.

Index	Severity of Injury	Year
1	2 - Injury (Severe)	2018
2	4 - Injury (Complaint of Pain)	2012
3	4 - Injury (Complaint of Pain)	2011
4	3 - Injury (Other Visible)	2015
5	3 - Injury (Other Visible)	2019

*Table 2 – Relevant Bicyclist Collision Information*

The map highlights collisions involving bicyclists between 01/01/2010 and 12/31/2019.

This includes five collisions involving bicyclists near the crossing on Blossom Hill Road from 2011 through 2019.

### **Pedestrian Network and Safety**

Similarly, this crossing is an important gap in the pedestrian network of sidewalks on the east side of Highway 17, and the significant multi-use trail system of the west side of Highway 17, including the Los Gatos Creek Trail connecting to and through Vasona County Park to the north, and to downtown Los Gatos and Los Gatos High School to the south, and to the sidewalk system further west.

Figure 10 highlights collisions involving pedestrians between 01/01/2010 and 12/31/2019. (Source: TIMS - Transportation Injury Mapping System: <https://times.berkeley.edu/>)

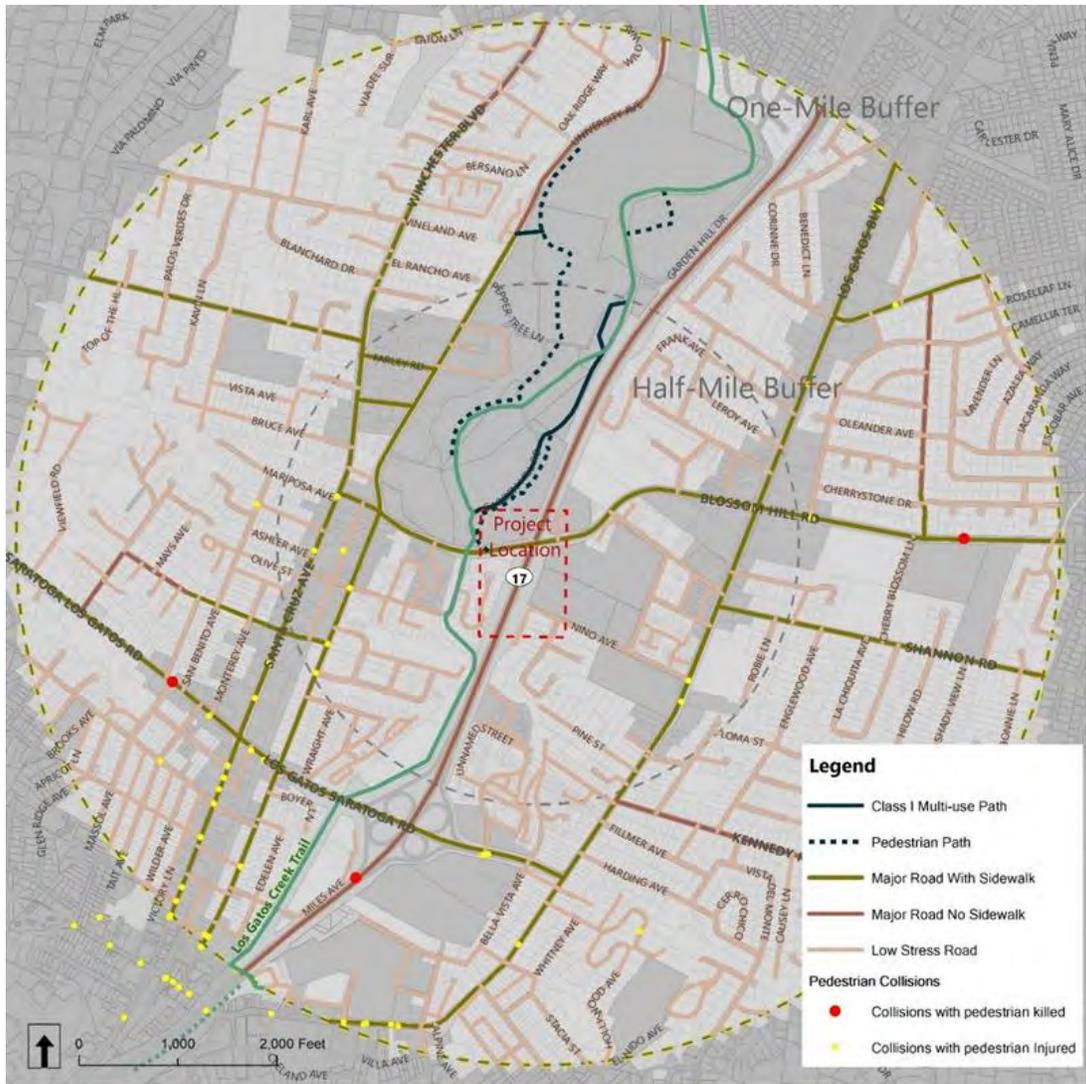


Figure 10 – Pedestrian Network Map

### III. PROJECT PURPOSE AND NEED

The purpose of the Highway 17 Bicycle and Pedestrian Overcrossing (BPOC) Project is to:

1. Improve bicycle and pedestrian mobility across Highway 17 in the vicinity of the Blossom Hill Road Bridge
2. Improve safety for all modes of travel
3. Provide a Safe Route to School
4. Promote active transportation
5. Reduce traffic congestion and greenhouse gas emissions by reducing vehicular traffic demand

With two travel lanes in each direction, carrying upwards of 63,000 vehicles per day, Highway 17 creates both a physical and psychological barrier for both pedestrians and bicyclists as it divides the Town of Los Gatos. Blossom Hill Road is one of a few roadways that provide east-west connectivity across the highway between the recreational sites and residences located on the west side, and schools/businesses located on the east side.

The existing sub-standard bridge width does not meet current and future bicycle and pedestrian demands, especially during school hours. The existing Blossom Hill Road Bridge is becoming increasingly more of a bottle neck to accommodate the large bike and pedestrian volumes, as it lacks the necessary separation and protection between the various modes of travel, which creates unsafe conditions given the high volume and speed of vehicles on the roadway. This bottleneck has become more apparent after the Town completed recent improvements to bicycle facilities, in 2018, on Blossom Hill Road to the east and west of the existing bridge.

During the school peak periods, bicyclists, most of which are students, are commonly observed riding on the sidewalks and therefore limit the space required for pedestrians, including those who use wheelchairs and other mobility devices. The existing vehicular travel lanes also present a challenge for larger vehicles who depend on this route. As shown in the image below, large vehicles have a challenge navigating the narrow lanes and often encroach into the adjacent shoulder.



*Photo 2. Large Vehicle Encroachment into Bicycle Lane (North side of Blossom Hill Road)*



The same is true for bicyclists during peak hours. As shown in Section II.C, directional bike volumes along the corridor do not fit within the narrow shoulders and often force riders into the adjacent travel lanes. Students have learned to adapt to the constrained facility, but they do not feel comfortable riding on the shoulders or sidewalks.

Given the high vehicular volumes and speed, and the limitations of the existing bike and pedestrian infrastructure, many consider the bridge uncomfortable and unsafe for active transportation modes. These amplified safety concerns for the various users who depend on the Blossom Hill Road Bridge has created a barrier to reaching the Town's goal of promoting active transportation. Providing an adequate bike and pedestrian facility is necessary to bridge the gap and increase user confidence.

The purpose and need have been approved by the Town Council at its March 3, 2020 meeting and are supported by the Complete Street and Transportation Commission and the community of Los Gatos.

## IV. EXISTING PLANNING DOCUMENTS

### A. TOWN OF LOS GATOS BICYCLE & PEDESTRIAN MASTER PLAN

The Los Gatos Bicycle and Pedestrian Master Plan (BPMP) was adopted in March 2017. The vision for the BPMP is to: increase bicycling and walking by residents, visitors, and employees; enhance the Town's reputation as a bicycle and pedestrian friendly community; create a bicycle and pedestrian network that expands access to community destinations; create a balance to access in the roadway network for all modes of transportation; balance the needs of recreational bicyclists, commuters, transit users and students; provide safe access throughout the community for the mobility impaired; and support and expand sustainable transportation options for the Town, while improving public health and benefiting the local economy.

In the BPMP, Blossom Hill Road is identified as an important route on the Town's Backbone Bikeway Network and is located on a designated School Walking Route. As a primary connection between East and West Los Gatos, improvements to the area around Blossom Hill Road are highlighted as a key need for improving the network. The Plan recommends multiple improvements within the Project Study area, including a bridge project is identified as a Phase 3 (10-20 year) project when published. Another



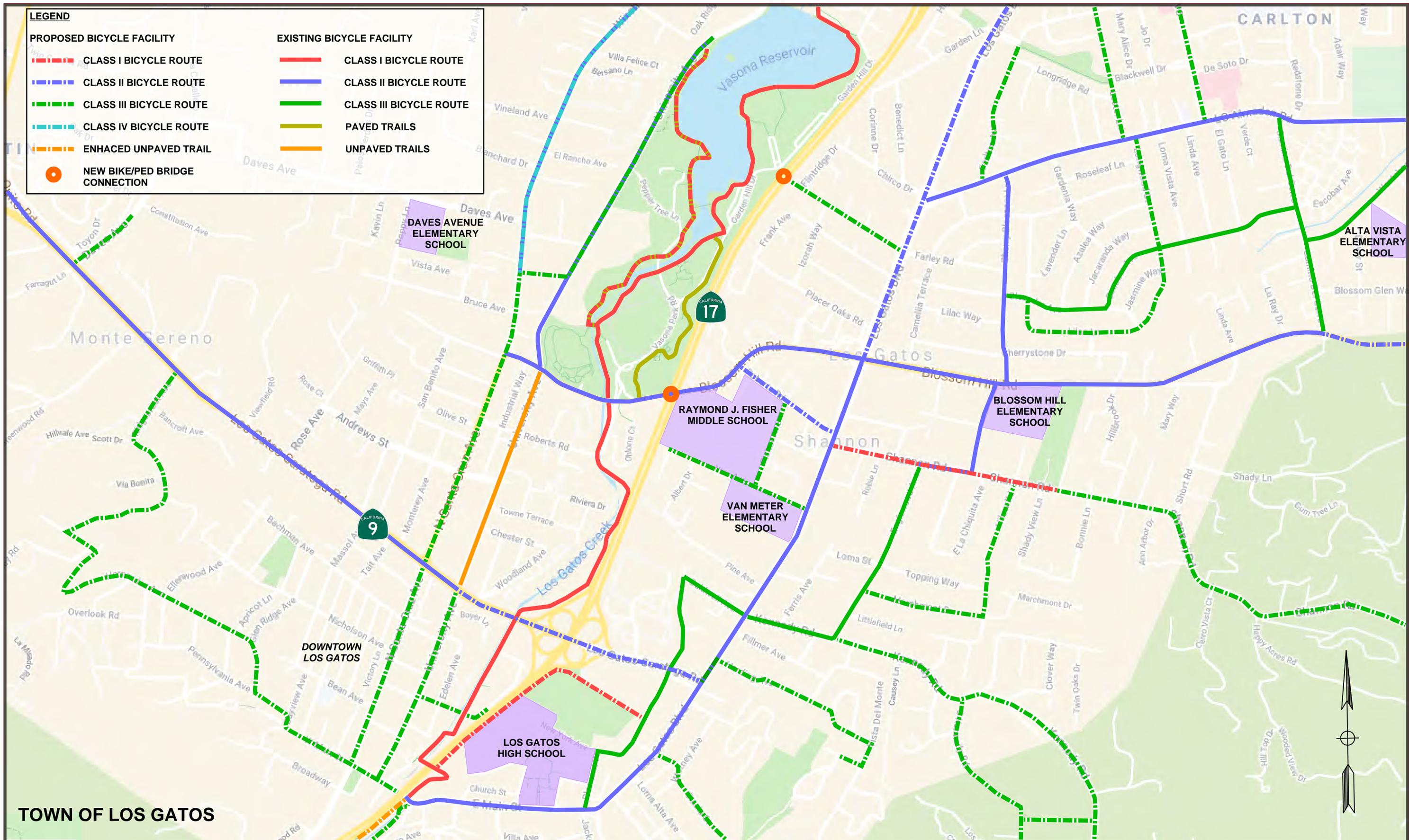
improvement identified in the BPMP includes the conversion of Class II Bike Lanes to a Class IV cycle track on Blossom Hill Road between Roberts Road and Los Gatos Blvd (Project 37). This project was completed in 2019 on both sides of the Blossom Hill Road Bridge. However, the existing structure still presents a gap to recent improvements on either side.

The Town began the Feasibility Study of the Highway 17 Bicycle and Pedestrian Overcrossing in 2019. This project has received significant community support and later was included in Connect Los Gatos, a program of bicycle and pedestrian projects that promote connectivity and improve the multimodal network throughout the Town.

The proposed Highway 17 bicycle and pedestrian overcrossing project is included in the 2020 BPMP Update that is being recommended for adoption by the Town Council at its September 1, 2020 meeting.

**LEGEND**

<b>PROPOSED BICYCLE FACILITY</b>		<b>EXISTING BICYCLE FACILITY</b>	
	CLASS I BICYCLE ROUTE		CLASS I BICYCLE ROUTE
	CLASS II BICYCLE ROUTE		CLASS II BICYCLE ROUTE
	CLASS III BICYCLE ROUTE		CLASS III BICYCLE ROUTE
	CLASS IV BICYCLE ROUTE		PAVED TRAILS
	ENHANCED UNPAVED TRAIL		UNPAVED TRAILS
	NEW BIKE/PED BRIDGE CONNECTION		



TOWN OF LOS GATOS



**HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT**  
**FIGURE 11 - EXISTING AND PROPOSED BICYCLE FACILITIES**





## B. THE TOWN OF LOS GATOS GENERAL PLAN

The Town has adopted four categories of Bikeways as part of the General Plan, which derive from Caltrans classifications and the Highway Design Manual. Generally, Class I and Class IV facilities are the most preferred type as they provide the highest user experience with the highest likelihood of promoting active transportation due to their inherent safety and are recommended improvements within the project study area. Discussion of the proposed alternative sections and their consistency with these recommendations are addressed throughout this report.

## C. SAFE ROUTES TO SCHOOL PLANNED ROADWAY FACILITIES

The Town of Los Gatos, Los Gatos Union School District, the Los Gatos-Saratoga Joint Union High School District, and Hillbrook School District partnered together to evaluate all modes of transportation around local schools in order to understand what improvements are needed to meet the needs of those commuting to and around the local schools. Their efforts and findings have been documented in the Los Gatos Safe Routes to School - Phase 1 Project Report, adopted by the Town Council on October 18, 2016. The Report recommends improvements to Blossom Hill Road and Roberts Road, such as enhancements to the Blossom Hill Road bikeway, enhanced crosswalk markings at Roberts Road, traffic signal modifications, and a potential trail connection to the LGUSC District Offices. The Town has explored this potential trail connection but found it to be infeasible.



## V. ALTERNATIVES

### A. BASIS OF CONCEPTUAL DESIGN

As shown in the Town’s previous planning studies, three general alternatives are identified as viable ways to meet the Project’s purpose and need. The options suggested are as follows:

- Alternative 1** – A new bicycle and pedestrian bridge connecting to Nino Avenue
- Alternative 2** – A separate bicycle and pedestrian bridge along Blossom Hill Road
- Alternative 3** – Widening the existing Blossom Hill Road Bridge for bicyclists and pedestrians



Figure 12 - Bicycle and Pedestrian Bridge Alternatives

The general design criteria used to develop and analyze the alignments presented in this study assume the following:

- The BPOC or widening would need to be located on the south side of the Blossom Hill Road Bridge due to the existing overhead electrical lines located along the north side.
- Any widening would need to provide greater clearance than the existing substandard 15’2” clearance.



- Widening of the existing bridge would need to consider the potential need to make structural modifications to existing Blossom Hill Road Bridge.

## B. INITIAL ALIGNMENT SCREENING

Several conceptual alignments deriving from the 3 project alternatives were initially studied for the main span crossing and approaches at the east and west sides. Alignments studied for the main span crossing consisted of perpendicular, skewed, and curved crossings over Highway 17, as shown in Figure 13. Based on the initial alignments studied, several were eliminated from further review because of significant drawbacks, as described on the next page. The remaining alignments were perused for their potential benefits and drawbacks, as detailed in Section V.C. A summary and exhibit illustrating the initial alignments is provided below:

- 1a. **Los Gatos Creek Trail Connector to Nino Ave** – A perpendicular crossing that provides a direct connection between Los Gatos Creek Trail on the west side and Nino Way on the east side.
- 1b. **Blossom Hill Rd Skewed Connector to Nino Ave** – A skewed main span crossing with a point of connection at Blossom Hill Rd to the West and Nino Way to the East. Additionally, the option of a second connection to East Blossom Hill Rd was studied, and is shown in Figure 13.
- 1c. **Blossom Hill Rd Perpendicular Connector to Nino Ave** – A perpendicular main span crossing that provides the same points of connection as Alternative 1b (with the exception of the optional second landing along East Blossom Hill Rd). A switchback alignment is required along the west approach to provide enough distance to conform to existing grades along Blossom Hill Rd with a profile grade of 5% or less that meets ADA requirements.
- 1d. **Blossom Hill Rd Curved Connector to Nino Ave** – A curved main span crossing that provides the same points of connection as Alternative 1c.
- 1e. **Ohlone Ct Connector to Pine Ave** – A skewed main span crossing that connects Ohlone Ct with Pine Ave. The option of a second connection to Nino Ave was studied, and is shown in the Figure 13.
2. **Blossom Hill Rd Adjacent Connector** – Provides a second parallel crossing with Blossom Hill Rd for bicyclists and pedestrians (see Figure 20).
3. **Blossom Hill Rd Bridge Widening** – Widens the existing Blossom Hill Rd Bridge for bicyclists and pedestrians.

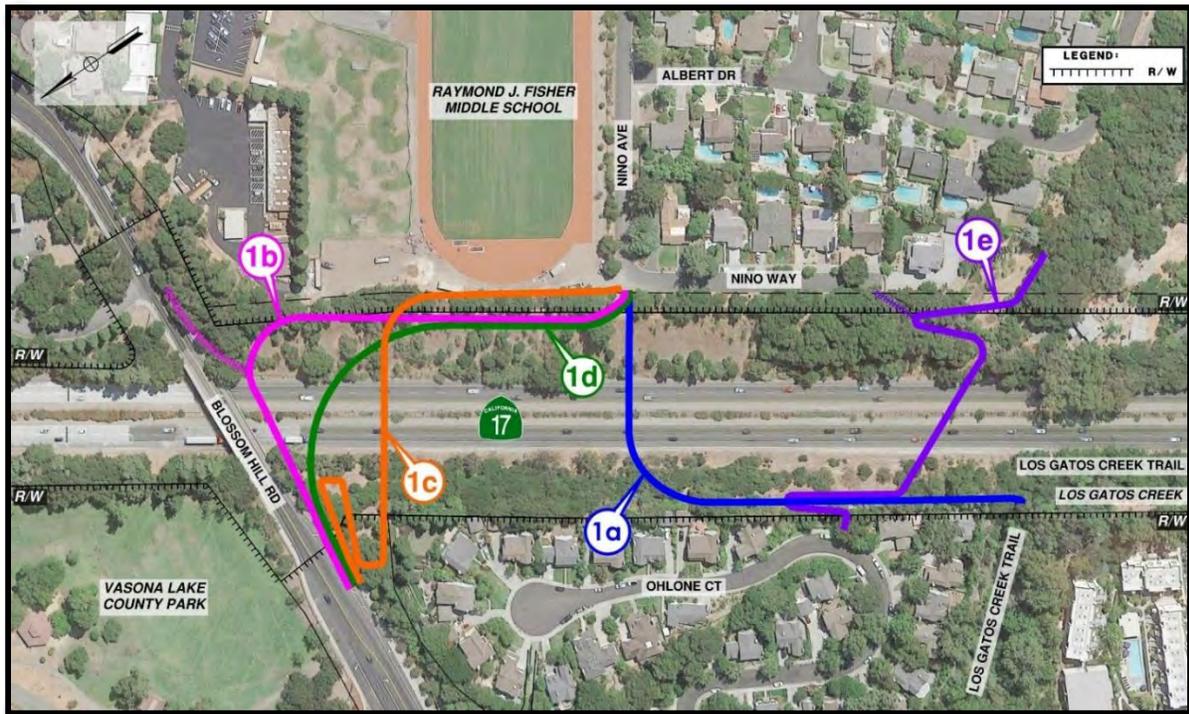


Figure 13 - Initial Alignment Alternatives

Based on a preliminary internal analysis of the initial alignments, Alignment 1d and 1e were eliminated from further review based on the following significant setbacks:

- **Alignment 1d** – The curved alignment over Highway 17 violates Caltrans requirements for longitudinal crossings, adds complexity to the structure type, and eliminates the potential for a prefabricated main span if steel is preferred. Eliminating the potential for a precast structure would increase construction costs and introduce significant construction staging challenges over Highway 17.
- **Alignment 1e** – This alternative would outlet directly into the private residential neighborhood at Ohlone Ct. Additionally, neither point of connection provides direct access to points of interest, which requires bicyclists and pedestrians to take indirect routes to access the bridge. Therefore, this alternative was removed from further study because it is less desirable to users than the more direct connections proposed.

### C. FEASIBLE ALTERNATIVES

Provided in Figures 14 and 15 below are the benefits and considerations for the alignments carried forward from the initial screening process. These alignments were further developed and considered feasible alternatives that meet the Project’s purpose and need.

ALTERNATIVES	BENEFITS	CONSIDERATIONS
 <p><b>1A</b> Los Gatos Creek Trail Connector to Nino Ave</p>	<ul style="list-style-type: none"> <li>• Provides connection to Los Gatos Creek Trail</li> <li>• Greatest Design Flexibility                             <ul style="list-style-type: none"> <li>○ Horizontal alignment is more direct of a connection to Nino Way</li> <li>○ Required vertical clearance can easily be achieved.</li> <li>○ Pier in Highway 17 median may not be required</li> </ul> </li> <li>• Safe and direct route to Fisher Middle School with connection at Nino Ave.</li> <li>• Better user experience with a separated Class 1 BPOC.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduces a visual obstruction and privacy issue to the residents of Ohlone Ct.</li> <li>• Incorporate mitigation measures such as railings, downward or dimmed lighting, sound barriers and or privacy screening.</li> <li>• Modification to existing sound walls at the Los Gatos Creek Trail and along Highway 17 would need to occur.</li> </ul>
 <p><b>1B</b> Blossom Hill Rd Skewed Connector to Nino Ave</p>	<ul style="list-style-type: none"> <li>• Maintains existing bike and pedestrian traffic patterns on the West side of Blossom Hill Road</li> <li>• Safe and direct route to Fisher Middle School with connection at Nino Ave.</li> <li>• Better user experience with a separated Class 1 BPOC.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential right of way impacts on East side.</li> <li>• Slightly constrains future Blossom Hill Road widening</li> <li>• Changes bike and pedestrian traffic patterns on East side.</li> </ul>
 <p><b>1C</b> Blossom Hill Rd Perpendicular Connector to Nino Ave</p>	<ul style="list-style-type: none"> <li>• Maintains existing bike and pedestrian traffic patterns on the West side of Blossom Hill Road</li> <li>• Safe and direct route to Fisher Middle School with connection at Nino Ave.</li> <li>• Better user experience with a separated Class 1 BPOC.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential right of way impacts on East side.</li> <li>• Slightly constrains future Blossom Hill Road widening</li> <li>• Changes bike and pedestrian traffic patterns on East side.</li> <li>• Impacts to Ohlone Ct. residences similar to Alternative 1A.</li> <li>• More costly due to longer route.</li> <li>• Tight radii create potential conflict points for bicyclists and pedestrians</li> </ul>

Figure 14 - Benefits and Considerations for Feasible Alignment Alternatives

ALTERNATIVES	BENEFITS	CONSIDERATIONS
 <p><b>Blossom Hill Rd Adjacent Connector</b></p>	<ul style="list-style-type: none"> <li>• Potential to provide a two-way Class I facility</li> <li>• Allows for sidewalk removal on south side of Blossom Hill Road and would provide the following:                             <ul style="list-style-type: none"> <li>◦ Room for wider existing vehicular lanes</li> <li>◦ Room for a Class IV westbound bike lane in addition to BPOC</li> </ul> </li> <li>• Provides greater user experience than Alternative 3 with the BPOC separated from vehicles</li> <li>• Does not preclude future widening of the Blossom Hill Road Overcrossing due to greater separation between existing and proposed structures</li> </ul>	<ul style="list-style-type: none"> <li>• Additional modifications will be necessary for a two-way path at the conforms on Blossom Hill Road</li> <li>• Aesthetic limitations due to adjacent bridge. A more intricate bridge design may visually conflict with the existing Bridge.</li> </ul>
 <p><b>Blossom Hill Rd Bridge Widening</b></p>	<ul style="list-style-type: none"> <li>• The Least initial construction cost is anticipated with this alternative.</li> <li>• Allows for sidewalk removal on south side of Blossom Hill Road and would provide the following:                             <ul style="list-style-type: none"> <li>◦ Room for wider existing vehicular lanes</li> <li>◦ Room for a Class IV westbound bike lane.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Limits future widening options greatly due to overlap with the existing bridge.</li> <li>• Vertical clearance is limited to existing Blossom Hill Road Profile.</li> <li>• Greatly reduced Aesthetic options due to adjacent bridge.</li> </ul>

Figure 15 - Benefits and Considerations for Feasible Alignment Alternatives

## D. CIRCULATION ANALYSIS

To evaluate the feasibility and benefits of each alternative presented in Section V.C, the Project Team looked into the existing and anticipated demand and travel patterns of active transportation trips and how people may utilize the three proposed alternative connections. The following pedestrian and bicycle circulation flow maps use relative line thickness to represent present and predicted traffic volumes for the proposed alignment alternatives. These maps were developed using existing employment data and pedestrian and bicycle counts. The data reviewed for this project was used to map pedestrian and bicycle flow and predict how the connecting routes and use would shift with each alternative alignment. Key business/shopping areas are identified in the southwest and northeast portions of the map. Employment centers were derived from the Town of Los Gatos FY 18/20 budget, Principal Employers of the last ten fiscal years (FY17/18 and total of 15 employers), and both school districts. The size of the bubble for major destinations corresponds to the numbers of employees or users at each location.

