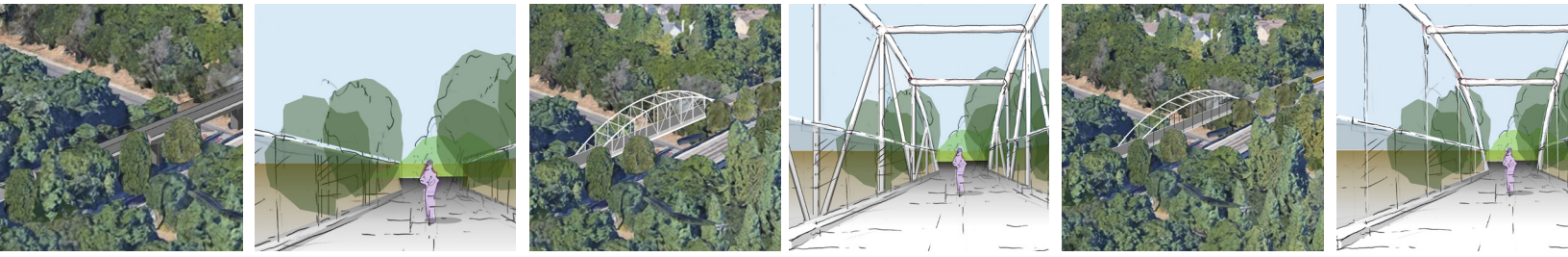
HIGHWAY 17
BICYCLE AND PEDESTRIAN OVERCROSSING
FEASIBILITY STUDY



NOVEMBER 2020

connect SKATE stay
BIKE LOS GATOS
JOG gather PLAY walk

PREPARED BY:

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I. PROJECT DESCRIPTION

Connect Los Gatos is a program of bicycle and pedestrian projects that promote connectivity and improve the multimodal network throughout the Town. The program will expand and provide safe access to key community destination points. Connect Los Gatos is aimed at making it easier and safer for all to bike and walk in Los Gatos. In the Bicycle and Pedestrian Master Plan Update, adopted by the Town Council in September 2020, prioritized Bicycle and Pedestrian Improvement Projects are branded as Connect Los Gatos Projects. The Bicycle and Pedestrian Overcrossing over Highway 17 is one of the Connect Los Gatos Projects.

This feasibility 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.

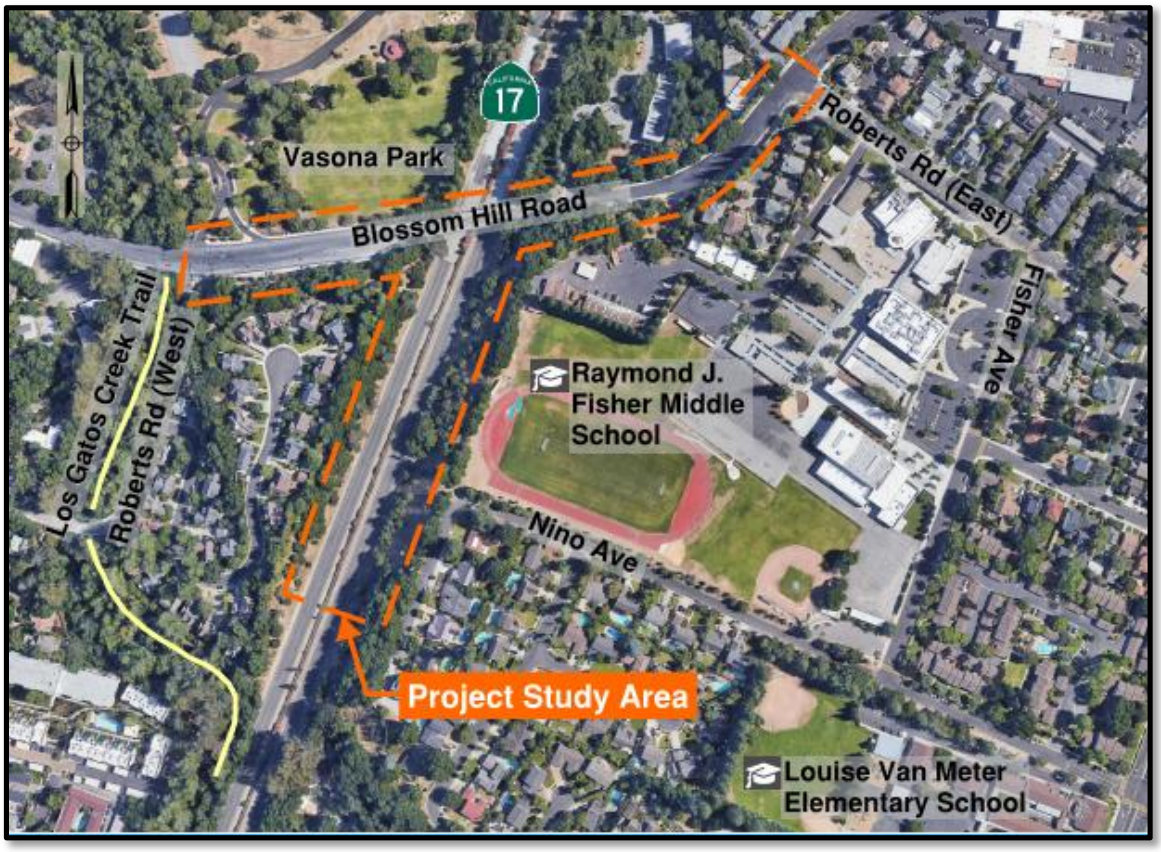

Figure 1 – Project Study Area

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 steps:

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 steps, the study intends to recommend a preferred alignment for further engineering evaluation and design, with the goal of supporting 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-feet wide with 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 to the south and Lark Avenue to the north.

Figure 2-Existing Highway 17 Crossings

Blossom Hill Road is currently one of the major east-west connections in the Town of Los Gatos. As currently configured, the Blossom Hill Road overcrossing lacks sufficient pedestrian and bicycle facilities due to physical constraints. Nevertheless, pedestrians and bicyclists utilize the existing structure as a key connection to major destinations, including Raymond J. Fisher Middle School, residential and commercial/employment centers on either side of Highway 17, and Vasona Lake County Park.

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 between the east and west side of Highway 17.

The Blossom Hill Road/Roberts Road West intersection approaches include the following:

- 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 approaches include the following:

- 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 gap in the Town's existing bike network. Existing bicycle facilities are provided east and west of the 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 and further east.

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

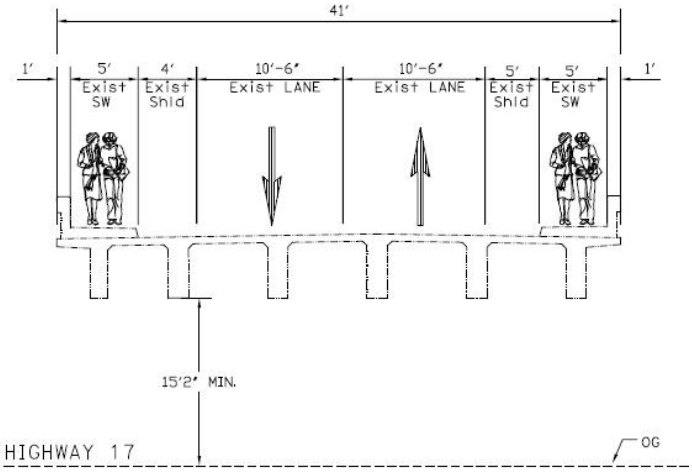

Figure 3 - Existing Blossom Hill Road Bridge

Hill Road Bridge does not meet the Caltrans minimum vertical clearance standards as it only provides 15'-2" vertical clearance over Highway 17.

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.

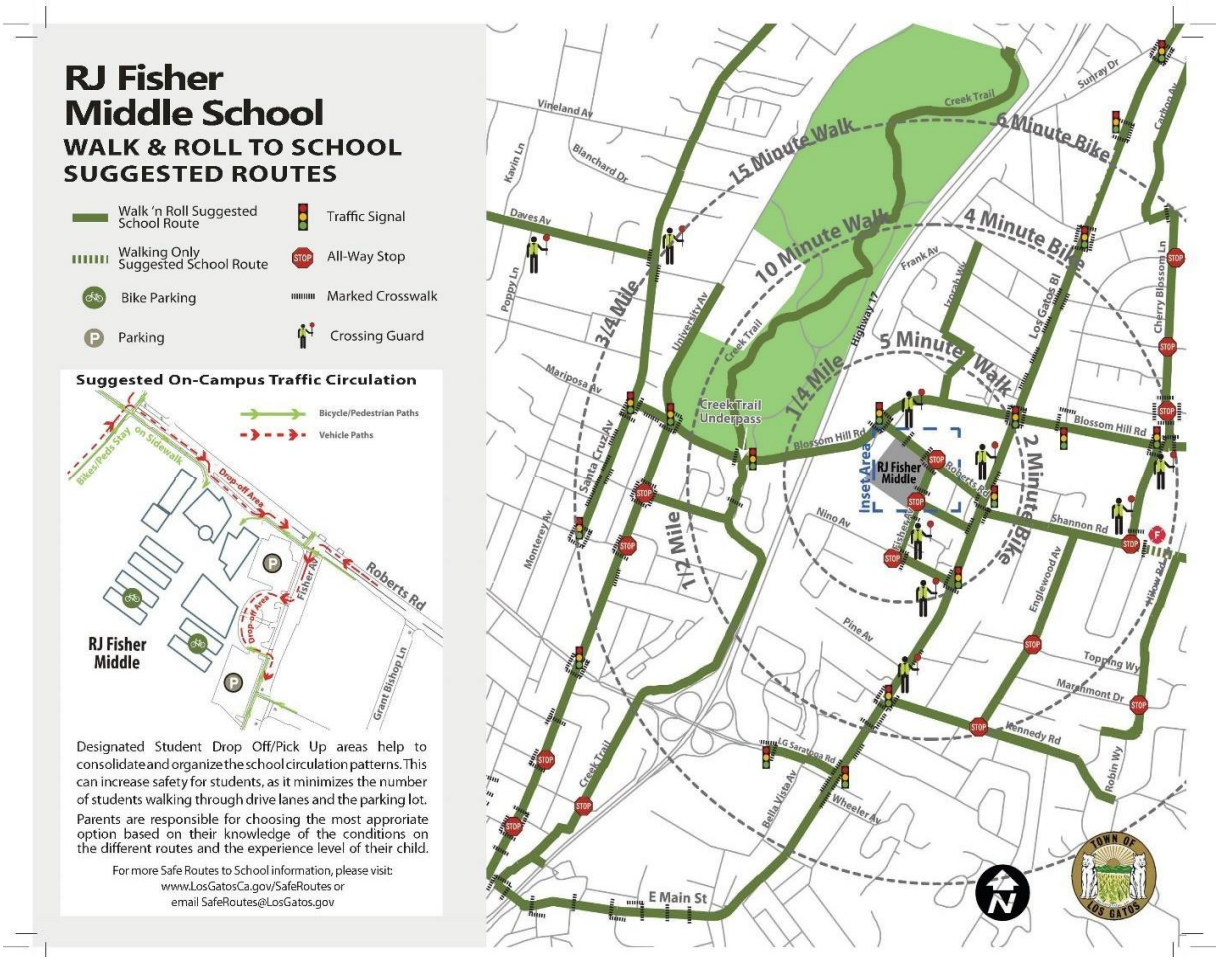

Figure 4 - Fisher Middle School Safe Route to School Map

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 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.

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

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	24	30	15	9	2019
Los Gatos Creek Trail Access Points at Roberts Road - to Los Gatos Creek Trail – Weekend	34	14	12	10	2019
Los Gatos Creek Trail Access Points at Roberts Road - Northward to Blossom Hill Road – Weekday	4	23	14	9	2019
Los Gatos Creek Trail Access Points at Roberts Road - Northward to Blossom Hill Road – Weekend	91	59	35	39	2019
Los Gatos Creek Trail Access Points at Roberts Road -Southward to University Ave – Weekday	10	14	13	13	2019
Los Gatos Creek Trail Access Points at Roberts Road -Southward to University Ave - Weekend	72	27	37	31	2019
Blossom Hill Road and Roberts Road West – Northward to Vasona County park - Weekday	0	1	1	2	2016
Blossom Hill Road and Roberts Road West – Southward to Roberts Road - Weekday	15	159	4	19	2016
Blossom Hill Road and Roberts Road West – East of Highway 17 - Weekday	88	11	56	4	2016
Blossom Hill Road and Roberts Road West – Westward to University Avenue - Weekday	3	39	5	33	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.

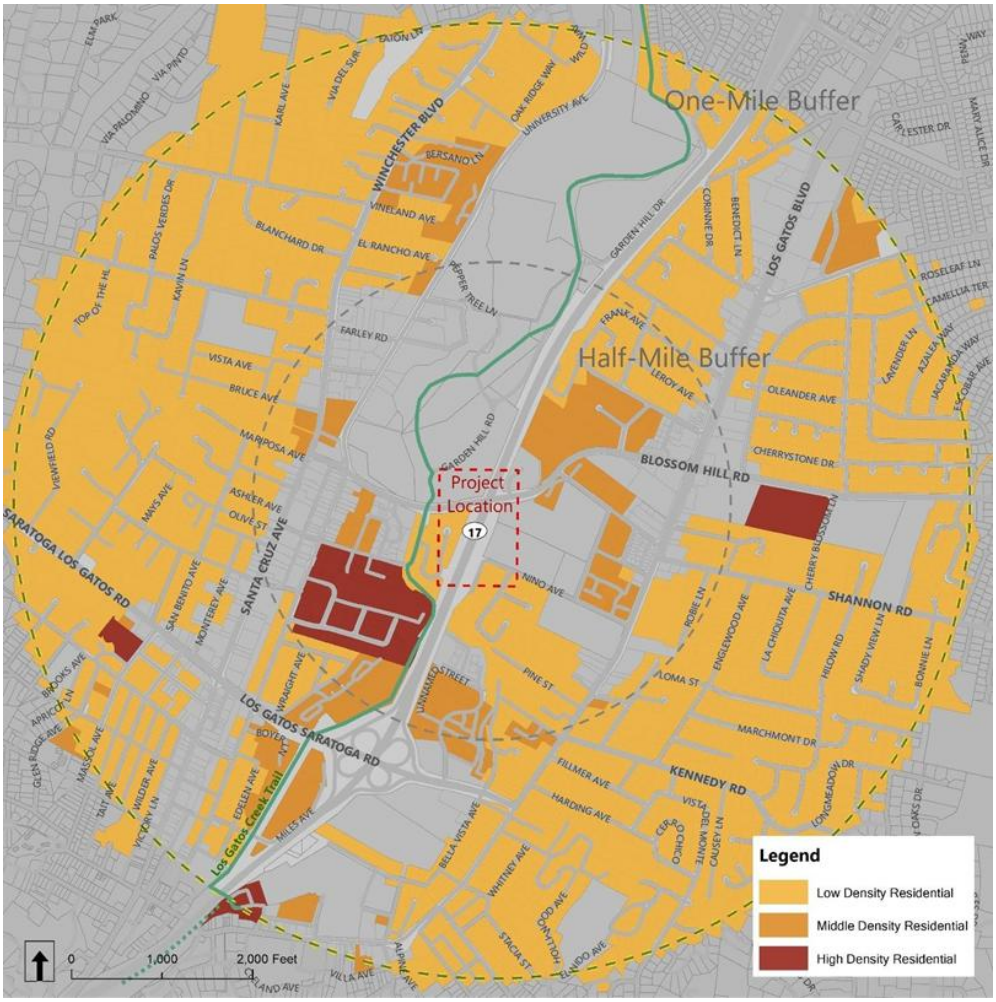

Figure 5 - Residential Land Use Map

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.

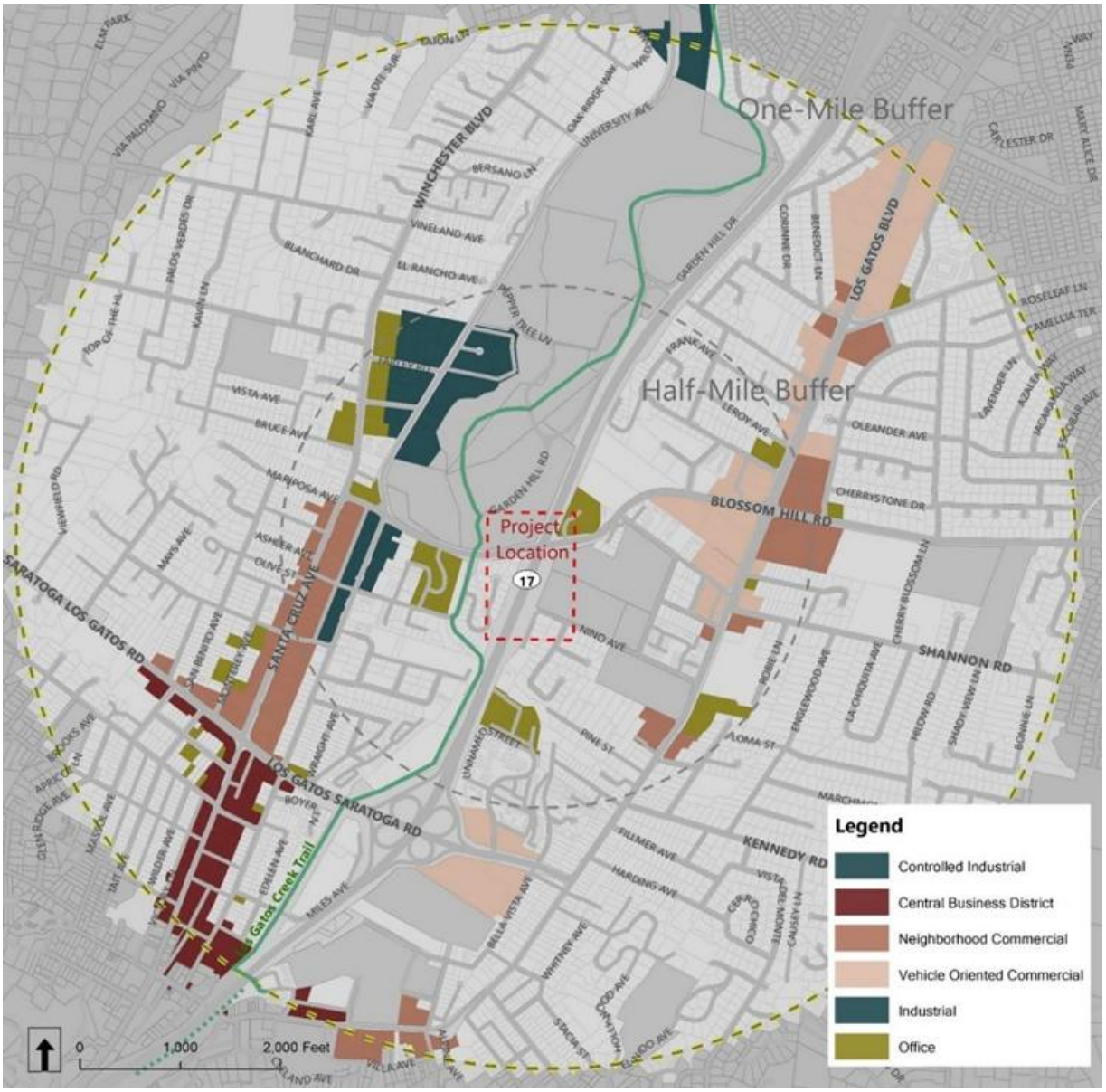

Figure 7 - Commercial Land Use Map

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.

