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CEQA INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

SHIELLS ROAD BRIDGE (NO.39C-0180) REPLACEMENT AT CENTRAL CALIFORNIA IRRIGATION DISTRICT MAIN CANAL BRLO-5938(192)

STANISLAUS COUNTY, CALIFORNIA

LSA

April 2015

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STANISLAUS COUNTY, CALIFORNIA

Submitted to:

Stanislaus County Department of Public Works
1716 Morgan Road
Modesto, California 95385

Prepared by:

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LSA Project No. NLT1203

LSA

April 2015

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1.0 INTRODUCTION

The Stanislaus County Department of Public Works (Stanislaus County), in coordination with the California Department of Transportation District 10 (Caltrans District 10), as assigned by the Federal Highway Administration (FHWA), proposes the Shiells Road Bridge over Central California Irrigation District (CCID) Main Canal Replacement Project, near Newman, Stanislaus County, California. The proposed Project includes the replacement of the Shiells Road Bridge (No. 39C-0180) and improvement of road approaches on Shiells Road and the CCID access roads.

1.1 ENVIRONMENTAL REVIEW

The proposed Project constitutes a "Project" in accordance with the California Environmental Quality Act (CEQA). Prior to approving the proposed Project, Stanislaus County must provide environmental review in accordance with CEQA to assess the potential impacts of the Project, including mitigation when necessary.

Stanislaus County has prepared this Initial Study (IS) to provide agencies and the public with information about the potential impacts of the proposed Project on the regional and local environment. This document has been prepared in compliance with the CEQA of 1970 as amended, and the State CEQA Guidelines, California Administrative Code, Title 14, Division 6, Chapter 3 (CEQA Guidelines).

In anticipation of determining that all potentially significant impacts resulting from the proposed Project can be mitigated to less than significant levels, a Mitigated Negative Declaration (MND) is being considered to provide environmental clearance for the proposed Project.

1.2 SUMMARY INFORMATION

1. **Project Title:**

   Shiells Road Bridge (No. 39C-0180) Replacement at Central California Irrigation District Main Canal BRLO-5938(192)

2. **Lead Agency Name and Address:**

   Stanislaus County Public Works
   1716 Morgan Road
   Modesto, California 95385

3. **Contact Person and Phone Number:**

   Sambath Chrun, P.E., Public Works Associate Civil Engineer, (209) 525-4133

4. Project Location:

The Project site is located at the Central California Irrigation District (CCID) Main Canal crossing, in southwestern Stanislaus County, approximately 2.3 miles east of Interstate 5 (I-5) and 18 miles southwest of U.S. Highway 99 (US-99), near the City of Newman, California. **Figure 1: Regional Location** and **Figure 2: Project Location** depicts the location of the Project site on a regional and local scale.

5. Project Sponsor's Name and Address:

Stanislaus County Public Works
1716 Morgan Road
Modesto, California 95385

6. General Plan Designation:

Shiells Road is a County-owned right-of-way, and, therefore has no land use designation. Surrounding APNs 026-025-034; 026-020-050; 026-025-002; and 026-020-012 have land use designations of Agricultural.

7. Zoning:

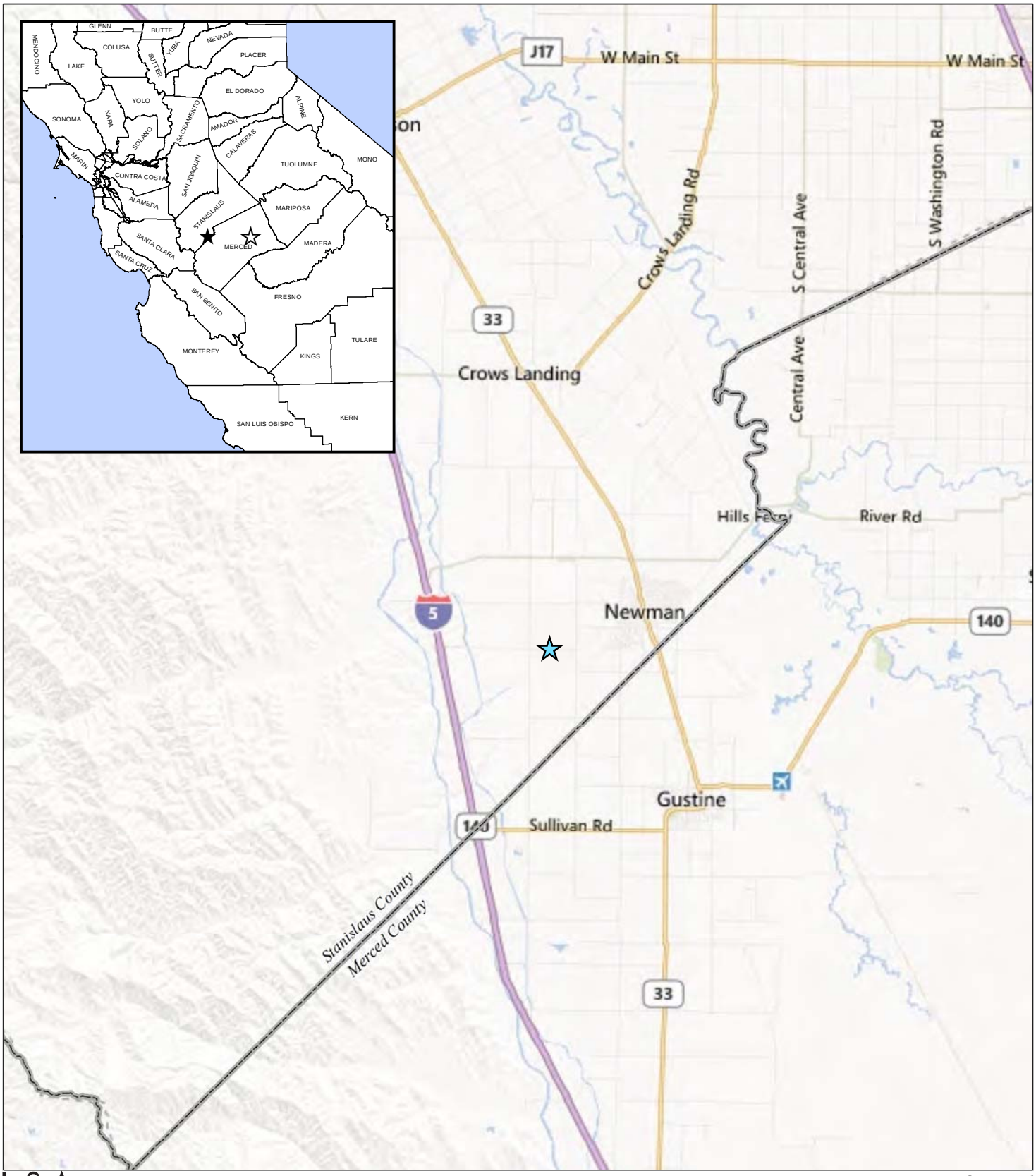
Shiells Road is a County-owned right-of-way, and therefore does not have a zoning designation. Surrounding APNs 026-025-034; 026-020-050; 026-025-002; and 026-020-012 are zoned A-2-40 (General Agriculture with a 40-acre minimum).

8. Description of Project:

The Project site is 3.77 acres in size and encompasses the maximum extent of ground disturbance including construction staging areas. The Project site extends 650 feet along Shiells Road and is approximately 50 feet wide (excluding the portion of the Project area that encompasses improvements to the levee maintenance roads and two driveways). **Figure 3: Project Design** shows the design of the proposed Project.

The Shiells Road Bridge was constructed in 1928 before the canal was filled with water. The bridge is a continuous three-span, reinforced concrete T-beam girder structure on diaphragm abutments and two reinforced concrete pier walls, supported by spread footings. The existing bridge is considered structurally deficient, with a sufficiency rating of 52.2 and a health index of 73.8. The soffit of the existing bridge is below the top of the canal and under normal flow conditions (300 cubic feet per second), the soffit is at the water level. The existing bridge is too narrow to accommodate traffic in both directions.

The proposed (replacement) bridge would have a 32-foot clear width with two 12-foot travel lanes and two 4-foot shoulders as prescribed by the County standard 3-A5 and AASHTO for a facility carrying an Average Daily Traffic (ADT) count of 309 with a truck ADT of 14.7 percent. The proposed bridge structure would be single-span and approximately 77 feet long with a total bridge deck width of 34.8 feet (32 feet of clear width). The roadway profile of the replacement bridge would be on a higher vertical alignment in order to improve the hydraulic performance of the canal crossing and allow debris to flow under the bridge. In order for the replacement structure to provide equal or greater hydraulic capacity, the soffit of the replacement bridge would be set 12 inches higher than the high water elevation, which would increase the roadway profile by about 20



LSA

LEGEND

Project Location

FIGURE 1

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Regional Location

N

0 1.5 3
MILES

SOURCE: Microsoft Bing Map - Roads (2010)

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LEGEND

Project Site Boundary

FIGURE 2

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

N

0 500 1000
FEET

Project Location

SOURCE: Microsoft Bing Aerial (2011)

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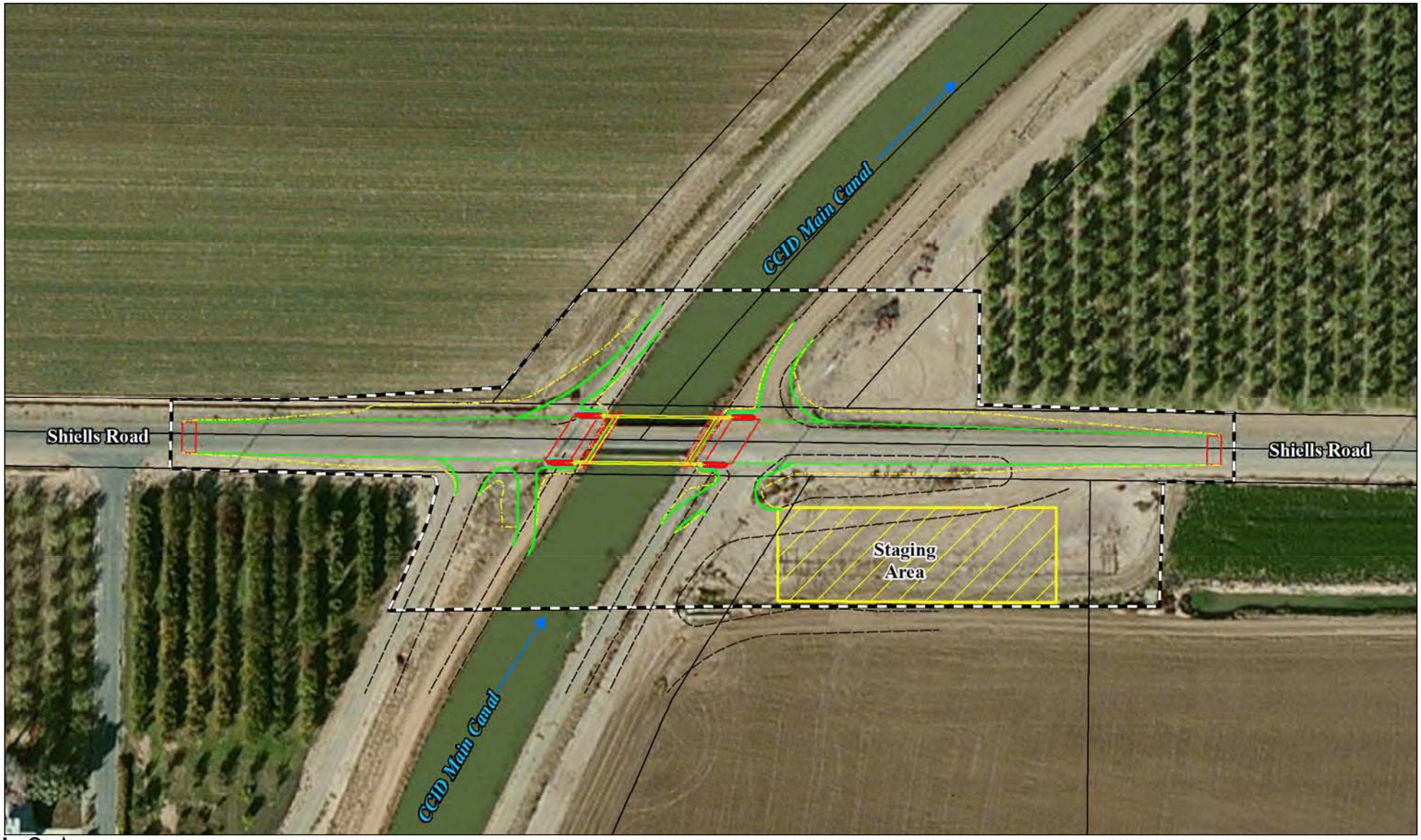

LSA

LEGEND

Project Site Boundary

FIGURE 3

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

0 50 100
FEET

Project Design

SOURCE: Basemap - Microsoft Bing Aerial (2011); Mapping - Nolte Engineering (2013)

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inches. The roadway approach work would extend approximately 200 feet east and west of the new bridge. Constructing the proposed bridge on the higher vertical roadway profile would require the acquisition of right-of-way on either side of the bridge or would require the construction of retaining walls along the length of the roadway to retain the new approach fill. Additionally, if the proposed bridge were to be constructed on a higher vertical roadway profile, retaining walls would potentially be required to keep the approach fill from encroaching into the existing canal limits.

Construction would include the full closure of the existing Shiells Road Bridge so that the proposed replacement bridge and associated roadway approach work can be built without using staged construction. Staged construction would require up to 8 months for full construction of the proposed bridge. With a full road closure and a local detour, the required bridge construction time would be reduced to 4 months. The full road detour is illustrated in **Figure 4: Detour Plan**. Construction of the proposed Project is anticipated to begin in November 2015 and would be completed in March 2016.

Temporary construction easements would be required on APN 026-025-034 and within the canal right-of-way (ROW). Approximately 50,000 square feet would be utilized for construction easements. No new ROW would be acquired.

Existing utilities within the Project area are located on the south side of Shiells Road and include four overhead power lines and below-grade telecommunications cables with a telephone conduit attached to the east edge of the bridge.

A construction staging area would be developed and utilized on the southeast quadrant of the Project area outside of the existing ROW. Shiells Road would be closed at the bridge location during proposed Project construction and an approximate 3-mile detour using adjacent local streets would be used to accommodate local traffic.

9. Surrounding Land Uses:

The Project area is located approximately 2.3 miles east of Interstate 5 (I-5) and 18 miles southwest of U.S. Highway 99 (US-99) within the rural area of southwestern Stanislaus County. The area is comprised primarily of agricultural lands transected by the CCID Main Canal. Adjacent land use designations of the 1994 *Stanislaus County General Plan* (revised in 2011) are Agricultural land uses.

Additional information concerning surrounding land uses within and adjacent to the Project area is included in the Land Use and Planning Section of this Initial Study.

10. Other Public Agencies whose Approval is Required (e.g., permits, financing approval, or participation agreement).

- Stanislaus County CEQA Approval
- Department of Transportation (Caltrans) District 10
- Central California Irrigation District Encroachment Permit

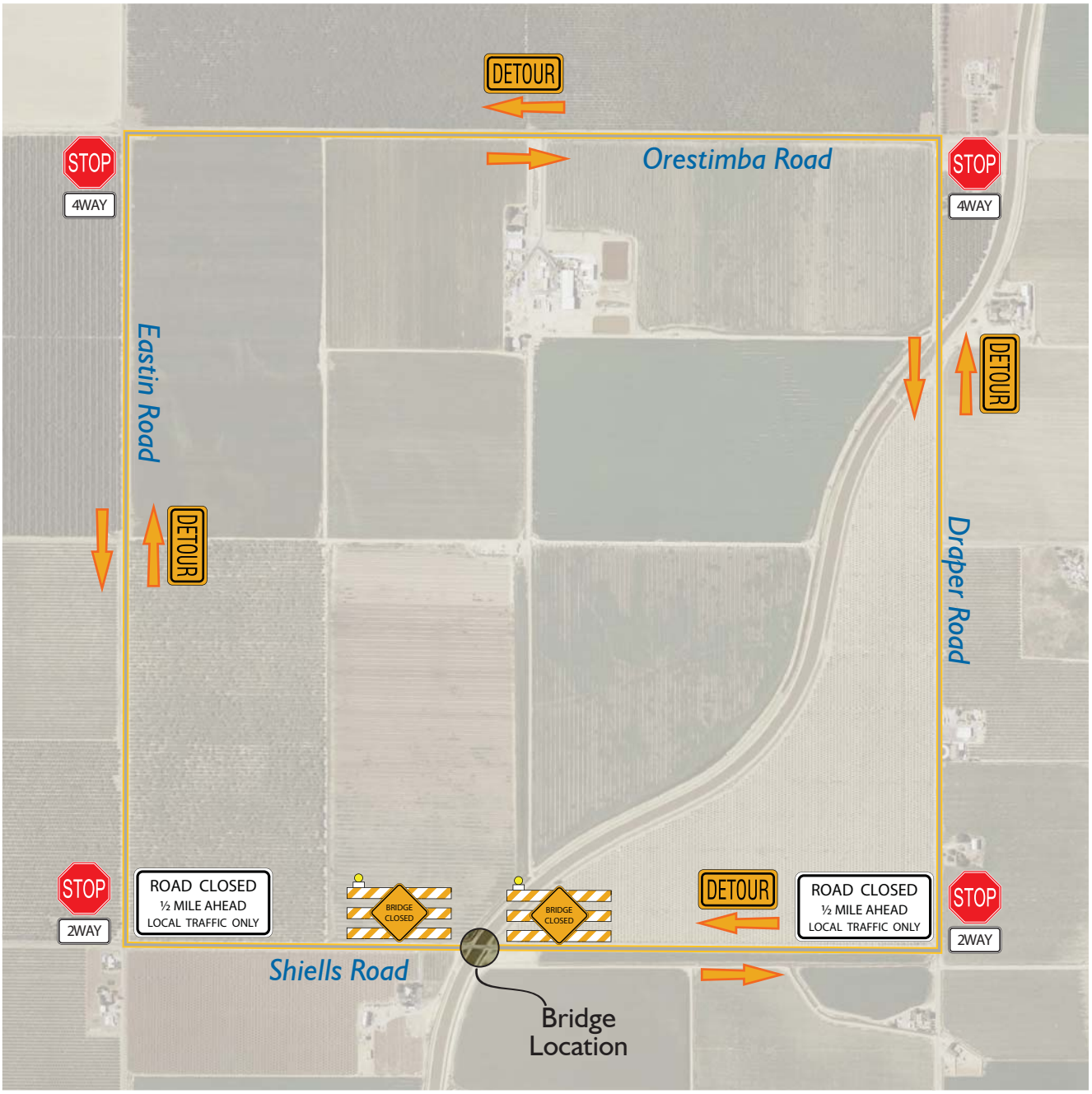

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FIGURE 4

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Construction Detour

SOURCE: NV5 Engineering (2013), LSA Associates, Inc. (2013).

I:\Nlt1203\AI\IS-MND\Figure 4.ai (10/8/2013)

11. Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Less Than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☒ Biological Resources
- ☒ Greenhouse Gas Emissions
- ☐ Land Use/Planning
- ☐ Population/Housing
- ☒ Transportation/Traffic
- ☐ Agricultural and Forestry Resources
- ☒ Cultural Resources
- ☒ Hazards & Hazardous Materials
- ☐ Mineral Resources
- ☐ Public Services
- ☐ Utilities/Service Systems
- ☐ Air Quality
- ☒ Geology/Soils
- ☐ Hydrology/Water Quality
- ☐ Noise
- ☐ Recreation
- ☐ Mandatory Findings of Significance

12. Determination. (To be completed by the Lead Agency.)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION would be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or potentially significant unless mitigated impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

_____ _____

Signature Date

2.0 ENVIRONMENTAL EVALUATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

The Project site is located in the southwestern portion of Stanislaus County in a rural area characterized by large parcels of agricultural land with active and inactive cropland and orchards, residential units and associated agricultural outbuildings. The Project site and surrounding area is topographically flat with an approximate elevation of 110 feet above mean sea level (msl).

Land adjacent to the Project area is characterized by dairy, irrigated open lands, and almond orchards, the Shiells Road ROW, unpaved CCID Main Canal access roads, single-family residential units, and agricultural outbuildings (storage buildings). CCID Main Canal is an unvegetated, concrete-lined waterway that transects Shiells Road through the Project site.

The State of California has designated various State highways as having natural scenic beauty worthy of preservation. Within Stanislaus County, I-5 is an officially adopted State Scenic Highway. The State has not designated any other potential scenic highways within the County. Stanislaus County has identified several roadways as potential scenic routes including: State Highway 132 (west of Modesto), Orange Blossom Road, La Grange Road, Del Puerto Canyon Road, and State Highway 4 in the northeastern portion of the County. Each of the abovementioned roads are characterized by open, undeveloped areas, in either a natural condition or devoted to agricultural production. None of these roadways are located near the Project site.

The main sources of light and glare emanating from or onto the Project site are generated by vehicle usage on nearby roadways or from nearby residences.

Discussion

a) Have a substantial adverse effect on a scenic vista?

No Impact. The Project site is located in an area of Stanislaus County that is characterized by agricultural land uses. The area surrounding and within the Project site is topographically level with an average elevation of 110 feet msl.

The proposed Project would require a construction period of approximately four months, during which time the existing bridge would be removed, a new bridge would be constructed, and roadway improvements would be developed. Once operational, the Project site would be visually similar to existing conditions. Development of the proposed Project would not have an adverse effect on a scenic vista; therefore, ***no impact*** would occur.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

No Impact. The Project site is not located within or near a designated State Scenic Highway. The nearest designated State Scenic Highway is I-5, located 2.3 miles west of the Project site. The Project site is located in a rural agricultural area that is topographically flat with no prominent visual features. Development of the proposed Project would not substantially damage scenic resources such as trees, rock outcroppings, or historic buildings within a designated State Scenic Highway. Therefore, ***no impact*** would occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant. Active and inactive agricultural lands (including dairy, irrigated open undeveloped lands, and almond orchards) define the existing visual character and quality of the Project site and the surrounding area.

Construction activities would result in temporary impacts to the visual character and quality of the land within the Project boundaries. Residents adjacent to the Project site and motorists traveling on Shiells Road approaching the Project site would recognize the visual change due to the presence of construction equipment and detour signage, removal of the existing bridge, roadway approach improvements, and development and installation of the new bridge. However, such visual changes would be minimal and temporary throughout the construction period and would only occur within the Project boundaries. The visual characteristics of the areas surrounding the Project site would remain intact during Project construction and operation.

Once construction is complete and the Project site is operational the visual character and quality of the site would be comparable to existing conditions. Once the proposed Project is operational adjacent residents and motorists traveling on Shiells Road approaching the Project site would notice the new bridge and roadway approach/departure areas; however, the viewer's exposure or sensitivity to the change would be minor. Motorists that are new to traveling on Shiells Road would most likely not recognize the change within the Project area.

Project development would not substantially degrade the existing visual character or quality of the site and surrounding areas; therefore, impacts would be ***less than significant***.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. The proposed Project would not create a new source of light or glare. The proposed Project would not incorporate lighting elements into the design. The new bridge and improvements to the roadway approach would not generate any additional traffic (e.g., additional vehicle headlights, taillights) light or glare. The proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use?	☐	☒	☐	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☒	☐	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

Environmental Setting

The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources based on soil information documented by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). Agricultural land is rated by the NRCS according to soil quality and

irrigation status. The best land suited for agricultural production is designated as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance and are collectively known as Important Farmland. The maps are updated every two years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. FMMP's statistical and mapping information is contiguous with modern soil surveys developed by the U.S. Department of Agriculture. The FMMP designates land into the following categories: Prime Farmland; Farmland of Statewide Importance, Unique Farmland; Farmland of Local Importance; Grazing Land; Urban and Built-Up Land; Other Land; and Water. The following provides definitions for each of these designations:

- **Prime Farmland –** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Unique Farmland –** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- **Farmland of Statewide Importance –** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Farmland of Local Importance –** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. In Stanislaus County, this designation is used for farmlands growing dryland pasture, dryland small grains, and irrigated pasture.
- **Grazing Land** – Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattleman's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.
- **Urban and Built-Up Land –** Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land –** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped under this designation.
- **Water –** Perennial water bodies with an extent of at least 40 acres.

Maps from the FMMP were reviewed to determine if the Project site is located within an area designated as Important Farmland. The proposed Project would be located on land designated as Prime Farmland on the California Department of Conservation State Lands 2012 Stanislaus County Important Farmland map. Temporary impacts of 0.84 acres and permanent impacts of 0.79 acres of Prime Farmland would occur as a result of implementing the proposed Project.

The California Department of Conservation (DOC) Land Evaluation and Site Assessment Model (LESA), is used to determine if the loss of Important Farmland (Prime Farmland, Unique Farmland or Farmland of Statewide Importance) due to Project implementation would cause a significant impact to the County and the State Important Farmland inventory. The LESA Model is composed of six different factors. Two Land Evaluation factors are based upon measures of soil resource quality. Four Site Assessment factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. This project score becomes the basis for determining the potential significance of a project on the loss of Important Farmland, based upon a range of the following established thresholds:

- **0 to 39 points:** Not considered significant;
- **40 to 59 points:** Considered significant only if LE and SA subscores are each greater than or equal to 20 points;
- **60 to 79 points:** Considered significant unless either LE or SA subscore is less than 20 points; and
- **80 to 100 points:** Considered significant.

Analysis using the LESA Model was conducted for the loss of Prime Farmland due to implementation of the proposed Project. The final LESA Model score is presented below. **Appendix A** provides the LESA Model worksheets that were completed for the proposed Project.

The proposed Project consists of land that is County and CCID-owned ROW; County and CCID-owned ROW does not possess a zoning designation. However, the proposed Project contains portions of parcels that are zoned General Agriculture District 40 Acre (A-2-40). The A-2-40 Zoning designation is intended to support and enhance agriculture as the predominant land use in the unincorporated areas of the County. This designation is also intended to protect open space lands pursuant to Government Code Section 65910. **Table A: Right-of-Way Acquisition of Agriculturally Zoned Parcels in Project Site** shows the parcels located within the Project boundary that are zoned under the A-2-40 designation, the total acreage of the parcels, and, the acreage of each parcel that is within the Project boundary.

Table A: Right-of-Way Acquisition of Agriculturally Zoned Parcels in Project Site

APN	Total Acres of Parcel	Acres of Right-of-Way Acquisition Associated with Project Implementation	Zoning Designation
026-025-034	40.4	0.39	A-2-40
026-020-050	40.4	0.021	A-2-40
026-025-002	102.3	0.01	A-2-40
026-020-012	92.0	0.033	A-2-40

Source: LSA Associates, October 2013.

As shown above in **Table A**, land within the A-2-40 zoning designation is located in the Project area and would require right-of-way acquisition with implementation of the proposed Project. Project implementation would require the acquisition of 0.39 acre from parcel 026-025-034, 0.021 acre from parcel 026-020-050, 0.01 acre from parcel 026-025-002, and 0.033 acre from parcel 026-020-012 for County and CCID ROW.The California Land Conservation Act, better known as the Williamson Act, has been California's premier agricultural land protection program since its enactment in 1965. The Williamson Act preserves agricultural and open space lands through property tax incentives and voluntary restrictive use contracts. Private landowners voluntarily restrict their land to agricultural and compatible open-space uses under minimum 10-year rolling term contracts with local governments (local County or City). In return, restricted parcels are assessed for property tax purposes at a rate consistent with the actual use, rather than potential market value. In August of 1998, the Legislature enhanced the Williamson Act with the Farmland Security Zone (FSZ) provisions. The FSZ provisions offer landowners greater property tax reduction in return for a minimal rolling contract term of 20 years. As of January 1, 2009, approximately 15 million acres of land were reported to be enrolled under the Williamson Act in California.[1] Portions of the Project site would be located on parcels that are under Williamson Act Contracts.

The following parcels within the Project site are currently under Williamson Act Contracts:

- **APN 026-025-034 (40.43 acres):** Williamson Act Contract 1972-0683;
- **APN 026-020-050 (40.4 acres):** Williamson Act Contract 1971-710381;
- **APN 026-025-002 (102.3 acres):** Williamson Act Contract 1971-0261; and
- **APN 026-020-012 (92 acres):** Williamson Act Contract 1999-4385.

The Project site is not designated as forestland or timberland and no areas designated as forestland or timberland are located around or near the Project site.

[1] California Department of Conservation, The California Conservation (Williamson) Act 2010 Status Report, November 2010, pg. 2.

Discussion

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use?

Less Than Significant with Mitigation Incorporated. In 2010, as part of the FMMP, the California Department of Conservation inventoried agricultural lands within Stanislaus County. According to the collected data, 253,435 acres of Prime Farmland exist within Stanislaus County. Lands within and surrounding the Project site are designated as Prime Farmland according to the FMMP 2010 Important Farmland Map update. Under CEQA Guidelines, Stanislaus County has some discretion in determining whether the conversion of agricultural land would have a significant adverse effect on the environment. A project would normally have a significant effect on the environment if it would convert prime agricultural land to non-agricultural use or impair the productivity of prime agricultural land. Several attempts have been made in years past to allow or require local governments to establish a threshold for agricultural land loss for the purpose of determining a significant effect on the environment, thereby necessitating the preparation of an Environmental Impact Report (EIR). However, instead of using an arbitrary threshold such as 100 acres to trigger an EIR, Stanislaus County prefers to evaluate each project on a case-by-case basis. When Stanislaus County determines that under the specific circumstances of the proposed project the conversion of agricultural land could have a significant effect, the County requires preparation of an EIR.[1]

Development of the proposed Project would result in temporary use of 0.84 acre of land designated as Prime Farmland during the four-month construction period. The 0.84 acre of land would be used for construction equipment staging areas and movement of construction vehicles and equipment around the Project site. Implementation of **Mitigation Measure AG-1** would ensure that the 0.84 acre of temporary impact area designated as Prime Farmland would be returned to its original condition once Project construction is completed. Development of the proposed Project would result in the permanent conversion of 0.79 acre of Prime Farmland to an urbanized use. The 0.79 acre of Prime Farmland that would be permanently lost is 0.00031 percent of the total amount of Prime Farmland within Stanislaus County. The permanent loss of 0.79 acre of Prime Farmland would be nominal compared to the 253,435 acres of Prime Farmland that is currently inventoried in Stanislaus County.

The LESA Model was used to determine if the loss of Prime Farmland due to development of the proposed Project would result in a significant impact to the Prime Farmland inventory of Stanislaus County. **Table B: LESA Model Results** shows the results of the LESA Model analysis for the proposed Project.

[1] Stanislaus County General Plan, Chapter 7 Agricultural Element, pg. 7-21.

Table B: LESA Model Results

	Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors			
Land Capability Classification	50.3	0.25	12.6
Stories Index	77.6	0.25	19.4
LE Subtotal		***0.50***	***32.0***
SA Factors			
Project Size	0	0.15	0
Water Resource Availability	0	0.15	0
Surrounding Agricultural Land	90	0.15	13.5
Protected Resource Land	100	0.05	5
SA Subtotal		***0.50***	***18.5***
Final LESA Score			**50.5**

Source: California Department of Conservation, Farmland Mapping and Monitoring Program, California Agricultural Land Evaluation and Site Assessment Model Instruction Manual, completed October 17, 2013. (Worksheets are attached as Appendix A).

The proposed Project would score 32.0 points and 18.5 points on the Land Evaluation (LE) and Site Assessment (SA) evaluation portion of the LESA Model, respectively. Based on these subscores, the proposed Project would have a final LESA Model score of 50.5 points. As discussed above, a final LESA score between 40 to 59 points is considered significant only if LE and SA subscores are each greater than or equal to 20 points. As shown above in **Table B**, the SA evaluation portion of the LESA Model scored a total of 18.5 points. Per the threshold standards of the LESA Model, Development of the proposed Project would not result in a significant impact to the loss of Prime Farmland.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less Than Significant with Mitigation Incorporated. The Project site is located in an area of Stanislaus County that is zoned for agricultural use. Specific portions of the Project site would include parcels that are zoned as A-2-40 per the Stanislaus County Zoning Ordinance. Project implementation would require County roadway ROW and CCID ROW acquisition on land that is currently zoned as A-2-40. Project implementation would require ROW acquisition of 0.39 acre from APN 026-025-034, 0.021 acre from APN 026-020-050, 0.01 acre from APN 026-025-002, and, 0.033 acre from APN 026-020-012. These portions of land would be designated as County roadway and CCID access/maintenance road ROW. The remaining land under each of the aforementioned parcels would remain zoned as A-2-40 and agricultural activities on these parcels would continue to operate as under existing conditions.