### Existing Condition

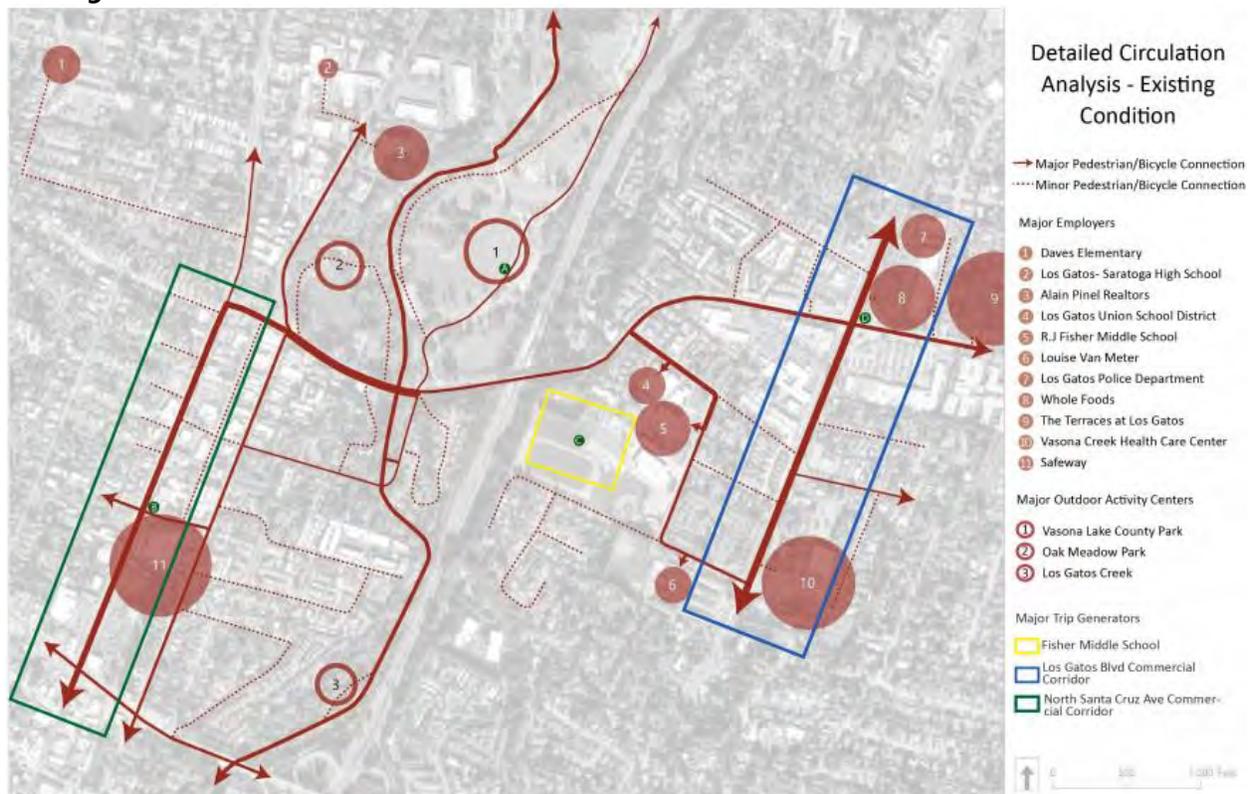


Figure 16 – Existing Circulation Map



From the Existing Circulation Map (Figure 16) it is apparent that Blossom Hill Road is the most direct route for people to cross Highway 17. The insufficient bicycle and pedestrian facilities limit the number of bicyclists and pedestrians using Blossom Hill Road to cross Highway 17.

### **Alternative 1A – Los Gatos Creek Trail Connector to Nino Avenue**

Alternative 1A would provide a more separate link for Fisher Middle School students travelling from residential areas on the southwest side of the study area. It would be a more direct route for residents on Nino Avenue and the greater southeast area of Los Gatos to the Santa Cruz Avenue shopping and employment district west of Highway 17. It would also be a more direct connection from the southeast sector to the northwest sector, including Vasona Park. This is the only alternative that provides direct access to Creek Trail without the need to bike or walk on Roberts Road West.

But for people traveling from residential areas northwest of the crossing to commercial/employment areas to the southwest, or vice-versa, it would be a more circuitous route than following Blossom Hill Road. It would be even more circuitous than Alternatives 1B and 1C for users traveling to or from Vasona Lake Park or other parts of the northwest sector to the commercial/employment centers in the northeast sector. They would likely need to travel at least an additional mile to reach their destination, or risk using the constrained Blossom Hill Road route.

### **Alternative 1B – Blossom Hill Road Skewed Connector to Nino Avenue and**

### **Alternative 1C – Blossom Hill Road Perpendicular Connector to Nino Avenue**

The proposed alignment Alternatives 1B and 1C would provide a minor reduction in distance travelled for those in the southeast sector of the study area (except for a greater benefit for residents close to the freeway). It is partly on quieter streets, which is generally regarded as a positive attribute of a pedestrian network. The most notable shift in traffic flow would be an increase of bicycle and pedestrian traffic in the quiet residential area south of Fisher Middle School. But for people traveling from residential areas to the northwest of the crossing to commercial/employment areas to the southwest, or vice-versa, it would be a more circuitous route than following Blossom Hill Road.



The flow of the existing network along Blossom Hill Road would not be accommodated in Alternatives 1B and 1C. For example, users traveling to or from Vasona Lake Park or other parts of the northwest sector to the commercial/employment centers in the northeast sector would likely need to travel at least an additional half mile to reach their destination, or risk using the constrained Blossom Hill Road route. Bicyclists and pedestrian with a destination to the commercial area at Los Gatos Boulevard/Blossom Hill Road would have a slighter longer travel distance and would likely continue to use Blossom Hill Road instead of the new BPOC.

**Alternative 2 – Blossom Hill Road Adjacent Connector and**

**Alternative 3 – Blossom Hill Road Bridge Widening**

The proposed alignment Alternatives 2 and 3 would match the existing travel routes by providing a direct connection with a separate bicycle and pedestrian overcrossing alongside the existing Blossom Hill Road Bridge. A key benefit of this alignment is that residents of either side of Highway 17 can access the crossing with little adjustment from existing travel patterns and maximize the utilization of the existing infrastructure on Blossom Hill Road to both sides of the existing bridge. It also provides a direct link between the employment centers.

## E. DISTANCES TO MAJOR DESTINATIONS BY ALTERNATIVE

**Walking and Biking Distance between Major Destinations**

Table 3 compares the distance between major destinations. The locations of the destinations are shown on Figure 16.

**Point A** represents the northwest section, west of Highway 17 and north of Blossom Hill Road, including Vasona County Park, Oak Meadow Park, and the Santa Cruz Avenue commercial and residential area north of Blossom Hill Road.

**Point B** represents the southwest section, west of Highway 17 and south of Blossom Hill Road, including residential areas and the Santa Cruz Avenue commercial area south of Blossom Hill Road.

**Point C** represents Raymond J. Fisher Middle School.



**Point D** represents the northeast section, east of Highway 17 and north of Blossom Hill Road, including residential areas and the commercial and residential area south of, along, or on either side of Los Gatos Boulevard south of Blossom Hill Road.

Distance Traveled						
	From Point A To Point B	From Point A To Point C	From Point A To Point D	From Point B To Point C	From Point B to Point D	From Point C to Point D
<b>Existing Condition</b>	4,893 Ft.	3,283 Ft.	4,957 Ft.	5,090 Ft.	6,858 Ft.	1,816 Ft.
<b>Alternative 1A</b>	4,893 Ft.	5,939 Ft.	8,611 Ft.	5,650 Ft.	7,378 Ft.	1,816 Ft.
<b>Alternative 1B and 1C</b>	4,893 Ft.	4,693 Ft.	7,228 Ft.	6,389 Ft.	8,174 Ft.	1,816 Ft.
<b>Alternative 2 and 3</b>	4,893 Ft.	3,283 Ft.	4,957 Ft.	5,090 Ft.	6,858 Ft.	1,816 Ft.

Table 3 – Distance between Major Destinations

Alternatives 1A, 1B, and 1C would have longer, more circuitous routes for users traveling across Highway 17 within the vicinity of Blossom Hill Road. Table 3 illustrates that Alternatives 1A, 1B, and 1C would significantly increase the travel distance from Point A and Point B to Points C and D. On the other hand, Alternatives 2 and 3 would maintain existing travel distances between major destinations. Although there are marginal benefits with Alternatives 1A, 1B, and 1C, the increased travel distances for those currently utilizing Blossom Hill Road are undesirable, especially since the majority of usage is to and from Raymond J. Fisher Middle School. Therefore, a new structure adjacent to the existing structure is preferred.

## F. ALTERNATIVE SELECTION

In addition to the benefits and considerations for the feasible alternatives, the circulation analysis for anticipated traffic volumes, and the distance between major destinations by alternative described in the previous sections, a number of other factors were taken into consideration when selecting the preferred alternative for this project. The criteria used to evaluate each alternative is summarized in Table 4 below.



	Alternative 1A	Alternative 1B	Alternative 1C	Alternative 2	Alternative 3
Circulation Improvements	✓	✓	✓	✓	✓
Maintains Existing Travel Patterns	✗	✗	✗	✓	✓
Meets Caltrans Standards	✓	✓	✓	✓	✗ <sup>1</sup>
Community Acceptance	✗	✗	✗	✓	✗
Additional Infrastructure Cost	High	High	High	Medium	High <sup>1</sup>
Accommodates Future Demand	✓	✓	✓	✓	✗
Right of Way Constraints and Impacts to Neighboring Communities	High	Medium	High	Low	Low
Environmental Impact	Medium	Medium	Medium	Medium	Low
Engineering Constraints and Complexity	Medium	Medium	Medium	Low	High

<sup>1</sup>Alternative 3 proposes widening of the existing structure, which currently does not meet Caltrans vertical clearance standards. Therefore, the cost for this alternative would be higher in comparison to the other alternatives assuming the existing structure would need to be replaced to meet current standards.

Table 4 – Alignment Selection Analysis

While all the alternatives presented in Section V.C are considered feasible, Alternatives 1A, 1B, 1C and 3 were eliminated from further consideration as a result of the analysis summarized in Table 4 above.

Caltrans coordination and community engagement that went into this analysis are discussed in further detail in Sections XI and XII respectively. Based on the analysis, the Alternative 2 concept is deemed the preferred alternative and has been developed further as part of this study. A draft plan and profile for Alternative 2 is included as Figure 20.

## G. ALTERNATIVE 2 CROSS-SECTION EVALUATION

To meet the Project’s design goals described in Section III, the design team looked into the design criteria for minor structures specified in *Caltrans Highway Design Manual* (HDM). When developing the cross-section design, the following HDM design criteria was taken into consideration:

- **HDM 1003.1(1)(a) Traveled Way** – The minimum paved width of travel way for a two-way bike path shall be 8 feet, 10 feet is preferred. The maximum paved width for a one-way bike path shall be 5 feet.



- **HDM 1003.1(1)(b) Shoulder** – A minimum 2-foot wide shoulder, composed of the same pavement material as the bike path or all weather surface material that is free of vegetation, shall be provided adjacent to the traveled way of the bike path when not on a structure.
- **HDM 1003.1(3) Clearance to Obstructions** – The clear width of a bicycle path on structures between railings shall not be less than 10 feet. It is desirable that the clear width of structures be equal to the minimum clear width of the path plus shoulders (i.e., 14 feet).
- **HDM 1003.1(7) Bike Paths Parallel and Adjacent to Streets and Highways** – The minimum separation between the edge of traveled way of a one-way or a two-way bicycle path and the edge of traveled way of a parallel road or street shall be 5 feet plus the standard shoulder width.

A number of factors were also taken into consideration including constructability, user experience, safety, right of way constraints, and impacts to existing utilities. With the aforementioned HDM criteria and these factors in mind, two typical section alternatives and two enhanced section alternatives were developed and evaluated. The typical section alternatives consist of a separate BPOC with a proposed structure width that varies between 11 and 15-feet. On the other hand, the enhanced section alternatives propose a structure width that varies between 16 and 20-feet. The benefits and challenges that need to be considered for each section alternative are identified in Figure 17 and Figure 18 respectively.

# HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

## FIGURE 17 - TYPICAL SECTION ALTERNATIVE COMPARISON MATRIX



Description	Proposed Section	Advantages	Disadvantages
<p><b>EB BIKE PATH BPOC –</b> Provide a separate BPOC adjacent to the existing Blossom Hill Road Bridge that will include a 5' EB bike lane and a 6' or 10' sidewalk. The existing Blossom Hill Road Bridge will be modified to provide a WB Class IV Bike lane. The vertical clearance of BPOC will be 18'6" minimum. The section will also include one 12' lane, one 13' lane.</p>		<ul style="list-style-type: none"> <li>• Maintains the existing WB bike travel pattern, but provides additional safety considerations with the widened lane and buffer zone, which meets Class IV requirements.</li> <li>• Provides separated EB bike path and sidewalk.</li> <li>• Minimum BPOC width is 10 feet, therefore this section complies with HDM requirements and provides a more economical solution than other alternatives.</li> <li>• Wider vehicle lane configuration than existing.</li> <li>• BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced.</li> <li>• Option for wider sidewalk if warranted by high pedestrian volumes.</li> <li>• Meets HDM 18'6" vertical clearance requirements for BPOC's.</li> </ul>	<ul style="list-style-type: none"> <li>• Bicyclist and pedestrian interaction will be greater with the reduced width of the BPOC.</li> <li>• Does not provide multiple WB bike lane options.</li> <li>• WB bicyclists leaving Raymond J. Fisher Middle School will cross Blossom Hill Rd twice when traveling to Los Gatos Creek Trail. These bicyclists will utilize the new BPOC, in which case there should be dedicated facilities for this WB movement.</li> </ul>
<p><b>MIXED-USE PATH BPOC –</b> Similar to the previous option, but contains two 4' mixed-use paths and 2' shoulders within the BPOC. This option allows for a reduced BPOC width and still provides WB bicyclist the option to use the BPOC as well. The 2' shoulders allow for better user experience by providing separation from the path and the bridge railing.</p>		<ul style="list-style-type: none"> <li>• Maintains the existing WB bike travel pattern, but provides additional safety considerations with the widened lane and buffer zone.</li> <li>• Consolidates Bike and Ped Facilities into mixed usage, requiring smaller structure and therefore cost.</li> <li>• Wider vehicle lane configuration than existing.</li> <li>• BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced.</li> <li>• Meets HDM 18'6" vertical clearance requirements for BPOC's.</li> </ul>	<ul style="list-style-type: none"> <li>• Mixed Bike and Pedestrian interaction</li> <li>• May not provide enough capacity for future demand.</li> <li>• Reduced width for both bicyclists and pedestrians using path.</li> </ul>

# HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

## FIGURE 18 - ENHANCED SECTION ALTERNATIVE COMPARISON MATRIX



Description	Proposed Section	Advantages	Disadvantages
<p><b>CYCLE TRACK BPOC –</b> Similar to the EB BIKE PATH BPOC Typical Section shown on Figure 17, this section will provide a separate BPOC and a WB Class IV facility, but will include a secondary WB Bike facility on the BPOC. Additionally 2' shoulders are proposed to improve bicyclist and pedestrian separation.</p>		<ul style="list-style-type: none"> <li>• Maintains the existing WB bike travel pattern with additional safety considerations, but provides an additional option for WB riders to travel on BPOC.</li> <li>• Provides a separated WB and EB bike path and sidewalk.</li> <li>• Enhanced user experience for bicyclists and pedestrians in comparison to other alternatives.</li> <li>• Reduces bicycle and pedestrian interaction with 2' shoulder separation. An elevated sidewalk can be added to further differentiate the facilities per user.</li> <li>• Wider vehicle lane configuration than existing.</li> <li>• BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced. The additional WB lane on the BPOC will provide greater traffic handling flexibility than Alt typical section.</li> <li>• Meets HDM 18'6" vertical clearance requirements for BPOC's.</li> </ul>	<ul style="list-style-type: none"> <li>• Initial cost will be greater than typical section due to the increased width.</li> <li>• Greater impact to the intersections at Roberts Rd. to provide cycle track crossing.</li> <li>• Some re-work to previously installed bicycle improvements</li> <li>• Potential bus stop relocation at Roberts Rd.</li> </ul>
<p><b>CYCLE TRACK BPOC –</b> This option would be a similar to the enhanced section illustrated above, but would allow for the option of a wider sidewalk with the removal of the 2' shoulders adjacent to the bike path. The wider 10' sidewalk would be proposed if the pedestrian volumes warranted it.</p>		<ul style="list-style-type: none"> <li>• Provides a WB bike path, an eastbound bike path and sidewalk on a separated structure.</li> <li>• The 5' shoulders can be used by more experienced bicyclists if desired.</li> <li>• Wider vehicle lane configuration than existing and increase vehicle safety with increase shoulder width.</li> <li>• BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced. The additional WB lane on the BPOC will provide greater traffic handling flexibility than alternative typical section.</li> <li>• Meets 18'6" vertical clearance requirements for BPOC's.</li> <li>• Option for increased sidewalk width if warranted by pedestrian volumes.</li> </ul>	<ul style="list-style-type: none"> <li>• Initial cost will be greater than the widening options and will be greater than typical section due to the increased width.</li> <li>• Lower overall bike lane width in comparison to enhanced section illustrated above.</li> <li>• Greater impact to the intersections at Roberts Rd. to provide cycle track crossing.</li> <li>• Some re-work to previously installed bicycle improvements and potential bus stop relocation at Roberts Rd.</li> </ul>



To further evaluate the typical and enhanced cross section alternatives, the Project Team compared the existing pedestrian and bicyclist counts along the existing Blossom Hill Road Bridge with pedestrian and bicycle counts of existing BPOC's in the Bay Area, which include Stevens Creek Trail Evenly Avenue Bridge, Mary Avenue Bridge, and Dale/Heatherstone Overcrossing.

Peak 60-Minute Volumes												
	Blossom Hill Road Bridge			Stevens Creek Trail Evenlyn Avenue Bridge			Mary Avenue Bridge			Dale/Heatherstone Overcrossing		
	Recommended 16'-20' wide			12' wide			12' wide			10' wide		
	Ped.	Bike	Total	Ped.	Bike	Total	Ped.	Bike	Total	Ped.	Bike	Total
Morning	87	46	<b>133</b>	29	137	<b>166</b>	24	39	<b>63</b>	59	139	<b>198</b>
Afternoon	174	84	<b>258</b>	30	109	<b>139</b>	39	44	<b>83</b>	36	83	<b>119</b>

Note: Data source: Town of Los Gatos, City of Mountain View, City of Cupertino

Table 5 - Bike and Pedestrian Volumes

As noted in Table 5, the existing pedestrian counts along the existing Blossom Hill Road Bridge exceeded the pedestrian counts of the other three Bay Area BPOCs. The width of the existing BPOCs used for this comparison vary between 10 and 12-feet. Although they are considered sufficient to accommodate moderate bicycle and pedestrian volumes, those at busy locations, such as Steven's Creek Trail, experience reported user conflicts. High pedestrian and bicycle counts with a good representation of both users warrant wider bridge sections with separation between user groups. Therefore, the enhanced section alternatives with widths between 16 and 20 feet illustrated in Figure 18 are preferred due to their more favorable user experience and capacity for existing and future demand.

Although preferred, the enhanced cross section alternatives would require additional cost due to the larger structure width and may be constrained due to available right-of-way. As noted in Section V.H, the enhanced cross section alternative would require realignment of Blossom Hill Road near Roberts Road East intersection in order to accommodate a 16 to 20-foot wide bicycle and pedestrian path within public right away. Therefore, final width of the proposed structure should be determined during final design when more accurate information is available for design.



## H. ALTERNATIVE 2 GEOMETRY

### Horizontal Considerations

As currently designed, the preferred horizontal alignment of Alternative 2 proposes to install the new structure as far from the existing structure as possible. This was done in an effort to address Caltrans concerns of future replacement of the existing Blossom Hill Road Bridge and to avoid preclusion of future widening. This greater separation presents several benefits, which include the following:

- **Construction staging** can be phased to minimize impacts on Blossom Hill Road. The new structure can be constructed independently with minimal impacts to existing bicycle and pedestrian facilities on Blossom Hill Road.
- **Maintenance** issues of the existing Blossom Hill Road Bridge and proposed bridge will be avoided. The horizontal separation between the two structures will provide sufficient room to inspect, repair, or replace the bridge in the future.
- **Throwaway cost** will be minimized if Caltrans decides to widen or replace the existing Blossom Hill Road Bridge in the future.
- **Enhanced user experience** for bicyclists and pedestrians in comparison with an alternative closer to the existing structure. In this scenario, bicyclists and pedestrians will be on a separate facility, higher than the adjacent roadway.

Exact separation between the existing and proposed structures will be determined during final design upon additional engineering work. Although the horizontal separation presents several benefits as described above, the separation would also increase project cost and environmental impacts as more trees along the easterly approach will need to be removed to install the proposed improvements. A detailed environmental analysis completed for this project is included in Section IX.

The horizontal separation between the existing and proposed structures would also create a separation between Blossom Hill Road and the proposed bicycle and pedestrian paths east and west of the proposed structure. This separation will decrease as the west and east paths conform to the existing grade elevations at Roberts Road West and Roberts Road East intersections, respectively.

The project design should attempt to install the proposed improvements entirely within public right of way to avoid impacts to private properties. The Project Team developed the preferred Alternative 2 alignment with right-of-way constraints in mind. However, additional studies during final design will be needed to determine if there is sufficient public right of way, east and west of Highway 17, to accommodate a new 16 to 20-foot wide bicycle and pedestrian path.

In an effort to minimize construction costs, the Project should attempt to install the proposed improvements adjacent to the existing retaining walls located along eastbound Blossom Hill Road. Generally speaking, there appears to be sufficient public right-of-way west of Highway 17 to accommodate the proposed improvements without impacting the existing wall shown in Photo 3.



*Photo 3 - Existing Retaining Walls along Eastbound Blossom Hill Road, west of Highway 17*

On the other hand, additional studies will be needed to determine if there is sufficient public right-of-way east of Highway 17 to accommodate the proposed improvements without impacting the existing decorative wall shown in Photo 4. This retaining wall separates Blossom Hill Road from the Serra Court community. The decorative wall shown



*Photo 4 - Existing Retaining Walls along Eastbound Blossom Hill Road, east of Highway 17*

The decorative wall shown in Photo 4 is maintained by the Town of Los Gatos, while the upper retaining wall behind it is maintained by the Serra Court community. Replacing these retaining walls would increase project costs; however, in order to avoid impacting them the project would be required to realign Blossom Hill Road near the Roberts Road East intersection.

As seen in Figure 19, the geometry developed for the realignment of Blossom Hill Road requires the removal of the existing 5-foot eastbound bike lane and 3-foot westbound bike lane buffer to



accommodate the proposed improvements. Doing so will gain approximately 8 feet to reallocate to the new pathway along the south side as shown in Section B-B in Figure 19. Dependent on the Town's desired width of the pedestrian and bicycle path, realignment of the roadway further north may be required to gain a few additional feet in order to provide a 20-foot width. A close evaluation of available right of way along the north side of the roadway will need to be completed during the Final Design phase to determine feasibility.

The proposed realignment illustrated in Figure 19 avoids impacts to the existing walls, but shifting the roadway realignment further north would decrease the stopping sight distance of the westbound traffic. To avoid potential collisions, westbound drivers must be provided with adequate stopping sight distance to see ahead along Blossom Hill Road as they approach the existing structure at or near the posted speed and to safely stop before reaching an object whether stationary or not. Therefore, the preliminary roadway realignment illustrated in Figure 19 will need to be refined during final design once more detail information is available to ensure the roadway realignment is designed with an adequate horizontal curve radius that provides westbound drivers sufficient stopping sight distance to safely stop and avoid potential collisions.



Plan View (Not to Scale)

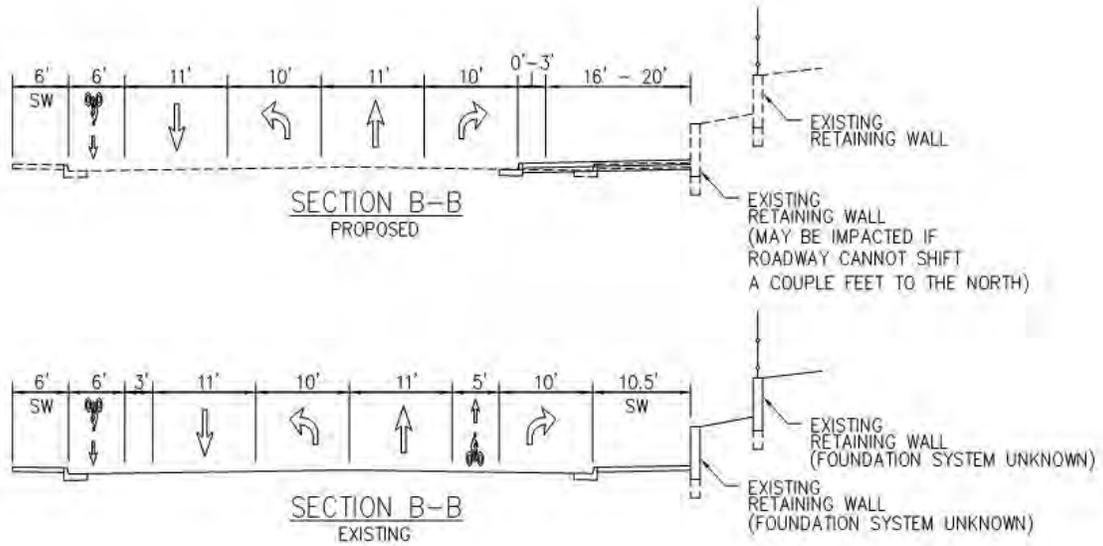


Figure 19 – Cross-Section Constraints along Blossom Hill Road near Roberts Road East intersection

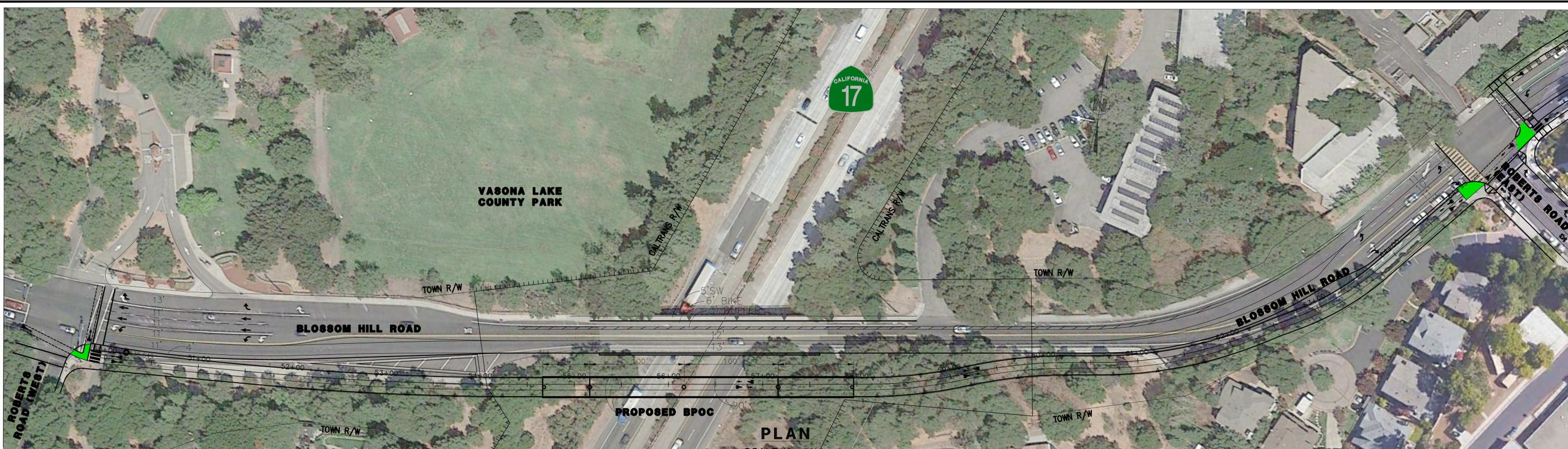


## Vertical Considerations

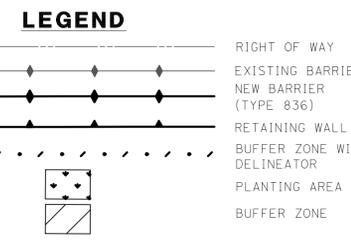
The initial consideration for profile grade was matching the existing grade of the structure to minimize the need for retaining walls at both the east and west approaches. However, doing so would limit potential structure types due to Caltrans' minimum vertical clearance requirement of 18'-6" for pedestrian overcrossings above the freeway. Raising the profile grade of the separate structure will require retaining walls at both approaches, which will increase costs. This will allow more flexibility in structure types for the main span crossing, which will decrease project costs considerably as noted in Section VIII and Section X. Placing the BPOC at a higher elevation makes Alternative 2 compatible with the future Blossom Hill Road Bridge elevation if Caltrans decides to replace the existing bridge and raise it to meet standard vertical clearance requirements over Highway 17.