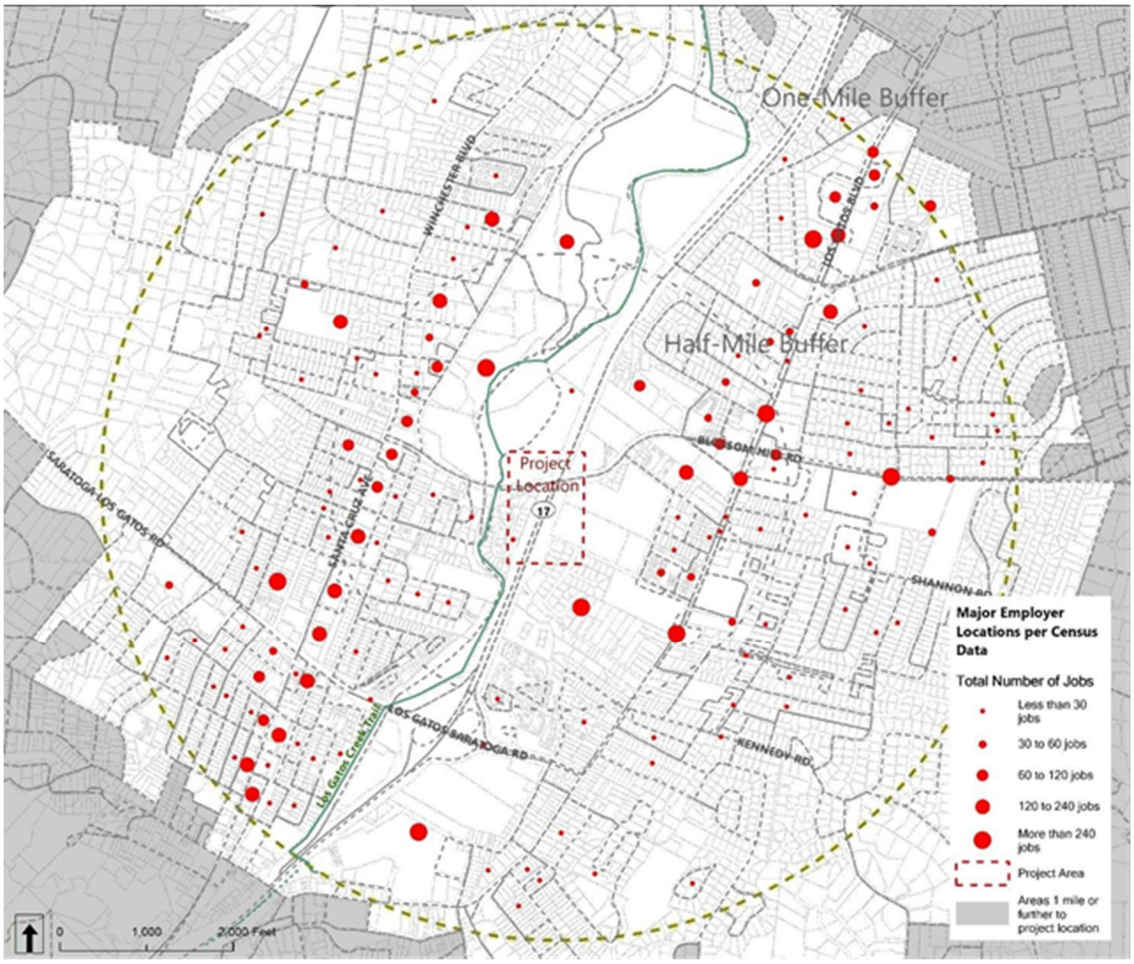

Figure 8- Major Employer Locations

Land Use Analysis

According to land use and census data, as illustrated in Figures 5, 7, and 8, the northeast area along Blossom Hill Road and along Los Gatos Boulevard to the north, and the southwest area along Santa Cruz Avenue south of Blossom Hill Road have the largest population and number of jobs. 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.

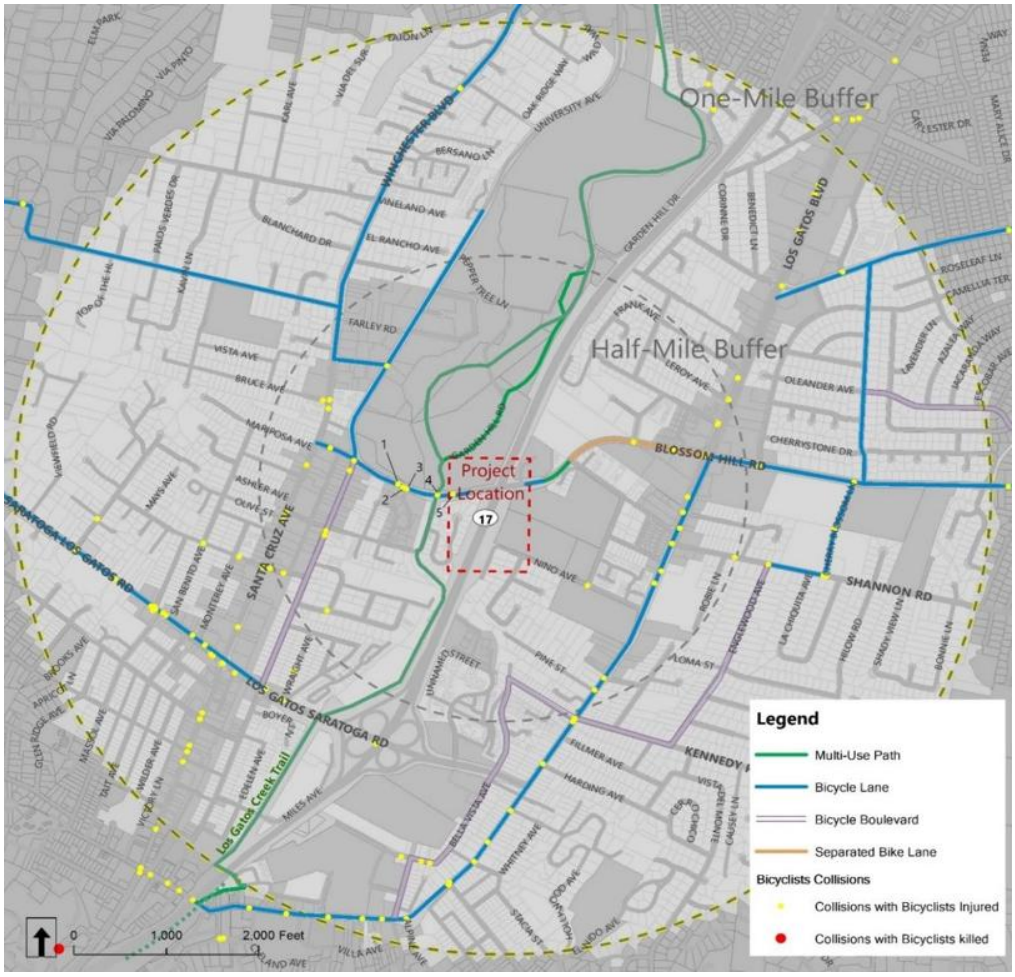

Figure 9 – Bicycle Network and Collision Map

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

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/)

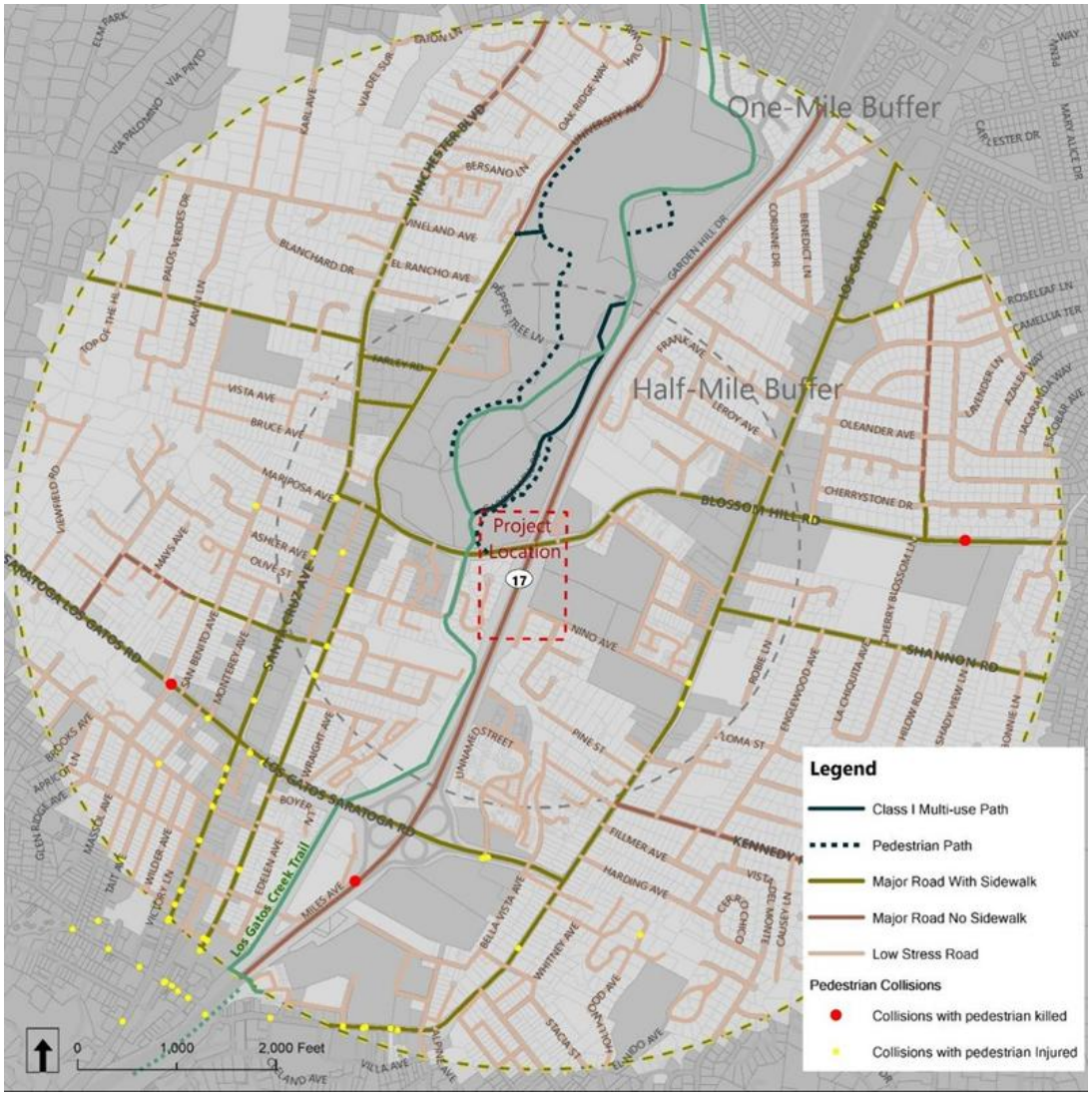

Figure 10 – Pedestrian Network Map

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 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.

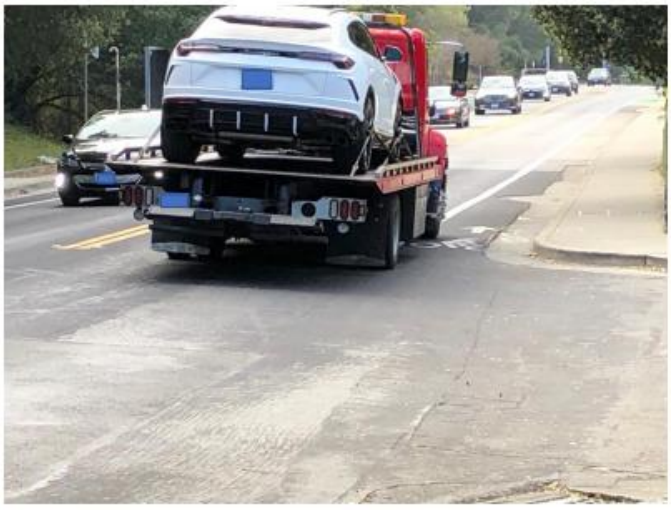

Photo 2. Large Vehicle Encroachment into Bicycle Lane (North side of Blossom Hill Road)

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. 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 17bicycle and pedestrian overcrossing project is included in the priority bike and pedestrian projects in the 2020 BPMP Update, adopted by the Town Council at its September 1, 2020 meeting.

LEGEND

PROPOSED BICYCLE FACILITY

- CLASS I BICYCLE ROUTE
- CLASS II BICYCLE ROUTE
- CLASS III BICYCLE ROUTE
- CLASS IV BICYCLE ROUTE
- ENHACED UNPAVED TRAIL
- NEW BIKE/PED BRIDGE CONNECTION

EXISTING BICYCLE FACILITY

- CLASS I BICYCLE ROUTE
- CLASS II BICYCLE ROUTE
- CLASS III BICYCLE ROUTE
- PAVED TRAILS
- UNPAVED TRAILS

DAVES AVENUE ELEMENTARY SCHOOL

RAYMOND J. FISHER MIDDLE SCHOOL

VAN METER ELEMENTARY SCHOOL

BLOSSOM HILL ELEMENTARY SCHOOL

ALTA VISTA ELEMENTARY SCHOOL

LOS GATOS HIGH SCHOOL

DOWNTOWN LOS GATOS

Vasona Reservoir

Los Gatos Creek

Monte Sereno

Los Gatos

Shannon

CARLTON

TOWN OF LOS GATOS

HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

FIGURE 11 - EXISTING AND PROPOSED BICYCLE FACILITIES

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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

To meet the Project's design goals described in Section III, the design team reviewed the following design criteria to develop and analyze the BPOC alignments presented in this study:

- **California Department of Transportation (Caltrans) Highway Design Manual (HDM), Seventh Edition –** Sections of notable interest are summarized below:
  - **HDM 208.4 Bridge Sidewalks –** The minimum width of a bridge sidewalk shall be 6 feet. The recommended width should be 8 feet for pedestrian comfort.

- **HDM 309.2(2) Minor Structures –** Pedestrian over-crossings shall have a minimum vertical clearance 2 feet greater than the standard for major structures for the State facility in question. Per Table 309.2A in the HDM, the proposed BPOC is required to provide a minimum vertical clearance of 18'-6".
- **HDM 1003.1(1)(a) Travel Way –** The minimum paved width of travel way for a two-way bike paths shall be 8 feet, 10 feet is preferred. The maximum paved width for a one-way bike path shall be 5 feet. Class I bikeways are designed for the exclusive use of bicyclists and pedestrians; equestrian access is prohibited.
- **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). The vertical clearance to obstructions across the width of a bike path shall be a minimum 8 feet and 7 feet over shoulder. Where practical, a vertical clearance of 10 feet is desirable.
- **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.
- **HDM 1003.1(8) Bike Paths in the Median of Highway or Roadway –** Bike paths should not be placed in the median of a State highway or local road, and shall not be in the median of a freeway or expressway.
- **HDM 1003.1(9) Bicycle Path Design Speed** – The design speed given in Table 1003.1 shall be the minimum.
- **HDM 1003.1(11) Stopping Sight Distance** – The minimum stopping sight distance based on design speed shall be 125 feet for 20 miles per hour, 175 feet for 25 miles per hour and 230 feet for 30mile per hour. The distance required to bring a bicycle to a full

controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

- **American with Disabilities Act of 1990 (ADA)** – Projects that create, alter or affect pedestrian facilities are required to be designed and constructed in accordance with the policies and standards in the current Design Information Bulletin 82 (DIB 82).
- **National Association of City Transportation Officials (NACTO)** – The Project will consider NACTO's guidelines to develop a geometric design that can create a complete street that is safe and enjoyable for all users.
- **American Association of State Highway Transportation Officials (AASHTO)** – 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 chose;
  - AASHTO LRFD Guide Specifications for Design of Pedestrian Bridges; and others.

A Project design objective is to propose a BPOC or bridge widening within the existing public right of way. 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.

2A. **Blossom Hill Rd Adjacent Connector south of BHR bridge** – Provides a second parallel crossing with Blossom Hill Rd for bicyclists and pedestrians (see Figure 20).

2B. **Blossom Hill Rd Adjacent Connector north of BHR bridge** – Provides a second parallel crossing with Blossom Hill Rd for bicyclists and pedestrians to the north of the existing bridge.

3. **Blossom Hill Rd Bridge Widening –** Widens the existing Blossom Hill Rd Bridge for bicyclists and pedestrians.

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.

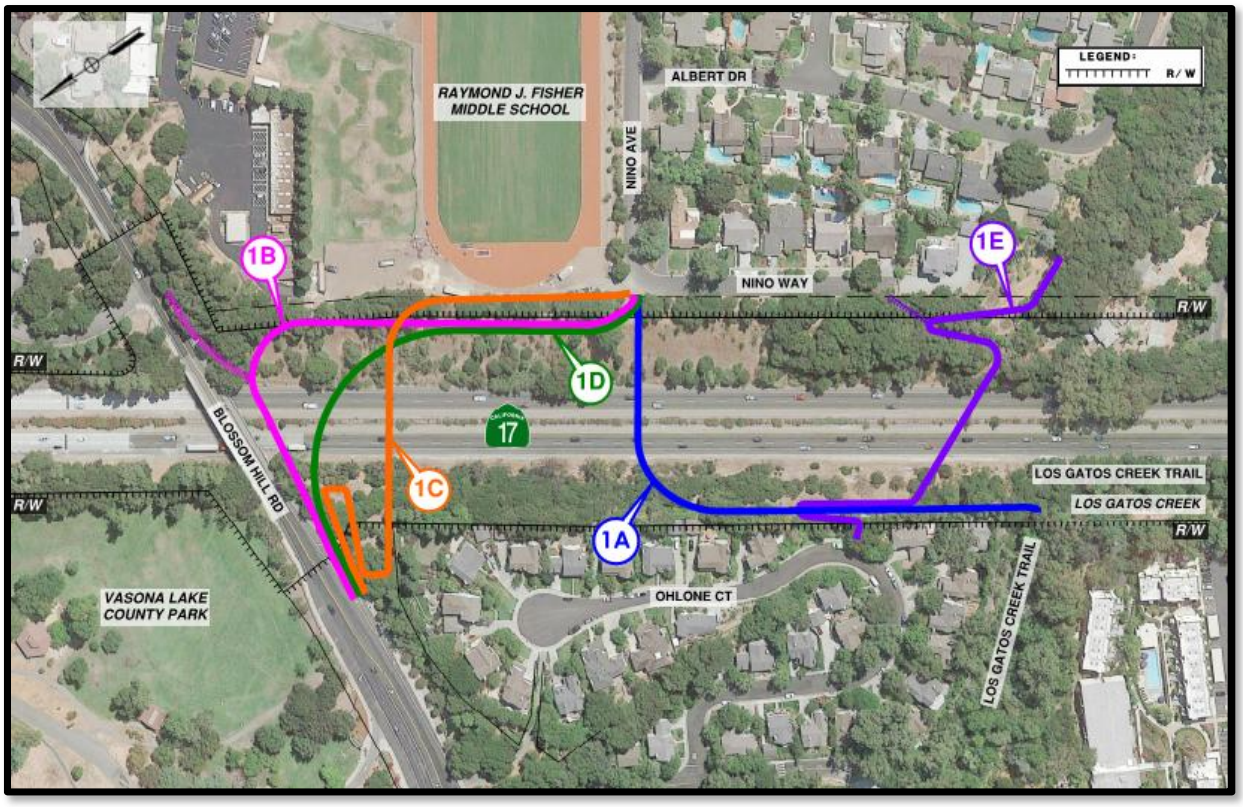


Figure 13 - Initial Alignment Alternatives

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 presented to the public for input at the February 25, 2020 community meeting. These are considered feasible alternatives that meet the Project's purpose and need.

