US 101 Express Lanes Project
Santa Clara County, California

Location Hydraulic Study Report

Prepared for: Prepared by:

Caltrans VTA URS WRECO

July 2013
US 101 Express Lanes Project
Santa Clara County, California

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Submitted to:
Santa Clara Valley Transportation Authority and
California Department of Transportation

This report has been prepared by or under the supervision of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained herein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

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Registered Civil Engineer

Date 7/14/13

July 2013
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Executive Summary

Santa Clara Valley Transportation Authority (VTA), in cooperation with the California Department of Transportation (Caltrans), proposes to convert the existing High Occupancy Vehicle (HOV) lanes along the United States Highway 101 (US 101) to High-Occupancy Toll (HOT) lanes (hereafter known as express lanes) and add a second express lane in each direction on northbound and southbound US 101 within the overall project limits of East Dunne Avenue interchange in Morgan Hill to the Santa Clara/San Mateo County line just north of the Oregon Expressway/Embarcadero Road interchange in Palo Alto. The express lanes will allow HOVs and eligible clean air vehicles to continue to use the lanes for free and eligible single-occupant vehicles (SOVs) to pay a toll. The project will also convert the US 101/State Route (SR) 85 HOV direct connectors in Mountain View to express lane connectors and restripe the northern 1.1 mile of SR 85 to introduce a buffer separating the mixed flow lanes from the express lane and connecting the SR 85 express lanes to the US 101 express lanes. A project Vicinity Map and project Location Map are shown in Figure 1. The project length is 36.55 mi on US 101 and 1.1 mi on SR 85, for a total of 37.65 mi.

The purpose of this Location Hydraulic Study is to examine and analyze the existing floodplains within the project limits, document any potential impacts to, or encroachments upon, these floodplains, and recommend mitigation that may be required. As defined by the Federal Highway Administration (FHWA), a significant encroachment is a highway encroachment and any action to promote base floodplain development that would involve one or more of the following construction or flood related impacts: 1) a significant potential for the interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route; 2) a significant risk; or 3) a significant adverse impact on the natural and beneficial floodplain values (FHWA, 1994).

Twelve major waterways cross US 101 within the project limits, with Coyote Creek crossing the highway alignment four times, for a total of 15 crossings. Eleven of these crossings are bridges, and four of them are culverts.

Floodplains within the project limits were identified using the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs). The FIRMs further categorize these areas into different flood hazard zones. Flood Zone AE represents areas with a 1% annual chance of flooding, where base flood elevations have been determined in the Flood Insurance Study (FIS) by detailed methods of analysis. Flood Zone AO represents areas with a 1% chance of shallow flooding with specified flood depths of 1 to 3 ft. Flood Zone A represents areas with a 1% annual chance of shallow flooding, where the floodplain has been analyzed by approximate methods based on historic information, existing hydrologic analyses, available data, and field observations, and base flood elevations have not been determined. Flood Zone AH represents areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with specified flood depths of 1 to 3 ft. Zone X (shaded) represents the areas between the 1% and 0.2% annual chance floodplains, areas protected from the 1% annual chance flood by levees, or shallow
Flooding with average depths of less than 1 ft. Zone X (un-shaded) represents areas of minimal flood hazard, usually depicted on FIRMs as above the 0.2% annual chance flood level.

The project does not constitute a longitudinal encroachment of the base floodplain. Coyote Creek generally runs parallel to US 101 and crosses US 101 four times within the project limits, however, the project will not propose fill that will decrease the flow area in the Coyote Creek floodplains. The project will retain the existing double thrie beam barriers within any floodplains, or replace them with structures that will not attenuate flow within the project limits.

Widening will be done in the median and the edges of US 101 in the project corridor. At most locations, the proposed widening is completely outside any floodplains; at other locations, there will be fill within the floodplains, but the fill will not significantly raise the grade or significantly decrease the flow area, and the areas of fill are insignificant compared to the overall floodplain areas. Therefore, the impacts to the floodplains due to fill will be minimal and no mitigation will be required.

Impervious areas will increase along US 101 as a result of the roadway widening. The increase in impervious area, however, will be minimal in comparison to the overall size of the watersheds for the creeks or floodplains. The largest increase in impervious area is less than 0.4% (see Table A). Thus, there will be insignificant increases in water surface elevation at each of these areas, and no mitigation will be required.

See Table A for a summary of floodplain impacts as a result of this project.

This project will not support incompatible floodplain development. The project will only widen and reconfigure the existing highway, and will not create new access to developed or undeveloped land.

Various areas within the project limits have natural and beneficial floodplain values. These areas include waters of the U.S., potential wetlands, and varying types of riparian forest. None of the work is anticipated to take place in these areas, but the contractor will be required to protect them when work is conducted in adjacent areas. Therefore, no special mitigation measures will be necessary for this project.

The project will improve the traffic conditions on US 101 in both directions in Santa Clara County by creating express lanes. There will be no roadway alignment modifications or significant changes in grade. There will be no bridge, cross culvert, or channel modifications at the major waterway crossings as part of this project, and all overall existing drainage patterns will be maintained.
## Table A. Summary of Base Floodplain Impacts

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<th>Route</th>
<th>Approx. Floodplain Post Mile</th>
<th>Approx. Floodplain Station</th>
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<th>% Area of Fill&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Added Impervious Area</th>
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<th>Level of Impact</th>
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Note:

1. Area of fill in the floodplain compared to the overall floodplain area.
Acronyms

BSA   Biological Study Area
BMPs  Best Management Practices
ESA   Environmentally Sensitive Area
FEMA  Federal Emergency Management Agency
FIRM  Flood Insurance Rate Map
FIS   Flood Insurance Study
ft    Feet
HOV   High Occupancy Vehicle
LOMR  Letter of Map Revision
mi    Mile
NAVD 88 North American Vertical Datum of 1988
NES   Natural Environment Study
RCB   Reinforced Concrete Box
SCVWD Santa Clara Valley Water District
SOV   Single-Occupant Vehicle
sq mi Square Mile
SR    State Route
SWPPP Storm Water Pollution Prevention Plan
US    United States Highway
USGS  United States Geological Survey
VTA   Santa Clara Valley Transportation Authority
WSE   Water Surface Elevation
1 GENERAL DESCRIPTION

1.1 Introduction

Santa Clara Valley Transportation Authority (VTA), in cooperation with the California Department of Transportation (Caltrans), proposes to convert the existing High-Occupancy Vehicle (HOV) lanes along the United States Highway 101 (US 101) to High-Occupancy Toll (HOT) lanes (hereafter known as express lanes) and add a second express lane in each direction on northbound and southbound US 101 within the overall project limits of the East Dunne Avenue interchange in Morgan Hill to the Santa Clara/San Mateo County line just north of the Oregon Expressway/Embarcadero Road interchange in Palo Alto. The express lanes will allow HOVs and eligible clean air vehicles to continue to use the lanes for free and eligible single-occupant vehicles (SOVs) to pay a toll. The project will also convert the US 101/State Route (SR) 85 HOV direct connectors in Mountain View to express lane connectors and restripe the northern 1.1 mile of SR 85 to introduce a buffer separating the mixed flow lanes from the express lane and connecting the SR 85 express lanes to the US 101 express lanes. A project Vicinity Map and project Location Map are shown in Figure 1. The project length is 36.55 mi on US 101 and 1.1 mi on SR 85, for a total of 37.65 mi.

1.2 Project Description

1.2.1 Existing Facilities

US 101 in Santa Clara County is a 52.55-mile long freeway that connects Gilroy to Palo Alto. US 101 passes through Gilroy, Morgan Hill, San Jose, Santa Clara, Sunnyvale, Mountain View and Palo Alto. US 101 intersects SR 85 in San Jose and in Mountain View, I-280/I-680, I-880, SR 87, and SR 237. US 101 typically has 4 lanes in each direction, including 3 mixed-flow lanes and 1 HOV lane with auxiliary lanes in some locations.

1.2.2 Proposed Project

The project consists of converting the existing HOV lane along both northbound and southbound US 101 into an express lane and widening the freeway to add a second express lane for the majority of the corridor. The project also proposes to build new express lanes in the northbound direction between East Dunne Avenue and the existing HOV lane at Cochrane Road, and in the southbound direction between Burnett Avenue and East Dunne Avenue.

With these changes, there would be two express lanes on US 101 extending from approximately the Cochrane Road interchange in Morgan Hill to just south of the Oregon Expressway/Embarcadero Road interchange in Palo Alto in the northbound direction, and from just south of the Oregon Expressway/Embarcadero Road interchange to just north of East Dunne Avenue in the southbound direction.
Figure 1. Project Location and Vicinity Map

Source: URS Corporation
**Build Alternative**

The addition of the second express lane will involve a combination of inside and outside widening. The majority of the inside widening will occur within the US 101 segments south of the SR 85/US 101 interchange in southern Santa Clara County where a wide unpaved median exists. The project proposes to widen and pave the median to accommodate the additional lanes. The outside widening will occur in the remainder of the corridor to accommodate the additional lanes where needed.

The express lanes facility would be separated from the adjacent mixed-flow lanes by a striped buffer. The buffer zone, delineated with solid stripes, will have designated openings to provide access into and out of the express lanes facility. The express lanes will allow HOVs to continue to use the lanes without cost and eligible SOVs to pay a toll.

The project proposes to construct and operate the express lane system with some non-standard cross sectional elements which will minimize the need for new right-of-way, outside widening, and structure reconstruction. The proposed project maximizes the use of the existing pavement cross section with a combination of inside and outside widening to create the additional pavement needed to accommodate the second express lane.

**Right of Way**

It is anticipated that the project will require Temporary Construction Easements (TCE). Right of way activities are currently being coordinated based on the approval of design exceptions. Utility relocations are anticipated to accommodate the outside widening.

**Construction Activities**

In the section between the southern project limit and the SR 85 interchange in southern San Jose, where the median width varies between 46 and 86 ft, pavement widening would be constructed in the median to accommodate the dual express lane facility. A retaining wall in the median is required to accommodate the inside widening where a split profile exists between northbound and southbound US 101. A dual express lane facility is proposed for the majority of the corridor, with the exception of short segments near the SR 85 express lane connectors where a single express lane is proposed. A single express lane is proposed between the SR 85 interchange and the Blossom Hill Road interchange in San Jose, and between the Mathilda Avenue interchange and the SR 85 interchange in Mountain View. Outside widening is proposed to accommodate dual express lanes between the Blossom Hill Road interchange and the Mathilda Avenue interchange. Modifications and relocations of highway drainage facilities are proposed as part of the project improvements.

Bridge widening will be required at a number of grade separations and undercrossings, as well as modifications to existing overcrossing abutments, which can be found in Table 1 and Table 2. Widening of creek bridges is not anticipated at this time pending the approval of non-standard cross sectional features.
Table 1. Proposed Bridge Widening

<table>
<thead>
<tr>
<th>Bridge No.</th>
<th>Post Mile</th>
<th>Bridge Name</th>
<th>Type of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>37-344</td>
<td>21.25</td>
<td>Coyote Creek Golf Drive UC</td>
<td>Widen Bridge (Inside)</td>
</tr>
<tr>
<td>37-404</td>
<td>21.55</td>
<td>Utility Facility UC (Golf Course)</td>
<td>Widen Bridge (Inside)</td>
</tr>
<tr>
<td>37-347</td>
<td>27.01</td>
<td>Bernal Rd UC</td>
<td>Widen Bridge (Inside)</td>
</tr>
<tr>
<td>37-108</td>
<td>29.72</td>
<td>Coyote Rd UC</td>
<td>Widen Bridge (Inside and Outside)</td>
</tr>
<tr>
<td>37-409</td>
<td>31</td>
<td>Yerba Buena Rd UC</td>
<td>Widen Bridge (Inside and Outside)</td>
</tr>
</tbody>
</table>

Source: URS Corporation

Table 2. Proposed Modification to Bridge Abutments

<table>
<thead>
<tr>
<th>Bridge No.</th>
<th>Post Mile</th>
<th>Bridge Name</th>
<th>Type of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>37-668</td>
<td>33.03</td>
<td>Tully Rd OC</td>
<td>Modify Abutments</td>
</tr>
<tr>
<td>37-222</td>
<td>35.46</td>
<td>San Antonio St OC</td>
<td>Modify Abutments</td>
</tr>
<tr>
<td>37-48</td>
<td>35.76</td>
<td>Santa Clara St OC</td>
<td>Modify Abutments</td>
</tr>
<tr>
<td>37-123</td>
<td>36.12</td>
<td>Julian/McKee OC</td>
<td>Modify NB Abutment</td>
</tr>
<tr>
<td>37-115</td>
<td>37.99</td>
<td>North San Jose UP</td>
<td>Modify SB Abutment</td>
</tr>
<tr>
<td>37-118</td>
<td>38.09</td>
<td>10th Street OC</td>
<td>Modify SB Abutment</td>
</tr>
<tr>
<td>37-403R</td>
<td>39.90</td>
<td>Route 87/101 SEP</td>
<td>Modify SB Abutment</td>
</tr>
<tr>
<td>37-183G</td>
<td>39.91</td>
<td>Jct 87/101 SEP</td>
<td>Modify SB Abutment</td>
</tr>
<tr>
<td>37-390</td>
<td>42.73</td>
<td>Bowers Ave OC</td>
<td>Modify Abutments</td>
</tr>
<tr>
<td>37-152</td>
<td>43.85</td>
<td>Lawrence Expwy</td>
<td>Modify Abutments</td>
</tr>
</tbody>
</table>

Source: URS Corporation

The piles for the overhead signs would be up to 6 ft in diameter and extend to approximately 30 ft below ground surface. The piles for the tolling devices would be up to 2.5 ft in diameter and would extend to approximately 10 ft below ground surface. Some Traffic Operations Systems (TOS) equipment such as traffic monitoring stations, Closed Circuit Televisions, cabinets, and controllers would be installed along the outside edge of pavement within the existing right-of-way.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 ft below the roadway surface. Conduits would be jacked across the freeway to the median where needed to provide power and communication feeds to the new overhead signage and tolling equipment. During construction, some lane and ramp closures would be required, but full freeway closures are not expected.
Biofiltration swales are proposed to provide storm water treatment for impervious areas that would be added or reworked as part of the project. These swales would be installed within the existing right-of-way.

**US 101/SR 85 Direct Connectors**

At the south end of the project in southern San Jose, both the northbound and southbound HOV direct connectors from SR 85 to US 101 (PM 26.78) will be converted to express lane connectors by the SR 85 Express Lanes Project (EA #04-4A7900), allowing SOVs with valid FasTrak devices to use the direct connectors.

At the north end of the project in Mountain View (PM 48.09), the US 101 Express Lanes Project will convert the existing HOV connectors to express lane connectors and will extend the buffer striping onto SR 85 to connect to the buffer constructed by the SR 85 Express Lanes Project. The combination of the SR 85 and US 101 Express Lanes projects will provide a complete express lane system on both freeways that includes the direct connectors.

**No Build Alternative**

The No Build Alternative assumes no modifications would be made to the current US 101 corridor, including the continuous access HOV lane, other than routine maintenance and rehabilitation of the facility and any currently planned and programmed projects within the area.

**1.3 Creek, Stream, and River Crossings**

Twelve major waterways cross US 101 within the project limits, with Coyote Creek crossing the highway alignment four times for a total of 15 crossings (see Figure 2). Eleven of these crossings are bridges, and the remaining four are cross culverts. These crossings were located from Federal Emergency Management Agency (FEMA) maps, as-built record drawings, Caltrans Structure Maintenance Logs, aerial photographs and site visits by WRECO staff on January 6 and January 11, 2012. The sizes and types of these crossings are discussed in the following sections and listed in Table 3. All creeks that pass through the project limits are maintained by the Santa Clara Valley Water District (SCVWD).

All stations in this document are referenced to the stations as shown on the pavement delineation plan of this project (see Appendix D).
### Table 3. Creek, Stream, and River Crossings within Project Limits

<table>
<thead>
<tr>
<th>No.</th>
<th>Crossing</th>
<th>Route</th>
<th>Post mile</th>
<th>Station</th>
<th>Description of Structure</th>
<th>Bridge Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coyote Creek</td>
<td>US 101</td>
<td>R019.21</td>
<td>232+50</td>
<td>410 ft long x 72 ft wide multiple prestressed box beam or girder bridge</td>
<td>37-0349L, 37-0349R</td>
</tr>
<tr>
<td>2</td>
<td>Coyote Creek</td>
<td>US 101</td>
<td>R026.47</td>
<td>617+00</td>
<td>474 ft long x 95 ft wide multiple prestressed box beam or girder bridge</td>
<td>37-0346L, 37-0346R, 37-0346E, 37-0346G</td>
</tr>
<tr>
<td>3</td>
<td>Coyote Creek</td>
<td>US 101</td>
<td>29.83</td>
<td>811+50</td>
<td>403 ft long x 72 ft wide steel multi-beam or girder</td>
<td>37-0102L, 37-0102R</td>
</tr>
<tr>
<td>4</td>
<td>Upper Silver Creek</td>
<td>US 101</td>
<td>31.15</td>
<td>881+00</td>
<td>Unknown</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>Lower Silver Creek</td>
<td>US 101</td>
<td>36.37</td>
<td>1155+00</td>
<td>63 ft long by 159 ft wide-3 span concrete slab bridge</td>
<td>37-0097</td>
</tr>
<tr>
<td>6</td>
<td>Coyote Creek</td>
<td>US 101</td>
<td>36.69</td>
<td>1173+00</td>
<td>200 ft long x 147 ft wide-6 span concrete tee beam</td>
<td>37-0039</td>
</tr>
<tr>
<td>7</td>
<td>Guadalupe River</td>
<td>US 101</td>
<td>40.19</td>
<td>1357+50</td>
<td>50 ft x 176 ft prestressed box beam or girders; 50 ft x 142 ft concrete tee beam</td>
<td>37-0037, 37-0037S</td>
</tr>
<tr>
<td>8</td>
<td>San Tomas Aquino Creek</td>
<td>US 101</td>
<td>42.45</td>
<td>1465+60</td>
<td>92 ft long x 166 ft wide concrete slab bridge</td>
<td>37-0041</td>
</tr>
<tr>
<td>9</td>
<td>Calabazas Creek</td>
<td>US 101</td>
<td>43.32</td>
<td>1522+00</td>
<td>40 ft long x 325 ft wide 3 span reinforced concrete culvert</td>
<td>37-0399</td>
</tr>
<tr>
<td>10</td>
<td>Sunnyvale East Channel</td>
<td>US 101</td>
<td>44.69</td>
<td>1594+10</td>
<td>12 ft x 8 ft reinforced concrete box culvert</td>
<td>N/A</td>
</tr>
<tr>
<td>11</td>
<td>Sunnyvale West Channel</td>
<td>US 101</td>
<td>45.87</td>
<td>1656+70</td>
<td>Unknown</td>
<td>N/A</td>
</tr>
<tr>
<td>12</td>
<td>Stevens Creek</td>
<td>US 101</td>
<td>48.04</td>
<td>1771+30</td>
<td>50 ft long by 20 ft wide dual span concrete bridge</td>
<td>37-0034</td>
</tr>
<tr>
<td>13</td>
<td>Permanente Creek</td>
<td>US 101</td>
<td>49.19</td>
<td>1832+00</td>
<td>12 ft x 12 ft reinforced concrete box culvert</td>
<td>N/A</td>
</tr>
<tr>
<td>14</td>
<td>Adobe Creek</td>
<td>US 101</td>
<td>50.66</td>
<td>1909+70</td>
<td>65 ft long by 133 ft wide single span concrete bridge</td>
<td>37-0174</td>
</tr>
<tr>
<td>15</td>
<td>Matadero Creek</td>
<td>US 101</td>
<td>51.37</td>
<td>1947+50</td>
<td>81 ft long by 133 ft wide single span concrete bridge</td>
<td>37-0040</td>
</tr>
</tbody>
</table>

Source: California Log of Bridges on State Highways
Figure 2. Major Waterway Crossings
1.3.1 **Coyote Creek**

The Coyote Creek watershed is the largest watershed in the Santa Clara Basin. It drains approximately 320 sq mi from the Diablo Range on the east side of the basin. Coyote Creek originates from the mountains northeast of the City of Morgan Hill, flows northwest for 42 mi and flows into Lower San Francisco Bay. At the base of the Diablo Range, Coyote Creek is impounded by two dams, which form Coyote Reservoir and Anderson Reservoir.