The vertical alignment of Alternative 2, illustrated in Figure 20, involves construction of the proposed structure over a 30-inch and 1.5-inch water lines located east of Highway 17 as noted in Section VI.B. The proposed improvements should attempt to avoid impacts to these water lines and the existing 30-foot wide water easement located south of Blossom Hill Road. Survey studies of the horizontal and vertical location of these water lines will be required during final design to assess the geometry of the proposed improvements. If deemed necessary, a longer bridge span should be evaluated to assess bridge foundation placement with sufficient clearance of these utilities. Increasing the length of the bridge span will slightly increase project costs, but would avoid the need for utility relocation which could otherwise result in a significant increase in project costs and potential construction delays.

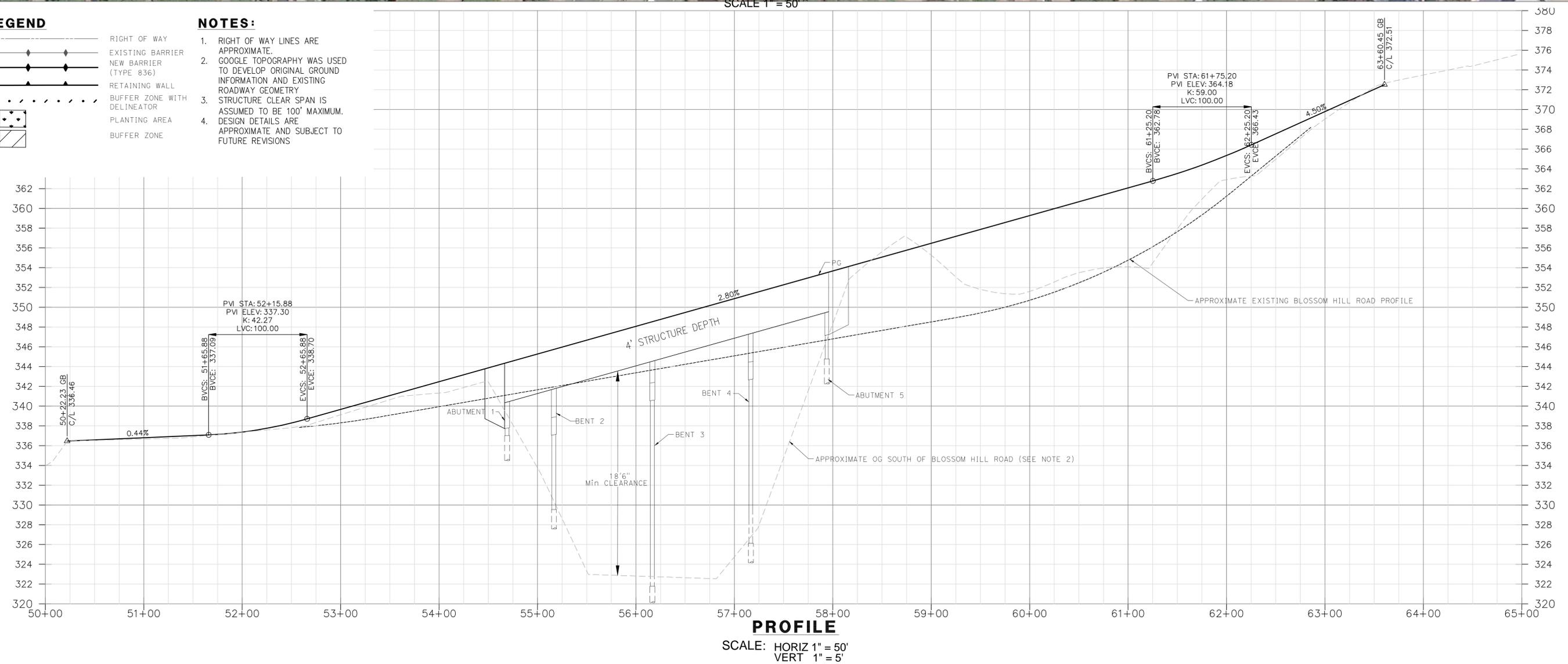
As previously noted, the enhanced section widths between 16 and 20 feet illustrated in Figure 18 are preferred due to the more favorable user experience and capacity for existing and future demand. Cross sections for the three bridge alternative concepts described in Section VIII.A are shown in Figure 21. These cross sections assume a 20-foot structure width; however, final width of the proposed structure will be determined during final design.



**PLAN**  
SCALE 1" = 50'



- NOTES:**
1. RIGHT OF WAY LINES ARE APPROXIMATE.
  2. GOOGLE TOPOGRAPHY WAS USED TO DEVELOP ORIGINAL GROUND INFORMATION AND EXISTING ROADWAY GEOMETRY.
  3. STRUCTURE CLEAR SPAN IS ASSUMED TO BE 100' MAXIMUM. DESIGN DETAILS ARE APPROXIMATE AND SUBJECT TO FUTURE REVISIONS.
  - 4.



**PROFILE**  
SCALE: HORIZ 1" = 50'  
VERT 1" = 5'

4670 WILLOW ROAD  
PLEASANTON, CA 94588  
925-396-7700  
925-396-7799 (FAX)



**BLOSSOM HILL ROAD  
HWY 17 BICYCLE AND PEDESTRIAN PROJECT  
FIGURE 20 - CYCLE TRACK**

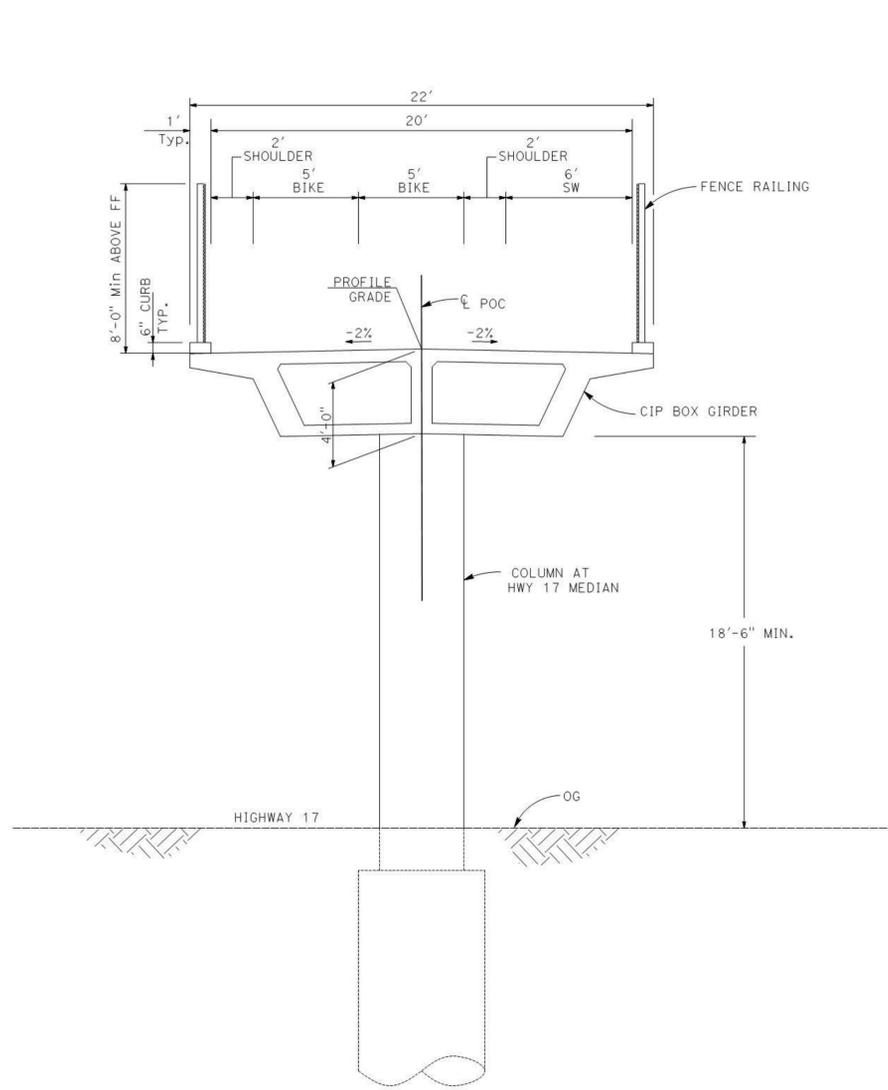
SANTA CLARA  
LOS GATOS

Date	Revisions
08/25/2020	No.
Scale: 1" = 50'	Design TC
Drawn TC	Approved
Job No. 2019097	

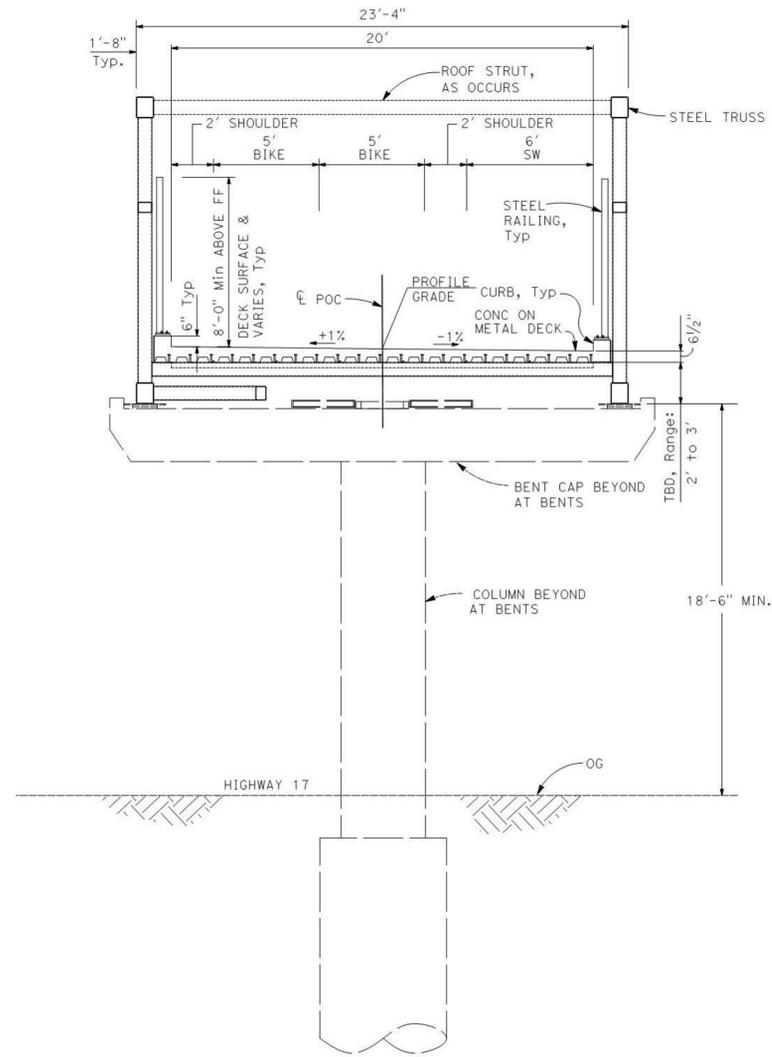
Drawing Number: **1**

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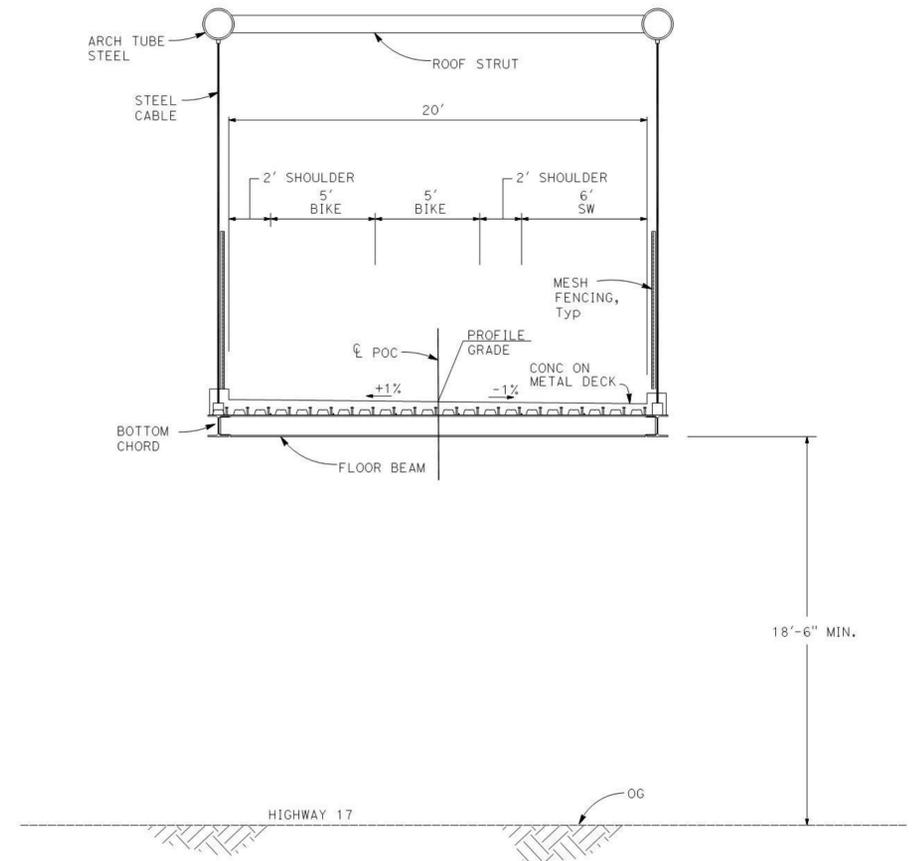
# PRELIMINARY BRIDGE TYPES - CROSS SECTION EVALUATION



**TYPE A  
CONCRETE BOX-GIRDER SPAN**



**TYPE B  
STEEL TRUSS SPAN**



**TYPE C  
STEEL ARCH SPAN**

Date	Revisions
08/25/2020	Design TC
	Drawn TC
	Approved
	Job No. 2019097

Scale: 1" = 50'

Drawing Number:

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## VI. CONSTRAINTS AND ADDITIONAL CONSIDERATIONS

### A. RIGHT OF WAY

The Project Team developed the Alternative 2 alignment with right of way constraints in mind. Generally speaking, there is sufficient public right of way to accommodate a new 20' wide bicycle and pedestrian bridge structure south of the existing Blossom Hill Road Bridge. As noted in other sections throughout this report, the existing bridge is very old and does not meet current design standards. Reconstruction of the bridge is not listed in the Regional Transportation Plan, and there is no schedule or funding identified for replacement. It is still possible that the bridge is replaced in the future, therefore it will be important for the Project Team to understand the Caltrans R/W at this location and design the new bridge with as much separation as possible from the existing structure. Caltrans will likely require the Town to demonstrate the new bridge will not preclude future widening of this structure and adequate clearance for existing and proposed maintenance of each.

A Maintenance Agreement between Caltrans and the Town will be required during final design since the main span crossing is located within Caltrans R/W. Based on our experience with several recent bicycle and pedestrian bridge projects throughout the Bay Area, Caltrans will require the Town to maintain this crossing or include language in the agreement outlining reimbursement for Caltrans to maintain the crossing.

An existing 30" water line easement is located adjacent to the Highway 17 Caltrans R/W. It will be important for the Project Team to evaluate the language in this Easement Agreement very closely during final design to determine if there are any restrictions prohibiting structures and/or other major improvements within the easement, and evaluate how this may impact design even on a temporary basis during proposed construction. It will be important for the Project Team to install bridge foundations and retaining wall footings outside of the limits of this line and easement. Additional consideration for excavation and other construction activities need to be taken during final design.

## B. UTILITIES

Although several utilities are located within the vicinity of Blossom Hill Road OC, those with significance to the proposed improvements are identified in Figure 22 and summarized below:

- **12kV PG&E Electrical Overhead** lines run parallel to the Blossom Hill Road OC along the north side. These lines run on overhead poles located along the north side of Blossom Hill Road. At approximately 115 feet east of Highway 17, these electrical overhead lines cross Blossom Hill Road to connect to an overhead pole located on the opposite side of the road. These electrical lines then cross Blossom Hill Road again to connect to a pole located on the southwest corner of the Roberts Road East intersection. The proposed improvements should attempt to minimize impacts to the electrical overhead lines; however, based on preliminary studies, the electrical pole located on the south side of Blossom Hill Road may require relocation to accommodate the proposed bicycle and pedestrian path. Survey studies of the overhead lines and poles will be required during final design to assess the geometry of the proposed pathway from a horizontal and vertical perspective.
- **Two OH Comcast Fiber lines** are located just below the aforementioned electrical lines on the same overhead poles; however, these lines only run along the overhead poles located along the east side of the Blossom Hill Road OC. As noted above, these lines may be modified as they are located on a pole that may need to be relocated to accommodate the preferred alternative.
- **A 1.5-inch Water line** runs parallel to the east side of Highway 17 and turns east on Blossom Hill Road for approximately 220 feet. This line provides service to the properties located south and north of Blossom Hill Road within the vicinity of the east side of the Blossom Hill Road Bridge. Impacts to this line will be important as they may require shutdowns and coordination with the private owners if relocations/adjustments are necessary.
- **10.75-inch and 12.75-inch Water** lines cross Highway 17 using the existing Blossom Hill Road Bridge and connect to a 30-inch water line located on the east side of the existing structure.

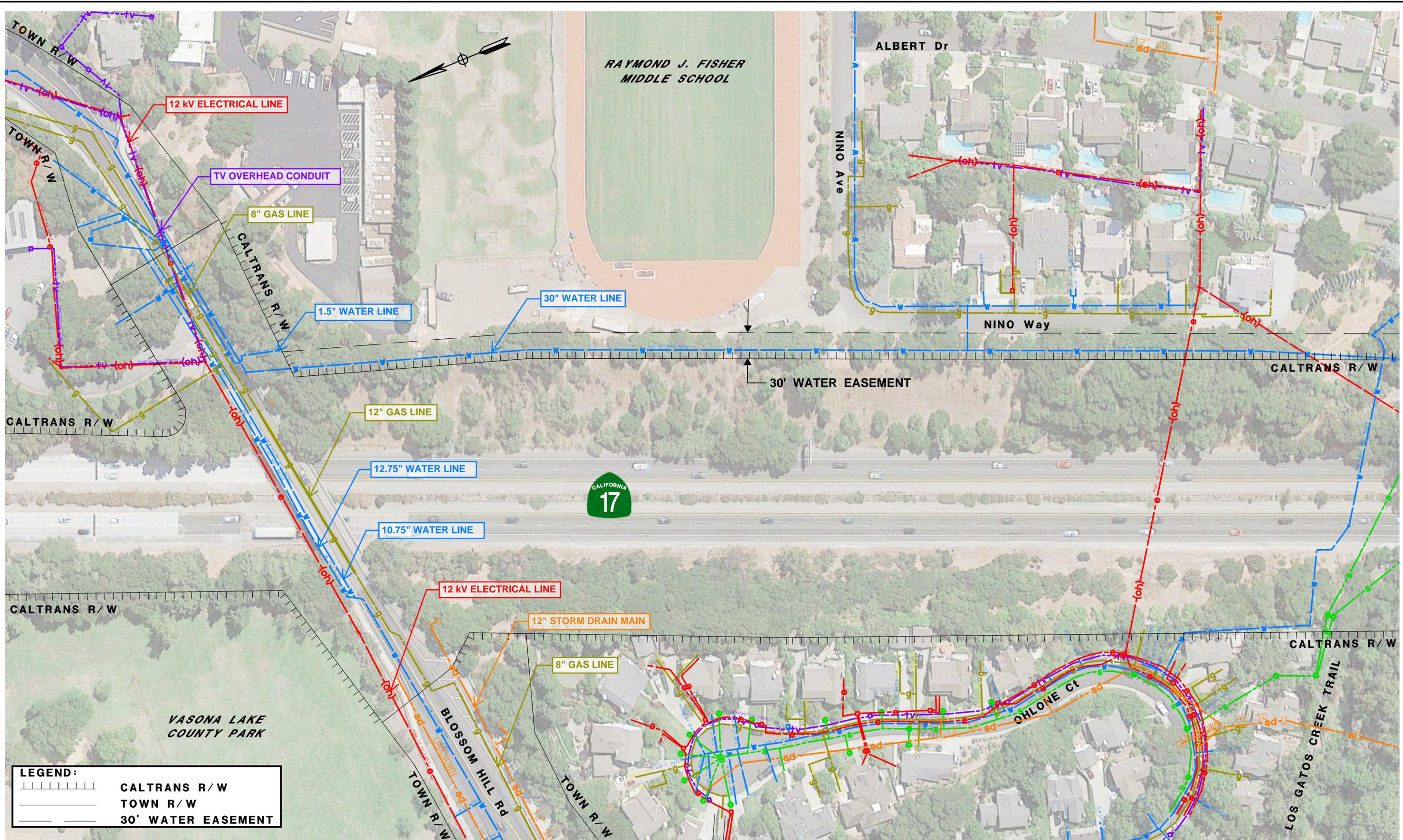




- **A 30-inch Water line** runs parallel to the east side of Highway 17 and turns east on Blossom Hill Road just east of the Blossom Hill Road Bridge. This 30-inch line connects to the aforementioned water lines; however this line continues along Blossom Hill Road whereas the aforementioned water lines end just east of the Blossom Hill Road Bridge. The segment of this line that runs parallel to Highway 17 is located in a 30-foot wide easement. It will be important for the Project Team to install bridge foundations and retaining wall footings outside of the limits of this line and easement. Additional consideration for excavation and other construction activities need to be taken during final design.
- **A 12-inch Gas line** also crosses Highway 17 using the existing Blossom Hill Road Bridge. This line is connected to an 8-inch gas line at both ends of the bridge and continues to run along the south side of Blossom Hill Road, from Roberts Road East to Roberts Road West.

As previously noted, Alternative 2 attempts to avoid the relocation of existing utilities within the limits of the project. Potholing to positively locate the above utilities is recommended to minimize potential conflicts with the preferred alternative. Additional studies during final design are needed to assess bridge foundation placement within the vicinity of the 8-inch gas line, 1.5-inch water line, and 30-inch water line located at the ends of the existing bridge. There is potential for the spans to get longer in order to avoid impacting gas and water lines located at the ends of the existing bridge, therefore assessment of bridge foundation placement within the vicinity of these line will be required.

Furthermore, the proposed improvements will place embankment on top of the existing underground utilities within the limits of Alternative 2. Therefore, the proposed improvements will need to be coordinated with utility owners to ensure the existing utilities can support the additional loading and to avoid future potential problems such as maintenance issues. Detailed utility studies and coordination with utility owners will also be required to determine if existing utility structures within public right of way will need to be adjusted to grade and/or relocated to accommodate the proposed improvements.



**LEGEND:**

	CALTRANS R/W
	TOWN R/W
	30' WATER EASEMENT

**HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT**  
**FIGURE 22 - EXISTING UTILITIES AND STORM DRAIN FACILITIES**



PROJECT NAME: HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT  
 SHEET NO: 22  
 DATE: 08/11/2014  
 DRAWN BY: J. BROWN  
 CHECKED BY: J. BROWN  
 APPROVED BY: J. BROWN



## C. STORM DRAIN FACILITIES

Several storm drain facilities are known to exist within the Project limits, such as storm drain pipes, inlets, and manholes. It is anticipated that modification to the existing storm drain systems would be required to accommodate the bicycle and pedestrian overcrossing along the south side of Blossom Hill Road.

Alternative 2 will attempt to minimize impacts to the existing storm drain facilities and will require active work with the Town to modify existing structures impacted by the project. Storm drain facilities known to exist within the limits of the project are shown in Figure 22.