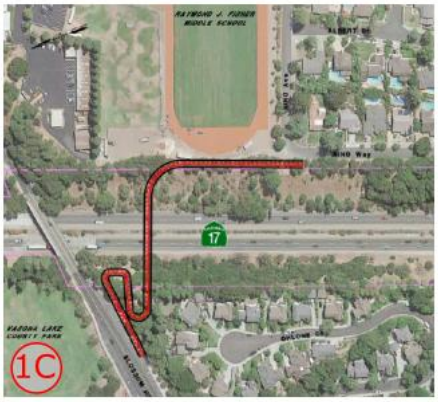
ALTERNATIVES	BENEFITS	CONSIDERATIONS
 **Los Gatos Creek Trail Connector to Nino Ave**	• Provides connection to Los Gatos Creek Trail • Greatest Design Flexibility ○ Horizontal alignment is more direct of a connection to Nino Way ○ Required vertical clearance can easily be achieved. ○ Pier in Highway 17 median may not be required • Safe and direct route to Fisher Middle School with connection at Nino Ave. • Better user experience with a separated Class 1 BPOC.	• Introduces a visual obstruction and privacy issue to the residents of Ohlone Ct. • Incorporate mitigation measures such as railings, downward or dimmed lighting, sound barriers and or privacy screening. • Modification to existing sound walls at the Los Gatos Creek Trail and along Highway 17 would need to occur.
 **Blossom Hill Rd Skewed Connector to Nino Ave**	• Maintains existing bike and pedestrian traffic patterns on the West side of Blossom Hill Road • Safe and direct route to Fisher Middle School with connection at Nino Ave. • Better user experience with a separated Class 1 BPOC.	• Potential right of way impacts on East side. • Slightly constrains future Blossom Hill Road widening •Changes bike and pedestrian traffic patterns on East side.
 **Blossom Hill Rd Perpendicular Connector to Nino Ave**	• Maintains existing bike and pedestrian traffic patterns on the West side of Blossom Hill Road • Safe and direct route to Fisher Middle School with connection at Nino Ave. • Better user experience with a separated Class 1 BPOC.	• Potential right of way impacts on East side. • Slightly constrains future Blossom Hill Road widening • Changes bike and pedestrian traffic patterns on East side. • Impacts to Ohlone Ct. residences similar to • Alternative 1A. More costly due to longer route. • Tight radii create potential conflict points for bicyclists and pedestrians

Figure 14 - Benefits and Considerations for Feasible Alignment Alternatives

ALTERNATIVES	BENEFITS	CONSIDERATIONS
 **Blossom Hill Rd Adjacent Connector South of Blossom Hill Road Bridge**	• Potential to provide a two-way Class I facility • Allows for sidewalk removal on south side of Blossom Hill Road and would provide the following: o Room for wider existing vehicular lanes o Room for a Class IV westbound bike lane in addition to BPOC • Provides greater user experience than Alternative 3 with the BPOC separated from vehicles • Does not preclude future widening of the Blossom Hill Road Overcrossing due to greater separation between existing and proposed structures	• Additional modifications will be necessary for a two-way path at the conforms on Blossom Hill Road • Aesthetic limitations due to adjacent bridge. A more intricate bridge design may visually conflict with the existing Bridge.
 **Blossom Hill Rd Adjacent Connector North of Blossom Hill Road Bridge**	• Potential to provide a two-way Class I facility • Allows for sidewalk removal on north side of Blossom Hill Road and would provide the following: o Room for wider existing vehicular lanes o Room for a Class IV eastbound bike lane in addition to BPOC • Provides greater user experience than Alternative 3 with the BPOC separated from vehicles	• Constructibility constraints (overhead utilities north of Blossom Hill Road) • Right of way constraints along the north side of Blossom Hill Road. • Precludes future widening of the Blossom Hill Road Overcrossing due to right of way constraints • Safety concerns - Additional conflict points • Environmental issues (Section 4f) - Alternative 2B would require R/W from Vasona Lake County Park • Aesthetic limitations due to adjacent bridge.
 **Blossom Hill Rd Bridge Widening**	• The Least initial construction cost is anticipated with this alternative. • Allows for sidewalk removal on south side of Blossom Hill Road and would provide the following: o Room for wider existing vehicular lanes o Room for a Class IV westbound bike lane.	• Limits future widening options greatly due to overlap with the existing bridge. • Vertical clearance is limited to existing Blossom Hill Road Profile. • Greatly reduced Aesthetic options due to adjacent bridge.

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

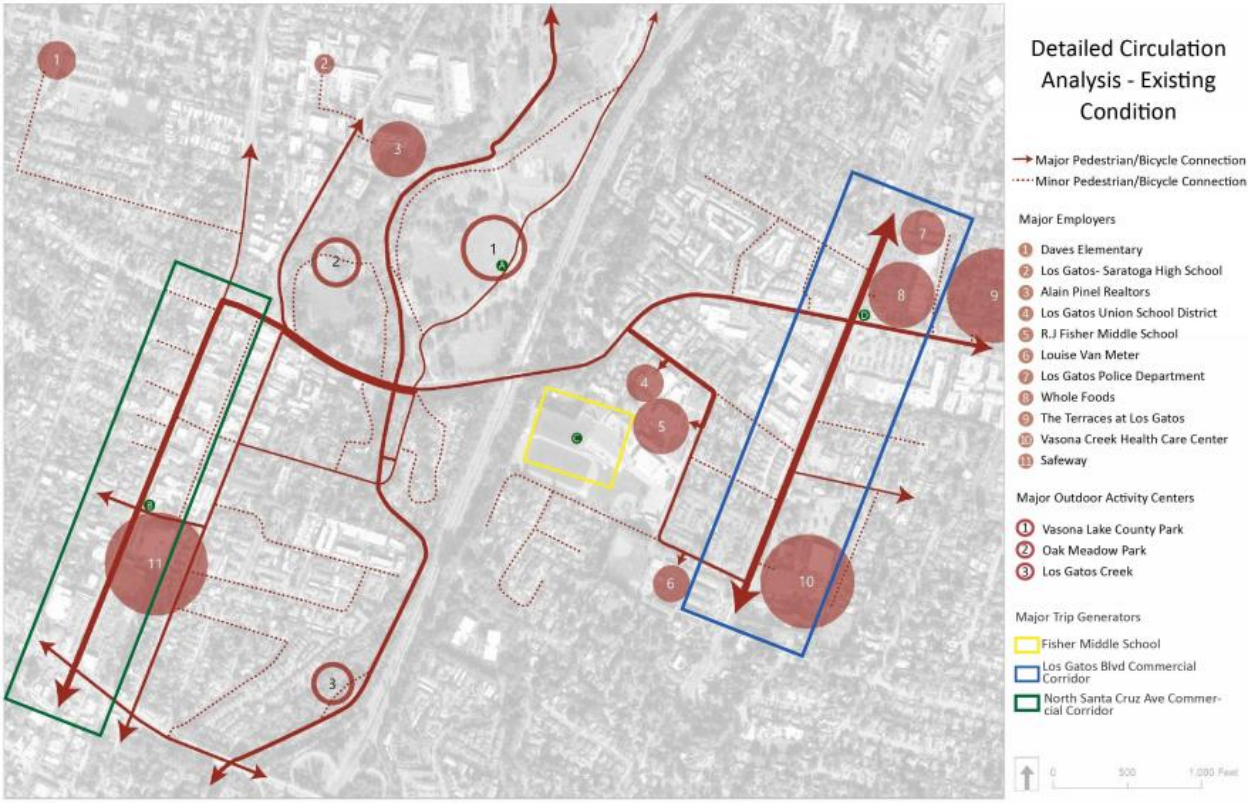


Figure 16 – Existing Circulation Map

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.

The following circulation analysis is intended to clarify the needs and benefits of the design features of the six alternative Highway 17 crossing structures based on the following criteria:

- Supporting existing travel patterns (impact or support)
- Future demand (opportunities for more efficient connections)
- User experience (separation between users and safety for all modes of travel)

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

Raymond J. Fisher Middle School students that live west of Highway 17 currently use Blossom Hill Road to access their campus via Roberts Road East. Alternative 1A would provide a more direct route to the campus by providing a connection between Los Gatos Creek Trail and Nino Avenue. This connection would mainly benefit students traveling from residential areas in the southwest quadrant of the study area. It would also be a more direct route for residents on Nino Avenue and the greater southeast area of Los Gatos Boulevard to the Santa Cruz Avenue shopping and employment district west of Highway 17.

However, this alternative would be a more circuitous route than following the existing Blossom Hill Road overcrossing for students and residents traveling from residential areas on the northwest quadrant of the study area to school and commercial/employment areas located on the southeast quadrant of the existing Blossom Hill Road overcrossing. Alternative 1A would be a more circuitous route 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.

This is the only alternative that provides direct access to Los Gatos Creek Trail for the residential areas southeast of the Blossom Hill Road overcrossing without the need to bike or walk on Roberts Road West. This alternative would also provide a greater separation from the existing structure than all the other alternatives, which is an important factor that affects people's perception of safety.

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

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 Raymond J. Fisher Middle School. However, for people traveling from residential areas to the northwest of the crossing to commercial/employment areas to the southeast, 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.

Switchbacks are needed to reach a higher elevation when there is limited space available. Alternative 1C features such switchbacks, which would negatively impact the users' experience as it would create a longer route and potential conflicts at every sharp corner.

Alternative 2A – Blossom Hill Road Adjacent Connector south of BHR

Alternative 2A proposes the construction of a separate BPOC south of the existing Blossom Hill Road overcrossing. 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. This alternative would especially benefit students that use Blossom Hill Road overcrossing to travel to and from Raymond J. Fisher Middle School. It also provides a direct link between the employment centers along both sides of Highway 17.

Unlike Alternatives 1A, 1B, and 1C, this alternative would not introduce additional bicycle and pedestrian traffic to the Nino Avenue neighborhood.

Alternative 2B – Blossom Hill Road Adjacent Connector north of BHR

Alternative 2B proposes the construction of a separate BPOC north of the existing Blossom Hill Road overcrossing. Compared to Alternative 2A, this alternative would be a more circuitous route than following the existing Blossom Hill Road overcrossing for students and residents traveling from residential areas on the southwest quadrant of the study area to school and commercial/employment areas located on the southeast quadrant of the existing Blossom Hill Road overcrossing. Since this alternative is located on the opposite side of Blossom Hill Road from Raymond J. Fisher Middle School, it would require student commuters who live on the southwest quadrant of the study area to make two additional crossings of Blossom Hill Road at peak commute hours, which would potentially increase the conflict between pedestrians, bicyclists, and motorist. Therefore, students would most likely continue to walk along the south side of Blossom Hill Road even if Alternative 2B was constructed.

Alternative 3 – Blossom Hill Road Bridge Widening

Similar to Alternative 2A, Alternative 3 would match the existing travel routes by providing a direct east-west connection across Highway 17 alongside the existing Blossom Hill Road Bridge. Compared to the other five aforementioned alternatives, this alternative provides the least separation from vehicular traffic on Blossom Hill Road overcrossing, which would negatively affect people's perception of safety.

Circulation Analysis Conclusion

Alternative 1A provides the greatest separation between the proposed BPOC and the existing Blossom Hill Road overcrossing, but creates a more circuitous route for users that travel from the northwest section of the study area. Similar to Alternative 1A, Alternatives 1B and 1C connect users west of Highway 17 to Nino Avenue, improving connectivity to Raymond J. Fisher Middle School. However, these alternatives do not maintain existing travel patterns and would instead force users to travel longer distances to reach their final destinations.

Alternatives 2A, 2B, and 3 would directly connect to existing bicycle and pedestrian facilities located on either side of Blossom Hill Road, while Alternatives 1A, 1B, and 1C would require the development of bicycle and pedestrian facilities on Nino Avenue and the western portion of Roberts Road West to support future demand generated by these alternatives. Future demand for the connection across Blossom Hill Road was assessed as higher for Alternatives 2A and 3 because they would provide more direct linkages between destinations in Los Gatos without the detour required by the alternatives that utilize Nino Avenue. However, Alternative 2B proposes a new BPOC on the opposite side of the street from Raymond J. Fisher Middle School, which creates safety concerns, as it would require student commuters from the southwest section of the study area to cross Blossom Hill Road twice. This would increase bicycle and pedestrian, especially vulnerable users such as young students, exposure to traffic at peak morning and afternoon commute hours. Section V.E. evaluates in more detail the east-west connectivity to major destinations for all six alternatives.

E. DISTANCES TO MAJOR DESTINATIONS BY ALTERNATIVE

Walking and Biking Distance between Major Destinations

The surrounding areas of the potential overcrossing location are highly urbanized. In this analysis, the surrounding areas are evenly divided into four regions by Highway 17 and Blossom Hill Road. The locations of the destinations analyzed are shown on Figure 16 and described below. As summarized in Table 3, the distances between these major destinations were calculated for the different crossing alternatives discussed in Section V.D.

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**
Existing Condition	4,893 Ft.	3,283 Ft.	4,957 Ft.	5,090 Ft.	6,858 Ft.	1,816 Ft.
Alternative 1A	4,893 Ft.	5,939 Ft.	8,611 Ft.	5,650 Ft.	7,378 Ft.	1,816 Ft.
Alternatives 1B and 1C	4,893 Ft.	4,693 Ft.	7,228 Ft.	6,389 Ft.	8,174 Ft.	1,816 Ft.
Alternatives 2A, 2B, and 3	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 2A, 2B, 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

The Project Team evaluated the six alternatives using the following criteria:

- Community Feedback
- Caltrans Coordination
- Travel Demand and Patterns
- User Experience

- Potential Environmental Impacts: utilities, Right of Way constraints, geotechnical considerations, trees, and visual impacts
- Cost: construction and maintenance

Alternative 1, a new bridge connecting at Nino Ave, includes three variations, one of which could provide a direct connection to the Los Gatos Creek Trail. There are benefits of providing a new connection to Nino Avenue, however, during the early engagement process from both the February community meeting and a community survey, residents on Nino Avenue expressed that the access would be an intrusion to the neighborhood. The Nino connection would provide a convenient path to the backside of Raymond J. Fisher Middle School. However, for travelers going to the commercial area along Los Gatos Boulevard, this path would be more circuitous than following the existing Blossom Hill Road Bridge.

Alternative 2A – Blossom Hill Road Adjacent Connector south of BHR

Alignment 2A provides connectivity to existing bicycle and pedestrian facilities located east and west of the existing Blossom Hill Road overcrossing. Unlike the three proposed variations under Alternative 1, this alternative would maintain existing travel patterns and existing travel distances between major destinations as discussed in Section V.E. This alternative would be constructed as far south from the existing Blossom Hill Road as possible to maximize user's experience and address Caltrans concerns of future replacement of the existing structure. During the open public-participation process of the Community Meeting held on February 2020, Alternative 2A was chosen as the community's preferred alignment alternative.

Alternative 2B – Blossom Hill Road Adjacent Connector north of BHR

Alignment 2B is less desirable due to the following significant setbacks:

- **Utility impacts:** Due to the existing overhead electrical lines located along the north side, this alignment would have significant interference with the overhead electrical lines. The construction of a bridge requiring the use of drill rigs for foundations or cranes for the erection of the main bridge members might not be possible given the low elevations of the overhead lines. The potential interference is discussed in VI. B. Utilities.

- **Potential property acquisition impacts:** There is more public right-of-way available on south side of Blossom Hill Road than on the north side. If the BPOC is built on the north side, it would require right-of-way from Vasona Lake County Park and private property acquisition from the property located on the northeast quadrant of the study are, which has already been permitted for a new development.
- **Potential property access or gradient impacts:** Adjoining north side properties east of Highway 17 are served by an access road connecting to Blossom Hill Road immediately east of the existing bridge. The required profile of the BPOC (to meet ADA gradient requirements through the Project area) will be higher than the Blossom Hill Road profile at this point, thus blocking access and additional roadway grading along Blossom Hill Road and further into the private property to conform to existing grades.
- **Match with the existing travel patterns:** The Preferred Alternative on the south side would best match the existing desired travel line. The Town's bicycle and pedestrian counts (see Section II.C. above) show that pedestrian volumes on the south side nearly double the volumes on the north side during key peak periods. Additionally, if the new BPOC is built on the north side, it would require a longer walk for Raymond J. Fisher Middle School students and make it difficult to navigate for eastbound cyclists to Fisher Middle School and further east.
- **Impacts to open space park:** The western alignment of this alternative would require right-of-way acquisition from Vasona Lake County Park, such action would be subject to Section 4(f) of the Department of Transportation Act. Publicly owned parks, recreational areas, wildlife and waterfowl refuges, as well as public and private historical sites are considered a Section 4(f) resource. Section 4(f) of the Department of Transportation Act prohibits the use of a Section 4(f) resource by a transportation project unless the following conditions apply: (1) there is no feasible and prudent avoidance alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from such use; or (2) the Administration (official with jurisdiction over the park) determines that the use of the property will have a de minimis impact. As discussed throughout this feasibility study, Project alternatives avoiding Vasona County Park are feasible.

In addition to the two variations, it was suggested that the Project Team consider putting a crossing below the existing Blossom Hill Road overcrossing, starting from the north side of Blossom Hill Road on

the west and ending on the south side of Blossom Hill Road to the east of Highway 17. Due to grade difference, such a crossing would have to slope down as it goes from west to the middle of Highway 17, then slope up sharply to match up with the grade to the east of Highway 17. In any design, the crossing has to meet the Caltrans vertical clearance requirement of 18'6" and ADA requirements. Due to the extreme grade differences required, the Project Team does not foresee a feasible engineering solution.

Alternative 3, widening the existing bridge, would present the most engineering constraints and complexity and would increase project construction costs. The existing Blossom Hill Road Bridge was built in 1959. Although minor improvements have occurred since its construction, the existing Blossom Hill Road Bridge does not meet the Caltrans minimum vertical clearance standard for roadway (16'-6") as it only provides 15'-2" vertical clearance over Highway 17. The existing structure is constrained by the nonstandard vertical clearance and widening of the bridge would require a design exception. As discussed in Section XI, the Project Team presented two different widening options for Alternative 3 at their in-person meeting with Caltrans held on December 2019. Caltrans expressed several concerns with both widening options and noted that the probability of receiving a design exception for maintaining or proposing nonstandard vertical clearance would be highly unlikely due to safety concerns, especially since the underside of the bridge was recently struck. Caltrans could require replacement of the entire bridge, which would increase project costs significantly.

A bridge reconstruction, which can include a rehabilitation, a seismic retrofit or even a complete bridge replacement, would be a very different project from building a BPOC. Caltrans would decide and lead such endeavor. The process of a highway bridge reconstruction starts with a local agency, such as the Town of Los Gatos, which files an application to define detailed eligible scopes of work and eligibility requirements. Caltrans then evaluates the candidate projects among a pool of different agency submittals for eligibility requirements and includes the successful candidate projects in the Highway Bridge Program. Currently the Blossom Hill Road Bridge is not included in the Highway Bridge Program Ten Year Plan (TYP). Furthermore, Caltrans indicated that given that most of the bridge assets are rating "good" and there is no target for Goods Movement (Clearance) at this time, no project would be forthcoming in the near future, in a minimum of ten to twenty years.

In summary, currently there is no schedule or funding identified for the replacement of the Blossom Hill Road Bridge. Due to these challenges and uncertainties, Town staff recommended not to pursue the widening option (Alternative 3) as part of this project. This alternative was removed from further consideration, as presented to the Town Council at the March 3, 2020 meeting.

It is still possible that the bridge is replaced in the future, so it will be important for the Project Team to understand the Caltrans right-of-way at this location and design the new BPOC with as much separation as possible from the existing structure.

Summary Scoring Matrix

Table 4 shows the relative scores for the six alternatives using the criteria identified in this Section and Section V.D. The scores for performance on each criterion were ranked as High, Medium, Low, or pass/fail.

Alternative	1A Nino	1B Nino	1C Nino	2A BHR South	2B BHR North	3 Widening
Circulation Improvements	✓	✓	✓	✓	✓	✓
Maintains Existing Travel Patterns	✗	✗	✗	✓	✗	✓
Meets Caltrans Standards	✓	✓	✓	✓	✓	✗
Community Acceptance	✗	✗	✗	✓	✓	Unknown
Additional Infrastructure Cost	High	High	High	Medium	Medium	High
Accommodates Future Demand	✓	✓	✓	✓	✓	✗
Right-of-Way & Utility Constraints	High	Medium	High	Low	High	High
Environmental Impacts	Medium	Medium	Medium	Medium	Medium	Medium
Engineering Constraints and Complexity	Medium	Medium	Medium	Low	Low	High

Table 4 – Alternative Alignment Selection Analysis

While all the alternatives presented in Section V.C are considered feasible, Alternative 2A emerged from the Alternative Selection Analysis as the preferred alignment choice due to superior performance in most categories listed in Table 4. Based on this analysis, Alternatives 1A, 1B, 1C, and 2B were eliminated from further consideration. As previously mentioned, Alternative 3 was also removed from further consideration due to the anticipated challenges and uncertainties with the bridge widening option. The Project Team concluded that Alternative 2A, a separate bridge structure just south of Blossom Hill Road Bridge, is the preferred alignment. The recommended alternative presents several benefits: consistency with the existing desired travel line, shortest distance between key origins and destinations, no or minimum utility impacts, no interference with the existing bridge, enhanced user experience, and neighborhood acceptance. The cost of this alternative is potentially lower than Alternatives 1A, 1B, and 1C because it would have a shorter bridge span.