Land parcels that are located within the Project site are currently under Williamson Act contracts. As discussed above, APNs 026-025-034, 026-020-050, 026-025-002, and 026-020-012 are all under Williamson Act Contracts. Government Code Section 51292(c) requires that a public agency interested in cancelling a Williamson Act Contract, "notify the Director of Conservation within 10 days of

acquiring the property under the Williamson Act contract". The Williamson Act requires that public agencies cannot locate public improvements in agricultural preserves unless the following findings as listed in Government Code Section 51292 are fulfilled: (1) The location of the proposed Project is not based on a consideration of the lower cost of acquiring land in an agricultural preserve; and, (2) There is no other land within or outside of the preserve which is not under a Williamson Act Contract on which it is reasonably feasible to locate the proposed Project. The preceding analysis is provided for the cancellation of Williamson Act contracts on portions of APNs 026-025-034, 026-020-050, 026-025-002, and 026-020-012.

The location of the proposed Project is not based on a consideration of the lower cost of acquiring land in an agricultural preserve.

The proposed Project would require the acquisition of 0.39 acre from APN 026-025-034, 0.021 acre from APN 026-020-050, 0.01 acre from APN 026-025-002, and 0.033 acre from APN 026-020-012. These parcels are located adjacent to a long-established road in Stanislaus County (Shiells Road) and the long-established Shiells Road Bridge.

ROW from these parcels would be acquired by the County for roadway improvements to Shiells Road to accommodate the demolition of the existing Shiells Road Bridge over CCID Main Canal and the installation of a new bridge. Improvements to ROW access are also necessary to modify existing CCID maintenance/access roads within the Project site. Regardless of whether these parcels are subject to a Williamson Act Contract, acquisition of portions from these parcels would be required to accommodate Project development.

There is no other land within or outside of the preserve, which is not under a Williamson Act Contract on which it is reasonably feasible to locate the proposed Project.

Shiells Road is a long-established route within Stanislaus County. The Shiells Road Bridge over the CCID Main Canal was built in 1928 and consists of a 68-foot-long by 22-foot-wide, 3-span concrete slab bridge supported on diaphragm abutments and intermediate concrete pier walls. The existing bridge is structurally deficient, hydraulically deficient, too narrow for a two-lane roadway, and in need of replacement. Permanent ROW acquisitions for CCID's maintenance road realignments and temporary construction easements would be required.

Development of the proposed Project in a different location would not accomplish the primary goals and purpose of replacing the Shiells Road Bridge over the CCID Main Canal, performing roadway improvements along Shiells Road, and realigning and modifying the CCID Main Canal maintenance/access roads. All of the parcels surrounding the Project site are currently under Williamson Act contracts; therefore, shifting the alignment of the proposed Project would not reduce the amount of Williamson Act contracted land that would be impacted. Shifting the alignment of the proposed Project would require acquisition of additional Williamson Act Contract lands (due to the proximity of the existing road alignment to the adjacent Williamson Act Contract lands). The proposed Project has been designed to accomplish the necessary improvements while acquiring the least amount of Williamson Act contracted land as possible.

Implementation of the following mitigation measure would reduce impacts associated with the acquisition of Williamson Act contracted land due to implementation of the proposed Project to a less than significant level:

> **Mitigation Measure AG-2:** Per the requirements of Government Code Section 51291 the Project applicant shall notify the Director of the California Department of Conservation Division of Land Resource Protection of the intention for public acquisition from land under Williamson Act Contract. The notification to the Director is intended to ensure that public acquisition projects move forward in a streamlined manner, by providing technical assistance toward meeting the requirements of Government Code Section 51291. The California Department of Conservation Division of Land Resource Protection provides guidance in developing a notification for the public acquisition process. The guidance document (Notification Form Template) can be accessed on the California Department of Conservation website. The notification requires analysis to be completed for the following:
>
> - *What is the total number of acres of Williamson Act contracted land and/or agricultural preserve land be considered for acquisition;*
> - *Is the land considered prime or nonprime agricultural land according to Government Code Section 51201(c);*
> - *What is the purpose of the acquisition;*
> - *Where is the land located;*
> - *What are the characteristics of the adjacent land;*
> - *Why was this land identified as necessary for public improvement;*
> - *How does this acquisition meet the finding required under Government Code Sections 51292(a) and 51292(b);*
> - *Submit a vicinity map and a location map;*
> - *Submit a copy of the contract(s) covering land;*
> - *Submit copies of all related Environmental Impact Reviews pursuant to the CEQA process; and,*
> - *Submit copies of all related Eminent Domain (or in lieu of Eminent Domain) documents pursuant.*

Implementation of **Mitigation Measure AG-2** would reduce potential impacts associated with the acquisition of Williamson Act Land due to development of the proposed Project. Impacts would be ***less than significant*** with mitigation incorporated.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. The Project site is not zoned for, or adjacent to land zoned for, forest land or timberland. ***No impact*** would occur.

d) Result in the loss of forestland or conversion of forest land to non-forest use?

No Impact. The Project site is not located on forestland, and therefore would not result in the loss of forestland or the conversion of forestlands to non-forest uses. ***No impact*** would occur.

e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forestland to non-forest use?

Less Than Significant. The proposed Project includes replacement of an existing bridge with a newly designed bridge and associated roadway improvements at the CCID Main Canal crossing at Shiells Road. Agricultural uses surround the Project site; however, implementation of the proposed Project would not result in the conversion of agriculturally active parcels to non-agricultural uses. Portions of these parcels are located within the boundary of the Project site and may be temporarily disturbed during Project construction. Potential disturbance to the agricultural productivity of portions of the adjacent parcels would be temporary; therefore, this impact would be considered ***less than significant***.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Environmental Setting

Air quality is a function of both local climate and local sources of air pollution. The amount of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and for photochemical pollutants, sunshine.

A region's topographic features have a direct correlation with air pollution flow and therefore are used to determine the boundary of air basins. The proposed Project is located in the San Joaquin Valley Air Basin (SJVAB), which is comprised of approximately 25,000 square miles and covers all of seven counties including Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the western portion of an eighth, Kern. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is topographically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. An aerial view of the SJVAB would simulate a "bowl" opening only to the north. These topographic features restrict air movement through and out of the basin.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and state air quality regulating agencies. Data collected at permanent monitoring stations are

used by the EPA to identify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the previous National Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the state on a pollutant by pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The San Joaquin Valley Air Basin's attainment statuses for each of the criteria pollutants for Stanislaus County are listed in **Table C: SJVAB Air Quality Attainment Status for Stanislaus County (2013)**.

Table C: SJVAB Air Quality Attainment Status for Stanislaus County (2013)

Pollutant	State	Federal
Ozone (1 hour)	Severe/Nonattainment	No Federal Regulation
Ozone (8 hour)	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Lead	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Regulation
Hydrogen Sulfide	Unclassified	No Federal Regulation

Source: California Air Resources Board, 2013. Area Designations. http://www.arb.ca.gov/desig/desig.htm. Accessed September 9, 2014.

An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a nonattainment area. The main purpose of air quality plans is to bring the area into compliance with the requirements of Federal and State air quality standards. The air quality plans use the assumptions and projections of local planning agencies to determine control strategies for regional compliance status. Since the plans are based on local General Plans (e.g., Stanislaus County General Plan), projects that are deemed consistent with applicable General Plans are usually found to be consistent with the air quality plans.

The SJVAPCD is responsible for formulating and implementing Attainment Demonstration Plans (ADP) for the Air Basin. The latest plans address several State and federal planning requirements and incorporate significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. These ADPs are consistent with and build upon the approaches taken in previous documents for the attainment of the federal ozone air quality standard:

- The next plan for EPA's 8-hour ozone standard is to address EPA's 2008 8-hour ozone standard of 75 parts per billion (ppb). EPA designated the San Joaquin Valley as an extreme nonattainment area for this standard. This 8-hour ozone plan is expected to be due to EPA in 2015;

- In September 2013, the SJVAPCD adopted a plan for EPA's revoked 1-hour ozone standard. Although EPA approved the District's 2004 plan for the 1-hour ozone standard in 2010, EPA withdrew this approval as a result of litigation. The District's 2013 Plan for the Revoked 1-Hour Ozone Standard was approved by the District Governing Board at a public hearing on September 19, 2013. The modeling confirms that the Valley would attain the revoked standard by 2017;
- On April 26, 1996, the Board approved the "Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas" as part of the State Implementation Plan (SIP) for Carbon Monoxide. U.S. EPA approved this revision on June 1, 1998 and redesignated the ten areas to attainment. On October 22, 1998, ARB revised the SIP to incorporate the effects of the recent Board action to remove the wintertime oxygen requirement for gasoline in certain areas. On July 22, 2004, ARB approved an update to the SIP that shows how the ten areas would maintain the standard through 2018, revises emission estimates, and establishes new on-road motor vehicle emission budgets for transportation conformity purposes;
- The ARB approved the District's 2012 $PM_{2.5}$ Plan at a public hearing on January 24, 2013. The plan, approved by the District Governing Board on December 20, 2012, would bring the San Joaquin Valley into attainment for EPA's 2006 $PM_{2.5}$ standard by the 2019 deadline, with most areas seeing attainment well before then; and,
- The District adopted the 2007 PM_{10} Maintenance Plan in September 2007 to assure the San Joaquin Valley's continued attainment of EPA's PM_{10} standard. EPA designated the San Joaquin Valley as an attainment/maintenance area for PM_{10}.

Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant. The proposed Project would not result in the generation of additional vehicle trips along Shiells Road and is not expected to increase regional Vehicle Miles Traveled (VMT) because the proposed Project would replace the existing bridge and would not expand bridge capacity. Construction and development of the proposed Project would include demolition of the existing bridge, channel work in CCID Main Canal, roadway approach work where Shiells Road meets the new bridge on the west and east side, and roadway improvements along Shiells Road to provide continued access to CCID easements. As such, the proposed Project would not conflict with or obstruct implementation of any SJVAPCD air quality plans. Impacts would be ***less than significant***.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant with Mitigation Incorporated. The short-term (construction) and long-term air quality impacts associated with implementation of the proposed Project are discussed below.

Short-Term (Construction) Emissions: Short-term air pollutant emissions associated with the proposed Project would occur during demolition and construction activities. Bridge demolition, grading, and vehicle/equipment use would contribute to short-term air pollution emissions.

Demolition and construction activities at the Project site would generate exhaust emissions from engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site,

and motor vehicles transporting construction crews. Exhaust emissions during construction would vary daily as construction activity levels change. The use of construction equipment would result in localized exhaust emissions that could affect the residential unit located southwest of the Project site. However, due to the limited extent of development proposed, the projected short-term emissions of criteria pollutants as a result of Project construction are expected to be below thresholds set forth by the SJVAPCD.

Construction activities at the Project site would include the use of construction vehicles and equipment that would increase air pollutants associated with burning fossil fuel and dust on a short-term basis (a four-month period). During the four-month construction period the existing bridge would be demolished and removed, the new bridge would be constructed, the bridge roadway approach work would be constructed, and CCID access roads would be improved to conform to the new bridge profile. Blowing dust from on-site construction activities is a major cause of increased PM_{10} and $PM_{2.5}$ concentrations.

Although the SJVAPCD *Guide to Assessing and Mitigating Air Quality Impacts* requires the implementation of PM10 control measures rather than a quantitative analysis of project emissions, construction emissions were estimated for the proposed Project using the Sacramento Air Quality Management District's Road Construction Emissions Model, Version 7.1.5.1. As shown in **Table D: Estimated Construction Emissions (Total Project Area)**, none of the criteria pollutants are anticipated to exceed the annual emissions thresholds for determination of whether a project requires an Indirect Source Review (ISR). Project-related construction emissions would therefore be less than significant.

Table D: Estimated Construction Emissions (Total Project Area)

Project Phases	ROG (lbs/day)	NO_x (lbs/day)	Total PM_{10} (lbs/day)	Total $PM_{2.5}$ (lbs/day)	Exhaust PM_{10} (lbs/day)	Exhaust Dust $PM_{2.5}$ (lbs/day)
Grubbing/Land Clearing	1.6	16.1	4.7	1.5	0.6	0.8
Grading/Excavation	4.4	51.3	6.2	2.7	1.9	0.8
Drainage/Utilities/Sub-Grade	4.1	37.8	6.0	2.6	1.8	0.8
Paving	2.3	19.1	1.3	1.1	1.1	-
Maximum (tons/year)	0.2	1.7	0.2	0.1	0.1	0.0
SJVAPCD Thresholds for ISR	-	2.0	2.0	-	-	-
Significant	-	No	No	-	-	-

Notes: Model inputs include: Project Start Year: 2016; Project Length (months): 4; Total Project Area (acres): 1.0; Total Soil Imported/Exported (yd^3/day): 400. Miles per round trip for soil hauling activities: 30 miles;
Number of round trips per day: 20.
PM_{10} estimates assume 50% control of fugitive dust from watering and associated dust control measures.
Total PM_{10} emissions are the sum of exhaust and fugitive dust emissions.
Emissions estimated using Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 7.1.5.1
Source: LSA, 2015

The Project site is not located in an area where ultramafic rock occurs and therefore naturally occurring asbestos (NOA) would not present an air quality concern during Project construction.

Long-Term (Operational) Emissions. Operational air emission impacts are associated with any change in permanent use of the Project site by on-site stationary and off-site mobile sources that substantially increase vehicle trip emissions. No stationary sources are associated with the proposed Project and new vehicle trips would not be generated. Additionally, significant increases in vehicle miles traveled (VMT) would not occur due to Project implementation. Therefore, operational activities associated with the proposed Project would not contribute substantially to an existing or projected air quality violation. Operational impacts would be ***less than significant***.

Mitigation Measure AIR-1 would be implemented during Project development to reduce construction-related dust emissions and air pollutant emissions.

> **Mitigation Measure AIR-1:** The Project contractor shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of construction and maintenance activities at the Project site. The Contractor shall implement, at a minimum, the following measures:
>
> - All visible dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions;
> - All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour;
> - Earth or other material that has been deposited by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed;
> - Asphalt, oil, water or suitable chemicals shall be applied on stockpiled materials and other surfaces that can give rise to airborne dusts;
> - All earthmoving activities shall cease when sustained winds exceed 15 miles per hour;
> - The contractor's foreman shall take reasonable precautions to prevent the entry of unauthorized vehicles during non-work hours; and,
> - The contractor's foreman shall keep a daily log of activities to control fugitive dust.

Implementation of **Mitigation Measure AIR-1** would ensure that PM_{10} and $PM_{2.5}$ levels generated during Project construction are within the standards of SJVAPCD for fugitive dust and particulate matter. Impacts would be ***less than significant*** with mitigation incorporated.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Less Than Significant with Mitigation Incorporated. As described above in Section III(b), the proposed Project would result in a short-term increase in air pollutant emissions due to construction activities. The proposed Project would not result in increased air pollutant emissions during operation. Increases of short-term air pollutant emissions would not result in a cumulatively considerable net

increase of criteria pollutants for which the Project region is in nonattainment for federal and State ambient air quality standards. Implementation of **Mitigation Measure AIR-1**, as described above, would reduce construction impacts regarding air quality issues to a ***less than significant*** level.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant with Mitigation Incorporated. Sensitive receptors are facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as young children, the elderly, and people with illnesses. The proposed Project is located in a rural area within Stanislaus County; however, the nearest residential structure is located approximately 225 feet southwest of the Project site. Construction activities occurring on the Project site may expose residents to airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. Implementation of **Mitigation Measure AIR-1** would reduce construction-related emissions to a less than significant level, thus minimizing possible exposure of sensitive receptors to substantial pollutant concentrations. As discussed in Section III(b), the proposed Project would not result in increased pollutant emissions during operation since its implementation would not increase traffic along Shiells Road. Therefore, the nearby sensitive receptors would not be exposed to substantial pollutant emissions during Project operation. Impacts would be ***less than significant***.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant. Some objectionable odors may be generated from the operation of diesel-powered construction equipment and/or vehicles during the Project construction period. However, these odors would be short-term in nature and would not result in permanent impacts to the nearby sensitive receptors. In addition, odors from construction equipment and vehicles on the Project site would be dispersed quickly and would not likely subject the adjacent residential units to objectionable odors. Long-term operation of the proposed Project would not generate any new vehicle trips; therefore, increases in permanent odors would not result from Project operation. Impacts would be ***less than significant***.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or State habitat conservation plan?	☐	☐	☐	☒

Environmental Setting

The *Shiells Road Bridge Replacement Project Natural Environment Study Minimal Impacts* (NESMI) report prepared in June 2014 contributes to the information in this section. The NESMI is attached as **Appendix B** of this document. Analysis presented below is based on the Biological Study Area (BSA), which totals 2.70 acres.

The BSA was developed for the proposed Project to determine if special status animal and plant species, natural communities, or other biota would be impacted during construction and operational

activities. The BSA consists of the Project footprint and construction access and staging areas, the CCID Main Canal, Shiells Road, unpaved and disturbed roadway shoulders and pullouts (which support sparse ruderal vegetation), and areas of agricultural land beyond the roadway shoulders. The BSA also includes lands beyond the roadway footprint to the edge of the road ROW that could potentially be affected by Project construction and/or were determined necessary to inventory in order to perform an adequate analysis of proposed Project impacts to biological resources. The BSA lies in the central San Joaquin Valley, which is characterized by large, flat areas of agricultural farmland. The majority of the land in the area is privately owned and appears to be similar to land directly adjacent to the BSA in use and vegetative characteristics. Lands directly adjacent to the BSA include a range of agricultural fields consisting of orchards and row crops. The topography of the BSA is flat, with an elevation approximately 110 feet above mean sea level. Shiells Road runs east to west through the BSA and consists of a two-lane asphalt roadway. The existing bridge is a narrow, three-span reinforced structure over the CCID Main Canal. The CCID Main Canal runs south to north through the BSA. While there is a natural bed and bank in the CCID Main Canal, the banks are vertical and regularly maintained with herbicide treatments. The CCID Canal pulls its waters from the San Joaquin River for agricultural irrigation. However, the canal ends abruptly without any downstream connectivity to tributary waters. A small agricultural drainage ditch is also located in the northwest corner of the BSA, and conveys adjacent pasture runoff. Neither of these features support wetland vegetation and appear to be regularly maintained and heavily utilized by adjacent agricultural operations.

No natural communities exist within the BSA. Land uses consist of agricultural row crops, ruderal vegetation, the canal/open water, and developed areas.

Row crops are agricultural lands that are not considered a natural community. Active orchards and row crop operations bound the BSA on all sides but due to the small size of the proposed Project, the BSA only extends into row crops in the northwest corner. Row crops comprise approximately 0.11 acre of the BSA.

Ruderal vegetation occurs along the unpaved road shoulders, edges of agricultural fields, and in the eastern side of the BSA along Shiells Road. Ruderal plant species are those that colonize and quickly establish in poor soils and disturbed or waste areas. Ruderal vegetation generally have fast-growing roots, low nutritional needs, and produce massive amounts of seed. Within the BSA, the majority of this community consists of bare dirt with pockets of sparsely vegetated weedy non-native plant species including field bindweed (*Convolvulus arvensis*), Russian thistle (*Salsola tragus*), nutsedge (*Cyperus eragrostis*), bearded sprangletop (*Leptochloa fascicularis*), and Russell River grass (*Paspalum paniculatum*). Ruderal areas comprise approximately 1.84 acres in the BSA.

Open water habitat in the BSA consists of the extent of the CCID Main Canal. The canal is regularly treated with herbicide and supports little to no vegetation. A few remnant plants were identified along the vertical banks and include: Russell River grass, watercress (*Rorippa nasturtium-aquatic*) and bearded sprangletop. The open water community comprises approximately 0.40 acre in the BSA.

Developed land within the BSA consists of the paved portions of Shiells Road. Developed areas comprise approximately 0.35 acre in the BSA.

A list of sensitive wildlife and plant species potentially occurring within the BSA was compiled to evaluate potential impacts resulting from Project construction. Sources used to compile the list include

the California Natural Diversity Data Base (CNDDB 2013), the California Native Plant Society (CNPS) Online Edition (2013) and the United States Fish and Wildlife Service (USFWS) online list (2013). The species on the special status species lists were reviewed to determine if they could potentially occur within the BSA. The determination of whether a species could potentially occur within the BSA was based on the availability of suitable habitat within the species' known range. Species determined unlikely to occur in the BSA based on these same factors are not discussed any further in the analysis presented below. For example, no suitable nesting or roosting habitat for swallows or bats are present in the BSA because the CCID Main Canal water is at soffit level. While these species may forage in the vicinity, the proposed Project would not affect these species and, therefore, are not discussed in the document.

The developed areas and ruderal vegetation in the BSA, as well as the surrounding agricultural lands, typically do not provide high quality habitat for wildlife species. However, a variety of species are known to occur in urbanized and agricultural settings. In addition, several large trees are located directly southwest of the BSA, which may provide nesting habitat for several bird species. A large nest was observed in a mature oak tree at the residence at this location. A red-tailed hawk (*Buteo jamaicensis*) was observed next to the nest. Common wildlife species that may occur in the BSA include, but are not limited to: coyote (*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphus virginiana*), red-shouldered hawk (*Buteo lineatus*), western terrestrial garter snake (*Thamnophis elegans*), western fence lizard (*Sceloporus occidentalis*), California ground squirrel (*Otospermophilus beecheyi*), common kingsnake (*Lampropeltis getula*), red-tailed hawk, Swainson's hawk, rock dove (*Columba livia*), American crow (*Corvus brachyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), American robin (*Turdus migratorius*), and mourning dove (*Zenaida macroura*).

The specific habitats required by each species included in the special status species lists and the specific habitats and habitat conditions present in the BSA were reviewed. Special status species that were observed, or determined to potentially occur in the BSA based on availability of suitable habitat or other factors include Swainson's hawk and migratory birds, and are discussed below. No habitats of concern are located within or near the BSA.

Jurisdictional waters include wetlands and other waters that fall under the jurisdiction of the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the Clean Water Act (CWA), the RWQCB pursuant to Section 401 of the CWA or the Porter-Cologne Water Quality Control Act (PCWQCA) or the California Department of Fish and Wildlife (CDFW) pursuant to Section 1600-1616 of the State Fish and Game Code. An ACOE Section 404 permit would not be required as the ACOE has determined that the aquatic features in the BSA are not tributary to Waters of the U.S. and, therefore, not subject to ACOE jurisdiction. As a result, the proposed Project would likely only require a Waste Discharge Waiver for impact to waters of the State from the RWQCB. Additionally, LSA coordinated with Sarah Paulson at CDFW on October 8, 2013, regarding the CCID Main Canal. It was determined that this feature is not subject to Section 1600 of the Fish and Game Code and therefore, will not require a Lake and Streambed Alteration Agreement..

Discussion

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated. As described above, no state or federally listed or proposed plant species occur in the BSA; therefore, none would be affected by Project implementation.

The proposed Project has the potential to affect Swainson's hawk habitat. Swainson's hawk is a State threatened species but has no federal status. This species are long distance migrants, wintering primarily in South America, and returning north to breed. Swainson's hawks are large, broad-winged raptors that occur in open country throughout the western half of the United States. In California, Swainson's hawks occur in the northeastern portion of the State, in the Great Basin Province, and in the Central Valley. Nests are built in the tops of large trees, primarily those associated with riparian habitats. This species is known to forage up to 10 miles from their nests. Six documented occurrences of the Swainson's hawk are in the search area.

The closest observation of the species occurred in 1988, approximately 3 miles northwest of the BSA. Most of the documented occurrences in the area included observations of nesting behavior, indicating a history of Swainson's hawks nesting nearby.

No suitable nesting habitat for Swainson's hawk occurs within the BSA. However, several large trees to the southwest of the BSA may provide nesting habitat for this species. At least one large nest was observed in a tree during an August 2013 site visit. Agricultural row crops within, and adjacent to the BSA, provide potential foraging habitat for Swainson's hawks. Since suitable nesting and foraging habitat is present adjacent to the BSA, this species could nest and forage within or near the Project site. Project implementation would result in permanent impacts to 0.01 acre of row crops and 0.43 acre of ruderal habitat that provide potential foraging habitat for Swainson's hawk during construction of the new bridge approaches. Temporary impacts, totaling 0.04 acre of row crops and 0.73 acre of ruderal habitat, would occur because of construction staging and access. Both of these habitats provide foraging habitat for wildlife.

CDFW generally recommends mitigation for loss of suitable foraging habitat for Swainson's hawk if the subject habitat is within 10 miles of an active nest (CDFW, 1994). A nest is considered active if it has been used in the last 5 years. However, for projects of this size, it is unreasonable to conduct Swainson's hawk protocol nesting surveys within a 10-mile radius of the Project site. Therefore, it is accepted standard practice to rely on CNDDB occurrence records to determine if active Swainson's hawk nests occur within a 10-mile radius. Per the CNDDB record search, no records of Swainson's hawk nesting have occurred within 10 miles of the BSA during the past 5 years; therefore, mitigation is not proposed for the loss of suitable foraging habitat for this species. However, Project implementation could potentially disrupt nesting for Swainson's hawk if the species is nesting in or near the BSA when construction begins. To reduce such an impact during Project construction, the following mitigation measure would be implemented:

Mitigation Measure BIO-1: The following measures shall be implemented by the Project applicant during construction activities:

- If work begins between February 1 and August 31, an early season preconstruction survey for nesting Swainson's hawks shall be conducted in the BSA and immediate vicinity (an approximately 0.25-mile radius) by a qualified biologist when tree foliage is relatively sparse and nests are easy to identify. A second preconstruction survey for nesting Swainson's hawks shall be conducted in the BSA and immediate vicinity (an approximately 0.25-mile radius) by a qualified biologist no more than 14 days prior to initiation of earthmoving activities. If nesting Swainson's hawks are found within the survey area, a qualified biologist shall evaluate the potential for the project to disturb nesting activities. CDFW shall be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities, which would result in "take" of a State threatened species. CDFW shall also be consulted to establish protection measures such as buffers, to avoid "take". Disturbance of active nests shall be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged. If work is allowed to proceed, at a minimum, a qualified biologist shall be on-site during the nesting season at the start of construction activities to monitor nesting activity. The monitor shall have the authority to stop work if it is determined the project is adversely affecting nesting activities.
- If work is conducted during the nesting season (February 1 to August 31), a qualified biologist shall survey all suitable nesting habitat in the BSA and within 100 feet for presence of other nesting birds. The survey radius may be decreased due to the presence of development or other land use that could preclude nesting. This survey shall occur no more than 10 days prior to the start of construction. If no nesting activity is observed, work may proceed as planned.
- If an active nest is discovered, a qualified biologist shall evaluate the potential for the proposed Project to disturb nesting activities. The evaluation criteria shall include, but are not limited to, the location/orientation of the nest in the nest tree, the distance of the nest from the BSA, and line of sight between the nest and the BSA. CDFW shall be contacted to review the evaluation and determine if the proposed Project can proceed without adversely affecting nesting activities.
- If work is allowed to proceed, a qualified biologist shall be on-site weekly (at a minimum) during construction activities that occur during the nesting season to monitor nesting activities until the biologist determines, in consultation with CDFW, that monitoring is no longer required. The biologist shall have the authority to stop work if it is determined the project is adversely affecting nesting activities. This measure only applies to construction activities.

The proposed Project would not affect any other special status species, including State or federally listed species, as Caltrans has made a "No Effect Determination". Consequently, consultation under Section 7 of the Federal Endangered Species Act would not be required, nor would an incidental take permit pursuant to Section 2081 of the State Fish and Game Code be required.

With implementation of **Mitigation Measure BIO-1** during construction, potential impacts to Swainson's hawks would be ***less than significant*** with mitigation incorporated.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant. As discussed above, the Project site is not located in an area that has riparian habitats or other sensitive natural communities. The lands surrounding and within the BSA consist of agricultural row crops, ruderal vegetation, canal/open water areas, and developed areas. Project implementation would result in permanent impacts to 0.01 acre of row crop and 0.43 acre of ruderal habitat during construction of the new bridge approaches. Temporary impacts would occur to 0.04 acre of row crops and 0.73 acre of ruderal habitat because of the construction staging and access areas. Although the proposed Project would not have any impacts on riparian habitat or sensitive natural communities; best management practices (BMPs) would be implemented as part of the construction plan to ensure that invasive species do not take hold and spread to neighboring habitat that could be identified as sensitive. The following BMPs would be implemented during Project construction:

- Following completion of construction activities, all fill slopes, temporary impact and/or otherwise disturbed areas shall be restored to preconstruction contours (if necessary) and revegetated with the native seed mix specified in **Table E: Native Seed Mix**. Invasive exotic plants would be controlled to the maximum extent practicable.

Table E: Native Seed Mix

Scientific Name	Common Name	Rate (Lbs./Acre)
Bromus carinatus	California bromegrass	5.0
Elymus glaucus	Blue wild rye	5.0
Elymus X triticum	Regreen	10.0
Eschscholzia californica	California poppy	2.0
Hordeum brachyantherum	Meadow barley	5.0
Lupinus bicolor	Bicolored lupine	4.0

Source: Shiells Road Bridge Replacement Project, Natural Environment Study Minimal Impacts (NESMI), June 2014.

- In accordance with Executive Order 13113 (Invasive Species), to avoid the distribution of invasives during Project construction, contract specifications shall include, at a minimum, the following measures:
    - All earthmoving equipment to be used during Project construction shall be thoroughly cleaned before arriving on the Project site;
    - All seeding equipment (i.e., hydroseed trucks) shall be thoroughly rinsed at least three times prior to beginning seeding work; and
    - To avoid spreading any nonnative invasive species already existing on-site to off-site areas, all equipment shall be thoroughly cleaned before leaving the Project site.

Implementation of these BMPs would ensure that invasive species would not spread to off-site riparian or natural community habitat near the Project site. Impacts would be ***less than significant***.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant. Open water habitat in the BSA consists of the CCID Main Canal. Project implementation would result in minor permanent (0.01 acre) and temporary impacts (0.05 acre) to the CCID Main Canal. As discussed above, the CCID Main Canal is not jurisdictional and no waters of the U.S. are located within the BSA. To reduce temporary impacts to waters of the State during Project construction and operation, the following BMPs would be implemented as part of the proposed Project:

- Measures consistent with the current Caltrans' Construction Site Best Management Practices (BMP) Manual (including the Storm Water Pollution Prevention Plan [SWPPP] and Water Pollution Control Plan [WPCP] Manuals) shall be implemented to minimize effects to waters of the State resulting from erosion, siltation, etc. during construction; and
- Prior to issuance of a grading permit or other authorization to proceed with Project construction, the Project applicant shall obtain any regulatory permits that are required from the RWQCB (CCID Main Canal is not subject to ACOE and CDFW jurisdiction).

With implementation of these BMPs impacts would be ***less than significant.***

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less Than Significant with Mitigation Incorporated. Wildlife movement corridors are linear habitats that function to connect two or more areas of significant wildlife habitat. These corridors may function on a local level between small habitat patches (e.g., streams in urban settings) or may provide critical connections between regionally significant habitats (e.g., deer movement corridors). Wildlife corridors typically include vegetation and topography that facilitate the movements of wild animals from one area of suitable habitat to another in order to fulfill foraging, breeding, and territorial needs. These corridors often provide cover and protection from predators that may be lacking in surrounding habitats. Wildlife corridors generally include riparian zones and similar linear expanses of contiguous habitat. The Project site is not located in or near a wildlife movement corridor.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code. Disturbance of migratory birds during their nesting season (February 1 to August 31) could result in "take" which is prohibited under the MBTA and Section 3513 of the California Fish and Game Code. California Fish and Game Code Section 3503 also prohibits the take or destruction of bird nests or eggs. Migratory birds can nest in a variety of habitats depending on the species, including, tree canopies, dense shrubs, and even on the ground. Within the Project site, all areas that are not paved, developed or otherwise exposed to constant disturbances could be utilized for nesting by various migratory bird species common to the region. Birds that nest on the ground in these habitats

could be affected by Project construction. Implementation of **Mitigation Measure BIO-1**, discussed above, would ensure that migratory birds are not impacted by Project construction activities. Impacts would be ***less than significant*** with mitigation incorporated.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less Than Significant. Stanislaus County does not have a specific ordinance for tree preservation; however, the Open Space and Conservation Element of the Stanislaus County General Plan calls for all discretionary projects with potential impacts to develop an oak woodland management plan. Additionally, the Open Space and Conservation Element recommends the protection of trees with historic significance including heritage trees; however, an ordinance regarding heritage tree protection has not been adopted by Stanislaus County.

The proposed Project would not include the removal of or impact to oak trees or heritage trees in the area. The proposed Project would be designed and developed to be in compliance with local policies and/or ordinances protecting biological resources as set forth by Stanislaus County. Impacts would be ***less than significant.***

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or State habitat conservation plan?