## VII. GEOTECHNICAL CONSIDERATIONS

A Geotechnical Feasibility Study Memorandum (Memorandum) for this project is attached to this report in Appendix XIV.C. The Memorandum evaluates readily available as-built data within the project limits and provides a discussion on the feasibility of the planned project elements, including bridge foundations and retaining wall construction along the approaches, from a geotechnical standpoint. The Memorandum includes the following recommendations:

- **Groundwater levels** should be verified during the final design phase. Based on readily available as-built data, groundwater level is anticipated to be within 6 to 7-feet below the existing Highway 17 grade.
- **Bridge foundations** installation should consider the existing traffic volume on Highway 17, limited room for construction, and groundwater levels. Groundwater is expected, therefore a Caltrans standard cast-in-drilled-hole (CIDH) concrete pile with 24-inch minimum diameter is recommended for foundation support of the proposed BPOC in the dense and cemented material.
- **Western Approach** profile requires new embankments up to 12 to 13-feet high at the planned BPOC Abutment 1. The need for a retaining wall along the north side is anticipated to contain the new embankments.
- **Eastern Approach** grading will require minor cut and fill within about 100-feet behind the planned BPOC Abutment 4 and additional embankments up to 8-feet high eastward. A retaining wall is anticipated along the north side to contain the embankments. For permanent design above the eastern approach, a slope gradient of 2H:1V is recommended for native material at the site.



- **Cast-in-place cantilever retaining walls** are a feasible option. This type of wall design will need to be checked from a seismic design standpoint as the site PGA is greater than 0.6 g.
- **Mechanically Stabilized Embankment (MSE) walls** are also feasible at the site. MSE walls are more accommodative for ground adjustments, but construction of this type of wall may need more excavation to accommodate the required reinforcements.

## VIII. AESTHETICS AND STRUCTURAL CONSIDERATIONS

In addition to providing local pedestrians and bicyclists with a visually attractive passage over a busy freeway, the bridge is an opportunity for Los Gatos to showcase a dynamic visual “gateway” to motorists travelling Highway 17, the main highway linking the Bay Area to Santa Cruz and the Monterey Peninsula.

The visual design of the bridge is therefore of paramount importance. In developing the “architecture” of a bridge, the Project Team looked at three fundamental ways in which a bridge is experienced – a successful design recognizes all three, both individually and collectively:

- **Bridge as an “Object”** – The bridge as a sculptural object in the landscape, viewed from many near and far vista points.
- **Bridge as a “Place”** – The experience of being on the bridge, within an attractive structure, looking out.
- **Bridge as an “Experience”** – the kinetic (moving) experience of passing over (pedestrians and cyclists), under (Highway 17), and alongside (Blossom Hill Road).

In the context of these three “points of view”, the Project Team then employed two interrelated aesthetic strategies: applying aesthetic details to structural elements (e.g., colors, textures, decorative elements such as lights and railings, public art), and maximizing the visual drama of potential bridge types such as arches, trusses, and cable-supported spans. Equally important is the cost effectiveness of this project. The Project Team was careful in striking a balance between form and function. Town staff provided initial input that the new BPOC would not be visible from the southbound approach on Highway 17, therefore, an iconic bridge type would not be appropriate for this location and would be an overly expensive choice.

Based on the initial input, the Project Team studied three preliminary concepts in the case of this bridge: a “standard” concrete box-girder span (Type A), a steel arch-shaped truss span (Type B), and a steel tied arch span (Type C) as discussed in Section VIII.A. The project’s effects to the surrounding area would be

evaluated in the CEQA Initial Study, however, due to the distance, fleeting view and existing infrastructure, aesthetic impacts are not anticipated to be significant.

## A. PRELIMINARY BRIDGE TYPES

For the purpose of evaluation, the west and east approaches to the main span are the same design in all three bridge types, and include a combination of column supported concrete viaducts, side-hill cuts, and sloped and retained-filled embankments. The three types of concepts developed as part of this study are outlined in detail below.

### **Type A - Concrete Box-Girder Span**

A Concrete Box-Girder Bridge (Type A), the standard bridge type of most highway and pedestrian/bicycle bridges, consists of one or more hollow reinforced concrete beams (known as “box girders”) that sit beneath and hold-up the bridge deck. The span length is interdependent with the structure depth, or vertical height, of the box girders – the longer the span, the deeper the girders. In the case of this bridge (as shown in Figure 23 and Figure 24), two spans, each 100 feet long with a girder depth of 4 feet, meet over a central support column in the median of Highway 17. On either side is an approach span, approximately 80’ and 50’ on the eastern and western sides respectively.



Figure 23 –Concrete Box-Girder Bridge  
Cross Section



Figure 24 - Highway 17/Blossom Hill Ped/Bike Overcrossing - Concrete Box-Girder Span

Bridge Type A box girders are cast-in-place, post tensioned and cured in forms atop temporary “falsework” that must remain until curing is complete, imposing negative impacts on freeway capacity and flow. As an alternative to cast-in-place box girders, structurally-equivalent precast concrete beams (such as “Bulb-Tees”) can be placed by crane, similar to bridge Type B and Type C (see below) – however, under both variations, construction of the central column in the freeway median will impose its own traffic impacts.

In comparison to the structurally-expressive bridge Type B and Type C described in the next sections, the visual image of the bridge Type A is common and “utilitarian”, comparable to the adjacent Blossom Hill Road Bridge. In this case, attractiveness relies on the application of up-close aesthetic details through standard techniques such as concrete “rustication” (the casting-in of artistic patterns and textures), colors (through concrete mix additives, paint, or other applied coatings), architecturally-designed railings and other elements, decorative lighting, and public art. Structural shapes can also be modified within certain limits: Figure 25 shows the use of curved (or “haunched”) box girders to produce a subtle arched appearance.



*Figure 25 - Highway 17/Blossom Hill BPOC –Concrete Arch-Shaped Girder Span*

### Type B – Steel Truss Span

The Steel Truss Span can be described as a structural cage made of rigid steel members welded together to form a network in which the various members work in tension or compression to support significant clear spans, much like an arch. Trusses can take on many forms, making them structurally and aesthetically flexible – in the case of this bridge, as shown in Figure 26 and Figure 27, a visually distinctive and structurally efficient steel truss is illustrated. By placing the structure above the deck (as opposed to the bridge Type A with its structure underneath), the clearance of the bridge over Highway 17 (the height from roadway surface to underside of deck) is maximized, allowing a more efficient profile, an advantage shared with bridge Type C described in the next section.



Figure 26 – Highway 17/Blossom Hill Ped/Bike Overcrossing – Steel Truss Span

The truss is proposed as a single clear span of approximately 200 feet, not requiring an intermediate column in the median of Highway 17. Similar to bridge Type A, there will be approach spans on either side of the main span, approximately 80' on the east side and 50' on the west side. The maximum height of the truss will depend on the Town's desired look for the structure and will be determined during the final design. As a self-contained structure, the truss can be assembled off-site and lifted into place by cranes or jacks, avoiding the need for disruptive and costly falsework and long inconvenient highway closures.



Figure 27 – Steel Arch-Shaped Truss Span Cross Section

Bridge Type B forms a distinctive structure spanning the Highway 17, highly visible from many directions. Key public views include the northbound and southbound approaches along the Highway (although the southbound view is interrupted by the Blossom Hill Road Bridge, the truss is fully visible rising high above and behind it), a southwest-facing view from Vasona Lake County Park, lateral views from adjacent Blossom Hill Road, and a northeast-facing view from the Raymond J. Fisher Middle School playing field.

Considering the bridge aesthetics described earlier, the truss provides a dynamic structural “tunnel” through which pedestrians and bicyclists pass, with views of mountains, valley, and town framed in the triangular spaces between the truss members.

### **Type C - Steel Arch Span**

The Steel Arch Span is an economical variation of a standard (or “true”) arch in which the outward/downward diagonal thrust of the arch is resolved by the bridge deck acting in tension (similar to how a bowstring contains the elastic force of a bow). This enables the arch and deck to be “self-contained” and only pass vertical dead/live loads and lateral seismic loads to bridge abutments and foundations.

Similar to bridge Type B, bridge Type C single clear span is approximately 200’ long, the same approach span configurations will be applied and the maximum height will be determined during the final design stage. Similar to Type B, the main span is assembled off-site and lifted into place. The arch would be constructed of steel members with the bridge deck suspended from the arch by steel rope hangers. The hangers may be vertical as shown in Figure 28 or crisscrossed diagonally, a variation known as a “network tied arch”. Variations of the arch itself include a basic double arch (as shown below) or the more costly and visually-dynamic single arch. The double arches can be vertical (as shown below), tipped outward (known as a “butterfly”) or inward (known as “basket handle”).



Figure 28 – Highway 17/Blossom Hill Ped/Bike Overcrossing – Steel Tied Arch Span

In general terms of overall scale and shape, bridge Type C is similar to bridge Type B, presenting a similar image in medium and long-distance views from Highway 17 and surrounding key public viewpoints. The aesthetic differences become apparent in close-up external views and the views of pedestrians and cyclists crossing the bridge. In comparison to Type B, bridge Type C is visually lighter, with slender cables replacing the robust steel members of the truss. In all three aspects of the bridge as “object”, “place”, and “experience”, the arch will appear as more transparent, delicate, and architecturally fluid.

Bridge Types B and C are equally aesthetic, while distinct in character. The bridge deck of these bridge types could be further enhanced with higher profiles depending on the Town’s preference. All three bridge types provide a good balance between utility and aesthetics, and yet in the mid-range in cost among many other bridge types. The three bridge types presented in this section are recommended for further evaluation during final design.



Figure 29 –, Steel Tied Arch Span Cross Section

## B. FEATURES AND REQUIREMENTS

### **Vertical Clearance and Falsework**

As previously mentioned, the minimum vertical clearance to the underside of the pedestrian bridges is 18’-6” per Caltrans’ requirements for pedestrian overcrossings over the traveled way of state roadways. For purposes of the bridge type concepts presented in this report, an 18’-6” clearance at each intersection is assumed. Vertical clearance considerations to existing utilities as described in Sections V.H and VI.B should also be considered as a criterion in the evaluation of each bridge type described in Section VIII.A.

Depending on the preferred structure type chosen by the Town, falsework may be required for construction of the main bridge and approach structures. It is possible that bridge Type B and Type C may require minimal or no falsework, depending on design details.

## **Guardrails**

The proposed BPOC shall include guardrails in compliance with the American Association of State Highway and Transportation Officials Standards/ Load and Resistance Factor Design (AASHTO LRFD). Guardrails shall be installed with a minimum height of 48" to comply with CA Amendment to AASHTO and to provide fall protection for bicyclists and pedestrians. Per AASHTO Guidelines, openings on guardrails shall not be large enough to allow a 4" sphere would pass through.

## **Wind and Seismic Design Considerations**

There are many different wind and earthquake design considerations and criteria that must be incorporated into the bridge design. The project-specific design criteria for wind and seismic design will consider the following design guidelines and codes:

- AASHTO LRFD Bridge Design Specifications;
- Various Caltrans bridge design documents including Caltrans Seismic Design Criteria and may include the Guide Specifications for Seismic Design of Steel Bridges depending on structure type chosen;
- AASHTO LRFD Guide Specifications for Design of Pedestrian Bridges; and others.

## **Screening on Bridge**

Caltrans typically requires screen fencing with a minimum height of 8'-4" along the sides of pedestrian bridges over highways. This requirement shall be further explored to develop adequate details and alternatives in the next stage of project development. Screening is primarily a security strategy, to discourage throwing or tossing of objects from the bridge onto the roadbed below, but also adds a measure of safety as persons on the bridge will be less able to climb over the fencing than over a guardrail alone. Conversely, screening tends to significantly change the character of the bridge and the experience of persons travelling across the bridge. Views can be obscured and a sense of openness is lost. Additionally, screening may increase the visual impact of the bridge from the roads below, tending to increase the perception of mass.

## **Lighting**

Bridge surfaces should be illuminated to IES standards to permit safe passage during dusk and night-time hours. Additionally, it is possible that the bridge will be up-lit for aesthetic purposes to enhance the appearance at night and improve safety.



Lighting is required to be installed on the BPOC and will be provided along the entire structure. Any lighting installed on the proposed BPOC will be shielded to avoid direct light spreading to sensitive receptors adjacent to the structure where light can be a distraction for operators of vehicles. In addition, vertical spread will be mitigated by fixture choice or shielding if "dark sky" policies are determined to be mandated. It is anticipated that the basic lighting for the structure will be provided along the bridge railing, to be mounted along the top of the railing fence or along the hand railing. Additional lighting may also be considered to highlight decorative surfaces or elements on the bridge structure. Examples include column lighting, up-lighting of deck undersides and bridge superstructure (arches, stay cables, truss members, etc.), and the creation of unique effects such as colored lighting and programed animation.

### **Maintenance**

Caltrans typically delegates maintenance of these bridge types over a State highway to the local agency proposing/executing its construction. As a result, a new maintenance agreement or modification to an existing agreement between the Town and Caltrans outlining each's responsibility and associated reimbursement for future maintenance will require revisions during the final design approval process. The bridge should be designed wide enough to accommodate light maintenance vehicles, but not to accommodate larger vehicles. Designing to accommodate larger vehicles tends to increase costs and can necessitate changes to the alignment and/or bridge structure components. At each end of the pathway, vehicular entry restriction devices will be considered to limit entry to authorized personnel only.

### **Constructability**

Construction access for the main bridge and the approach spans will be highly dependent on the preferred bridge type option chosen by the Town. As previously mentioned, a concrete cast-in-place structure would require falsework and a column support located within the Highway 17 median, requiring extensive construction access along Highway 17. However, bridge Type B and Type C could be constructed within the median or shoulder of Highway 17 with potentially no falsework, minimizing impact to traffic along Highway 17. The construction would require overnight closure of Highway 17 for a short period of time for erection of the bridge. Construction access for the required retaining walls along the approaches would also be from Blossom Hill Road and would extend to portions of the existing highway embankment within Caltrans right of way.



## IX. ENVIRONMENTAL CONSIDERATIONS

### A. ENVIRONMENTAL ANALYSIS

The environmental analysis was prepared using field survey and existing biological and cultural resource information available for the project area. The analysis includes an overall discussion of the potential environmental impacts of the proposed project improvements. The primary issues evaluated in the analysis are biological resources, hydrology and water quality, land use, construction-related noise and air quality, long-term noise, and traffic/transportation, as discussed in the following sections.

#### Biological Resources

A United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) report was prepared for the proposed project to identify the list of plant and animal species and other resources (e.g. critical habitat) under USFWS jurisdiction known or expected to be on or near the project area. The following species and other resources were identified in the IPaC report as being within the project area:

Species Type	Species / USFWS Status
Birds	California Least Tern / <i>Endangered</i> Marbled Murrelet / <i>Threatened</i>
Amphibians	California Red-legged Frog / <i>Threatened</i> California Tiger Salamander / <i>Threatened</i>
Fishes	Delta Smelt / <i>Threatened</i> Tidewater Goby / <i>Endangered</i>
Insects	Bay Checkerspot Butterfly / <i>Threatened</i>
Flowering Plants	Metcalf Canyon Jewelflower / <i>Endangered</i> Robust Spineflower / <i>Endangered</i> Santa Clara Valley Dudleya / <i>Endangered</i>
Migratory Birds	Allen’s Hummingbird Bald Eagle Clark’s Grebe Common Yellowthroat Costa’s Hummingbird Golden Eagle Lawrence’s Goldfinch Nuttall’s Woodpecker Oak Titmouse Rufous Hummingbird Song Sparrow Spotted Towhee Wrentit



Many of the species identified in the IPaC report (e.g., California Red-Legged Frog) as being within the project area are not expected to occur on the project site, because the habitat necessary to support the species is not present. A project-specific biological assessment of the project area to be completed as part of the CEQA process may identify additional animal species of concern.

Nesting raptors and other migratory birds are protected under the Migratory Bird Treaty Act and California Department of Fish and Wildlife (CDFW) Code Sections 3503, 3503.5, and 2800. Raptors (such as falcons, hawks, eagles, and owls) and other migratory birds may utilize the large trees on-site or adjacent to the site for foraging or nesting. Construction disturbance near raptor nests can result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Construction activities may result in nesting raptors having to relocate to another site. Relocation of mature raptors or migratory birds would not, by itself, be significant. However, disturbance that causes abandonment and/or loss of reproductive effort is considered a taking by the CDFW and therefore would be considered a significant impact. Pre-construction surveys for nesting raptors and other migratory birds would be required for the project. Scheduling of construction activities to avoid the nesting bird season (February 1<sup>st</sup> – August 31<sup>st</sup>) or preconstruction nesting bird surveys would reduce impacts to nesting birds to a less than significant level.

### **Tree Removal**

The proposed alignment would necessitate removal of numerous trees on the eastern alignment in order to construct the bridge and its associated structural components (abutments, footings, etc.). Additional trees may require removal to allow equipment access and facilitate construction of the trail. Trees removed would be replaced with new trees consistent with The Los Gatos Town Code (Town Code).

### **Cultural Resources**

Areas adjacent to creeks are typically sensitive to archaeological resources. Los Gatos Creek is located approximately 180 feet west to the western alignment. For this reason, a literature review at the Sonoma State Northwest Information Center is recommended to determine the locations of recorded archaeological sites that could be affected by project construction. If it is determined that a recorded site could be affected, archaeological monitoring could be required during initial site grading depending upon the depths of excavation. This would be determined during preparation of the CEQA Initial Study for



the project. Mitigation measures could be included in the project to reduce potential impacts to archaeological resources to a less than significant level.

### **Hydrology and Water Quality**

The proposed bicycle and pedestrian path and overcrossing would be up to 20 feet wide and would be constructed with impervious materials (i.e., concrete). The bicycle and pedestrian path and bridge would be constructed on/over existing paved (i.e., impervious) surfaces, except for the segments over the undeveloped slopes on each side of Highway 17 and on the hillside east of Highway 17, which would increase impervious surfaces.

### **Land Use**

The purpose of the proposed project is to provide additional non-vehicular connectivity across Highway 17, and increase bike and pedestrian safety traveling across Highway 17; therefore, the project would not physically divide an established community.

As discussed throughout this environmental analysis, the project would be required to comply with The Los Gatos Town Code, standard construction measures, and all necessary mitigation measures to avoid or reduce environmental impacts to a less than significant level; therefore, the project would not cause a significant environmental impact due to a conflict with a plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

### **Noise**

Existing ambient noise levels in the project area are relatively high and are primarily the result of traffic on Highway 17 and Blossom Hill Road. While the project area contains noise sensitive uses (i.e., residential, school, and park uses), given the existing noise environment and the anticipated use of the structure, the project would not result in substantial permanent increase in the existing ambient noise levels in the project area.

### **Construction-Related Impacts**

The project area is primarily developed with single-family residential and commercial uses, a public park, and school facilities. Residential uses, schools, and parks are sensitive to construction dust, equipment emissions, and noise and vibration. These potential impacts would be evaluated in the CEQA Initial Study



and standard construction measures and mitigation measures would be identified to reduce or avoid potential construction noise and air quality impacts to a less than significant level.

### **Traffic/Transportation**

As previously stated, the purpose of the proposed project is to provide additional non-vehicular connectivity across Highway 17 and increase bike and pedestrian safety traveling east and west of Highway 17. The project area contains residential and residential supporting uses (i.e., commercial, school, and recreational uses) on both sides of Highway 17, including Downtown Los Gatos, Vasona Park, and Los Gatos Creek Trail to the west, and a commercial core along Los Gatos Boulevard near Blossom Hill Road and Raymond J. Fisher Middle School to the east. The project would reduce local vehicular miles traveled by providing an additional bicycle and pedestrian facility to facilitate travel from the adjacent residential neighborhoods to residential supporting commercial, school, and recreational uses.

### **CEQA-level Analysis**

Further evaluation and analysis would be required after final design to complete the CEQA-level analysis for the project. It is anticipated that the document required would be an Initial Study leading to a Mitigated Negative Declaration, because construction and operation of the proposed project improvements is not expected to result in significant impacts that could not be avoided or reduced to a less than significant level with compliance of applicable regulations and implementation of mitigation measures. If after preparing the Initial Study it is determined the proposed project would not result in significant impacts and the project qualifies for a Categorical Exemption, then a Notice of Exemption (NOE) can be filed instead of adopting a Mitigated Negative Declaration. The Initial Study and NOE would not require circulation to the public.

### **Environmental Review**

If federal funding would be used, then environmental review in accordance with the National Environmental Policy Act (NEPA) would need to be completed for the project. It is likely that the level of environmental review necessary for the project under NEPA would be a Categorical Exclusion (CE). The Caltrans Office of Local Assistance would be the NEPA lead agency.



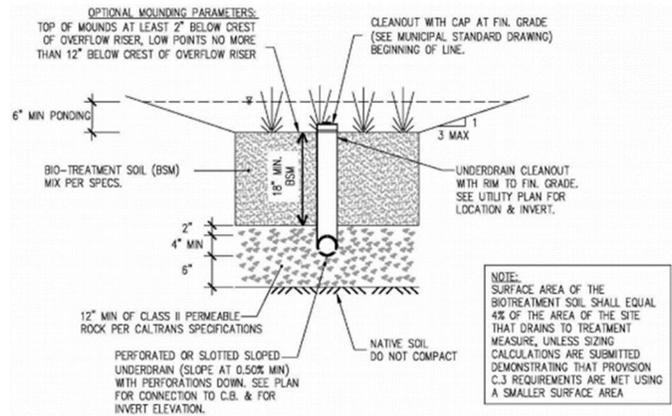
## B. STORM WATER TREATMENT

As a project under The Town of Los Gatos, the project will likely be held to the Municipal Regional Stormwater NPDES Permit (MRP). Per requirements in C.3.b.ii.(4)(a)-(c) the project may fall under the treatment requirements for over 10,000 sf of newly constructed contiguous impervious surface if a greater than 10-foot wide impervious trail is constructed. However, specific exclusions to Provisions C.3.b.ii.(4)(a)-(c) include the following:

- Sidewalks built as part of new streets or roads and built to direct stormwater runoff to adjacent vegetated areas.
- Bicycle lanes built as part of new streets or roads but are not hydraulically connected to the new streets or roads and that direct stormwater runoff to adjacent vegetated areas.
- Impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees.
- Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.
- Caltrans highway projects and associated facilities.

Most of the exclusions are not feasible due to the existing conditions and needs of the Town – a 10-foot wide trail would not provide adequate width for dedicated bike and pedestrian paths. A multi-use path could be accommodated at a 10' width, but this would greatly reduce user experience and increase bike and pedestrian interactions. Hydraulically disconnecting the two facilities would be extremely costly and would require re-profiling the existing roadway. Directing the runoff to a vegetated area would not be feasible. A pervious surface could potentially be incorporated on the bridge approaches to reduce the impervious square footage, but would need to be further studied, and analyzed in final design. Based on the considerations above, the preferred approach for meeting the requirement of the MRP, would be to incorporate treatment and potentially use Interceptor Tree credits when possible.

The current square footage of the preferred alignment, assuming a 20-foot width, is approximately 26,000 sf. The required treatment would be planned to be 4% or 1,040 square feet. Based on the current draft alignment and profile, treatment would be best suited to be incorporated on the Southwest side of Blossom Hill Road due to existing roadway grades and available space. Figure 30 shows a typical cross section of a Bioretention area that could be utilized. The treatment would have the added benefit of providing additional vegetation to the project, which would enhance user experience and aesthetics.



NOT TO SCALE  
SEE FIGURE 6-3 FOR TYPICAL OVERFLOW

Figure 30 - Bioretention Area Cross-Section  
(Source: SCVURPP C.3 Stormwater Handbook, June 2016)

Tree Interceptor Credits would also aid in meeting the requirements at the Blossom Hill Road and Roberts Road West intersection. Due to the existing grades, it would be challenging to drain storm water runoff to the recommended treatment area. It would also encourage maintaining as many existing Trees as feasible in order to achieve more credit towards reducing the required treatment square footage. Provided in Figure 31 is a breakdown of potential credits per type of tree.

Table 4-1 Stormwater Treatment Credits for Interceptor Trees			
	New Evergreen Trees	New Deciduous Trees	Existing Trees
Credits for new and existing trees that meet minimum interceptor tree requirements	200 square feet	100 square feet	Square footage under the tree canopy for trees with an average DBH of 12 inches or more.
*DBH: Diameter at breast height (4.5 feet above grade).			
Source: BASMAA LID Feasibility Criteria Report, 2011, (based on the tree credit system in the State Construction General Permit standards for post-construction stormwater control (CGP Appendix 2)).			

Figure 31 - Tree Interceptor Credits (Source: SCVURPP C.3 Stormwater Handbook, June 2016)



## X. COST AND SCHEDULE

### A. CONCEPTUAL COST ESTIMATE

A summary of the estimated costs associated with each phase of the Project is presented in Table 6 below. A detailed breakdown of the Project Cost Estimate can be found in Appendix XIV.B.

Phase	Concrete Box Girder Span	Steel Truss Span	Steel Tied Arch Span
Feasibility Study	\$234,500	\$234,500	\$234,500
Preliminary Engineering/ Environmental Studies/Final Design (PS&E)	\$3,701,200	\$3,701,200	\$3,701,200
Utility Relocation and Protection	\$500,000	\$500,000	\$500,000
Construction Capital	\$16,612,000	\$18,937,000	\$19,638,000
Construction Support	\$4,056,000	\$4,623,000	\$4,794,000
<b>Total Project Cost</b>	<b>\$25,103,700</b>	<b>\$27,995,700</b>	<b>\$28,867,700</b>

Table 6 – Project Cost Estimate

### B. DELIVERY PLAN

A depiction of the approximate delivery plan for this project is included in Figure 32\*\* below. Preliminary engineering and environmental approval phase are estimated to take approximately 2 years to complete. Final Design will follow and will take approximately 1 year to complete. Overall project construction is anticipated to take just over 2 years to complete.

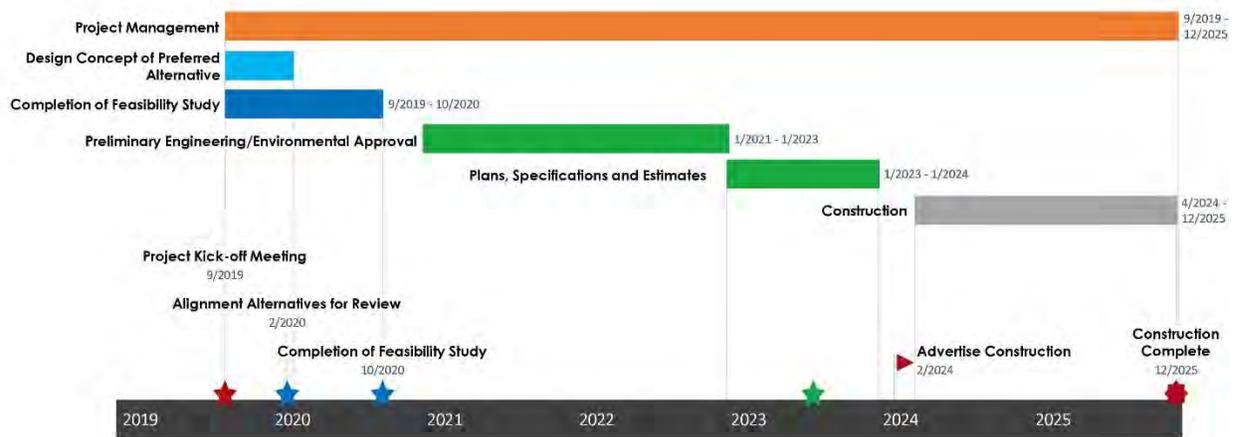


Figure 32 – Approximate Delivery Plan\*\*

**\*\* Note:** This schedule is subject to change pending funding availability. The Town has secured funds to complete final design, but will need to pursue competitive funding for construction.