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

G. ALTERNATIVE 2A CROSS-SECTION EVALUATION

To meet the Project's design goals described in Section III, the design team reviewed 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:

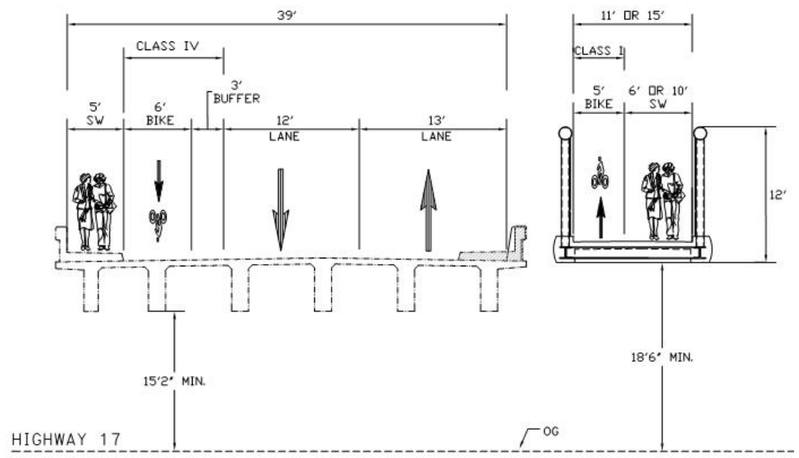
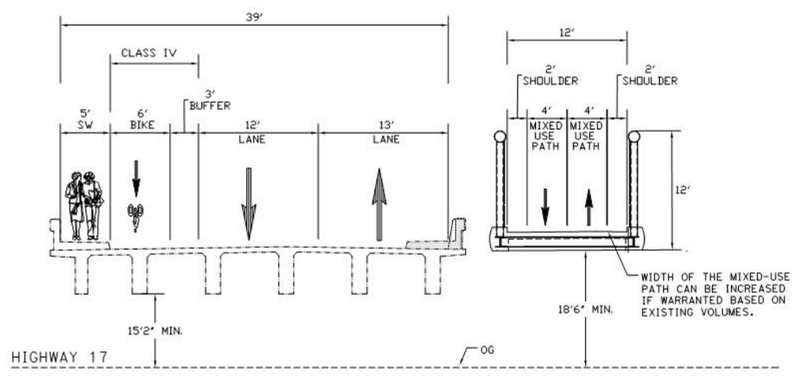
- **HDM 1003.1(1)(a) Traveled Way** – The minimum paved width of travel way for a two-way bike path shall be 8 feet, 10 feet is preferred. The maximum paved width for a one-way bike path shall be 5 feet.
- **HDM 1003.1(1)(b) Shoulder** – A minimum 2-foot wide shoulder, composed of the same pavement material 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.

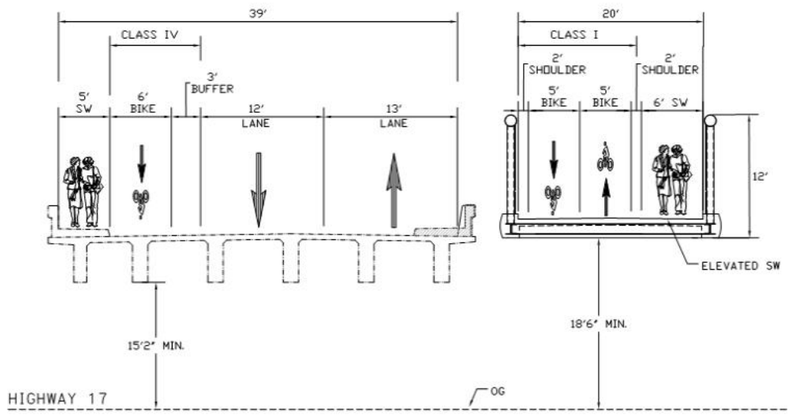
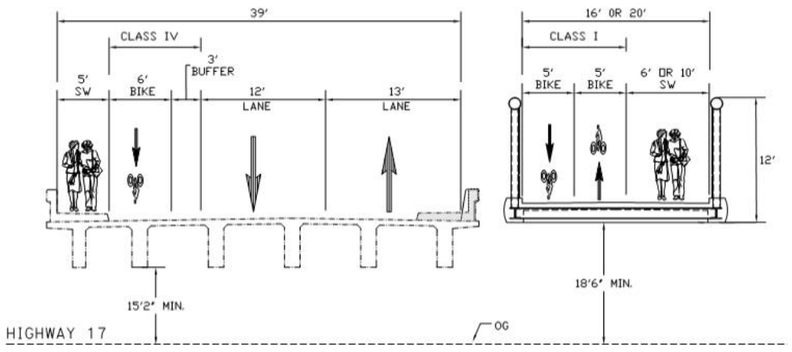
HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

FIGURE 17 - TYPICAL SECTION ALTERNATIVE COMPARISON MATRIX

Description	Proposed Section	Advantages	Disadvantages
EB BIKE PATH BPOC – 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.		• Maintains the existing WB bike travel pattern, but provides additional safety considerations with the widened lane and buffer zone, which meets Class IV requirements. • Provides separated EB bike path and sidewalk. • Minimum BPOC width is 10 feet, therefore this section complies with HDM requirements and provides a more economical solution than other alternatives. • Wider vehicle lane configuration than existing. • BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced. • Option for wider sidewalk if warranted by high pedestrian volumes. • Meets HDM 18′6″ vertical clearance requirements for BPOC's.	• Bicyclist and pedestrian interaction will be greater with the reduced width of the BPOC. • Does not provide multiple WB bike lane options. • 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.
MIXED-USE PATH BPOC – 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.		• Maintains the existing WB bike travel pattern, but provides additional safety considerations with the widened lane and buffer zone. • Consolidates Bike and Ped Facilities into mixed usage, requiring smaller structure and therefore cost. • Wider vehicle lane configuration than existing. • BPOC construction can be phased such that traffic, bike, and pedestrian impacts are reduced. • Meets HDM 18′6″ vertical clearance requirements for BPOC's.	• Mixed Bike and Pedestrian interaction • May not provide enough capacity for future demand. • Reduced width for both bicyclists and pedestrians using path.

HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

FIGURE 18 - ENHANCED SECTION ALTERNATIVE COMPARISON MATRIX

Description	Proposed Section	Advantages	Disadvantages
CYCLE TRACK BPOC – 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.		• Maintains the existing WB bike travel pattern with additional safety considerations, but provides an additional option for WB riders to travel on BPOC. • Provides a separated WB and EB bike path and sidewalk. • Enhanced user experience for bicyclists and pedestrians in comparison to other alternatives. • Reduces bicycle and pedestrian interaction with 2' shoulder separation. An elevated sidewalk can be added to further differentiate the facilities per user. • Wider vehicle lane configuration than existing. • 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. • Meets HDM 18'6" vertical clearance requirements for BPOC's.	• Initial cost will be greater than typical section due to the increased width. • Greater impact to the intersections at Roberts Rd. to provide cycle track crossing. • Some re-work to previously installed bicycle improvements • Potential bus stop relocation at Roberts Rd.
CYCLE TRACK BPOC – 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.		• Provides a WB bike path, an eastbound bike path and sidewalk on a separated structure. • The 5' shoulders can be used by more experienced bicyclists if desired. • Wider vehicle lane configuration than existing and increase vehicle safety with increase shoulder width. • 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. • Meets 18'6" vertical clearance requirements for BPOC's. • Option for increased sidewalk width if warranted by pedestrian volumes.	• Initial cost will be greater than the widening options and will be greater than typical section due to the increased width. • Lower overall bike lane width in comparison to enhanced section illustrated above. • Greater impact to the intersections at Roberts Rd. to provide cycle track crossing. • Some re-work to previously installed bicycle improvements and potential bus stop relocation at Roberts Rd.

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 Evelyn Avenue Bridge, Mary Avenue Bridge, and Dale/Heatherstone Overcrossing.

Peak 60-Minute Volumes												
	Blossom Hill Road Bridge			**Stevens Creek Trail Evelyn 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	**133**	29	137	**166**	24	39	**63**	59	139	**198**
Afternoon	174	84	**258**	30	109	**139**	39	44	**83**	36	83	**119**

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-feet 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 2A GEOMETRY

Horizontal Considerations

As currently designed, the preferred horizontal alignment of Alternative 2A proposes to install the new structure as far south from the existing Blossom Hill Road Bridge 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.

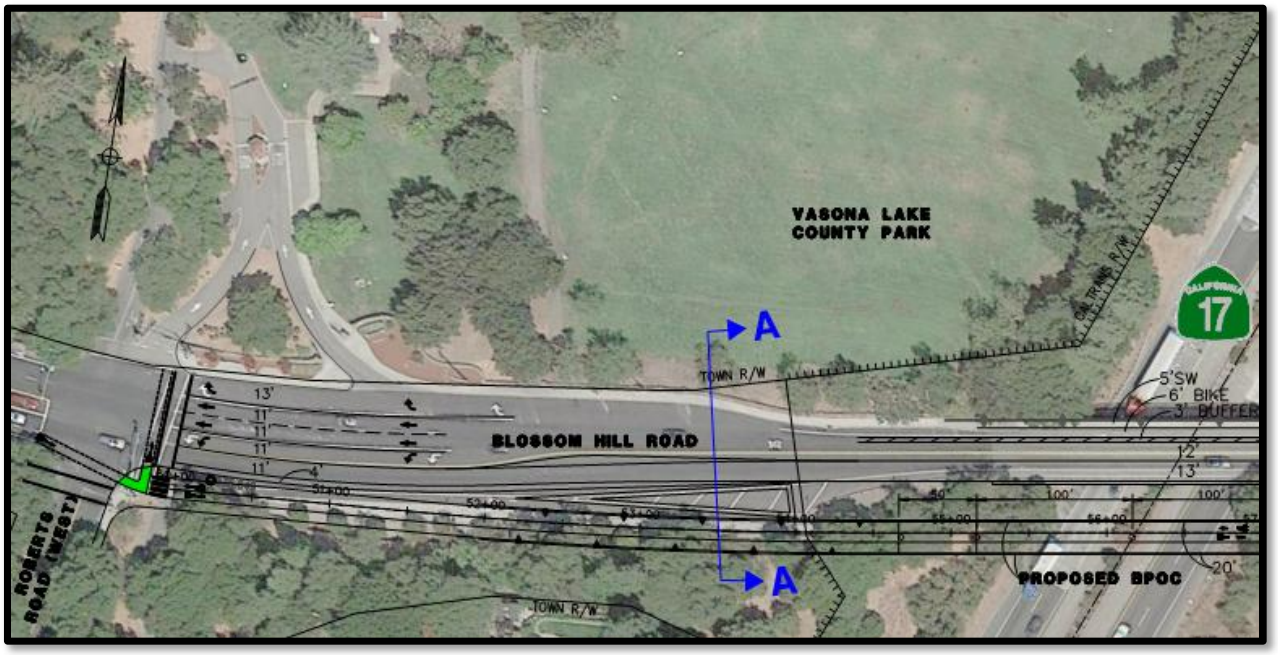
The project design should attempt to install the proposed improvements entirely within public right away to avoid impacts to private properties. The Project Team developed the preferred Alternative 2A alignment with right-of-way constraints in mind. However, additional studies during final design will 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.

Approach to the West of Highway 17

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

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

As illustrated in Figure 19, the geometry developed for the proposed bicycle/pedestrian path west of Highway 17 would require the removal of the existing 6-foot sidewalk, 7-foot bike lane, and approximately 5-foot eastbound bike lane buffer to accommodate the proposed improvements adjacent of the existing retaining wall. The removal of these existing facilities would provide approximately 18 feet to install the new proposed pathway, which includes retaining walls to contain the approach embankments. Final width of the proposed bicycle/pedestrian path will be determined during final design; however, realignment of the eastbound and westbound travel lanes near the Blossom Hill Road/Roberts Road West intersection may be required to gain a few additional feet to accommodate a 20-foot wide bicycle/pedestrian path with minimal impacts to the existing retaining wall. As seen in Figure 19, the Project Team developed the BPOC approach to the west of Highway 17 within public right of way to avoid impacts to private properties. However, additional studies during the preliminary design phase of the Project will be needed to determine the extent of the improvements.



Plan View (Not to Scale)

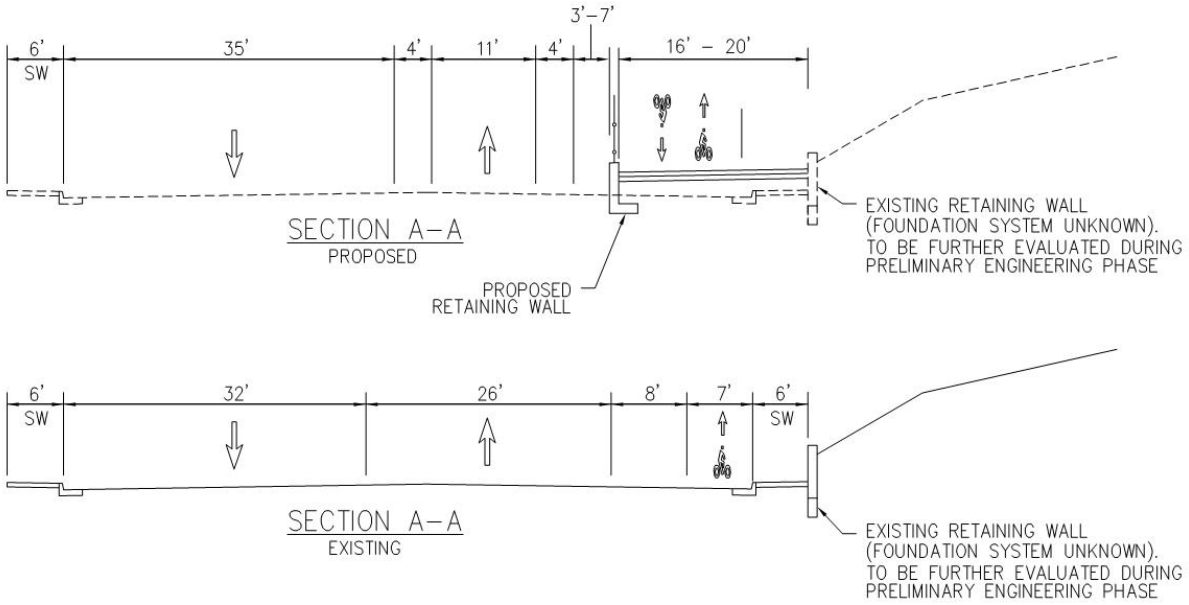


Figure 19 – Cross-Section of Approach to the West of Highway 17

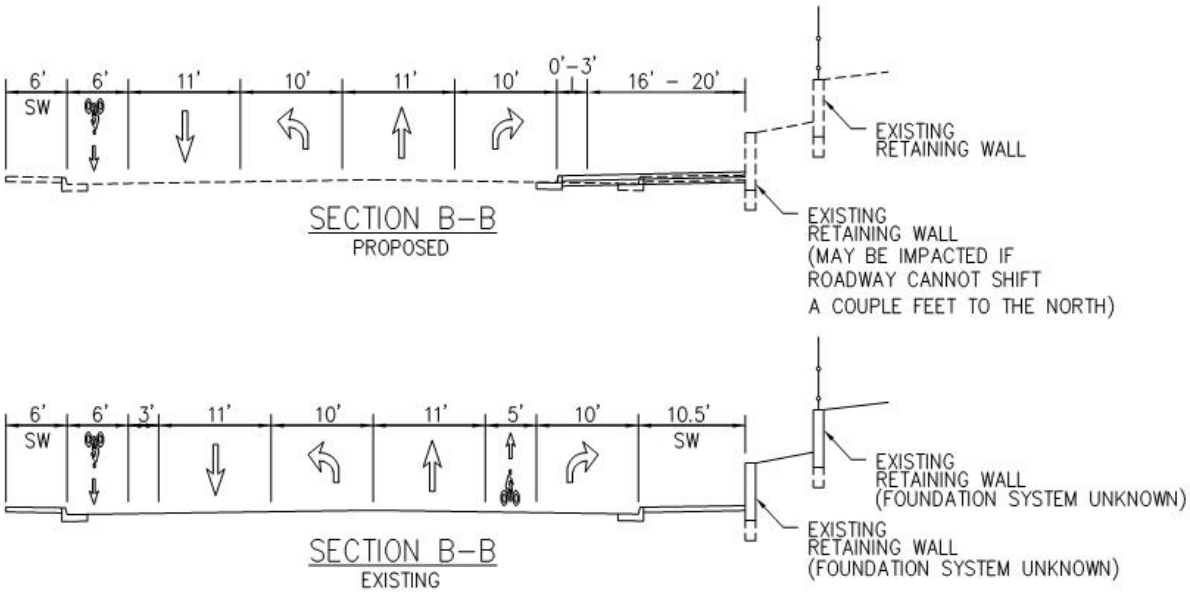
Approach to the East of Highway 17

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

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 any impacts to the existing decorative wall shown in Photo 4. This retaining wall separates Blossom Hill Road from the Serra Court community. The Town of Los Gatos maintains the decorative wall shown in Photo 4, while the Serra Court community maintains the upper retaining wall behind it. 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 20, 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 20. 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 20 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 20 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)

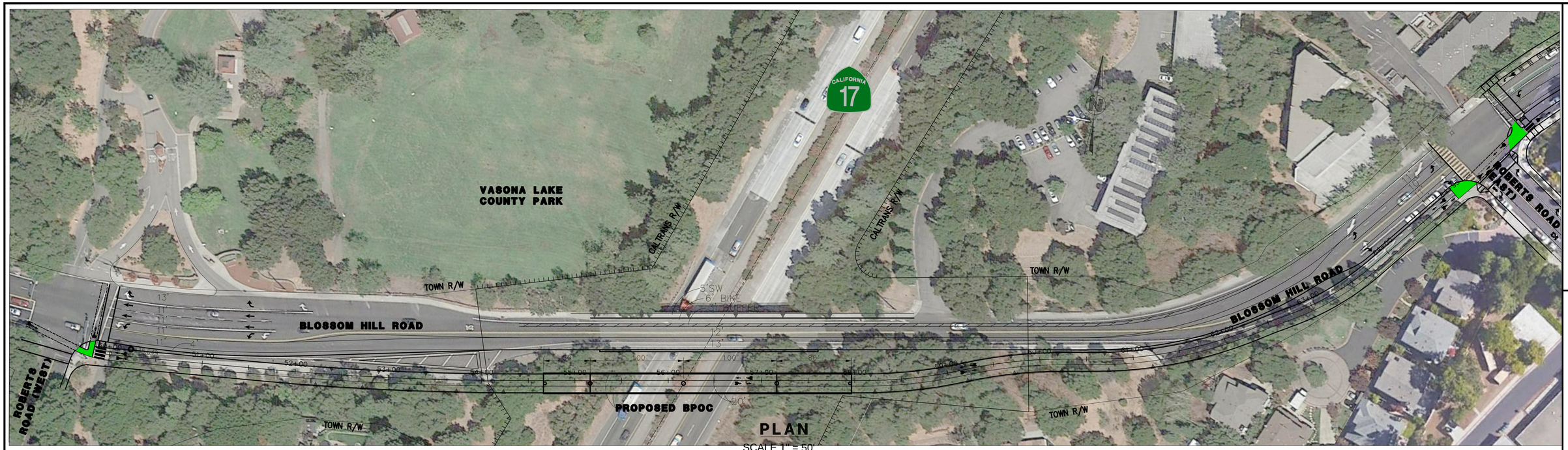
Figure 20 – Cross-Section Constraints along Blossom Hill Road near Roberts Road East intersection

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 2A 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 2A, illustrated in Figure 21, involves construction of the proposed structure over a 30-inch water line and a 1.5-inch water line 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-feet wide water easement located south of Blossom Hill Road. Survey studies of the horizontal and vertical locations 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 22. These cross sections assume a 20-feet structure width; however, final width of the proposed structure will be determined during final design.