Coyote Creek runs through unincorporated agricultural and rapidly urbanizing land between the cities of Morgan Hill and San Jose. It then runs through the urbanized area in the City of San Jose and the lower edge of Milpitas before reaching the Lower South San Francisco Bay.

Coyote Creek crosses US 101 four times within the project area. These crossings are described below.

1.3.1.1 **Coyote Creek at US 101 (PM-19.21)**

Coyote Creek crosses US 101 approximately 0.6 mi north of the Burnett Avenue overcrossing. The creek crosses the highway through two 410 ft long by 71 ft wide three-span bridge structures (one for northbound US 101 and the other for southbound US 101) (see Photo 1).

![Photo 1. Coyote Creek at Bridge Under US 101, PM-19.21(Looking Upstream)](image-url)
1.3.1.2 Coyote Creek at US 101 (PM-26.47)
Coyote Creek is conveyed under US 101 via four separate bridges ranging from 474 ft to 773 ft in length and from 47 to 95 ft in width at this location. The creek is in a partially straightened gravel and earth channel with riparian vegetation surrounding, but not under the bridges (see Photo 2).

Photo 2. Coyote Creek at Bridge Under US 101, PM-26.47 (Looking Downstream)

1.3.1.3 Coyote Creek at US 101 (PM-29.83)
Coyote Creek crosses US 101 approximately 0.1 mi north of the Coyote Road undercrossing in the City of San Jose. The creek crosses the highway through two 406 ft long by 72 ft wide four-span bridge structures (one for northbound US 101 and the other for southbound US 101) (see Photo 3).

Photo 3. Coyote Creek at Bridge Under US 101, PM-29.83 (Looking Downstream)
1.3.1.4 Coyote Creek at US 101 (PM-36.69)

Coyote Creek crosses US 101 between the Taylor Street overcrossing to the northwest and the East San Jose underpass to the southwest in the City of San Jose. The creek crosses US 101 through a 197 ft long by 147 ft wide six-span bridge (see Photo 4).

Photo 4. Coyote Creek at Bridge Under US 101, PM-36.69 (Looking Upstream)
1.3.2 upper silver creek at us 101 (pm-31.15)

upper silver creek, which is approximately 7 mi long is one of the tributaries that drain to coyote creek. it watershed drains approximately 6 sq mi. it crosses us 101 in the city of san jose. upstream of the us 101 crossing, the creek is a concrete-lined trapezoidal channel (see photo 5) that runs parallel to the us 101 northbound on-ramp. then it crosses us 101 through a culvert (size unknown) that daylights and becomes a concrete-lined trapezoidal channel that runs parallel to southbound us 101. it then makes a 90-degree bend and flows into coyote creek approximately 0.5 mi southwest of us 101.

historically, upper silver creek (and thompson creek) flowed into a large freshwater marsh in the evergreen area of santa clara county. the marsh served as the headwaters of lower silver creek but was drained for flood control and urban development. later in the 1970s, upper silver creek was shunted into a flood control channel draining directly into coyote creek (scvwd).

photo 5. upper silver creek at box culvert under us 101 (looking downstream)
1.3.3 Lower Silver Creek at US 101 (PM-36.37)

Lower Silver Creek is one of the tributaries that drain to Coyote Creek. The Lower Silver Creek watershed drains approximately 43.5 sq mi. Lower Silver Creek originates near Silver Road and flows northerly to the Lake Cunningham area, then flows in a northwesterly direction to its confluence with Coyote Creek in the City of San Jose. The tributaries of Lower Silver Creek include, from south to north, Norwood Creek, Ruby Creek, Flint Creek, South Babb Creek, North Babb Creek, and Miguelita Creek.

The lowland areas within the Lower Silver Creek Watershed are predominantly urban. The upland areas are devoted to uses from rangelands to wildlife habitat, and are largely located outside of the City of San Jose and in unincorporated areas of Santa Clara County.

Lower Silver Creek crosses US 101 approximately 0.2 mi northwest of the McKee Road overcrossing. It crosses the highway through a 63 ft long by 156 ft wide three-span bridge, and then flows into Coyote Creek approximately 0.4 mi downstream of this bridge crossing (see Photo 6).

1.3.4 Guadalupe River at US 101 (PM-40.19)

The Guadalupe River watershed drains approximately 171 sq mi. It originates from the eastern Santa Cruz Mountains near the summit of Loma Prieta. The Guadalupe River actually begins on the valley floor at the confluence of Alamitos Creek and Guadalupe Creek just downstream of Coleman Road in San Jose. It flows north for approximately 14 mi and discharges into the Lower South San Francisco Bay via Alviso Slough. It runs through the town of Los Gatos, and the cities of San Jose, Campbell, and Santa Clara. The major tributaries include Ross Creek, Canoas Creek, and Los Gatos Creek. Six
major reservoirs exist in the Guadalupe River watershed: Calero Reservoir on Calero Creek, Guadalupe Reservoir on Guadalupe Creek, Almaden Reservoir on Alamitos Creek, Vasona Reservoir, Lexington Reservoir, and Lake Elsman on Los Gatos Creek.

The upper watershed is composed of predominantly heavily forested areas with pockets of low-density development. As the creek runs through the alluvial foothills, residential density gradually increases to high density in the lower watershed. Commercial development is concentrated along major streets, and industrial development is concentrated closer to the bay, mostly downstream of the El Camino Real crossing.

Guadalupe River crosses US 101 just west of the SR 87/US 101 separation in the City of San Jose. It crosses the US 101 mainline through a 142 ft long by 174 ft wide four-span bridge (see Photo 7). It then also crosses the US 101 northbound on-ramp through a 176 ft long by 50 ft wide dual-span bridge.

Photo 7. Guadalupe River at Bridge under US 101 (Looking Downstream)
1.3.5 San Tomas Aquino Creek at US 101 (PM-42.45)

The San Tomas Aquino Creek watershed drains approximately 45 sq mi. San Tomas Aquino Creek flows northerly from the forested foothills of the Santa Cruz Mountains, through the cities of Campbell and Santa Clara, into Guadalupe Slough, and finally into Lower South San Francisco Bay. Several major tributaries to San Tomas Aquino Creek include Saratoga Creek, Wildcat Creek, Smith Creek, and Vasona Creek. The largest tributary to San Tomas Aquino Creek is Saratoga Creek. It drains approximately 17 sq mi and joins San Tomas Aquino Creek 1.5 mi upstream of US 101. The majority of San Tomas Aquino Creek has been modified and concrete-lined, from the Smith Creek Confluence in the upper reaches, downstream to US 101.

Over half of the San Tomas Aquino Creek watershed is developed as high-density residential area. The rest of the area within the watershed includes industrial/commercial uses (18.8%) and forest (23.7%).

San Tomas Aquino Creek crosses US 101 approximately 0.3 mi west of Montague Expressway in the City of Santa Clara, through a 92 ft long by 166 ft wide three-span bridge (see Photo 8).

![Photo 8. San Tomas Aquino Creek at Bridge under US 101 (Looking Downstream)](image-url)
1.3.6 Calabazas Creek at US 101 (PM-43.32)

The Calabazas Creek watershed covers approximately 20 sq mi. Calabazas Creek originates from the northeast-facing slopes of the Santa Cruz Mountains, flows through a small portion of unincorporated Santa Clara County, and runs through the cities of Saratoga, Cupertino, Sunnyvale, San Jose, and Santa Clara, and finally discharges into the South San Francisco Bay via Guadalupe Slough. Calabazas Creek is approximately 13.3 mi long and its major tributaries include Prospect Creek, Rodeo Creek, and Regnart Creek. Other major sources of water draining to Calabazas Creek include the El Camino storm drain (main and East Branch) and Junipero Serra Channel.

The Calabazas Creek watershed is highly urbanized, predominantly with high-density residential areas (54.5%), and industrial/commercial areas (29.4%). Industrial areas exist between the US 101 and Central Expressway corridors. The commercial areas concentrate along El Camino Real, Wolfe Road, and Saratoga-Sunnyvale Road.

Calabazas Creek has been extensively modified for flood protection due to extensive residential development during the 1950s and 1960s. About 32% of its length (4.2 mi) is classified as “hard bottom” channel. From Guadalupe Slough to US 101, Calabazas Creek is an enlarged earthen channel with levees; from US 101 to Lawrence Expressway, Calabazas Creek is a trapezoidal concrete-lined channel.

Calabazas Creek crosses US 101 approximately 0.5 mi east of the Lawrence Expressway overcrossing. It crosses US 101 through a 40 ft long by 325 ft wide three-span concrete culvert (see Photo 9).

Photo 9. Calabazas Creek at Bridge under US 101 (Looking Upstream)
1.3.7 Sunnyvale East Channel at US 101 (PM-44.69)

The Sunnyvale East Channel watershed covers approximately 7.1 sq mi extending from central Cupertino northeast toward the City of Sunnyvale. The watershed is located entirely on the alluvial plain of the Santa Clara Valley. This 6-mi long channel extends from I-280 in the south to Guadalupe Slough in the north. The channel is a completely engineered man-made channel, with a quarter of the length constructed as an underground culvert system. The Sunnyvale East Channel drains to the Lower South San Francisco Bay via the Junipero Serra Channel and the Guadalupe Slough.

The Sunnyvale East Channel watershed is almost entirely urbanized except for some open space in the Sunnyvale Baylands along the San Francisco Bay shoreline and some small city-owned parks in Sunnyvale and Cupertino. The urbanized area predominantly contains approximately 59% residential development and 23% commercial and industrial area.

The Sunnyvale East Channel crosses US 101 approximately 750 ft east of the Fair Oaks Avenue overcrossing in the City of Sunnyvale. It crosses US 101 through a 12 ft by 8 ft reinforced concrete box culvert. The culvert system continues underground on the downstream side of US 101 and daylights approximately 700 ft downstream of the crossing (see Photo 10).

Photo 10. Sunnyvale East Channel at Box Culvert under US 101 (Looking Downstream)
1.3.8 Sunnyvale West Channel at US 101 (PM-45.87)

The Sunnyvale West Channel drains approximately 7.5 sq mi, and its watershed is entirely located on the alluvial plain of the Santa Clara Valley. The channel is approximately 3 mi long, originating in the urbanized sections of Sunnyvale and draining to Guadalupe Slough. From the upstream end of the channel at Maude Avenue to Almanor Avenue west of US 101, the channel is a concrete pipe culvert. From downstream of Almanor Avenue to the North Mathilda Avenue and West Moffett Park Drive intersection, the channel is an earth-excavated channel. The channel then becomes an underground culvert system. The culvert system terminates northwest of West Caribbean Drive where the channel daylights again and drains toward Lower South San Francisco Bay via the Moffett Channel and the Guadalupe Slough.

The Sunnyvale West Channel watershed is mostly urbanized except for some open space in the Sunnyvale Baylands along the San Francisco Bay shoreline and a few small city-owned parks in Sunnyvale. The urbanized area contains approximately 31% public/institutional development area, 25% industrial area, and 23% residential area.

The Sunnyvale West Channel crosses US 101 between the SR 237 Junction and the Mathilda Avenue overcrossing in the City of Sunnyvale. It crosses US 101 through a reinforced concrete box culvert (size unknown) (see Photo 11).

Photo 11. Sunnyvale West Channel at Box Culvert under US 101 (Looking Downstream)
1.3.9 Stevens Creek at US 101 (PM-48.04)

Stevens Creek drains a 29 sq mi watershed originating within the foothills of the Santa Cruz Mountains of the Santa Clara Valley. The creek originates at an elevation of 2,500 ft and flows southeast along the San Andreas Fault for approximately 5 mi, then bends northeast and flows for an additional 3 mi before reaching Stevens Creek Reservoir. From the reservoir, the creek continues 12.5 mi before discharging into the southern San Francisco Bay. Approximately 6.3 mi from Stevens Creek reservoir, peak flows of Permanente Creek (up to 1,400 cfs) are diverted into Stevens Creek via the Permanente Diversion, bringing the total watershed area for Stevens Creek to 38 sq mi (of which 36.4 sq mi are upstream of the US 101 crossing according to the FEMA Flood Insurance Study [FIS]). Historic evidence suggests that Permanente Creek was originally a tributary of Stevens Creek. North of I-280, it runs generally parallel to SR 85. Stevens Creek crosses US 101 just east of the US 101/SR 85 interchange in a small stretch of concrete lined trapezoidal channel. North of US 101 it flows through a straightened earth channel and eventually outfalls into the San Francisco Bay.

Approximately 34% of the watershed consists of urbanized areas of Cupertino, Sunnyvale and Mountain View. In addition to the urbanized area, approximately 2% of the area is used as non-urbanized development, such as agriculture, golf courses and mines. The remaining 64% is open space, located primarily in the Santa Cruz Mountains (Tetra Tech, 2006).

Stevens Creek crosses US 101 just east of the US 101/SR 85 interchange under a 50 ft long, 201 ft wide, dual-span concrete bridge in a concrete lined trapezoidal channel. The Stevens Creek trail follows the western bank of the creek at this location (see Photo 12).

Photo 12. Stevens Creek at Bridge under US 101 (looking upstream)
1.3.10 Permanente Creek at US 101 (PM-49.19)

Permanente Creek crosses US 101 between the North Rengstorff Avenue interchange (approximately 2,200 ft northwest of the creek crossing) and the Shoreline Boulevard interchange (approximately 3,100 ft southeast of the creek crossing). The creek originates in the Santa Cruz Mountains, travels 19 mi north to the San Francisco Bay, and passes through the unincorporated areas of Santa Clara County as well as the cities of Cupertino, Los Altos, Mountain View and the Town of Los Altos Hills. At the downstream end of the project site, Permanente Creek passes through a twin reinforced concrete box (RCB) culvert at Charleston Road and a bridge at Amphitheatre Parkway to discharge to Mountain View Slough; the creek eventually outfalls to the San Francisco Bay.

The watershed area of Permanente Creek is approximately 15.8 sq mi at the US 101 crossing. The cities of Mountain View and Los Altos are fully developed and cover approximately 55% of the watershed area. In addition to the urbanized area, approximately 8% of the area is used as non-urbanized development, such as a golf course and a mine. The remaining 37% is open space, predominantly located in the ridge foothills.

Permanente Creek crosses US 101 in a 230 ft long single 12 ft by 12 ft RCB culvert. Existing rectangular concrete lined channels upstream and downstream of the RCB culvert crossing have very flat slopes of 0.1%. The channel upstream of the US 101 cross culvert is a 12 ft wide by 9 ft deep concrete lined channel. There is a 3 ft drop immediately upstream of the US 101 cross culvert. The end of the transition from the concrete lined channel to the earthen channel takes place approximately 200 ft downstream from the cross culvert. (Tetra Tech, 2006) (see Photo 13).

US 101 has an existing concrete median barrier in the vicinity of the Permanente Creek crossing. There is no frontage road for US 101 in the vicinity of the Permanente Creek crossing. A chain-link fence is used as a barrier between US 101 and the adjacent area in the vicinity of the US 101 crossing of Permanente Creek.

Photo 13. Permanente Creek at box culvert under US 101 (looking upstream)
1.3.11 Adobe Creek at US 101 (PM-50.66)
Adobe Creek crosses US 101 between the Matadero Creek crossing (approximately 3,700 ft northwest of the creek crossing) and the San Antonio Road interchange (approximately 1,800 ft southeast of the creek crossing). Adobe Creek has its confluence with Barron Creek at the upstream face of the US 101 crossing. Adobe Creek originates in the highlands of the unincorporated areas of Santa Clara County and Palo Alto Hills. The total watershed area of Adobe Creek is approximately 13.5 sq mi. Land use within the cities of Palo Alto and Los Altos is fully urbanized. Open space is limited to the area in the foothills of the upstream watershed. Approximately 70% of the watershed area is urbanized and 30% is open space. Currently, the area surrounding the project site is 40 to 60% impervious, but future residential or commercial developments could increase impervious area (Tetra Tech, 2006).

Adobe Creek flows in a natural channel with moderate to steep slopes within the City of Los Altos and Town of Los Altos Hills. In the City of Palo Alto, Adobe Creek travels in a wide rectangular concrete channel with very flat slopes. Adobe Creek is conveyed under US 101 in a 65 ft long by 133 ft wide single-span concrete bridge (see Photo 14). The slope of the channel within the project area is less than 0.1%. At the downstream end of its US 101 crossing, Adobe Creek discharges to Charleston Slough, which eventually outfalls to the San Francisco Bay.

The existing median barrier of US 101 in the vicinity of the Adobe Creek crossing comprises thrie beam barrier and concrete barrier. The US 101 traveled-way and the frontage road are separated by a narrow strip of open space and a chain-link fence. The US 101 Auxiliary Lanes project was required to maintain the thrie-beam barrier locations to allow the lateral movement to continue to cross the freeway (see Photo 14).