## XI. CALTRANS COORDINATION

The Project Team initiated the Caltrans coordination process for preliminary feedback on the Project’s proposed alternatives with an in-person meeting held on December 3, 2019. At the meeting, Caltrans received information about the Project’s background, purpose and need, and information about the existing conditions of the Blossom Hill Road Bridge. In addition, the Project Team presented Caltrans with a general overview of Alternatives 1, 2, and 3 to solicit their feedback regarding the associated alternatives in terms of preference, probability of obtaining approval, and design requirements. The Project Team’s main interest included receiving formal feedback regarding the vertical clearance issues associated with the existing structure and whether Caltrans would support a design exception for a widening alternative that maintains the existing vertical clearance, or incrementally improves the existing vertical clearance but still does not meet standard requirements.

As part of the discussions, the Project Team presented two different widening options for Alternative 3. One included a traditional option that would widen the existing bridge structure along the south side. The other included a creative solution to build a completely independent structure just south of the existing bridge with a 12-foot wide sidewalk slab that would cantilever over the deck of the existing structure, giving it the appearance of being widened at the deck surface. This latter option would allow the separate independent structure to utilize precast, prestressed girders to improve the existing

nonstandard 15'2" vertical clearance of the existing bridge. Precast elements are required as part of this solution due to the minimum temporary vertical clearance necessary to support falsework (15' minimum) for cast-in-place construction which would not be feasible. Although vertical clearance would improve as part of this alternative, the provided clearance would still not comply with the Caltrans HDM standards for minor (bicycle/pedestrian) structures of 18'6". While these present challenges, the Project Team noted that this alternative should be evaluated as it provides a compelling cost-effective solution to the Project's purpose and need in comparison to Alternatives 1 and 2 being considered. As part of the meeting discussions, Caltrans requested that the Project Team formally submit a memorandum to document the request with more detail. The Project Team prepared this memorandum and submitted this for Caltrans review on April 9, 2020.

Following the initial coordination meeting, discussions regarding the widening options ensued. As expected, Caltrans expressed several concerns with both widening options and confirmed that a design exception approval would be required to advance either one going forward. Given the existing structure's nonstandard vertical clearance and history of being struck, Caltrans noted that the probability of receiving this design exception for maintaining or proposing nonstandard vertical clearance would be highly unlikely due to safety concerns. Furthermore, Caltrans noted that the Santa Clara Valley Transportation Authority (VTA) had started the State Route 17 Corridor Congestion Relief Project in partnership with Caltrans. Although it is in its very early stages, this project is evaluating potential widening options along Highway 17, which will overlap with this Project's study limits that may create potential impacts. Caltrans encouraged the Project Team to continue to engage the regional partners to coordinate future planning efforts and leverage any synergies.

Due to the overall challenges and uncertainties with the proposed widening options, Alternative 3 was eliminated from further consideration.



## XII. COMMUNITY ENGAGEMENT

(Under a separate cover)



## XIII. APPENDICES

- A. PEDESTRIAN AND BICYCLE COUNTS**
- B. PROJECT COST ESTIMATE SUMMARY**
- C. GEOTECHNICAL MEMORANDUM**

**APPENDIX A**  
**PEDESTRIAN AND BICYCLE COUNTS**

### Town of Los Gatos Pedestrian/Bicycle Counts

Project:	Blossom Hill Road at Hwy 17 Overcrossing		Survey Date:	3/13/2020		
N-S Approach:	Highway 17 Overcrossing		Survey Time:	7-9 AM		
E-W Approach:	Blossom Hill Road		Recorder:	GV & JT		
<b>Time Period</b>						
<b>From</b>		<b>Northside</b>			<b>Southside</b>	
<b>To</b>		<b>Peds</b>	<b>Bikes</b>		<b>Peds</b>	<b>Bikes</b>
<b>AM Data</b>						
7:00 AM	---	7:15 AM	2	0	3	0
7:15 AM	---	7:30 AM	5	2	0	0
7:30 AM	---	7:45 AM	5	2	2	3
7:45 AM	---	8:00 AM	4	1	10	2
8:00 AM	---	8:15 AM	2	4	27	24
8:15 AM	---	8:30 AM	2	5	31	8
8:30 AM	---	8:45 AM	7	1	4	1
8:45 AM	---	9:00 AM	4	2	5	0

Peds	Bikes	Total
5	0	5
5	2	7
7	5	12
14	3	17
29	28	57
33	13	46
11	2	13
9	2	11

### Town of Los Gatos Pedestrian/Bicycle Counts

Project:	Blossom Hill Road at Hwy 17 Overcrossing		Survey Date:	3/12/2020		
N-S Approach:	Highway 17 Overcrossing		Survey Time:	2-4 PM		
E-W Approach:	Blossom Hill Road		Recorder:	MR & BB		
<b>Time Period</b>						
<b>From</b>		<b>Northside</b>			<b>Southside</b>	
<b>To</b>		<b>Peds</b>	<b>Bikes</b>		<b>Peds</b>	<b>Bikes</b>
<b>PM Data</b>						
2:00 PM	---	2:15 PM	4	3	2	2
2:15 PM	---	2:30 PM	8	6	3	2
2:30 PM	---	2:45 PM	8	12	6	1
2:45 PM	---	3:00 PM	34	44	97	14
3:00 PM	---	3:15 PM	5	2	5	6
3:15 PM	---	3:30 PM	11	3	8	2
3:30 PM	---	3:45 PM	3	2	4	3
3:45 PM	---	4:00 PM	3	3	5	3

Peds	Bikes	Total
6	5	11
11	8	19
14	13	27
131	58	189
10	8	18
19	5	24
7	5	12
8	6	14

#### Summary:

	Peds	Bikes	Total
Morning Peak 60-Minute	7:45 - 8:45		
	87	46	133
Afternoon Peak 60-Minute	2:30 - 3:30		
	174	84	258

**APPENDIX B**  
**PROJECT COST ESTIMATE SUMMARY**

**Project Cost Estimate Summary**

Project Sponsor: Town of Los Gatos  
 Project Name: Highway 17 Bike & Pedestrian Overcrossing  
 Project location and brief description:

DATE: 8/26/2020  
 REV:

The Project will provide cyclists and pedestrians with a safer way to cross over HWY 17. The alternative assumed in this estimate is a separate pedestrian overcrossing that is adjacent to Blossom Hill Road Overcrossing. The Project components consist of a new concrete box girder supported bicycle and pedestrian bridge over HWY 17, and modification to Blossom Hill Road Structure. The proposed improvements include a two-way cycle track with Class IV protection along the south side. The two-way cycle track will conform to protected corners at each adjacent signalized intersection (Roberts Road and E. Roberts Road).

TYPE OF ESTIMATE: Preliminary  
 PREPARED BY: BKF

SUMMARY OF PROJECT OUTLAY COSTS

I. ROADWAY.....	ETCC	\$ 15,396,707
II. STRUCTURES.....		
III. RIGHT OF WAY.....		\$ 0
IV. CONCEPTUAL ENGINEERING STUDIES.....		\$ 418,358
V. ENVIRONMENTAL STUDIES.....		\$ 418,358
VI. DESIGN ENGINEERING.....		\$ 1,812,885
VII. DESIGN SERVICES DURING CONSTRUCTION.....		\$ 976,169
VIII. CONSTRUCTION STAKING.....		\$ 348,632
IX. CONSTRUCTION MANAGEMENT.....		\$ 1,812,885
X. RISK BASED ALLOWANCES.....		\$ 1,577,246
DIRECT PROJECT COSTS		\$ 22,761,241
(Sum of ETCC and sections III through X)		
XI. AGENCY MANAGEMENT.....		\$ 1,952,338
TOTAL PROJECT COSTS		\$ 24,713,579

HWY 17 BPOC				
Phase	Direct Cost	Risk Factors	Agency Costs	Total
Scoping/Planning	\$ -	\$ -	\$ -	\$ -
Preliminary Engineering/Environmental Studies	\$ 836,716	\$ 299,677	\$ 331,897	\$ 1,468,291
Final Design (PS&E)	\$ 1,812,885	\$ 63,090	\$ 702,842	\$ 2,578,817
<b>Final Design Total</b>	<b>\$ 2,649,602</b>	<b>\$ 362,767</b>	<b>\$ 1,034,739</b>	<b>\$ 4,047,107</b>
Right of Way Capital	\$ -	\$ -	\$ -	\$ -
Right of Way Support	\$ -	\$ -	\$ -	\$ -
Utility Relocation and Protection	\$ 400,000	\$ 100,000	\$ -	\$ 500,000
Construction Capital	\$ 15,396,707	\$ 1,214,479.57	\$ -	\$ 16,611,187
Construction Support	\$ 3,137,686	\$ -	\$ 917,599	\$ 4,055,285
<b>TOTALS</b>	<b>\$ 21,583,995</b>	<b>\$ 1,577,246</b>	<b>\$ 1,952,338</b>	<b>\$ 25,213,579</b>

**Assumptions:**

1. There is sufficient vertical clearance between Overhead Electrical Utility and proposed BPOC deck.
2. Minor modifications to existing drainage, water, and natural gas utilities will be needed. With relocation of 1 overhead electrical pole.
3. No right-of-way acquisitions will be required; All improvements will be within public right-of-way.
4. Main-span will be a 200-foot long Concrete Box Girder
5. Retaining walls are assumed to average 8' overall height.
6. Bridge Section assumes 20' clear width for two-way cycle track and pedestrian walkway.
7. Landscaped Median barrier located between two-way cycle track and EB Blossom Hill Rd.
8. TCC assumes estimate in 2020 dollars.

**Project Cost Estimate Summary, Sections I through XI**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

I. ROADWAY	UNIT	ALLOWANCE			
I.1 Total Earthwork	LS	N/A	\$	692,000.00	\$ 692,000.00
I.2 Total Pavement Structural Section	LS	N/A	\$	945,800.00	\$ 945,800.00
I.3 Total Drainage	LS	N/A	\$	400,000.00	\$ 400,000.00
I.4 Total Specialty Items	LS	N/A	\$	654,000.00	\$ 654,000.00
I.5 Total Traffic Items	LS	N/A	\$	860,000.00	\$ 860,000.00
I.6 Total Planting and Irrigation	LS	N/A	\$	700,000.00	\$ 700,000.00
I.7 Total Roadside Management	LS	N/A	\$	125,000.00	\$ 125,000.00
I.8 Minor Items (5-10% of total costs of items I.1 thru I.7)	LS	10%		--	\$ 437,680.00
I.9 Roadway Mobilization (10% of total cost of items I.1 thru I.8)	LS	10%		--	\$ 481,448.00
I.10 Roadway Additions					
Supplemental Work (5-10% of total cost of items I.1 thru I.8)	LS	10%		--	\$ 481,448.00
Supplemental Contingency (5-20% of total cost of items I.1 thru I.8)	LS	20%		--	\$ 962,896.00
<b>TOTAL FOR SECTION I. ROADWAY</b>					<b>\$ 6,740,272.00</b>

II. STRUCTURES	STRUCTURE TYPE	UNIT	TOTAL AREA		
II.1 Total Structure Items		LS	1	\$ 5,764,000.00	\$ 5,764,000.00
					\$ 5,764,000.00
Design Contingency (25% of total cost of items II.1a thru II.1b)		LS	25%	--	\$ 1,441,000.00
<b>TOTAL FOR SECTION II. STRUCTURES</b>					<b>\$ 7,205,000.00</b>

**TCC TOTAL CONSTRUCTION COST (TCC) - SUM OF SECTION I. ROADWAY AND II. STRUCTURES** **\$ 13,945,272.00**

III. RIGHT OF WAY	UNIT	ALLOWANCE			
III.1 Partial Acquisitions	LS	N/A	\$	-	\$ -
III.2 Aerial Easements	LS	N/A	\$	-	\$ -
III.3 Temporary Construction Easements	LS	N/A	\$	-	\$ -
<b>TOTAL FOR SECTION III. RIGHT OF WAY</b>					<b>\$ -</b>

**ENGINEERING AND MANAGEMENT COSTS**

Note: Depending on the project's level of development, Sections IV through VI may not be applicable.

	ALLOWANCE			
<b>IV. CONCEPTUAL ENGINEERING STUDIES</b>	3.0%	\$	13,945,272.00	\$ 418,358.16
<b>V. ENVIRONMENTAL STUDIES</b>	3.0%	\$	13,945,272.00	\$ 418,358.16
<b>VI. DESIGN ENGINEERING</b>	13.0%	\$	13,945,272.00	\$ 1,812,885.36
<b>VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)</b>	7.0%	\$	13,945,272.00	\$ 976,169.04
<b>VIII. CONSTRUCTION STAKING</b>	2.5%	\$	13,945,272.00	\$ 348,631.80
<b>IX. CONSTRUCTION MANAGEMENT</b>	13.0%	\$	13,945,272.00	\$ 1,812,885.36
<b>XI. AGENCY MANAGEMENT</b>	14.0%	\$	13,945,272.00	\$ 1,952,338.08

**X. RISK BASED ALLOWANCES**

RISK CATEGORY	UNIT	ALLOWANCE (APP. A)			
X.1 Utilities (sum sections I.2, III)	Low	10%	\$	945,800.00 \$ 94,580.00	
X.2 Geotechnical and/or Seismic (sum sections I.1 thru I.4, II)	Low	4%	\$	9,896,800.00 \$ 395,872.00	
X.3 Environmental (sections I.4, I.6, III, IV, V)	Low	10%	\$	2,190,716.32 \$ 219,071.63	
X.4 Site Access and Traffic Control (sum sections I.1, I.5, I.7, I.9, II)	Low	5%	\$	9,363,448.00 \$ 468,172.40	
X.5 Hazardous Materials (sum sections I.1 thru I.4, III)	Low	5%	\$	2,691,800.00 \$ 134,590.00	
X.6 Controversy and/or Environmental Justice (sum sections IV, V, VI)	Low	10%	\$	2,649,601.68 \$ 264,960.17	
<b>TOTAL FOR SECTION X. RISK BASED ALLOWANCES</b>					<b>\$ 1,577,246.20</b>

**ESCALATION**

	VALUE	
1 Anticipated year to begin construction, $N_{start}$ :	2024	
2 Estimated construction duration (in years)	2	
3 Number of years to midpoint of construction, $N_{\Delta}$	5	
4 Annual Escalation Rate, AER (percentage)	2.0%	
5 Total Construction Cost (TCC)	\$ 13,945,272	
6 Total Escalation	1.10	
	<hr style="border-top: 1px solid black;"/>	
ESCALATED TOTAL CONSTRUCTION COST (ETCC)	\$ 15,396,707	<hr style="border-top: 3px double black;"/> \$ 15,396,707.11

To escalate the TCC to midpoint of construction:

$$\text{Total Escalation} = (1 + \text{AER})^{N_{\Delta}}$$

where  $N_{\Delta} = N_{mid} - N_{current}$

$$N_{mid} = \text{duration}/2 + N_{start}$$

$$\text{ESCALATED TOTAL CONSTRUCTION COST (ETCC)} = \text{TCC} \times \text{Total Escalation}$$

Example: Determine  $N_{\Delta}$ , number of years to midpoint of construction.

First: Determine the year that construction would be at a midpoint. Divide the estimated construction duration in half and add the anticipated year that construction will begin.

1 Anticipated year to begin construction	<u>2024</u>
2 Estimated construction duration	<u>2</u>

$$N_{mid} = 2/2 + 2024 = 2025$$

Second: The number of years to midpoint of construction equals the difference between the midpoint year of construction and the current year.

$$N_{\Delta} = 2025 - 2020 = 5$$

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**TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = \$ 22,761,241.19**

**Project Cost Estimate Section I. Roadway, Subsections 1-7**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
<b>01 EARTHWORK</b>					
01	IMPORT BORROW	CY	\$ 180.00	1,500	\$ 270,000.00
01	REMOVE ASPHALT PAVING	SF	\$ 7.00	6,000	\$ 42,000.00
01	REMOVE CONCRETE (CURB, GUTTER, SIDEWALK, DRIVEWAY)	CY	\$ 100.00	300	\$ 30,000.00
01	CLEARING & GRUBBING	LS	\$ 200,000.00	1	\$ 200,000.00
01	DIFFERING SITE CONDITIONS	LS	\$ 150,000.00	1	\$ 150,000.00
SUBTOTAL FOR ITEM 01 EARTHWORK					\$ 692,000.00
<b>02 PAVEMENT STRUCTURAL SECTION</b>					
02	HOT MIX ASPHALT	TONS	\$ 280.00	585	\$ 163,800.00
02	AGGREGATE BASE (CLASS 2)	CY	\$ 200.00	700	\$ 140,000.00
02	CONCRETE SIDEWALK	SF	\$ 12.00	36,000	\$ 432,000.00
02	CONCRETE CURB & GUTTER	CY	\$ 1,500.00	130	\$ 195,000.00
02	CONCRETE CURB	CY	\$ 1,500.00	10	\$ 15,000.00
SUBTOTAL FOR ITEM 02 PAVEMENT STRUCTURAL SECTION					\$ 945,800.00
<b>03 DRAINAGE</b>					
03	DRAINAGE SYSTEM	LS	\$ 400,000.00	1	\$ 400,000.00
SUBTOTAL FOR ITEM 03 DRAINAGE					\$ 400,000.00
<b>04 SPECIALTY ITEMS</b>					
04	WATER POLLUTION CONTROL	LS	\$ 50,000.00	1	\$ 50,000.00
04	INSTALL PATHWAY LIGHTING	LF	\$ 300.00	800	\$ 240,000.00
04	MODIFY STREET LIGHTING	LS	\$ 100,000.00	1	\$ 100,000.00
04	INSTALL CONCRETE BARRIER	LF	\$ 200.00	220	\$ 44,000.00
04	GREEN INFRASTRUCTURE (WITHIN LANDSCAPED AREAS)	LF	\$ 200.00	900	\$ 180,000.00
04	CONCRETE CURB RAMP	EA	\$ 10,000.00	4	\$ 40,000.00
SUBTOTAL FOR ITEM 04 SPECIALTY ITEMS					\$ 654,000.00
<b>05 TRAFFIC ITEMS</b>					
05	SIGNING AND STRIPING	LS	\$ 60,000.00	1	\$ 60,000.00
05	TRAFFIC HANDLING (INC. HWY 17)	LS	\$ 200,000.00	1	\$ 200,000.00
05	TRAFFIC SIGNAL MODIFICATION (W. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
05	TRAFFIC SIGNAL MODIFICATION (E. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
SUBTOTAL FOR ITEM 05 TRAFFIC ITEMS					\$ 860,000.00

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**06 PLANTING AND IRRIGATION**

06	LANDSCAPING IMPROVEMENTS	LS	\$	400,000.00	1	\$	400,000.00
06	IRRIGATION MODIFICATIONS	LS	\$	250,000.00	1	\$	250,000.00
06	TREE REMOVALS	EA	\$	1,000.00	50	\$	50,000.00
			\$	-		\$	-

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SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION

\$ 700,000.00

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**07 ROADSIDE MANAGEMENT AND SAFETY SECTION**

07	STREET SWEEPING	LS	\$	25,000.00	1	\$	25,000.00
07	TEMPORARY FENCE (K-RAIL)	LS	\$	100,000.00	1	\$	100,000.00

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SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION

\$ 125,000.00

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TOTAL FOR SECTION I.1 THROUGH I.7 = \$ 4,376,800.00

**Project Cost Estimate Section II. Structures, Subsections 1-2**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing  
 Alternative: 2A - Concrete Box Girder (2-Span) - 200' long

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 STRUCTURES</b>				
08	Main Bridge - 20' wide (Net) x See Options	LS	\$ 2,200,000.00	1 \$ 2,200,000.00
08	Approach East Span Bridge - 20' wide x 80' long	LS	\$ 704,000.00	1 \$ 704,000.00
08	Approach West Span Bridge - 20' wide x 50' long	LS	\$ 440,000.00	1 \$ 440,000.00
08	East Ramp (north side) MSE Wall - 20' wide x 500' long	LS	\$ 437,500.00	1 \$ 437,500.00
08	Retaining Wall South Side at East Side Ramp (Approx. 300' long)	LS	\$ 600,000.00	1 \$ 600,000.00
08	East Ramp South Side MSE Wall - 20' wide x 100' long	LS	\$ 70,000.00	1 \$ 70,000.00
	Retaining Wall Modification at East Sidewalk adjacent to Blossom Hill			
08	Road (Approx. 350' long)	LS	\$ 525,000.00	1 \$ 525,000.00
08	West Ramp MSE Walls on both sides of path- 20' wide x 270' long	LS	\$ 472,500.00	1 \$ 472,500.00
08	Lighting on Bridge - 330'	LS	\$ 165,000.00	1 \$ 165,000.00
08	Existing Bridge Barrier Modification	LS	\$ 150,000.00	1 \$ 150,000.00
SUBTOTAL FOR ITEM 01 STRUCTURES				\$ 5,764,000.00

**Project Cost Estimate Section III. Right of Way, Subsections 1-3**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 PARTIAL ACQUISITIONS</b>				
				\$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS			\$ -
<b>02 AERIAL EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS			\$ -
<b>03 TEMPORARY CONSTRUCTION EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 03 TEMPORARY CONSTRUCTION EASEMENTS			\$ -
				TOTAL FOR SECTION I.1 THROUGH I.3 = \$ -

**Project Cost Estimate Section IV. Utilities, Subsections 1**

SPONSOR: Town of Los Gatos  
PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 Utility Relocations</b>				
	<b>ELECTRICAL POLE RELOCATION</b>	EA	\$ 100,000.00	1 \$ 100,000.00
	GAS LINE RELOCATION	LF	\$ 2,000.00	100 <u>\$ 200,000.00</u>
	SUBTOTAL FOR ITEM 01 Utility Relocations			\$ 300,000.00

TOTAL FOR SECTION I.1 = \$ 300,000.00

**Project Cost Estimate Summary**

Project Sponsor: Town of Los Gatos  
 Project Name: Highway 17 Bike & Pedestrian Overcrossing  
 Project location and brief description:

DATE: 8/26/2020  
 REV:

The Project will provide cyclists and pedestrians with a safer way to cross over HWY 17. The alternative assumed in this estimate is a separate pedestrian overcrossing that is adjacent to Blossom Hill Road Overcrossing. The Project components consist of a new steel truss supported bicycle and pedestrian bridge over HWY 17, and modification to Blossom Hill Road Structure. The proposed improvements include a two-way cycle track with Class IV protection along the south side. The two-way cycle track will conform to protected corners at each adjacent signalized intersection (Roberts Road and E. Roberts Road).

TYPE OF ESTIMATE: Preliminary  
 PREPARED BY: BKF

SUMMARY OF PROJECT OUTLAY COSTS

I. ROADWAY.....	ETCC	\$	17,549,665
II. STRUCTURES.....			
III. RIGHT OF WAY.....		\$	0
IV. CONCEPTUAL ENGINEERING STUDIES.....		\$	476,858
V. ENVIRONMENTAL STUDIES.....		\$	476,858
VI. DESIGN ENGINEERING.....		\$	2,066,385
VII. DESIGN SERVICES DURING CONSTRUCTION.....		\$	1,112,669
VIII. CONSTRUCTION STAKING.....		\$	397,382
IX. CONSTRUCTION MANAGEMENT.....		\$	2,066,385
X. RISK BASED ALLOWANCES.....		\$	1,801,496
DIRECT PROJECT COSTS		\$	25,947,699
(Sum of ETCC and sections III through X)			
XI. AGENCY MANAGEMENT.....		\$	2,225,338
TOTAL PROJECT COSTS		\$	28,173,037

HWY 17 BPOC				
Phase	Direct Cost	Risk Factors	Agency Costs	Total
Scoping/Planning	\$ -	\$ -	\$ -	\$ -
Preliminary Engineering/Environmental Studies	\$ 953,716	\$ 342,284	\$ 378,307	\$ 1,674,308
Final Design (PS&E)	\$ 2,066,385	\$ 72,060	\$ 801,122	\$ 2,939,567
<b>Final Design Total</b>	<b>\$ 3,020,102</b>	<b>\$ 414,344</b>	<b>\$ 1,179,429</b>	<b>\$ 4,613,875</b>
Right of Way Capital	\$ 0	\$ -	\$ -	\$ 0
Right of Way Support	\$ -	\$ -	\$ -	\$ -
Utility Relocation and Protection	\$ 400,000	\$ 100,000	\$ -	\$ 500,000
Construction Capital	\$ 17,549,665	\$ 1,387,152.07	\$ -	\$ 18,936,817
Construction Support	\$ 3,576,436	\$ -	\$ 1,045,909	\$ 4,622,345
<b>TOTALS</b>	<b>\$ 24,546,203</b>	<b>\$ 1,801,496</b>	<b>\$ 2,225,338</b>	<b>\$ 28,673,037</b>

**Assumptions:**

1. There is sufficient vertical clearance between Overhead Electrical Utility and proposed BPOC deck.
2. Minor modifications to existing drainage, water, and natural gas utilities will be needed. With relocation of 1 overhead electrical pole.
3. No right-of-way acquisitions will be required; All improvements will be within public right-of-way.
4. Main-span will be a 330-foot structural steel truss (single span) .
5. Retaining walls are assumed to average 8' overall height.
6. Bridge Section assumes 20' clear width for two-way cycle track and pedestrian walkway.
7. Landscaped Median barrier located between two-way cycle track and EB Blossom Hill Rd.
8. TCC assumes estimate in 2020 dollars.