No Impact. The proposed Project is not located in or near an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan designated area. Therefore, the proposed Project would not conflict with goals, policies or objectives of such conservation plans. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Environmental Setting

A Historical Property Survey Report (HPSR) and Archaeological Survey Report (ASR) (June, 2014) was completed by LSA for the proposed Project (see **Appendix B**). These studies consisted of background research, consultation with potentially interested parties and a field survey. The information for the following section was based on these two reports.

Cultural Resources. The Shiells Road Bridge spanning the CCID Main Canal was constructed circa 1928, and is listed in the *Caltrans Historic Bridge Inventory* as a Category 5 bridge, "not eligible" for the National Register of Historic Places.

Research was conducted regarding historical properties and Native American cultural sites in an Area of Potential Effect (APE) associated with the proposed Project. The APE for the proposed Project has been determined to include the maximum extent of all ground disturbing activities including staging areas and access routes associated with the site. The APE for the proposed Project is approximately 3.7 acres in size. LSA conducted a record search of the APE on August 8, 2013, at the Central California Information Center (CCIC) of the California Historical Resources Information System, California State University, Stanislaus. The records search included the APE and a ¼-mile radius for previous cultural resource studies and cultural sites. No cultural resources were found within the Project APE or the ¼-mile search radius.

Consultation with the *Native American Heritage Commission* occurred on April 16, 2013, and the results indicated that after a review of the Sacred Lands File "... cultural resource sites were not identified within one-half mile of the project site ..." LSA contacted 13 local Native American Tribe representatives on July 29, 2013, regarding the location of the proposed Project and requested information or concerns regarding cultural resources within the APE. Of the 13 representatives contacted, one representative from *the California Valley Miwok Tribe* requested that she be notified if

Miwok artifacts or human remains are discovered during construction. The 11 other local Native American Tribe representatives that were contacted have not responded, to date, to the records search request for Native American cultural sites within or near the APE.

On April 17, 2013, LSA sent a letter describing the proposed Project with maps depicting the APE to the McHenry Museum & Historical Society and Newman Historical Society and Museum requesting any information or concerns regarding the proposed Project. The McHenry Museum & Historical Society did not respond to the letter and on September 23, 2013, LSA left a message asking the Museum and Historical Society to contact LSA with any information or concerns regarding cultural resources within the APE. No response has been received to date. In a letter dated May 9, 2013, Ms. Barbara Powell of the Newman Historical Society and Newman Museum stated that there are no concerns with the proposed Project.

Archaeological Sensitivity. The ASR consisted of archival and background research, a field survey conducted on October 29, 2013, consultation with potentially interested parties, and an archaeological sensitivity assessment. The Central California Information Center records search and background research identified no recorded archaeological cultural resources in, or within ¼-mile of, the Project APE. During intensive pedestrian survey of the APE ground visibility within County right-of-way, CCID right-of-way, and APN 026-025-002 was 100 percent and APN 026-025-034 was surveyed from County right-of-way. No archaeological cultural resources were identified in the records search or field survey. The archaeological sensitivity assessment identified sensitivity for encountering prehistoric archaeological deposits, and a low sensitivity for encountering historic-period archaeological deposits within the APE.

Discussion

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?

Less Than Significant with Mitigation Incorporated. As described above, research was conducted to determine if historical or Native American sensitive sites are located within the APE or surrounding the Project site. No historical resources were identified within or adjacent to the Project area.

The possibility exists that previously unknown buried archaeological deposits could be discovered during grading and excavation work associated with Project construction. Prehistoric materials can include flaked-stone tools (e.g., projectile points, knives, choppers) or obsidian, chert, basalt or quartzite tool making debris; bone tools; culturally darkened soil (e.g., midden soil often containing heat-affected rock, ash and charcoal, shellfish remains, faunal bones, and cultural materials); and stone milling equipment (e.g., mortars, pestles, handstones). Prehistoric archaeological sites often contain human remains. Historical materials can include wood, stone, concrete, or adobe footings, walls and other structural remains; debris-filled wells or privies; and deposits of wood, glass, ceramics, metal and other refuse. Implementation of **Mitigation Measure CULT-1**, presented below, would reduce impacts to undiscovered resources if found during proposed Project construction activities.

> **Mitigation Measure CULT-1**: If deposits of prehistoric or historical archaeological materials are discovered during non-monitored Project construction activities, all work within 25-feet of the discovery shall be redirected and a qualified archaeologist contacted, if one is

not present, to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Personnel at Stanislaus County shall be notified. Project personnel shall not collect or move any archaeological materials.

Impacts to archaeological deposits shall be avoided by Project activities, but if such impacts cannot be avoided, the deposits shall be evaluated for their California Register of Historical Resources eligibility. If the deposit is not eligible, then no further protection of the finds are necessary. If the deposits are eligible, they shall be protected from Project-related impacts, or such impacts shall be mitigated. Mitigation may consist of, but is not necessarily limited to, systematic recovery and analysis of archaeological deposits; recording the resource; preparation of a report of findings; and accessioning recovered archaeological materials at an appropriate curation facility. The report shall be submitted to Stanislaus County.

Implementation of **Mitigation Measure CULT-1**, discussed above, would ensure that undiscovered historical resources as defined in § 15064.5 would be identified, catalogued or preserved if found during proposed Project construction activities; therefore, impacts would be less than significant with mitigation incorporated.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Less Than Significant with Mitigation Incorporated. No archaeological resources, as defined by § 15064.5, have been identified in the Project area. Archaeological resources are not anticipated to be discovered during proposed Project construction activities. If, however, such resources are discovered, **Mitigation Measure CULT-1** would be implemented. **Mitigation Measure CULT-1** would ensure that undiscovered archaeological resources pursuant to § 15064.5 would be identified, catalogued, or preserved if found during construction activities; therefore, with implementation of **Mitigation Measure CULT-1,** impacts to archaeological resources would be considered ***less than significant***.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant with Mitigation Incorporated. No paleontological resources or unique geologic features are known to exist within the APE or near the Project site. However, should undiscovered paleontological resources be found during proposed Project construction, **Mitigation Measure CULT-2**, shall be implemented to reduce impacts.

Mitigation Measure CULT-2: If undiscovered paleontological resources are encountered during proposed Project subsurface construction and no monitor is present, all ground-disturbing activities within 50 feet shall be redirected to other areas until a qualified paleontologist can be retained to evaluate the find and make recommendations for determining the significance of the resource. Scientifically significant paleontological resources are "identified sites or geologic deposits containing individual fossils or assemblages of fossils that are unique or unusual, diagnostically or stratigraphically important, and add to the existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally". Fossils are particularly important when they are found undisturbed in their primary context because they aid in stratigraphic correlation, evolution, and paleoclimatology. If found to be significant and proposed Project activities cannot avoid the paleontological resources, a paleontological evaluation and monitoring plan shall be

developed and implemented. Adverse impacts to paleontological resources shall be mitigated, which may include monitoring, data recovery and analysis, a final report, and the accession of all fossil material to a paleontological repository. Upon completion of proposed Project ground-disturbing activities, a report documenting methods, findings, and recommendations shall be prepared and submitted to the paleontological repository.

Implementation of **Mitigation Measure CULT-2**, discussed above, would ensure that undiscovered paleontological resources and unique geologic features would be identified, catalogued or preserved if found during proposed Project construction activities and would not be directly or indirectly destroyed; therefore, impacts would be less than significant with mitigation incorporated.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant with Mitigation Incorporated. No human remains are known to exist with the APE or near the Project site. Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the Stanislaus County Coroner has determined whether or not the remains are subject to the coroner's authority. There is no indication that human remains are present within the Project site. Implementation of **Mitigation Measure CULT-3** would ensure that potential impacts to human remains, should they be discovered during proposed Project construction activities, are identified, collected and reinterred.

> **Mitigation Measure CULT-3:** In the event that human remains are encountered, work within 50 feet of the discovery shall be redirected to another area on the Project site and the Stanislaus County Coroner shall be immediately notified. At the same time, a qualified archaeologist shall be retained to assess the situation and consult with agencies as appropriate. Construction personnel working at the Project site shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24-hours of this identification. The Native American Heritage Commission shall identify a Most Likely Descendant (MLD) that would be retained to inspect the find and provide recommendations for the proper treatment of the remains and associated grave goods. Upon completion of such an assessment, the archaeologist that has been retained shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The finalized report shall be submitted to Stanislaus County.

Implementation of **Mitigation Measure CULT-3** would ensure that undiscovered human remains, including those interred outside of formal cemeteries would not be disturbed if found during proposed Project construction activities. Therefore, impacts would be less than significant with mitigation incorporated.

VI. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Environmental Setting

Background information contained within this section has been derived from the "Foundation Report Shiells Road Bridge Replacement Bridge No. 38C0180" (Parikh Consultants, Inc. 2013), which is attached as **Appendix C.**

Site Geology

The Project site and its vicinity is generally underlain by late Tertiary to Quaternary sediments, including alluvium, lake, playa, terrace deposits, sandstone, shale, conglomerate, minor limestone, and gravel deposits (Parikh Consultants 2013).

Soils

Soil types located within the Project area are comprised of Vernalis-Zacharias complex, 0 to 2 percent slopes (120); Vernalis loam, 0 to 2 percent slopes (122); and Vernalis-Zacharias complex, 0 to 2 percent slopes, rarely flooded (126). Below is a summary of the characteristics of each soil type:

- **Vernalis-Zacharias complex, zero to 2 percent slopes (120):** The Vernalis soil is a very deep, well-drained, nearly level soil on alluvial fans that formed in alluvium derived from mixed rock sources. The Zacharias soil is also a very deep, well-drained, nearly level soil on alluvial fans that formed in alluvium from mixed rock sources. Permeability is moderately slow in both the Vernalis and Zacharias soils. Available water capacity for the Vernalis-Zacharias complex is high, runoff is negligible to low, and the hazard of water erosion is slight.
- **Vernalis loam, 0 to 2 percent slopes (122):** This very deep, well-drained, nearly level soil is on alluvial fans that formed in alluvium derived from mixed rock sources. Permeability is moderately slow in the Vernalis soil. Available water capacity for Vernalis loam is high, runoff is negligible to low, and the hazard of water erosion is slight.
- **Vernalis-Zacharias complex, 0 to 2 percent slopes, rarely flooded (126):** The Vernalis soil is a very deep, well-drained, nearly level soil on alluvial fans that formed in alluvium derived from mixed rock sources. The Zacharias soil is also a very deep, well-drained, nearly level soil on alluvial fans that formed in alluvium from mixed rock sources. Permeability is moderately slow in both the Vernalis and Zacharias soils. Available water capacity for the Vernalis-Zacharias complex is high, runoff is negligible to low, and the hazard of water erosion is slight.

Parikh Consultants conducted borings to determine the subsurface conditions within the Project area. Boring tests indicate that soils consist of 6.5 to 7.5 feet of stiff to hard lean clay underlain by medium-dense gravel to 14 to 29 feet. Soils beyond the medium-dense gravel at the west end of the bridge are composed of medium-dense to very dense sandy soils interbedded with stiff to hard sandy lean clay and sandy silt to approximately 91.5 feet. Soils beyond the medium-dense gravel at the east end of the bridge are composed of interbedded stiff to hard lean clay and sandy silt, medium-dense to very dense sand or silty sand, and very dense clayey gravel to approximately 86.5 feet.

Earth Movement

Faults are surface and subsurface fissures that are located in geographically weak areas of the Earth's underlying bedrock, and potential fault zones prone to stress. Faults that are considered active include areas where shifting or deformation has been observed in the past 11,000 years (Holocene period). Potentially active, or Quaternary faults, refers to movement or deformation during the Quaternary period (typically less than 1.8 million years).

The Project site is located in a seismically active part of northern California. Many faults in the San Francisco Bay Area are capable of producing earthquakes, which may cause strong ground shaking at the site. The relevant faults in the area are summarized in **Table F: Faults in the Vicinity of the Project Area** (Caltrans ARS Online Report [V2, 2012]). The maximum magnitudes represent the largest earthquake that a fault is capable of generating.

Table F: Faults in the Vicinity of the Project Area

Fault	Potentially Active/ Active	Maximum Magnitude (M_{max})	Approximate Distance from Project Site (miles)
Great Valley 07 (Orestimba)	Potentially Active	6.7	0.41
Great Valley 08 (Quinto)	Potentially Active	6.8	3.65
Ortigalita Fault Zone (Ortigalita-Cottonwood Arm Section)	Active	7.0	11.88
Greenville (So) 2011 CFM	Active	6.9	25.27

Source: Parikh Consultants, Inc. *Foundation Report Shiells Road Bridge Replacement,* August 26, 2013.

The APEFZA (Alquist-Priolo Earthquake Fault Zoning Act) provides policies and criteria to assist cities, counties and State agencies in restricting development on active faults. The APEFZA requires the State geologist to delineate regulatory zones that encompass all potentially and recently active traces of named faults and other such faults, or fault segments that are deemed sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep. No APEFZA faults or zones are located within the Project area; however, the closest fault is the Great Valley 07 (Orestimba) fault, a potentially active fault that passes approximately 0.41 mile west of the Project site.

According to Parikh Consultants (2013), the Project site is located outside the designated State of California "Earthquake Fault Zones" (2010) for active faulting, and no mapped evidence of active or potentially active faulting was found for the site. The potential for fault rupture at the Project site is considered to be low.

The California Geologic Survey Probabilistic Seismic Hazard Assessment (PHSA) calculates earthquake shaking hazards through historic seismic activity and fault slip rates. Shaking from faults is expressed as the Peak Ground Acceleration (PGA) measured as a percentage (or fraction) of acceleration due to gravity (%g) from ground motion that has a 10 percent probability of being exceeded in 50 years. The Project site is located in an area with a PGA of 30 to 40 percent (0.30 to 0.40g).[1]

The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of key responses such as people awakening, movement of furniture, damage to chimneys, and total destruction. Although numerous intensity scales have been developed over the last hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The following is an abbreviated description of the 12 levels of the Modified Mercalli Intensity Scale:

I. Not felt except by a very few under especially favorable conditions;

[1] California Department of Conservation, California Geologic Survey, Probabilistic Seismic Hazard Map, http://www.consrv.ca.gov/cgs/rghm/psha/Map_index/Pages/San_Jose.aspx. Accessed October 16, 2013.

II. Felt only by a few persons at rest, especially on upper floors or buildings;
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing vehicles may rock slightly. Vibrations similar to the passing of a truck. Duration estimated;
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing vehicles rocked noticeably;
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop;
VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight;
VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken;
VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned;
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations;
X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent;
XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly; and
XII. Total damage. Lines of sight and level are distorted. Objects thrown into the air.

According to the Stanislaus County General Plan, the proposed Project is in an area rated as IX to X on the Modified Mercalli Intensity Scale.

Seismic ground shaking can result in soil compaction and settlement. If the sediments that compact during an earthquake become saturated, they are subject to liquefaction. If liquefaction occurs, soil loses its supporting structure, resulting in a condition where buildings and other constructed facilities could settle into the ground. Based on the investigations conducted by Parikh Consultants (2013), groundwater appeared to be located at deeper than 40 feet below grade. Since the most medium dense granular materials were encountered in the upper approximately 40 feet, liquefaction potential at the Project site is considered to be relatively low (Parikh 2013). However, if groundwater rises to a historical high, approximately within 15 to 30 feet below grade, the possibility of liquefaction would increase.

Seiches are waves caused by earthquakes in bodies of water that can be compared to the back-and-forth sloshing of water in a tub. The risk of seiche is considered very low since no significant water bodies are located in the vicinity of the proposed Project.
Slope instability (landslides and rockslides) can result in the movement of material down a slope or gradient. Within Stanislaus County, a majority of the land located west of Interstate 5 is classified as a "geologic formation representing the ability to slide" (Stanislaus County 1987). The Project site is located outside of this region and is located on flat topographical land. No hillsides, slopes, steep

topographical areas, cliffs or mountains are located within the boundary of the proposed Project nor are any located near the Project site. The potential for landslides occurring on or adjacent to the Project site is low.

Discussion

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant. Stanislaus County is listed as an affected county by the Alquist-Priolo Earthquake Fault Zones according to the Division of Mines and Geology Special Publication 42, Index to Earthquake Fault Zone Maps Figure 4B. The State of California Division of Mines and Geology has published maps identifying Alquist-Priolo Special Study Zones. The Ortigalita Fault, located in southwestern Stanislaus County, is identified as an Alquist-Priolo Special Study Zone. The zone extends 500 feet in either direction from the fault. The Ortigalita Fault is located approximately 11.7 miles southwest of the Project area.

The closest fault, though not located in an Alquist-Priolo Earthquake Fault Zone, is the Great Valley 07 (Orestimba) fault, a potentially active fault that passes approximately 0.41 mile to the west of the Project site.

The proposed Project would replace an existing bridge and would not include the development of structures housing people or new infrastructure. Therefore, the proposed Project would not expose people or structures to potential risk of loss, injury or death involving rupture of a known earthquake fault or Alquist-Priolo Earthquake Fault Zone. This impact would be ***less than significant***.

ii) Strong seismic ground shaking?

Less Than Significant. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake and is normally the major cause of damage in seismic events. The extent of ground-shaking is controlled by the magnitude and intensity of the earthquake, depth of the epicenter, distance from the epicenter, and local geological conditions.

As discussed above, the Project site is located approximately 0.41 mile from the nearest active fault (Great Valley 07 [Orestimba]). According to the Stanislaus County General Plan Safety Element Support Documentation, "The western half of the county can expect to receive shaking to an intensity of VII or VIII Mercalli which can cause considerable damage to ordinary structures. The area around the City of Newman may have shaking intensity of IX or X. This may be considered a major hazard area." Based on the available geological and seismic data, the Project site is located in an area that has the potential to experience Peak Ground Acceleration between 30 to 40 percent (0.30 to 0.40g) during such a seismic event (Stanislaus County 2004). Although the Project site could be exposed to high ground shaking, the proposed Project would be designed and constructed consistent with County of Stanislaus and Caltrans seismic retrofitting standards. The proposed Project would not expose people

or structures to potential adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. Impacts would be ***less than significant***.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant. Soil liquefaction is a phenomenon primarily associated with the saturated soil layers located close to the ground surface. These soils lose strength during ground shaking in seismic events. Due to the loss of strength, the soil acquires "mobility" sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, uniformly graded; saturated, fine-grained sands that lie relatively close to the ground surface. However, loose sands that contain a significant amount of fines (minute silt and clay fraction) may also liquefy. As discussed above, groundwater within the Project area appears to be located deeper than 40 feet below grade. Since the most medium dense granular materials are encountered in the upper approximately 40 feet, liquefaction potential at the Project site is considered to be relatively low. This impact would be ***less than significant***.

iv) Landslides?

Less Than Significant. Within Stanislaus County, a majority of the land located west of Interstate 5 is classified as a "geologic formation representing the ability to slide" (Stanislaus County 1987). Figure 5-4 "Geological Hazards" of the Stanislaus County General Plan Safety Element illustrates historic sites of landslides within the County. The Project site is located outside of this region and is located on flat topographical land. No hillsides, slopes, steep topographical areas, cliffs or mountains are located within the boundary of the proposed Project nor are any located near the Project site. The potential for landslides occurring on or adjacent to the Project site is low. Therefore, this impact would be ***less than significant***.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant with Mitigation Incorporated. The Project site is located on relatively flat to gently sloping land; therefore, construction activities associated with the proposed Project would not result in substantial soil erosion or loss of topsoil. Once the proposed bridge replacement is completed, the disturbed construction area would be stabilized to prevent erosion. As a BMP, projects that disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit would require development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a project site map(s), which shows the construction site perimeter, existing and proposed facilities, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the Project site. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

With development of a SWPPP and the implementation of **Mitigation Measure GEO-1**, potential erosion impacts would be reduced to ***less than significant***.

Mitigation Measure GEO-1: Since the Project site is greater than 1 acre in size, the construction contractor, prior to commencement of construction activities, shall develop a Stormwater Pollution Prevention Plan (SWPPP) that is in compliance with minimum requirements of the Environmental Project Agency's 2012 Construction General Permit. The SWPPP shall include Best Management Practices (BMPs) designed to reduce erosion and prevent sediment or other potential pollutants from leaving the work site or impacting water quality to CCID Main Canal which flows into Orestimba Creek. The County shall require the construction contractor to implement BMPs for erosion and sedimentation outlined in the most recent version of the Erosion and Sediment Control Field Manual (California Regional Water Quality Control Board, 2002), the Environmental Protection Agency Construction Site Stormwater Runoff Control BMP Fact Sheets, or an equivalent publication. Below are some examples of the measures that shall be included and/or implemented in the SWPPP to reduce stormwater runoff during construction of the proposed Project:

- Best management practices outlined in the most recent version of the Erosion and Sediment Control Field Manual, published by the Regional Water Quality Control Board, or equivalent publication, shall be implemented for erosion, sediment and turbidity control during and after any ground clearing activities or any other proposed Project activities that could result in erosion or sediment discharges to surface water;
- Exposed slopes shall be protected using temporary erosion control blankets, fiber rolls, silt fences, or other approved erosion and sediment controls;
- Erosion prevention and sediment control measures shall be inspected and maintained until disturbed areas are stabilized;
- Disturbed ground surfaces near the creek bank shall be revegetated and monitored for future erosion;
- To ensure that stockpiled granular material does not enter the creek or storm drains, the material shall be covered with a tarp and surrounded with sand bags when rain is forecast;
- At the end of each working day roadways shall be cleaned and swept, and scrap, debris, and waste material shall be collected and disposed of properly;
- Vehicle or equipment cleaning shall be performed with water only, and in a designated, bermed area that shall not allow rinse water to run off-site or into the canal;
- Maintenance and fueling of construction vehicles and equipment shall be performed in a designated, bermed area or over a drip pan that shall not allow run-on of stormwater or runoff of spills; and
- Discharges to the CCID Main Canal shall be reported to the County and/or CCID immediately upon discovery and a written discharge notification must be submitted to the Regional Water Quality Control Board within seven (7) days of such a discharge.

Implementation of **Mitigation Measure GEO-1** would reduce potential erosion impacts to a ***less than significant*** level.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less Than Significant. As discussed above, groundwater within the Project area appeared to be located deeper than 40 feet below grade. Since the most medium dense granular materials were encountered in the upper approximately 40 feet, liquefaction potential at the Project site is considered to be relatively low. Soils within the Project area are not considered unstable due to the granular nature of the soil; therefore, this impact would be ***less than significant***.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant. Expansion and contraction of soils occurs when soils undergo alternating cycles of wetting (swelling) and drying (shrinking) and are generally associated with clayey soils. During these cycles, the volume of the soil changes substantially. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during the construction process. Tests conducted by Parikh Consultants (2013) indicate that soils within the Project area have a Plasticity Index of 11, suggesting a low to medium plasticity. Because of the low plasticity index, this impact would be ***less than significant***.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

No Impact. Construction and operational activities associated with implementation of the proposed Project would not generate wastewater that would require disposal. Septic tanks are not proposed as part of the proposed Project. Therefore, the proposed Project would not result in impacts to soil associated with the use of such wastewater treatment systems. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Environmental Setting

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases (GHGs) that contribute to global climate change have a broader global impact. Global climate change is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global climate change are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. Among the potential implications of global climate change are, rising sea levels, and adverse impacts to water supply, water quality, agriculture, forestry and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air pollutants, much of the GHG production is generated by motor vehicle usage. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning on the city, county, and subregional level, and other measures to reduce automobile use. Energy conservation measures can contribute to reduction in GHG emissions as well.

The primary existing sources of human-caused GHGs in the Project area are emissions from vehicles traveling along Shiells Road and operation of farming equipment on surrounding agricultural land.

Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant with Mitigation Incorporated. GHG emissions associated with implementation of the proposed Project would occur over the short-term due to construction activities. Construction-related GHG emissions would primarily consist of exhaust from construction equipment and from on-road fuel combustion from employee commutes.

Short-Term GHG Emissions. Demolition of the existing bridge and construction of the new bridge at the Project site would generate combustion emissions from various sources. During site preparation, demolition and construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site demolition and construction activities would vary daily as construction activity levels change. Construction activities would contribute to the total annual GHG emissions in the State. Neither SJVAPCD nor ARB has issued clear thresholds on construction-related GHG emissions for CEQA. Likewise, SJVAPCD has not released an adopted set of construction-related BPS for GHG emissions.

In the absence of clear thresholds, guidance, or BPS for construction-related GHG emissions, the Project would instead adhere to a suite of best practices extracted from the existing literature.

In 2009, EPA's Sector Strategies Program produced a report analyzing construction-related GHG emissions titled Potential for Reducing Greenhouse Gas Emissions in the Construction Sector (EPA 2009). The report identifies fossil fuel combustion, primarily from construction equipment, and fuel use from purchased electricity as the two major sources of GHG emissions in the construction industry, with approximately three-quarters of GHG emissions from the construction sector resulting from diesel, gasoline, and natural gas combustion. Therefore, strategies to reduce GHG emissions from construction projects should focus on reducing fossil fuel consumption by construction equipment.

Implementation of **Mitigation Measure GHG-1**, presented below, would reduce the contribution of GHG emissions during the construction period of the proposed Project.

> **Mitigation Measure GHG-1:** To the extent feasible and to the satisfaction of Stanislaus County official and Caltrans, the following measures shall be incorporated into the design, demolition and construction of the proposed Project:
>
> - On-site idling of construction equipment shall be minimized (no more than 5 minutes maximum);
> - Biodiesel shall be used as an alternative fuel diesel for at least 15 percent of the construction vehicles/equipment used if there is a biodiesel station within 5 miles of the Project site;
> - At least 10 percent of the building material used for the proposed Project shall be local to the extent feasible; and
> - At least 50 percent of construction waste or demolition materials shall be recycled.

Long-Term GHG Emissions. The proposed Project would include the demolition of the existing Shiells Road Bridge over the CCID Main Canal, the development of a new bridge, and roadway approach improvements. Once completed, the new bridge on Shiells Road would not generate any new vehicle trips that would contribute to an increase in GHG emissions. Therefore, the proposed Project would not contribute to a long-term increase in GHG emissions.

Implementation of **Mitigation Measure GHG-1** would reduce the contribution of GHG emissions during construction. Impacts would be ***less than significant*** with mitigation incorporated.

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals for the State of California: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2025.

California's major initiative for reducing GHG emissions is outlined in AB 32, the "Global Warming Solutions Act," passed by the California State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels of 427 million metric tons (MMT) of CO_2eq. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 requires ARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to the established climate change goals. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emissions reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures (CARB 2008). The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The measures in the Scoping Plan would not be binding until they are adopted through the normal rulemaking process and, therefore, are only recommendations at this time. The ARB rulemaking process includes preparation and release of each of the draft measures, public input through workshops and a public comment period, followed by an ARB hearing and rule adoption.

The California Environmental Protection Agency Climate Action Team (CAT) and the ARB have developed several reports to achieve the Governor's GHG targets that rely on voluntary actions of California businesses, local government and community groups, and State incentive and regulatory programs. These include the CAT's 2006 "*Report to Governor Schwarzenegger and the Legislature*," ARB's 2007 "*Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*," and ARB's "*Climate Change Scoping Plan: a Framework for Change."* The reports identify strategies to reduce California's emissions to the levels proposed in Executive Order S-3-05 and AB 32.

In addition to reducing GHG emissions to 1990 levels by 2020, AB 32 directed ARB to identify a list of "discrete early action GHG reduction measures" that can be adopted and made enforceable by January 1, 2010. In June 2007, ARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on High Global Warming Potential Refrigerants, and Landfill Methane Capture). The ARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures.

ARB identified 44 early action items as measures "expected to yield significant GHG emission reductions, [and] are likely to be cost-effective and technologically feasible." The combination of early action measures is estimated to reduce State-wide GHG emissions by nearly 16 MMT. Accordingly, the 44 early action items focus on industrial production processes, agriculture, and transportation sectors. Early action items associated with industrial production and agriculture do not apply to the

proposed Project. The transportation sector early action items such as truck efficiency, low carbon fuel standard, proper tire inflation, truck stop electrification and strengthening light duty vehicle standards are either not specifically applicable to the proposed Project or would not result in a reduction of GHG emissions associated with the proposed Project. State measures include emission reductions assumed as part of the Scoping Plan, including light-duty vehicle GHG standards ("Pavley standards"), low carbon fuel standard, and energy efficiency measures.

The proposed Project includes the replacement of an existing bridge to allow for development of a bridge that conforms to current standards. The proposed Project would not conflict with the State goal of reducing GHG emissions and would not conflict with the AB 32 Scoping Plan or the early action measures. The proposed Project would be subject to all applicable permit and planning requirements in place or adopted by Stanislaus County. Therefore, the proposed Project would not conflict with any applicable plan, policy or regulation of an agency adopted for reducing the emissions of greenhouse gases. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Environmental Setting

Hazardous materials include all flammable, reactive, corrosive, or toxic substances which, because of these properties, pose potential harm to the public or environment. Hazardous materials such as agricultural chemicals, natural gas and petroleum, explosives, radioactive materials and various commercial chemical substances are used, stored, or produced in Stanislaus County.

The Project site and nearby land uses are not located in an area that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5. A search of the California State Water Resources Control Board (SWRCB) GeoTracker website (SWRCB 2013) indicates there are no hazardous materials sites located within 1,000 feet of the Project site.[1]

Considering that the original bridge spanning the CCID Main Canal on Shiells Road was developed in 1928, the Project site may contain hazardous materials associated with the existing bridge (e.g., asbestos containing materials). No evidence of the pesticides, herbicides, or arsenic is present at the Project site and its immediate vicinity. No evidence of aerial deposited lead (ADL) or lead-based paint is present at the Project site and its immediate vicinity (Stanislaus County 2014).

According to the California Geologic Survey, the northwest portion of Stanislaus County contains ultramafic rocks that could contain Naturally Occurring Asbestos (NOA). The Project site is located in a geological area that is composed of Quaternary alluvium and marine deposits (Pliocene to Holocene) which are known not to generate NOA.

Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant with Mitigation Incorporated. The proposed Project would include the demolition of an existing bridge, approach roadway work, and development of a new bridge across the CCID Main Canal on Shiells Road. During construction, hazardous materials may be present on-site from construction vehicles and demolition debris. Upon completion (operation) of the proposed Project the routine transport, use or disposal of hazardous materials would not occur.

Construction of the proposed Project would involve the use of heavy equipment for grading, hauling and handling materials. Use of this equipment may require the use of fuels and other common materials that have hazardous properties (e.g., fuels are flammable). These materials would be used in accordance with all applicable laws and regulations and, if used properly, would not pose a hazard to people, animals, plants or sensitive areas on or near the Project site. All refueling of construction vehicles and equipment would occur within the designated staging areas for the proposed Project. The use of such hazardous materials would be temporary and the proposed Project would not include a permanent use or source of hazardous materials. Implementation of **Mitigation Measure HAZ-1**, as presented below, would reduce this impact to a ***less than significant*** level.

[1] California State Water Resources Control Board, GeoTracker. Accessed September 4, 2013. http://geotracker.waterboards.ca.gov/.

> **Mitigation Measure HAZ-1:** The construction contractor shall prepare a Spill Prevention and Countermeasure Plan (SPCP) prior to the commencement of construction activities. The SPCP shall include information on the nature of all hazardous materials that would be used on-site. The SPCP shall also include information regarding proper handling of hazardous materials, and clean-up procedures in the event of an accidental release. The phone number of the agency contact overseeing hazardous materials and toxic clean-up shall be provided in the SPCP.

Implementation of **Mitigation Measure HAZ-1** would reduce this impact to a ***less than significant*** level.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant with Mitigation Incorporated. After Project construction, the newly developed bridge on Shiells Road crossing the CCID Main Canal would operate similar to existing conditions; therefore, operation of the proposed Project would not create a significant hazard to the public or the environment. However, demolition and construction activities at the Project site could expose construction workers to potentially hazardous materials, including asbestos containing materials.

Asbestos Containing Materials. The existing bridge spanning across the CCID Main Canal on Shiells Road was built in 1928. Due to the age of this existing bridge, there is a potential for presence of asbestos containing materials (ACM). Demolition of the existing structure could potentially release airborne particles of hazardous materials that may affect construction workers or the public.

The U.S. EPA, federal and State Occupational Safety and Health Administration (OHSA), and the DTSC regulate removal of asbestos or suspect ACM, including removal as part of bridge demolition. All friable (crushable by hand) ACM, or non-friable ACM subject to damage, must be abated prior to disturbance in accordance with applicable requirements. Friable ACM must be disposed of as an asbestos waste at an approved facility. Non-friable ACM may be disposed of as a non-hazardous waste at landfills that accept such wastes. Workers conducting asbestos abatement must be trained in accordance with State and federal OSHA requirements.