Photo 14. Adobe Creek at Bridge under US 101 (Looking Upstream)
1.3.12 Matadero Creek at US 101 (PM-51.37)

Matadero Creek crosses US 101 approximately 3,200 ft southeast of the Oregon Expressway interchange. The creek originates in the Town of Los Altos Hills and the upper portion of Palo Alto, flowing northeast through the unincorporated areas of Santa Clara County and the City of Palo Alto. According to the Watershed Stewardship Plan, the overall watershed area of Matadero Creek is approximately 14 sq mi, of which 13.6 sq mi are upstream of the US 101 crossing according to the FIS. Of the total watershed, 11 sq mi are within mountainous areas, and 3 sq mi are in gently sloping terrain. Within the City of Palo Alto, the watershed is almost fully urbanized. Overall, 76% of the watershed area is urbanized for residential, commercial, industrial, and institutional use. There is open space in the foothills, which covers approximately 24% of the watershed area. About 40 to 60% of the fully urbanized area near the project site is impervious. The impervious area is expected to increase in the future from probable developments (Tetra Tech, 2006).

Matadero Creek flows in a natural channel with steep slopes through the unincorporated areas of Santa Clara County. In the City of Palo Alto, Matadero Creek travels in a U-shaped concrete channel with relatively flat slopes. The creek is conveyed under US 101 in a concrete lined channel under a 81 ft long by 133 ft wide double-span concrete bridge (see Photo 15). At the downstream end of the project site, Matadero Creek discharges into the Palo Alto Flood Basin, which eventually outfalls to the San Francisco Bay. This area is a straightened, earthen bed channel with a channel longitudinal slope of less than 0.1%.

The existing median barrier of US 101 at the vicinity of the Matadero Creek crossing is a mixture of thrie-beam barrier and concrete barrier. The US 101 traveled-way and frontage road are separated by narrow open space and a chain-link fence. The existing US 101 barriers in the vicinity of Matadero Creek crossing do not obstruct the lateral movement of the storm runoff (see Photo 15).

Photo 15. Matadero Creek entering Bridge under US 101 (Looking Downstream)
1.4 Bridge Numbers
Four of the 15 crossings are cross culverts. The other 11 are bridges with assigned bridge numbers. Table 3 lists all the bridges and the corresponding bridge numbers.

1.5 Geographical References
The project maps were based on the following quadrangles from the United States Geological Survey: Morgan Hill, Santa Teresa Hills, San Jose East, San Jose West, Milpitas, Mountain View and Palo Alto.

All elevations listed in the FEMA Flood Insurance Rate Maps (FIRMs) and the FIS are based on the North American Vertical Datum of 1988 (NAVD 88). All elevations listed in this report are also based on NAVD 88.

1.6 Traffic
US 101 is a major highway used for emergency supply or evacuation, emergency vehicle access, school buses and mail delivery. However, practical detour routes are available and can be made available during construction. Following is the summary of the traffic assessment:

<table>
<thead>
<tr>
<th>Traffic Feature</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Emergency Supply or Evacuation Route</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency Vehicle Access</td>
<td>Yes</td>
</tr>
<tr>
<td>Practical Detour Route</td>
<td>Yes</td>
</tr>
<tr>
<td>School bus or mail route</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Average daily traffic information was obtained from the National Bridge Inventory Data as shown in Table 4. However, the data is based on older studies. The traffic study for the project has not yet been completed. Traffic volumes will be updated as the information becomes available.
Table 4. Average Daily Traffic

<table>
<thead>
<tr>
<th>Waterway</th>
<th>Bridge Number</th>
<th>Route</th>
<th>PM</th>
<th>Average Daily Traffic</th>
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<tr>
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<td>US 101</td>
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<td>50,500 (as of 2000)</td>
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<tr>
<td>Coyote Creek</td>
<td>37-0346</td>
<td>US 101</td>
<td>26.47</td>
<td>50,500 (as of 1998)</td>
</tr>
<tr>
<td>Coyote Creek</td>
<td>37-0102</td>
<td>US 101</td>
<td>29.83</td>
<td>69,500 (as of 1999)</td>
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<td>US 101</td>
<td>31.15</td>
<td>N/A</td>
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<tr>
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<td>37-0097</td>
<td>US 101</td>
<td>36.37</td>
<td>174,000 (as of 1998)</td>
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<td>US 101</td>
<td>36.69</td>
<td>174,000 (as of 1998)</td>
</tr>
<tr>
<td>Guadalupe River</td>
<td>37-0037</td>
<td>US 101</td>
<td>40.19</td>
<td>190,000 (as of 1998)</td>
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<td>US 101</td>
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<td>US 101</td>
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<td>US 101</td>
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<td>Adobe Creek</td>
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<td>US 101</td>
<td>51.37</td>
<td>192,000 (as of 2000)</td>
</tr>
</tbody>
</table>

Source: National Bridge Inventory Data

1.7 Traffic Interruptions for Base Flood (Q100)

Traffic studies are not currently available. However, there are several areas within the project corridor that are inundated during a 1% annual chance flood, and there may be associated traffic interruptions. These areas are summarized in Table 6. During the time that the traffic on US 101 is interrupted, other local roads that are not flooded can be used as a detour route.
2 HYDROLOGIC AND HYDRAULIC DATA

Floodplains within the project limits were identified using the FEMA FIRMs. The FIRMs further categorize these areas into different flood hazard zones. Zone AE represents areas with a 1% annual chance of flooding, where base flood elevations have been determined in the FIS by detailed methods of analysis. Zone AO represents areas with a 1% chance of shallow flooding, with specified flood depths of 1 to 3 ft. Zone A represents areas with a 1% annual chance of flooding, where the floodplain has been analyzed by approximate methods based on historic information, existing hydrologic analyses, available data, and field observations, and base flood elevations have not been determined. Zone AH represents areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with specified flood depths of 1 to 3 ft.

According to the FIRMs, various areas within the project limits are identified as being within Zone X (shaded) and Zone X (un-shaded). Zone X (shaded) represents the areas between the 1% and 0.2% annual chance floodplains, areas protected from the 1% annual chance flood by levees, or shallow flooding with average depths of less than 1 ft. Zone X (un-shaded) represents areas of minimal flood hazard, usually depicted on FIRMs as above the 0.2% annual chance flood level. These areas do not support the typical beneficial uses associated with floodplains, nor do they require the purchase of flood insurance. Several areas are identified as being within Zone D on the FIRMs. These areas have possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

The FIS for Santa Clara County, CA and Incorporated Areas (2009) was used to obtain existing floodplain information within the project area to supplement the data provided by the FIRMs. The FIS provides hydrologic information and explains the methods of analysis used to generate the floodplains shown on the FIRMs. The FIS also includes profiles of the floodplain elevations.

An overview of the floodplain maps is shown in Figure 3, Figure 4, and Figure 5, and the FIRMs can be found in Appendix B. Table 5 and Table 6 summarize the hydrologic and hydraulic and base floodplain information.
Figure 3. Floodplain Map, Part 1 of 3

Source: FEMA, Google Earth
Figure 4. Floodplain Map, Part 2 of 3

Source: FEMA, Google Earth
Figure 5. Floodplain Map, Part 3 of 3

Source: FEMA, Google Earth
2.1 Floodplain of Madrone Channel at US 101 (PM-16.85)

Madrone Channel flows southerly, parallel to the US 101 northbound lanes from the Cochrane Avenue interchange, and it discharges to Llagas Creek (outside of the southern project limit). According to FIRM number 06085C0444H, a Zone AE floodplain exists along the channel with a 1% annual chance flood water surface elevation (WSE) of approximately 381 ft at the Cochrane Avenue interchange and approximately 359 ft at the East Dunne Avenue interchange. The FIRM shows that the 1% annual chance flood does not inundate US 101, and the 1% annual chance flood discharge is contained in the channel.

2.2 Floodplain of Coyote Creek at US 101 (PM-19.21)

Coyote Creek crosses US 101 north of Burnett Avenue. According to FIRM number 06085C0441H, a floodplain designated as Zone AE exists at this creek crossing. According to the FIRM, the 1% annual chance flood WSE is approximately 357 ft at the crossing, while the roadway elevation shown on the as-built drawings (Contract No 04-117384) is approximately 376 ft, which is well above the floodplain elevation. Therefore, the roadway is not inundated during a 1% annual chance flood event.

The largest recorded flow on Coyote Creek was 25,000 cfs in 1911, 1.2 mi downstream of the future Anderson Dam, and it caused a large lake at the junction with the overflow of Guadalupe River. Since the construction of Anderson Dam, the largest recorded flow on Coyote Creek was 5,750 cfs, recorded in April 1958. The floods of 1983, however, caused extensive damage.

2.3 Floodplain of Coyote Creek at US 101 (PM-19.64)

According to FIRM number 06085C0441H, a Zone AE floodplain is approximately 0.5 mi north of the Coyote Creek crossing. According to the FIRM, the floodplain limits are shown to extend onto US 101, and the roadway is inundated by the 1% annual chance flood. However, it is worth noting that the floodplain elevation shown on the FIRM is approximately 346 ft, while the roadway elevation shown on the survey topography is 350 ft, which is well above the floodplain elevation. This is because the FIS was completed in 1979 before the completion of the US 101 roadway project (Contract No. 04-117384) in 1980.

2.4 Floodplain of Coyote Creek at US 101 (PM-23.10)

Approximately 0.4 mi southeast of the US 101/Bailey Road interchange, FIRM number 06085C0428H shows the floodplain of Coyote Creek designated as Zone AE extending onto US 101, and covers both the northbound and southbound traveled lanes. However, it is worth noting that the floodplain elevation shown on the FIRM is 272 ft, while the roadway elevation shown on the as-built drawings (Contract No. 04-117384) is 280 ft or higher, which is well above the floodplain elevation. This is most likely because the FIS
was completed in 1979 and has not been updated to include the US 101 roadway project (Contract No. 04-117384) that was completed in 1980.

2.5 Floodplain of Coyote Creek at US 101 (PM-23.90)
Approximately 0.5 mi northwest of the US 101/Bailey Road interchange, FIRM number 06085C0428H shows the floodplain of Coyote Creek designated as Zone AE extending onto US 101, and it covers most of the southbound lanes and a very small portion of the northbound lanes. However, it is worth noting that the floodplain elevation shown on the FIRM is 264 ft, while the roadway elevation shown on the as-built drawings (Contract No. 04-117384) is 280 ft or higher, which is well above the floodplain elevation. This is most likely because the FIS was completed in 1979 and has not been updated to include the US 101 roadway project (Contract No. 04-117384) that was completed in 1980.

2.6 Floodplain of Coyote Creek at US 101 (PM-25.13)
Just southeast of the US 101/Metcalf Canyon Road interchange, FIRM number 06085C0426H shows the floodplain of Coyote Creek designated as Zone AE extending onto US 101, and the roadway is inundated by the 1% annual chance flood. However, it is worth noting that the floodplain elevation shown on the FIRM is 248 ft, while the roadway elevation shown on the topography is 256 ft, which is well above the floodplain elevation. This is most likely because the FIS was completed in 1979 and has not been updated to include the US 101 roadway project (Contract No. 04-117384) that was completed in 1980.

2.7 Floodplain of Coyote Creek at US 101 (PM-25.70)
FIRM number 06085C0407H shows that a floodplain of Coyote Creek, which is designated as Zone AE, is located approximately 0.5 mi northwest of the US 101/Metcalf Canyon Road interchange. According to the FIRM, the floodplain limits are shown to extend onto US 101, and the roadway is inundated by the 1% annual chance flood. However, it is worth noting that the floodplain elevation shown on the FIRM is 235 ft, while the roadway elevation shown on the survey topography is 245 ft, which is well above the floodplain elevation. This is most likely because the FIS was completed in 1979 and has not been updated to reflect the effect of the US 101 roadway project (Contract No. 04-117384) which was completed in 1980.

2.8 Floodplain of Coyote Creek at US 101 (PM-26.47)
According to FIRM number 06085C0407H, a floodplain designated as within Zone AE exists at the Coyote Creek crossing of US 101. The FIRM indicates that the floodplain limits extend onto US 101, and the roadway is inundated by a 1% annual chance flood. However, it is worth noting that the floodplain elevations shown on the FIRM are approximately 228 ft upstream of the crossing and 226.2 ft downstream of the crossing, while the roadway elevation shown on the as-built drawings (Contract No 04-117384) is at least approximately 241.5 ft, which is well above the floodplain elevations. This is
because the FIS was completed in 1979 before the completion of the US 101 roadway project (Contract No. 04-117384) in 1980.

### 2.9 Floodplain of Coyote Creek at US 101 (PM-28.06)

Approximately 0.6 mi southeast of the US 101/Silver Creek Valley Road overcrossing, FIRM number 06085C0268H shows the floodplain of Coyote Creek extending across US 101 and flooding the property on the west side of the roadway. The FIRM lists this floodplain as Zone AO with a depth of 1 ft during a 1% annual chance flood.

### 2.10 Floodplain of Coyote Creek at US 101 (PM-29.83)

Coyote Creek crosses US 101 north of Coyote Road. According to FIRM number 06085C0268H, the area upstream and downstream of the creek crossing is identified as Zone AE. The FIRM lists the 1% annual chance WSEs as 170 ft downstream of the crossing and 171 ft upstream of the crossing. The FIRM defines the US 101 traveled-way as Zone D, representing areas with possible but undetermined flood hazards. However, according to the FIS, the 1% annual chance WSE is approximately 170 ft, and the roadway elevation is approximately 182 ft. Therefore, the 1% annual chance flood does not overtop the roadway at the creek crossing.

### 2.11 Floodplain of Upper Silver Creek at US 101 (PM-30.95)

The FIRMs identify the areas along the creek upstream of Yerba Buena Road and the Yerba Buena Road underpass as Zone AE. The 1% annual chance flood WSE is 173 ft for the underpass, and 173 ft upstream of Yerba Buena Road. According to the FIS, this floodplain is caused by the culvert constriction at Yerba Buena Road. The spill flows in both directions perpendicular to the channel with the majority flowing to the northeast along Yerba Buena Road. According to the FIS, the flow on Yerba Buena Road spills to the northeast to an elevation of 170 ft, and to the southwest under US 101 to an elevation of 167 ft (these values deviate from the values from FIRM number 06085C0266H, which indicates that the 1% annual chance flood elevation is 173 ft on Yerba Buena Road). The US 101 roadway elevation is not available; however, by observation, the US 101 roadway is at least 15 ft higher than the underpass at this location. Therefore, the 1% annual chance flow does not overtop US 101.

### 2.12 Floodplain of Upper Silver Creek at US 101 (PM-31.15)

Upper Silver Creek crosses US 101 north of Yerba Buena Road. FIRMs 06085C0262H and 06085C0266H identify the area within the concrete-lined channel from Yerba Buena Road on the upstream side of US 101 and the Coyote Creek confluence on the downstream side of US 101 as being within flood hazard Zone A, and indicate that the 1% annual chance flood discharge is entirely contained within the channel. Therefore, the US 101 roadway at this crossing is not inundated by the 1% annual chance flood.
2.13 **Floodplain of Lower Silver Creek / Coyote Creek at US 101 (PM-35.96)**

The area south of Silver Creek is a large floodplain, according to FIRM 06085C0251H. This floodplain covers both sides of US 101 (including the traveled-way in both directions), and extends to I-280 to the south. The FIRM designates the northern part of this large floodplain (north of Alum Rock Avenue) as Zone AH, with a 1% annual chance flood WSE of 89 ft; The FIRM designates the southern part of this large floodplain (south of Alum Rock Avenue) as Zone AO, with a 1% annual chance flood depth of 1 ft.

2.14 **Floodplain of Lower Silver Creek at US 101 (PM-36.37)**

Lower Silver Creek crosses US 101 and flows into Coyote Creek just upstream of the US 101 crossing. According to FIRM 06085C0251H, the area within Lower Silver Creek channel is Zone A; however, the FIRM does not specify whether the 1% annual chance discharge is contained within the channel. According to the FIS, the 1% annual chance WSE is approximately 85.5 ft, and the roadway elevation at the bridge is approximately 92 ft. Therefore, the US 101 roadway is not inundated by the 1% annual chance flood at this crossing.

2.15 **Floodplain at US 101 (PM-36.48)**

In addition to the floodplain directly affected by Coyote Creek, according to FIRM 06085C0232H and 06085C0251H, the area on the northeast quadrant of the creek crossing is defined as being within Zone AH, with a 1% annual chance flood WSE of 87 ft. According to the FIS, the US 101 roadway elevation is approximately 92 ft at the Silver Creek crossing. Therefore, US 101 is not inundated during a 1% annual chance flood.

2.16 **Floodplain of Coyote Creek at US 101 (PM-36.69)**

According to FIRM 06085C0232H and 06085C0251H, a floodplain exists along Coyote Creek at the vicinity of the US 101 creek crossing. The area on both sides of the creek at the US 101 crossing is designated as Zone AE, with 1% annual chance WSEs ranging between 84 and 85 ft on the upstream side of US 101, and between 82 and 83 ft on the downstream side of US 101 before the East Taylor Street overcrossing. The FIRM defines the US 101 traveled-way as Zone D, representing areas with possible but undetermined flood hazards. However, according to the FIS, the 1% annual chance WSE is approximately 84 ft, and the roadway elevation is approximately 92 ft. Therefore, the 1% annual chance flood does not overtop the roadway at the creek crossing.

2.17 **Floodplain at US 101 (PM-38.24)**

According to FIRM 06085C0232H, a floodplain exists at the southeast quadrant of the US 101/I-880 junction. The floodplain is designated as within Zone AH, with a 1% annual chance flood WSE of 55 ft. According to the FIRM, the 1% annual chance flood slightly inundates the southbound I-880 to southbound US 101 on-ramp.
2.18 **Floodplain at US 101 (PM-39.34)**
According to FIRM 06085C0231H, a Zone AO floodplain exists at the Airport Parkway and North 1st Street undercrossings, and extends onto US 101 southbound with a depth of 1 ft during a 1% annual chance flood. This floodplain also covers much of the area south of this undercrossing.

2.19 **Floodplain at US 101 (PM-39.85)**
According to FIRM 06085C0231H, a Zone AH floodplain exists at the US 101/SR 87 interchange, and extends onto US 101 in the northbound and southbound directions, with a 1% annual chance WSE of 39 ft. This floodplain also covers much of the southeast quadrant of the interchange.

2.20 **Floodplain of Guadalupe River at US 101 (PM-40.19)**
According to FIRMs 06085C0064H, 06085C0068H, 06085C0231H, a floodplain exists within the Guadalupe River channel area and is designated as being within Zone A. The FIRMs also indicate that the 1% annual chance flood discharge is entirely contained within Guadalupe River. According to the FIS, the 1% annual chance WSE at the crossing is approximately 29.5 ft, and the roadway elevation at the creek crossing is approximately 41.4 ft; therefore, the flow from Guadalupe River does not overtop the roadway at the bridge location.

2.21 **Floodplain at US 101 (PM-40.62)**
According to FIRMs 06085C0231H, 06085C0068H, 06085C0064H, a Zone AH floodplain exists at the West Trimble Road overcrossing, and extends onto US 101 in the northbound and southbound directions, with a 1% annual chance WSE of 36 ft. This floodplain also covers much of the area south of this overcrossing.