**Project Cost Estimate Summary, Sections I through XI**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

I. ROADWAY	UNIT	ALLOWANCE			
I.1 Total Earthwork	LS	N/A	\$	692,000.00	\$ 692,000.00
I.2 Total Pavement Structural Section	LS	N/A	\$	945,800.00	\$ 945,800.00
I.3 Total Drainage	LS	N/A	\$	400,000.00	\$ 400,000.00
I.4 Total Specialty Items	LS	N/A	\$	654,000.00	\$ 654,000.00
I.5 Total Traffic Items	LS	N/A	\$	860,000.00	\$ 860,000.00
I.6 Total Planting and Irrigation	LS	N/A	\$	700,000.00	\$ 700,000.00
I.7 Total Roadside Management	LS	N/A	\$	125,000.00	\$ 125,000.00
I.8 Minor Items (5-10% of total costs of items I.1 thru I.7)	LS	10%	--	\$	437,680.00
I.9 Roadway Mobilization (10% of total cost of items I.1 thru I.8)	LS	10%	--	\$	481,448.00
I.10 Roadway Additions					
Supplemental Work (5-10% of total cost of items I.1 thru I.8)	LS	10%	--	\$	481,448.00
Supplemental Contingency (5-20% of total cost of items I.1 thru I.8)	LS	20%	--	\$	962,896.00
<b>TOTAL FOR SECTION I. ROADWAY</b>					<b>\$ 6,740,272.00</b>

II. STRUCTURES	STRUCTURE TYPE	UNIT	TOTAL AREA		
II.1 Total Structure Items		LS	1	\$ 7,324,000.00	\$ 7,324,000.00
					\$ 7,324,000.00
Design Contingency (25% of total cost of items II.1a thru II.1b)		LS	25%	--	\$ 1,831,000.00
<b>TOTAL FOR SECTION II. STRUCTURES</b>					<b>\$ 9,155,000.00</b>

**TCC TOTAL CONSTRUCTION COST (TCC) - SUM OF SECTION I. ROADWAY AND II. STRUCTURES** **\$ 15,895,272.00**

III. RIGHT OF WAY	UNIT	ALLOWANCE			
III.1 Partial Acquisitions	LS	N/A	\$	-	\$ -
III.2 Aerial Easements	LS	N/A	\$	-	\$ -
III.3 Temporary Construction Easements	LS	N/A	\$	-	\$ -
<b>TOTAL FOR SECTION III. RIGHT OF WAY</b>					<b>\$ -</b>

**ENGINEERING AND MANAGEMENT COSTS**

Note: Depending on the project's level of development, Sections IV through VI may not be applicable.

	ALLOWANCE			
<b>IV. CONCEPTUAL ENGINEERING STUDIES</b>	3.0%	\$	15,895,272.00	\$ 476,858.16
<b>V. ENVIRONMENTAL STUDIES</b>	3.0%	\$	15,895,272.00	\$ 476,858.16
<b>VI. DESIGN ENGINEERING</b>	13.0%	\$	15,895,272.00	\$ 2,066,385.36
<b>VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)</b>	7.0%	\$	15,895,272.00	\$ 1,112,669.04
<b>VIII. CONSTRUCTION STAKING</b>	2.5%	\$	15,895,272.00	\$ 397,381.80
<b>IX. CONSTRUCTION MANAGEMENT</b>	13.0%	\$	15,895,272.00	\$ 2,066,385.36
<b>XI. AGENCY MANAGEMENT</b>	14.0%	\$	15,895,272.00	\$ 2,225,338.08

**X. RISK BASED ALLOWANCES**

RISK CATEGORY	UNIT	ALLOWANCE (APP. A)			
X.1 Utilities (sum sections I.2, III)	Low	10%	\$	945,800.00	\$ 94,580.00
X.2 Geotechnical and/or Seismic (sum sections I.1 thru I.4, II)	Low	4%	\$	11,846,800.00	\$ 473,872.00
X.3 Environmental (sections I.4, I.6, III, IV, V)	Low	10%	\$	2,307,716.32	\$ 230,771.63
X.4 Site Access and Traffic Control (sum sections I.1, I.5, I.7, I.9, II)	Low	5%	\$	11,313,448.00	\$ 565,672.40
X.5 Hazardous Materials (sum sections I.1 thru I.4, III)	Low	5%	\$	2,691,800.00	\$ 134,590.00
X.6 Controversy and/or Environmental Justice (sum sections IV, V, VI)	Low	10%	\$	3,020,101.68	\$ 302,010.17
<b>TOTAL FOR SECTION X. RISK BASED ALLOWANCES</b>					<b>\$ 1,801,496.20</b>

**ESCALATION**

	VALUE	
1 Anticipated year to begin construction, $N_{start}$ :	2024	
2 Estimated construction duration (in years)	2	
3 Number of years to midpoint of construction, $N_{\Delta}$	5	
4 Annual Escalation Rate, AER (percentage)	2.0%	
5 Total Construction Cost (TCC)	\$ 15,895,272	
6 Total Escalation	1.10	
	<hr/>	
ESCALATED TOTAL CONSTRUCTION COST (ETCC)	\$ 17,549,665	<hr/> <hr/> \$ 17,549,664.68

To escalate the TCC to midpoint of construction:

$$\text{Total Escalation} = (1 + \text{AER})^{N_{\Delta}}$$

where  $N_{\Delta} = N_{mid} - N_{current}$

$$N_{mid} = \text{duration}/2 + N_{start}$$

$$\text{ESCALATED TOTAL CONSTRUCTION COST (ETCC)} = \text{TCC} \times \text{Total Escalation}$$

Example: Determine  $N_{\Delta}$ , number of years to midpoint of construction.

First: Determine the year that construction would be at a midpoint. Divide the estimated construction duration in half and add the anticipated year that construction will begin.

1 Anticipated year to begin construction	<u>2024</u>
2 Estimated construction duration	<u>2</u>

$$N_{mid} = 2/2 + 2024 = 2025$$

Second: The number of years to midpoint of construction equals the difference between the midpoint year of construction and the current year.

$$N_{\Delta} = 2025 - 2020 = 5$$

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**TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = \$ 25,947,698.76**

**Project Cost Estimate Section I. Roadway, Subsections 1-7**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
<b>01 EARTHWORK</b>					
01	IMPORT BORROW	CY	\$ 180.00	1,500	\$ 270,000.00
01	REMOVE ASPHALT PAVING	SF	\$ 7.00	6,000	\$ 42,000.00
01	REMOVE CONCRETE (CURB, GUTTER, SIDEWALK, DRIVEWAY)	CY	\$ 100.00	300	\$ 30,000.00
01	CLEARING & GRUBBING	LS	\$ 200,000.00	1	\$ 200,000.00
01	DIFFERING SITE CONDITIONS	LS	\$ 150,000.00	1	\$ 150,000.00
SUBTOTAL FOR ITEM 01 EARTHWORK					\$ 692,000.00
<b>02 PAVEMENT STRUCTURAL SECTION</b>					
02	HOT MIX ASPHALT	TONS	\$ 280.00	585	\$ 163,800.00
02	AGGREGATE BASE (CLASS 2)	CY	\$ 200.00	700	\$ 140,000.00
02	CONCRETE SIDEWALK	SF	\$ 12.00	36,000	\$ 432,000.00
02	CONCRETE CURB & GUTTER	CY	\$ 1,500.00	130	\$ 195,000.00
02	CONCRETE CURB	CY	\$ 1,500.00	10	\$ 15,000.00
SUBTOTAL FOR ITEM 02 PAVEMENT STRUCTURAL SECTION					\$ 945,800.00
<b>03 DRAINAGE</b>					
03	DRAINAGE SYSTEM	LS	\$ 400,000.00	1	\$ 400,000.00
SUBTOTAL FOR ITEM 03 DRAINAGE					\$ 400,000.00
<b>04 SPECIALTY ITEMS</b>					
04	WATER POLLUTION CONTROL	LS	\$ 50,000.00	1	\$ 50,000.00
04	INSTALL PATHWAY LIGHTING	LF	\$ 300.00	800	\$ 240,000.00
04	MODIFY STREET LIGHTING	LS	\$ 100,000.00	1	\$ 100,000.00
04	INSTALL CONCRETE BARRIER	LF	\$ 200.00	220	\$ 44,000.00
04	GREEN INFRASTRUCTURE (WITHIN LANDSCAPED AREAS)	LF	\$ 200.00	900	\$ 180,000.00
04	CONCRETE CURB RAMP	EA	\$ 10,000.00	4	\$ 40,000.00
SUBTOTAL FOR ITEM 04 SPECIALTY ITEMS					\$ 654,000.00
<b>05 TRAFFIC ITEMS</b>					
05	SIGNING AND STRIPING	LS	\$ 60,000.00	1	\$ 60,000.00
05	TRAFFIC HANDLING (INC. HWY 17)	LS	\$ 200,000.00	1	\$ 200,000.00
05	TRAFFIC SIGNAL MODIFICATION (W. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
05	TRAFFIC SIGNAL MODIFICATION (E. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
SUBTOTAL FOR ITEM 05 TRAFFIC ITEMS					\$ 860,000.00

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**06 PLANTING AND IRRIGATION**

06	LANDSCAPING IMPROVEMENTS	LS	\$	400,000.00	1	\$	400,000.00
06	IRRIGATION MODIFICATIONS	LS	\$	250,000.00	1	\$	250,000.00
06	TREE REMOVALS	EA	\$	1,000.00	50	\$	50,000.00
			\$	-		\$	-

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SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION

\$ 700,000.00

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**07 ROADSIDE MANAGEMENT AND SAFETY SECTION**

07	STREET SWEEPING	LS	\$	25,000.00	1	\$	25,000.00
07	TEMPORARY FENCE (K-RAIL)	LS	\$	100,000.00	1	\$	100,000.00

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SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION

\$ 125,000.00

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TOTAL FOR SECTION I.1 THROUGH I.7 = \$ 4,376,800.00

**Project Cost Estimate Section II. Structures, Subsections 1-2**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing  
 Alternative: 2B - Steel Truss (Single Span) - 330' long

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 STRUCTURES</b>				
08	Main Bridge - 20' wide (Net) x See Options	LS	\$ 3,760,000.00	1 \$ 3,760,000.00
08	Approach East Span Bridge - 20' wide x 80' long	LS	\$ 704,000.00	1 \$ 704,000.00
08	Approach West Span Bridge - 20' wide x 50' long	LS	\$ 440,000.00	1 \$ 440,000.00
08	East Ramp (north side) MSE Wall - 20' wide x 500' long	LS	\$ 437,500.00	1 \$ 437,500.00
08	Retaining Wall South Side at East Ramp (Approx. 300' long)	LS	\$ 600,000.00	1 \$ 600,000.00
08	East Ramp South Side MSE Wall - 20' wide x 100' long	LS	\$ 70,000.00	1 \$ 70,000.00
08	Retaining Wall Modification at East Sidewalk adjacent to Blossom Hill			
08	Road (Approx. 350' long)	LS	\$ 525,000.00	1 \$ 525,000.00
08	West Ramp MSE Walls on both sides of path - 20' wide x 270' long	LS	\$ 472,500.00	1 \$ 472,500.00
08	Lighting on Bridge - 330'	LS	\$ 165,000.00	1 \$ 165,000.00
08	Existing Bridge Barrier Modification	LS	\$ 150,000.00	1 \$ 150,000.00
SUBTOTAL FOR ITEM 01 STRUCTURES				\$ 7,324,000.00

**Project Cost Estimate Section III. Right of Way, Subsections 1-3**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 PARTIAL ACQUISITIONS</b>				
				\$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS			\$ -
<b>02 AERIAL EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS			\$ -
<b>03 TEMPORARY CONSTRUCTION EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 03 TEMPORARY CONSTRUCTION EASEMENTS			\$ -
				TOTAL FOR SECTION I.1 THROUGH I.3 = \$ -

**Project Cost Estimate Section IV. Utilities, Subsections 1**

SPONSOR: Town of Los Gatos  
PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 Utility Relocations</b>				
	<b>ELECTRICAL POLE RELOCATION</b>	EA	\$ 100,000.00	1 \$ 100,000.00
	GAS LINE RELOCATION	LF	\$ 2,000.00	100 <u>\$ 200,000.00</u>
	SUBTOTAL FOR ITEM 01 Utility Relocations			\$ 300,000.00

TOTAL FOR SECTION I.1 = \$ 300,000.00

**Project Cost Estimate Summary**

Project Sponsor: Town of Los Gatos  
 Project Name: Highway 17 Bike & Pedestrian Overcrossing  
 Project location and brief description:

DATE: 8/26/2020  
 REV:

The Project will provide cyclists and pedestrians with a safer way to cross over HWY 17. The alternative assumed in this estimate is a separate pedestrian overcrossing that is adjacent to Blossom Hill Road Overcrossing. The Project components consist of a new steel tied-arch supported bicycle and pedestrian bridge over HWY 17, and modification to Blossom Hill Road Structure. The proposed improvements include a two-way cycle track with Class IV protection along the south side. The two-way cycle track will conform to protected corners at each adjacent signalized intersection (Roberts Road and E. Roberts Road).

TYPE OF ESTIMATE: Preliminary  
 PREPARED BY: BKF

SUMMARY OF PROJECT OUTLAY COSTS

I. ROADWAY.....	ETCC	\$	18,198,312
II. STRUCTURES.....			
III. RIGHT OF WAY.....		\$	0
IV. CONCEPTUAL ENGINEERING STUDIES.....		\$	494,483
V. ENVIRONMENTAL STUDIES.....		\$	494,483
VI. DESIGN ENGINEERING.....		\$	2,142,760
VII. DESIGN SERVICES DURING CONSTRUCTION.....		\$	1,153,794
VIII. CONSTRUCTION STAKING.....		\$	412,069
IX. CONSTRUCTION MANAGEMENT.....		\$	2,142,760
X. RISK BASED ALLOWANCES.....		\$	1,869,059
DIRECT PROJECT COSTS		\$	26,907,721
(Sum of ETCC and sections III through X)			
XI. AGENCY MANAGEMENT.....		\$	2,307,588
TOTAL PROJECT COSTS		\$	29,215,309

HWY 17 BPOC				
Phase	Direct Cost	Risk Factors	Agency Costs	Total
Scoping/Planning	\$ -	\$ -	\$ -	\$ -
Preliminary Engineering/Environmental Studies	\$ 988,966	\$ 355,121	\$ 392,290	\$ 1,736,377
Final Design (PS&E)	\$ 2,142,760	\$ 74,762	\$ 830,732	\$ 3,048,254
<b>Final Design Total</b>	<b>\$ 3,131,727</b>	<b>\$ 429,884</b>	<b>\$ 1,223,022</b>	<b>\$ 4,784,632</b>
Right of Way Capital	\$ 0	\$ -	\$ -	\$ 0
Right of Way Support	\$ -	\$ -	\$ -	\$ -
Utility Relocation and Protection	\$ 400,000	\$ 100,000	\$ -	\$ 500,000
Construction Capital	\$ 18,198,312	\$ 1,439,175.20	\$ -	\$ 19,637,487
Construction Support	\$ 3,708,624	\$ -	\$ 1,084,566	\$ 4,793,190
<b>TOTALS</b>	<b>\$ 25,438,663</b>	<b>\$ 1,869,059</b>	<b>\$ 2,307,588</b>	<b>\$ 29,715,309</b>

**Assumptions:**

1. There is sufficient vertical clearance between Overhead Electrical Utility and proposed BPOC deck.
2. Minor modifications to existing drainage, water, and natural gas utilities will be needed. With relocation of 1 overhead electrical pole.
3. No right-of-way acquisitions will be required; All improvements will be within public right-of-way.
4. Main-span will be a 330-foot long steel tied-arch (single span).
5. Retaining walls are assumed to average 8' overall height.
6. Bridge Section assumes 20' clear width for two-way cycle track and pedestrian walkway.
7. Landscaped Median barrier located between two-way cycle track and EB Blossom Hill Rd.
8. TCC assumes estimate in 2020 dollars.

**Project Cost Estimate Summary, Sections I through XI**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

I. ROADWAY	UNIT	ALLOWANCE			
I.1 Total Earthwork	LS	N/A	\$	692,000.00	\$ 692,000.00
I.2 Total Pavement Structural Section	LS	N/A	\$	945,800.00	\$ 945,800.00
I.3 Total Drainage	LS	N/A	\$	400,000.00	\$ 400,000.00
I.4 Total Specialty Items	LS	N/A	\$	654,000.00	\$ 654,000.00
I.5 Total Traffic Items	LS	N/A	\$	860,000.00	\$ 860,000.00
I.6 Total Planting and Irrigation	LS	N/A	\$	700,000.00	\$ 700,000.00
I.7 Total Roadside Management	LS	N/A	\$	125,000.00	\$ 125,000.00
I.8 Minor Items (5-10% of total costs of items I.1 thru I.7)	LS	10%	--	\$	437,680.00
I.9 Roadway Mobilization (10% of total cost of items I.1 thru I.8)	LS	10%	--	\$	481,448.00
I.10 Roadway Additions					
Supplemental Work (5-10% of total cost of items I.1 thru I.8)	LS	10%	--	\$	481,448.00
Supplemental Contingency (5-20% of total cost of items I.1 thru I.8)	LS	20%	--	\$	962,896.00
<b>TOTAL FOR SECTION I. ROADWAY</b>					<b>\$ 6,740,272.00</b>

II. STRUCTURES	STRUCTURE TYPE	UNIT	TOTAL AREA		
II.1 Total Structure Items		LS	1	\$ 7,794,000.00	\$ 7,794,000.00
					\$ 7,794,000.00
Design Contingency (25% of total cost of items II.1a thru II.1b)		LS	25%	--	\$ 1,948,500.00
<b>TOTAL FOR SECTION II. STRUCTURES</b>					<b>\$ 9,742,500.00</b>

**TCC TOTAL CONSTRUCTION COST (TCC) - SUM OF SECTION I. ROADWAY AND II. STRUCTURES** **\$ 16,482,772.00**

III. RIGHT OF WAY	UNIT	ALLOWANCE			
III.1 Partial Acquisitions	LS	N/A	\$	-	\$ -
III.2 Aerial Easements	LS	N/A	\$	-	\$ -
III.3 Temporary Construction Easements	LS	N/A	\$	-	\$ -
<b>TOTAL FOR SECTION III. RIGHT OF WAY</b>					<b>\$ -</b>

**ENGINEERING AND MANAGEMENT COSTS**

Note: Depending on the project's level of development, Sections IV through VI may not be applicable.

	ALLOWANCE			
<b>IV. CONCEPTUAL ENGINEERING STUDIES</b>	3.0%	\$	16,482,772.00	\$ 494,483.16
<b>V. ENVIRONMENTAL STUDIES</b>	3.0%	\$	16,482,772.00	\$ 494,483.16
<b>VI. DESIGN ENGINEERING</b>	13.0%	\$	16,482,772.00	\$ 2,142,760.36
<b>VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)</b>	7.0%	\$	16,482,772.00	\$ 1,153,794.04
<b>VIII. CONSTRUCTION STAKING</b>	2.5%	\$	16,482,772.00	\$ 412,069.30
<b>IX. CONSTRUCTION MANAGEMENT</b>	13.0%	\$	16,482,772.00	\$ 2,142,760.36
<b>XI. AGENCY MANAGEMENT</b>	14.0%	\$	16,482,772.00	\$ 2,307,588.08

**X. RISK BASED ALLOWANCES**

RISK CATEGORY	UNIT	ALLOWANCE (APP. A)			
X.1 Utilities (sum sections I.2, III)	Low	10%	\$	945,800.00	\$ 94,580.00
X.2 Geotechnical and/or Seismic (sum sections I.1 thru I.4, II)	Low	4%	\$	12,434,300.00	\$ 497,372.00
X.3 Environmental (sections I.4, I.6, III, IV, V)	Low	10%	\$	2,342,966.32	\$ 234,296.63
X.4 Site Access and Traffic Control (sum sections I.1, I.5, I.7, I.9, II)	Low	5%	\$	11,900,948.00	\$ 595,047.40
X.5 Hazardous Materials (sum sections I.1 thru I.4, III)	Low	5%	\$	2,691,800.00	\$ 134,590.00
X.6 Controversy and/or Environmental Justice (sum sections IV, V, VI)	Low	10%	\$	3,131,726.68	\$ 313,172.67
<b>TOTAL FOR SECTION X. RISK BASED ALLOWANCES</b>					<b>\$ 1,869,058.70</b>

**ESCALATION**

	VALUE	
1 Anticipated year to begin construction, $N_{start}$ :	2024	
2 Estimated construction duration (in years)	2	
3 Number of years to midpoint of construction, $N_{\Delta}$	5	
4 Annual Escalation Rate, AER (percentage)	2.0%	
5 Total Construction Cost (TCC)	\$ 16,482,772	
6 Total Escalation	1.10	
	<hr style="border-top: 1px solid black;"/>	
ESCALATED TOTAL CONSTRUCTION COST (ETCC)	\$ 18,198,312	<hr style="border-top: 3px double black;"/> \$ 18,198,312.15

To escalate the TCC to midpoint of construction:

$$\text{Total Escalation} = (1 + \text{AER})^{N_{\Delta}}$$

where  $N_{\Delta} = N_{mid} - N_{current}$

$$N_{mid} = \text{duration}/2 + N_{start}$$

$$\text{ESCALATED TOTAL CONSTRUCTION COST (ETCC)} = \text{TCC} \times \text{Total Escalation}$$

Example: Determine  $N_{\Delta}$ , number of years to midpoint of construction.

First: Determine the year that construction would be at a midpoint. Divide the estimated construction duration in half and add the anticipated year that construction will begin.

1 Anticipated year to begin construction	<u>2024</u>
2 Estimated construction duration	<u>2</u>

$$N_{mid} = 2/2 + 2024 = 2025$$

Second: The number of years to midpoint of construction equals the difference between the midpoint year of construction and the current year.

$$N_{\Delta} = 2025 - 2020 = 5$$

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**TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = \$ 26,907,721.23**

**Project Cost Estimate Section I. Roadway, Subsections 1-7**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
<b>01 EARTHWORK</b>					
01	IMPORT BORROW	CY	\$ 180.00	1,500	\$ 270,000.00
01	REMOVE ASPHALT PAVING	SF	\$ 7.00	6,000	\$ 42,000.00
01	REMOVE CONCRETE (CURB, GUTTER, SIDEWALK, DRIVEWAY)	CY	\$ 100.00	300	\$ 30,000.00
01	CLEARING & GRUBBING	LS	\$ 200,000.00	1	\$ 200,000.00
01	DIFFERING SITE CONDITIONS	LS	\$ 150,000.00	1	\$ 150,000.00
SUBTOTAL FOR ITEM 01 EARTHWORK					\$ 692,000.00
<b>02 PAVEMENT STRUCTURAL SECTION</b>					
02	HOT MIX ASPHALT	TONS	\$ 280.00	585	\$ 163,800.00
02	AGGREGATE BASE (CLASS 2)	CY	\$ 200.00	700	\$ 140,000.00
02	CONCRETE SIDEWALK	SF	\$ 12.00	36,000	\$ 432,000.00
02	CONCRETE CURB & GUTTER	CY	\$ 1,500.00	130	\$ 195,000.00
02	CONCRETE CURB	CY	\$ 1,500.00	10	\$ 15,000.00
SUBTOTAL FOR ITEM 02 PAVEMENT STRUCTURAL SECTION					\$ 945,800.00
<b>03 DRAINAGE</b>					
03	DRAINAGE SYSTEM	LS	\$ 400,000.00	1	\$ 400,000.00
SUBTOTAL FOR ITEM 03 DRAINAGE					\$ 400,000.00
<b>04 SPECIALTY ITEMS</b>					
04	WATER POLLUTION CONTROL	LS	\$ 50,000.00	1	\$ 50,000.00
04	INSTALL PATHWAY LIGHTING	LF	\$ 300.00	800	\$ 240,000.00
04	MODIFY STREET LIGHTING	LS	\$ 100,000.00	1	\$ 100,000.00
04	INSTALL CONCRETE BARRIER	LF	\$ 200.00	220	\$ 44,000.00
04	GREEN INFRASTRUCTURE (WITHIN LANDSCAPED AREAS)	LF	\$ 200.00	900	\$ 180,000.00
04	CONCRETE CURB RAMP	EA	\$ 10,000.00	4	\$ 40,000.00
SUBTOTAL FOR ITEM 04 SPECIALTY ITEMS					\$ 654,000.00
<b>05 TRAFFIC ITEMS</b>					
05	SIGNING AND STRIPING	LS	\$ 60,000.00	1	\$ 60,000.00
05	TRAFFIC HANDLING (INC. HWY 17)	LS	\$ 200,000.00	1	\$ 200,000.00
05	TRAFFIC SIGNAL MODIFICATION (W. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
05	TRAFFIC SIGNAL MODIFICATION (E. ROBERTS ROAD)	LS	\$ 300,000.00	1	\$ 300,000.00
SUBTOTAL FOR ITEM 05 TRAFFIC ITEMS					\$ 860,000.00

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**06 PLANTING AND IRRIGATION**

06	LANDSCAPING IMPROVEMENTS	LS	\$	400,000.00	1	\$	400,000.00
06	IRRIGATION MODIFICATIONS	LS	\$	250,000.00	1	\$	250,000.00
06	TREE REMOVALS	EA	\$	1,000.00	50	\$	50,000.00
			\$	-		\$	-

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SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION

\$ 700,000.00

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**07 ROADSIDE MANAGEMENT AND SAFETY SECTION**

07	STREET SWEEPING	LS	\$	25,000.00	1	\$	25,000.00
07	TEMPORARY FENCE (K-RAIL)	LS	\$	100,000.00	1	\$	100,000.00

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SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION

\$ 125,000.00

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TOTAL FOR SECTION I.1 THROUGH I.7 = \$ 4,376,800.00

**Project Cost Estimate Section II. Structures, Subsections 1-2**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing  
 Alternative: 2C - Steel Tied-Arch (Single Span) - 330' long

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
<b>01 STRUCTURES</b>					
08	Main Bridge - 20' wide (Net) x See Options	LS	\$ 4,230,000.00	1	\$ 4,230,000.00
08	Approach East Span Bridge - 20' wide x 80' long	LS	\$ 704,000.00	1	\$ 704,000.00
08	Approach West Span Bridge - 20' wide x 50' long	LS	\$ 440,000.00	1	\$ 440,000.00
08	East Ramp (north side) MSE Wall - 20' wide x 500' long	LS	\$ 437,500.00	1	\$ 437,500.00
08	Retaining Wall South Side at East Side Ramp (Approx. 300' long)	LS	\$ 600,000.00	1	\$ 600,000.00
08	East Ramp South Side MSE Wall - 20' wide x 100' long	LS	\$ 70,000.00	1	\$ 70,000.00
08	Retaining Wall Modification at East Sidewalk adjacent to Blossom Hill				
08	Road (Approx. 350' long)	LS	\$ 525,000.00	1	\$ 525,000.00
08	West Ramp MSE Walls on both sides of path- 20' wide x 270' long	LS	\$ 472,500.00	1	\$ 472,500.00
08	Lighting on Bridge - 330'	LS	\$ 165,000.00	1	\$ 165,000.00
08	Existing Bridge Barrier Modification	LS	\$ 150,000.00	1	\$ 150,000.00
SUBTOTAL FOR ITEM 01 STRUCTURES					\$ 7,794,000.00

**Project Cost Estimate Section III. Right of Way, Subsections 1-3**

SPONSOR: Town of Los Gatos  
 PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
 REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 PARTIAL ACQUISITIONS</b>				
				\$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS			\$ -
<b>02 AERIAL EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS			\$ -
<b>03 TEMPORARY CONSTRUCTION EASEMENTS</b>				
				\$ -
	SUBTOTAL FOR ITEM 03 TEMPORARY CONSTRUCTION EASEMENTS			\$ -
				TOTAL FOR SECTION I.1 THROUGH I.3 = \$ -

**Project Cost Estimate Section IV. Utilities, Subsections 1**

SPONSOR: Town of Los Gatos  
PROJECT: Highway 17 Bike & Pedestrian Overcrossing

DATE: 8/26/2020  
REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY
<b>01 Utility Relocations</b>				
	<b>ELECTRICAL POLE RELOCATION</b>	EA	\$ 100,000.00	1 \$ 100,000.00
	GAS LINE RELOCATION	LF	\$ 2,000.00	100 <u>\$ 200,000.00</u>
	SUBTOTAL FOR ITEM 01 Utility Relocations			\$ 300,000.00

TOTAL FOR SECTION I.1 = \$ 300,000.00

**APPENDIX C**  
**GEOTECHNICAL MEMORANDUM**



## MEMORANDUM

To: BKF Engineers  
4670 Willow Road, Suite 250,  
Pleasanton, CA 94588

August 28<sup>th</sup>, 2020  
Job No.: 2019-150-PGR

Attn.: Mr. Jaggi Bhandal, P.E., LEED AP

From: Yeqi (Jackson) Zhang, P.E. 85137  
Y. David Wang, Ph.D., P.E. 52911

Sub: Geotechnical Feasibility Study Memorandum  
Blossom Hill Road, Highway 17 Bicycle and Pedestrian Project, Los Gatos, CA

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### Introduction

This geotechnical memorandum is prepared for the proposed Blossom Hill Road/Highway (Hwy) 17 Bicycle and Pedestrian Overcrossing Feasibility Analysis and Conceptual Engineering Project (PROJECT) in Los Gatos, California. The proposed bridge is planned to be just south of the existing Blossom Hill Road Overcrossing at Hwy 17 (BR. No. 37-0148). The proposed Bicycle and Pedestrian Overcrossing (BPOC) is a 3-span structure with approximately 350 feet in length and 22.5 feet in width. The structure is 4 feet in depth supported by two abutments and two bents with 12 feet high fence on both side of the deck. The general project location map is attached in Attachment A.