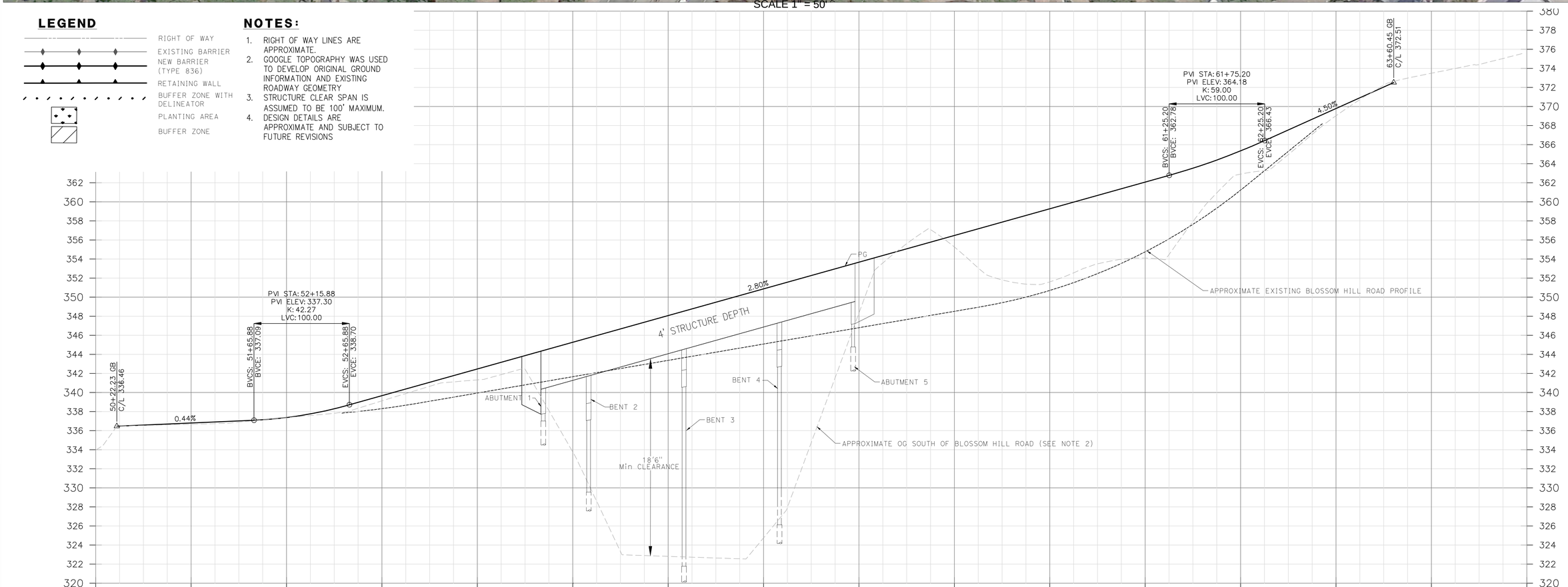
PLAN
SCALE 1" = 50'

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.
4. DESIGN DETAILS ARE APPROXIMATE AND SUBJECT TO FUTURE REVISIONS



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

BKF
4670 WILLOW ROAD
SUITE 250
PLEASANTON, CA 94588
925-396-7700
925-396-7799 (FAX)
BKF 100+ YEARS
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BLOSSOM HILL ROAD PEDESTRIAN PROJECT
HWY 17 BICYCLE AND PEDESTRIAN CYCLE TRACK
FIGURE 21 - CYCLE TRACK

LOS GATOS — SANTA CLARA — CALIFORNIA

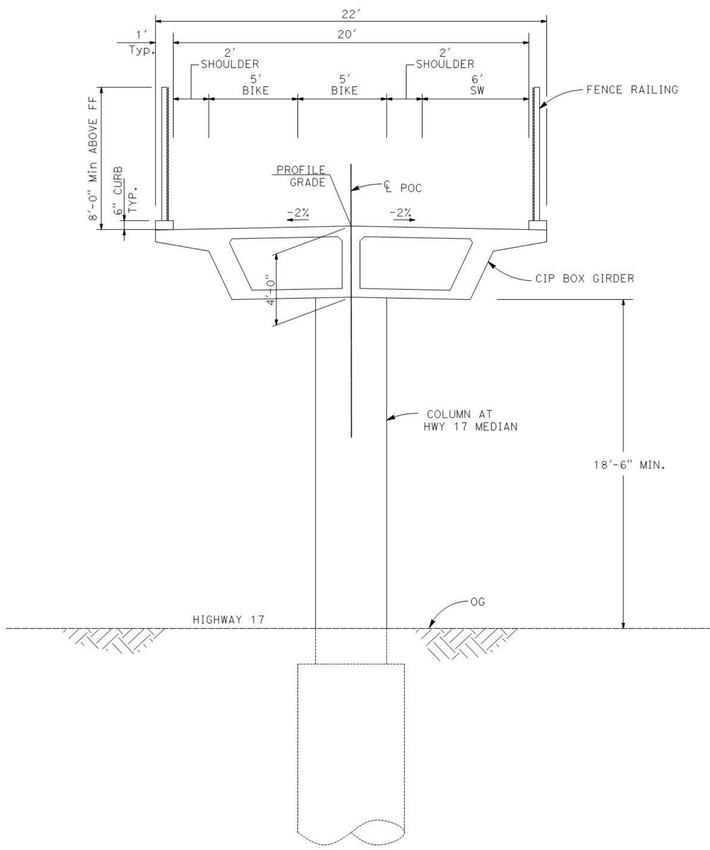
No.	Revisions

Date 08/25/2020
Scale 1" = 50'
Design TC
Drawn TC
Approved
Job No. 20190997

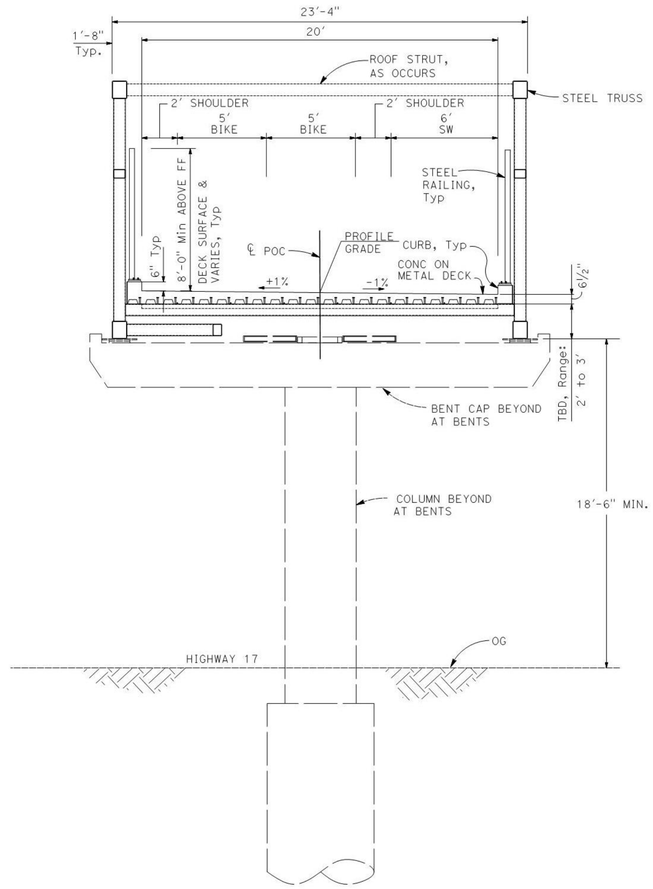
Drawing Number:
1

P:\2019\190997 Los Gatos_Blossom_Hill_Hwy 17 @PCC\ENG\EXHIBITS\008_Cycle Track with more separation\Cycle track.dwg 25 Aug 2020 7:22:23am mort

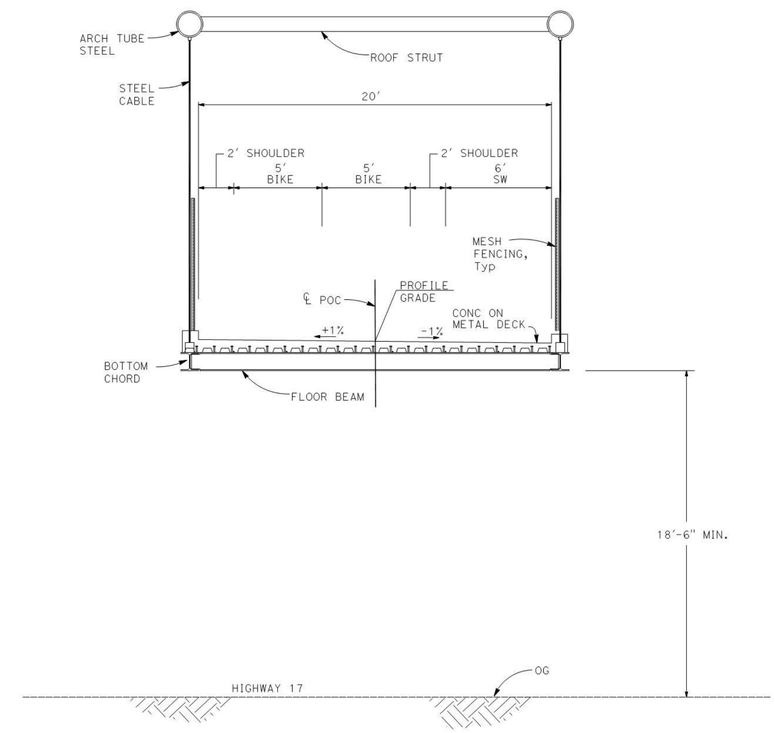
PRELIMINARY BRIDGE TYPES - CROSS SECTION EVALUATION



TYPE A
CONCRETE BOX-GIRDER SPAN



TYPE B
STEEL TRUSS SPAN



TYPE C
STEEL ARCH SPAN

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4670 WILLOW ROAD
SUITE 250
PLEASANTON, CA 94588
925-396-7700
925-396-7799 (FAX)

BLOSSOM HILL ROAD
HWY 17 BICYCLE AND PEDESTRIAN PROJECT
FIGURE 22 - PRELIMINARY BRIDGE TYPES
LOS GATOS — SANTA CLARA — CALIFORNIA

No.	Revisions

Date 08/25/2020
Scale 1" = 50'
Design TC
Drawn TC
Approved
Job No. 20190997

Drawing Number:

VI. CONSTRAINTS AND ADDITIONAL CONSIDERATIONS

A. RIGHT OF WAY

The Project Team developed the Alternative 2A 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 right-of-way 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 right-of-way. 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 right-of-way. 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 23 and summarized below:

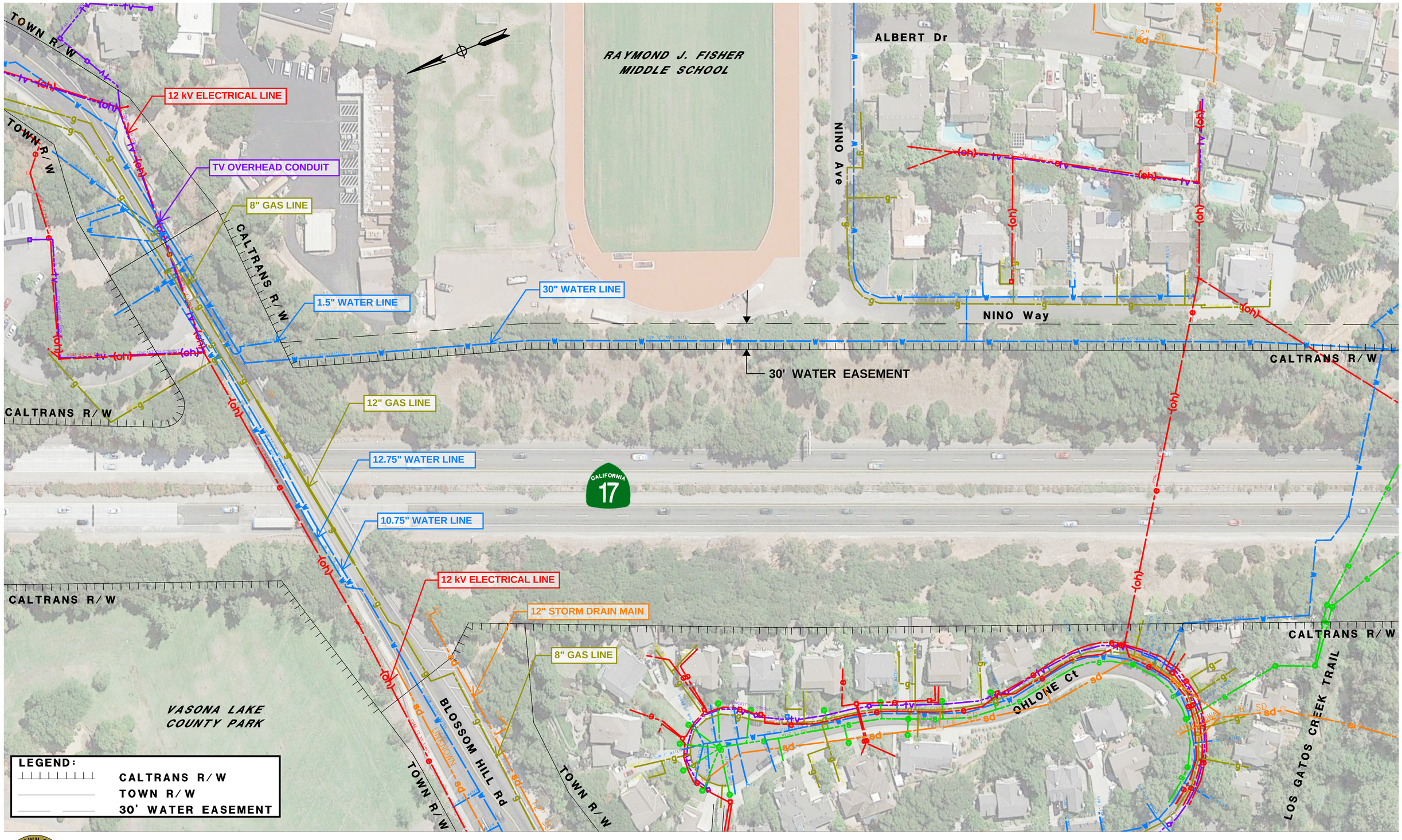
- **12kV PG&E Electrical Overhead** lines run parallel to the Blossom Hill Road OC on overhead poles located along the north side of Blossom Hill Road. At approximately 115 feet east of Highway 17, these electrical overhead lines cross Blossom Hill Road to connect to an overhead pole located on the opposite 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.

Additional studies of potential impacts and opportunities to improve these existing water lines will need to occur during final design once the Project has more detailed information.

- **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-feet 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 2A 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 lines will be required.

Furthermore, the proposed improvements will place embankment on top of the existing underground utilities within the limits of Alternative 2A. 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.



HIGHWAY 17 BICYCLE AND PEDESTRIAN BRIDGE PROJECT

FIGURE 23 - EXISTING UTILITIES AND STORM DRAIN FACILITIES

ENGINEERS . SURVEYORS . PLANNERS

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 2A 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 23.

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 approximately 2-feet high near the planned BPOC Abutment 1. Relatively short retaining walls approximately 200-feet long are anticipated along the sides of the western approach to contain the approach embankments.
- **Eastern Approach** grading will require minor cut and fill within about 100-feet behind the planned BPOC Abutment 5 and additional embankments up to 8-feet high further eastward. The conceptual plan indicates that retaining walls between 400-feet to 500-feet in length are anticipated along the north and south sides of the eastern approach to contain the approach

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. For additional details regarding MSE wall, see Section VIII.B.

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 motorits 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, there are three fundamental ways in which a bridge may be 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", bridge architecture can employ 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 "iconic" bridge types such as arches, trusses, and cable-supported spans.

Equally important is cost effectiveness, and an optimum design will, carefully strike a balance between form and function. In the case of this Project, Town staff suggested initially that the new BPOC would not

be visible from the southbound approach on Highway 17 (due to being obscured by the adjacent Blossom Hill Road overcrossing), and therefore, an "iconic" bridge type would not be appropriate for this location and would thus be an overly costly choice. However, initial investigation by the Project Team (using 3-D mapping and modeling techniques) revealed that the vertical elements of arch, truss, and cable-stayed bridges – already fully visible to northbound motorists – are high enough to be prominently visible above the Blossom Hill Road bridge for southbound motorists as well.

Based on these considerations, the Project Team studied three preliminary concepts for this BPOC: 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

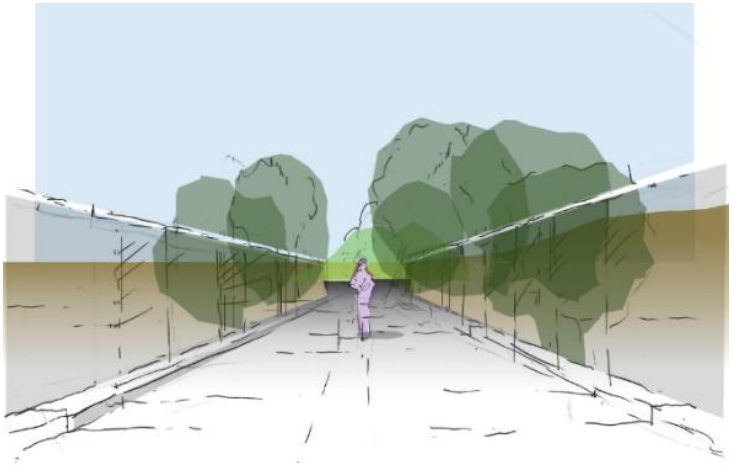


Figure 24 –Concrete Box-Girder Bridge Cross Section

this bridge (as shown in Figure 24 and Figure 25), 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 25 - 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 Types B and 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 Types B and C described in the next sections, the visual image of 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 26 shows the use of curved (or "haunched") box girders to produce a subtle arched appearance.

Figure 26 - 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 27 and Figure 28, 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 27 – 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 28 –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.

Figure 29 –Steel Tied Arch Span Cross Section

Similar to Bridge Type B, Bridge Type C has a single clear span of 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 30 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").

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

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 Types B and C may require minimal or no falsework, depending on design details.

Mechanically Stabilized Embankment (MSE) walls

A MSE wall or mechanically stabilized earth wall is a type of soil retaining structure that utilizes reinforced soil as well as traditional retaining wall elements. Reinforced soil is fill behind a retaining wall that has multiple layers of man-made reinforcement incorporated within the soil to improve its behavior, such as increasing force resisting capacity and reducing settlement. A few examples of the reinforcement elements used to do this include steel strips, geotextile sheets, steel and polymeric grids. The other major parts of a MSE wall are the facing and retained backfill. The facing is a component of the reinforced soil system used to prevent the soil from raveling out between the layers of reinforcement. Common facings are precast concrete panels, dry cast modular blocks, welded wire mesh, gabions, shotcrete, as well as timber lagging and panels. Retained backfill, sometimes referred to as 'Select Backfill', is the fill material located behind the mechanically stabilized soil zone. Figure 31 below shows a generic MSE wall cross section with the aforementioned components.

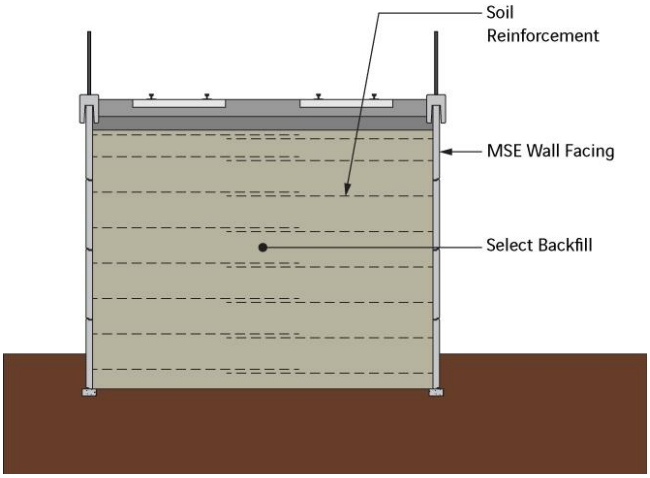


Figure 31 – MSE Wall Cross-Section

MSE walls are cost-effective soil retaining structures that can tolerate much larger settlements when compared to standard type reinforced concrete walls. By placing tensile reinforcement elements in the soil, the strength of the soil can be improved significantly. Use of a facing system to prevent soil raveling between the reinforcement elements allows very steep slopes and vertical walls to be constructed safely. MSE walls are also easy to build and use simple and rapid construction procedures that do not require as large of construction equipment or special worker skills, reducing costs significantly relative to traditional types of retaining walls. A few more advantages of MSE walls include requiring less site preparation than other alternatives, requiring less space in front of the structure for construction operations, and reducing right-of-way acquisition. These last two considerations are especially pertinent to this project along the path's west alignment and guided the selection of this type of retaining structure. Installation of MSE walls in this section of the pathway would avoid impacts to the existing retaining wall west of Highway 17 and sloped area behind the wall shown in Section V.H (see Photo 3). Precast concrete facing elements can be made with various shapes and textures for aesthetic considerations. Masonry units, timber and gabions can also be used to blend in the environment.

The following is an example of the construction sequence for a MSE wall using precast concrete panels for the facing. The first step in the construction sequence is the preparation of the subgrade material that will serve to support the foundation for the wall. This involves the removal of unsuitable materials from the area to be occupied by the MSE wall structure and the compaction of the subgrade. Next is the placement of the leveling pad for the erection of the facing elements. This pad is generally unreinforced concrete and is usually about 1 foot wide and 6 inches thick. After the leveling pad is in place, the first row of precast facing panels is erected. The first row must be braced to maintain stability and alignment, but subsequent rows are simply wedged and clamped to adjacent panels. It is important to note that for this project the pathway proposes to construct a MSE wall on either side of the alignment, essentially building an increasingly tall "box" of reinforced fill upon which the walking surface is placed. Figure 31 is an example of this type of construction. Once the first tier of facing panels have been erected on both sides of the alignment, the reinforced wall fill may be placed and compacted on the subgrade up to the level of the first reinforcement layer. Then, once the wall fill has been compacted, the reinforcement is placed on the compacted fill perpendicular to and connected to the facing panels. The steps above are repeated for each additional level of facing panels once the reinforcement has been placed for the first level. Once all

the levels of facing panels are placed along with each corresponding level of compacted fill and reinforcement, the final construction sequence is to install a coping slab at the top of the wall that serves as the pathway curb and gutter.