2.22 **Floodplain at US 101 (PM-41.05)**
According to FIRM 06085C0064H, a Zone AH floodplain exists within the US 101 roadway at the Lafayette Street overcrossing, with a 1% annual chance WSE of 25 ft. This floodplain is approximately 500 ft long along US 101, and covers both the northbound and southbound traveled lanes at this overcrossing.

2.23 **Floodplain at US 101 (PM-41.75)**
According to FIRM 06085C0064H, a Zone AH floodplain exists along the US 101 southbound traveled lanes between San Tomas Expressway and Lafayette Street. This floodplain has a 1% annual chance WSE of 32 ft. It overtops most of the US 101 southbound traveled lanes.
2.24  Floodplain of San Tomas Aquino Creek at US 101 (PM-42.45)

According to FIRM 06085C0063H and 06085C0064H, a Zone AE floodplain exists on the southeast quadrant of the San Tomas Aquino Creek and US 101 crossing, and it is bound by San Tomas Expressway to the east. This floodplain has a 1% annual chance WSE of 33 ft on the upstream side of US 101 and 32 ft on the downstream side of US 101. According to the FIS, the US 101 roadway elevation at the crossing is approximately 34.5 ft and is not inundated by the 1% annual chance flood at the bridge location. However, the FIRM 06085C0063H also indicates that on the east side of the creek crossing, this floodplain extends onto the US 101 southbound off-ramp to San Tomas Expressway. There is a levee immediately downstream of US 101 to protect the adjacent area.

2.25  Floodplain of Calabazas Creek at US 101 (PM-43.32)

According to FIRM 06085C0063H, a Zone AO floodplain exists on the south side of US 101 between the Calabazas Creek crossing and Lawrence Expressway, and it extends onto both the US 101 northbound and southbound traveled lanes with a 1% annual chance depth of flooding of 1.5 ft. This floodplain is generally caused by insufficient capacity of the channel. SCVWD proposed a flood control project to improve Calabazas Creek from San Francisco Bay to Miller Avenue in the City of Cupertino. The flood control project was designed for a 1% annual chance flood to eliminate any overbank spill within this segment of Calabazas Creek. The improvement project for the segment from Guadalupe Slough to Argues Avenue (The project is within this segment) was completed in 1995. Per conversation with the project manager Tony Ndah, SCVWD has already requested FEMA to update the FIRM and FIS for the improvements. It is anticipated that the updated FIRM will not show a floodplain that will encroach onto US 101 at this crossing.

According to FIRM 06085C0063H, the 1% annual chance flood discharge is entirely contained within the channel downstream of the US 101 crossing.

2.26  Floodplain of Sunnyvale East Channel at US 101 (PM-44.69)

Sunnyvale East Channel was constructed by SCVWD in the early 1960s to convey internal drainage from the City of Sunnyvale and surrounding areas to the San Francisco Bay. According to the FIS, the channel was built to convey a 10% annual chance flood from the tributary storm drain system.

Sunnyvale East Channel crosses US 101 just east of the North Fair Oaks Avenue overcrossing. According to FIRM 06085C0045H, a floodplain of Sunnyvale East Channel exists south of US 101 between North Fair Oaks Avenue and Lawrence Expressway, and it extends onto most of the southbound traveled lanes and a portion of the northbound traveled lanes of US 101. The floodplain is defined as Zone AE with a 1% annual chance WSE of 29 ft.
2.27 **Floodplain of Sunnyvale West Channel at US 101 (PM-45.87)**

Sunnyvale West Channel was constructed by SCVWD in early the 1960s to convey internal drainage from the City of Sunnyvale and surrounding areas to the San Francisco Bay. According to the FIS, the channel was built to convey a 10% annual chance flood from the tributary storm drain system.

According to FIRM 06085C0045H, no base floodplain exists at the Sunnyvale West Channel crossing at US 101. The area at this crossing is defined as Zone X (shaded), which represents the area between the 1% annual chance and 0.2% annual chance floodplains, areas protected from the 1% annual chance flood by levees, or shallow flooding with average depths of less than 1 ft.

2.28 **Floodplain of Stevens Creek at US 101 (PM-48.04)**

Stevens Creek crosses US 101 immediately west of the SR 85/US 101 interchange. According to FIRM number 06085C0037H, a floodplain exists at the Stevens Creek crossing of US 101. This floodplain is within Zone A, and a WSE is not listed. Although the FIRM does not list WSEs, the profiles in the FIS show the 1% annual chance WSE to be 35.9 ft upstream of the crossing and 35.7 ft just downstream of the crossing. The existing roadway elevation is approximately 40.0 ft, and it is not inundated by the 1% annual chance flood. The FEMA layer in Google Earth also shows that the waterway is contained within the channel at this crossing.

For a segment of Stevens Creek north of the US 101 crossing, the FIRMs show that the 1% annual discharge is contained within the culvert but do not specify whether this applies to the entire creek segment at the creek crossing.

Nearly the entire cities of Mountain View and Sunnyvale are defined as being within Zone X (shaded). Downstream of the US 101 crossing, the FIRM states that Zone X (shaded) areas are protected from the 1% annual chance flood hazard by a levee system that has been provisionally accredited. In November 2010, FEMA issued a Letter of Map Revision (LOMR) confirming the accreditation of these levees, but notes that the overtopping of the levees is possible.

2.29 **Floodplain of Permanente Creek at US 101 (PM-49.19)**

Permanente Creek crosses US 101 between the North Rengstorff Avenue and Old Middlefield Way interchanges. According to FIRM 06085C0037H, there is no floodplain directly at the US 101 crossing, but this floodplain extends approximately 0.3 mi southeast of the creek crossing and covers part of the US 101 southbound lanes. This area is designated as being within Zone AO with a depth of 1 ft, which represents the floodplain caused by the shallow sheet flow that overtops the banks of Permanente Creek during a 1% annual chance storm event. This overtopping is due to insufficient capacity of the concrete lined channel upstream of US 101. The area immediately downstream of
the US 101 crossing is defined as being within Zone AE, with a 1% annual chance WSE of 16 ft.

### 2.30 Floodplains of Adobe and Matadero Creeks at US 101 (PM-50.66 and 51.37)

Northwest of the US 101/SR 85 interchange, Matadero and Adobe creeks each cross US 101. According to FIRMs 06085C0030H, 06085C0036H and 06085C0037H, these creeks together generate large floodplains that cover much of US 101 and the surrounding areas within the project limits.

The Zone AE floodplain that covers much of US 101 represents the 1% annual chance floodplain determined by detailed hydraulic analyses. According to the City of Palo Alto, the flooding in this area is caused by the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with a storm front. According to FIRMs, the 1% annual chance flood WSE is 11 ft. The floodplain defined as being within Zone AE represents areas with an elevation of less than 11 ft, which is subject to the tidal flooding. The floodplain covers the northbound and southbound lanes of US 101 from the Embarcadero Road interchange to the North Rengstorff Avenue interchange.

As noted above, the WSE throughout this area is 11 ft. This elevation is higher than the existing US 101 in some locations through this stretch.
<table>
<thead>
<tr>
<th>Route</th>
<th>Approx. Floodplain Post Mile</th>
<th>Approx. Floodplain Station</th>
<th>Flood Source</th>
<th>At Creek Crossing</th>
<th>1-Percent Annual Chance Peak Discharge (cfs)</th>
<th>Drainage Area (mi²)</th>
<th>Water Surface Elevation (ft)</th>
<th>Approx. Roadway Elevation (ft)</th>
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Note: "-" Indicates that information is not available or not applicable

Source: FEMA, Caltrans
## Table 6. Base Floodplain Information

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<th>Approx. Floodplain Station</th>
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Notes:
1. Based on information shown on FIRMs
2. Based on comparison between 1% annual chance flood water surface elevation provided by FEMA and the roadway elevation when available. "-" indicates the flood elevation and/or the roadway elevation are not available for comparison.
3 ENVIRONMENTAL CONSEQUENCES AND PROJECT IMPACTS

Executive Order 11988 (Floodplain Management) directs all federal agencies to avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Requirements for compliance are outlined in Title 23, Code of Federal Regulations, Part 650, Subpart A (23 CFR 650A) titled “Location and Hydraulic Design of Encroachment on Floodplains.”

3.1 Summary of Potential Encroachments

The Federal Highway Administration (FHWA) defines a significant encroachment as a highway encroachment, and any direct support of likely base floodplain development, that would involve one or more of the following construction or flood-related impacts: 1) significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route; 2) a significant risk; or 3) a significant adverse impact on the natural and beneficial floodplain values (1994). The following sections discuss the potential impacts to the floodplain that result from the proposed action. The risk associated with implementation of the action is discussed in Section 3.2.

3.1.1 Potential Traffic Interruptions Due to the Proposed Action

The project does not have significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route. Other local roads can be utilized for emergency vehicles or as evacuation routes. There may be traffic interruption for the base flood (locations are summarized in Table 6, where floodplain inundates freeway), but traffic from US 101 may utilize the local roads that aren’t flooded for a detour route. The project will not have a significant impact to the floodplains within the project area, and therefore, will not have an adverse affect on traffic interruptions for the base flood.

3.1.2 Impacts on Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values include, but are not limited to: fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

The Natural Environment Study (NES) for this project identified approximately 9.16 acres of potentially jurisdictional waters that exist within the biological study area (BSA). These jurisdictional features include perennial and intermittent streams, some of which may be considered waters of the U.S. Some of these streams also contain potential wetland areas within their channels. A summary of these areas can be found in Table 7.
Table 7. Potential Waters of the U.S. and Wetland Areas within Project BSA

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WWUS: Wetland Water of the U.S.  
WUS: Water of the U.S.  
Source: NES (URS, 2012)

The NES also identifies different vegetation communities within the BSA, which are riparian in nature. The riparian areas identified include Mixed Willow Riparian Forest and California Bay Riparian Forest. Mixed willow riparian forests are dominated by a combination of willow species. Red willow, arroyo willow and narrow leaf willow (*Salix exigua*) occur on the ends of culverts at small creeks on the west side of the US 101 freeway near Coyote Creek golf course. California Bay Riparian Forests are dominated by California bay (*Umbellularia californica*), which occurs on the west side of US 101 along a ditch near a PG&E utility substation. The California Bay riparian forest includes other species such as coast live oak (*Quercus agrifolia*) and California buckeye.
3.1.3 Support of Probable Incompatible Floodplain Development
As defined by the FHWA, the support of incompatible base floodplain development will encourage, allow, serve, or otherwise facilitate incompatible base floodplain development, such as commercial development or urban growth.

The project will only include widening of the existing highway, and will not create new access to developed or undeveloped land; therefore, the project will not support incompatible floodplain development.

3.1.4 Longitudinal Encroachments
As defined by the FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is longitudinal to the normal direction of the floodplain.

The project does not constitute a longitudinal encroachment of the base floodplain. Coyote Creek generally runs parallel to US 101 and crosses US 101 four times within the project limits. At those locations where the roadway is inundated by the 1% annual chance flood, no fill or any structures that would decrease the flow area will be proposed.

3.2 Risk Associated with Implementation of the Action
As defined by the Code of Federal Regulations (CFR) Title 23 Part 650, risk shall mean the consequences associated with the probability of flooding attributable to an encroachment. It shall include the potential for property loss and hazard to life during the service life of the proposed bridges and station structures.

The potential risk associated with the implementation of the proposed project include: 1) change in land use; 2) fill inside floodplain; and 3) changes in the 1% annual chance flood WSE. This project will not change the land use within the project limits. See below for the discussion of potential risks as a result of this project, and see Table 8 for a summary of fill in the floodplains within the project limits.

The bridge widenings at the Coyote Creek Golf Drive undercrossing, the Utility Facility undercrossing (Golf Course), the Bernal Road undercrossing, and the Yerba Buena Road undercrossing (see Table 1) are not within any floodplains; therefore, there will be no floodplain impacts as a result of widening these bridges. The bridge widening at Coyote Road undercrossing will be within a floodplain. The floodplain impacts as a result of the Coyote Road undercrossing bridge widening will be discussed in Section 3.2.10.

The abutment modifications listed in Table 2 will not impact any floodplains because the new abutment configurations will not decrease the flow area or storage volume of any floodplains.

3.2.1 Floodplain of Madrone Channel at US 101 (PM-16.85)
The impacts to the floodplain of Madrone Channel (PM-16.85) will be minimal. There will be only median widening at this location, and the widening is entirely outside the
floodplain (no fill in the floodplain). The roadway widening will result in an increase in impervious area draining to the channel, but this increase will be insignificant compared to the overall watershed of the floodplain. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.2 Floodplain of Coyote Creek at US 101 (PM-19.21)
The impacts to the floodplain at the Coyote Creek crossing (PM-19.21) will be minimal. The bridge and channel will not be modified as part of this project. There will be median widening, but the widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The roadway widening will result in an increase in impervious area draining to the creek, but this increase will be insignificant compared to the overall watershed of the floodplain. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.3 Floodplain of Coyote Creek at US 101 (PM-19.64)
The impacts to the floodplain of Coyote Creek (PM-19.64) will be minimal. Widening is proposed at this location only at the median. The proposed median shoulder widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The widening will result in some increase in impervious area draining to Coyote Creek, but this increase will be insignificant compared to the overall watershed of the floodplain. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.4 Floodplain of Coyote Creek at US 101 (PM-23.10)
The impacts to the floodplain of Coyote Creek (PM-23.10) will be minimal. Both median shoulder and outside shoulder widening will be proposed at this location. The widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The project may replace the existing concrete barriers with new concrete barriers, which will not change the existing flow characteristics. The widening will result in some increase in impervious area draining to Coyote Creek, but this increase will be insignificant compared to the overall watershed of the creek. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.5 Floodplain of Coyote Creek at US 101 (PM-23.90)
The impacts to the floodplain of Coyote Creek (PM-23.90) will be minimal. Both median shoulder and outside shoulder widening will be proposed at this location. The widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The project may replace the existing concrete barriers/retaining walls with new retaining walls, which will not change the existing flow characteristics. The widening will result in some increase in impervious area draining to
Coyote Creek, but this increase will be insignificant compared to the overall watershed of the creek. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.6 Floodplain of Coyote Creek at US 101 (PM-25.13)
The impacts to the floodplain of Coyote Creek (PM-25.13) will be minimal. Both median shoulder and outside shoulder widening will be proposed at this location. The widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The project may replace the existing concrete barriers/retaining walls with new retaining walls, which will not change the existing flow characteristics. The widening will result in some increase in impervious area draining to Coyote Creek, but this increase will be insignificant compared to the overall watershed of the creek. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.7 Floodplain of Coyote Creek at US 101 (PM-25.70)
The impacts to the floodplain of Coyote Creek (PM-25.70) will be minimal. Both median shoulder and outside shoulder widening will be proposed at this location. The widening will be well above the 1% annual chance flood WSE, so there will be no fill in the floodplain as a result of the widening. The project may replace the existing concrete barriers with new concrete barriers, which will not change the existing flow characteristics. The widening will result in some increase in impervious area draining to Coyote Creek, but this increase will be insignificant compared to the overall watershed of the creek. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.8 Floodplain of Coyote Creek at US 101 (PM-26.47)
The impacts to the floodplain at the Coyote Creek crossing (PM-26.47) will be minimal. The bridge and channel will not be modified as part of this project. There will be outside shoulder widening within the floodplain at this location, but the fill as a result of the widening will not significantly raise the grade and the area of fill will be insignificant compared to the overall area of the floodplain. The widening will result in some increase in impervious area draining to the floodplain, but this increase is insignificant compared to the overall watershed of the floodplain. The fill and the increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.9 Floodplain of Coyote Creek at US 101 (PM-28.06)
There is a floodplain of Coyote Creek (PM-28.06) approximately 0.4 mi south of the Coyote Creek crossing (PM-29.83). There will only be median shoulder widening at this location within the floodplain and the widening will match the existing grade, so there will be no fill as the result of the median widening. The project will retain the existing
double thrie beam barriers, or replace them with structures that will not attenuate flow. The widening will result in some increase in impervious area draining to Coyote Creek, but this increase will be insignificant compared to the overall watershed of the creek and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.10  **Floodplain of Coyote Creek at US 101 (PM-29.83)**

The impacts to the floodplain at the Coyote Creek crossing (PM-29.83) will be minimal. The Coyote Creek bridge and US 101 at the vicinity of this creek crossing are not inundated during the 1% annual chance flood. The Coyote Creek bridge and channel will not be modified as part of this project. The proposed US 101 roadway widening and the Coyote Road bridge widening (approximately 0.1 mi south of this creek crossing) within this floodplain will not significantly change the existing grade, and the area of fill will be insignificant compared to the overall area of the floodplain. The roadway widening will result in some increase in impervious area draining to this floodplain, but this increase is insignificant compared to the overall watershed of the floodplain and will not have a significant impact to the floodplain at this crossing. Therefore, the potential risk as a result of this project is low at this location.

3.2.11  **Floodplain of Upper Silver Creek at US 101 (PM-30.95)**

Impacts to the floodplain of Upper Silver Creek (PM-30.95) will be minimal. The 1% annual chance flood does not overtop US 101 at this location. The proposed inside and outside widening at this location will be completely outside of the floodplain limits (no fill in the floodplain). The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain, and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.12  **Floodplain of Upper Silver Creek at US 101 (PM-31.15)**

Impacts to the floodplain at the Upper Silver Creek crossing (PM-31.15) will be minimal. The cross culvert and the channel will not be modified as part of this project. The 1% annual chance flood does not overtop the roadway and is entirely contained within the channel. The proposed inside and outside roadway widening at this location will be completely outside of the floodplain limits (no fill in the floodplain). The roadway widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.13  **Floodplain of Lower Silver Creek/Coyote Creek at US 101 (PM-35.96)**

The 1% annual chance flood overtops the roadway at this location (PM-35.96). There will be median widening, and the widening will match the existing grade. The project will retain the existing double thrie beam barriers, or replace them with structures that will not attenuate flow. There will be outside widening within the floodplain, but it will
be within cut areas or match the existing grade (no fill). The roadway widening will result in an increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.14 Floodplain of Lower Silver Creek at US 101 (PM-36.37)
Impacts to the floodplain at the Lower Silver Creek crossing (PM-36.37) will be minimal. The 1% annual chance flood does not overtop the roadway at the creek crossing. The bridge and channel will not be modified as part of this project. There will not be any roadway widening within this floodplain, and there will be no fill. The roadway widening upstream of this location will result in some increase in impervious area draining to this floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.15 Floodplain at US 101 (PM-36.48)
Impacts to the floodplain at US 101 (PM-36.48) will be minimal. The proposed widening at this location will be well above the 1% annual chance flood WSE (no fill in the floodplain). The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.16 Floodplain of Coyote Creek at US 101 (PM-36.69)
Impacts to the floodplain at the Coyote Creek crossing (PM-36.69) will be minimal. The 1% annual chance flood does not overtop the roadway at the creek crossing. The bridge and channel will not be modified as part of this project. The proposed roadway median widening is completely outside the floodplain (no fill in the floodplain). There will be cut and fill as a result of the widening, however the fill as a result of this widening is insignificant. The roadway widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. The fill and the increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.17 Floodplain at US 101 (PM-38.24)
Impacts to the floodplain at US 101 (PM-38.24) will be minimal. Most of the widening at the US 101/I-880 junction will be outside of this floodplain, except for the widening of the southbound I-880 to southbound US 101 on-ramp. This widening will not significantly raise the grade, and the area of the fill as a result of this widening will be insignificant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. The fill and the
increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.18 Floodplain at US 101 (PM-39.34)
Impacts to the floodplain at US 101 (PM-39.34) will be minimal. The outside shoulder widening will not significantly raise the existing grade, and the area of the fill as a result of the widening will be insignificant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain and will not significantly increase the 1% annual chance flood WSE. Therefore, the potential risk as a result of this project is low at this location.