The Town of Los Gatos has contracted with BKF Engineers, the designer, to provide design for the planned bridge. The scope of work for the geotechnical feasibility study consists of reviewing readily available as-built data and providing discussion on the feasibility of the planned project elements, including bridge foundations and retaining wall construction along the approaches, from geotechnical standpoint.

### Subsurface Conditions

We referred to Caltrans as-built Log of Test Borings performed in February 1955 for the existing Blossom Hill Road Overcrossing (Br. No. 37-0148) for subsurface information. Two rotary wash borings (B-1 and B-4) and three penetration tests (B-2, B-3 and B-5) were performed along the alignment of Blossom Hill Road Overcrossing from Elev. ~330 to 331 ft before the current Hwy 17 construction that was cut to Elev. 318 ft (NGVD 29).

The boring data (1955) indicated loose to medium dense granular material (silty sand with gravel and cobbles) through about Elev. 320 ft. Below that, the borings encountered generally dense to very dense weathered and cemented silty sand and gravel and cemented/friable sandy silt (Santa Clara Formation). Pockets of relatively loose material were also encountered in the borings. The 1955 as-built borings were explored to Elev. ~290 ft.

Groundwater was found at Elev. 312.2 ft (NGVD 29) in B-2 in February 1955. Please note that groundwater may vary due to seasonal groundwater fluctuation, subsurface flows or seepages, ground surface run-off, and other factors that may not be present at the time of the investigation. Groundwater levels should be verified during the PS&E design phase. The current conceptual plan, dated 06/25/2020, indicates Hwy 17 at Elev. 322 ft (likely with Datum of NAVD 88). We anticipate that groundwater level could be within 6 to 7 ft depth of the existing Hwy 17 grade.

It should be noted that the descriptions of the soils encountered and relevant boring information presented on the boring log depict subsurface conditions only at the locations indicated on the plan and on the particular date noted on the boring log. Because of the variability from place to place within soil in general, subsurface conditions at other locations may differ from conditions occurring at the boring locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the soil conditions at these locations due to environmental changes.

### **Seismic Design Criteria**

The design spectrum was developed in accordance with the Caltrans Seismic Design Criteria (SDC) version 2.0 and the Acceleration Response Spectrum (ARS) Online web tool (Version 3.0.2).

For SDC 2.0, the Design Spectrum is based on the USGS 975-year uniform hazard spectrum only. Effective December 1, 2019, the USGS hazard spectrum is based on the 2014 National Hazard Map per the memorandum from the State Bridge Engineer. The updated Design Spectrum continues the use of near-fault adjustment factors and basin amplification factors. The only change to these factors is the use of the Campbell-Bozorgnia (2014) and Chiou-Youngs (2014) basin amplification factors, updated from their 2008 models. The development of the design ARS curve is based on several input parameters, including site location (longitude/latitude), average shear wave velocity for the top 30 meters/100 feet ( $V_{s30m}$ ), and other site parameters, such as fault characteristics, site-to-fault distances.

A shear wave velocity for the top 30 m (100 feet) at the location was estimated by using established correlations and the procedure provided in the "Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations (November 2012)". The shear wave velocity is estimated to be 295 m/s. The recommended design curve,



and comparison of deterministic and probabilistic ARS curves are attached to this memorandum in Attachment B. The site location and the relevant parameters are summarized as follows:

- Site Location: 37.234378°N/121.970862°W
- Estimated  $V_{S30m}$ : 295 m/s
- Anticipated Peak Ground Acceleration (PGA): 0.800 g (Design  $S_{a2014}$ )
- Maximum Moment Magnitude: 7.28 (Per USGS Unified Hazard Tool -Site Class D)
- Near fault adjustment was applied to the ARS curve.
- No adjustment was needed for basin effect

**Liquefaction Potential.** The borings encountered predominantly sandy soils and cemented material in substrata. Based on liquefaction analyses, liquefaction exists in the following listed layer:

- As-built Boring B-4 (1955): ~5 ft thick at Elev. 311 to 306 ft,  $S_r = 290$  psf

The B-3 penetration test (1955) also appeared to indicate an isolated loose spot at about Elev. 315 ft. In general, liquefaction potential exists, but the overall impact on the project design is deemed relatively insignificant.

### **Geotechnical Discussions on Foundation Design Elements**

**Bridge Foundations.** The boring data indicated dense to very dense weathered and cemented silty sand and gravel below Elev. 306 ft. The existing Blossom Hill Road OC is supported on spread footing foundations (Bents at Elev. ~306 ft with service bearing capacity of 4 tsf). For the proposed bicycle and pedestrian structure, the new Bent 2 is located in the existing median of Hwy 17 and the new Bent 3 is further east of Hwy 17 NB on the existing 1.5H:1V cut slope.

Considering the existing congested traffic on Hwy 17 and limited room for construction, we believe that Caltrans standard cast-in-drilled-hole (CIDH) concrete pile is a viable option for foundation support of the proposed BPOC in the dense and cemented material. Driven pile is not feasible. Groundwater is expected (as shown on Elev. 312.2 ft of the 1955 as-built LOTB sheet), so minimum 24-inch diameter CIDH concrete pile is recommended. Caltrans standard specifications with slurry construction and use of temporary casing are anticipated for CIDH installation. Alternatively, large diameter pile columns are also feasible for the new bents if there is limitation for pile cap/footing to fit within the constraints.

In our opinion, the use of spread footing foundations is less preferred compared to the CIDH concrete piles because the need for excavation shoring and dewatering within congested Hwy 17 traffic. Spread footing foundations do not provide uplift capacity.



**Approaches and Retaining Walls.** The approaches for the BPOC follows the existing terrain of the alignment. For the western approach, the profile requires new embankments up to 12 to 13 ft high at Abutment 1. A retaining wall is anticipated along the north side to contain the embankments.

For the eastern approach, there is a small hillside immediately on the SE quadrant of the existing Blossom Hill Road OC. Based on the topo information on the Caltrans 1993 as-built foundation plan, the terrain slopes upward from Blossom Hill Road at about 3H:1V to 2H:1V. The existing grade is at Elev. 340 ft at Blossom Hill Road, and the terrain slope upward to about Elev. 383 ft (Google Earth) at a private parking lot on top. The planned BPOC Abutment 4 is at Elev. 354 ft. The grading for the eastern approach requires minor cut and fill within about 100 ft behind the abutment and additional embankments up to 8 ft high eastward. A retaining wall is anticipated along the north side to contain the embankments. For permanent design above the eastern approach, a slope gradient of 2H:1V is recommended for native material at the site.



Figure 1 views eastward on the existing Blossom Hill Road OC. Note the hillside on the SE quadrant of the site. The terrain is heavily vegetated. As grading is needed, it is anticipated that this could be the access for construction of foundation piles at the planned Abutment 4 and Pier 3. Accessing from Hwy 17 NB with 1.5H:1V slope appears to be more difficult.

Figure 1: Viewing eastward from existing Blossom Hill Road OC. The terrain slopes up on the SE quadrant of Blossom Hill Rd. OC.

Based on readily available geological information, the native soils at shallow depth appear to consist primarily of granular materials (sand with gravel and cobbles) in loose to medium consistency. Cast-in-place cantilever retaining walls are feasible, but we anticipate footing subgrade improvement such as by over-excavation and replacement with compacted Aggregate Base rock to provide uniform foundation support. Because the site PGA is > 0.6 g, Caltrans standard cantilever retaining wall design needs to be checked from seismic design standpoint.

Alternatively, Mechanically Stabilized Embankment (MSE) walls are also feasible at the site. MSE walls are more accommodative for ground adjustments. We do not think ground settlement is a design issue at the site for the planned embankment heights. The construction of MSE may need more excavation to accommodate the required reinforcements.



## **Limitation**

Please be advised that we are performing a professional service and that our conclusions are professional opinions only. All work done and all recommendations made are in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work.

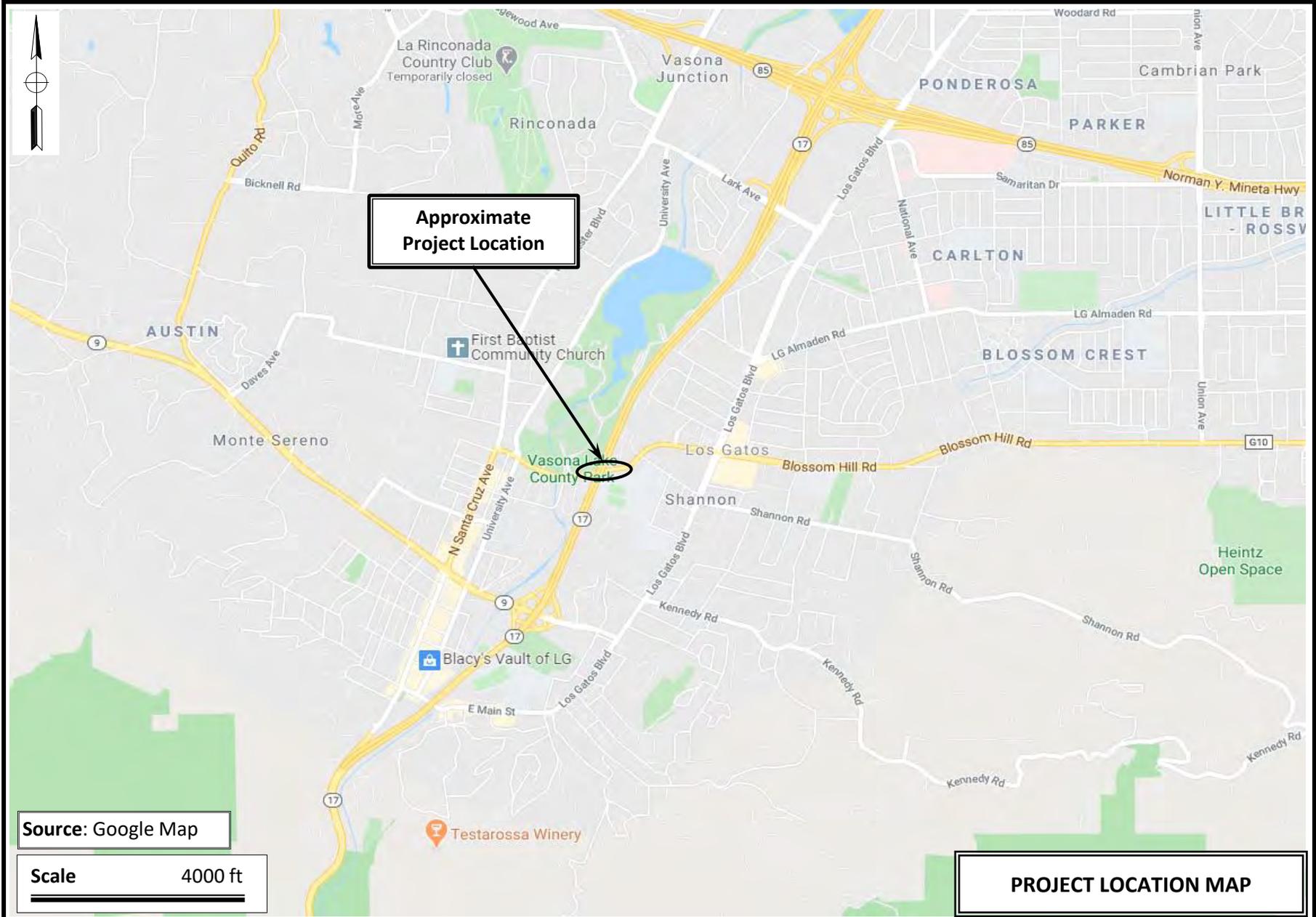
## **Attachments:**

- Attachment A - Project Location Map  
Geologic Map  
As-Built Log of Test Boring (Br. No. 37-0148, 1955)  
Preliminary General Plan, Profile and Support Locations (BKF, 06/25/20)  
Caltrans As-Built General Plan and Foundation Plan (Br. No. 37-0148, 1955)
- Attachment B - Recommended ARS Curve per Caltrans Guidelines

[https://parikhnet.sharepoint.com/sites/projects2/Ongoing\\_Projects/2019/2019-150-PGR BKF Rte 17 POC Study Los Gatos/Design Memo/Rte 17 POC Study \\_Geotech Memo\\_080720.docx](https://parikhnet.sharepoint.com/sites/projects2/Ongoing_Projects/2019/2019-150-PGR%20BKF%20Rte%2017%20POC%20Study%20Los%20Gatos/Design%20Memo/Rte%2017%20POC%20Study%20_Geotech%20Memo_080720.docx)



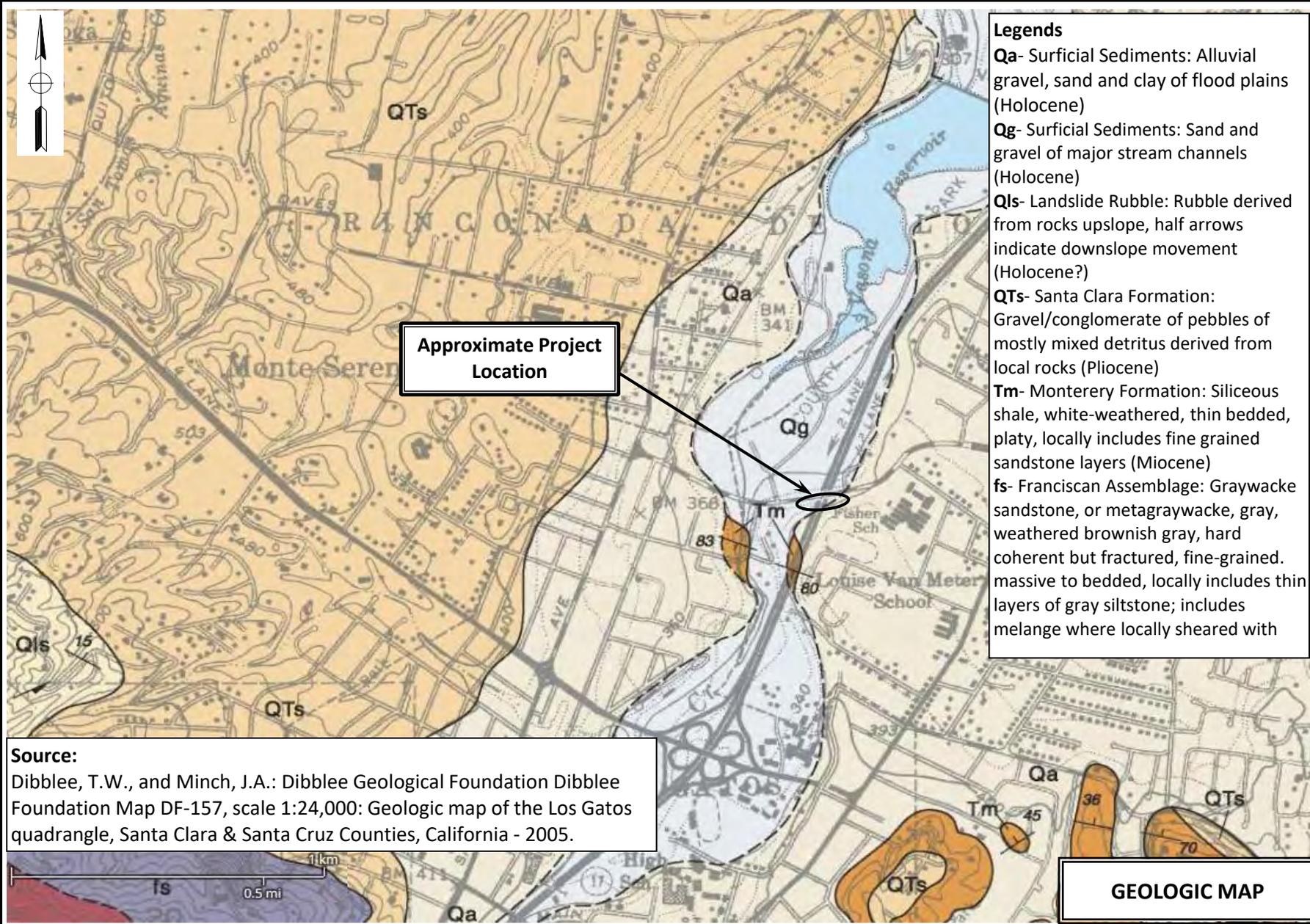
# **ATTACHMENT A**



**HWY 17 BICYCLE AND PEDESTRIAN BRIDGE  
FEASIBILITY ANALYSIS AND CONCEPTUAL ENGINEERING PROJECT  
LOS GATOS, CALIFORNIA**

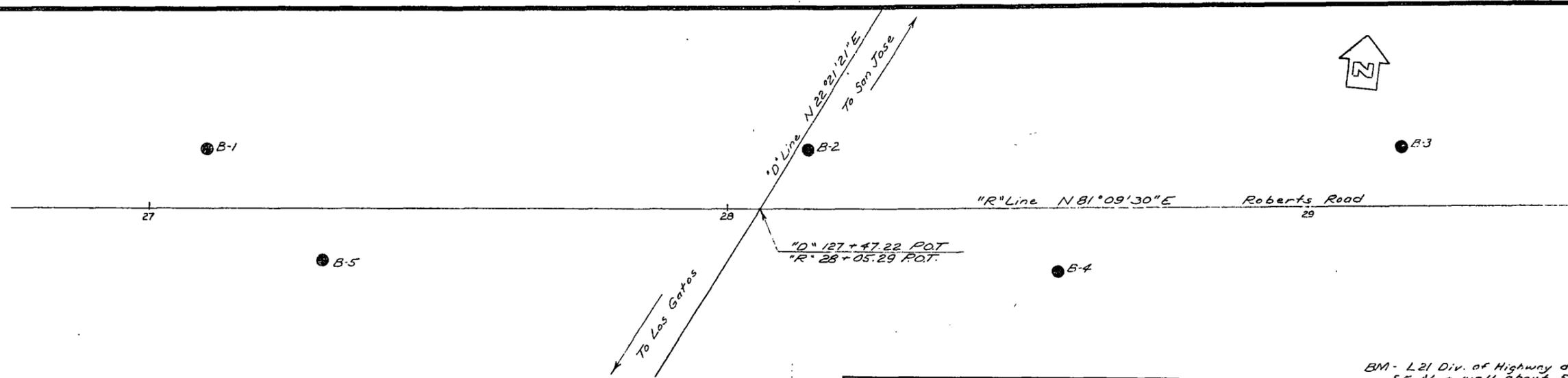
**JOB NO.: 2019-150-PGR**

**Attachment A-1**



FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.				

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
IV	SCI	5	D		



DIST.	COUNTY	ROUTE	POST MILES - TOTAL PROJECT	Sheet No.	Total Sheets
04	SCI	17	7.7	26	26

OFFICE OF ENGINEERING GEOLOGY - DIV. OF NEW TECH., MATLS. & RESEARCH

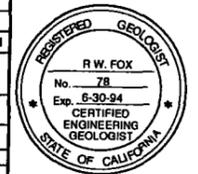
*R.W. Fox* 5-2-94  
CERTIFIED ENGINEERING GEOLOGIST PLANS APPROVAL DATE

**BLOSSOM HILL ROAD OVERCROSSING (WIDEN)**

**LOG OF TEST BORINGS**

NOTE: THIS LOG OF TEST BORINGS IS AVAILABLE ON MICROFILM AT OFFICE OF STRUCTURES DESIGN SACRAMENTO, CALIFORNIA

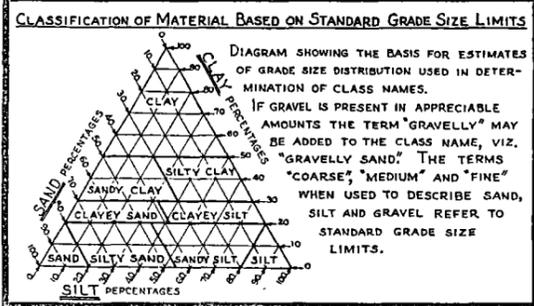
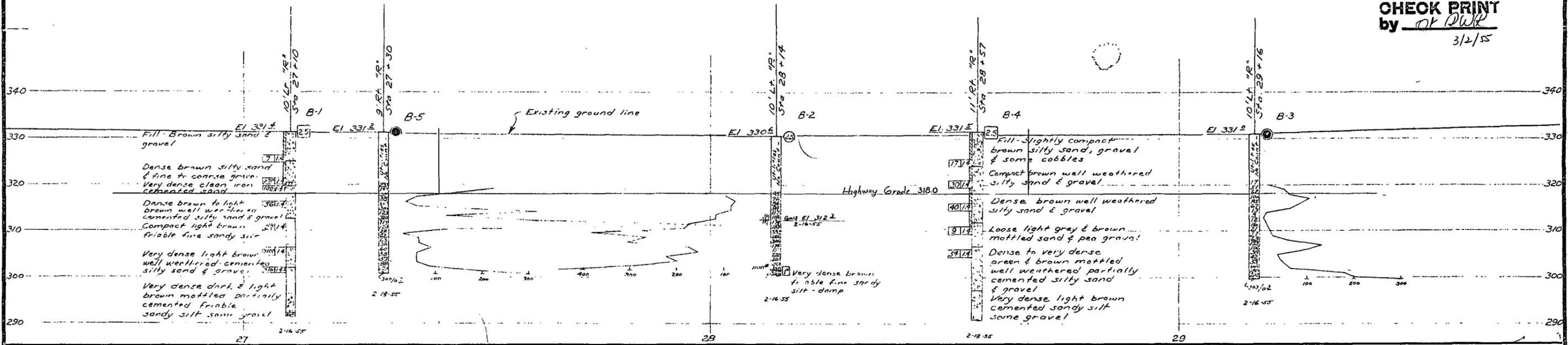
CU: 04273 BRIDGE No. 37-148  
EA: 134951



BM - L21 Div. of Highway disc. set SE Abut. wall about 5' from E. Abut. of Cypress Ave. Br. across Los Gatos Creek (Note: On Roberts Rd.) Elev. 335.60

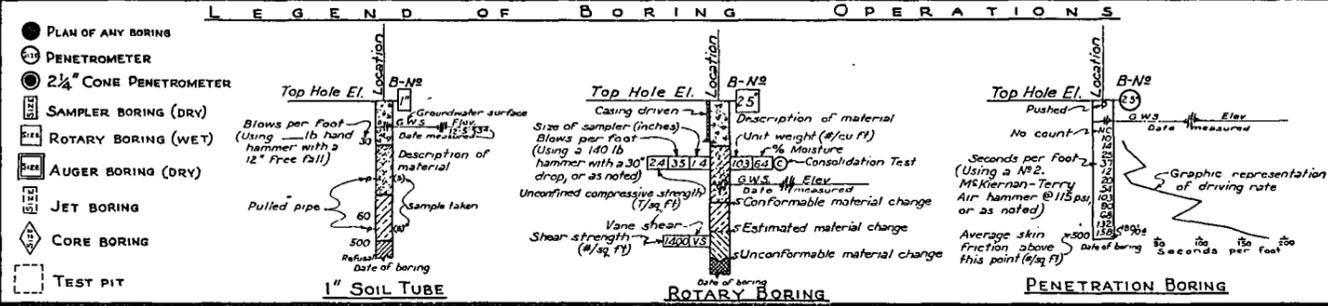
TBM #1 Nail in pavement by Dist. IV survey crew - 11' Lt. Sta. 30+00 "R" Elev. 333.11

CHECK PRINT by *R.W. Fox* 3/2/55



**LEGEND OF EARTH MATERIALS**

GRAVEL	SILTY CLAY OR CLAYEY SILT
SAND	PEAT AND/OR ORGANIC MATTER
SILT	FILL MATERIAL
CLAY	IGNEOUS ROCK
SANDY CLAY OR CLAYEY SAND	SEDIMENTARY ROCK
SANDY SILT OR SILTY SAND	METAMORPHIC ROCK