Implementation of **Mitigation Measures HAZ-2** and **HAZ-3** would reduce impacts related to the release of airborne ACM to a ***less than significant*** level.

> **Mitigation Measure HAZ-2:** During construction, the Project contractor shall comply with the OSHA Standard 1926 related to state and federal requirements for handling and disposal of ACM and universal wastes.
>
> Prior to demolition of the existing bridge on the Project site, ACM surveys shall be performed by a qualified environmental professional. ACM inspections in California are required to be conducted by a Certified Asbestos Consultant (CAC) or by a Certified Site Surveillance Technician (CSST) working under a CAC. If any ACM is identified, it shall be abated and removed from the site in accordance with all applicable regulations, including OHSA requirements. The County of Stanislaus shall verify that the surveys and abatement or removal, as necessary, have been completed prior to any demolition and construction activities on the Project site.

Mitigation Measure HAZ-3: Prior to any demolition, grading or construction activities on the Project site, a Health and Safety Plan shall be prepared in accordance with state and federal laws and regulations with provisions to protect construction workers and the nearby residential units from health risks from any residual contaminants in site soils, groundwater, and/or the existing bridge during demolition and construction of the proposed Project. The Health and Safety Plan shall summarize previous environmental investigations and health risk assessments conducted for the Project site (if any are applicable) and identify any known residual contamination that remains in soil or groundwater that would be disturbed or handled during demolition and construction.

The Health and Safety Plan shall also: 1) provide procedures to be undertaken in the event that previously and unreported construction hazards or previously undetected subsurface hazards, including soil or groundwater contamination, are discovered during construction; 2) incorporate construction safety measures for excavation and other construction activities; 3) establish procedures for safe storage, stockpile, use, and disposal of contaminated soils and groundwater and other hazardous materials from the Project site; 4) provide emergency response procedures; and 5) designate personnel responsible for implementation of the Health and Safety Plan during the construction phase of the proposed Project. If regulatory oversight is required for site remediation, the Health and Safety Plan shall be subject to review and approval by regulatory oversight agencies. The County of Stanislaus shall verify that the Health and Safety Plan has been completed prior to any grading or demolition activities on the Project site.

Implementation of **Mitigation Measures HAZ-2** through **HAZ-3** would ensure that a significant hazard to the public or environment would not occur from reasonably foreseeable upset and accident conditions involving the release of hazardous materials from the proposed Project. Impacts would be ***less than significant*** with mitigation incorporated.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The Project site is not located within one-quarter mile of an existing or proposed school. The nearest school is Yolo Middle School located in the City of Newman, approximately 1.4 miles northeast of the Project site. Therefore, the proposed Project would not emit hazardous emissions nor handle hazardous materials or substances within one-quarter of a mile from a school. ***No impact*** would occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. As described above, the Project site is not on or near a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5. Therefore, implementation of the proposed Project would not create a significant hazard to the public or the environment. ***No impact*** would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The Project site is not located within the boundary of an airport land use plan and is not within two miles of a public use airport. The nearest airport is Crows Landing Naval Auxiliary Landing Field, 7.25 miles north-northwest of the Project site. Therefore, implementation of the proposed Project would not result in safety hazards to construction crews, in association with airports. ***No impact*** would occur.

f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. Aerial views of the Project site and surrounding areas were reviewed using Google Earth. The proposed Project is not located in the vicinity of a private airstrip. The nearest private airstrip is Alhem Farms Airport, 9.25 miles northeast of the Project site. The proposed Project would not result in a safety hazard for construction crews in association with private use airstrips. ***No impact*** would occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant. The Project site is located in a rural part of Stanislaus County along Shiells Road. Shiells Road does not provide connectivity to U.S. Highway 99 (which is located approximately 18 miles northeast of the Project area) or Interstate 5 (which is located approximately 2.3 miles west of the Project area). Roads in the vicinity of the proposed Project have been designed in a grid pattern, and in the event of an emergency, residents adjacent to the Project site would use Shiells Road to connect with other rural roadways to access Interstate 5 and exit the area. The proposed Project would include the demolition of the existing bridge and development of a new bridge across the CCID Main Canal. During construction activities, the existing bridge would be closed to through traffic while the new bridge is developed. **Figure 4: Detour Plan** illustrates the detour routes that would be used by area residents and local motorists during construction of the proposed Project. Signage would be posted at the Shiells Road-Eastin Road intersection and the Shiells Road-Draper Road intersection alerting motorists of the detour. Closure of Shiells Road would be coordinated with the appropriate law enforcement and emergency response personnel agencies to ensure adequate notification of the road closure. The proposed detour would involve agency coordination and notification and other area roads would remain open for emergency evacuation purposes. Impacts would be ***less than significant***.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less Than Significant. According to the California Fire Hazard Severity Zone Map for Stanislaus County, the Project area is located outside of a State Responsibility Area. No fire hazard designation is indicated on the Fire Hazard Severity Zone Map. The West Stanislaus County Fire Protection District is responsible for protection and response in the vicinity of the proposed Project. However, the proposed Project would not include the development of structures or endanger the lives of residents or construction workers if a wildland fire were to occur. Impacts would be ***less than significant***.

IX. HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Environmental Setting

The *Bridge Hydraulics and Evaluation of the Existing Condition Technical Memorandum* prepared by NV5 contributed to the information and analysis in this section (attached as **Appendix D**).

Agricultural and urban water supplies for Stanislaus County originate from both groundwater and surface water. Extensive energy-efficient gravity flow irrigation systems have been developed in Stanislaus County to provide continued supply of agricultural and urban waters to customers. The main sources of irrigation water in the County include: the Stanislaus River, Tuolumne River, and San Joaquin River. These rivers contain water of excellent quality at their sources in the Sierra Nevada, but as they flow through the County, their quality is impaired by each successive use. Both agricultural and domestic use-and-return contributes to this degradation. As flows decrease seasonably, concentrations of pollutants increase, particularly in the San Joaquin River, which drains return water and domestic and industrial wastes through the entire San Joaquin Valley. Quality of the Stanislaus River is somewhat deteriorated at its confluence with the San Joaquin River. The Tuolumne River's condition has deteriorated more than the Stanislaus River due to agricultural return wastes and gas well wastes before it reaches the San Joaquin River (Stanislaus County 1987).

Groundwater is the major source of domestic and industrial water in Stanislaus County, and is used as a supplemental water supply for irrigation. The quality of groundwater is determined by the geologic formations through which it filters. Groundwater recharge occurs by water conduction through the gravels of major streams and rivers, seepage from reservoirs, irrigations, and rainfall on well-drained alluvial soils in the valley portion of the County. Rainfall is not a dependable recharge source since the average annual County rainfall is only 12 inches and of this amount, only about half can be considered an effective recharge source. The groundwater situation west of the San Joaquin River is substantially different from the rest of the County to the east of the river. Three major problems exist, including a rising, perched water table, saline build-up in the soil, and an increasing imbalance in the groundwater body. These conditions exist through combinations of canal seepage, excessive irrigation, and poor quality irrigation waters. The decreasing groundwater quality is having adverse effects on domestic water supplies, as well as agricultural lands throughout the County (Stanislaus County 1987).

The Project site is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB); which is under the direction of the California State Water Resources Control Board. Under the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act, the CVRWQCB has regulatory responsibility for protecting water quality.

Surface Water

The Project site is located in the San Joaquin River Basin. The San Joaquin River, which flows 5.5 miles northeast of the Project site, drains into the southern part of the San Joaquin Valley, and flows south into the Sacramento-San Joaquin River Delta. This portion of the San Joaquin River is currently on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments, and therefore, does not currently meet state water quality standards. High levels of diazinon, pesticides, and mercury contribute to the San Joaquin River exceeding current CWA standards.

The CCID Main Canal is part of the Central California Irrigation District water delivery system. CCID provides the primary water supply for the area. Based on discussions with CCID, the maximum flow in the canal is 300 cubic feet per second (cfs). The existing bridge is located over CCID Main Canal

which generally flows from south to north. The soffit of the existing bridge is below the top of the canal and under normal flow conditions (300 cfs) the soffit is right at the water level (NV5 2013).

Water flow within the Project area occurs via percolation to adjacent properties. Roadside ditches are shallow and convey runoff within the Project area.

Wetlands

Wetlands are highly productive natural habitats used for foraging and nesting by many types of wildlife. These areas are given a high priority for protection by the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service. Surface water resources throughout Stanislaus County include a variety of wetlands. Wetlands are typically found at the margins of ponds, lakes, and streams, in low-lying areas that collect precipitation and may be seasonal or perennial. Wetlands are also found in areas where groundwater precipitates to the ground surface. Many constructed ponds (stockponds) are located throughout the County that may be classified as wetlands. Wetlands are not located within or near the Project site.

Groundwater

The proposed Project is located within the boundary of the Delta-Mendota Subbasin of the San Joaquin Valley Groundwater Basin. The San Joaquin Valley Groundwater Basin lies within the San Joaquin River and Tulare Lake Hydrologic Regions (HRs). The San Joaquin River HR portion of the basin covers approximately 3.73 million acres with the Tulare Lake HR portion of the basin, covering approximately 5.15 million acres. Groundwater is used extensively in the San Joaquin Valley Groundwater Basin by agricultural and urban entities and accounts for approximately 48 percent of the groundwater used in California. The northern portion of the basin is within the San Joaquin River HR and consists of nine subbasins, including the Delta-Mendota Groundwater Subbasin.

The Delta-Mendota Subbasin is within the San Joaquin River HR and covers approximately 747,000 acres in Stanislaus, Merced, Madera and Fresno counties. The Delta-Mendota Subbasin is bounded on the west by the Tertiary and older marine sediments of the Coast Ranges, on the north by the Tracy Subbasin, on the south by the Westside Subbasin, and on the east end by the Modesto, Turlock, Merced, Chowchilla, Madera, and Kings subbasins. The primary sources of groundwater recharge in the subbasin are from deep percolation of applied irrigation water and from canals and water storage facilities. Lesser groundwater recharge occurs from percolation from small streams and direct percolation of precipitation. Natural recharge is estimated at 8,000 acre-feet annually while recharge of applied water is estimated at 74,000 acre-feet annually. Annual groundwater extraction is estimated at 17,000 acre-feet for urban use and 491,000 acre-feet for agricultural use.

Based on the groundwater data from the monitoring stations, published on the website of California Department of Water Resources, the historical groundwater level in the proximity of the Project site is estimated to be within approximately 15 to 30 feet below grade; however, at the time of the Parikh field investigation, groundwater appeared to be located deeper than 40 feet below grade.

Water Quality

Between 1983 and 2003, groundwater samples were collected from 900 wells in Stanislaus County for analysis of pesticides. Groundwater samples from 45 of the wells had verified detections of pesticides and 171 of the wells had unverified detections of pesticides. Detected pesticides included ACET, atrazine, bentazon, diuron, bromacil, DACT, DEA, prometon, and simazine. Groundwater samples

collected from 47 water supply wells regulated by the Department of Health Services within the subbasin from 1994 through 2000, were analyzed for pesticides. Pesticides were detected in groundwater from one well at concentrations greater than an applicable Maximum Contaminant Level (MCL). Groundwater in the subbasin is typically a mixed sulfate to bicarbonate type water. Areas of sodium chloride and sodium sulfate type groundwater exist in the central and southern portions of the subbasin. Total Dissolved Solids (TDS) ranges from 400 to 1,600 mg/L in the northern part of the subbasin and 730 to 6,000 mg/L in the southern part. Analysis from groundwater samples collected between 1994 and 2000 from 44 wells regulated by DHS detected TDS concentrations from 210 to 1,750 mg/L, with an average of 770 mg/L.[1]

The nearest groundwater monitoring station to the Project site that exceeded State groundwater quality standards is located 0.97 mile to the northeast. The cluster of wells at this location was last tested in 1985 and the collected groundwater exceeded State standards for Boron, Nitrate, and Zinc levels. A second cluster of wells is located approximately 1.3 miles southwest of the Project site. These wells were tested on January 1, 2012 and the collected groundwater exceeded State standards for Barium, Boron, and Nitrate levels.[2]

Floodplain: The Federal Emergency Management Agency (FEMA) (FEMA Map No. 06099C0945E) has designated the Project area as follows:

- **Zone X.** Zone X indicates areas of 0.2 percent annual chance flood or areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile and areas protected by levees from 1 percent annual chance flood.
- **Zone AH.** Zone AH indicates areas that experience flood depths of 1 to 3 feet (usually areas of ponding).

Floodplain designations within the Project vicinity are shown on the figure provided in **Appendix E**.

Discussion

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant. The CCID Main Canal is the nearest body of water to the Project site. The CCID Main Canal flows south to north through the Project area. Surface drainage outflows from CCID flow northeast into neighboring irrigation districts and into the grasslands and the San Joaquin River. Concrete-lined lateral canals are connected to the Main Canal, and water flow is controlled by gates and only drains into the CCID Main Canal during heavy storm or flood events.

Construction activities associated with the proposed Project have the potential to expose bare soil and potentially generate other water quality pollutants that could be exposed to precipitation and subsequent entrainment in surface runoff to the CCID Main Canal. Prior to in-channel construction activities, the area of the channel where construction activities occur would be dewatered. Construction

[1] Jones and Stokes, Central Valley Regional Water Quality Control Board, Irrigated Lands Program, Draft Existing Conditions Report, Chapter 4 Groundwater Quality, pg. 4-324, February 2006.

[2] California State Water Resources Control Board, GeoTracker Groundwater Ambient Monitoring and Assessment, http://geotracker.waterboards.ca.gov/gama/. Accessed October 23. 2013.

activities involving soil disturbance, pile driving, excavation, cutting/filling, and grading activities could result in increased erosion and sedimentation to the CCID Main Canal and waters downstream. Construction materials such as asphalt, concrete, and equipment fluids could be exposed to precipitation and subsequent runoff. If precautions are not taken to contain contaminants, construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality.

The proposed Project would be subject to the National Pollutant Discharge Elimination System (NPDES) permit, which requires the use of Best Management Practices (BMPs), as outlined in the *Storm Water Management Program for Stanislaus County*, to minimize water quality impacts from construction projects. The County would obtain coverage for the proposed Project under the Statewide General Permit for Discharges of Storm Water Associated with Construction Activity, Order No. 99-08 DWQ. In accordance with the provisions of the General Permit and the Storm Water Management Program for Stanislaus County, the County would require the contractor to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) to reduce or minimize discharge of pollutants from construction activities.

Due to the implementation of BMPs as required by the NPDES permit, construction activities associated with the proposed Project would result in ***less than significant*** impacts to water quality.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant. The Project site is not an area of high groundwater recharge. The proposed Project would not construct a significant amount of new impervious surfaces that would impede surface water drainage into the soil. This impact would be ***less than significant***.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less Than Significant. The Project site includes the existing Shiells Road Bridge, the CCID Main Canal, the banks of the CCID Main Canal, and the east and west approaches to the bridge. The proposed Project would remove the existing bridge and replace it with a wider bridge that would result in a greater impervious surface area. The proposed Project would result in a slight increase in runoff over existing conditions due to the increase in impervious surface area of the new bridge. The new bridge and maintenance access roads would not result in a significant increase in drainage and erosion from the Project site that would generate a substantial amount of runoff that would exceed the capacity of the CCID Main Canal or lateral canals near the proposed Project. The existing bridge is a three-span bridge while the proposed bridge would be a single-span. Because the proposed bridge would eliminate footings in the CCID Main Canal, flows would not be impeded due to the proposed Project. Therefore, the proposed Project would not substantially redirect flows in the Canal that would result in increasing the amount of erosion on- or off-site. This impact would ***less than significant***.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant. As discussed in Section IX(c), the proposed Project would remove the existing bridge and replace it with a wider bridge that would result in a greater impervious surface area. The increase in impervious surface would not alter the existing drainage pattern nor would the proposed Project result in flooding on- or off-site. Because the proposed bridge would eliminate footings in the CCID Main Canal, flows would not be impeded due to the proposed Project. Therefore, the proposed Project would not substantially alter the drainage pattern in the CCID Main Canal in a way that would result in increasing the amount of flooding on- or off-site. This impact would be ***less than significant***.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant. As discussed in Sections IX(c) and (d), the proposed Project would remove the existing bridge and replace it with a wider bridge that would result in a greater impervious surface area. The proposed Project would result in a slight increase in runoff over existing conditions due to the increase in impervious surface area of the new bridge. The increase in runoff would not exceed the capacity of existing or planned stormwater drainage systems (likely percolation to adjacent lands) nor would the proposed Project result in substantial additional sources of polluted runoff. This impact would be ***less than significant***.

f) Otherwise substantially degrade water quality?

Less Than Significant. No additional impacts other than those discussed under Sections IX(a), IX(c), and IX(e) above are anticipated. Impacts would be ***less than significant***.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. No housing units are proposed as part of the proposed Project. Therefore, the proposed Project would not place housing within the boundary of a 100-year flood hazard area. ***No impact*** would occur.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less Than Significant. As discussed in Section IX(c) above, the existing bridge is a three-span bridge while the proposed bridge would be a single-span. Because the proposed bridge would eliminate footings in the CCID Main Canal, water flow would not be impeded due to the proposed Project. Therefore, the proposed Project would not substantially redirect water flows in the CCID Main Canal. This impact would be ***less than significant***.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?

Less Than Significant. The proposed Project would not result in an increase in flooding as a result of the failure of a levee or dam. The proposed Project would not result in a significant increase in runoff

and would not result in increased water flows in the CCID Main Canal. It should be noted that the *Orestimba Creek, West Stanislaus County, California Draft Report for Public Review, Draft Interim Feasibility Study Draft EA/IS* (December 2012) identifies the possible development of a levee along the east bank of the CCID Main Canal. Such a levee would reduce the risk of flooding to adjacent lands; however, levee development is not included as an element of the proposed Project. This impact would be ***less than significant***.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. The proposed Project is not located adjacent to the ocean, a lake, or a reservoir that could result in impacts caused by inundation by seiche or tsunami. The Project site does not contain mountains or other geologic formations that would make it prone to being damaged by mudflows. Therefore, ***no impacts*** related to exposure to seiche, tsunami or mudflows would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING				
Would the project :				
a) Physically divide an established community?	☐	☐	☒	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Environmental Setting

The proposed Project includes the removal of an existing bridge and development of a new bridge over the CCID Main Canal along Shiells Road in rural Stanislaus County. One residential unit is located southwest of the Project area. Aside from this residential unit, the nearest established community is the City of Newman located 1.5 miles northeast of the Project site.

The proposed Project is within the jurisdiction of the Stanislaus County General Plan. The Stanislaus County General Plan (1987) identifies the land use patterns and development in the County. In Stanislaus County, nearly 80 percent of land is devoted to agricultural production (Stanislaus County 1987). According to Stanislaus County's November 2010 zoning district map, the Project site is in zoning district A-2-40. The A-2-40 zoning designation, as defined by the Stanislaus County General Plan, applies to areas presently or potentially valuable for agricultural use and is intended to prevent incompatible urban development within agricultural areas. Specifically, the A-2-40 zoning district allows for residential building intensity ranging from zero to two dwellings per 40 acres of land and for agricultural buildings and related uses.

The Project site is not located in an area that is designated under a habitat conservation plan or natural community conservation plan.

Discussion

a) Physically divide an established community?

Less Than Significant. The proposed Project would include the demolition of the existing bridge on Shiells Road at the CCID Main Canal crossing, alignment of Shiells Road to improve approach areas to a new bridge, and development of a new bridge at the crossing. The removal of the existing bridge would result in a temporary access barrier to surrounding rural residential parcels. Once completed, the proposed bridge would eliminate the temporary access barrier. Impacts would be ***less than significant***.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The proposed Project would not involve a change in land use and would continue to comply with the Stanislaus County General Plan Land Use Element, Land Use Map and Zoning Ordinance. Furthermore, the proposed Project would continue to be in compliance with policy and regulations per Caltrans. The proposed Project would not conflict with applicable land use plans, policies, or regulations. ***No impact*** would occur.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The Project site is not within the boundary of a habitat conservation plan or natural community conservation plan area. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES				
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Environmental Setting

Minerals are any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances including, but not limited to, coal, peat and oil bearing rock, but excluding geothermal resources, natural gas and petroleum. Rock, sand, gravel and earth are also considered minerals by the California Department of Conservation when extracted by surface mining operations.

Stanislaus County is not prolific in extractive resources. Some magnesite has been produced commercially, and attempts have been made to market a variety of manganese minerals found in the western portion of the County. Sand and gravel deposits presently constitute the only significant extractive resource from a commercial viewpoint. Numerous exploratory oil and gas wells have been drilled within the County. Although none of the wells are producing commercially, the underlying geological structure of the County indicates oil or gas may be present which could lead to the likelihood of more exploration. Minerals found in Stanislaus County include: bementite, braunite, chromite, cinnabar, garnet, gypsum, hausmannite, hydromagnesite, inesite, magnesite, psilomelane, pyrobrsite, and rhodochrosite. Small deposits of gold, clay, and lead are also known to exist; however, present economic conditions make commercial extraction of these minerals difficult or impossible. According to the Stanislaus County General Plan, the Project site is not located in a mineral resource zone (MRZ).[1]

Discussion

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

No Impact. According to the Stanislaus County General Plan, the proposed Project is not located within an MRZ nor is one located nearby. Therefore, the proposed Project would not result in loss of availability of a known mineral resource that would be of value in Stanislaus County. ***No impact*** would occur.

[1] Stanislaus County General Plan, General Plan Support Documentation, Chapter 3 Conservation, pg. 3-16.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. As discussed above, the Project site is not located in an area of locally important mineral resource recovery sites. The proposed Project would not result in the loss of such locally important mineral resources in Stanislaus County. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE				
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Environmental Setting

The *Construction Noise Technical Memorandum* prepared by LSA Associates, Inc. dated October 10, 2013, contributes to the information and analysis in this section (attached as **Appendix F**).

Fundamentals of Noise and Vibration

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more

intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness.

Construction Noise Fundamentals. Noise levels generated by individual pieces of construction equipment and specific construction operations form the basis for the prediction of construction-related noise levels. Two types of sources generate noise during construction activities: Stationary Equipment and Mobile Equipment. Stationary equipment generates noise from one general area and includes items such as pumps, generators, compressors, etc. These types of equipment operate at a constant noise level under normal operation and are classified as non-impact equipment. Other types of stationary equipment such as pile drivers, jackhammers, pavement breakers, and blasting operations produce variable and sporadic noise levels and often produce impact-type noises. Impact equipment generates impulsive noise, where impulsive noise is defined as noise of short duration (generally less than one second), high intensity, abrupt onset, rapid decay, and often rapidly changing spectral composition. For impact equipment, the noise is produced by the impact of a mass on a surface, typically repeating over time. Mobile equipment such as bulldozers, scrapers, graders, loaders, and mobile cranes may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power. Other equipment, such as compressors, although generally considered to be stationary when operating, can be readily located to another location for the next operation. **Table G: Noise Levels of Construction Equipment** shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

During development of a project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Two types of short-term noise impacts typically occur during construction of a project. The first type includes noise generated by construction crew commutes and the transport of construction equipment and materials to and from a project site. This activity would incrementally increase noise levels on access roads (or roadways in the vicinity) leading to a project site. Typically, pieces of heavy equipment would be moved on-site to a construction staging area and would remain for the duration of each necessary construction phase. This equipment would not add to the daily traffic volume on roadways in the vicinity of a project. The second type of short-term noise impact is related to noise generated during on-site construction. For the proposed Project, bridge construction would be performed in discrete steps; each step of bridge replacement would have its own mix of equipment and, consequently, its own noise characteristics. These various replacement activities would change the character of the noise generated at the Project site and, therefore, the noise levels as construction progresses.

Table G: Typical Construction Equipment Noise Levels

Type of Equipment	Impact Devices? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Impact Pile Driver	Yes	95
Auger Drill Rig	No	85
Vibratory Pile Driver	No	95
Jackhammers	Yes	85
Pneumatic Tools	No	85
Pumps	No	77
Scrapers	No	85
Cranes	**No**	**85**
Portable Generators	No	82
Rollers	No	85
Dozers	**No**	**85**
Tractors	No	84
Front-End Loaders	**No**	**80**
Backhoe	**No**	**80**
Excavators	**No**	**85**
Graders	**No**	**85**
Air Compressors	No	80
Dump Truck	No	84
Concrete Mixer Truck	No	85
Pickup Truck	No	55

Source: FHWA, 2006, *Highway Construction Noise Handbook*
Notes: **Bold** indicates the type of construction equipment that would be used during development of the proposed Project.

Ground-borne Vibration Fundamentals. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in **Table H: Vibration Levels of Construction Equipment**.

Table H: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Air Compressor	0.090	87.0
Backhoe	**0.040**	**80.0**
Caisson drilling	0.089	86.9
Clam shovel drop (slurry wall)	0.202	94.1
Compactor	0.050	82.0
Compressor	0.045	81.0
Concrete Mixer	0.040	80.0
Concrete Pump	0.028	77.0
Concrete Vibrator	0.014	71.0
Crane (Derrick)	0.057	83.0
Crane (Mobile)	**0.057**	**83.0**
Generator	0.018	73.0
Excavator	**0.040**	**80.0**
Hydromill (slurry wall-in soil)	0.008	66.0
Hydromill (slurry wall-in rock)	0.017	72.6
Jackhammer	0.035	78.8
Large Bulldozer	**0.089**	**86.9**
Loaded Trucks	0.076	85.6
Water Trucks	0.076	85.6
Loader	**0.071**	**85.0**
Pavement Breaker	0.100	88.0
Paver	0.063	84.0
Pile Driver (impact-upper range)	1.518	111.6
Pile Driver (impact-typical)	0.644	104.1
Pile Driver (sonic-upper range)	0.734	105.3
Pile Driver (sonic-typical)	0.170	92.6
Pneumatic Tool	0.040	80.0
Pump	0.014	71.0
Roller	0.020	74.0
Saw	0.018	73.0
Scraper/Grader	**0.057**	**83.0**
Shovel	0.028	77.0
Tub Grinder	0.252	96.0
Small Bulldozer	0.001	48.5

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, Table 12-2, pg. 12-12.
Notes: **Bold** indicates the type of construction equipment that would be used during development of the proposed Project.

Existing Noise Setting

The Project site is located in a rural portion of Stanislaus County that is characterized by agricultural and rural residential land uses. Vehicles traveling along Shiells Road and agricultural activities are the main noise generators in the vicinity of the Project site. Additionally some noise is generated by rural residential activities such as landscape maintenance, children playing, and domestic animals. Rural residential and agricultural areas typically have a daytime noise level of about 50.0 dBA CNEL.

Sensitive Receptors. Schools, hospitals, and places of worship are sensitive uses that rely on the maintenance of adequate quiet to be able to carry on indoor speech and communication and to have minimum disturbances for people using such facilities to sleep at night. Residential areas require low noise levels to allow residents to perform daily activities with little annoyance from loud noise levels and to sleep during nighttime hours. The nearest sensitive receptor to the proposed Project is a single-family residential unit located approximately 260 feet southwest of the Project site.

Discussion

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact With Mitigation Incorporated. The proposed Project would be subject to the following construction and operational noise standards established by Stanislaus County and the Code of Federal Regulations (CFR).

Stanislaus County Noise Ordinance. Stanislaus County regulates noise and ground-borne vibration related to construction activities through Chapter 10.46 Noise Control of the County Noise Ordinance. The Noise Ordinance prohibits operation of any construction equipment so as to cause an average sound level greater than 75 dBA between the hours of 7:00 p.m. and 7:00 a.m. at or beyond the property line of any property upon which a dwelling unit is located.

Stanislaus County vibration ordinance (Chapter 10.46, Section 10.46.070 Vibration) prohibits the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source on private property, or at 150 feet from the source on a public space or public right-of-way. The County defines "vibration perception threshold" to mean the minimum ground-borne or structure-borne vibration motion necessary to cause a reasonable person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects, or a measured motion velocity of 0.01 PPV in/sec over the range of 1 to 100 Hertz.

23 CFR 772. Title 23 Code of Federal Regulations (CFR) 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. The Federal Highway Administration defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway that substantially changes either the horizontal or the vertical alignment or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that

does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

Short-Term (Construction) Impacts. During construction of the proposed Project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Two types of short-term noise impacts would occur during the proposed Project construction period, including: 1) construction workers and equipment arriving and departing from the Project site; and, 2) construction equipment operation on the Project site.

Heavy equipment for grading, bridge demolition, and construction would be moved on site, would remain for the duration of each construction phase, and would not add to the daily traffic volume level to which the nearby residential unit would be exposed. There is a potential for a high single-event noise exposure at a maximum level of 87 dBA maximum instantaneous noise level (L_{max}) from trucks passing as measured from 50 feet from the centerline of Shiells Road. During these events, the nearest sensitive receptor (the single-family residential unit 260 feet southwest of the Project area) would be exposed to an L_{max} noise level of 72.7 dBA. However, the projected construction traffic would be temporary, would not occur between the hours of 7:00 p.m. and 7:00 a.m., and the associated short-term noise level change would not be perceptible to residents at the nearby sensitive receptor.

Bridge construction would be performed in discrete steps; each step of bridge replacement would have its own mix of equipment and, consequently, its own noise characteristics. These various construction operations would change the character of the noise generated at the Project site and, therefore, the ambient noise level as construction progresses. As shown in **Table H**, the following types of equipment (and their estimated noise level as measured at 50 feet from the operating equipment) would be used during on-site construction activities: Backhoe (80 dBA L_{max}); Mobile Crane (83 dBA L_{max}); Dozer (85 dBA L_{max}); Excavator (81 dBA L_{max}); Grader (85 dBA L_{max}); and, Loader (85 dBA L_{max}). Construction operations could occur as close as 260 feet from the residential unit southwest of the Project site. Under a worst case scenario, if all of the pieces of construction equipment were operating simultaneously within the proposed Project construction area approximately 260 feet from the residential unit, residents at this sensitive receptor would be exposed to maximum noise levels of up to approximately 77 dBA L_{max}.

To minimize the construction noise impacts to the sensitive receptors adjacent to the Project site, construction noise is regulated by the California Department of Transportation (Caltrans) Standard Specification Section 14-8.02, "Noise Control," and also by Caltrans Standard Special Provisions S5-310, "Noise Control." These regulations state that noise levels generated during construction shall comply with applicable local, state, and federal regulations. The following Best Management Practices (BMPs) shall be implemented during Project construction to reduce temporary noise impacts to the adjacent sensitive receptor:

Mitigation Measure NOI-1:

- The construction contractor shall comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract;

- Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without a muffler;
- Between the hours of 7:00 p.m. and 7:00 a.m. (night work), the noise level from the Contractor's operations shall not exceed 86 dBA at a distance of 50 feet; or shall not exceed an average sound level greater than 75 dBA L_{eq}(h) as measured on the property line of any residential parcel. Work is permitted Monday through Saturday, but not allowed on Sundays, unless specifically permitted by contract. This requirement shall not relieve the Contractor from the responsibility of complying with local ordinances regulating construction noise levels. The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel; and,
- As directed by Caltrans and the County, the construction contractor shall implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources if needed.

With implementation of **Mitigation Measure NOI-1** construction noise would be compliant with applicable standards. Impacts would be ***less than significant***.

Long-Term (Operational) Impacts. The proposed Project meets the criteria for a Type III project established by Title 23 CFR 772. The proposed Project would not increase traffic volumes along Shiells Road, construct new through lanes or auxiliary lanes along Shiells Road, result in substantial changes in the horizontal or vertical alignment of Shiells Road, or expose noise sensitive land uses to new highway noise sources or an increase in existing highway noise sources. Therefore, the proposed Project would not require further analysis for operational noise impacts. Impacts would be ***less than significant***.