3.2.19 Floodplain at US 101 (PM-39.85)
Impacts to the floodplain at US 101 (PM-39.85) will be minimal. The proposed widening within this floodplain will not significantly change the existing grade, and thus the fill as a result of the widening will be minimal. The area of the fill is insignificant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. The fill and the increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.20 Floodplain of Guadalupe River at US 101 (PM-40.19)
Impacts to the floodplain at the Guadalupe River crossing will be minimal. The 1% annual chance flood does not overtop the roadway and is entirely contained in the channel. The bridge and channel will not be modified as part of this project. No widening is proposed within the floodplain at the river crossing (no fill in the floodplain). There will be roadway widening (outside of this floodplain) that will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. It will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.21 Floodplain at US 101 (PM-40.62)
Impacts to the floodplain at US 101 (PM-40.62) will be minimal. Median shoulder and outside shoulder widening within the floodplain will not significantly change the existing grade (insignificant fill in the floodplain). The area of fill as a result of the widening is insignificant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. The fill and the increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.
3.2.22 Floodplain at US 101 (PM-41.05)
Impacts to the floodplain at US 101 (PM-41.05) will be minimal. There will not be any inside widening at this location. The outside widening areas are entirely within cut areas (no fill in the floodplain). The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.23 Floodplain at US 101 (PM-41.75)
Impacts to the floodplain at US 101 (PM-41.75) will be minimal. There will not be any inside widening at this location. The proposed outside shoulder widening within the floodplain will not significantly raise the grade (insignificant fill in the floodplain). The area of fill as a result of the widening is significant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. It will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.24 Floodplain of San Tomas Aquino Creek at US 101 (PM-42.45)
Impacts to the floodplain at the San Tomas Aquino Creek crossing will be minimal. The roadway at the creek crossing is not inundated during a 1% annual chance flood, except for a portion of the southbound off-ramp to San Tomas Expressway. The existing bridge and channel will not be modified as part of this project. There will be outside roadway widening at this crossing, but none of the widening will encroach onto the San Tomas Aquino Creek floodplain. The widening will result in some increase in impervious area draining to the floodplain, but this increase will be insignificant compared to the overall watershed of the floodplain. It will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.25 Floodplain of Calabazas Creek at US 101 (PM-43.32)
Impacts to the floodplain at the Calabazas Creek crossing will be minimal. The existing cross culvert and channel will not be modified as part of this project. The proposed roadway widening will be completely outside of the floodplain (no fill in the floodplain). The widening will result in some increase in impervious area draining to Calabazas Creek, but this increase will be insignificant compared to the overall watershed of the floodplain. The increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.26 Floodplain of Sunnyvale East Channel at US 101 (PM-44.69)
Impacts to the floodplain at the Sunnyvale East Channel crossing will be minimal. The FIRM shows that the roadway to the west of the creek crossing is inundated during a 1% annual chance flood, but the culvert on the north side of the crossing is able to contain the
1% annual chance flood discharge. The existing cross culvert and channel will not be modified as part of this project. There will be inside and outside widening at this location. The inside widening will not significantly alter the existing grade (insignificant fill in the floodplain). The outside widening that is within the limits of this floodplain located along the southbound US 101 to Lawrence Expressway off-ramp. The widening will not significantly raise the existing grade (insignificant fill in the floodplain). The area of fill is insignificant compared to the overall floodplain area. The widening will result in some increase in impervious area draining to Sunnyvale East Channel, but this increase will be insignificant compared to the overall watershed of the floodplain. The fill and the increase in impervious area will not significantly increase the 1% annual chance flood WSE; therefore, the potential risk as a result of this project is low at this location.

3.2.27 Floodplain of Sunnyvale West Channel at US 101 (PM-45.87)
As discussed in Section 2.27, no base floodplain exists at the Sunnyvale West Channel crossing at US 101. Therefore, there is no potential risk as a result of this project at this crossing.

3.2.28 Floodplain of Stevens Creek at US 101 (PM-48.04)
Impacts to the floodplain at the Stevens Creek crossing will be minimal. The roadway at the creek crossing is not inundated during a 1% annual chance flood. The existing bridge and channel will not be modified as part of this project. The proposed roadway widening will be completely outside the limits of any floodplain at the vicinity of the creek crossing, therefore there will be no fill in any floodplain. The widening will result in some increase in impervious area draining to Stevens Creek, but this increase will be insignificant compared to the overall watershed of the floodplain. It will not significantly increase the 1% annual chance flood WSE of this floodplain; therefore, the potential risk as a result of this project is low at this location.

3.2.29 Floodplain of Permanente Creek at US 101 (PM-49.19)
There will be no impacts to the floodplain at the Permanente Creek crossing as a result of this project. The roadway at the creek crossing is not inundated during a 1% annual chance flood. The existing cross culvert and channel will not be modified as part of this project. There will be no roadway widening and therefore no fill in the floodplain. No additional impervious area is expected and thus, there will be no additional flow anticipated as a result of this project. Therefore, the potential risk as a result of this project is low at this location.

3.2.30 Floodplains of Adobe Creek and Matadero Creek at US 101 (PM-50.66 and PM-51.37)
There will be no impacts to the floodplains at the Adobe Creek and Matadero Creek crossings as a result of this project. The roadway at the vicinity of these creek crossings is inundated during a 1% annual chance flood, and this is due to the potential overtopping of bayfront levees in the event of an extremely high tide. The existing bridges and channels will not be modified as part of this project. There will be no roadway widening
at the vicinity of these creek crossings, and thus there will be no fill or added impervious area as a result of the widening. Therefore, the potential risk as a result of this project is low at this location.
Table 8. Summary of Fill in the Base Floodplains

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</tr>
<tr>
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<td>23.10</td>
<td>438+00</td>
<td>Coyote Creek</td>
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<td>-</td>
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</tr>
<tr>
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<td>Coyote Creek</td>
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<td>-</td>
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<td>-</td>
</tr>
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<td>25.13</td>
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<td>25.70</td>
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<tr>
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<td>26.47</td>
<td>617+00</td>
<td>Coyote Creek</td>
<td>Yes</td>
<td>0.67</td>
<td>3,500</td>
<td>0.02%</td>
</tr>
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<tr>
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<td>29.83</td>
<td>811+50</td>
<td>Coyote Creek</td>
<td>Yes</td>
<td>0.34</td>
<td>3,500</td>
<td>0.01%</td>
</tr>
<tr>
<td>US 101</td>
<td>30.95</td>
<td>870+50</td>
<td>Upper Silver Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>31.15</td>
<td>881+00</td>
<td>Upper Silver Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>35.96</td>
<td>1135+00</td>
<td>Lower Silver Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>36.37</td>
<td>1155+00</td>
<td>Lower Silver Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>36.48</td>
<td>1161+00</td>
<td>N/A</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>36.69</td>
<td>1173+00</td>
<td>Coyote Creek</td>
<td>Yes</td>
<td>0.47</td>
<td>3,500</td>
<td>0.01%</td>
</tr>
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<td>US 101</td>
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<td>1255+00</td>
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<td>0.92</td>
<td>74.00</td>
<td>1.24%</td>
</tr>
<tr>
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<td>162.94</td>
<td>0.30%</td>
</tr>
<tr>
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<td>39.85</td>
<td>1340+00</td>
<td>N/A</td>
<td>Yes</td>
<td>0.63</td>
<td>162.94</td>
<td>0.39%</td>
</tr>
<tr>
<td>US 101</td>
<td>40.19</td>
<td>1357+50</td>
<td>Guadalupe River</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>40.62</td>
<td>1380+00</td>
<td>N/A</td>
<td>Yes</td>
<td>1.15</td>
<td>144</td>
<td>0.80%</td>
</tr>
<tr>
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<td>41.05</td>
<td>1403+00</td>
<td>N/A</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>41.75</td>
<td>1440+00</td>
<td>N/A</td>
<td>Yes</td>
<td>0.11</td>
<td>39</td>
<td>0.28%</td>
</tr>
<tr>
<td>US 101</td>
<td>42.45</td>
<td>1465+60</td>
<td>San Tomas Aquino Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>43.32</td>
<td>1522+00</td>
<td>Calabazas Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>44.69</td>
<td>1594+10</td>
<td>Sunnyvale East Channel</td>
<td>Yes</td>
<td>0.40</td>
<td>114</td>
<td>0.35%</td>
</tr>
<tr>
<td>US 101</td>
<td>48.04</td>
<td>1771+30</td>
<td>Stevens Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>49.19</td>
<td>1832+00</td>
<td>Permanente Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>50.66</td>
<td>1909+70</td>
<td>Adobe Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>51.37</td>
<td>1947+50</td>
<td>Matadero Creek</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: "-" indicates that information is not available or not applicable. Source: FEMA, Google

3.3 Increase in Impervious Surfaces

In addition to converting the existing HOV lane to express lane, the project will widen the traveled-way to include an additional express lane throughout most of the project. The widening will increase the impervious area within the project limits, resulting in increases in the peak runoff due to the deduction in the amount of pervious surfaces available for infiltration of stormwater runoff. Table 9 summarizes the amount of added impervious area draining to each of the floodplains. The watershed areas for each creek at the creek crossings are also listed in the table for comparison. These watershed areas were taken from the FIS for Santa Clara County (see Table 5).
Table 9. Added Impervious Area Draining to Base Floodplains

<table>
<thead>
<tr>
<th>Route</th>
<th>Approx. Floodplain Post Mile</th>
<th>Approx. Floodplain Statin</th>
<th>Flood Source</th>
<th>Drainage Area (m²)</th>
<th>Drainage Area (ac)</th>
<th>Total Added Impervious Area Draining to the Floodplain (ac)</th>
<th>% Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 101</td>
<td>16.85</td>
<td>108+00</td>
<td>Madrone Channel</td>
<td>3.1</td>
<td>1,984</td>
<td>7.12</td>
<td>0.359%</td>
</tr>
<tr>
<td>US 101</td>
<td>19.21</td>
<td>232+50</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>US 101</td>
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<td>255+00</td>
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<td></td>
<td></td>
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<td></td>
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<td>US 101</td>
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<td>438+00</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>23.90</td>
<td>480+00</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>25.13</td>
<td>545+00</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
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<td>575+00</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>26.47</td>
<td>617+00</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>28.06</td>
<td>695+00</td>
<td>Coyote Creek</td>
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<td></td>
<td></td>
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<tr>
<td>US 101</td>
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<td>811+50</td>
<td>Coyote Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>30.95</td>
<td>870+50</td>
<td>Upper Silver Creek</td>
<td>5.5</td>
<td>3,520</td>
<td>0.24</td>
<td>0.007%</td>
</tr>
<tr>
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<td>31.15</td>
<td>881+00</td>
<td>Upper Silver Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 101</td>
<td>35.96</td>
<td>1135+00</td>
<td>Lower Silver Creek</td>
<td>43.5</td>
<td>27,840</td>
<td>1.92</td>
<td>0.007%</td>
</tr>
<tr>
<td>US 101</td>
<td>36.37</td>
<td>1155+00</td>
<td>Lower Silver Creek</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>36.48</td>
<td>1161+00</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
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<td>Coyote Creek</td>
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<td>186,240</td>
<td>38.23</td>
<td>0.021%</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>US 101</td>
<td>39.34</td>
<td>1313+00</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>39.85</td>
<td>1340+00</td>
<td>N/A</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>1357+50</td>
<td>Guadalupe River</td>
<td>153</td>
<td>97,920</td>
<td>4.11</td>
<td>0.004%</td>
</tr>
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<td>40.62</td>
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</tr>
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<tr>
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<td>San Tomas Aquino Creek</td>
<td>41.8</td>
<td>26,752</td>
<td>2.17</td>
<td>0.008%</td>
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<td>1522+00</td>
<td>Calabazas Creek</td>
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<td>0.028%</td>
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<td>1594+10</td>
<td>Sunnyvale East Channel</td>
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<td>3,904</td>
<td>1.54</td>
<td>0.039%</td>
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<td>36.4</td>
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<td>0.000%</td>
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<td>1832+00</td>
<td>Permanente Creek</td>
<td>15.8</td>
<td>10,112</td>
<td>-</td>
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<td>1909+70</td>
<td>Adobe Creek</td>
<td>13.5</td>
<td>8,640</td>
<td>-</td>
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<td>1947+50</td>
<td>Matadero Creek</td>
<td>13.6</td>
<td>8,704</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: "-" indicates that information is not available or not applicable

Source: FEMA, URS

According to the comparison between the added impervious and the overall watershed area for each creek, the project will not pose a significant risk. As shown in Table 9, the increase in impervious area as a result of the project is minimal in comparison to the overall watershed area for each creek (less than 0.4%). Therefore, there will be no significant change in WSE to the identified floodplains due to the increases in impervious areas.

3.4 Measures to Minimize Floodplain Impacts Associated with the Action

The proposed fill within the floodplain is limited to pavement widening and regrading of side slopes to conform to the existing topography. In order to minimize impacts to the floodplains, the project has avoided fill in the floodplains whenever feasible and minimized additional impervious area that will result in additional flow to the floodplains. In addition, the project will retain the existing double thrie beam barriers whenever feasible to maintain the existing flow characteristics within the floodplains. As a result of these measures, the project will have minimal to no impacts to the floodplains within the project limits.
3.5 Measures to Restore and Preserve the Natural and Beneficial Floodplain Values Impacted by this Action

There are no anticipated impacts to areas with natural and beneficial floodplain values as a result of the project.

All construction activities will be limited to the existing right-of-way. All environmentally sensitive areas (ESAs), including wetlands, waters, and habitats that support sensitive species will be specified on contract documents to be protected. Contractor encroachment into ESAs will be prohibited.

In addition, the contractor will be required to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) to ensure water quality during the construction. The contractor will be required to install erosion control BMPs, prevent asphalt concrete from entering live streams, and keep all staging areas away from the waters of the U.S. or wetlands. Refer to the project storm water data report for more information on the proposed BMPs.

3.6 Practicability of Alternatives to any Significant Encroachments

The FHWA defines a “significant encroachment” as a highway encroachment, and any direct support of likely base floodplain development, that will involve one or more of the following construction or flood-related impacts: 1) significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route; 2) a significant risk; or 3) a significant adverse impact on the natural and beneficial floodplain values (1994).

The project will generally maintain the existing roadway profile. The impacts to the floodplains will be minimal due to the minor fill and minor increases in flows. Therefore, the floodplain encroachments will not be significant. The project will be entirely within the right-of-way of US 101 and SR 85. It will be impractical to relocate the project.

3.7 Practicability of Alternatives to any Longitudinal Encroachments

As defined by the FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is longitudinal to the normal direction of the floodplain.

The project does not constitute a longitudinal encroachment of the base floodplain. Coyote Creek generally runs parallel to US 101 and crosses US 101 four times within the project limits. At those locations where the roadway is inundated by the 1% annual chance flood, no fill or any structures that would decrease the flow area will be proposed at these areas.
4 REFERENCES


City of Palo Alto, California, Department of Public Works. (2009). Flood Zone Descriptions: Zone AE.


National Bridge Inventory Data. Santa Clara County Bridges.