**NOTES**

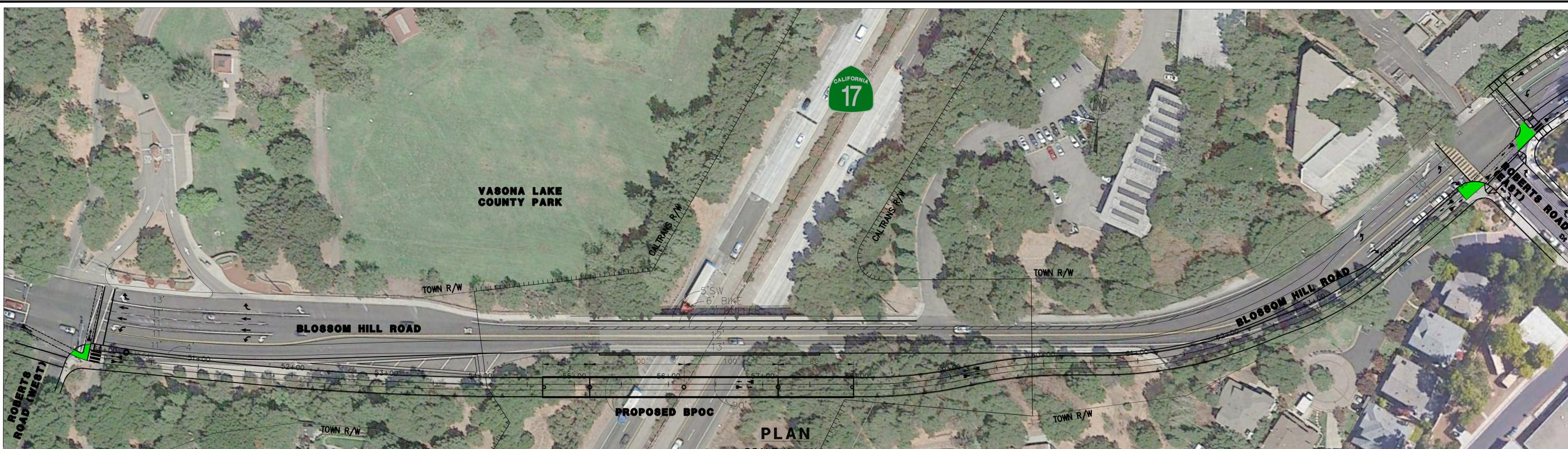
The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans. Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF HIGHWAYS

**ROBERTS ROAD OVERCROSSING**

**LOG OF TEST BORINGS**

SCALE 1" = 10' BRIDGE 37-148 FILE DRAWING PR-4053-3



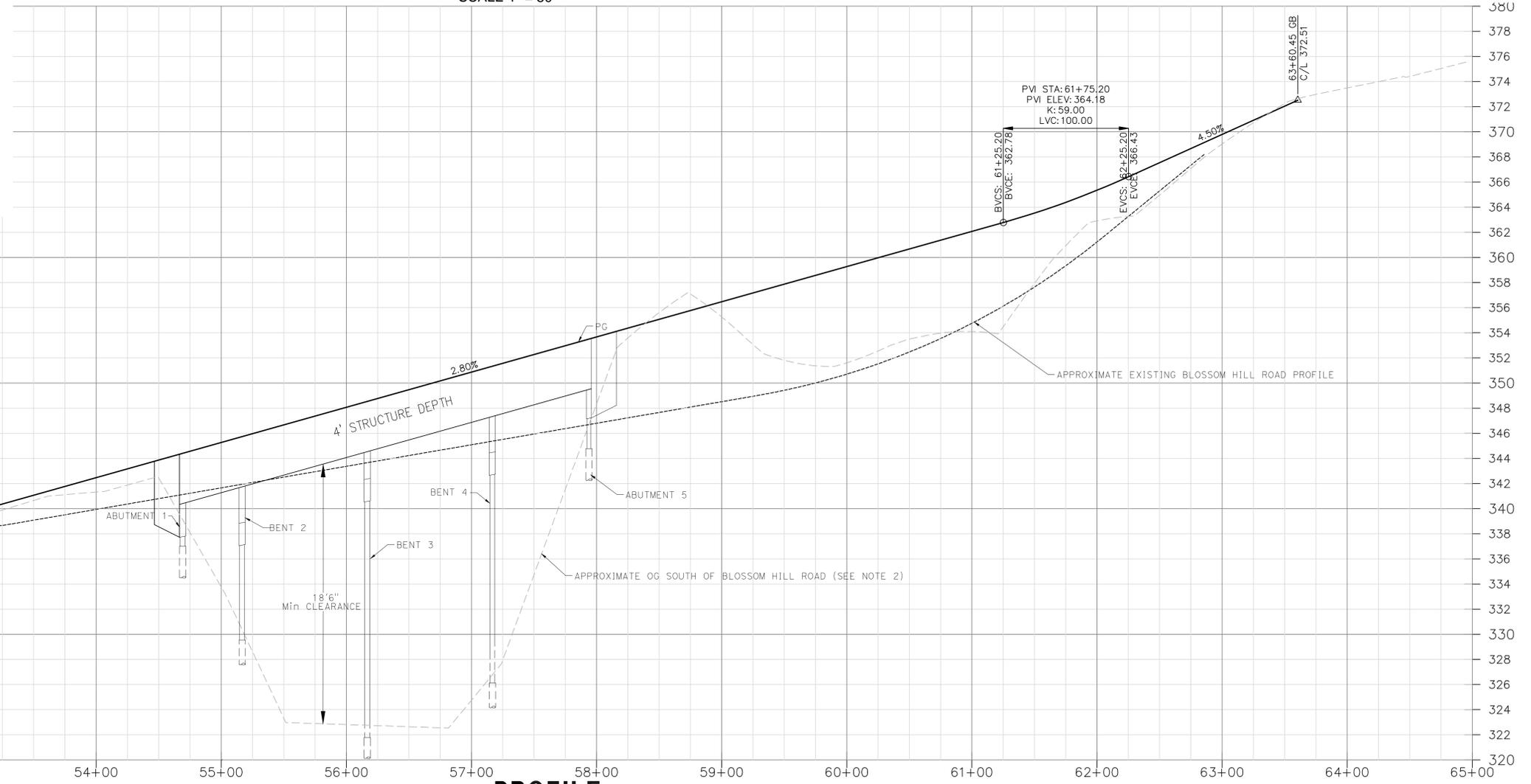
**PLAN**  
SCALE 1" = 50'

**LEGEND**

- RIGHT OF WAY
- EXISTING BARRIER
- NEW BARRIER (TYPE 836)
- RETAINING WALL
- BUFFER ZONE WITH DELINEATOR
- PLANTING AREA
- BUFFER ZONE

**NOTES:**

1. RIGHT OF WAY LINES ARE APPROXIMATE.
2. GOOGLE TOPOGRAPHY WAS USED TO DEVELOP ORIGINAL GROUND INFORMATION AND EXISTING ROADWAY GEOMETRY.
3. STRUCTURE CLEAR SPAN IS ASSUMED TO BE 100' MAXIMUM. DESIGN DETAILS ARE APPROXIMATE AND SUBJECT TO FUTURE REVISIONS.
4. DESIGN DETAILS ARE APPROXIMATE AND SUBJECT TO FUTURE REVISIONS.



**PROFILE**  
SCALE: HORIZ 1" = 50'  
VERT 1" = 5'

4670 WILLOW ROAD  
PLEASANTON, CA 94588  
925-396-7700  
925-396-7799 (FAX)

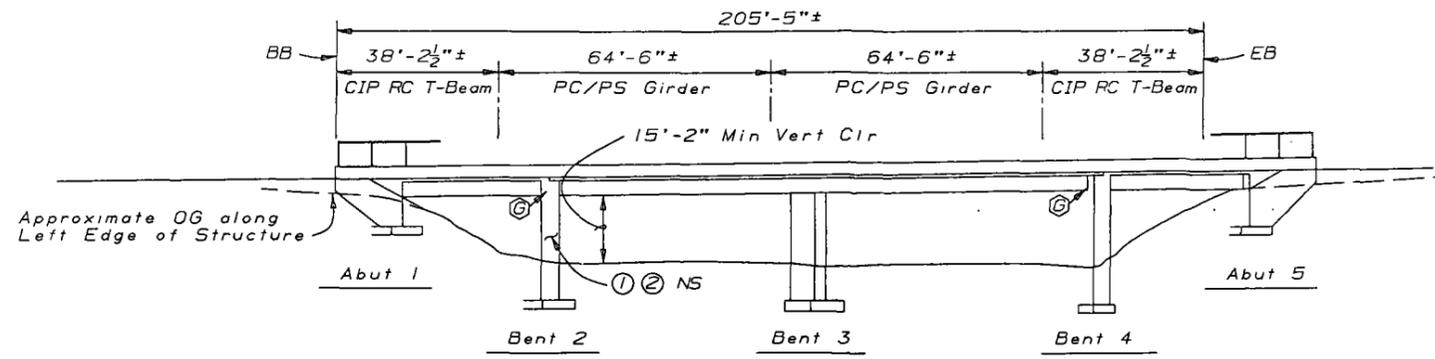


**BLOSSOM HILL ROAD  
HWY 17 BICYCLE AND PEDESTRIAN PROJECT  
CYCLE TRACK**  
SANTA CLARA  
LOS GATOS

Date	Revisions
08/25/2020	1

P:\2019\190997\_Los\_Gatos\_Blossom\_Hill\_Hwy\_17\_BPOC\_ENG\ENR\B19097\_Cycle\_Track\_with\_mtrns\_separation\Cycle\_track.dwg 25 Aug 2020 7:22:23am mwd

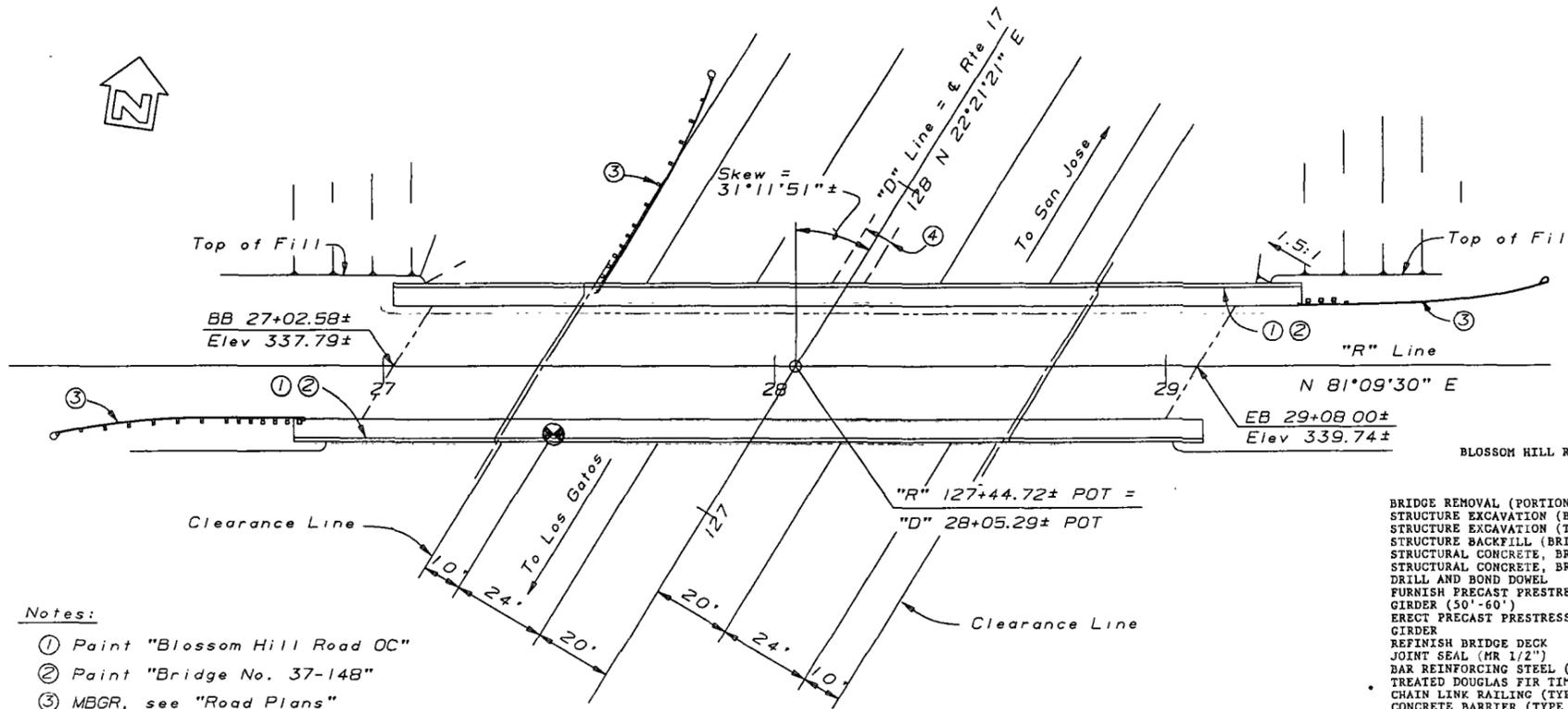
Note: Match existing grade and cross slope.



Datum Elev 280.0

**MIRROR ELEVATION**

1" = 20'



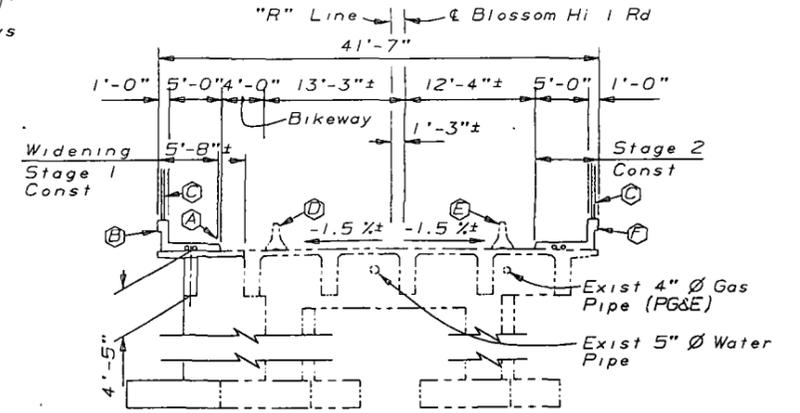
**PLAN**

1" = 20'

**Notes:**

- ① Paint "Blossom Hill Road OC"
- ② Paint "Bridge No. 37-148"
- ③ MBGR, see "Road Plans"
- ④ Existing Thrie Beam Barrier, see "Road Plans" for limits of removal & replacement
- ⊗ Point of minimum vertical clearance
- - - Indicates existing structure

- Ⓐ Remove existing curb, railing, chain link railing and overhang
- Ⓑ Concrete Barrier Type 26
- Ⓒ Chain Link Railing Type 7
- Ⓓ Temporary Railing (Type K) - Stage 1 Const, see "Road Plans"
- Ⓔ Temporary Railing (Type K) - Stage 2 Const, see "Road Plans"
- Ⓕ Remove existing curb, railing and chain link railing and replace with Concrete Barrier Type 26R (Mod)
- Ⓖ a. Construct shear keys  
b. Timber blocking



**TYPICAL SECTION**

1/8" = 1'-0"

**INDEX TO PLANS**

SHEET NO.	TITLE
1	General Plan
2	Foundation Plan
3	Abutment & Bent Layout No. 1
4	Abutment & Bent Layout No. 2
5	Abutment & Bent Details
6	Bent 2 & 4 Details
7	Bent 3 Details
8	Bent 3 Cap Details
9	Bent 2 & 4 Retrofit Details
10	Typical Section
11	Girder Layout
12	Precast Prestressed Girder
13	Log of Test Borings

Standard Plans dated July 1992

QUANTITIES	LUMP SUM
BRIDGE REMOVAL (PORTION)	58 CY
STRUCTURE EXCAVATION (BRIDGE)	117 CY
STRUCTURE EXCAVATION (TYPE D)	130 CY
STRUCTURE BACKFILL (BRIDGE)	22 CY
STRUCTURAL CONCRETE, BRIDGE FOOTING	135 CY
STRUCTURAL CONCRETE, BRIDGE	210 LF
DRILL AND BOND DOWEL	2 EA
FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (50'-60')	2 EA
ERECT PRECAST PRESTRESSED CONCRETE GIRDER	210 SFT
REFINISH BRIDGE DECK	29 LF
JOINT SEAL (MR 1/2")	29 LF
BAR REINFORCING STEEL (BRIDGE)	34,300 LB
TREATED DOUGLAS FIR TIMBER	2 MFBM
CHAIN LINK RAILING (TYPE 7)	462 LF
CONCRETE BARRIER (TYPE 26)	232 LF
CONCRETE BARRIER (TYPE 26R MODIFIED)	232 LF



NOTE  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

Note: For "General Notes", see "Bent 2 & 4 Retrofit Details".

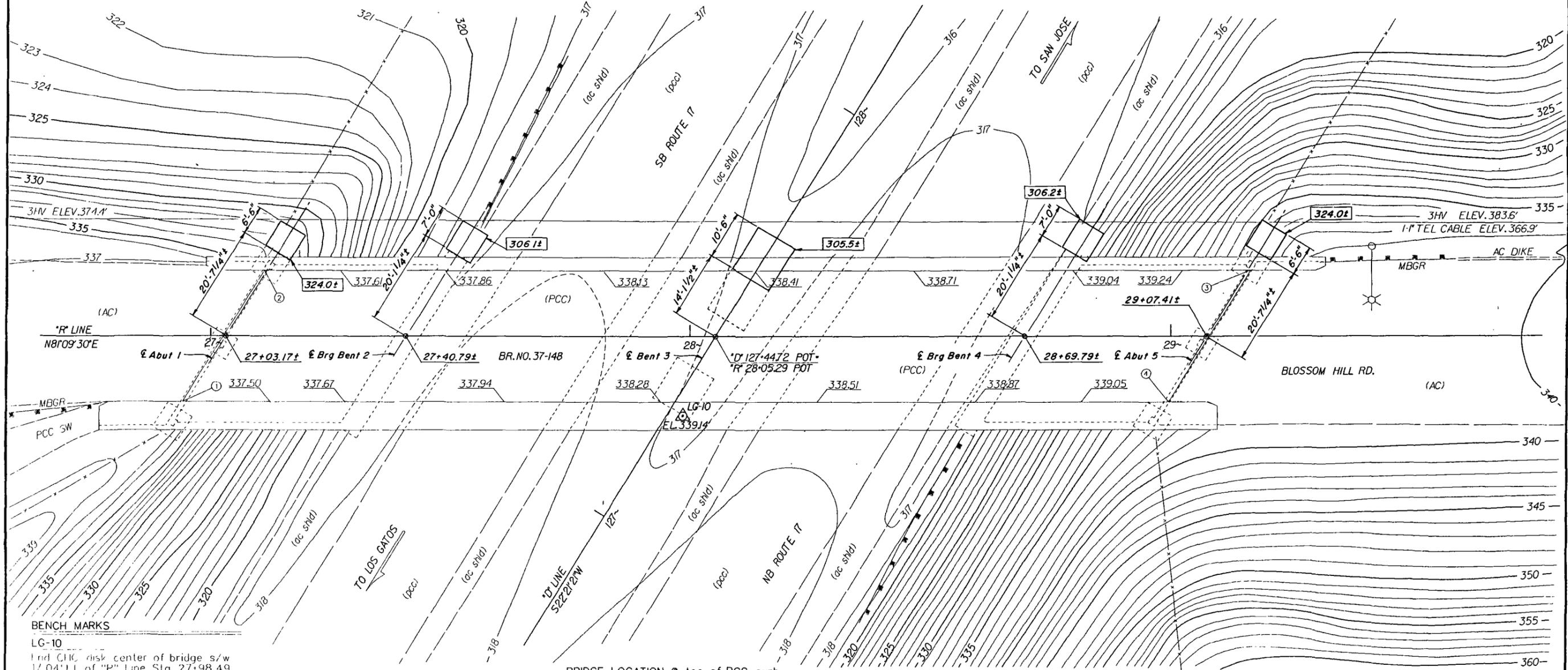
 M.S. CIVIL ENGINEER	DESIGN	BY M Downs	CHECKED A. Christensen	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DR'G NO	37-148	BLOSSOM HILL ROAD OC - WIDEN GENERAL PLAN	
	DETAILS	BY K. Endow	9-93	CHECKED A. Christensen	LAYOUT		BY M Downs	POST MILE		7.6
	QUANTITIES	BY J Wiley		CHECKED T S / M D.	SPECIFICATIONS		BY Mary E. Kopp	CU 04 EA 134951		DISREGARD PRINTS BEARING EARLIER REVISION DATES

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	17	7.7	15	26

*Survey Sanders*  
 REGISTERED ENGINEER-CIVIL  
 REGISTERED PROFESSIONAL ENGINEER  
**L. SANDERSON**  
 No. 48605  
 Exp. 6-30-98  
 CIVIL  
 STATE OF CALIFORNIA

5-2-94  
 PLANS APPROVAL DATE



**BENCH MARKS**

LG-10  
 1" dia. disk center of bridge s/w  
 17'04" LI of "R" Line Sta 27+98.49  
 El. 339.14'

WP-B  
 1" dia. hub & lock in RL shld of SB lane  
 60'22" LI of "D" Line Sta 128+78.73  
 El. 315.85'

- BRIDGE LOCATION @ toe of PCC curb**
- ① 14.24' RI, "R" 26+93.93 Elev. 337.35'
  - ② 14.05' LI, "R" 27+10.78 Elev. 337.45'
  - ③ 13.99' LI, "R" 29+16.02 Elev. 339.32'
  - ④ 14.05' RI, "R" 28+99.15 Elev. 339.21'

**Notes.**

▭ Indicates bottom of footing elevation

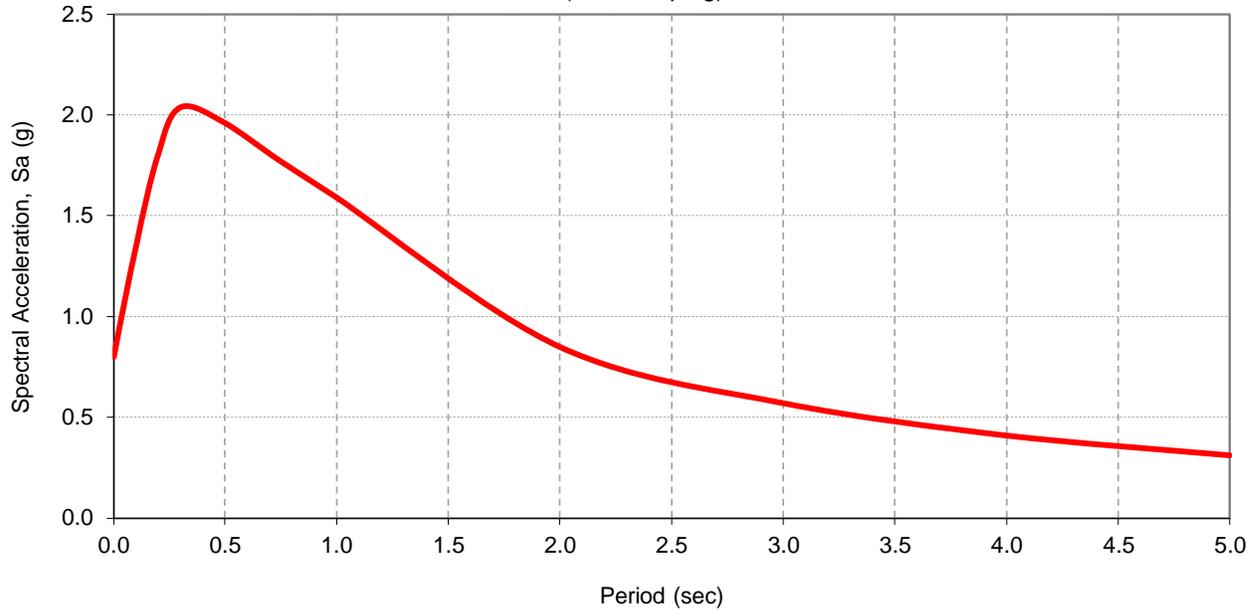
All supports are parallel with a bearing of N 22° 21' 21" E ±.

PR 37148-1

<b>PRELIMINARY INVESTIGATION SECTION</b>				DESIGN BY M Downs	CHECKED A Christensen	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 37-148	BLOSSOM HILL RD. O.C. (WIDEN) FOUNDATION PLAN
SCALE 1" = 10'	DATUM NGVD	PHOTOGRAMMETRY AS OF 1/5/1961	DRAWN BY JWR 9/83	DETAILS BY K Endow	CHECKED A Christensen		DIVISION OF STRUCTURES STRUCTURES DESIGN 10	
ALIGNMENT TIES	FIELD CHECKED BY PA 9/83	CHECKED BY SMG 10/93	QUANTITIES BY J. Wiley	CHECKED T.S. / M.D.		CU 04273 EA 114964	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET 2 OF 13

# **ATTACHMENT B**

## RECOMMENDED ACCELERATION RESPONSE SPECTRUM (5% Damping)



### Site Information

Latitude: 37.2344  
 Longitude -121.9709  
 $V_{S30}$  (m/s) = 295  
 Mean Magnitude (for PGA) 7.28  
 Near Fault Factor, Derived from USGS Unified Hazard Site (km) = 7.86

### Recommended Response Spectrum

Period (sec)	Spectral Acceleration (2014) (g)	Adjusted for Near Fault Effect	Adjusted For Basin Effect	Design Spectral Acceleration (2014) (g)
0.0	0.8	1	1	0.800
0.1	1.35	1	1	1.350
0.2	1.81	1	1	1.810
0.3	2.04	1	1	2.040
0.5	1.96	1	1	1.960
0.75	1.6	1.1	1	1.770
1.0	1.33	1.2	1	1.590
2.0	0.71	1.2	1	0.850
3.0	0.47	1.2	1	0.570
4.0	0.34	1.2	1	0.410
5.0	0.26	1.2	1	0.310

### Source:

1. Caltrans ARS Online tool (V.3.0.2, <https://arsonline.dot.ca.gov/>)
2. USGS Unified Hazard Tool (<https://earthquake.usgs.gov/hazards/interactive/>)
3. Caltrans SDC 2.0 was adopted September 1, 2019. Design Spectrum is based on the USGS 975 year uniform hazard spectrum only.



**HWY 17 BICYCLE AND PEDESTRIAN BRIDGE  
 FEASIBILITY ANALYSIS AND CONCEPTUAL ENGINEERING PROJECT  
 LOS GATOS, CALIFORNIA**

**Project No.: 2019-150-PGR**

**Attachment B**