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Less Than Significant. Project-related construction equipment such as cranes, excavators, graders, loaders, backhoes, and bulldozers may be used as close as 260 feet from the nearest sensitive receptor. As shown in **Table H**, the construction equipment that would be used during construction of the proposed Project would generate vibration levels between 0.04 and 0.089 PPV as measured at a distance of 25 feet from operating machinery. Based on the distance between the nearest sensitive receptor and the nearest point from which Project construction activity would occur, residents may be exposed to ground-borne vibration levels ranging up to 0.003 PPV. These levels are well below the Stanislaus County ground-borne vibration exposure threshold of 0.01 PPV for residential units. Impacts would be ***less than significant***.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant. As discussed above, the proposed Project would not increase or generate new vehicle trips along Shiells Road. Therefore, during operation of the proposed Project roadway noise emanating from Shiells Road would remain the same as under existing conditions. The proposed Project would not result in an increase in vehicular trips; therefore, long-term (operational) noise would not increase. Impacts would be ***less than significant***.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant with Mitigation Incorporated. Temporary intermittent noise from short-term Project-related construction activities would occur. These activities would expose the sensitive receptors near the Project site to intermittent short-term increases in ambient noise levels. Implementation of **Mitigation Measure NOI-1** would reduce the short-term noise exposure that the residents at this sensitive receptor would experience as a result of Project construction activities. Impacts would be ***less than significant***.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed Project is not located within two miles of a public airport or within the vicinity of a private airstrip. The nearest airport is Crows Landing Naval Auxiliary Landing Field, 7.25 miles to the north-northwest of the Project site. Therefore, the proposed Project would not expose people working in the area to excessive noise levels associated with airports and airplanes. ***No impact*** would occur.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed Project is not located within the vicinity of a private airstrip. Therefore, the proposed Project would not expose people residing or working in the area to excessive noise levels from private airstrip operations. ***No impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING				
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

The Project site is located in a rural region of Stanislaus County along Shiells Road at the CCID Main Canal crossing. The area surrounding the Project site is characterized by agricultural uses with areas of rural residential units and agricultural outbuildings. The nearest residence is located approximately 260 feet southwest of the Project site. The proposed Project would not require the relocation of residents nor would it require the demolition of existing residential units in the area.

The proposed Project is located approximately 1.5 miles southwest of Newman, California. Newman has a population of 10,224 and approximately 3,357 housing units.[1] The Project site is located in Stanislaus County Census Tract 34, which has a current population of 1,601 residents and 646 residential units.[2]

Discussion

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed Project would include the demolition of the existing bridge on Shiells Road at the CCID Main Canal crossing, alignment of Shiells Road to improve the approach areas to a new bridge, and development of a new bridge at the crossing. Once completed, the new bridge would not result in an increase in vehicle traffic volume, which could indirectly induce substantial population

[1] U.S. Department of Commerce, U.S. Census Bureau, American Fact Finder, City of Newman Profile of General Population and Housing Characteristics: 2010. Accessed October 17, 2013.

[2] U.S. Department of Commerce, U.S. Census Bureau, American Fact Finder, Stanislaus County Census Tract 34 Profile of General Population and Housing Characteristics: 2010. Accessed October 17, 2013.

growth near the Project site. The nearest residential unit is located approximately 260 feet southwest of the proposed Project. The proposed Project would not induce direct population growth to the rural-residential area adjacent to the Project site. Therefore, the proposed Project would not directly or indirectly induce population growth. ***No impact*** would occur.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. One rural residential unit is located approximately 260 feet southwest of the Project site. The proposed Project would not displace this residential unit and would not require construction of replacement housing elsewhere. ***No impact*** would occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. As discussed above, one residential unit is located 260 feet southwest of the Project site. The proposed Project would not require the displacement of residents from this residential unit. Therefore, replacement housing would not be needed elsewhere to accommodate displaced residents due to Project implementation. ***No impacts*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Environmental Setting

The Project site is located in Stanislaus County and is served by the following public services:

Fire Protection: The proposed Project is located in the jurisdiction of the West Stanislaus County Fire Protection District (District). The District is currently staffed with 85 volunteers who provide fire protection and EMS services for the communities of Patterson, Westley, El Solyo, Newman, Crows Landing, and Diablo Grande. The nearest fire station is Fire Station 5-Newman, located at 1162 N Street in the City of Newman, 2.1 miles northeast of the Project site. This fire station is jointly owned by the District and the City of Newman.

Law Enforcement: The Stanislaus County Sheriff's Department provides law enforcement services for the Project area. The Department's Main Station is located at 250 East Hackett Road in Modesto, California approximately 20 miles north of the Project site. Traffic control is provided by the California Highway Patrol (CHP) on roadways in the vicinity of the Project site.

Schools: The Project site is located within the boundary of the Newman-Crows Landing Unified School District, which is comprised of four elementary schools, one middle school and two high schools. The school nearest to the Project site is Yolo Middle School located at 901 Hoyer Road in Newman, approximately 1.3 miles east-northeast of the Project area.

Parks: For a discussion of parks and recreation, see **Section XV Recreation**.

Other Public Facilities: The closest public government facilities are located in the City of Newman. Library service in the Project area is provided by Stanislaus County. The Newman Branch Library, at 1305 Kern Street in Newman, is located 2 miles to the northwest of the Project site.

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection, police protection, schools, parks, other public facilities?

No Impact. The proposed Project would include the demolition of an existing bridge on Shiells Road spanning the CCID Main Canal, Shiells Road improvements including realignment for placement of a new bridge, and development of a new bridge over the CCID Main Canal. Although the proposed detour would have the potential to temporarily impact emergency service response times during construction, the proposed Project would not increase demand for public services, nor degrade the quality of existing public services. No parks, recreational facilities, or other public facilities are located near the proposed Project; therefore, such public services would not be impacted by the proposed Project. ***No impacts*** to public services would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

The Stanislaus County Department of Parks and Recreation manages recreational opportunities in Stanislaus County. The County is home to two off-highway vehicular parks and 18 community parks. The closest County-maintained park is Bonita Park and Pool in Crows Landing, approximately 6.2 miles north of the Project site. The park facility nearest to the proposed Project is Lions Park, maintained by the city of Newman, approximately 1.6 miles northeast of the Project area.

Discussion

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. The Project site is located in a rural part of Stanislaus County and is not located near any existing regional and neighborhood parks or other recreational facilities. Implementation of the proposed Project would not increase the use of recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. ***No impact*** would occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. Recreational facilities would not be included as part of the proposed Project, and the expansion of an existing recreational facility would not be required. ***No impact*** would occur under this criterion.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC				
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☒	☐	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Environmental Setting

The proposed Project is located on Shiells Road at the CCID Main Canal crossing. The Shiells Road Bridge was originally constructed in 1928 and is a 68-foot long by 22-foot wide, three-span concrete slab bridge supported on diaphragm abutments and intermediate concrete pier walls. The existing bridge has a Sufficiency Rating of 52.2 making it eligible for Federal Highway Bridge Replacement and Rehabilitation Program (HBRRP) funding.

Shiells Road is a rural road located in southern Stanislaus County, and no major or minor intersections are located near the Project site.

According to the Stanislaus County Non-Motorized Transportation Plan (2008), a Class I bicycle facility is proposed along the length of the CCID Main Canal within the vicinity of the proposed Project. Development of the proposed Project would not preclude the future development of a Class I bicycle facility through the Project area. The Project site is not located on an existing or proposed bus transit service system route or designated/eligible scenic roadway segment.

The proposed Project would include the demolition of the existing bridge, channel work in CCID Main Canal, roadway approach work where Shiells Road meets the new bridge on the south and north side, and roadway improvements along Shiells Road to provide continued access to CCID easements.

Discussion

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less Than Significant. The purpose of the proposed Project is to provide adequate and safe vehicle access and to provide a structure that would meet current design standards for the traffic utilizing this bridge. The proposed Project would not increase the number of lanes and would not increase long-term traffic volumes along Shiells Road. The proposed Project would not conflict with any plan or policy established for measuring the performance of the circulation system of Stanislaus County. The proposed Project would not result in impacts to intersection level of service (LOS) along Shiells Road. This impact would be ***less than significant***.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less Than Significant. The proposed Project would not increase the number of lanes and would not increase long-term traffic volumes along Shiells Road. The proposed Project would not conflict with any plan or policy established for measuring the performance of the circulation system of Stanislaus County. The proposed Project would not result in impacts to intersection levels of service along Shiells Road. This impact would be ***less than significant***.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

No Impact. The proposed Project does not include the development of structures or uses that would affect air traffic patterns, nor is an airport located in proximity to the Project site. Therefore, the proposed Project would not result in substantial safety risks related to air traffic. ***No impact*** would occur.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant. One of the primary purposes of the proposed Project is to improve safe access to the bridge for vehicles and improve the structural safety of the bridge. Traffic hazards would not be increased as a result of the proposed Project. Impacts would be ***less than significant***.

e) Result in inadequate emergency access?

Less Than Significant with Mitigation Incorporated. Construction of the proposed Project would require a temporary traffic detour around the bridge. The required detour would bypass the Shiells Road crossing of the CCID Main Canal and utilize Draper Road or Eastin Road to access Orestimba Road (see **Figure 4**). Emergency access to the vicinity of the Project site may be temporarily inhibited during construction of the proposed Project. Implementation of **Mitigation Measure TRAFF-1** would ensure that traffic disruption impacts would be ***less than significant***.

> **Mitigation Measure TRAFF-1:** The construction contractor for the proposed Project shall implement a standard traffic management plan to minimize traffic disruption and to ensure adequate access is maintained to surrounding properties. Detour signs shall be placed at the Shiells Road/Eastin Road and Shiells Road/Draper Road intersections during construction. The traffic management plan shall include construction staging and traffic control measures to be implemented during construction to maintain and minimize impacts to property access during construction. The traffic management plan shall address the coordination issues for residential access during short-term road closures during the construction window. The traffic management plan shall include coordination with local law enforcement and emergency services providers.

Implementation of **Mitigation Measure TRAFF-1** would ensure that traffic disruption impacts would be ***less than significant***.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. The Project site is located in a rural agricultural area. The proposed Project would not conflict with adopted policies, plans, or programs supporting alternative transportation. N***o impact*** would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, State, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Environmental Setting

The proposed Project is located in a rural area of unincorporated Stanislaus County. This setting describes the utility services (potable and non-potable water service, wastewater service, solid waste disposal service, and electric/natural gas service) that are located in the area of the proposed Project.

Potable and Non-Potable Water Service

Residential uses in the vicinity of the proposed Project receive potable water from privately owned wells. Non-potable water supply in the proposed Project vicinity is provided by the Central California

Irrigation District.[1] The CCID is one of the largest irrigation districts in the Central Valley of California, serving 1,600 farms across more than 143,000 acres of Prime Farmland.

Wastewater Service

The Project site is located in a rural portion of Stanislaus County. Currently, wastewater service is not provided in the proposed Project vicinity and all wastewater generated by residents in the proposed Project vicinity is treated in underground septic tanks and leach field systems.

Solid Waste Disposal Service

Solid waste generated by the proposed Project during construction activities would be collected and transported to an active and permitted landfill. All solid waste generated within unincorporated areas of the County are taken to Fink Road Landfill located at 4000 Fink Road in Crows Landing, approximately 6.8 miles to the northwest of the Project site. Fink Road Landfill intakes several different types of waste, including, agricultural, asbestos, ash, construction/demolition debris, contaminated soils, dead animals, industrial, inert, mixed municipal, sludge (BioSolids), tires, and wood waste. The landfill is a Class II and III type and permits a maximum intake of 2,400 tons of solid waste per day. The maximum permitted capacity of the landfill is 14,640,000 cubic yards and as of January 5, 2012, the landfill has a remaining capacity of 8,240,435 cubic yards.[2]

Electrical and Natural Gas Service

The Project site is located in the electrical and natural gas service district of Pacific Gas and Electric (PG&E). Utility poles and electrical lines are located on the south and north side of Shiells Road within the Project area. Temporary relocations and/or service disruption of the overhead electrical lines may be required due to the proposed Project. No major transmission lines are located in the Project vicinity. The major natural gas supply for the County parallels Interstate 5 and transports natural gas produced elsewhere to Stanislaus County residents. Major PG&E natural gas pipelines are not located near the Project site.

Discussion

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No Impact. During construction of the proposed Project, construction workers on-site would generate a nominal amount of wastewater. Any amount of wastewater generated by construction workers would be hauled and treated off-site. Once operational, the proposed Project would not generate wastewater. The proposed Project would not result in the exceedance of wastewater treatment requirements. ***No impacts*** would occur.

[1] Central California Irrigation District, District Service Map, http://www.ccidwater.org/index.html. Accessed October 18, 2013.

[2] CalRecycle, Facility/Site Summary Details: Fink Road Landfill (50-AA-0001), http://www.calrecycle.ca.gov/SWFacilities/Directory/50-AA-0001/Detail/. Accessed October 18, 2013

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Please see Section XVII(a) above. Furthermore, the proposed Project would have no impact on water or wastewater treatment facilities. ***No impact*** would occur.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant. The proposed Project would result in a nominal increase of impervious surface in the form of the wider and longer bridge deck. No additional storm water drainage improvements are proposed due to this minimal increase in impervious surface. Minor modifications to existing drainage would not result in significant environmental effects. This impact would be ***less than significant***.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less Than Significant. Operation of the proposed Project would not require water service; however, the proposed Project would require water for dust suppression during construction. Water required during construction activities would be transported to the Project site by water trucks and stored in these trucks at the construction staging areas. Water requirements for the proposed Project would not exceed existing entitlements. This impact would be ***less than significant***.

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The proposed Project would not produce wastewater; therefore, the proposed Project would not result in an impact to wastewater treatment capacity. ***No impact*** *would occur.*

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less Than Significant. Solid waste generated by the proposed Project would be limited to construction debris, including asphalt and concrete, generated by the construction and removal of the existing bridge. Solid waste disposal would occur in accordance with federal, State, and local regulations. Disposal would occur at the Fink Road Sanitary Landfill which has sufficient permitted capacity remaining. The proposed Project would be served by a landfill with sufficient permitted capacity; therefore, impacts would be ***less than significant***.

g) Comply with federal, State, and local statutes and regulations related to solid waste?

Less Than Significant. The proposed Project would conform to all applicable local, state and federal solid waste regulations; therefore, the impact would be considered ***less than significant***.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Environmental Setting

The Mandatory Findings of Significance section discusses the potential of the proposed Project to degrade the quality of the environment and any biological habitats. Impacts on a cumulative basis are also discussed as well as the potential for the proposed Project to result in any environmental impacts, which would cause substantial direct or indirect adverse impacts on human beings.

Discussion

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant. As discussed throughout this checklist, the proposed Project has the potential to result in adverse physical effects on the environment; however, with the implementation of the proposed mitigation measures, the proposed Project is not expected to degrade the quality of the environment. Furthermore, the proposed Project is not expected to substantially reduce the habitat or affect populations of any fish or wildlife species (see **Section IV**) or eliminate important examples of

the major period of California history or prehistory (see **Section V**). Full implementation of the recommended mitigation measures would result in a ***less than significant*** impact.

b) Does the project have impacts that are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less Than Significant. The impacts of the proposed Project would be individually limited and would not be cumulatively considerable. The proposed Project would include the demolition of an existing bridge and development of a replacement bridge over the CCID Main Canal along Shiells Road. All environmental impacts that could occur as a result of the proposed Project would be reduced to a ***less than significant*** level with implementation of the mitigation measures recommended throughout this Initial Study. When viewed in conjunction with other closely related past, present or reasonably foreseeable future projects, development of the proposed Project would not cumulatively contribute to impacts.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant. The purpose of the proposed Project is to replace the existing Shiells Road Bridge over the CCID Main Canal with a bridge constructed to current standards and codes. The proposed Project would replace the existing bridge constructed in 1928 with a new bridge 34.8 feet wide and 77 feet long. Once completed, the new bridge would meet current design standards. As described in this Initial Study, implementation of the proposed Project could result in temporary agricultural, air quality, biology, cultural, geology and soils, greenhouse gas, hazards and hazardous materials, and transportation/traffic impacts as a result of development of the proposed Project. Implementation of the mitigation measures recommended in this Initial Study, compliance with Stanislaus County regulations, and application of standard construction practices would ensure that the proposed Project would not result in environmental impacts that would cause substantial direct or indirect adverse impacts on human beings. Impacts would be ***less than significant.***

3.0 REPORT PREPARERS

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4.0 REFERENCES

Alta Planning + Design. 2008. Stanislaus County Non-Motorized Transportation Plan. Prepared for Stanislaus Council of Governments. September 2008.

California Department of Conservation, The California Conservation (Williamson) Act 2010 Status Report, November 2010, pg. 2.

California Department of Conservation. 2012. Rural Land Mapping Edition Stanislaus County Important Farmland 2012, Sheet 2 of 2. Published February 2014.

LSA Associates, Inc. 2014. Archaeological Survey Report/Historic Property Survey Report. June 2014.

LSA Associates, Inc. Shiells Road Bridge Replacement Project, Natural Environment Study Minimal Impacts, June 2014.

NV5. 2013. Bridge Hydraulics and Evaluation of the Existing Condition. August 2, 2013.

Parikh Consultants, Inc. 2013. Foundation Report Shiells Road Bridge Replacement Bridge No. 38C0180, Stanislaus County, California (County Project No. 9609). August 26, 2013.

Stanislaus County. 1987. General Plan Support Documentation. Adopted June 1987.

Stanislaus County. 2004. Stanislaus County Local Hazard Mitigation Plan Risk Assessment. Revised September 14, 2004.

Stanislaus County. 2014. Memorandum from Sambath Chrun, Stanislaus County Public Works to San Li, Caltrans District 10. Dated September 22, 2014.

State of California. 2000. A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Map.

State Water Resources Control Board. 2013. GeoTracker. Available at: http://geotracker.waterboards.ca.gov/

U.S. Army Corps of Engineers, Central Valley Flood Protection Board, Stanislaus County. 2012. Orestimba Creek, West Stanislaus County, California Draft Report for Public Review, Draft Interim Feasibility Study Draft EA/IS. December 2012.

U.S. Environmental Protection Agency. 2009. Potential for Reducing Greenhouse Gas Emissions in the Construction Sector. February 2009.

APPENDIX A
LESA MODEL WORKSHEET

NOTES

Calculation of the Land Evaluation (LE) Score

Part 1. Land Capability Classification (LCC) Score:

(1) Determine the total acreage of the project.
(2) Determine the soil types within the project area and enter them in **Column A** of the **Land Evaluation Worksheet** provided on page 2-A.
(3) Calculate the total acres of each soil type and enter the amounts in **Column B**.
(4) Divide the acres of each soil type (**Column B**) by the total acreage to determine the proportion of each soil type present. Enter the proportion of each soil type in **Column C**.
(5) Determine the LCC for each soil type from the applicable Soil Survey and enter it in **Column D**.
(6) From the LCC Scoring Table below, determine the point rating corresponding to the LCC for each soil type and enter it in **Column E**.

LCC Scoring Table

LCC Class	I	IIe	IIs,w	IIIe	IIIs,w	IVe	IVs,w	V	VI	VII	VIII
Points	100	90	80	70	60	50	40	30	20	10	0

(7) Multiply the proportion of each soil type (**Column C**) by the point score (**Column E**) and enter the resulting scores in **Column F**.
(8) Sum the LCC scores in **Column F**.
(9) Enter the LCC score in box <1> of the **Final LESA Score Sheet** on page 10-A.

Part 2. Storie Index Score:

(1) Determine the Storie Index rating for each soil type and enter it in **Column G**.
(2) Multiply the proportion of each soil type (**Column C**) by the Storie Index rating (**Column G**) and enter the scores in **Column H**.
(3) Sum the Storie Index scores in **Column H** to gain the Storie Index Score.
(4) Enter the Storie Index Score in box <2> of the **Final LESA Score Sheet** on page 10-A.

Land Evaluation Worksheet

Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
122	0.08	0.02	IIIe	50	1	100	2.0
121	0.48	0.12	IIIw	40	4.8	79	9.5
120	3.22	0.85	IIIe	50	42.5	83	70.6
Totals	3.78	(Must Sum to 1.0)		***LCC Total Score***	51.3	***Storie Index Total Score***	82.1

Site Assessment Worksheet 1.

Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV - VIII
			0.08
			0.48
			3.22
Total Acres			3.78
Project Size Scores			0

Highest Project Size Score 0

NOTES

Calculation of the Site Assessment (SA) Score

Part 1. Project Size Score:.

(1) Using **Site Assessment Worksheet 1** provided on page 2-A, enter the acreage of each soil type from **Column B** in the **Column - I, J or K** - that corresponds to the LCC for that soil. (Note: While the Project Size Score is a component of the Site Assessment calculations, the score sheet is an extension of data collected in the Land Evaluation Worksheet, and is therefore displayed beside it).
(2) Sum **Column I** to determine the total amount of class I and II soils on the project site.
(3) Sum **Column J** to determine the total amount of class III soils on the project site.
(4) Sum **Column K** to determine the total amount of class IV and lower soils on the project site.
(5) Compare the total score for each LCC group in the Project Size Scoring Table below and determine which group receives the highest score.

Project Size Scoring Table

Class I or II		Class III		Class IV or Lower	
Acreage	Points	Acreage	Points	Acreage	Points
>80	100	>160	100	>320	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	70	100-159	40
10-19	30	40-59	60	40-99	20
10<	0	20-39	30	40<	0
		10-19	10		
		10<	0		

(6) Enter the **Project Size Score** (the highest score from the three LCC categories) in box <3> of the **Final LESA Score Sheet** on page 10-A.

NOTES

Part 2. Water Resource Availability Score:

(1) Determine the type(s) of irrigation present on the project site, including a determination of whether there is dryland agricultural activity as well.

(2) Divide the site into portions according to the type or types of irrigation or dryland cropping that is available in each portion. Enter this information in **Column B** of **Site Assessment Worksheet 2. - Water Resources Availability**.

(3) Determine the proportion of the total site represented for each portion identified, and enter this information in **Column C**.

(4) Using the Water Resources Availability Scoring Table, identify the option that is most applicable for each portion, based upon the feasibility of irrigation in drought and non-drought years, and whether physical or economic restrictions are likely to exist. Enter the applicable Water Resource Availability Score into **Column D**.

(5) Multiply the Water Resource Availability Score for each portion by the proportion of the project area it represents to determine the weighted score for each portion in **Column E**.

(6) Sum the scores for all portions to determine the project's total Water Resources Availability Score

(7) Enter the Water Resource Availability Score in box <4> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 2. - Water Resources Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	Non-Irrigated	1.0	0	0
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	***Total Water Resource Score***	0

Water Resource Availability Scoring Table

Option	Non-Drought Years			Drought Years			WATER RESOURCE SCORE
	RESTRICTIONS			RESTRICTIONS			
	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	
1	YES	NO	NO	YES	NO	NO	100
2	YES	NO	NO	YES	NO	YES	95
3	YES	NO	YES	YES	NO	YES	90
4	YES	NO	NO	YES	YES	NO	85
5	YES	NO	NO	YES	YES	YES	80
6	YES	YES	NO	YES	YES	NO	75
7	YES	YES	YES	YES	YES	YES	65
8	YES	NO	NO	NO	-- --	-- --	50
9	YES	NO	YES	NO	-- --	-- --	45
10	YES	YES	NO	NO	-- --	-- --	35
11	YES	YES	YES	NO	-- --	-- --	30
12	Irrigated production not feasible, but rainfall adequate for dryland production in both drought and non-drought years						25
13	Irrigated production not feasible, but rainfall adequate for dryland production in non-drought years (but not in drought years)						20
14	Neither irrigated nor dryland production feasible						0

NOTES

See attachment

Part 3. Surrounding Agricultural Land Use Score:

(1) Calculate the project's Zone of Influence (ZOI) as follows:

(a) a rectangle is drawn around the project such that the rectangle is the smallest that can completely encompass the project area.

(b) a second rectangle is then drawn which extends one quarter mile on all sides beyond the first rectangle.

(c) The ZOI includes all parcels that are contained within or are intersected by the second rectangle, less the area of the project itself.

(2) Sum the area of all parcels to determine the total acreage of the ZOI.

(3) Determine which parcels are in agricultural use and sum the areas of these parcels

(4) Divide the area in agriculture found in step (3) by the total area of the ZOI found in step (2) to determine the percent of the ZOI that is in agricultural use.

(5) Determine the Surrounding Agricultural Land Score utilizing the Surrounding Agricultural Land Scoring Table below.

Surrounding Agricultural Land Scoring Table

Percent of ZOI in Agriculture	Surrounding Agricultural Land Score
90-100	100
80-89	90
75-79	80
70-74	70
65-69	60
60-64	50
55-59	40
50-54	30
45-49	20
40-44	10
<40	0

(5) Enter the Surrounding Agricultural Land Score in box <5> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 3.
Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence						
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (A/B)	Percent Protected Resource Land (A/C)	Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
667.9	586.9	652.1	87.90	97.60	9.00	100

NOTES

Part 4. Protected Resource Lands Score:

The Protected Resource Lands scoring relies upon the same Zone of Influence information gathered in Part 3, and figures are entered in Site Assessment Worksheet 3, which combines the surrounding agricultural and protected lands calculations.

(1) Use the total area of the ZOI calculated in Part 3. for the Surrounding Agricultural Land Use score.
(2) Sum the area of those parcels within the ZOI that are protected resource lands, as defined in the California Agricultural LESA Guidelines.
(3) Divide the area that is determined to be protected in Step (2) by the total acreage of the ZOI to determine the percentage of the surrounding area that is under resource protection.
(4) Determine the Surrounding Protected Resource Land Score utilizing the Surrounding Protected Resource Land Scoring Table below.

Surrounding Protected Resource Land Scoring Table

Percent of ZOI Protected	Protected Resource Land Score
90-100	100
80-89	90
75-79	80
70-74	70
65-69	60
60-64	50
55-59	40
50-54	30
45-49	20
40-44	10
<40	0

(5) Enter the Protected Resource Land score in box <6> of the **Final LESA Score Sheet** on page 10-A.

NOTES

Final LESA Score Sheet

Calculation of the Final LESA Score:

(1) Multiply each factor score by the factor weight to determine the weighted score and enter in Weighted Factor Scores column.
(2) Sum the weighted factor scores for the LE factors to determine the total LE score for the project.
(3) Sum the weighted factor scores for the SA factors to determine the total SA score for the project.
(4) Sum the total LE and SA scores to determine the Final LESA Score for the project.

	Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors			
Land Capability Classification	<1> 51.3	0.25	12.8
Storie Index	<2> 82.1	0.25	20.5
LE Subtotal		***0.50***	33.3
SA Factors			
Project Size	<3> 0	0.15	0
Water Resource Availability	<4> 0	0.15	0
Surrounding Agricultural Land	<5> 90	0.15	13.5
Protected Resource Land	<6> 100	0.05	5.0
SA Subtotal		***0.50***	18.5
		Final LESA Score	51.8

For further information on the scoring thresholds under the California Agricultural LESA Model, consult Section 4 of the Instruction Manual.

Section IV. California Agricultural LESA Scoring Thresholds - Making Determinations of Significance Under CEQA

A single LESA score is generated for a given project after all of the individual Land Evaluation and Site Assessment factors have been scored and weighted as detailed in Sections 2 and 3. Just as with the scoring of individual factors that comprise the California Agricultural LESA Model, final project scoring is based on a scale of 100 points, with a given project being capable of deriving a maximum of 50 points from the Land Evaluation factors and 50 points from the Site Assessment factors.

The California Agricultural LESA Model is designed to make determinations of the potential significance of a project's conversion of agricultural lands during the Initial Study phase of the CEQA review process. Scoring thresholds are based upon both the total LESA score as well as the component LE and SA subscores. In this manner the scoring thresholds are dependent upon the attainment of a minimum score for the LE and SA subscores so that a single threshold is not the result of heavily skewed subscores (i.e., a site with a very high LE score, but a very low SA score, or vice versa). Table 9 presents the California Agricultural LESA scoring thresholds.

Table 9. California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39 Points	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

APNs in ZOI	Acres	Land in Ag. Production?(1)	Williamson Act Land?
260200460	39.7	35.7	Y
260200470	40.5	36.5	Y
26020051	39	35.1	Y
26020050	40.4	36.4	Y
26020049	46.2	41.6	Y
26020012	92	82.8	Y
26025045	159.1	143.2	Y
26025033	52.5	47.3	Y
26025034	40.4	36.4	Y
260250020	102.3	92.1	Y
Total	**652.1**	**586.9**	**652.1**
Percent		**87.9**	**97.6**
Total Land in ZOI	**667.9**		
(1) 90 % of the acreage of each parcel.			

APPENDIX B
NATURAL ENVIRONMENT STUDY MINIMAL IMPACTS REPORT

Natural Environment Study

(Minimal Impacts)

Shiells Road Bridge (No 38C0180) Replacement over Central California Irrigation District Main Canal
Stanislaus County, California
BRLO-5938(192)

June 2014

STATE OF CALIFORNIA
Department of Transportation

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Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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1. Summary

The Stanislaus County Department of Public Works (County) proposes to replace the existing Shiells Road Bridge (No. 38C0180) over the Central California Irrigation District (CCID) Main Canal. The project is located in southern Stanislaus County, California.

The project proposes to replace the existing Shiells Road Bridge with a longer, wider, and slightly higher bridge that will help improve hydraulic performance.

The Biological Study Area (BSA) includes the proposed project and lands beyond the footprint to the edge of the road right-of-way that could potentially be affected by project construction. Project staging will be located in an agricultural field in the southeast corner of the BSA.

The CCID Main Canal flows from south to north through the BSA. The canal is regularly treated with herbicide, resulting in little to no vegetation. Due to the regular maintenance and lack of vegetation, the canal does not provide suitable habitat for special status species.

A few mature trees associated with an adjacent residence to the southwest may provide nesting habitat for Swainson's hawk (*Buteo swainsonii*) and other birds. Additionally, a large nest is present in a mature oak tree at this location. Agriculture row crops and orchards surrounding the BSA provide potential foraging habitat for Swainson's hawks and other raptor species.

The BSA does not support suitable habitat for any other special status species that could occur in the area, and consequently, the project will not affect any other special status wildlife or plant species.

Additionally, the project will not result in "take" of any federally listed species. Consultation pursuant to Section 7 of the Endangered Species Act will not be required because a "No effect" determination has been made.

The proposed project includes avoidance and minimization measures to protect water quality, prevent the spread of invasive plant species, protect potential nesting by Swainson's hawk/raptors and migratory birds, and to restore temporarily impacted areas.

The project will result in minor temporary and permanent impacts to the CCID Main Canal. However, a a Section 404 U.S. Army Corps of Engineers (ACOE) Nationwide Permite will not be required, as the CCID has determined that the subject section of the CCID Main Canal is isolated; therefore, the ACOE will not assert jurisdiction. As a result, the project will likely only require a Waste Discharge Waiver from the Regional Water Quality Control Board

(RWQCB). Additionally, per coordination with Sarah Paulson at the California Department of Fish and Wildlife (CDFW) on October 8, 2013, the CCID Main Canal is not subject to Section 1600 of the California Fish and Game Code; therefore, a Lake and Streambed Alteration Agreement will not be required.

Shiells Road will be closed during project construction and a detour using adjacent local streets will be used to accommodate local traffic. Access to private residences during the road closure will be provided at all times during construction. Construction is expected to last 4 months.

2. Introduction

The County in conjunction with the Federal Highways Administration (FHWA) and the California Department of Transportation (Caltrans) proposes to replace the existing Shiells Road Bridge (No. 38C0180) over the CCID Main Canal.

The Environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being or has been, carried out by the California Department of Transportation (Caltrans) under its assumption of responsibility pursuant to National Environmental Policy Act (NEPA) Assignment MOU (23 USC 326).The County will serve as lead agency for the California Environmental Quality Act.