Santa Clara Valley Water District. Calabazas Creek Capacity Improvement Project Fact Sheet

Appendix A  Federal Emergency Management Agency
Flood Insurance Rate Maps
Appendix B  Floodplain Evaluation Report Summary
FLOODPLAIN EVALUATION REPORT SUMMARY
District: 04   County: Santa Clara   Route: US 101   PM: 16.85
Project No: 0412000459   Bridge No.: N/A
Limits: Along Madrone Channel
Floodplain Description: The 1% annual chance floodplain (Zone AE) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

[Signature]
5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature]
8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature]
10/25/13

Signature - Dist. Environmental Branch Chief  Date

[Signature]
10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
District: 04  County: Santa Clara  Route: US 101  PM: 19.21
Project No. 0412000459  Bridge No.: 37-0349L, 37-0349R
Limits: Coyote Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AE) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain? [ ] No  [ ] Yes
2. Are the risks associated with the implementation of the proposed action significant? [ ]
3. Will the proposed action support probable incompatible floodplain development? [ ]
4. Are there any significant impacts on natural and beneficial floodplain values? [ ]
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. [ ]
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). [ ]
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. [ ]

PREPARED BY:

[Signature]  5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature]  8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature]  10/23/13

Signature - Dist. Environmental Branch Chief  Date

[Signature]  10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04     County: Santa Clara     Route: US 101     PM: 19.64
Project No. 0412000459     Bridge No.: N/A
Limits: Approximately 0.5 mi north of the Coyote Creek crossing at 232+50
Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating
US 101 but may be outdated: elevations shown on FIRM would not inundate current US 101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain? [ ] No    [ ] Yes
2. Are the risks associated with the implementation of the proposed action significant? [ ] No    [ ] Yes
3. Will the proposed action support probable incompatible floodplain development? [ ] No    [ ] Yes
4. Are there any significant impacts on natural and beneficial floodplain values? [ ] No    [ ] Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. [ ] No    [ ] Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). [ ] No    [ ] Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. [ ] No    [ ] Yes

PREPARED BY:

[Signature]     5/24/13

Signature - Hydraulic Engineer     Date

CONCURRENCE FROM:

[Signature]     8/05/13

Signature - Dist. Hydraulic Engineer     Date

[Signature]     10/25/13

Signature - Dist. Environmental Branch Chief     Date

[Signature]     10/23/13

Signature - Dist. Project Engineer     Date
FLOODPLAIN EVALUATION REPORT SUMMARY
District: 04  County: Santa Clara  Route: US 101  PM: 23.10
Project No. 0412000459  Bridge No.: N/A
Limits: Approximately 0.4 mi southeast of the US 101/Bailey Road interchange
Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating US 101 but may be outdated: elevations shown on FIRM would not inundate current US 101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain? [X] No  [ ] Yes
2. Are the risks associated with the implementation of the proposed action significant? [X] No  [ ] Yes
3. Will the proposed action support probable incompatible floodplain development? [X] No  [ ] Yes
4. Are there any significant impacts on natural and beneficial floodplain values? [ ] No  [X] Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. [ ] No  [X] Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). [ ] No  [X] Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. [ ] No  [X] Yes

PREPARED BY:

[Signature - Hydraulic Engineer]  5/24/13

CONCURRENCE FROM:

[Signature - Dist. Hydraulic Engineer]  8/05/13

[Signature - Dist. Environmental Branch Chief]  10/25/13

[Signature - Dist. Project Engineer]  10/23/13
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 23.90
Project No. 0412000459  Bridge No.: N/A
Limits: Approximately 0.5 mi northwest of the US 101/Bailey Road interchange
Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating
US 101 but may be outdated: elevations shown on FIRM would not inundate current US
101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action
   significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain
   development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the
   floodplain. Are there any special mitigation measures necessary to minimize
   impacts or restore and preserve natural and beneficial floodplain values? If
   yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as
   defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If
   not explain.  Yes  No

PREPARED BY:

[Signature]

5/24/13

Signature - Hydraulic Engineer  Date

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8/05/13

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 25.13
Project No. 0412000459  Bridge No.: N/A
Limits: Just southeast of the US 101/Metcalf Canyon Road interchange
Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating US 101 but may be outdated; elevations shown on FIRM would not inundate current US 101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  ☒ No  ☐ Yes
2. Are the risks associated with the implementation of the proposed action significant?  ☐
3. Will the proposed action support probable incompatible floodplain development?  ☐
4. Are there any significant impacts on natural and beneficial floodplain values?  ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  ☒

PREPARED BY:

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FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 25.70
Project No.: 0412000459  Bridge No.: N/A
Limits: Approximately 0.5 mi northwest of the US 101/Metcalf Canyon Road interchange

Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating US 101 but may be outdated: elevations shown on FIRM would not inundate current US 101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 26.47
Project No. 0412000459  Bridge No.: 37-0346L, 37-0346R, 37-0346E, 37-0346G,
Limits: Coyote Creek at US 101
Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AE) inundating
US 101 but may be outdated: elevations shown on FIRM would not inundate current US
101 elevations.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? No Yes
3. Will the proposed action support probable incompatible floodplain development? No Yes
4. Are there any significant impacts on natural and beneficial floodplain values? No Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. No Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). No Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No Yes

PREPARED BY:

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FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 28.06
Project No. 0412000459  Bridge No.: N/A
Limits: Approximately 0.6 mi southeast of the US 101/Silver Creek Valley Road overcrossing

Floodplain Description: FIRM shows 1% annual chance floodplain (Zone AO) inundating US 101 with a depth of 1 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 29.83
Project No. 0412000459  Bridge No.: 37-0102L, 37-0102R
Limits: Coyote Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone E) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No ☒ Yes ☐
2. Are the risks associated with the implementation of the proposed action significant? ☐ ☒
3. Will the proposed action support probable incompatible floodplain development? ☐ ☒
4. Are there any significant impacts on natural and beneficial floodplain values? ☐ ☒
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. ☐ ☒
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). ☐ ☒
7. Location Hydraulic Studies that document the above answers on file? If not explain. ☐ ☒

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 30.95
Project No. 0412000459  Bridge No.: N/A
Limits: Yerba Buena Road underpass at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AE) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  ☒  ☐
3. Will the proposed action support probable incompatible floodplain development?  ☒  ☐
4. Are there any significant impacts on natural and beneficial floodplain values?  ☒  ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  ☒  ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 31.15
Project No. 0412000459  Bridge No.: N/A
Limits: Upper Silver Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone A) does not inundate US 101.

1.  Is the proposed action a longitudinal encroachment of the base floodplain?  ☒  ☐
2.  Are the risks associated with the implementation of the proposed action significant?  ☒  ☐
3.  Will the proposed action support probable incompatible floodplain development?  ☒  ☐
4.  Are there any significant impacts on natural and beneficial floodplain values?  ☒  ☐
5.  Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  ☒  ☐
6.  Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  ☒  ☐
7.  Are Location Hydraulic Studies that document the above answers on file? If not explain.  ☐  ☒

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FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 35.96
Project No. 0412000459  Bridge No.: N/A
Limits: South of Lower Silver Creek
Floodplain Description: FIRM shows that the 1% annual chance floodplain inundates US 101. Area north of Alum Rock Avenue is within Zone AH with a 1% annual chance flood water surface elevation of 89 ft; Area south of Alum Rock Avenue is within Zone AO, with a 1% annual chance flood depth of 1 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  Yes
3. Will the proposed action support probable incompatible floodplain development?  No
4. Are there any significant impacts on natural and beneficial floodplain values?  No
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  Yes

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 36.37
Project No. 0412000459  Bridge No.: 37-0097
Limits: Lower Silver Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone A) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

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FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 36.48
Project No. 0412000459  Bridge No.: N/A
Limits: Northeast quadrant of the Lower Silver Creek crossing at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AH) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

[Signature]  5/24/13
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CONCURRENCE FROM:

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Signature - Dist. Hydraulic Engineer  Date

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04    County: Santa Clara    Route: US 101    PM: 36.69
Project No. 0412000459    Bridge No.: 37-0039
Limits: Coyote Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AE) does not inundate US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? ❌ □
3. Will the proposed action support probable incompatible floodplain development? ❌ □
4. Are there any significant impacts on natural and beneficial floodplain values? ❌ □
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. ❌ □
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). ❌ □
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. ❌ □

PREPARED BY:

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Signature - Dist. Project Engineer    Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 38.24
Project No. 0412000459  Bridge No.: N/A
Limits: The southeast quadrant of the US 101 / I-880 Junction
Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the
southbound I-880 to southbound US 101 on-ramp.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes

2. Are the risks associated with the implementation of the proposed action
   significant?

3. Will the proposed action support probable incompatible floodplain
   development?

4. Are there any significant impacts on natural and beneficial floodplain values?

5. Routine construction procedures are required to minimize impacts on the
   floodplain. Are there any special mitigation measures necessary to minimize
   impacts or restore and preserve natural and beneficial floodplain values? If
   yes, explain.

6. Does the proposed action constitute a significant floodplain encroachment as
   defined in 23 CFR, Section 650.105(g).

7. Are Location Hydraulic Studies that document the above answers on file? If
   not explain.

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 39.34
Project No. 0412000459  Bridge No.: N/A
Limits: The Airport Parkway and North 1st Street undercrossings
Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the US 101 southbound traveled-lanes, with a depth of 1 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  Yes  No
3. Will the proposed action support probable incompatible floodplain development?  Yes  No
4. Are there any significant impacts on natural and beneficial floodplain values?  Yes  No
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  Yes  No
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  Yes  No
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  Yes  No

PREPARED BY:

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FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04   County: Santa Clara   Route: US 101   PM: 39.85
Project No. 0412000459   Bridge No.: N/A
Limits: The US 101/SR 87 interchange
Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the US
101 traveled-lanes in both directions, with a WSE of 39 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  ☒  ☐
2. Are the risks associated with the implementation of the proposed action
   significant?  ☒  ☐
3. Will the proposed action support probable incompatible floodplain
   development?  ☐  ☒
4. Are there any significant impacts on natural and beneficial floodplain values?  ☐  ☒
5. Routine construction procedures are required to minimize impacts on the
   floodplain. Are there any special mitigation measures necessary to minimize
   impacts or restore and preserve natural and beneficial floodplain values? If
   yes, explain.  ☐  ☒
6. Does the proposed action constitute a significant floodplain encroachment as
   defined in 23 CFR, Section 650.105(q).  ☐  ☒
7. Are Location Hydraulic Studies that document the above answers on file? If
   not explain.  ☐  ☒

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 40.19
Project No. 0412000459  Bridge No.: 37-0037, 37-0037S
Limits: Guadalupe River at US 101

Floodplain Description: The 1% annual chance flood is contained within the channel. The 1% annual chance floodplain (Zone A) does not inundate the US 101 traveled-lanes in both directions.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
2. Are the risks associated with the implementation of the proposed action significant?  
3. Will the proposed action support probable incompatible floodplain development?  
4. Are there any significant impacts on natural and beneficial floodplain values?  
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?  
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 40.62
Project No. 0412300459  Bridge No.: N/A
Limits: The West Trimble Road overcrossing interchange
Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the US 101 traveled-lanes in both directions, with a WSE of 36 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  ☑ Yes  ☐ No
2. Are the risks associated with the implementation of the proposed action significant?  ☑ Yes  ☐ No
3. Will the proposed action support probable incompatible floodplain development?  ☑ Yes  ☐ No
4. Are there any significant impacts on natural and beneficial floodplain values?  ☐ No  ☑ Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  ☐ No  ☑ Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  ☑ Yes  ☐ No
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  ☑ Yes  ☐ No

PREPARED BY:

__________________________  5/24/13
Andrette Otha

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

__________________________  8/05/13

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__________________________  10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 41.05
Project No. 0412000459  Bridge No.: N/A

Limits: The Lafayette Street overcrossing
Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the US 101 traveled-lanes in both directions, with a WSE of 25 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 41.75
Project No. 0412000459  Bridge No.: N/A
Limits: US 101 southbound travel lanes between San Tomas Expressway and Lafayette St

Floodplain Description: The 1% annual chance floodplain (Zone AH) inundates the US 101 traveled-lanes in both directions, with a WSE of 25 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

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Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 42.45
Project No. 0412000459  Bridge No.: 37-0041
Limits: San Tomas Aquino Creek at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AE) does not inundate the US 101 roadway.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

Signature - Hydraulic Engineer  Date

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Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 43.32
Project No. 0412000459  Bridge No.: 37-0399
Limits: Calabazas Creek at US 101

Floodplain Description: The current FIRM shows 1% annual chance floodplain (Zone AO) inundate the US 101 traveled-lanes in both directions, with a depth of 1.5 ft. The updated FIRM should show the 1% annual chance floodplain does not inundate US 101 or surrounding areas.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  
   No  Yes
3. Will the proposed action support probable incompatible floodplain development?  
   No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  
   No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
   No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   No  Yes

PREPARED BY:

[Signature]  5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature]  8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature]  10/25/13

Signature - Dist. Environmental Branch Chief  Date

[Signature]  10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 44.69
Project No. 0412000459  Bridge No.: N/A
Limits: Sunnyvale East Channel at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AE) inundates the US 101 traveled-lanes in both directions between North Fair Oaks Avenue and Lawrence Expressway, with a WSE of 29 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  No  Yes
3. Will the proposed action support probable incompatible floodplain development?  No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  No  Yes

PREPARED BY:

[Signature] 5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature] 8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature] 10/25/13

Signature - Dist. Environmental Branch Chief  Date

[Signature] 10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 48.04
Project No. 0412000459  Bridge No.: 37-0034

Limits: Stevens Creek at US 101

Floodplain Description: The 1% annual chance floodplain (Zone A) does not inundate the US 101 roadway. The 1% annual chance flood is contained within the channel.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   □ No □ Yes

2. Are the risks associated with the implementation of the proposed action significant?  
   □ Yes □ No

3. Will the proposed action support probable incompatible floodplain development?  
   □ Yes □ No

4. Are there any significant impacts on natural and beneficial floodplain values?  
   □ Yes □ No

5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
   □ Yes □ No

6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?  
   □ Yes □ No

7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
   □ Yes □ No

PREPARED BY:

[Signature]
5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature]
8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature]
10/25/13

Signature - Dist. Environmental Branch Chief  Date

[Signature]
10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 49.19
Project No. 0412000459  Bridge No.: N/A
Limits: 0.3 mi southeast of Permanente Creek crossing at US 101
Floodplain Description: The 1% annual chance floodplain (Zone AO/AE) does not inundate the US 101 roadway. The 1% annual chance flood inundates the US 101 southbound lanes with a depth of 1 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No ☒ Yes ☐
2. Are the risks associated with the implementation of the proposed action significant?  
   ☒ ☐
3. Will the proposed action support probable incompatible floodplain development?  
   ☒ ☐
4. Are there any significant impacts on natural and beneficial floodplain values?  
   ☒ ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   ☒ ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
   ☐ ☒
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   ☒ ☐

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04  County: Santa Clara  Route: US 101  PM: 50.66
Project No. 0412000459  Bridge No.: 37-0174
Limits: Adobe Creek at US 101

Floodplain Description: The 1% annual chance floodplain (Zone AE) inundates much of the surrounding area, including the US 101 roadway. The 1% annual chance flood water surface elevation is 11 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No  ❌  Yes  ☑️
2. Are the risks associated with the implementation of the proposed action significant?  
   No  ❌  Yes  ☑️
3. Will the proposed action support probable incompatible floodplain development?  
   No  ❌  Yes  ☑️
4. Are there any significant impacts on natural and beneficial floodplain values?  
   No  ❌  Yes  ☑️
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   No  ❌  Yes  ☑️
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?  
   No  ❌  Yes  ☑️
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   No  ❌  Yes  ❌

PREPARED BY:

[Signature]  5/24/13

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

[Signature]  8/05/13

Signature - Dist. Hydraulic Engineer  Date

[Signature]  10/23/13

Signature - Dist. Environmental Branch Chief  Date

[Signature]  10/23/13

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY

District: 04    County: Santa Clara    Route: US 101    PM: 51.37
Project No. 0412000459    Bridge No.: 37-0040
Limits: Mateadero Creek at US 101

Floodplain Description: The 1% annual chance floodplain (Zone AE) inundates much of the surrounding area, including the US 101 roadway. The 1% annual chance flood water surface elevation is 11 ft.

1. Is the proposed action a longitudinal encroachment of the base floodplain? ☒ ☐
2. Are the risks associated with the implementation of the proposed action significant? ☐ ☒
3. Will the proposed action support probable incompatible floodplain development? ☐ ☒
4. Are there any significant impacts on natural and beneficial floodplain values? ☐ ☒
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. ☐ ☒
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). ☐ ☒
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. ☒ ☐

PREPARED BY:

[Signature]

5/24/13

Signature - Hydraulic Engineer

Date

CONCURRENCE FROM:

[Signature]

8/05/13

Signature - Dist. Hydraulic Engineer

Date

[Signature]

10/25/13

Signature - Dist. Environmental Branch Chief

Date

[Signature]

10/23/13

Signature - Dist. Project Engineer

Date
Appendix C  Location Hydraulic Study Forms
LOCATION HYDRAULIC STUDY FORM


Federal-Aid Project Number: ____________________________

Floodplain Description:
According to FIRMs 06085C0444H, US 101 is located Adjacent to the 100-year floodplain of Madrone Channel (approximately at Sta “A” 108+00); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed median widening and the widening is completely outside of the Madrone Channel floodplain (no fill in the floodplain) and result in insignificant added impervious area.

2. ADT:
   Current  N/A  Projected  N/A

3. Hydraulic Data:
   Base Flood Q100= 430 cfs
   WSE100= 359 ft - 381 ft
   Q= N/A cfs
   Overtopping flood Q= N/A cfs

   The flood of record, if greater than Q100:
   WSE= N/A

Are NFIP maps and studies available?  YES

4. Is the highway location alternative within a regulatory floodway?  NO  X  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences?  NO  X  YES
   B. Other Bldgs?  NO  X  YES
   C. Crops?  NO  X  YES
   D. Natural and beneficial Floodplain values?  NO  X  YES

   “Natural and beneficial floodplain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route?  NO  YES  X
   B. Emergency vehicle access?  NO  YES  X
   C. Practicable detour available?  NO  YES  X
   D. School bus or mail route?  NO  YES  X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level:
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low  X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 16.85
Federal-Aid Project Number: ____________________________
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature]  
Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?

NO  X  YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of the Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature]  
Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature]  
Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature]  
Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 19.21 EA: 04-2G7100

Federal-Aid Project Number: 

Floodplain Description:
According to FIRMS 06085C0441H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta “A” 232+50); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance flood
   water surface elevation (no fill in the floodplain) and result in insignificant added impervious area.

2. ADT:
   Current N/A
   Projected N/A

3. Hydraulic Data:
   Base Flood Q100 = 15,000 cfs
   WSE100 = 358 ft The flood of record, if greater than Q100:
   Q= N/A cfs
   WSE= N/A
   Overtopping flood Q= N/A cfs
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 19.21
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. 37-0349L and 37-0349R

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/5/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 19.64 EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRMs 06085C0441H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta “A” 255+00); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance flood water surface elevation (no fill in the floodplain) and result in insignificant added impervious area.

2. ADT:
Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100= N/A cfs
WSE100= 346 ft The flood of record, if greater than Q100:
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Blds? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 19.64
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

Anabelle Othman Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

District Project Engineer (capital and 'on' system projects) Date 10/23/13

Local Agency Project Engineer (local assistance projects) Date

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

District Hydraulic Engineer (capital and 'on' system projects) Date 8/05/13

District Project Manager (capital and 'on' system projects) Date

Local Agency Project Manager (Local Assistance projects) Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determinations includes environmental mitigation consistent with the Floodplain analysis.

District Senior Environmental Planner (or Designee) Date

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 23.10 EA: 04-2G7100
Federal-Aid Project Number:

Floodplain Description:
According to FIRM's 06085C04128H and 06085C0429H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta "A" 438+400); the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc and design elements to minimize floodplain impacts):
There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance flood water surface elevation (no fill in the floodplain) and result in insignificant added impervious area.

2. ADT:
   Current N/A
   Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 272 ft
   The flood of record, if greater than Q100:
   Q= N/A cfs
   Overtopping flood Q= N/A cfs
   WSE= N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO X YES
   B. Emergency vehicle access? NO X YES
   C. Practicable detour available? NO X YES
   D. School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) -- moderate risk level:
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low
   Moderate
   X
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 23.10
Federal-Aid Project Number:
EA: 04-207100 Bridge No. N/A

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

AnaLisa Ochoa Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of this report.

District Project Engineer (capital and 'on' system projects) Date 10/23/13

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

District Hydraulic Engineer (capital and 'on' system projects) Date 8/05/13

District Project Manager (capital and 'on' system projects)

Date

Local Agency Project Manager (Local Assistance projects)

Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 21 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

District Senior Environmental Planner (or Designee) Date

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 23.90 EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM 06085C0428H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta. "A" 480+00); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance flood water surface elevation (no fill in the floodplain) and result in insignificant added impervious area. The project may replace the existing concrete barriers / retaining walls with new retaining walls, which will not change the existing flow characteristics.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 264 ft The flood of record, if greater than Q100:
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 23.90
Federal-Aid Project Number:
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate

Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report

Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650

Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Date

Local Agency Project Manager (Local Assistance projects)

Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM


Federal-Aid Project Number:

Floodplain Description:
According to FIRMs 06085C0426H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta "A" 545+00); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance floodwater surface elevation (no fill in the floodplain) and result in insignificant added impervious area. The project may replace the existing concrete barriers/retaining walls with new retaining walls, which will not change the existing flow characteristics.