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 to 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, cables, truss members, etc.), and the creation of unique effects such as LED 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 be developed and finalized 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 leading to the bridge, 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 Types B and C could be constructed off-line within the median or shoulder of Highway 17 with potentially no falsework, minimizing impact to

traffic along Highway 17. The construction would require an overnight closure of Highway 17 for a short period of time for placement of the pre-assembled span by crane or jacking. 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 / *Endangered* Marbled Murrelet */ Threatened*
Amphibians	California Red-legged Frog / *Threatened* California Tiger Salamander */ Threatened*
Fishes	Delta Smelt / *Threatened* Tidewater Goby / *Endangered*
Insects	Bay Checkerspot Butterfly / *Threatened*
Flowering Plants	Metcalf Canyon Jewelflower / *Endangered* Robust Spineflower / Endangered Santa Clara Valley Dudleya / Endangered
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 1st – August 31st) 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 of 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 that 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. For details of possible storm water management practices, see Section IX.B.

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 connect, 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 relative high noise environment and the anticipated use of the structure (bicycle and pedestrian overcrossing), the project would not result in substantial permanent increase in the existing ambient noise levels in the project area; therefore, a Noise Study for the Project would not be warranted. By replacing some of the automobile trips with biking/walking trips, the project will potentially have the benefit of reducing noise from traffic on Blossom Hill Road.

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 support increased "active transportation" travel between adjacent residential neighborhoods and residential supporting commercial, school, and recreational uses. The purpose of this Project is to provide a safer and better bicycle and pedestrian facility. The Roberts Road East and Roberts Road West intersections will be re-designed to allow proper space and separation of users. There are no inherent safety concerns by increasing bicycle and pedestrian usage.

CEQA-level Analysis

Further evaluation and analysis would be required after selecting the design alternative to complete the CEQA-level analysis for the project. It is anticipated that the CEQA analysis would begin within an Initial Study, which will identify potential environmental impact of the Project. Based on the preliminary evaluation, construction and operation of the proposed Project 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, the Town could decide if the Project qualifies for a Categorical Exemption under Section 15300 of the CEQA Guidelines and file a

Notice of Exemption (NOE) or decide the Project does not qualify for Categorical Exemption and adopt a Negative Declaration or a Mitigated Negative Declaration.

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. 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 32 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.

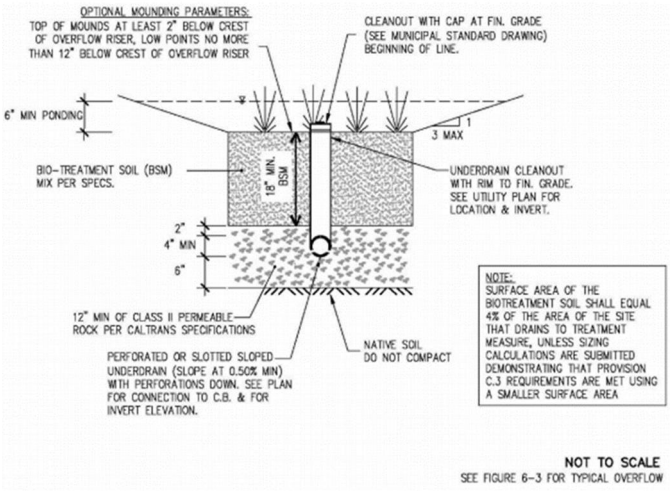


Figure 32 - Bioretention Area Cross-Section
(Source: SCVURPP C.3 Stormwater Handbook, June 2016)

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 33 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 33- 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
Total Project Cost	**$25,103,700**	**$27,995,700**	**$28,867,700**

Table 6 – Project Cost Estimate

B. DELIVERY PLAN

A depiction of the approximate delivery plan for this project is included in Figure 34** 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.

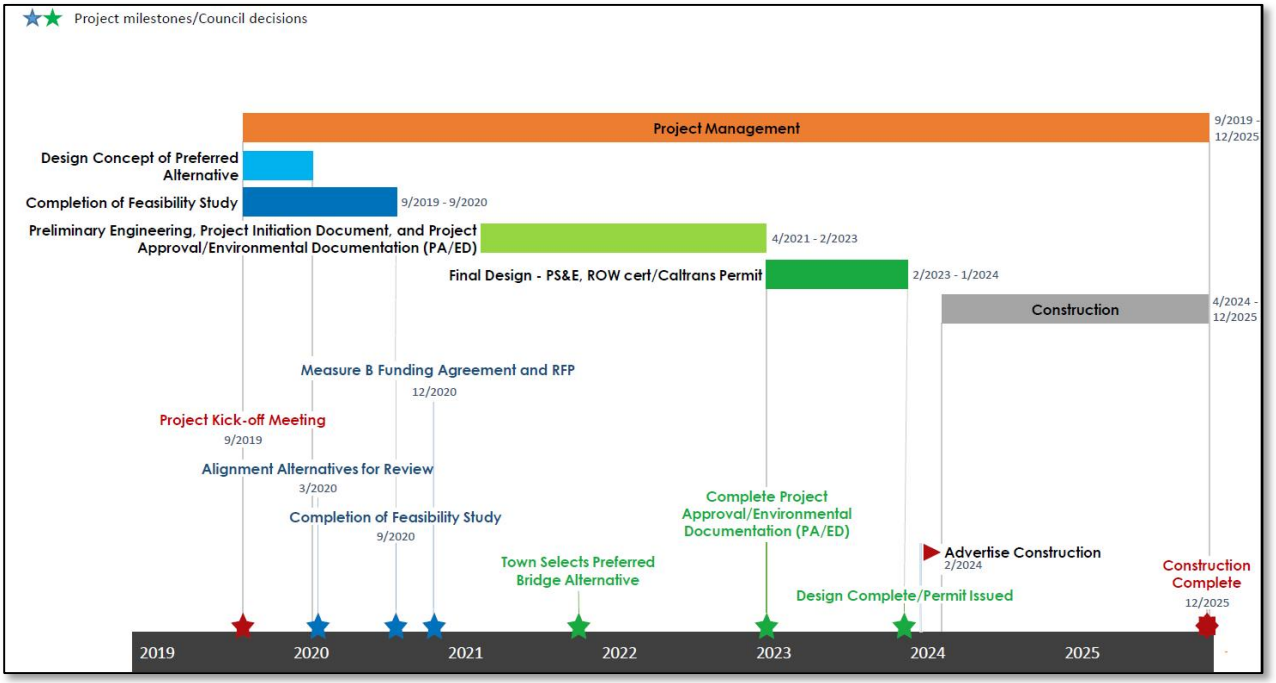


*Figure 34 – Approximate Delivery Plan***

Milestone	Schedule
Preliminary Evaluation	January - March, 2020
Outreach Round 1 – Initial Screening	February 2020
Town Council confirmed two alternatives	March 3, 2020
Community Meeting via Zoom	August 25, 2020 at 7:00 pm
Outreach Round 2	August 2020
Town Council considers preferred alternative	September 1, 2020
Preliminary Eng/Env. Approval/Final design	Early 2021 - Jan 2024
Advertise Construction (pending funding availability)	November 2023
Award Contract (pending funding availability)	February 2024
Construction (pending funding availability)	April 2024 – December 2025

Figure 35 – Milestones and Schedule

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

Time Period			Northside			Southside				
From		To	Peds	Bikes		Peds	Bikes	Peds	Bikes	Total
AM Data										
7:00 AM	---	7:15 AM	2	0		3	0	5	0	5
7:15 AM	---	7:30 AM	5	2		0	0	5	2	7
7:30 AM	---	7:45 AM	5	2		2	3	7	5	12
7:45 AM	---	8:00 AM	4	1		10	2	14	3	17
8:00 AM	---	8:15 AM	2	4		27	24	29	28	57
8:15 AM	---	8:30 AM	2	5		31	8	33	13	46
8:30 AM	---	8:45 AM	7	1		4	1	11	2	13
8:45 AM	---	9:00 AM	4	2		5	0	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

Time Period			Northside			Southside				
From		To	Peds	Bikes		Peds	Bikes	Peds	Bikes	Total
PM Data										
2:00 PM	---	2:15 PM	4	3		2	2	6	5	11
2:15 PM	---	2:30 PM	8	6		3	2	11	8	19
2:30 PM	---	2:45 PM	8	12		6	1	14	13	27
2:45 PM	---	3:00 PM	34	44		97	14	131	58	189
3:00 PM	---	3:15 PM	5	2		5	6	10	8	18
3:15 PM	---	3:30 PM	11	3		8	2	19	5	24
3:30 PM	---	3:45 PM	3	2		4	3	7	5	12
3:45 PM	---	4:00 PM	3	3		5	3	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 DATE: 11/30/2020

Project Name: Highway 17 Bike & Pedestrian Overcrossing REV:

Project location and brief description:

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

Highway 17 BPOC	
Phase	***Concrete Box Girder Span***
Feasibility Study	$ 234,500
Preliminary Engineering/Environmental Studies/Final Design (PS&E)	$ 3,701,200
Utility Relocation and Protection	$ 500,000
Construction Capital	$ 16,612,000
Construction Support	$ 4,056,000
TOTAL Project Cost	$ **25,103,700**

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-feet 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. Feasibility Study and Design costs are in 2020 dollars, rounded to nearest $100.
9. Construction costs are in 2024/25 dollars (mid point of construction), rounded to nearest $100.

Project Cost Estimate Summary, Sections I through XI

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

DATE: 11/30/2020
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	
	TOTAL FOR SECTION I. ROADWAY					$	6,740,272.00	
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	
		UNIT	ALLOWANCE					
	Design Contingency (25% of total cost of items II.1a thru II.1b)	LS	25%		--	$	1,441,000.00	
	TOTAL FOR SECTION II. STRUCTURES					$	7,205,000.00	
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	$	-	$	-	$ -
	TOTAL FOR SECTION III. RIGHT OF WAY							$ -

ENGINEERING AND MANAGEMENT COSTS

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

		ALLOWANCE			
IV. CONCEPTUAL ENGINEERING STUDIES					$ 383,249.88
V. ENVIRONMENTAL STUDIES					$ 383,249.88
VI. DESIGN ENGINEERING					$ 1,660,749.48
VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)		7.0%	$ 13,945,272.00		$ 976,169.04
VIII. CONSTRUCTION STAKING		2.5%	$ 13,945,272.00		$ 348,631.80
IX. CONSTRUCTION MANAGEMENT		13.0%	$ 13,945,272.00		$ 1,812,885.36
XI. AGENCY MANAGEMENT		14.0%	$ 13,945,272.00		$ 1,952,338.08

X. RISK BASED ALLOWANCES							
	RISK CATEGORY		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%	$	2,120,499.76	$	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	11%	$	2,427,249.24	$	264,960.17
	TOTAL FOR SECTION X. RISK BASED ALLOWANCES					$	1,577,246.20

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_{Δ}	5	
4	Annual Escalation Rate, AER (percentage)	2.0%	
5	Total Construction Cost (TCC)	$ 13,945,272	
6	Total Escalation	1.10	
	ESCALATED TOTAL CONSTRUCTION COST (ETCC)	$ 15,396,707	$ 15,396,707.11

To escale the TCC to midpoint of construction:

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

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

N_{mid} = duration/2 + N_{start}

ESCALATED TOTAL CONSTRUCTION COST (ETCC) = TCC x Total Escalation

Example: *Determine* N_{Δ}, 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	2024
2	Estimated construction duration	2

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_{Δ} = 2025 - 2020 = 5

TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = $ 22,538,888.75

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

SPONSOR: Town of Los Gatos DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 EARTHWORK					
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
02 PAVEMENT STRUCTURAL SECTION					
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
03 DRAINAGE					
03	DRAINAGE SYSTEM	LS	$ 400,000.00	1	$ 400,000.00
	SUBTOTAL FOR ITEM 03 DRAINAGE				$ 400,000.00
04 SPECIALTY ITEMS					
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
05 TRAFFIC ITEMS					
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

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
			$	-		$	-
	SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION					$	700,000.00
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
	SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION					$	125,000.00
					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 DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

Alternative: 2A - Concrete Box Girder (2-Span) - 200' long

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 STRUCTURES					
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
08	Retaining Wall Modification at East Sidewalk adjacent to Blossom Hill 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 DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 PARTIAL ACQUISITIONS					
					$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS				$ -
02 AERIAL EASEMENTS					
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS				$ -
03 TEMPORARY CONSTRUCTION EASMENTS					
	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 DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 Utility Relocations					
	ELECTRICAL POLE RELOCATION	EA	$ 100,000.00	1	$ 100,000.00
	GAS LINE RELOCATION	LF	$ 2,000.00	100	$ 200,000.00
	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 DATE: 11/30/2020

Project Name: Highway 17 Bike & Pedestrian Overcrossing REV:

Project location and brief description:

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

Highway 17 BPOC	
Phase	***Steel Truss Span***
Feasibility Study	$ 234,500
Preliminary Engineering/Environmental Studies/Final Design (PS&E)	$ 3,701,200
Utility Relocation and Protection	$ 500,000
Construction Capital	$ 18,937,000
Construction Support	$ 4,623,000
TOTAL Project Cost	$ **27,995,700**

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-feet 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. Feasibility Study and Design costs are in 2020 dollars, rounded to nearest $100.
9. Construction costs are in 2024/25 dollars (mid point of construction), rounded to nearest $100.

Project Cost Estimate Summary, Sections I through XI

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

DATE: 11/30/2020
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	
	TOTAL FOR SECTION I. ROADWAY					$	6,740,272.00	
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	
		UNIT	ALLOWANCE					
	Design Contingency (25% of total cost of items II.1a thru II.1b)	LS	25%		--	$	1,831,000.00	
	TOTAL FOR SECTION II. STRUCTURES					$	9,155,000.00	
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	$	-	$	-	$ -
	TOTAL FOR SECTION III. RIGHT OF WAY							$ -

ENGINEERING AND MANAGEMENT COSTS

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

		ALLOWANCE			
IV. CONCEPTUAL ENGINEERING STUDIES					$ 383,249.88
V. ENVIRONMENTAL STUDIES					$ 383,249.88
VI. DESIGN ENGINEERING					$ 1,660,749.48
VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)		7.0%	$ 15,895,272.00		$ 1,112,669.04
VIII. CONSTRUCTION STAKING		2.5%	$ 15,895,272.00		$ 397,381.80
IX. CONSTRUCTION MANAGEMENT		13.0%	$ 15,895,272.00		$ 2,066,385.36
XI. AGENCY MANAGEMENT		14.0%	$ 15,895,272.00		$ 2,225,338.08

X. RISK BASED ALLOWANCES							
	RISK CATEGORY		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	11%	$	2,120,499.76	$	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	12%	$	2,427,249.24	$	302,010.17
	TOTAL FOR SECTION X. RISK BASED ALLOWANCES					$	1,801,496.20

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_{Δ}	5	
4	Annual Escalation Rate, AER (percentage)	2.0%	
5	Total Construction Cost (TCC)	$ 15,895,272	
6	Total Escalation	1.10	
	ESCALATED TOTAL CONSTRUCTION COST (ETCC)	$ 17,549,665	$ 17,549,664.68

To escale the TCC to midpoint of construction:

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

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

N_{mid} = duration/2 + N_{start}

ESCALATED TOTAL CONSTRUCTION COST (ETCC) = TCC x Total Escalation

Example: *Determine* N_{Δ}, 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	2024
2	Estimated construction duration	2

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_{Δ} = 2025 - 2020 = 5

TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = $ 25,354,846.32

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

SPONSOR: Town of Los Gatos DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 EARTHWORK					
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
02 PAVEMENT STRUCTURAL SECTION					
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
03 DRAINAGE					
03	DRAINAGE SYSTEM	LS	$ 400,000.00	1	$ 400,000.00
	SUBTOTAL FOR ITEM 03 DRAINAGE				$ 400,000.00
04 SPECIALTY ITEMS					
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
05 TRAFFIC ITEMS					
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

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
			$	-		$	-
	SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION					$	700,000.00
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
	SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION					$	125,000.00
					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 DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:
Alternative: 2B - Steel Truss (Single Span) - 330' long

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 STRUCTURES					
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 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 DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 PARTIAL ACQUISITIONS					
					$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS				$ -
02 AERIAL EASEMENTS					
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS				$ -
03 TEMPORARY CONSTRUCTION EASMENTS					
	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 DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 Utility Relocations					
	ELECTRICAL POLE RELOCATION	EA	$ 100,000.00	1	$ 100,000.00
	GAS LINE RELOCATION	LF	$ 2,000.00	100	$ 200,000.00
	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 DATE: 11/30/2020

Project Name: Highway 17 Bike & Pedestrian Overcrossing REV:

Project location and brief description:

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

Highway 17 BPOC	
Phase	***Steel Tied Arch Span***
Feasibility Study	$ 234,500
Preliminary Engineering/Environmental Studies/Final Design (PS&E)	$ 3,701,200
Utility Relocation and Protection	$ 500,000
Construction Capital	$ 19,638,000
Construction Support	$ 4,794,000
TOTAL Project Cost	$ **28,867,700**

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-feet 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. Feasibility Study and Design costs are in 2020 dollars, rounded to nearest $100.
9. Construction costs are in 2024/25 dollars (mid point of construction), rounded to nearest $100.

Project Cost Estimate Summary, Sections I through XI

SPONSOR: Town of Los Gatos DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing 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	
	TOTAL FOR SECTION I. ROADWAY					$	6,740,272.00	
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	
		UNIT	ALLOWANCE					
	Design Contingency (25% of total cost of items II.1a thru II.1b)	LS	25%		--	$	1,948,500.00	
	TOTAL FOR SECTION II. STRUCTURES					$	9,742,500.00	
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	$	-	$	-	$ -
	TOTAL FOR SECTION III. RIGHT OF WAY							$ -

ENGINEERING AND MANAGEMENT COSTS

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

		ALLOWANCE			
IV. CONCEPTUAL ENGINEERING STUDIES					$ 383,249.88
V. ENVIRONMENTAL STUDIES					$ 383,249.88
VI. DESIGN ENGINEERING					$ 1,660,749.48
VII. DESIGN SERVICES DURING CONSTRUCTION (DSDC)		7.0%	$ 16,482,772.00		$ 1,153,794.04
VIII. CONSTRUCTION STAKING		2.5%	$ 16,482,772.00		$ 412,069.30
IX. CONSTRUCTION MANAGEMENT		13.0%	$ 16,482,772.00		$ 2,142,760.36
XI. AGENCY MANAGEMENT		14.0%	$ 16,482,772.00		$ 2,307,588.08

X. RISK BASED ALLOWANCES							
	RISK CATEGORY		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	11%	$	2,120,499.76	$	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	13%	$	2,427,249.24	$	313,172.67
	TOTAL FOR SECTION X. RISK BASED ALLOWANCES					$	1,869,058.70

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_{Δ}	5	
4	Annual Escalation Rate, AER (percentage)	2.0%	
5	Total Construction Cost (TCC)	$ 16,482,772	
6	Total Escalation	1.10	
	ESCALATED TOTAL CONSTRUCTION COST (ETCC)	$ 18,198,312	$ 18,198,312.15

To escale the TCC to midpoint of construction:

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

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

N_{mid} = duration/2 + N_{start}

ESCALATED TOTAL CONSTRUCTION COST (ETCC) = TCC x Total Escalation

Example: *Determine* N_{Δ}, 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	2024
2	Estimated construction duration	2

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_{Δ} = 2025 - 2020 = 5

TOTAL PROJECT COSTS = SUM OF ETCC AND SECTIONS III THROUGH X = $ 26,203,243.79

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

SPONSOR: Town of Los Gatos DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 EARTHWORK					
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
02 PAVEMENT STRUCTURAL SECTION					
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
03 DRAINAGE					
03	DRAINAGE SYSTEM	LS	$ 400,000.00	1	$ 400,000.00
	SUBTOTAL FOR ITEM 03 DRAINAGE				$ 400,000.00
04 SPECIALTY ITEMS					
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
05 TRAFFIC ITEMS					
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

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
			$	-		$	-
	SUBTOTAL FOR ITEM 06 PLANTING AND IRRIGATION					$	700,000.00
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
	SUBTOTAL FOR ITEM 07 ROADSIDE MANAGEMENT AND SAFETY SECTION					$	125,000.00
					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 DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:
Alternative: 2C - Steel Tied-Arch (Single Span) - 330' long

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 STRUCTURES					
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 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 DATE: 11/30/2020
PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

GROUP CODE	ITEM DESCRIPTION	UNIT	PRICE	QUANTITY	
01 PARTIAL ACQUISITIONS					
					$ -
	SUBTOTAL FOR ITEM 01 PARCEL ACQUISITIONS				$ -
02 AERIAL EASEMENTS					
	SUBTOTAL FOR ITEM 02 AERIAL EASEMENTS				$ -
03 TEMPORARY CONSTRUCTION EASMENTS					
	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 DATE: 11/30/2020

PROJECT: Highway 17 Bike & Pedestrian Overcrossing REV:

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

TOTAL FOR SECTION I.1 = $ 300,000.00

APPENDIX C
GEOTECHNICAL MEMORANDUM

PARIKH
Practicing in the Geosciences

MEMORANDUM

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

November 20th , 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

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 4-span structure with approximately 350 ft in length and 16 to 20 ft in width. The structure is about 4 feet in depth supported by two abutments and three bents with 12 feet high fence on both side of the deck. The general project location map is attached in Attachment A-1. The conceptual drawing of the planned project is shown in Attachment A-4.