2.1 Project Location

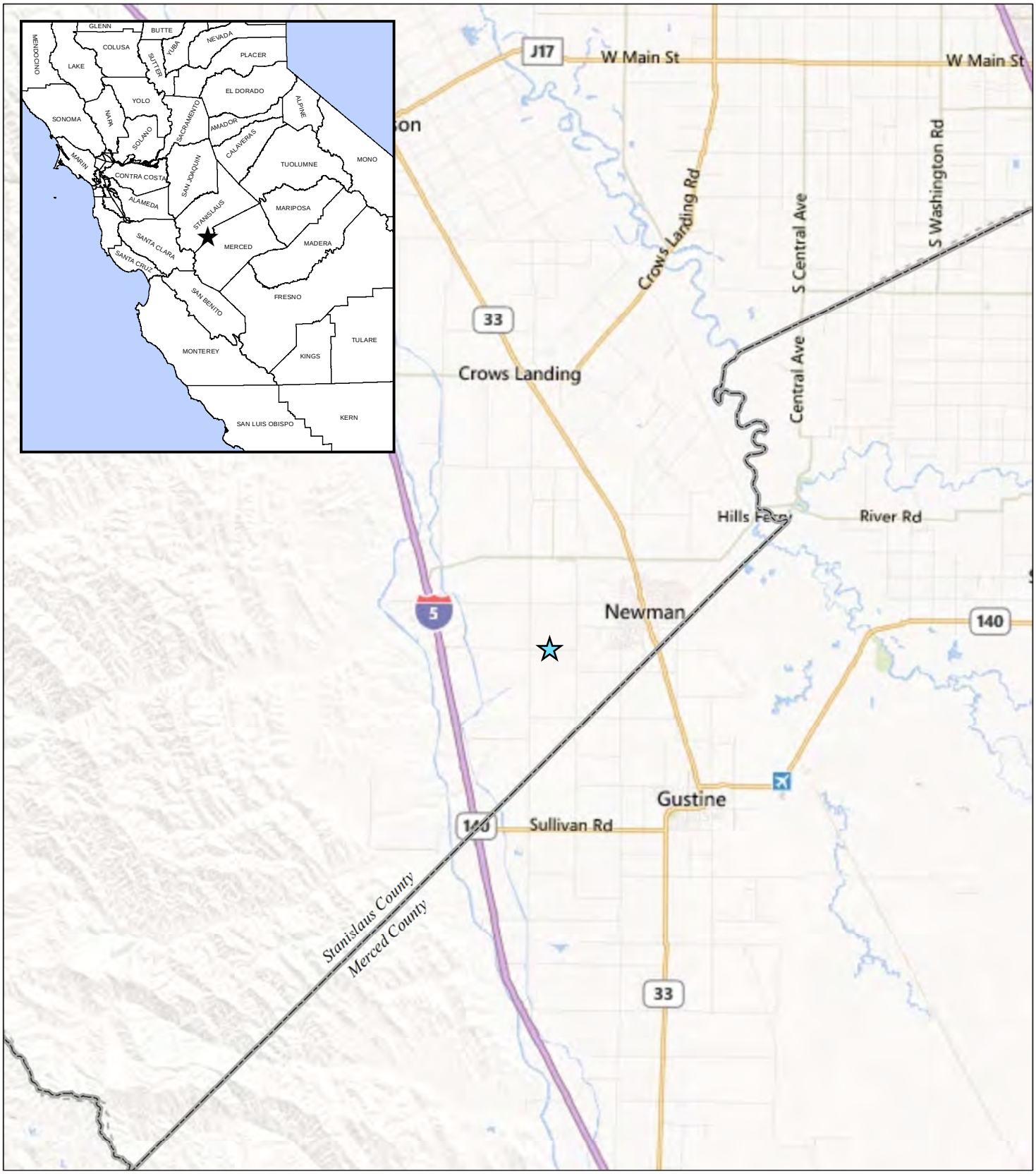
The proposed project is located on Shiells Road at the CCID Main Canal crossing, located in southwestern Stanislaus County, California (Figures 1, 2 and 3).

2.2 Project Description

The purpose of this project is to replace the existing Shiells Road Bridge with a longer and wider structure, to improve hydraulic performance of the canal, and to improve the roadway approaches on Shiells Road. The current structure, constructed in 1928, consists of a 68-foot (ft) long by 22-ft wide, three-span concrete slab bridge supported on diaphragm abutments and intermediate concrete pier walls. A Sufficiency Rating of 52.2 and health index of 73.8 classifies the bridge as functionally obsolete; the bridge is programmed for replacement under the Federal Highway Bridge Programs. Additionally, the bridge is too narrow to support a two-lane road.

The proposed bridge will be a single-span two-lane bridge with two Type 732 concrete barriers. The bridge will be 77 ft long, 34.8 ft wide and consist of two 12-ft lanes with two 4-ft shoulders. To improve hydraulics, the vertical alignments will be increased by elevating the soffit 12 inches higher than the high water elevation. The bridge roadway approaches will also be increased approximately 20 ft to conform to the new vertical alignment of the bridge. The roadway approach work will extend 200 ft east and west of the new bridge.

Several utility poles exist at the south side of the project site, including telecommunication cables with a telephone conduit attached to the south side of the bridge and overhead power lines. The electricity and telephone lines may need to be temporarily relocated or shut down during construction of the bridge.



LEGEND

Project Location

FIGURE 1

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Project Location Map

0 1.5 3
MILES

SOURCE: Microsoft Bing Map - Roads (2010)

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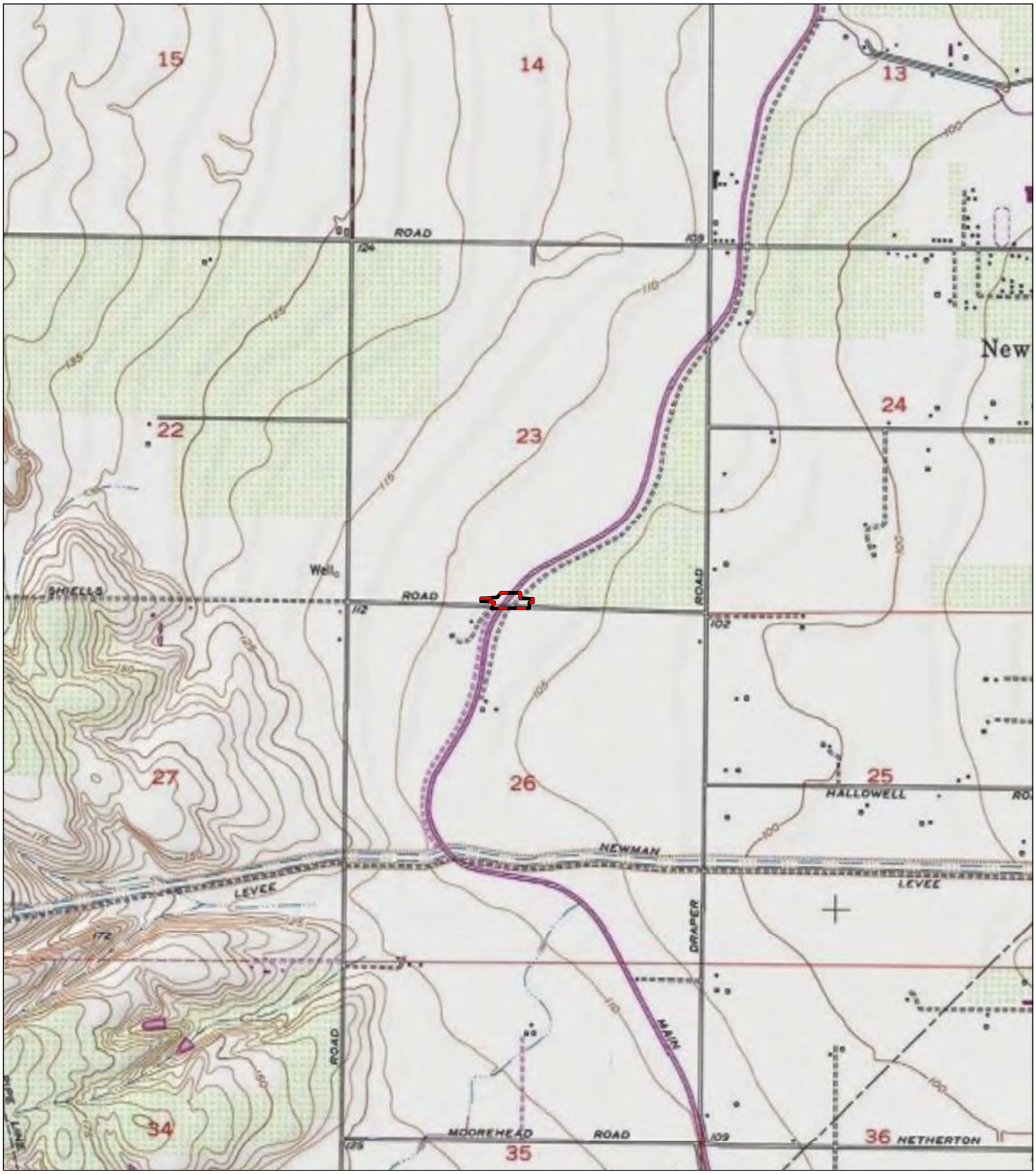

LEGEND

Biological Study Area

FIGURE 2

0 1000 2000

FEET

SOURCE: USGS 7.5-Minute Quadrangle (Newman)

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Project Vicinity on Topographic Base

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LEGEND

Biological Study Area

FIGURE 3

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Project Vicinity on Aerial Base

0 500 1000
FEET

SOURCE: Microsoft Bing Aerial (2011)

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Project staging will be located in a ruderal area along the south side of the east bridge approach. The area is currently used as staging for adjacent agricultural row crops. Full closure of the existing Shiells Road Bridge is required so that the project can be completed without staged construction. A full road closure with a local detour would reduce the required bridge construction time to 4 months.

Typical equipment used on the project will include trucks, scrapers, excavators, graders, loaders, backhoes, and bulldozers.

Project design plans are included in Appendix A.

3. Study Methods

Prior to conducting any field studies, the limits of the BSA were established, as shown in Figure 4. The BSA totals approximately 2.70 acres (ac) and consists of the project footprint and access and staging areas. The BSA also includes lands beyond the footprint to the edge of the road right-of-way that could potentially be affected by project construction and/or were determined necessary to inventory in order to perform an adequate analysis of project impacts.

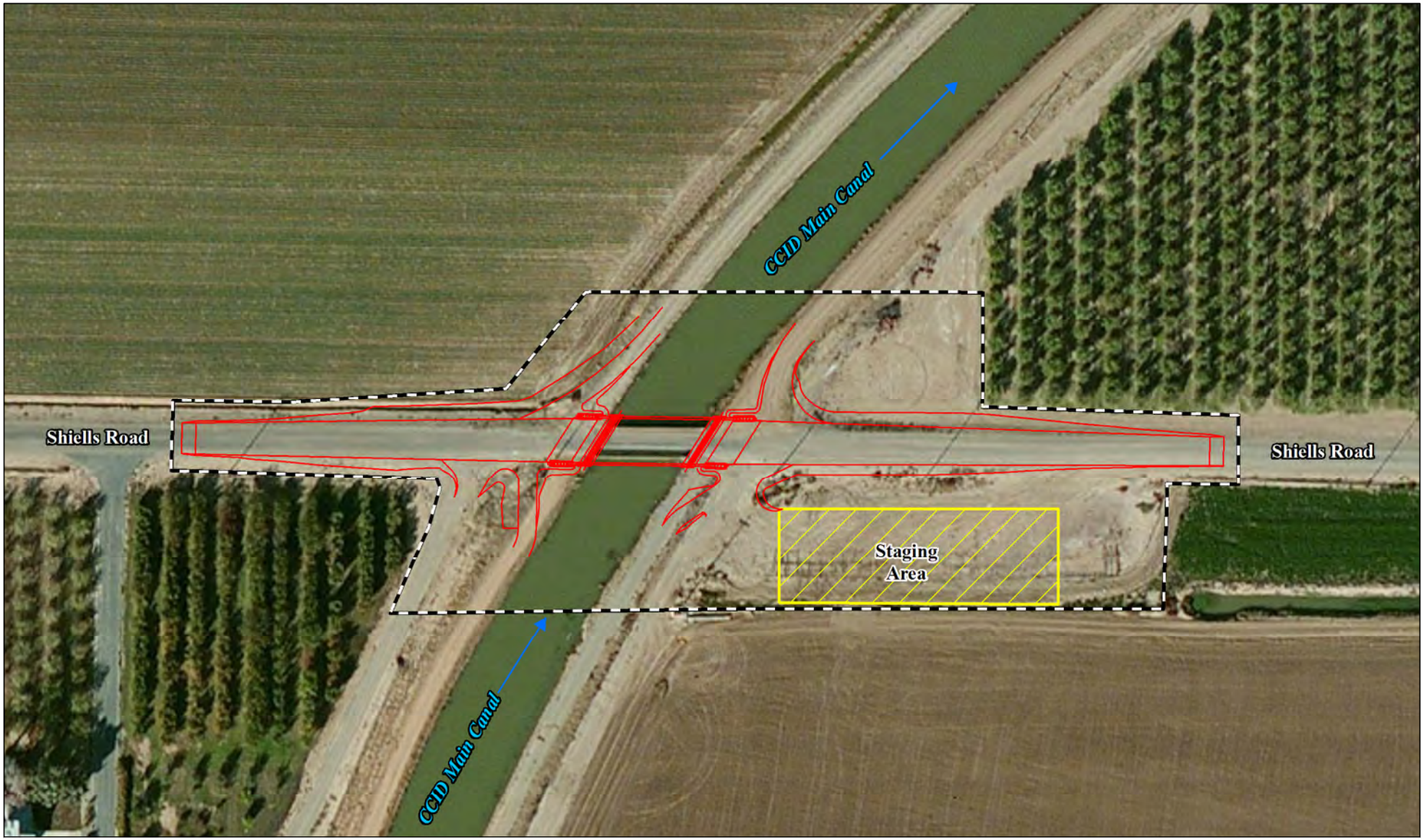
A list of sensitive wildlife and plant species potentially occurring within the BSA was compiled to evaluate potential impacts resulting from project construction. Sources used to compile the list include the California Natural Diversity Data Base (CNDDB 2014), the California Native Plant Society (CNPS) Online Edition (2014), and the United States Fish and Wildlife Service (USFWS) online list (2014). The extent of the record search has been designed to obtain a sufficient representative sampling of special status species that could occur in the area. Due to the location, and limited size and scope of the project, six U.S. Geological Survey 7.5-minute quadrangles were referenced to compile the species lists: Newman, Crows Landing, Hatch, Gustine, Ingomar, and Howard Ranch. The individual lists are included in Appendix B.

The species on the special status species lists were reviewed to determine if they could potentially occur within the BSA. The determination of whether a species could potentially occur within the BSA was based on the availability of suitable habitat within the species' known range. Species requiring specific habitat not present in the vicinity of the project (e.g., vernal pools) were eliminated as potentially occurring and are not discussed. Those species that could potentially occur in the BSA from a habitat suitability standpoint are discussed in Section 4.4.

LSA biologist Dayna Hambrick surveyed the BSA on August 1, 2013. Vegetation communities in the BSA were mapped and assessed for the potential to support special status species.

Vegetation in the BSA was characterized in accordance with *A Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf, and Evans 2008), as appropriate. The names of the plant species are consistent with *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin, B. G., et. al., editors 2012).

Potential waters of the U.S. in the BSA were delineated in accordance with the 1987 ACOE Wetland Delineation Manual (1987 Manual), the September 2008 Regional Supplement - Arid West Region, and the ACOE Regulatory Guidance Letter 08-02 regarding PreliminaryJurisdictional Delineations (June 2008).



Caltrans

LEGEND

Biological Study Area - (2.70 ac)

Project Design

Staging Area

0 50 100

FEET

SOURCE: Basemap - Microsoft Bing Aerial (2011); Mapping - Nolte Engineering (2013)

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FIGURE 4

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Biological Study Area and Project Design

LSA biologist Dayna Hambrick conducted a preliminary jurisdictional delineation on August 1, 2013. The field investigation was conducted in accordance with the ACOE Routine Approach for small areas (i.e., equal to or less than 5 ac), as described in the 1987 Manual. However, the CCID Main Canal has vertical banks with very little vegetation; consequently, data on vegetation and soils were not available, and formal observation points were not collected. The ordinary high water mark was determined to be at the top of vertical banks.

No problems or limitations were encountered during the research, field work, or document preparation that influenced the results presented herein.

4. Environmental Setting

The BSA is located on Shiells Road at the CCID Main Canal crossing; approximately 2 miles (mi) west of the City of Newman. The project is located in the Newman quadrangle, Township 7 South, Range 8 East, and in Sections 23 and 26.

Lands directly adjacent to the BSA are predominantly comprised of rural residential and agricultural lands. Undeveloped lands in the vicinity are typically agricultural (row crops/orchards/vineyards) or pastureland.

4.1 Description of the Existing Biological and Physical Conditions

The BSA lies in the central San Joaquin Valley, which is characterized by large, flat areas of agricultural farmland. The majority of the land in the area is privately owned and appears to be similar to land directly adjacent to the BSA in use and vegetative characteristics. The BSA is small, totaling 2.70 ac, and contains the CCID Main Canal, Shiells Road, unpaved and disturbed roadway shoulders and pullouts (which supports sparse ruderal vegetation), and areas of agricultural land beyond the roadway shoulders. Directly adjacent lands include a range of agricultural fields consisting of orchards and row crops. The topography of the BSA is flat, with an elevation approximately 110 ft above mean sea level.

Shiells Road extends east to west through the BSA and consists of a two-lane asphalt roadway. The existing bridge is a narrow, three-span reinforced concrete structure over the CCID Main Canal. The canal runs south to north through the BSA.

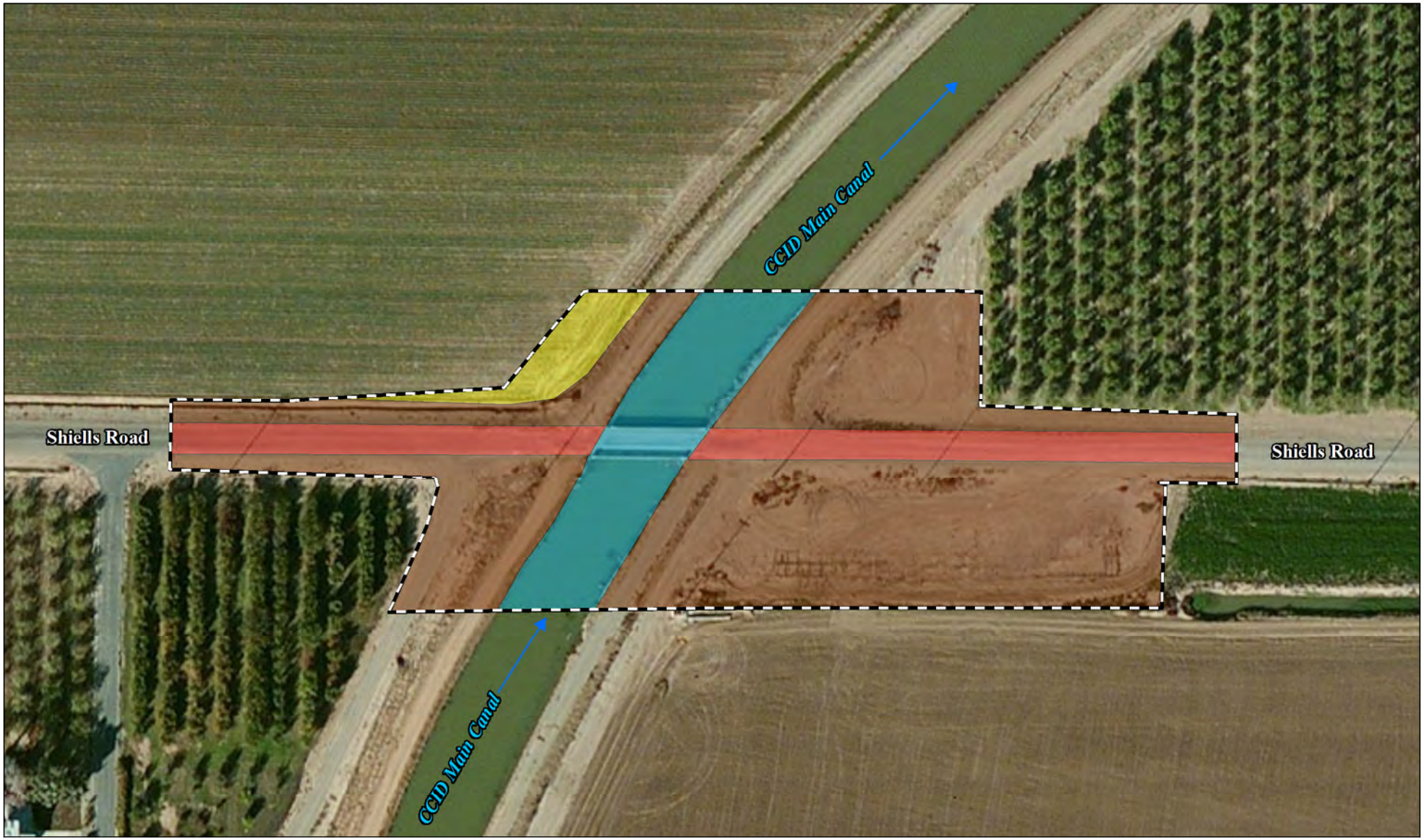
The reach of CCID Main Canal in the BSA flows south to north. While there is a bed and bank, the banks are vertical and regularly maintained with herbicide treatments. A small drainage ditch also occurs in the northwest corner of the BSA, and conveys adjacent pasture runoff. Neither of these features support wetland vegetation, and they appear to be regularly maintained and heavily utilized by adjacent agricultural operations.

Representative photos are provided in Appendix D.

4.2 Natural Communities/Land Uses

There are no natural communities within the BSA. Land uses consist of agricultural row crops, ruderal vegetation, the canal/open water, and developed areas.

Land uses are shown in Figure 5.



LEGEND

- Biological Study Area

Natural Communities / Land Uses - (2.70 ac)

- Row Crops - (0.11 ac)
- Open Water/Canal - (0.40 ac)
- Ruderal/Disturbed - (1.84 ac)
- Developed - (0.35 ac)

Caltrans

0 50 100
FEET

SOURCE: Microsoft Bing Aerial (2011)

I:\Nlt1203\GIS\Nesmi_fig5-plant_comm.mxd (9/27/2013)

FIGURE 5

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Natural Communities / Land Uses

4.2.1 Row Crops

Row crops are agricultural lands and are not considered a natural community. Active orchards and row crop operations bound the BSA on all sides, but due to the small size of the project, the BSA only extends into row crops in the northwest corner. Approximately 0.11 ac of row crops occur in the BSA.

4.2.2 Ruderal

Ruderal vegetation occurs along the unpaved road shoulders, edges of agricultural fields and in the eastern side of the BSA along Shiells Road. Ruderal plant species are those that colonize and quickly establish in poor soils and disturbed or waste areas. They generally have fast-growing roots, low nutritional needs, and produce massive amounts of seed. Within the BSA, the majority of this community consists of bare dirt with pockets of sparsely–vegetated, weedy non-native plant species including field bindweed (*Convolvulus arvensis*), Russian thistle (*Salsola tragus*), nutsedge (*Cyperus eragrostis*), bearded sprangletop (*Leptochloa fusca spp. fascicularis*), and Russell River grass (*Paspalum paniculatum*). Ruderal areas comprise approximately 1.84 ac in the BSA.

4.2.3 Canal/Open Water

Open water habitat in the BSA consists of the section of the CCID Main Canal. The canal is regularly treated with herbicide and supports little to no vegetation. A few remnant plants were identified along the vertical banks and include Russell River grass, watercress (*Rorippa nasturtium officinale*), and bearded sprangletop. The open water community comprises approximately 0.40 ac in the BSA.

4.2.4 Developed

Developed land within the BSA consists of the paved portions of Shiells Road. Developed areas comprise approximately 0.35 ac in the BSA.

4.3 Wildlife

The developed areas and ruderal vegetation in the BSA, as well as the surrounding agricultural lands, typically do not provide high quality habitat for wildlife species. However, a variety of species are known to occur in urbanized and agricultural settings. In addition, several large trees are located directly southwest of the BSA, which may provide nesting habitat for several bird species. A large nest was observed in a mature oak tree at the residence at this location, and a red-tailed hawk (*Buteo jamaicensis*) was observed next to the nest. Common wildlife species that may occur in the BSA include, but are not limited to, coyote (*Canis latrans*), raccoon (*procyon lotor*), opossum (*Didelphis virginiana*), red-shouldered hawk (*Buteo*

lineatus), western terrestrial garter snake (*Thamnophis elegans*), western fence lizard (*Sceloporus occidentalis*), California ground squirrel (*Otospermophilus beecheyi*), common kingsnake (*Lampropeltis getula*), red-tailed hawk, Swainson's hawk, rock dove (*Columba livia*), American crow (*Corvus brachyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), American robin (*Turdus migratorius*), and mourning dove (*Zenaida macroura*).

4.4 Regional Species and Habitats of Concern

LSA reviewed the specific habitat required by each species included in the special status species lists in Appendix B, and the specific habitats and habitat conditions present in the BSA. LSA's previous experience with these species was also taken into consideration. Based on this evaluation, LSA determined the likelihood of each species included in the special status species lists to occur in the BSA. Special status species that were observed, or determined to potentially occur in the BSA based on availability of suitable habitat or other factors include Swainson's hawk and migratory birds; these species are discussed below. Species determined unlikely to occur in the BSA based on these same factors are not discussed any further in this report. For example, no suitable nesting or roosting habitat for swallows or bats are present in the BSA. While these species may forage in the vicnity, the project will not effect these species and, therefore, are not discusses in the document.

No habitats of concern are located within or in the vicinity of the BSA.

4.4.1 Swainson's Hawk

The Swainson's hawk is a State threatened species; it has no federal status. Swainson's hawks are long distance migrants, wintering primarily in South America, and returning north to breed. Swainson's hawks are large, broad-winged hawks that occur in open country throughout the western half of the United States. In California, Swainson's hawks occur in the northeastern portion of the State, in the Great Basin Province, and in the Central Valley. They return to the Central Valley in mid-March and begin migrating south in August. Nests are built in the tops of large trees, primarily those associated with riparian habitats. They are known to forage up to 10 mi from their nest sites.

There are 17 documented occurrences of the Swainson's hawk in the search area. The closest occurrence, dated 1988, is located approximately 3 mi northwest of the BSA. Most of the documented occurrences in the area include observations of nesting behavior, indicating a history of nesting Swainson's hawks in the vicinity of the project.

No suitable nesting habitat for Swainson's hawk occurs within the BSA. However, several large trees to the southwest of the BSA may provide nesting habitat for this species. At least one large nest was observed in a tree during the August 2013 visit. Additionally, agricultural row crops within, and adjacent to, the BSA provide potential foraging habitat for Swainson's hawk.

4.4.2 Nesting Migratory Birds

While not typically considered special status species, migratory birds are protected under the Migratory Bird Treat Act (MBTA) and the California Fish and Game Code. Disturbance of migratory brids during their nesting season (Februrary 1 to August 31) could result in "take" which is prohibited under the MBTA and Section 3513 of the California Fish and Game Code. Fish and Game Code (Section 3503) also prohibits take or destruction of bird nests or eggs.

Migratory birds can nest in a variety of habitats depending on the species including tree canopies, dense shrubs, and on the ground.

Within the BSA, all areas that are not paved, developed or otherwise exposed to constant disturbance, could be utilized for nesting by various migratory bird species common to the region.

4.5 Jurisdictional Waters

Jurisdictional waters include wetlands and other waters that fall under the jurisdiction of the ACOE pursuant to Section 404 of the Clean Water Act (CWA), the RWQCB pursuant to Section 401 of the CWA or the Porter-Cologne Water Quality Act, or the CDFW pursuant to Section 1600-1616 of the California Fish and Game Code.

An ACOE Section 404 permit will not be required as the CCID has determined that the aquatic features in the BSA are isolated and, therefore, not subject to ACOE jurisdiction. As a result, the project will likely only require a Waste Discharge Waiver from the RWQCB. See Appendix C for correspondence.

LSA coordinated with Sarah Paulson at CDFW on October 8, 2013, regarding the CCID Main Canal. It was determined that this feature is not subject to Section 1600 of the Fish and Game Code and therefore, will not require a Lake and Streambed Alteration Agreement. See Appendix C for agency correspondence.

5. Project Impacts

The project will result in permanent impacts to 0.01 ac of row crops and 0.43 ac of ruderal habitat during construction of the new bridge approaches. Temporary impacts include 0.04 ac row crops and 0.73 ac of ruderal habitat, as a result of the construction staging and access. Both of these habitats provide foraging habitat for wildlife.

The project will eliminate approximately 0.44 acre of ruderal vegetation and row crops that provide potential foraging habitat for Swainson's hawk, a State threatened species, during construction of the new bridge approaches.

CDFW generally recommends mitigation for loss of suitable foraging habitat for Swainson's hawk if the subject habitat is within 10 mi of an active nest (CDFW, 1994). A nest is considered active if it has been used in the last 5 years. However, for projects of this size, it is unreasonable to conduct Swainson's hawk protocol nesting surveys within a 10 mi radius of the project site. Therefore, it is accepted standard practice to rely on CNDDB occurrence records to determine if active Swainson's hawk nests occur within a 10 mi radius. Per the CNDDB record search, there are no records of Swainson's hawk nesting within 10 mi of the BSA during the past 5 years; therefore, mitigation is not proposed for the loss of suitable foraging habitat for this species.

There will be no loss of nesting habitat for Swainson's hawk associated with the project; however, the project could potentially disrupt nesting for Swainson's hawk if the species is nesting near the BSA when construction begins. No impacts to Swainson's hawks are expected with the implementation of avoidance and minimization efforts described in Section 6.

Birds that nest on the ground in these habitats could be affected by the project. No impacts to nesting migratory birds are expected with implementation of avoidance and minimization efforts described in Section 6.

The project will not affect any other species status species, including State or federally listed species, as Caltrans has made a "No Effect Determination". Consequently, consultation under Section 7 of the Federal Endangered Species Act will not be required, nor will the project require an Incidental Take Permit pursuant to Section 2081 of the California Fish and Game Code.

The project will result in minor permanent (0.01 ac) and temporary impacts (0.05 ac) to the CCID Main Canal. As stated in Section 4, the CCID Main Canal is not subject to ACOE or CDFW, only RWQCB jurisdiction, and there are no waters of the U.S. within the BSA. All

avoidance and minimization measures listed in Section 6 will be followed to minimize project impacts to waters of the State.

6. Avoidance and Minimization Measures

1. Measures consistent with the current Caltrans' Construction Site Best Management Practices (BMP) Manual (including the Storm Water Pollution Prevention Plan [SWPPP] and Water Pollution Control Plan [WPCP] Manuals) shall be implemented to minimize effects to jurisdictional waters resulting from erosion, siltation, etc. during construction.

2. Following completion of construction activities, all fill slopes, temporary impact and/or otherwise disturbed areas shall be restored to preconstruction contours (if necessary) and revegetated with the native seed mix specified in Table 1. Invasive exotic plants will be controlled to the maximum extent practicable.

Table 1: Native Seed Mix

Scientific Name	Common Name	Rate (Lbs./Acre)
Bromus carinatus	California bromegrass	5.0
Elymus glaucus	Blue wild rye	5.0
Elymus X triticum	Regreen	10.0
Eschscholzia californica	California poppy	2.0
Hordeum brachyantherum	Meadow barley	5.0
Lupinus bicolor	Bicolored lupine	4.0

3. Prior to issuance of a grading permit or other authorization to proceed with project construction, the project proponent shall obtain any regulatory permits that are required from the RWQCB (CCID Main Canal not subject to ACOE and CDFW jurisdiction).

4. The following measures are recommended to minimize adverse effects to nesting birds per the MBTA and Sections 3513 and 3503 of the California Fish and Game Code:

    a. If work begins between February 1 and August 31, an early season preconstruction survey for nesting Swainson's hawks shall be conducted in the BSA and immediate vicinity (an approximately 0.25 mi radius) by a qualified biologist when tree foliage is relatively sparse and nests are easy to identify. A second preconstruction survey for nesting Swainson's hawks shall be conducted in the BSA and immediate vicinity (an approximately 0.25 mi radius) by a qualified biologist no more than 14 days prior to initiation of earthmoving activities. If nesting Swainson's hawks are found within the survey area, a

qualified biologist shall evaluate the potential for the project to disturb nesting activities. CDFW shall be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities. CDFW shall also be consulted to establish protection measures such as buffers. Disturbance of active nests shall be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged. If work is allowed to proceed, at a minimum, a qualified biologist shall be on-site during the start of construction activities during the nesting season to monitor nesting activity. The monitor shall have the authority to stop work if it is determined the project is adversely affecting nesting activities.

b. If work is conducted during the nesting season (February 1 to August 31), a qualified biologist shall survey all suitable nesting habitat in the BSA and within 100 ft for presence of other nesting birds. The survey radius may be decreased due to the presence of development or other land use that could preclude nesting. This survey shall occur no more than 10 days prior to the start of construction. If no nesting activity is observed, work may proceed as planned.

c. If an active nest is discovered, a qualified biologist shall evaluate the potential for the proposed project to disturb nesting activities. The evaluation criteria shall include, but are not limited to, the location/orientation of the nest in the nest tree, the distance of the nest from the BSA, and line of sight between the nest and the BSA. CDFW shall be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities.

d. If work is allowed to proceed, a qualified biologist shall be on-site weekly (at a minimum) during construction activities that occur during the nesting season to monitor nesting activities until the biologist determines, in consultation with CDFW, that monitoring is no longer required. The biologist shall have the authority to stop work if it is determined the project is adversely affecting nesting activities. This measure only applies to construction activities.

5. In accordance with Executive Order 13113 (Invasive Species), to avoid the distribution of invasives during project construction, contract specifications should include, at a minimum, the following measures:

a. All earthmoving equipment to be used during project construction should be thoroughly cleaned before arriving on the project site.

b. All seeding equipment (i.e. hydroseed trucks) shall be thoroughly rinsed at least three times prior to beginning seeding work.

c. To avoid spreading any nonnative invasive species already existing on-site to off-site areas, all equipment should be thoroughly cleaned before leaving the site.