2. ADT:  
   Current N/A  
   Projected N/A

3. Hydraulic Data:  
   Base Flood Q100= N/A cfs  
   WSE100= 248 ft  
   Q= N/A cfs  
   Overtopping flood Q= N/A cfs

   The flood of record, if greater than Q100:

   WSE= N/A

   Are NFIP maps and studies available?  YES

4. Is the highway location alternative within a regulatory floodway?  NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldg? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   “Natural and beneficial floodplain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level:
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 25.13
Federal-Aid Project Number: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: Analili Otero
Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature: [Signature]
Date 10/28/13
District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

Signature: [Signature]
Date 8/05/13
District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Signature: [Signature]
Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 25.70 EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM 06085C0407H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta "A" 575+00): the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but the widening will be well above the 1% annual chance flood water surface elevation (no fill in the floodplain) and result in insignificant added impervious area. The project may replace the existing concrete barriers / retaining walls with new retaining walls, which will not change the existing flow characteristics.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= _____ N/A cfs
   WSE100= 235 ft
   \( Q= \) N/A cfs
   Overtopping flood Q= N/A cfs
   WSE= N/A

   The flood of record, if greater than Q100:
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 25.70
Federal-Aid Project Number:
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of this report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

Date

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Date

Local Agency Project Manager (Local Assistance projects)

Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRMs 06085C0407H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta “A” 617+00); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers,vails, etc. and design elements to minimize floodplain impacts)
There will be widening within this floodplain. The fill and added impervious area will be insignificant compared to the overall floodplain. The bridge and channel will be not modified.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data:
Base Flood Q100= 14,830 cfs
WSE100= 228 ft
Q= N/A cfs
Overtopping flood Q= N/A cfs

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.
Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

*“Natural and beneficial floodplain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours; N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 26.47
Federal-Aid Project Number: 04-207100

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature]  Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible floodplain development?  NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature]  Date 10/23/13

District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature]  Date 8/05/13

District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature]  Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Federal-Aid Project Number: ________________

Floodplain Description:
According to FIRM 0608, Site 60268, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta. "A" 69S+00); the area is designated as Zone AO. FEMA's Zone AO represents the floodplain caused by the shallow sheet overtopping flow from Coyote Creek during a 1% annual chance storm event. Zone AO at this location has a shallow flooding depth of 1 foot.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be median widening, and will match the existing grade (no fill). The added impervious area will be insignificant compared to the overall floodplain watershed. The existing double thrie beam barriers will be retained or replace with similar structures that will not attenuate flow from flowing across US 101.

2. ADT:  
   Current ______ N/A ______  
   Projected ______ N/A ______

3. Hydraulic Data:  
   Base Flood Q100 = ______ N/A ______ cfs  
   WSE100 = ______ N/A ______ WSE = ______ N/A ______  
   The flood of record, if greater than Q100:  
   Q = ______ N/A ______ cfs  
   WSE = ______ N/A ______  
   Overtopping flood Q = ______ N/A ______ cfs  
   WSE = ______ N/A ______

Are NFIP maps and studies available?  
   YES

4. Is the highway location alternative within a regulatory floodway?  
   NO ____ X ____ YES ______

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:  
   A. Residences?  
      NO ____ X ____ YES ______
   B. Other Bldgs?  
      NO ____ X ____ YES ______
   C. Crops?  
      NO ____ X ____ YES ______
   D. Natural and beneficial floodplain values?  
      NO ____ X ____ YES ______

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:  
   A. Emergency supply or evacuation route?  
      NO ____ YES ____ X ______
   B. Emergency vehicle access?  
      NO ____ YES ____ X ______
   C. Practicable detour available?  
      NO ____ YES ____ X ______
   D. School bus or mail route?  
      NO ____ YES ____ X ______

7. Estimated duration of traffic interruption for 100-year event hours:  
   ______ N/A ______

8. Estimated value of Q100 flood damages (if any) - moderate risk level.  
   A. Roadway $ ______ N/A ______
   B. Property $ ______ N/A ______
   Total $ ______ N/A ______

9. Assessment of Level of Risk  
   Low ____ X ______
   Moderate ______
   High ______

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 28.06
Federal-Aid Project Number: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6, 7 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 29.83  EA: 04-2G7100

Federal-Aid Project Number:

Floodplain Description:
According to FIRMs 06085C0268H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta. "A" 817+50); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e., concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain, but the widening will result in insignificant fill and added impervious area. The bridge and creek channel will not be modified.

2. ADT:
   Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= 13,670 cfs
   WSE100= 171 ft
   The flood of record, if greater than Q100:
   Q= N/A cfs
   WSE= N/A
   Overtopping flood Q= N/A cfs
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bllds? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

*“Natural and beneficial floodplain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 29.83

Federal-Aid Project Number:

EA: 04-207100 Bridge No. 37-0102L and 37-0102R

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (Local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final FS&E reflects the information and recommendations of said report:

[Signature] Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (Local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 30.95 EA: 04-2G7100
Federal-Aid Project Number:

Floodplain Description:
According to FIRM's 06085C0266H, US 101 is located within the 100-year floodplain of Upper Silver Creek (approximately at Sta "A" 870+50); the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be no widening within this floodplain (no fill). The widening outside this floodplain will result in insignificant added impervious area draining to this floodplain.

2. ADT:
   Current N/A
   Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 173 ft
   Q= N/A cfs
   Overtopping flood Q= N/A cfs
   WSE= N/A
   The flood of record, if greater than Q100:
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 30.95
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?

NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 4, and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplain studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara RTE. US 101 P.M. 31,15 EA: 04-2G7100

Federal-Aid Project Number:

Floodplain Description:
According to FIRMs 06085C0262H and 06085C0266H, US 101 is located within the 100-year floodplain of Upper Silver Creek (approximately at Sta “A” 881+00); the area is designated as Zone A. FEMA’s Zone A represents a floodplain determined by approximate methods. The 100-year flood is contained within the channel.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be no widening within this floodplain (no fill). The widening outside this floodplain will result in insignificant added impervious area draining to this floodplain. The cross culvert and creek channel will not be modified.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= N/A cfs
WSE100= N/A (contained)

Q= N/A cfs
Overtopping flood Q= N/A cfs

WSE= N/A
WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences?
   NO X YES
B. Other Blgs?
   NO X YES
C. Crops?
   NO X YES
D. Natural and beneficial Floodplain values?
   NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, agriculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route?
   NO YES X
B. Emergency vehicle access?
   NO YES X
C. Practicable detour available?
   NO YES X
D. School bus or mail route?
   NO YES X

7. Estimated duration of traffic interruption for 100-year event hours; N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara Rte. US 101 P.M. 31.15
Federal-Aid Project Number: ____________________________________________
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

__________________________________________ Date 5/24/13
Analotte Othman
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6, and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

__________________________________________ Date 10/23/13
Carrick Mullen
District Project Engineer (capital and 'on system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date 8/05/13
Jenelle Cline
District Hydraulic Engineer (capital and 'on system projects)

__________________________________________ Date
District Project Manager (capital and 'on system projects)

__________________________________________ Date
Local Agency Project Manager (Local Assistance projects)

__________________________________________ Date
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA documents or determinations include environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 35.96  EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM's 060850C0251H, US 101 is located within the 100-year floodplain of Lower Silver Creek (approximately at Sta "A" 1135+00); the area is designated as Zones AH and AO. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 89 ft. FEMA's Zone AO represents the floodplain caused by the shallow sheet overtopped flow from Lower Silver Creek during a 1% annual chance storm event. Zone AO at this location has a shallow flooding depth of 1 foot.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

There will be outside widening within the floodplain, but it will be within cut areas or match the existing grade (no fill in the floodplain). There will be median widening, and the existing double three beam barriers will be retained or replaced with similar structures that will not attenuate flow from flowing across US 101. The added impervious area as a result of the widening will be insignificant.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 89 ft  The flood of record, if greater than Q100:
   Q= N/A cfs  WSE= N/A
   Overtopping flood Q= N/A cfs  WSE= N/A

Are NFIP maps and studies available?  YES

4. Is the highway location alternative within a regulatory floodway?  NO  X  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences?  NO  X  YES
B. Other Bldgs?  NO  X  YES
C. Crops?  NO  X  YES
D. Natural and beneficial Floodplain values?  NO  X  YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route?  NO  YES  X
   B. Emergency vehicle access?  NO  YES  X
   C. Practicable detour available?  NO  YES  X
   D. School bus or mail route?  NO  YES  X

7. Estimated duration of traffic interruption for 100-year event hours:  N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low  X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 35.96
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in Items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that Items numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of this report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date 
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 36.37 EA: 04-2G7100

Federal-Aid Project Number: 

Floodplain Description:
According to FIRMs 06085C0251H and 06085C0253H, US 101 is located within the 100-year floodplain of Lower Silver Creek (approximately at Stn “A” 1155+00); the area is designated as Zone A. FEMA’s Zone A represents floodplain determined by approximate methods.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be no widening within this floodplain (no fill). The widening outside this floodplain will result in insignificant added impervious area draining to this floodplain. The bridge and creek channel will not be modified.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100= 2,670 cfs
WSE100= 89 ft
The flood of record, if greater than Q100:
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water-quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk
Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 36.37
Federal-Aid Project Number: __________________________
EA: 04-2G7100 Bridge No. 37-0097

PREPARED BY:

Signature: __________________________ Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report. Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

Date

District Project Manager (capital and 'on' system projects)

Date

Local Agency Project Manager (Local Assistance projects)

Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplain studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 36.48  EA: 04-2G7100

Federal-Aid Project Number: __________________________

Floodplain Description:
According to FIRM 06085C0251H, US 101 is located within the 100-year floodplain (approximately at Sta "A" 1161+00, flood source undetermined); the area is designated as Zone AH. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 87 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be no widening within this floodplain (no fill). The widening outside this floodplain will result in insignificant added impervious area draining to this floodplain.

2. ADT:
   Current N/A  Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 87 ft
   Q= N/A cfs
   Overtopping flood Q= N/A cfs

   The flood of record, if greater than Q100:
   WSE= N/A
   WSE= N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO  X  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO  X  YES
   B. Other Bldgs? NO  X  YES
   C. Crops? NO  X  YES
   D. Natural and beneficial Floodplain values? NO  X  YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO  YES  X
   B. Emergency vehicle access? NO  YES  X
   C. Practicable detour available? NO  YES  X
   D. School bus or mail route? NO  YES  X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low  X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 36.48

Federal-Aid Project Number: 

EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? 

NO  _____ YES  

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of this report.

[Signature] Date 10/23/13

District Project Engineer (capital and "on" system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and "on" system projects)

District Project Manager (capital and "on" system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date 

District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. ______ Co. ___________ Rte. ___ US ___ P.M. __________ EA: ___
Federal-Aid Project Number: ____________________________

Floodplain Description:
According to FIRMs 06085C0232H and 06085C0251H, US 101 is located within the 100-year floodplain of Coyote Creek (approximately at Sta. "A" 1173+00); the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be proposed widening within this floodplain but the widening will result in insignificant fill and added impervious area. The bridge and the creek channel will not be modified.

2. ADT:
   Current ______ N/A ______
   Projected ______ N/A ______

3. Hydraulic Data:
   Base Flood Q100= ______ 12,500 cfs
   WSE100= ______ 84 ft
   The flood of record, if greater than Q100:
   Q= ______ N/A cfs
   WSE= ______ N/A
   Overtopping flood Q= ______ N/A cfs
   WSE= ______ N/A

   Are NFIP maps and studies available? ______ YES ______

4. Is the highway location alternative within a regulatory floodway? ______ NO ______ X ______ YES ______

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? ______ NO ______ X ______ YES ______
   B. Other Bldgs? ______ NO ______ X ______ YES ______
   C. Crops? ______ NO ______ X ______ YES ______
   D. Natural and beneficial Floodplain values? ______ NO ______ X ______ YES ______

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? ______ NO ______ X ______ YES ______
   B. Emergency vehicle access? ______ NO ______ X ______ YES ______
   C. Practicable detour available? ______ NO ______ X ______ YES ______
   D. School bus or mail route? ______ NO ______ X ______ YES ______

7. Estimated duration of traffic interruption for 100-year event hours: ______ N/A ______

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
   A. Roadway $ ______ N/A ______
   B. Property $ ______ N/A ______
   Total $ ______ N/A ______

9. Assessment of Level of Risk ______ Low ______ X ______ Moderate ______
    ______ High ______

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 36.69
Federal-Aid Project Number: ____________________________________________
EA: 04-267100  Bridge No. 37-0039

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature]  Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? 

NO  X  YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

[Signature]  Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Date __________________________

Local Agency Project Engineer (local assistance projects)

Date __________________________

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature]  Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

Date __________________________

District Project Manager (capital and 'on' system projects)

Date __________________________

Local Agency Project Manager (Local Assistance projects)

Date __________________________

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Date __________________________

District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 38.24 EA: 04-2G7100
Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM 060850232H, the southbound I-80 to southbound US 101 on-ramp is located within the 100-year floodplain (approximately at Sta "A" 1255+00, flood source undetermined); the area is designated as Zone AH having a 1% flood WSE of 55 ft. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= N/A
   The flood of record, if greater than Q100:
   Q= N/A cfs
   Overtopping flood Q= N/A cfs
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, agriculture, forestry, natural restoration of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO _____ YES X
   B. Emergency vehicle access? NO _____ YES X
   C. Practicable detour available? NO _____ YES X
   D. School bus or mail route? NO _____ YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara Rte. US 101 P.M. 38.24
Federal-Aid Project Number: EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?

NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 39.34 EA: 04-2G7100

Federal-Aid Project Number: __________________________

Floodplain Description:
According to FIRMs 06085C0231H, US 101 is located within the 100-year floodplain (approximately at Sta “A” 1313+00, flood source undetermined); the area is designated as Zone AH. FEMA’s Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a shallow flooding depth of 1 foot.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100= N/A cfs
WSE100= N/A The flood of record, if greater than Q100:
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

“Natural and beneficial flood-plain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural modification of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 39.34
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: [Signature]
Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?

NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.
District Project Engineer (capital and "on" system projects)
Date 10/23/13

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650
District Hydraulic Engineer (capital and "on" system projects)
Date 8/05/13

District Project Manager (capital and "on" system projects)
Date

Local Agency Project Manager (Local Assistance projects)
Date

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

District Senior Environmental Planner (or Designee)
Date

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Federal-Aid Project Number: ____________________________

Floodplain Description:
According to FIRM 06085C0231H, US 101 is located within the 100-year floodplain (approximately at Sta "A" 1340+00, flood source undetermined); the area is designated as Zone AH. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 39 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.

2. ADT: Current ______ N/A ______ Projected ______ N/A ______

3. Hydraulic Data:
Base Flood Q100= ______ N/A _____ cfs
WSE100= 39 ft The flood of record if greater than Q100:
Q= ______ N/A _____ cfs WSE= ______ N/A ______
Overtopping flood Q= ______ N/A _____ cfs WSE= ______ N/A ______

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO _____ X _____ YES ______

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO _____ X _____ YES ______
   B. Other Bldgs? NO _____ X _____ YES ______
   C. Crops? NO _____ X _____ YES ______
   D. Natural and beneficial floodplain values? NO _____ X _____ YES ______

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO _____ YES _____ X ______
   B. Emergency vehicle access? NO _____ YES _____ X ______
   C. Practicable detour available? NO _____ YES _____ X ______
   D. School bus or mail route? NO _____ YES _____ X ______

7. Estimated duration of traffic interruption for 100-year event hours: ______ N/A ______

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
   A. Roadway $ ______ N/A ______
   B. Property $ ______ N/A ______
   Total $ ______ N/A ______

9. Assessment of Level of Risk Low _____ X _____ Moderate _____
   High ______

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 39.85
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:
Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that items numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PSE reflects the information and recommendations of said report.

[Signature] Date 10/23/13
District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Pracicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 40.19 EA: 04-2G7100

Federal-Aid Project Number: __________________________

Floodplain Description:
According to FIRMs 06085C006-H, 06085C0068H and 06085C0231H US 101 is located within the 100-year floodplain of Guadalupe River (approximately at Stu “A” 1357+50); the area is designated as Zone A. FEMA’s Zone A represents a floodplain determined by approximate methods.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be no widening within this floodplain. The widening outside this floodplain will result in insignificant added impervious area draining to this floodplain. The bridge and the channel will not be modified.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100 = 9,800 cfs
WSE100= 29.5 ft The flood of record if greater than Q100:
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs?
C. Crops?
D. Natural and beneficial Floodplain values?

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO X YES
B. Emergency vehicle access? NO X YES
C. Practicable detour available? NO X YES
D. School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 40.19
Federal-Aid Project Number: ____________________________
EA: 04-2G7100  Bridge No. 37-0037 and 37-0037S

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature]  Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO  X  YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6, and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature]  Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature]  Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the nominal and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature]  Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Funding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 40.62 EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM's 06085C006-H, 06085C0068-H, 06085C0231-H, US 101 is located within the 100-year floodplain (approximately at Sta "A" 1380+00, flood source undetermined); the area is designated as Zone AH. FEMA’s Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 39 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.
   There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100 = N/A cfs
   WSE100 = 39 ft
   The flood of record, if greater than Q100:
   Q = N/A cfs
   WSE = N/A
   Overtopping flood Q = N/A cfs
   WSE = N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agricultural, architectural, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 40.62
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature]  Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature]  Date 10/23/13
District Project Engineer (capital and 'on' system projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature]  Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature]  Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04  Co. Santa Clara  Rte. US 101  P.M.  41.05  EA: 04-2G7100

Federal-Aid Project Number:

Floodplain Description:
According to FIRM: 06085C0064H, US 101 is located within the 100-year floodplain (approximately at Sta "A" 1403+40, flood source undetermined): the area is designated as Zone AH. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 36 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but only within a cut area (no fill) The widening will result in insignificant added impervious area.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data:
   - Base Flood Q100 = N/A cfs
   - WSE100 = 36 ft
   - Overtopping flood Q = N/A cfs

   The flood of record, if greater than Q100:
   - Q = N/A cfs
   - WSE = N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway?  NO  X  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO  X  YES
B. Other Bldgs? NO  X  YES
C. Crops? NO  X  YES
D. Natural and beneficial Floodplain values? NO  X  YES

"Natural and beneficial flood-plain values" shall include but are not limited to timothy, wildlife, plants, open space, natural beauty, scientific value, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO  X  YES
B. Emergency vehicle access? NO  X  YES
C. Practicable detour available? NO  X  YES
D. School bus or mail route? NO  X  YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   - Low  X
   - Moderate
   - High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 41.05
Federal-Aid Project Number: ____________________________
EA: 04-2G7100 Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

[Signature] Date 10/23/13

District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date

District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 41.75 EA: 04-2G7100

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM: 06085C0064H, US 101 is located within the 100-year floodplain (approximately at Sta "A"
1440+00, flood source undetermined); the area is designated as Zone AH. FEMA's Zone AH represents the areas of 1% annual chance shallow flooding where average depths are between 1 and 3 ft. Zone AH at this location has a BFE of 25 ft.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be widening within this floodplain. The widening will result in insignificant fill and added impervious area draining to this floodplain.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 25 ft
   Q= N/A cfs
   Overtopping flood Q= N/A cfs

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 41.75
Federal-Aid Project Number: ________________________
EA: 04-2Q7100  Bridge No. N/A

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in item numbers 3, 4, 5, 8, and 9 of this form is accurate.