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 (LOTB) performed in February 1955 for the existing Blossom Hill Road Overcrossing (Br. No. 37-0148) for subsurface information. An overall geologic map of the area is shown in Attachment A-2. 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 Hwy 17 construction that was cut to Elev. 318 ft (likely NGVD 29) as indicated in the as-built LOTB (see Attachment A-3).

The boring data (1955) indicated loose to medium dense granular material (silty sand with gravel and cobbles) through about Elev. 320 ft (likely NGVD29). 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 (likely NGVD 29).

Groundwater was found at Elev. 312.2 ft (likely NGVD 29) in B-2 in February 1955 (Attachment A-3). 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 08/25/2020, indicates Hwy 17 at about Elev. 323 ft.. We anticipate that groundwater level could be within 6 to 7 ft depth of the existing Hwy 17 grade. We understand that the current conceptual plan of 08/25/2020 is prepared based on current Google Topography. The datum adopted by Google is probably different from that used for the 1955 as-built drawings

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 (Vs30m), 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: 37.234378ºN/121.970862ºW
- Estimated V_{S30m}: 295 m/s
- Anticipated Peak Ground Acceleration (PGA): 0.800 g (Design Sa_{2014})
- 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, Sr = 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 (1955 as-built LOTB). 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 west of Hwy 17 SB on existing 1.5H:1V cut slope, the new Bent 3 is located in the existing median of Hwy 17, and the new Bent 4 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 about 2 ft high near Abutment 1. Relatively short retaining walls of approximately 200 ft long are anticipated along the sides to contain the approach embankments.

For the eastern approach, there is a small hillside immediately on the SE quadrant of the existing Blossom Hill Road OC. The picture below, Figure 1, views eastward on the existing Blossom Hill Road OC. Note the hillside on the SE quadrant of the site. The existing terrain slopes upward from the Blossom Hill Road OC. The grading for the eastern approach requires minor cut and fill within about 100 ft behind the new abutment and additional embankments up to 8 ft high further eastward. The conceptual plan indicates that retaining walls of 350 ft and 460 ft in length are needed along the sides of the eastern approach embankments. For permanent design above the eastern approach, a slope gradient of 2H:1V is recommended for native material at the site.

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

In the SE quadrant of the site, the terrain is heavily vegetated as shown in Figure 1. As grading is needed, it is anticipated that this could be the access for construction of foundation piles at the planned Abutment 5 and Bent 4. Accessing from Hwy 17 NB with 1.5H:1V slope appears to be more difficult.

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

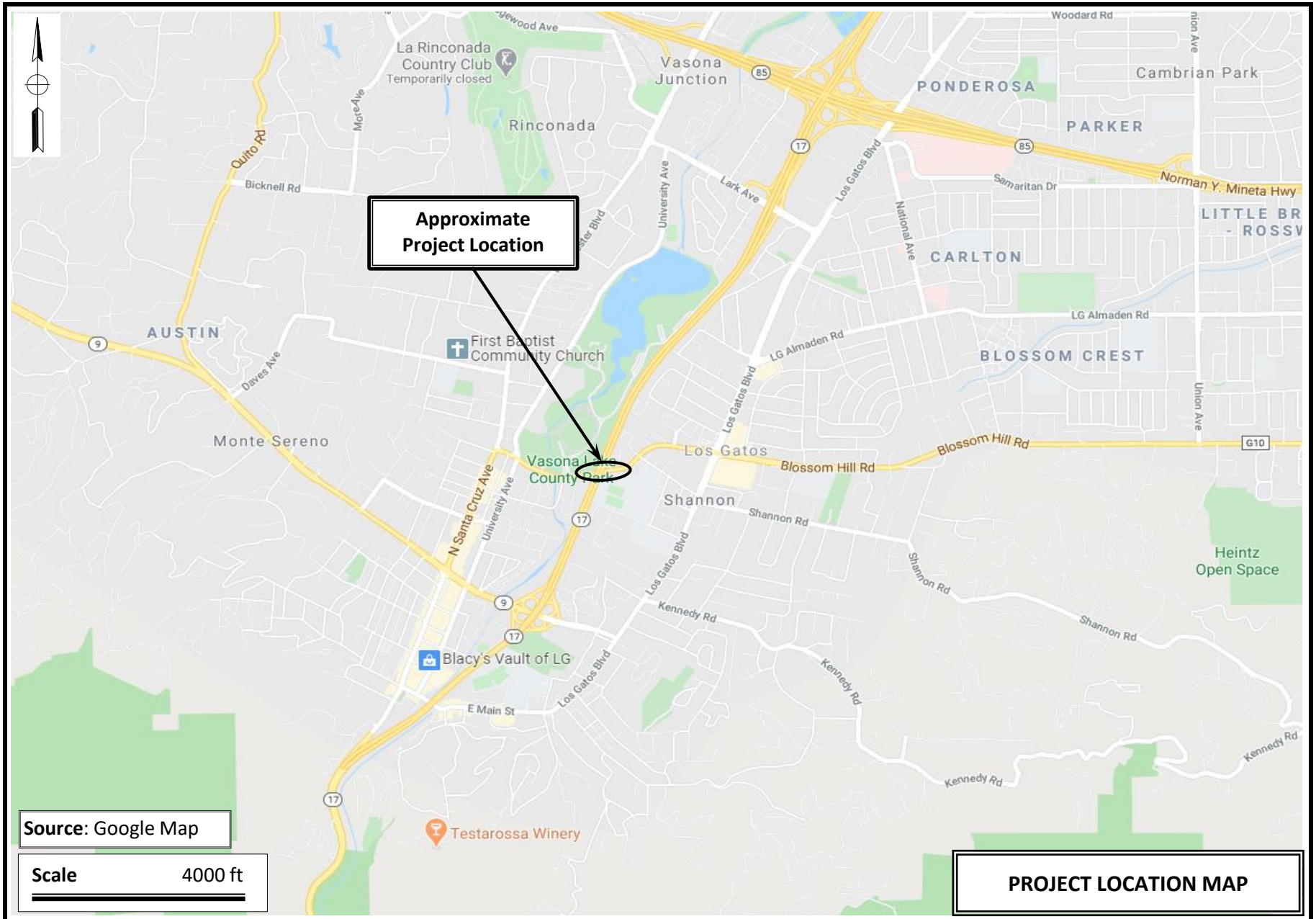
Please be advised that we are performing a professional service and that our conclusions are professional opinions only. All work done and all recommendations made are in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability 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, 08/25/20)
Caltrans As-Built General Plan and Foundation Plan (Br. No. 37-0148, 1955)

Attachment B - Recommended ARS Curve per Caltrans Guidelines

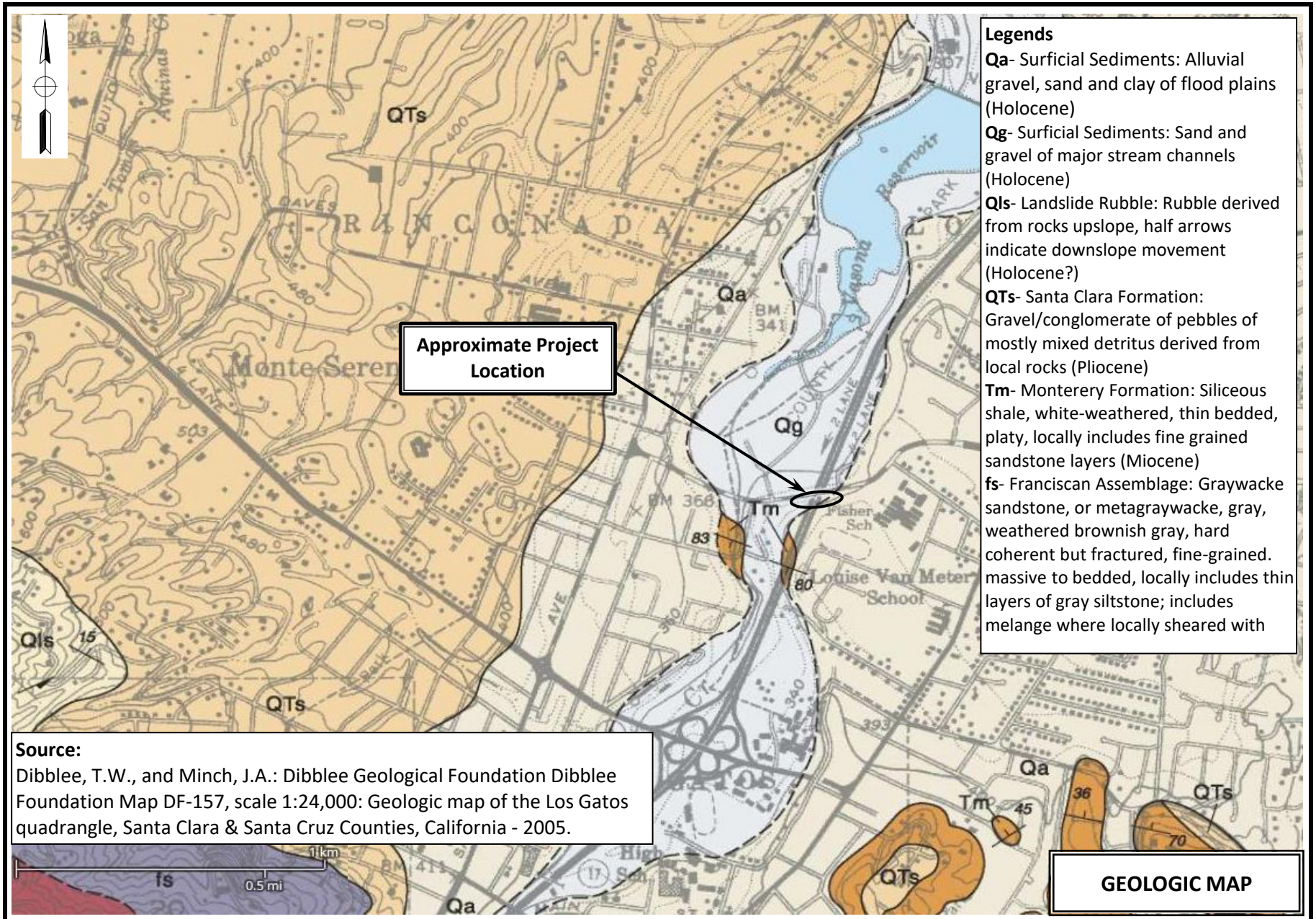
ATTACHMENT A



PARIKH
Practicing in the Geosciences

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

JOB NO.: 2019-150-PGR	Attachment A-1



PARIKH
Practicing in the Geosciences

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

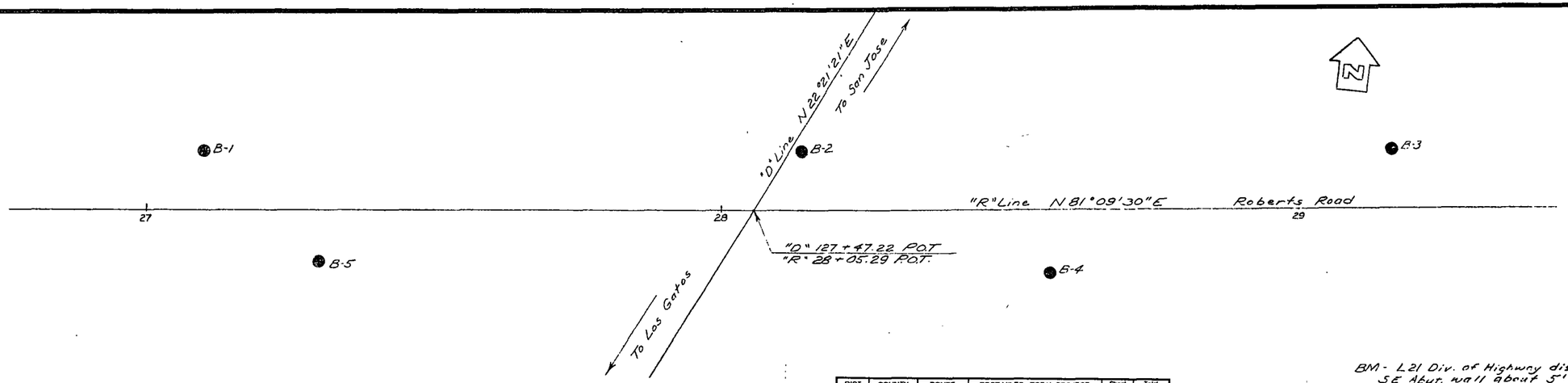
JOB NO.: 2019-150-PGR | **Attachment A-2**

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

DIST	COUNTY	ROUTE	SECTION	SHEET No	TOTAL SHEETS
IV	SCL	5	D		

BRIDGE ENGINEER ~~CIVIL~~ REGISTERED—LICENSE 0000

DATE APPROVED



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

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

CERTIFIED ENGINEERING GEOLOGIST — 5-2-94 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 EA: 134951

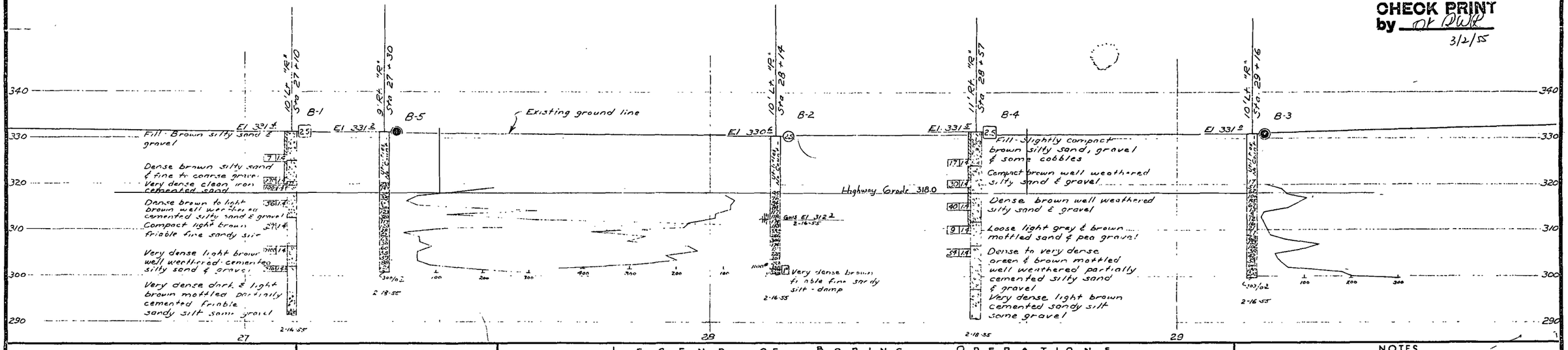
BRIDGE No. 37-148

REGISTERED GEOLOGIST — R W. FOX — No. 78 — Exp. 6-30-94 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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 DR DWR 3/2/95



CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

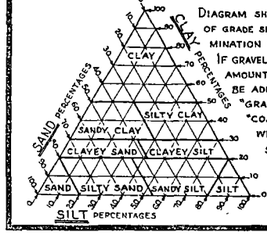


DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.

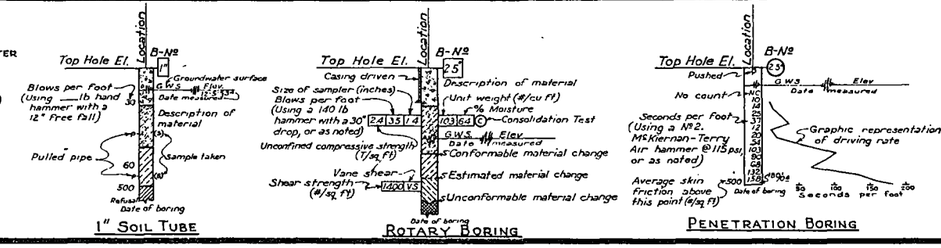
IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE", "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

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

- PLAN OF ANY BORING
- PENETROMETER
- 2¼" CONE PENETROMETER
- SAMPLER BORING (DRY)
- ROTARY BORING (WET)
- AUGER BORING (DRY)
- JET BORING
- CORE BORING
- TEST PIT

LEGEND OF BORING OPERATIONS



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.

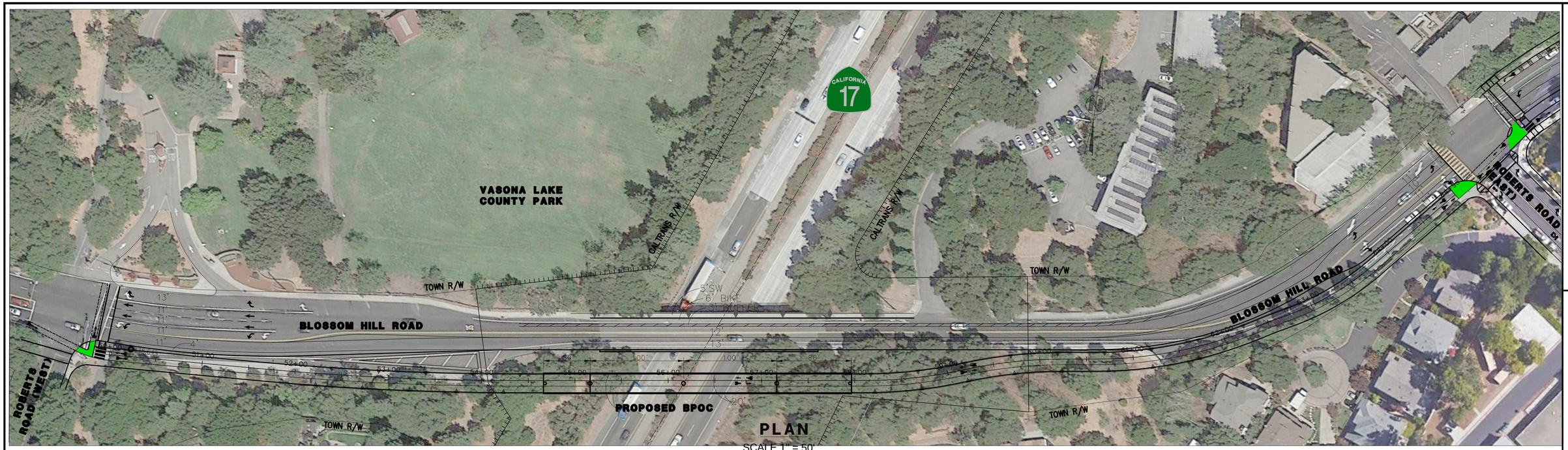
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ROBERTS ROAD OVERCROSSING