7. Permits Required

The CCID Main Canal has been determined to be an isolated water with no apparent interstate or foreign commerce connection and, as such, is not currently regulated by the ACOE under Section 404 of the CWA. Therefore, no jurisdictional waters of the U.S. are present in the BSA.

However, authorization from the RWQCB pursuant to Section 401 of the CWA will likely be required. It is expected the RWQCB will issue a Waste Discharge Waiver to authorize discharges into waters of the State.

Per coordination with Sarah Paulson at CDFW, work in the CCID Main Canal will not require a Lake and Streambed Alteration Agreement (See Appendix D).

8. References

Baldwin, Bruce G. et. al., Ed. 2012. The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press.

California Department of Fish and Wildlife. 2013. Rarefind 4 online computer database. Sacramento, CA. Records search executed May 19, 2014. Sacramento, California.

_____. 2013. California Wildlife Habitat Relationships System. Life History Accounts. February, 2013. Sacramento, CA.

_____. 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo Swainsoni*) in the Central Valley of California. November 8, 1994. Sacramento, CA.

California Native Plant Society. 2013. 8th Inventory of Rare and Endangered Vascular Plants of California - Online Edition. Records search executed May 19, 2014. Sacramento, California.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-97-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Sawyer, John O. Keeler-Wolf, Todd. and Evens, Julie M. 2008. A Manual of California Vegetation: Second Edition. California Native Plant Society. Sacramento, CA.

U.S. Army Engineer Research and Development Center. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid Southwest Region. ERDC/EL TR-08-28.

U.S. Fish and Wildlife Service. 2013. Online Threatened and Endangered Species Lists. Sacramento Fish and Wildlife Office. Records search executed May 19, 2014. Sacramento, California: Sacramento Fish and Wildlife Office.

Appendix A Design Plans

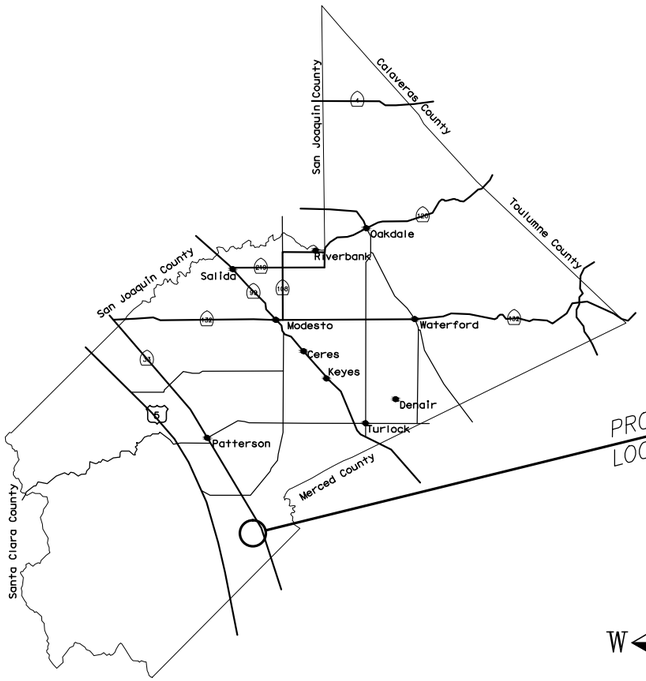
INDEX OF SHEETS

STANISLAUS COUNTY

PLANS FOR THE CONSTRUCTION OF

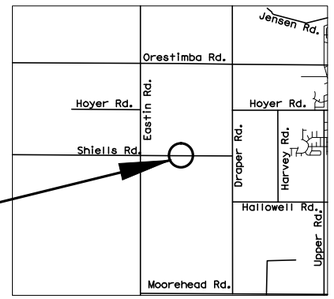
SHIELLS ROAD BRIDGE REPLACEMENT
BRIDGE REPLACEMENT AND IMPROVEMENT PROJECT

30% PLANS MARCH 2013



STANISLAUS COUNTY

NO SCALE



STATE OF CALIFORNIA

COUNTY OF STANISLAUS

PUBLIC WORKS ADMINISTRATOR — DATE
--

ASSISTANT DIRECTOR OF PUCLIC WORKS — DATE
--

MICHAEL A. PUGH, PE, SE — DATE
RPE 53967
NV5, INC.

30% SUBMITTAL
NOT FOR CONSTRUCTION
MAY 2013

PREPARED UNDER THE DIRECTION OF: DATE:

NO	DESCRIPTIONS	REVISIONS	DATE	APPROVED

STANISLAUS COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING AND OPERATIONS DIVISION
1716 MORGAN ROAD – MODESTO, CA 95358

Stanislaus County — Striving to be the best

SHIELLS ROAD BRIDGE REPLACEMENT

TITLE SHEET

JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
T-1
OF 8 SHEETS

NV5 BEYOND ENGINEERING
2495 NATOMAS PARK DRIVE, FOURTH FLOOR SACRAMENTO, CA 95833
916.641.9100 TEL 916.641.9222 FAX WWW.NV5.COM

CALL BEFORE YOU DIG USA 800-227-2600

PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\T-1.DWG

CONSTRUCTION NOTES

A. MISCELLANEOUS

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2010 EDITION OF STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, REFERRED TO AS "STANDARD SPECIFICATIONS" AND WITH STANISLAUS COUNTY SPECIFICATIONS AND IMPROVEMENT STANDARDS. ALL IMPROVEMENTS ARE SUBJECT TO THE INSPECTION AND APPROVAL OF THE PUBLIC WORKS DEPARTMENT.
2. PRIOR TO STARTING ANY WORK, THE CONTRACTOR SHALL OBTAIN A ENCROACHMENT PERMIT FROM THE STANISLAUS COUNTY DEPARTMENT OF PUBLIC WORKS. 48 HOUR ADVANCED NOTICE SHALL BE PROVIDED TO ENCROACHMENT INSPECTOR PRIOR TO STARTING ANY WORK.
3. CONTRACTOR SHALL ONLY USE EQUIPMENT PROVIDED WITH A SPARK ARRESTOR DEVICE TO REDUCE A POTENTIAL FIRE HAZARD.
4. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITIES. THE CONTRACTOR SHALL DO NO EXCAVATION UNTIL ALL UTILITY AGENCIES AND THE STANISLAUS COUNTY DEPARTMENT OF PUBLIC WORKS HAVE BEEN NOTIFIED AND HAVE BEEN GIVEN THE OPPORTUNITY TO MARK THEIR FACILITIES IN THE FIELD. THE CONTRACTOR SHALL CALL U.S.A. AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO DOING ANY EXCAVATING.
5. CONTRACTOR SHALL PRESERVE ALL SURROUNDING PROPERTY BY CONFINING OPERATIONS TO WITHIN THE "LIMITS OF WORK".
6. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE OSHA REGULATIONS.
7. THESE PLANS HAVE BEEN CHECKED BY THE STANISLAUS COUNTY DEPARTMENT OF PUBLIC WORKS AND/OR AUTHORIZED REPRESENTATIVE, BUT SUCH CHECKING AND/OR APPROVAL DOES NOT RELIEVE THE CONTRACTOR FROM HIS/HER RESPONSIBILITY TO CORRECT ERRORS, OMISSIONS OR MAKE CHANGES REQUIRED BY CONDITIONS DISCOVERED IN THE FIELD DURING COURSE OF CONSTRUCTION.
8. THE CONTRACTOR SHALL CONTROL DUST AT ALL TIMES. DUST CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IMPLEMENTED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL GUIDELINES (INCLUDING, BUT NOT LIMITED TO THE SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT).
9. CONSTRUCTION STAKING FOR STORM DRAINS, WATER LINES, FIRE HYDRANTS, ELECTROLIERS, ETC. SHALL BE DONE UNDER THE DIRECTION OF A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.
10. UNLESS OTHERWISE APPROVED, HOUSE SERVICES, FIRE HYDRANT LATERALS, GAS AND TELEPHONE LINES, AND ALL OTHER UNDERGROUND UTILITIES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ROAD PAVING.
11. ALL LINES ABANDONED DURING CONSTRUCTION SHALL BE REMOVED.
12. ALL INDEPENDENT LABORATORY INSPECTION REQUESTED BY THE COUNTY ENGINEER SHALL BE PAID FOR BY THE CONTRACTOR.
13. STREET STRIPING SHALL INCLUDE STOP BARS, CENTERLINE STRIPING, AND LANE LINE MARKERS AND ALL OTHER MARKINGS REQUIRED BY THE ENGINEER. STRIPING SHALL BE DONE WITH THERMOPLASTIC AND REFLECTIVE MARKERS.
14. ALL TRENCHES SHALL BE BACK FILLED IN ACCORDANCE WITH STANISLAUS COUNTY SPECIFICATIONS AND IMPROVEMENTS STANDARDS.
15. WHEN WIDENING THE PAVEMENT ON AN EXISTING ROAD, THE EXISTING PAVEMENT SHALL BE CUT (SAW) TO A NEAT LINE AND REMOVED BACK TO AN EXISTING ADEQUATE STRUCTURAL SECTION, OR TO THE ORIGINAL ROAD SECTION. AN EXPLORATORY TRENCH, OR POT-HOLING, MAY BE REQUIRED TO DETERMINE THE LIMITS OF PAVEMENT REMOVAL.
16. EXISTING ROADSIDE FACILITIES WITHIN THE PROJECT LIMITS THAT ARE DAMAGED OR DISPLACED, EVEN THOUGH THEY WERE NOT TO BE REMOVED, SHALL BE REPAIRED OR REPLACED PER STANISLAUS COUNTY STANDARDS EVEN IF DAMAGE OR DISPLACEMENT OCCURRED PRIOR TO ANY WORK PERFORMED BY THE CONTRACTOR.
17. ASBESTOS CEMENT PIPE (ACP) OR FITTINGS SHALL NOT BE USED.
18. PRIOR TO TRENCHING FOR STORM DRAIN PIPE, THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE SIZE AND LOCATION OF EXISTING PIPE AT THE POINT OF CONNECTION. ANY DEVIATION FROM THE PLANS SHALL BE RESOLVED BY THE DESIGN ENGINEER AND APPROVED BY THE COUNTY PRIOR TO TRENCHING.
19. MANHOLES, VALVES, CLEAN OUTS, ETC. SHALL BE BROUGHT TO FINISH GRADE BY THE CONTRACTOR AFTER THE FINAL PAVING COURSE IS PLACED.
20. STORM DRAIN PIPE SIZES SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF STANISLAUS COUNTY.
21. ALL TREES TO REMAIN SHALL BE PRESERVED AND PROTECTED BY ERECTING A 48" HIGH ORANGE CONSTRUCTION FENCE AROUND THE TREE TRUNK PRIOR TO STARTING WORK ON THE SITE.
22. ALL CONSTRUCTION SITE ACTIVITIES SHALL CONFORM TO THE STATE WATER RESOURCES CONTROL BOARD, NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES), WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH CONSTRUCTION ACTIVITY.
23. AN APPROVED SWPPP SHALL BE SUBMITTED TO THE COUNTY AND MUST BE ON-SITE DURING ALL CONSTRUCTION ACTIVITIES.
24. CONTRACTOR'S OPERATIONS SHALL BE PERFORMED IN A MANNER WHICH WILL NOT ALLOW HARMFUL POLLUTANTS TO ENTER SAN JOAQUIN RIVER. CONTRACTOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) AS INDICATED IN THE SPECIFICATIONS AND AS REQUIRED BY STANISLAUS COUNTY.
25. ALL CONSTRUCTION SITE ACTIVITIES SHALL COMPLY WITH ALL CONDITIONS OF APPROVAL, DEVELOPMENT STANDARDS, AND/OR MITIGATION MEASURES ADOPTED BY THE PLANNING COMMISSION AND/OR BOARD OF SUPERVISORS FOR THE SPECIFIC PROJECT.
26. PRIOR TO INITIATING ANY CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THAT ALL NECESSARY FEDERAL, STATE, AND LOCAL PERMITS AND/OR AUTHORIZATIONS HAVE BEEN OBTAINED.

B. DEMOLITION

1. DEBRIS GENERATED FROM DEMOLITION WORK TO BE DISPOSED OF OFF-SITE, AT AN APPROVED LOCATION, AT THE CONTRACTOR'S EXPENSE.
2. CLEARING AND GRUBBING SHALL CONFORM TO THE PROVISIONS IN SECTION 16, "CLEARING AND GRUBBING," OF THE STANDARD SPECIFICATIONS.

C. SITE WORK

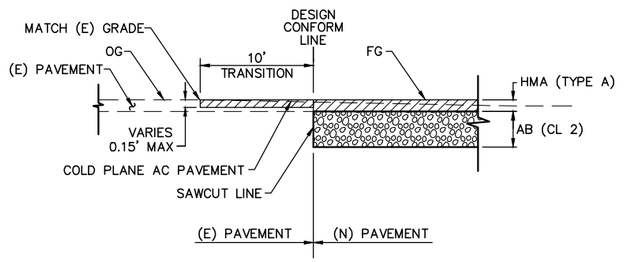
1. EARTHWORK SHALL CONFORM TO THE PROVISIONS IN SECTION 19, "EARTHWORK," OF THE STANDARD SPECIFICATIONS. ROADWAY EXCAVATION SHALL CONFORM TO THE PROVISIONS IN SECTION 19-2, "ROADWAY EXCAVATION," OF THE STANDARD SPECIFICATIONS.
2. SUBGRADE PREPARATION SHALL BE COMPACTED TO 95% RELATIVE COMPACTION AND CONFORM TO SECTION 26 OF THE STANDARD SPECIFICATIONS.
3. HOT MIX ASPHALT SHALL BE TYPE A, 3/4" MEDIUM CONFORMING TO SECTION 39 OF THE STANDARD SPECIFICATIONS. THE RELATIVE COMPACTION SHALL BE 95%.
4. PRIME COAT ALL AGGREGATE BASE SURFACES PRIOR TO PLACING HMA PAVING CONSTRUCTED IN ACCORDANCE WITH SECTION 37-2.02E OF THE STANDARD SPECIFICATIONS. USE SC-250 OR MC-250 LIQUID ASPHALT IN ACCORDANCE WITH SECTION 93 OF THE STANDARD SPECIFICATIONS.
5. SAWCUT AT ALL PAVEMENT CONFORMS. PROVIDE A NEAT, CLEAN EDGE.
6. AGGREGATE BASE SHALL BE CLASS 2, WITH DEPTH AS SPECIFIED PER PLAN AND SHALL CONFORM TO THE PROVISIONS IN SECTION 26, "AGGREGATE BASES," OF THE STANDARD SPECIFICATIONS.
7. DEBRIS GENERATED BY CLEARING, GRUBBING, EXCAVATION AND DEMOLITION WORK SHALL BE DISPOSED OF OFF-SITE AT APPROVED DISPOSAL SITES AT THE CONTRACTOR'S EXPENSE.

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ADA	AMERICAN DISABILITIES ACT
AS	AGGREGATE SUBBASE
BB	BEGIN BRIDGE
BC	BEGIN HORIZONTAL CURVE
BVC	BEGIN VERTICAL CURVE
"CA"	CARPENTER ROAD CONTROL LINE
℄	CENTER LINE
CL	CLASS
"CL"	CROWS LANDING CONTROL LINE
CMP	CORRUGATED METAL PIPE
CTRL	CONTROL
E	EASTING
(E)	EXISTING
EB	END BRIDGE
EC	END HORIZONTAL CURVE
EG	EXISTING GROUND
EL	ELEVATION
EP	EDGE OF PAVEMENT
ES	EDGE OF SHOULDER
ETW	EDGE OF TRAVELED WAY
EVC	END VERTICAL CURVE
FES	FLARED END SECTION
FG	FINISHED GRADE
GB	GRADE BREAK
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT (TYPE A)
HP	HINGE POINT
Lt	LEFT
MAX	MAXIMUM
MBGR	METAL BEAM GUARD RAIL
MIN	MINIMUM
MON	MONUMENT
(N)	NEW
N	NORTHING
OG	ORIGINAL GRADE
(P)	PROPOSED
PG	PROFILE GRADE
P/L	PROPERTY LINE
PT	POINT
PVI	POINT OF VERTEX/INTERSCTION OF TANGENTS
R	RADIUS
Rt	RIGHT
ROW	RIGHT OF WAY
RSP	ROCK SLOPE PROTECTION
TBD	TO BE DETERMINED
TCE	TEMPORARY CONSTRUCTION EASEMENT
TW	TRAVELED WAY
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VAR	VARIES
VC	VERTICAL CURVE

LEGEND

- P/L OR ROW
- LIMIT OF WORK
- MBGR
- FILL LINE
- EXISTING UNDERGROUND ELECTRICAL LINE
- EXISTING OVERHEAD LINE
- PROPOSED STORM DRAIN LINE
- CUT LINE
- GRADE BREAK
- ℄ OF DRAINAGE SWALE
- AB (CLASS 2)
- HMA (TYPE A)



TYPICAL CONFORM DETAIL

N.T.S.

30% SUBMITTAL NOT FOR CONSTRUCTION MAY 2013

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NO	DESCRIPTIONS	REVISIONS	DATE	APPROVED

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ENGINEERING AND OPERATIONS DIVISION
1716 MORGAN ROAD - MODESTO, CA 95358

Stanislaus County — Serving to be the best

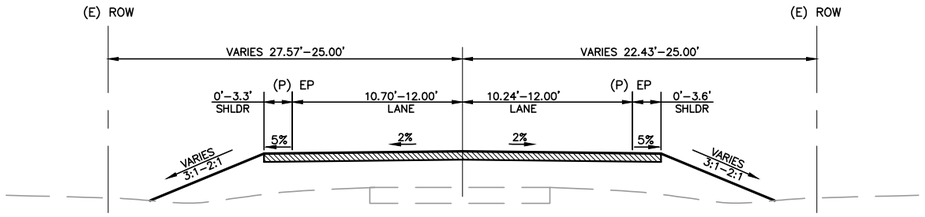
SHIELLS ROAD BRIDGE REPLACEMENT

CONSTRUCTION NOTES & DETAILS

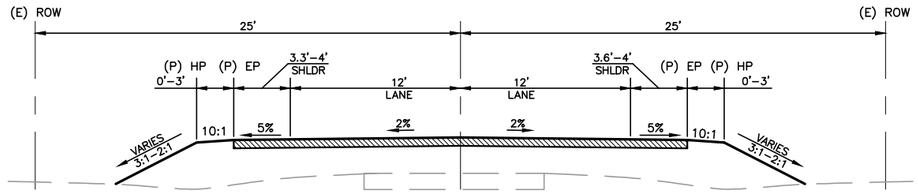
JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
DT-1
OF 8 SHEETS

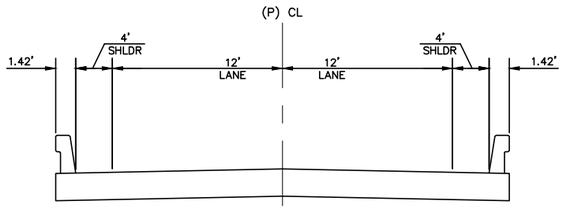
PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\DT-1.DWG



SHIELLS ROAD
STA 3+00.00 - STA 5+56.15
STA 7+16.17 - STA 10+50.00
SCALE: NTS



SHIELLS ROAD
STA 5+56.15 - STA 6+00.00
STA 6+77.00 - STA 7+16.17
SCALE:



SHIELLS ROAD
STA 6+00.00 - STA 6+77.00
SCALE: NTS

DESIGN CRITERIA/PARAMETERS:

1) AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH EDITION WITH THE 2010 INTERIMS AND THE CALTRANS AMENDMENTS V4
2) AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS
3) DESIGN SPEED: 45 MPH
4) FUTURE AVERAGE DAILY TRAFFIC (ADT): 309
5) LANE WIDTH - 2@ 12-0"
6) SHOULDER WIDTH - 2@ 4'-0"

30% SUBMITTAL
NOT FOR CONSTRUCTION
MAY 2013

PREPARED UNDER THE DIRECTION OF: DATE:

NO	DESCRIPTIONS	REVISIONS	DATE	APPROVED

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DEPARTMENT OF PUBLIC WORKS
ENGINEERING AND OPERATIONS DIVISION
1716 MORGAN ROAD – MODESTO, CA 95358

SHIELLS ROAD BRIDGE REPLACEMENT

TYPICAL SECTIONS

JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
X-1
OF 8 SHEETS

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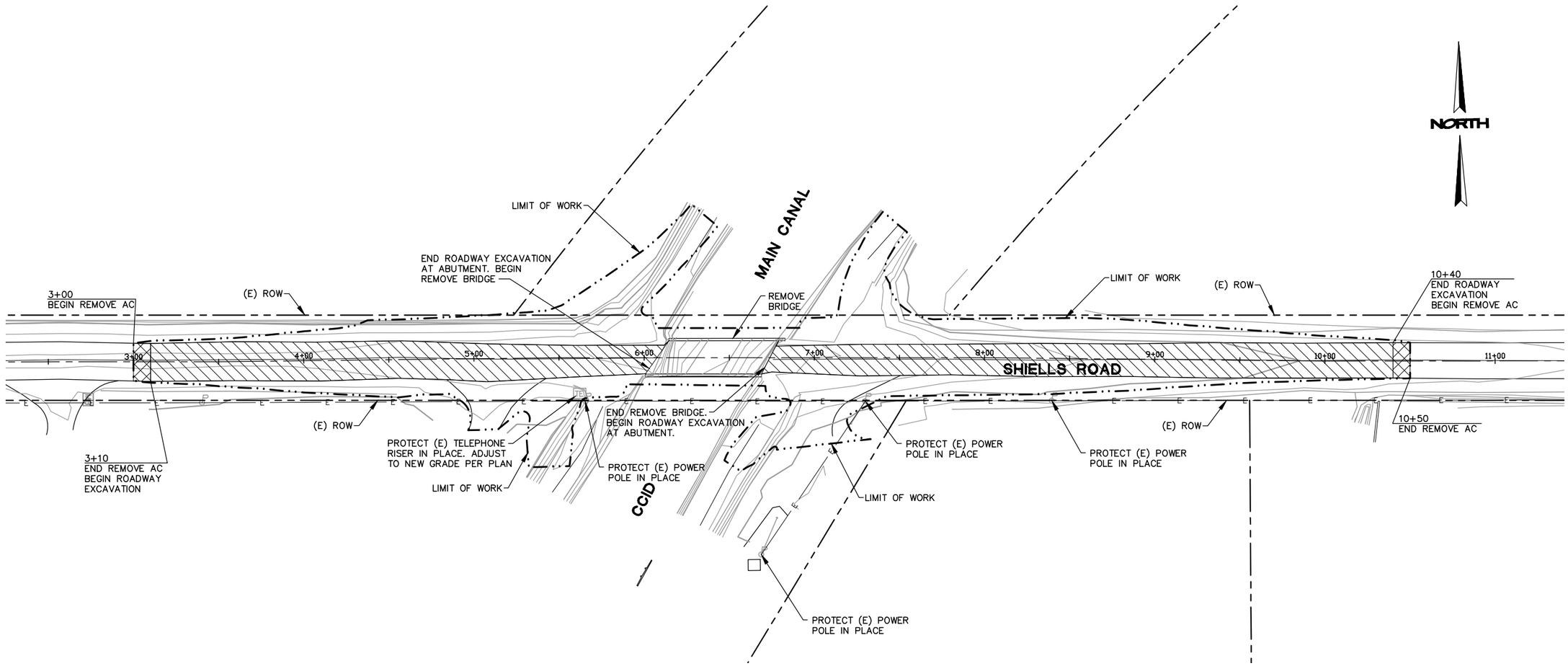
PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\X-1.DWG



PLAN
SCALE: 1"=30'

NOTES:

1. SEE SHEET DT-1 FOR ABBREVIATIONS AND DEMOLITION NOTES.
2. ALL STATIONING AND OFFSET CALLOUTS ARE BASED ON THE "CL" LINE UNLESS NOTED OTHERWISE.
3. REMOVE AC INCLUDES REMOVAL OF AC DIKE.

LEGEND:

ROADWAY EXCAVATION

REMOVE AC

GRAPHIC SCALE: 1" = 30'

30% SUBMITTAL
NOT FOR CONSTRUCTION
MAY 2013

PREPARED UNDER THE DIRECTION OF: DATE:

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ENGINEERING AND OPERATIONS DIVISION
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SHIELLS ROAD BRIDGE REPLACEMENT

DEMOLITION PLAN

JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
DM-1
OF 8 SHEETS

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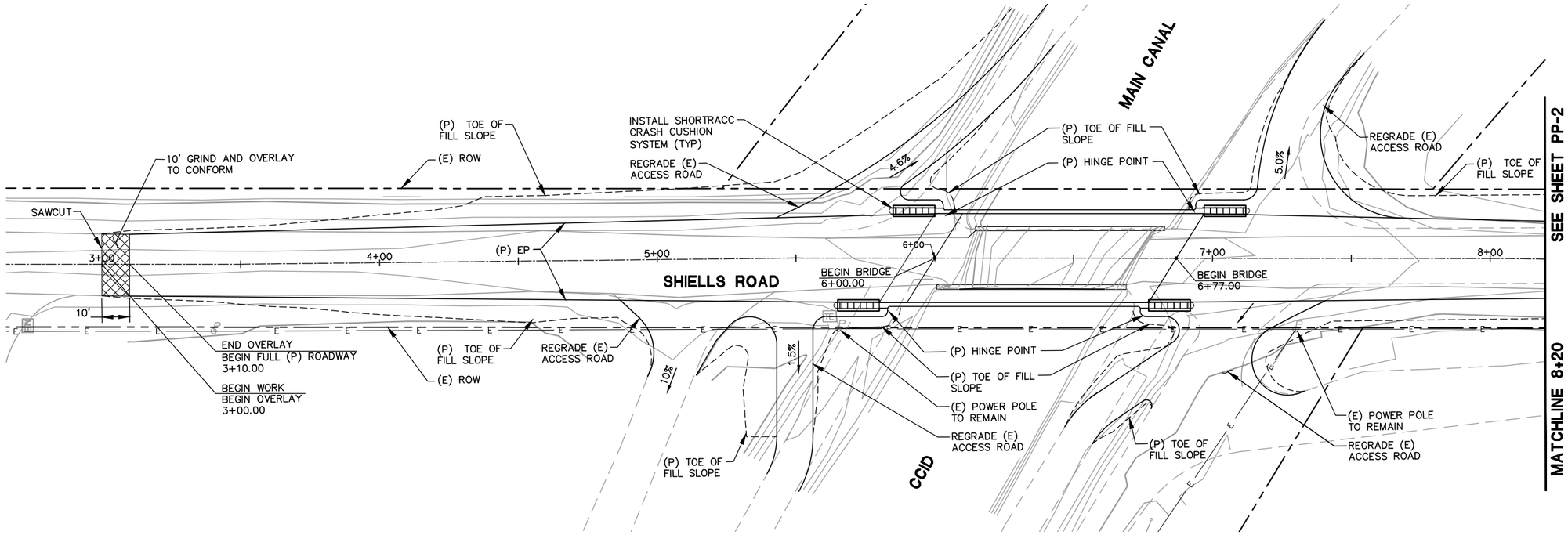
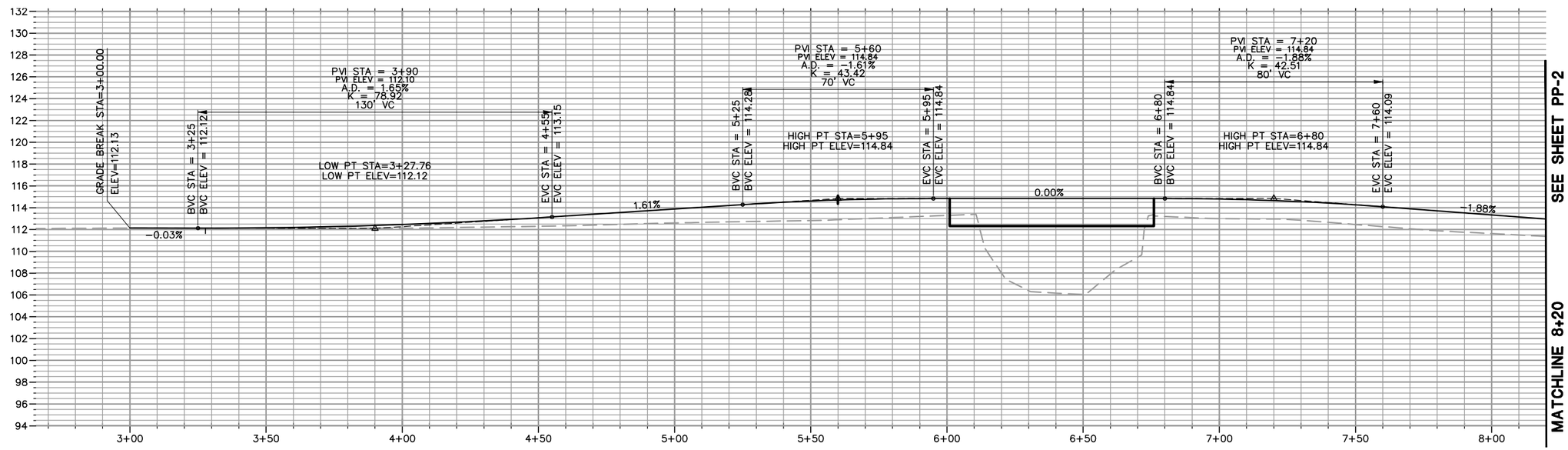
PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\DM-1.DWG



PLAN
1" = 20'



PROFILE
H: 1" = 20'
V: 1" = 5'

30% SUBMITTAL
NOT FOR CONSTRUCTION
MAY 2013

N|V|5
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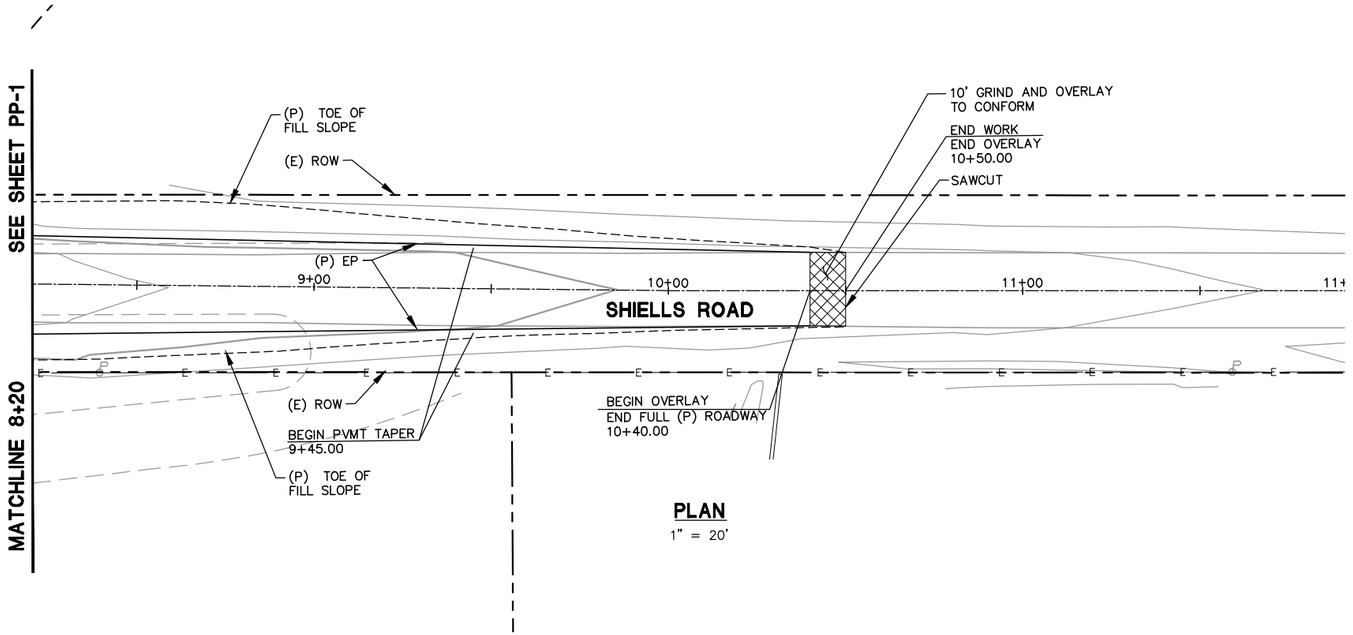
SHIELLS ROAD BRIDGE REPLACEMENT