Anallete Othow Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that items numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final FS&E reflects the information and recommendations of said report.

Caroline Simon Date 10/33/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

Date ______________________

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submital consistent with the attached checklist, and concur that the submital is adequate to meet the mandates of 23 CFR 650.

Jamiel Coli Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Date ______________________

Local Agency Project Manager (Local Assistance projects)

Date ______________________

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

District Senior Environmental Planner (or Designee)

Date ______________________

Note: If a significant floodplain encroachment is identified as a result of floodplain studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 42.45 EA: 04-2G7100
Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRMs 06085C0063H and 06085C0064H, US 101 is located within the 100-year floodplain of San Tomas Aquino Creek (approximately at Sta "A" 1465+60); the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The proposed roadway widening will be entirely outside the floodplain limits (no fill in the floodplain). The widening outside of the floodplain will result insignificant added impervious area draining to this floodplain. The bridge and channel will not be modified.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100= 9,100 cfs
WSE100= 33 ft The flood of record, if greater than Q100;
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water-quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO X YES
B. Emergency vehicle access? NO X YES
C. Practicable detour available? NO X YES
D. School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 42.45
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. 37-0041

PREPARED BY:
Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 6, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date 
District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 43.32 EA: 04-2G7100
Federal-Aid Project Number: ____________________________

Floodplain Description:
According to FIRMs 06085C0063H, US 101 is located within the 100-year floodplain of Calabazas Creek (approximately at Sta “A” 1522+00); the area is designated as Zone AO. FEMA’s Zone AO represents the floodplain caused by the shallow sheet overtopped flow from Coyote Creek during a 1% annual chance storm event. Zone AO upstream of the US 101 crossing has a shallow flooding depth of 1.5 ft. The 100-year flood downstream of the US 101 crossing is contained within the channel.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be no proposed widening within this floodplain. The adjacent widening outside of this floodplain will result in insignificant added impervious area draining to this floodplain. The bridge and channel will not be modified.

2. ADT:
Current N/A Projected N/A

3. Hydraulic Data:
Base Flood Q100 = 4,780 cfs
WSE100 = N/A
Q = N/A cfs
Overtopping flood Q = N/A cfs

The flood of record, if greater than Q100: WSE = N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway S N/A
B. Property S N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clar Rte. US 101 P.M. 43.32
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. 37-0399

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 3, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/3/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/5/13
District Hydraulic Engineer (capital and 'on' system projects)

Date
District Project Manager (capital and 'on' system projects)

Date
Local Agency Project Manager (Local Assistance projects)

Date
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. ___________ Co. ___________ Rte. ___________ P.M. ___________ EA: ___________
Federal-Aid Project Number: ___________

Floodplain Description:
According to FIRMs 06085C0045H and 06085C0063H, US 101 is located within the 100-year floodplain of Sunnyvale East Channel (approximately at Sta “A” 1594+10); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses. The 100-year flood is contained within the channel.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
There will be proposed widening within this floodplain but the widening will result in insignificant fill and added impervious area draining to this floodplain. The culvert and the channel will not be modified.

2. ADT: Current ___________ N/A ___________ Projected ___________ N/A ___________

3. Hydraulic Data:
Base Flood Q100 = _______ cfs
WSE100 = N/A ___________
The flood of record, if greater than Q100:
Q = _______ N/A ___________ cfs
Overtopping flood Q = _______ N/A ___________ cfs
WSE = N/A ___________

Are NFIP maps and studies available? YES ___________

4. Is the highway location alternative within a regulatory floodway? NO ___________ X YES ___________

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO ___________ X YES ___________
B. Other Bldgs? NO ___________ X YES ___________
C. Crops? NO ___________ X YES ___________
D. Natural and beneficial Floodplain values? NO ___________ X YES ___________

"Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO ___________ YES ___________ X ___________
B. Emergency vehicle access? NO ___________ YES ___________ X ___________
C. Practicable detour available? NO ___________ YES ___________ X ___________
D. School bus or mail route? NO ___________ YES ___________ X ___________

7. Estimated duration of traffic interruption for 100-year event hours: ___________ N/A ___________

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ _______ N/A ___________
B. Property $ _______ N/A ___________
Total $ _______ N/A ___________

9. Assessment of Level of Risk
Low ___________ X
Moderate ___________
High ___________

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04  Co. Santa Clara  Rte. US 101  P.M. 44.69
Federal-Aid Project Number: 
EA: 04-2G7100  Bridge No. N/A

PREPARED BY:

Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? 

NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13

District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04  Co. Santa Clara  Re. US 101  P.M. 48.04  EA: 04-2G7100

Federal-Aid Project Number: __________________________

Floodplain Description:
According to FIRM 06085C0037H, US 101 is located within the 100-year floodplain of Stevens Creek (approximately at Sta. “A” 1771+30); the area is designated as Zone A. FEMA’s Zone A represents a floodplain determined by approximate methods.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be no roadway widening within this floodplain. The widening outside this floodplain will result in insignificant impervious area draining to this floodplain. The bridge and the channel will not be modified.

2. ADT:  
   Current N/A  
   Projected N/A

3. Hydraulic Data:
   Base Flood Q100 = 5,750 cfs
   WSE100 = 35.9 ft
   Q = N/A cfs
   Overtopping flood Q = N/A cfs
   WSE = N/A

4. Are NFIP maps and studies available? YES

5. Is the highway location alternative within a regulatory floodway? NO X YES

6. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial floodplain values" shall include but not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) - moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 48.04
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. 37-0034

PREPARED BY:

Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?

NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13

District Project Engineer (capital and ‘on’ system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and ‘on’ system projects)

District Project Manager (capital and ‘on’ system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date 

District Senior Environmental Planner (or Designer)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Federal-Aid Project Number: ___

Floodplain Description:
According to FIRMs 06085C0037H, US 101 is located within the 100-year floodplain of Permanente Creek (approximately at Sta “A” 1832+00); the area is designated as Zone AE and AO. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses. FEMA’s Zone AO represents the floodplain caused by the shallow sheet overtopped flow from Permanente Creek during a 1% annual chance storm event. Zone AO at this location has a shallow flooding depth of 1 foot.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, sandwalls, etc. and design elements to minimize floodplain impacts). There will be no roadway widening and therefore no fill in the floodplain. No additional impervious area is expected and thus, there will be no additional flow anticipated as a result of this project. The cross culvert and the channel will not be modified.

2. ADT: Current ___ N/A ___ Projected ___ N/A ___

3. Hydraulic Data:
Base Flood Q100= ___ 4,000 ___ cfs
WSE100= ___ 16 ___ ft
The flood of record, if greater than Q100:
Q= ___ N/A ___ cfs
WSE= ___ N/A ___
Overtopping flood Q= ___ N/A ___ cfs
WSE= ___ N/A ___

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO ___ X ___ YES ___

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO ___ X ___ YES ___
   B. Other Bldgs? NO ___ X ___ YES ___
   C. Crops? NO ___ X ___ YES ___
   D. Natural and beneficial Floodplain values? NO ___ X ___ YES ___

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO ___ X ___ YES ___
   B. Emergency vehicle access? NO ___ X ___ YES ___
   C. Practicable detour available? NO ___ X ___ YES ___
   D. School bus or mail route? NO ___ X ___ YES ___

7. Estimated duration of traffic interruption for 100-year event hours: ___ N/A ___

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ ___ N/A ___
   B. Property $ ___ N/A ___
   Total $ ___ N/A ___

9. Assessment of Level of Risk
   Low ___ X ___
   Moderate ___
   High ___

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 49.19
Federal-Aid Project Number: ________________________________
EA: 04-247100 Bridge No. N/A

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

_________________________Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

_________________________Date 10/23/13
District Project Engineer (capital and ‘on’ system projects)

________________________________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_________________________Date 8/05/13
District Hydraulic Engineer (capital and ‘on’ system projects)

________________________________________
District Project Manager (capital and ‘on’ system projects)

________________________________________
Local Agency Project Manager (Local Assistance projects)

________________________________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

________________________________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 50.66 EA: 04-2G7100
Federal-Aid Project Number:______________________________

Floodplain Description:
According to FIRMs 06085C0036H, US 101 is located within the 100-year floodplain of Adobe Creek (approximately at Sta “A” 1909+70); the area is designated as Zone AE. FEMA’s Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be no roadway widening at the vicinity of this floodplain, and thus there will be no fill or added impervious area as a result of the widening. The bridge and channel will not be modified. The existing DTBB will be retained.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100=1,780 cfs
   WSE100=11 ft
   The flood of record, if greater than Q100:
   Q=N/A cfs WSE=N/A
   Overtopping flood Q=N/A cfs WSE=N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

“Natural and beneficial flood plain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 50.66
Federal-Aid Project Number: 
EA: 04-2G7100 Bridge No. 37-0174

PREPARED BY:

Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. 

[Signature] Date 5/24/13

Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that items numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final FS&E reflects the information and recommendations of said report. 

[Signature] Date 10/23/13

District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650. 

[Signature] Date 8/05/13

District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis. 

[Signature] Date

District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 51.37 EA: 04-2G7100

Federal-Aid Project Number: __________________________

Floodplain Description:
According to FIRM s 06085C0030H, US 101 is located within the 100-year floodplain of Matadoreo Creek (approximately at Sta. "A" 1947+50); the area is designated as Zone AE. FEMA's Zone AE represents the 1% annual chance floodplain determined by detailed hydraulic analyses.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   There will be no roadway widening at the vicinity of this floodplain, and thus there will be no fill or added impervious area as a result of the widening. The bridge and channel will not be modified. The existing DTBB will be retained.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= 1,775 efs
   WSE 100= 11 ft
   Q= N/A efs
   Over topping flood Q= N/A efs

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial floodplain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) — moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 51.37
Federal-Aid Project Number:
EA: 04-2G7100 Bridge No. 37-0040

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

[Signature] Date 5/24/13
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  
NO  X  YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report.

[Signature] Date 10/23/13
District Project Engineer (capital and 'on' system projects)

Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

[Signature] Date 8/05/13
District Hydraulic Engineer (capital and 'on' system projects)

District Project Manager (capital and 'on' system projects)

Local Agency Project Manager (Local Assistance projects)

District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

[Signature] Date
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplain studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
Appendix D  Pavement Delineation Plan
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

- Drainage inlet
- Drainage outlet
- Drainage discharge point
- Drainage junction box
- Drainage pipe

MORGAN HILL

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'
PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

MORGAN HILL

PUENTE AVE

ROUTE 101

DIANA Ave

15,300' EXPRESS LANE
FACILITY OPENING
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

MORGAN HILL

1000 EXPRESS LANE
FACILITY OPENING

LAUREL Rd

1000 EXPRESS LANE
FACILITY OPENING

15,000 EXPRESS LANE
FACILITY OPENING

FOR NOTES AND LEGEND
SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

MORGAN HILL

1000' EXPRESS LANE
ROUTE OPENING

10' SHLD
12'
12'
12'
10' SHLD

15,300' EXPRESS LANE
ROUTE OPENING

1000' EXPRESS LANE
ROUTE TRANSITION

0 TO 2

PD-9

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
R/W R/W
R/W R/W
R/W R/W
R/W R/W

CHECKED BY
REVISED BY
DATE REVISED
CONSULTANT FUNCTIONAL SUPERVISOR

DATE
USERNAME =>
DGN FILE =>

CALCULATED-
DESIGNED BY

DATE PLOTTED =>

TIME PLOTTED =>

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

MORGAN HILL

LAUREL Rd

15,500' EXPRESS LANE
FACILITY OPENING

PD-10

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
NOTE:
For accurate right of way data, contact
right of way engineering at the district office.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

MORGAN HILL

NOTE:

FOR NOTES AND LEGEND
SEE SHEET PD-1
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

NOTE:
FOR NOTES AND LEGEND SEE SHEET PD-1

S A N J O S E

ROUTE 101

2000' EXPRESS LANE FACILITY OPENING

LANE TRANSITIONS
12' TO 11'

ROUTE 101

LANE TRANSITIONS
12' TO 11'

15,300' EXPRESS LANE FACILITY OPENING

BUFFER TRANSITION
  0' TO 2'

0' TO 2'

10' SHld

12'

12'

12'

12'

12'

12'

10' SHld

12'

12'

12'

12'

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10' SHld

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10' SHld

12'

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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

S A N  J O S E

ROUTE 101

For notes and legend see sheet PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-19
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

AVENUE STREETS - DEVELOPMENT OF TRANSPORTATION
COMMUNITY, CIVIL, AND GENERAL SERVICES

PD-20

SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PD-24

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

CONSULTANT FUNCTIONAL SUPERVISOR

CHECKED BY

PLANS APPROVAL DATE

REVISED BY

DATE REVISED

CALCULATED-

DESIGNED BY

REVISED BY

DATE REVISED

USERNAME =>

DGN FILE =>

RELATIVE BORDER SCALE

IS IN INCHES

UNIT

04000026710

BORDER LAST REVISED 7/2/2010

FOR NOTES AND LEGEND

SEE SHEET PD-1

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NOTE:
For accurate right of way data, contact right of way engineering at the district office.

For notes and legend see sheet PD-1.
NOTE:
For accurate right of way data, contact Right of Way Engineering at the District Office.

For notes and legend, see sheet PD-1.

Approved for pavement delineation work only.

State of California - Department of Transportation

Caltrans District 4

San Jose, CA 95134

Transportation Authority
Santa Clara Valley

URS Corporation
100 W San Fernando St
Suite 200
San Jose, CA 95113

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NOTE: FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

NOTE: FOR NOTES AND LEGEND
SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

PD-27
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SAN JOSE

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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FOR NOTES AND LEGEND
SEE SHEET PD-1
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FOR NOTES AND LEGEND
SEE SHEET PD-1
NOTE:
For accurate right of way data, contact Right of Way Engineering at the District Office.

NOTE:
For notes and legend, see Sheet PD-1

SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

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S C A L E : 1" = 5 0'

NOTE:
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

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FOR NOTES AND LEGEND
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APPROVED FOR PAVEMENT DELINEATION WORK ONLY
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FOR NOTES AND LEGEND
SEE SHEET PD-1

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

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FOR NOTES AND LEGEND
SEE SHEET PD-1

S A N J O S E
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SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
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SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

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PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

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PAVEMENT DELINEATION PLAN
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SCALE: 1" = 50'

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SCALE: 1" = 50'

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SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

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NOTE:

FOR NOTES AND LEGEND
SEE SHEET PD-1
NOTE:
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES AND LEGEND
SEE SHEET PD-1

SAN JOSE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-73

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
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NOTE:
For accurate right of way data, contact
right of way engineering at the district office.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

For notes and legend see Sheet PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
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PAVEMENT DELINEATION PLAN

NOTE: FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
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NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1

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NOTE:
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For accurate right of way data, contact Right of Way Engineering at the District Office.

NOTE:
For notes and legend see Sheet PD-1.
NOTE:
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

- Driver Transition 9' to 11'
- Lane Transition 11' to 13'
- 4,500' Express Lane Facility Opening

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
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STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

PAVEMENT DELINEATION PLAN

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NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

S A N J O S E

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
EINHOF OF RIGHT ENGINEERING AT THE DISTRICT OFFICE.

SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

PD-110

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

NOTE FOR COORDINATES AND LEGEND SEE SHEET PD-1
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SANTA CLARA

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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SANTA CLARA

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SCON COUNTY
ROUTE
POST MILES
TOTAL PROJECT
SHEET
No.
TOTAL
SHEETS

STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

NOTE:
SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'
PD-113
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1

SANTA CLARA

ROUTE 101

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-115
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SAN JOSE 95134
3331 N First Street
Transportation Authority
Santa Clara Valley
URS Corporation
100 W San Fernando St
Suite 200
San Jose, CA 95113
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

SUNNYVALE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
UNIT OF R/W ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PAVEMENT DELINEATION PLAN

SCALE: 1" = 50'

SUNNYVALE

NOTE:
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RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

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NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1

SUNNYVALE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-128

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

NOTE:
FOR NOTES AND LEGEND
SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

SUNNYVALE

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-130
NOTE:
For accurate right of way data, contact Right of Way Engineering at the District Office.
NOTE:
For accurate right of way data, contact Right of Way Engineering at the District Office.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES AND LEGEND SEE SHEET PD-1
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
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NOTE:
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MOUNTAIN VIEW

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
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STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

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PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

STATE OF CALIFORNIA  -  DEPARTMENT OF TRANSPORTATION

NOTE:
FOR NOTES AND LEGEND SEE SHEET PD-1

APPROVED FOR PAVEMENT DELINEATION WORK ONLY
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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
PERSON OF RIGHT ENGINEERING AT THE DISTRICT OFFICE.
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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

EXISTING MILE MARKERS

ROUTE 101

W BAYSHORE Rd

E BAYSHORE Rd

S BAYSHORE Rd

M BAYSHORE Rd

LOCALITEE 65' SHLD

E BAYSHORE Rd

W BAYSHORE Rd

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7
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9
10

7,900' EXPRESS LANE

FACILITY OPENING

3,797' EXPRESS LANE

FACILITY OPENING

+48

+81

1,319'

131.9:1 Min TAPER

6.5' Shld

4.3' & Var Shld

10' & Var Shld

7.9' & Var Shld

SEE SHEET

SEE SHEET

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NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
NOTE:
For accurate right of way data, contact right of way engineering at the district office.

P A V E M E N T   D E L I N E A T I O N   P L A N

SCALE: 1" = 50'

NOTE:
For accurate right of way data, contact right of way engineering at the district office.

NOTE:
For notes and legend, see Sheet PD-1

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NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
ROOM 65 ENGINEERING AT THE DISTRICT OFFICE.

M O U N T A I N  V I E W

PAVEMENT DELINEATION PLAN
SCALE: 1" = 50'

PD-159

APPROVED FOR PAVEMENT DELINEATION WORK ONLY

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ROOM 65 ENGINEERING AT THE DISTRICT OFFICE.
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