LOG OF TEST BORINGS

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

Attachment A-3



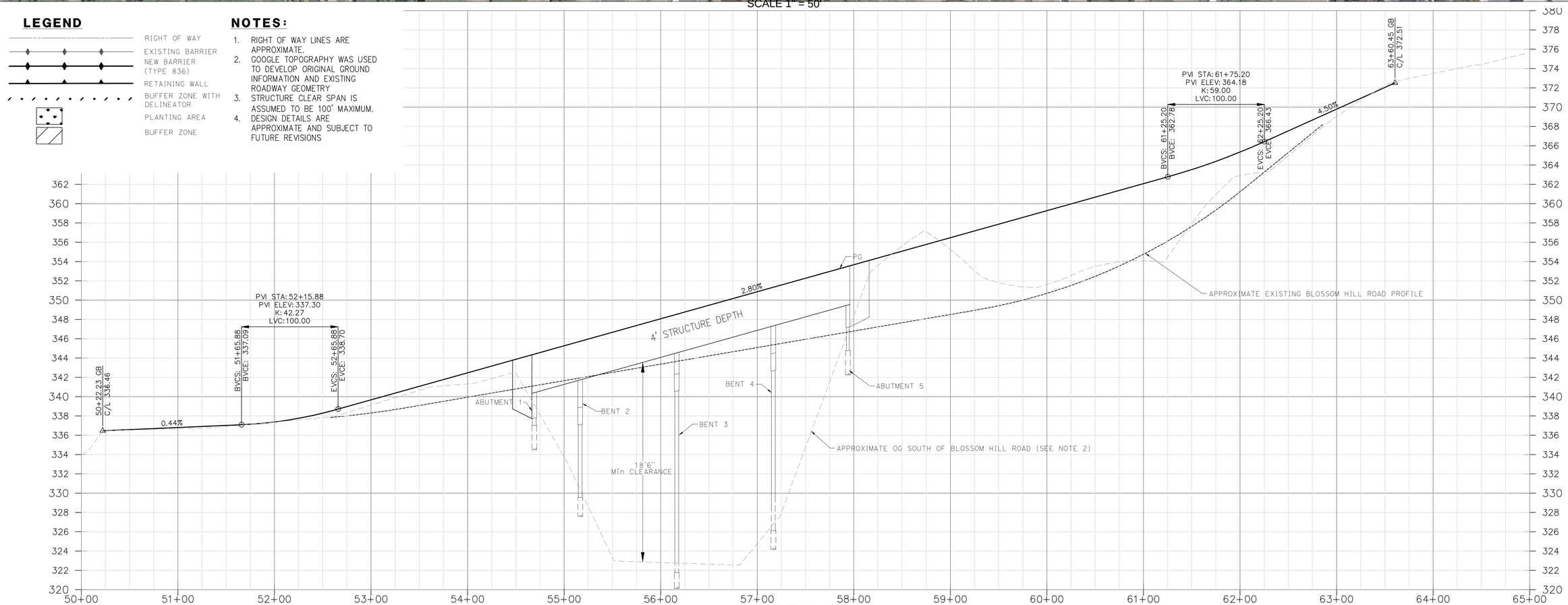
PLAN
SCALE 1" = 50'

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.
4. DESIGN DETAILS ARE APPROXIMATE AND SUBJECT TO FUTURE REVISIONS



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

Attachment A-4

BKF
4670 WILLOW ROAD
SUITE 250
PLEASANTON, CA 94588
925-396-7700
925-396-7799 (FAX)
BKF 100+ YEARS
ENGINEERS . SURVEYORS . PLANNERS

BLOSSOM HILL ROAD
HWY 17 BICYCLE AND PEDESTRIAN PROJECT
CYCLE TRACK

LOS GATOS — SANTA CLARA — CALIFORNIA

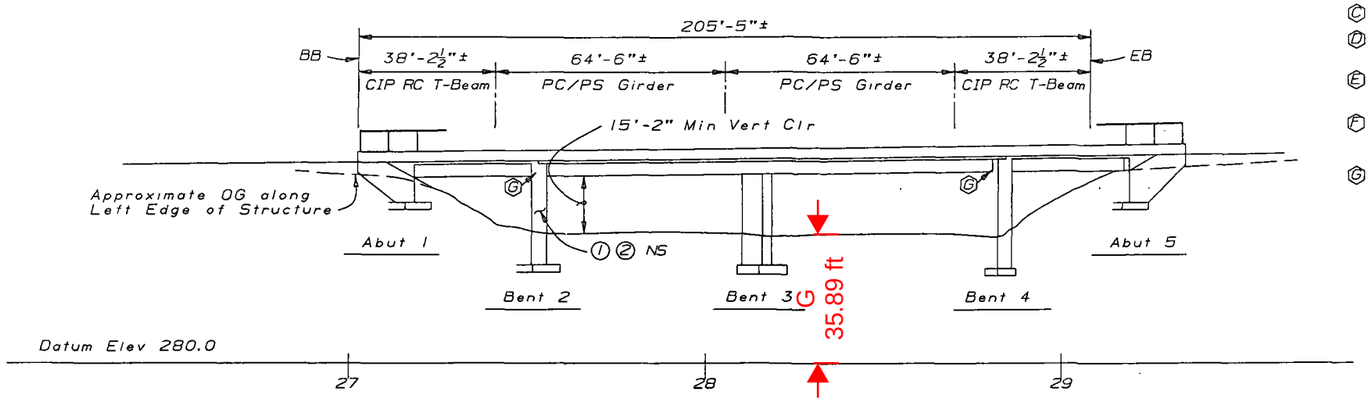
Revisions

No.	

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

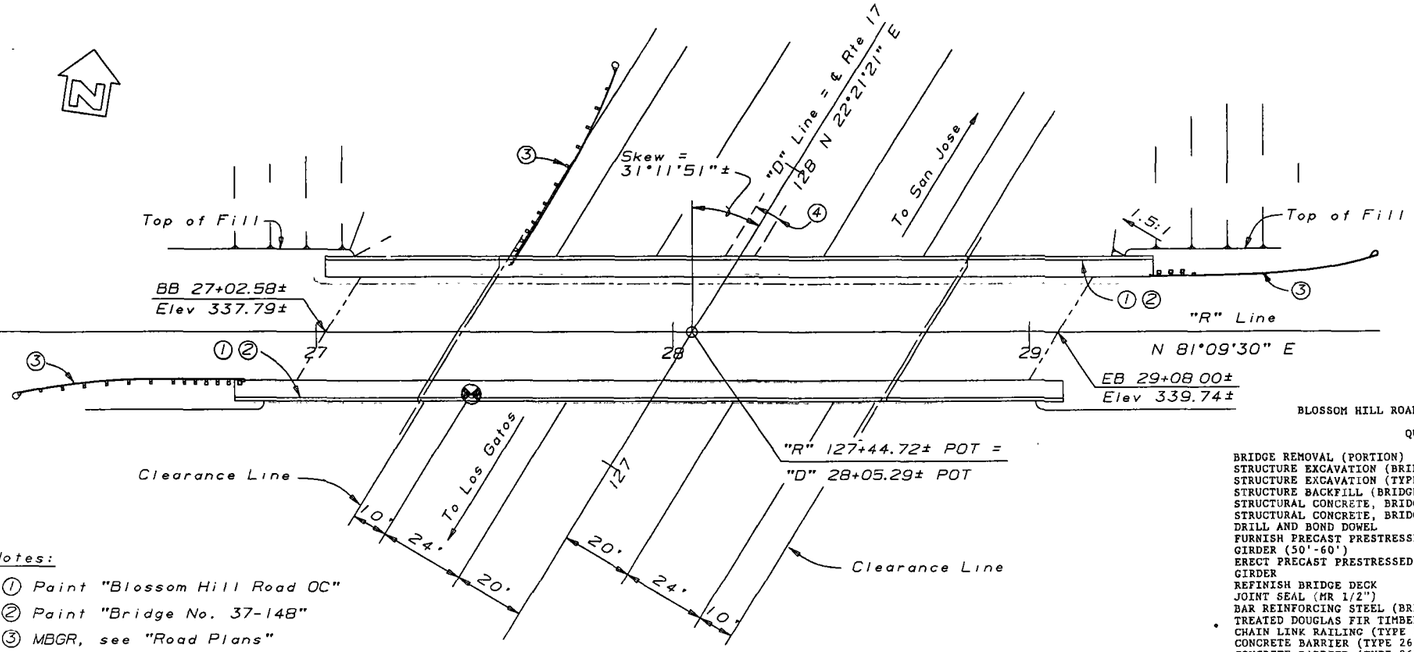
Drawing Number:
1

Note: Match existing grade and cross slope.



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

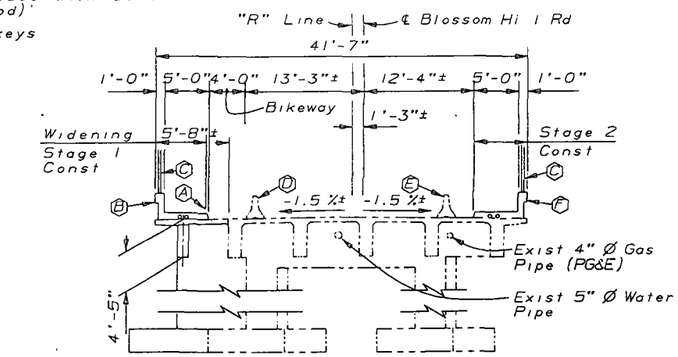
b. Timber blocking

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCl	17	7.7	15	27

REGISTERED ENGINEER - CIVIL

TIERNEY L. SANDERSON No 48605 Exp 6-30-96 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

5-2-94
PLANS APPROVAL DATE



TYPICAL SECTION

⅛" = 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

A62-C	Limits of Payment for Excavation and Backfill - Bridge
B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details
B0-13	Bridge Details
B6-1	T-Beam Details
B6-21	Joint Seals (Maximum Movement Rating = 2")
B11-52	Chain Link Railing Type 7
B11-54	Concrete Barrier Type 26

Standard Plan Sheet No.

Detail No.

BLOSSOM HILL ROAD OC (WIDEN) 37-148

QUANTITIES

	LUMP SUM
BRIDGE REMOVAL (PORTION)	LUMP SUM
STRUCTURE EXCAVATION (BRIDGE)	58 CY
STRUCTURE EXCAVATION (TYPE D)	117 CY
STRUCTURE BACKFILL (BRIDGE)	130 CY
STRUCTURAL CONCRETE, BRIDGE FOOTING	22 CY
STRUCTURAL CONCRETE, BRIDGE	135 CY
DRILL AND BOND DOWEL	210 LF
FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (50'-60')	2 EA
ERECT PRECAST PRESTRESSED CONCRETE GIRDER	2 EA
REFINISH BRIDGE DECK	210 SQFT
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: For "General Notes", see "Bent 2 & 4 Retrofit Details".

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

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	DIVISION OF STRUCTURES STRUCTURE DESIGN
DETAILS	BY K. Endow 9-93	CHECKED A. Christensen	LAYOUT	BY M Downs	CHECKED A. Christensen		
QUANTITIES	BY J Wiley	CHECKED T S / M D.	SPECIFICATIONS	BY Mary E Kapsa	PLANS AND SPECS COMPARED M E Kapsa		

STRUCTURES ENGINEER

DS 050 2.38 (CADD 4/89)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04
EA 134951

BRIDGE NO 37-148
POST MILE 7.6

DISREGARD PRINTS BEARING EARLIER REVISION DATES

BLOSSOM HILL ROAD OC - WIDEN

GENERAL PLAN

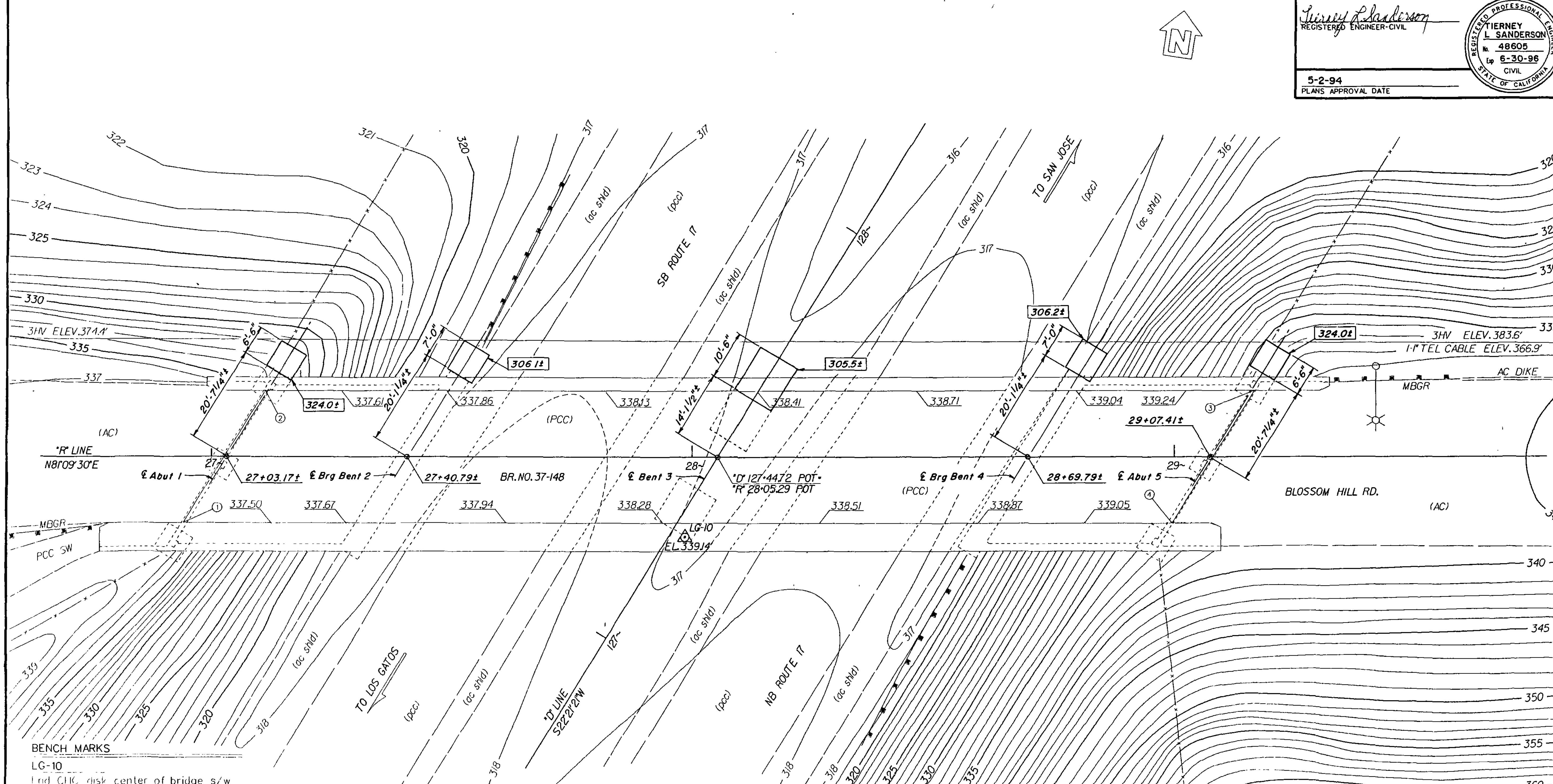
Attachment A-5

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

Tierney L Sanderson
REGISTERED ENGINEER-CIVIL

REGISTERED PROFESSIONAL ENGINEER
TIERNEY L SANDERSON
No. 48605
Exp 6-30-96
CIVIL
STATE OF CALIFORNIA

5-2-94
PLANS APPROVAL DATE



BENCH MARKS

LG-10
Fnd CHC disk center of bridge s/w
17.04' Lt of "R" Line Sta 27+98.49
El 339.14'

WP-B
Fnd hub & tack in Rt shld of SB lane
60.22' Lt of "D" Line Sta 128+78.73
El 315.85'

BRIDGE LOCATION @ toe of PCC curb

① 14.24' Rt. "R" 26+93.93 Elev.337.35'
② 14.05' Lt. "R" 27+10.78 Elev.337.45'
③ 13.99' Lt. "R" 29+16.02 Elev.339.32'
④ 14.05' Rt. "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

PRELIMINARY INVESTIGATION SECTION			
SCALE 1" = 10'	DATUM NGVD	PHOTOGRAMMETRY AS OF	
		SURVEYED BY DISTRICT	
ALIGNMENT PER		FIELD CHECKED BY	9/93
DRAWN BY JWR 9/93	TRACED BY JWR 10/93	CHECKED BY SMG 10/93	

	BY	CHECKED
DESIGN	M Downs	A Christensen
DETAILS	K Endow	A Christensen
QUANTITIES	J. Wiley	T.S / M.D

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURES DESIGN 10

BRIDGE NO. 37-148
POST MILE 7.67

BLOSSOM HILL RD. O.C. (WIDEN)
FOUNDATION PLAN

CU 04273
EA 134951

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 2 OF 13

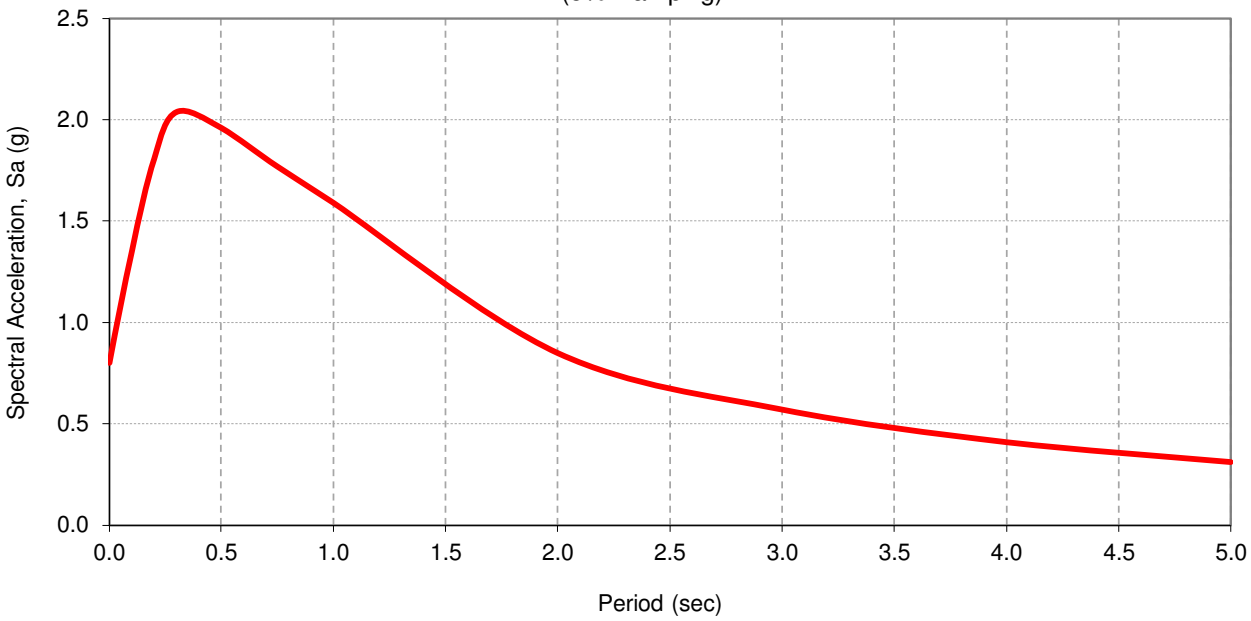
DS OSD 2145 (4/89)

Attachment A-6

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.

ARS Online V3.0.2

Using the tool: Specify latitude and longitude in decimal degrees in the input boxes below. Alternatively, **Google Maps** can be used to find the site location. Specify the time-averaged shear-wave velocity in the upper 30m (Vs30) in the input box. After submitting the data, the USGS 2014 hazard data for a 975-year return period will be reported along with adjustment factors required by Caltrans Seismic Design Criteria (SDC) V2.0.

Latitude: 37.2344 **Longitude:** -121.9709 **Vs30 (m/s):** 295 Submit

Caltrans Design Spectrum (5% damping)

Period(s)	Sa_{2008}(g)	Sa_{2014}(g)	$Basin_{2008}$	$Basin_{2014}$	Near Fault Amp	Design Sa_{2008}(g)	Design Sa_{2014}(g)
PGA	0.75	0.8	1	1	1	0.75	0.8
0.10	1.3	1.35	1	1	1	1.3	1.35
0.20	1.61	1.81	1	1	1	1.61	1.81
0.30	1.64	2.04	1	1	1	1.64	2.04
0.50	1.48	1.96	1	1	1	1.48	1.96
0.75	1.28	1.6	1	1	1.1	1.4	1.77
1.0	1.05	1.33	1	1	1.2	1.26	1.59
2.0	0.59	0.71	1	1	1.2	0.71	0.85
3.0	0.4	0.47	1	1	1.2	0.48	0.57
4.0	0.29	0.34	1	1	1.2	0.35	0.41
5.0	0.23	0.26	1	1	1.2	0.28	0.31

Copy table

Deaggregation (based on 2014 hazard)

mean magnitude (for PGA)	7.28
mean site-source distance (km, for Sa at 1s)	7.7

Option: recalculate Near Fault amplification with user specified distance

Site-source distance (km): 7.86 Update