PLAN AND PROFILE
SHIELLS ROAD 3+50 TO 8+20

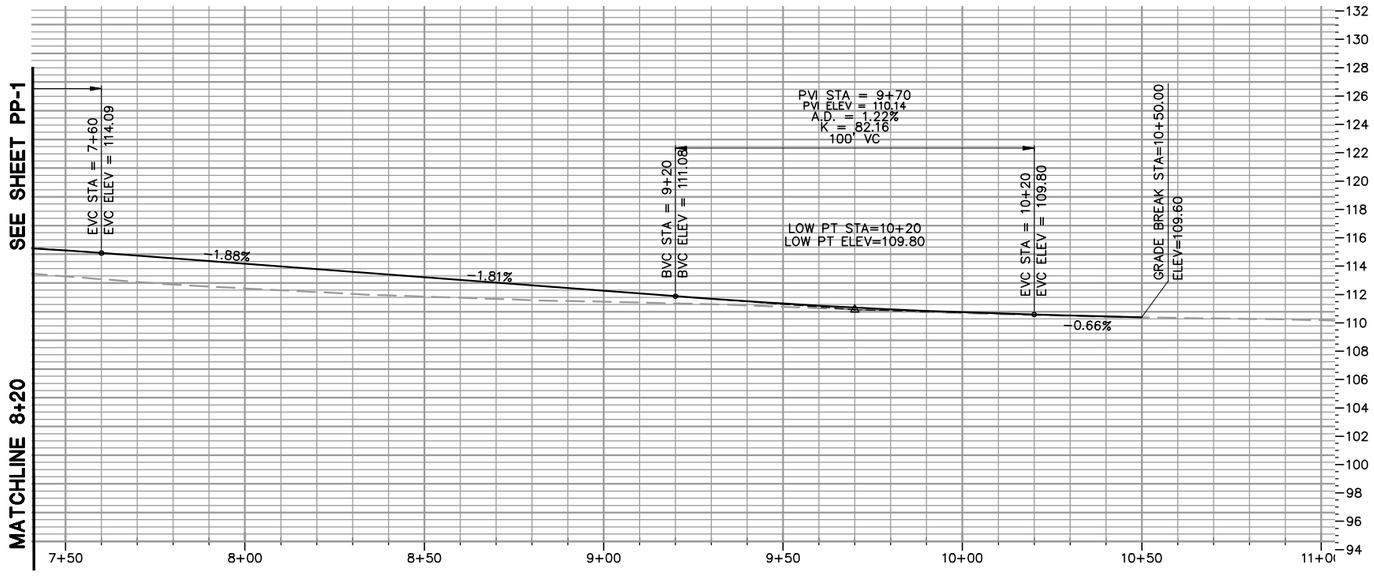
JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
PP-1
OF 8 SHEETS

PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\PP-1_PP-2.DWG



PLAN
1" = 20'



PROFILE
H: 1" = 20'
V: 1" = 5'

30% SUBMITTAL
NOT FOR CONSTRUCTION
MAY 2013

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SHIELLS ROAD BRIDGE REPLACEMENT

PLAN AND PROFILE
SHIELLS ROAD 8+20 TO 10+00

JOB NO. SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
PP-2
OF 8 SHEETS

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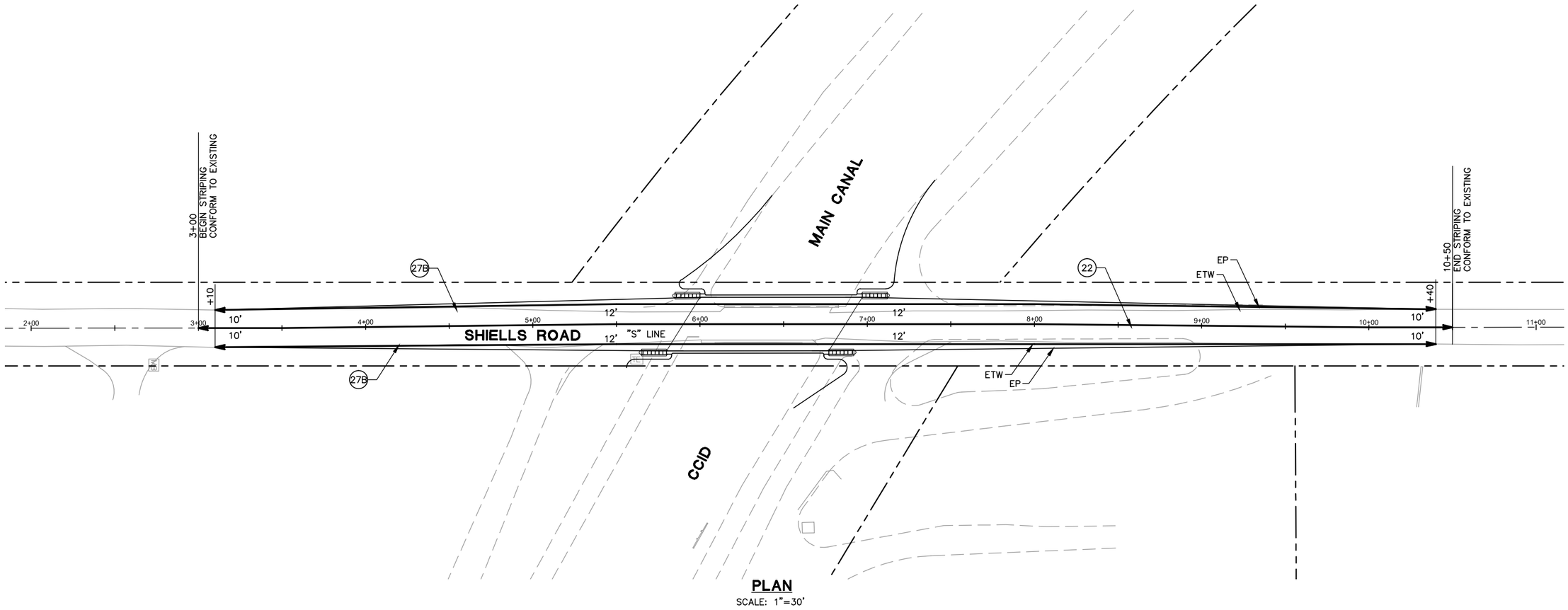

PLAN
SCALE: 1"=30'

PAVEMENT MARKER SUMMARY

SHEET No.	ROUTE	ALIGNMENT	LOCATION FROM STATION	LOCATION TO STATION	DETAIL No.	RETROREFLECTIVE TYPE D Yellow	RETROREFLECTIVE TYPE G Clear
PD-1		"S"	3+00	10+50	22	62	
PD-1		"S"	3+10 RT	10+40 RT	27b		
PD-1		"S"	3+10 LT	10+40 LT	27b		
		TOTALS				62	

TRAFFIC STRIPE SUMMARY

THERMOPLASTIC (ft) 4" YELLOW	4" WHITE	4" WHITE (BROKEN)	8" WHITE
1500			
	730		
	730		
1500	1460		

NOTES:

1. FOR LIST OF ABBREVIATIONS, SEE SHEET DT-1.
2. PAVEMENT MARKINGS TO BE THERMOPLASTIC. ALL STRIPING TO BE V.O.C. COMPLIANT PAINT.
3. CONTRACTOR SHALL REMOVE ALL EXISTING TRAFFIC STRIPES AND PAVEMENT MARKINGS AS NECESSARY TO INSTALL NEW TRAFFIC STRIPES AND PAVEMENT MARKINGS.
4. LOCATION AND POSITION OF REMOVED AND REPLACED ROADSIDE SIGNS SHALL BE DETERMINED BY THE ENGINEER.

(XX) PAVEMENT DELINEATION DETAIL, PER CALTRANS STANDARD PLANS A20A TO A20D

ROADSIDE SIGN–ONE POST SIGN LOCATION DESIGNATION PER LATEST MUTCD EDITION–CALIFORNIA CODE)

EXISTING SIGN

DENOTES THE LIMIT OF THE DESIGNATED LINE OR CHANGE OF PAVEMENT DELINEATION DETAIL

0 30' 60' 90'
GRAPHIC SCALE: 1" = 30'

30% SUBMITTAL
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MAY 2013

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SHIELLS ROAD BRIDGE REPLACEMENT

PAVEMENT DELINEATION & SIGNING

JOB NO SAB048800
DATE 5/10/13
DR BY SMS
CK BY MAP
SCALE AS SHOWN

SHEET NUMBER
PD-1
OF 8 SHEETS

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PLOT DATE: June 11, 2012 FILE: N:\SAB048800\CADD\CIVIL\IP\PD-1.DWG

Appendix B CNDDB, CNPS and USFWS Lists

CNPS California Native Plant Society — Rare and Endangered Plant Inventory

Plant List

1 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37121C1**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	1B.2	S2.2	G2

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

CNPS California Native Plant Society Rare and Endangered Plant Inventory

Plant List

1 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37121B1**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
California macrophylla	round-leaved filaree	Geraniaceae	annual herb	1B.1	S2	G2

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

CNPS California Native Plant Society — Rare and Endangered Plant Inventory

Plant List

4 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37120B8**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	1B.2	S2	G3T2
California macrophylla	round-leaved filaree	Geraniaceae	annual herb	1B.1	S2	G2
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.1	S2	G2T2
Stuckenia filiformis ssp. alpina	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb	2B.2	S3	G5T5

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

CNPS California Native Plant Society — Rare and Endangered Plant Inventory

Plant List

10 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37120C8**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	1B.2	S2	G3T2
Atriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	1B.2	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	1B.2	S2	G2
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.1	S2	G2T2
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	1B.1	S1	G1Q
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	1B.2	S2.2	G2
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	3.1	S2.2	G5T2Q
Navarretia prostrata	prostrate vernal pool navarretia	Polemoniaceae	annual herb	1B.1	S2	G2
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb	1B.2	S3	G3

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

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About the Inventory
About the Rare Plant Program
CNPS Home Page
About CNPS
Join CNPS

Contributors
The Calflora Database
The California Lichen Society

CNPS California Native Plant Society — Rare and Endangered Plant Inventory

Plant List

1 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37120D8**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	1B.1	S2	G2

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

CNPS California Native Plant Society — Rare and Endangered Plant Inventory

Plant List

5 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad **37121D1**

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	1B.2	S2	G3T2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	1B.1	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	1B.2	S2	G2
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	1B.1	S1	G1Q

Suggested Citation

CNPS, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 19 May 2014].

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Newman (3712131) or Crows Landing (3712141) or Hatch (3712048) or Gustine (3712038) or Ingomar (3712028) or Howard Ranch (3712121))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Atriplex persistens vernal pool smallscale	PDCHE042P0	None	None	G2	S2	1B.2
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G1	S1	
Branchinecta longiantenna longhorn fairy shrimp	ICBRA03020	Endangered	None	G1	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S2	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Chloropyron molle ssp. hispidum hispid salty bird's-beak	PDSCR0J0D1	None	None	G2T2	S2	1B.1
Circus cyaneus northern harrier	ABNKC11010	None	None	G5	S3	SSC
Cismontane Alkali Marsh Cismontane Alkali Marsh	CTT52310CA	None	None	G1	S1.1	
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T3Q	S3	WL
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1Q	S1	1B.1
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3?	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4?	
Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.1
Oncorhynchus mykiss irideus steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2	S2	
Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061	None	None	G4T2T3	S2S3	
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Stuckenia filiformis ssp. alpina slender-leaved pondweed	PMPOT03091	None	None	G5T5	S3	2B.2
Sycamore Alluvial Woodland Sycamore Alluvial Woodland	CTT62100CA	None	None	G1	S1.1	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Sacaton Grassland	CTT42120CA	None	None	G1	S1.1	
Valley Sacaton Grassland						
Valley Sink Scrub	CTT36210CA	None	None	G1	S1.1	
Valley Sink Scrub						
Vulpes macrotis mutica	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3	
San Joaquin kit fox						

Record Count: 43

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the NEWMAN (424D) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila

blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the HOWARD RANCH (404A) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the INGOMAR (403B) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta longiantenna
longhorn fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the GUSTINE (423C) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)
Critical habitat, Conservancy fairy shrimp (X)

Branchinecta longiantenna
Critical habitat, longhorn fairy shrimp (X)
longhorn fairy shrimp (E)

Branchinecta lynchi
Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the HATCH (423B) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the CROWS LANDING (424A) U.S.G.S. 7 1/2 Minute Quad

Report Date: May 19, 2014

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Vulpes macrotis mutica
San Joaquin kit fox (E)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
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- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Appendix C Agency Coordination

Dayna Hambrick

From: Paulson, Sarah@Wildlife <Sarah.Paulson@wildlife.ca.gov>
Sent: Tuesday, October 08, 2013 3:24 PM
To: Dayna Hambrick
Subject: RE: California Central Irrigation District Main Canal at Shiells Road, Stanislaus County

Hi Dayna,

At this location, it does not appear that the CCID Main Canal is jurisdictional and would not require Notification.

Please let me know if you have any additional questions or concerns.

Take Care,

Sarah Paulson
Environmental Scientist
Lake and Streambed Alteration Program
California Department of Fish and Wildlife
1234 East Shaw Avenue
Fresno, CA 93710
(559) 243-4014 ext. 293

From: Dayna Hambrick [mailto:Dayna.Hambrick@lsa-assoc.com]
Sent: Thursday, October 03, 2013 10:09 AM
To: Paulson, Sarah@Wildlife
Subject: California Central Irrigation District Main Canal at Shiells Road, Stanislaus County

Hi Sarah,

Mike Trueblood in our office passed along your contact information to me since I have a question regarding jurisdiction at a proposed project of ours. The proposed bridge replacement project is located where Shiells Road crosses over the California Central Irrigation District Main Canal, located approximately 2 miles west of the city of Newman in Stanislaus County. I have attached a kmz file showing the location.

Is the irrigation canal, at this location, subject to section 1600 of Fish and Game Code? Would the proposed bridge replacement require a Lake and Streambed Alteration Agreement?

Thank you,
Dayna Hambrick
Assistant Biologist
LSA Associates, Inc
4200 Rocklin Rd, Suite 11B
Rocklin, CA 95677
(916) 630-4600

Dayna Hambrick

From: Dayna Hambrick
Sent: Wednesday, October 23, 2013 11:44 AM
To: Dayna Hambrick
Subject: FW: CCID Main Canal (Shiells Road) near Newman, CA

From: Mike Trueblood
Sent: Wednesday, October 23, 2013 11:38 AM
To: Dayna Hambrick; Jeff Bray (Jeff.Bray@lsa-assoc.com)
Subject: FW: CCID Main Canal (Shiells Road) near Newman, CA

From: Russell Landon [mailto:RLandon@ccidwater.org]
Sent: Wednesday, October 23, 2013 11:37 AM
To: Mike Trueblood
Subject: RE: CCID Main Canal (Shiells Road) near Newman, CA

Sorry to be late Mike. The Main Canal ends just north of Ike Crow Road in Crows Landing. The end facilities is a deliver gate to adjacent lands and a well of ours in the vicinity. The ACOE has been working with us on a levee project of theirs for the city of Newman involving the same canal. They understand they have no jurisdiction of our canal or water and have not attempted to claim us as a subordinate. We have great relationship with the ACOE and most projects serve a mutual benefit.

Russell

From: Mike Trueblood [mailto:Mike.Trueblood@lsa-assoc.com]
Sent: Wednesday, October 23, 2013 8:43 AM
To: Russell Landon
Subject: RE: CCID Main Canal (Shiells Road) near Newman, CA

Hey Russell – Have you had a chance to look into my query regarding any project where the ACOE asserted jurisdiction over the Main Canal yet? I just want to close the loop on my argument that it is not Waters of the U.S.

Thanks,

Mike Trueblood
Senior Biologist
LSA Associates, Inc.
4200 Rocklin Road, Suite 11B
Rocklin, CA 95677
(916) 630-4600
mike.trueblood@lsa-assoc.com

From: Russell Landon [mailto:RLandon@ccidwater.org]
Sent: Thursday, October 03, 2013 11:16 AM

To: Mike Trueblood
Subject: RE: CCID Main Canal (Shiells Road) near Newman, CA

I will let you know next week.

From: Mike Trueblood [mailto:Mike.Trueblood@lsa-assoc.com]
Sent: Thursday, October 03, 2013 9:58 AM
To: Russell Landon
Subject: RE: CCID Main Canal (Shiells Road) near Newman, CA

Thanks Russell – I was asking because the Army Corps of Engineers has recently been asserting jurisdiction over irrigation canals that are hydrologically connected to tributary navigable waters. Since that seems not to be the case here, I'd like to argue that the Main Canal is not Waters of the U.S. Do you know of any other projects associated with the Main Canal where the ACOE has asserted jurisdiction?

Thanks.

Mike

From: Russell Landon [mailto:RLandon@ccidwater.org]
Sent: Thursday, October 03, 2013 9:08 AM
To: Mike Trueblood
Subject: RE: CCID Main Canal (Shiells Road) near Newman, CA

Mike- The canal channel does terminate a the point you describe. At the end are only one or two delivery gates to service lands from there to Marshall Road.

Russell

From: Mike Trueblood [mailto:Mike.Trueblood@lsa-assoc.com]
Sent: Wednesday, October 02, 2013 2:46 PM
To: Russell Landon
Subject: CCID Main Canal (Shiells Road) near Newman, CA

Hi Russell – Jeff Bray at our office passed along your contact info to me since I have a question about the CCID Main Canal for a different project. I was trying to find the upstream and downstream extent of the canal. From what I can gather, it appears to originate near Mendota at the San Joaquin River and then travel north to approximately one mile north of Crows Landing where the canal seems to end abruptly. I just wanted to verify that the canal ends at this location and does not have some sort of underground conveyance that discharges back into jurisdictional waters.

Thanks,

Mike Trueblood
Senior Biologist
LSA Associates, Inc.
4200 Rocklin Road, Suite 11B
Rocklin, CA 95677
(916) 630-4600
mike.trueblood@lsa-assoc.com

Appendix D Representative Photos

Looking northwest toward Shiells Road Bridge.

Looking at the Shiells Road Bridge from the east.

Looking at the Shiells Road Bridge from the north.

Looking at Shiells Road Bridge from the south.

Caltrans

Shiells Road Bridge (No. 38C0180) Replacement
at CCID Main Canal
Federal Aid No. BRLO 5938 (192)

Representative Photos

SOURCE: LSA Associates, Inc. (2013).

I:\Nlt1203\AI\NESMI\Appendix D Representative Photos.ai (9-30-13).

APPENDIX C
FOUNDATION REPORT

FOUNDATION REPORT
SHIELLS ROAD BRIDGE REPLACEMENT
BRIDGE NO. 38C0180
STANISLAUS COUNTY, CALIFORNIA
(COUNTY PROJECT NO. 9609)

For

NOLTE VERTICAL FIVE
2495 Natomas Park Drive, 4th Floor
Sacramento, CA 95833

PARIKH CONSULTANTS, INC.
2360 Qume Drive, Suite A
San Jose, CA 95131

August 26, 2013 Job No. 2013-112-FDN

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FOUNDATION REPORT
SHIELLS ROAD BRIDGE REPLACEMENT
BRIDGE NO. 38C0180
STANISLAUS COUNTY, CALIFORNIA
(COUNTY PROJECT NO. 9609)

1.0 SCOPE OF WORK

This report presents the results of our geotechnical engineering investigation for the proposed new Shiells Road Bridge (Bridge No. 38C0180), as described herein, to be constructed in Stanislaus County, California. The subject bridge is located between Eastin Road and Draper Road west of Newman, over the Central California Irrigation District (CCID) main canal. The approximate location of the project is shown on the Project Location Map, Plate No. 1.

The purpose of this investigation was to evaluate the general soil and groundwater conditions at the project site, to evaluate their engineering properties, and to provide foundation design recommendations for the proposed project. The scope of work performed for this investigation included a review of the readily available geologic literature pertaining to the site, obtaining representative soil samples and logging materials encountered in the exploratory borings, laboratory testing of the collected soil samples, engineering analysis of the field and laboratory data, and preparation of this report.

The geotechnical recommendations presented in this report are intended for design input and are not intended to be used directly as specifications. These recommendations should not be used directly for bidding purposes.

2.0 PROJECT DESCRIPTION

The County of Stanislaus plans to replace the existing bridge on Shiells Road over CCID main canal with a new bridge (County project number 9609). Based on the general plan (February, 2012) provided by Nolte Vertical Five (Designer), the project will replace the existing bridge with a single span, either cast-in-place post-tension slab or precast prestressed box beam structure on reinforced concrete abutments. The new bridge will be approximately 77 feet in length and 27 feet in total width, with two 10-foot wide traffic lanes and two 2-foot wide shoulders. Other

improvements may include approach embankment and roadway widening on both sides of the bridge.

3.0 EXCEPTIONS TO POLICY

Normal procedures were assumed for construction of the bridge structure throughout our analysis and represent one of the bases of recommendations presented herein. The investigation for the proposed foundations has generally followed Caltrans guidelines.

4.0 FIELD INVESTIGATION AND TESTING PROGRAM

Two borings were drilled for this study with a truck-mounted drill rig on April 8, 2013. The drilling started with hollow-stem auger and converted to rotary wash later. Selected soil samples were obtained from an either 2.5-inch I.D. (Modified California, MC) or 1.4-inch I.D. Standard Penetration Test (SPT) sampler at various depths. The samplers were driven into subsurface soils under the impact of a 140-pound hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the Log of Test Borings (LOTBs) in Appendix A. The drilling subcontractor was Technicon Engineering Services, Inc. of Fresno, California. Based on the hammer energy calibration information provided by the drilling company, the hammer energy ratio of the drill rig (CME 55) used is approx. 85%. Using a method suggested by Daniel, Howie, and Sy (2003), when correlating standard penetration data, the blow counts for the Modified California Sampler may be converted to equivalent SPT blow counts by multiplying a conversion factor of 0.9. The soil samples were sealed and transported to our laboratory for further evaluation and testing. Two bulk soil samples within the upper about 5 feet of subgrade were also collected for R-value tests. The field investigation was conducted under the supervision of our field engineer who logged the test borings and prepared the samples for subsequent laboratory testing and evaluation. The approximate boring locations are shown on the Site Plan, Plate No. 2.

5.0 LABORATORY TESTING PROGRAM

Laboratory tests were performed on selected samples in the laboratory to evaluate the physical and engineering properties of the subsoils. The tests performed for the study included the following: Laboratory determination of Moisture-Density (ASTM Test Method D 2216), Atterberg Limits (ASTM Test Method D 4318), Grain Size Analysis (ASTM Test Method D 422), Unconfined Compression (ASTM D 2166), Corrosion Test (California Test Methods 643/417/422), and R-value Test (California Test Method 301). The corrosion tests were performed by Sunland Analytical in Rancho Cordova, California. The laboratory test results are attached in Appendix B.

6.0 SITE GEOLOGY AND SUBSURFACE CONDITIONS

6.1 Site Geology

General geologic features pertaining to the site were evaluated by reference to the Geologic Map of California, Geologic Data Map No. 2, California Geologic Survey (2010). Based on the publication, the project site and its vicinity is generally underlain by late Tertiary to Quaternary sediments including geologic units of Q, Qoa, and Qpc. Q represents Pleistocene to Holocene alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated. Qoa includes older Pleistocene to Holocene alluvium, lake, playa, and terrace deposits. Qpc represents Pliocene and/or Pleistocene sandstone, shale, and gravel deposits; mostly loosely consolidated. The underlying rocks include geologic units of E and Ep: the former represents Eocene shale, sandstone, conglomerate, and minor limestone; the latter represents Paleocene sandstone, shale, and conglomerate. Both geologic units of E and Ep are mostly well consolidated. A portion of the published Geologic Map covering the project site is attached as Plate No. 3.

6.2 Subsurface Conditions

The subsurface conditions are based on the field exploration. According to Google Earth (2012), the existing ground surface elevations are estimated to be at approximately 111 and 109 feet at boring locations of R-13-001 and R-13-002, respectively.

Boring R-13-001 was drilled at the west end of the existing bridge. The boring encountered about 6.5 feet of stiff to hard lean clay underlain by predominately medium dense gravely materials (gravel size up to about 2 inches) to about 29 feet. Below about 29 feet, the soils were mostly composed of medium dense to very dense sandy soils interbedded with stiff to hard sandy lean clay and sandy silt to the maximum depth drilled, approximately 91.5 feet.

Boring R-13-002 was drilled at the east end of the existing bridge. The boring encountered about 7.5 feet of stiff to very stiff lean clay underlain by medium dense gravel (gravel size up to about 2 inches) to about 14 feet. The soils encountered below about 14 feet consisted mainly of interbedded stiff to hard lean clay and sandy silt, medium dense to very dense sand or silty sand, and very dense clayey gravel to the maximum depth drilled, approximately 86.5 feet.

Groundwater was not encountered in the upper about 36.5 feet in R-13-001 and 26.5 feet in R-13-002, and was not measured thereafter due to rotary wash drilling method during drilling. Based on the groundwater data from the monitoring stations, published on the website of California Department of Water Resources, the historical groundwater level in the proximity of the project site could be within about 15 to 30 feet below grade.

The boring logs presented in Appendix A were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the logs. The abrupt stratum changes shown on these logs may be gradual and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the soil conditions during construction nor is it practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering services to attain a properly constructed project. Therefore, it is recommended that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

7.0 SCOUR EVALUATION

The subject should be determined by the project hydraulic study. The bridge abutments should be set back adequate distance to protect from any potential scour along the channel bank. Otherwise, canal slope protection measures should be implemented. Ultimate design should be based on the findings of hydraulic study for the project.

8.0 CORROSION EVALUATION

The corrosion investigation for this project was performed on selected soil samples in general accordance with the provisions of California Test Methods 643, 417 and 422. A summary of the corrosion test results is presented in Table 8.1. For structural elements, Caltrans Corrosion Guidelines (November 2012) consider a site to be corrosive if one or more of the following conditions exist for the representative soil/water samples at the site: Chloride concentration is 500 ppm or greater; Sulfate concentration is 2,000 ppm or greater; or the pH value is 5.5 or less.

TABLE 8.1 - CORROSION TEST RESULTS

Boring No.	Depth (ft)	pH	Minimum Resistivity (ohms-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
R-13-001	3	6.92	1,210	19.4	10.1
R-13-002	16	7.22	720	69.1	10.7

Based on the test results, the on-site materials are considered non-corrosive according to the Corrosion Guidelines by Caltrans Division of Engineering Services. Standard Type II modified or Type I-P (MS) modified cement may be used for the concrete substructures. The minimum cement factor and cover thickness may be per Section 8.22 of Caltrans Bridge Design Specifications (2003).

9.0 SEISMIC RECOMMENDATIONS

9.1 Seismic Sources

The project site is located in a seismically active part of northern California. Many faults in the San Francisco Bay Area are capable of producing earthquakes, which may cause strong ground shaking at the site. The proposed bridge site is located at coordinates of approximately 37.3040 degrees north latitude and 121.0595 degrees west longitude. The information of the relevant faults in the area based on the Caltrans ARS Online Report (V2, 2012) is summarized in Table 9.1. The maximum magnitudes represent the largest earthquake that a fault is capable of generating and is related to the seismic moment. The attached Fault Map, Plate No. 4, presents the locations of the fault system relative to the project site.

TABLE 9.1 - EARTHQUAKE INFORMATION

Fault	Fault ID	Maximum Magnitude (M_{max})	Fault Type	Approx. Nearest Distance (miles)
Great Valley 07 (Orestimba)	138	6.7	R	0.41
Great Valley 08 (Quinto)	160	6.8	R	3.65
Ortigalita Fault Zone (Ortigalita-Cottonwood Arm section)	159	7.0	SS	11.88
Greenville (So) 2011 CFM	144	6.9	SS	25.27

R = Reverse fault
SS = Strike-slip fault

9.2 Seismic Design Criteria

The Caltrans ARS Online (V2, 2012) program was used for development of acceleration response spectra. Development of the design ARS curve is based on several input parameters, including site location (longitude/latitude), average shear wave velocity for the upper 100 feet (30 m, V_{s30}) of soils, and other site parameters, such as fault characteristics, site-to-fault distances. The design methods incorporate both deterministic and probabilistic seismic hazards to produce the Design Response Spectrum. The probabilistic response spectrum to be used for design of structures is based on the data from the USGS Interactive Deaggregations (Beta) program (2008) for a 5% in 50 years probability of exceedance (975-year return period) or the Caltrans ARS Online program. The controlling spectrum (upper envelope) is adopted for design response spectrum.

The average shear wave velocity for the upper 100 feet of soils at the bridge site was estimated by using the established correlations and guidelines in the Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations (November 2012). An average shear wave velocity of 245 m/sec was adopted. According to the Caltrans guidelines, the USGS Beta program should be checked and compared with the Caltrans ARS Online program for four probabilistic spectral outputs (at periods of 0, 0.3, 1 and 3 sec.). If the discrepancy between the USGS spectral acceleration values and the Caltrans Online results is less than 10%, then the probabilistic ARS curve generated by Caltrans ARS Online is acceptable for design. For this project, the Caltrans Online probabilistic ARS curve governs. A near fault factor of 20% increase has been applied to the curves with periods of 1.0 second and longer, and tapered to zero at a period of 0.5 second. No adjustments are needed for basin effect. The ARS Comparison Curves and Recommended ARS Curve are included on Plates No. 5A and 5B, respectively.

9.3 Seismic Hazard

Faulting

The project site is located outside the designated State of California "Earthquake Fault Zones" (2010) for active faulting and no mapped evidence of active or potentially active faulting was found for the site. The potential for fault rupture at the project site is considered to be low.

Liquefaction

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and low-plastic silts of low relative density are the type of soils that usually are susceptible to liquefaction. Clay is generally not susceptible to liquefaction. The liquefaction potential was evaluated according to the procedure proposed by Youd et al. (2001).

Using the Caltrans ARS Online and reference to the USGS Beta online program, peak ground acceleration (PGA) was estimated to be 0.49g and the moment magnitude was estimated to be 6.6, representing a hazardous level of 5% exceedance in 50 years. The above seismic parameters were incorporated into the liquefaction analysis. In general, for sand layer with liquefaction factor of safety of 1.10 and greater, liquefaction potential is considered to be relatively low. For potentially liquefiable soils located below 50 feet, liquefaction should generally have minor impact on the foundation according to Martin and Lew (1999).

At the time of our filed investigation, groundwater appeared to be located at deeper than 40 feet below grade. Since the most medium dense granular materials were encountered in the upper about 40 feet, liquefaction potential at the site is considered to be relatively low. However, if groundwater rises to historical high, approximately within 15 to 30 feet below grade, the possibility of liquefaction will increase. Based on the calculations, the medium dense gravel and sand, encountered approximately between 15 and 31 feet, and 36 and 39 feet in R-13-001; between

19 and 30 feet as well as between 38 and 43 feet in R-13-002, appear to be potentially liquefiable if they become saturated. Post-liquefaction settlement was calculated to be about 2 to 4 inches. Post-liquefaction settlement will create downdrag force on the deep foundation, which should be considered when calculating pile capacity. Liquefaction calculations are attached in Appendix C.

10.0 AS-BUILT FOUNDATION DATA

Based on the information obtained from the County web site, capital improvement plan of fiscal year 2011-2012, the existing bridge was built in 1928. The bridge consists of continuous 3 span reinforced T-beam, reinforced concrete end diaphragm abutments, and solid pier walls on spread footings. The entire bridge span length is about 62 feet. The bridge was determined to be functionally obsolete with a sufficiency rating of 52.4.

11.0 FOUNDATION RECOMMENDATIONS

11.1 General

This report was prepared specifically for the proposed project as described earlier. Normal procedures were assumed for construction of the bridge structure throughout our analysis and represent one of the bases of recommendations presented herein. The design criteria have been based upon the materials encountered at the site. Therefore, we should be notified in the event that these conditions are changed, so as to modify or amend our recommendations.

11.2 Foundations

Based on the subsurface conditions and the proposed structure, foundation system consisting of driven steel pipe pile such as Caltrans standard steel pipe pile Alternative “W” (PP 16 x 0.5 inches), open ended, is selected. Driven precast prestressed concrete pile was also considered. However, due to the load demand and required pile length, the pile may not be able to penetrate

through very dense gravel layer encountered in the boring, and therefore was not selected. The SPT blow counts in soils, after corrected for hammer energy ratio of the drill rig, are mostly less than 45. Isolated soil layers below about 40 feet have corrected SPT blow counts of 50 to 90. Relatively hard driving condition may be encountered at localized locations. A minimum pile spacing of three (3) times the pile diameter, center to center, is recommended. Per Caltrans Memo to Designers 3-1 (2008), the design will be based on Working Stress Design (WSD) for the foundations at the abutments, which will use load of LRFD Service-I limit state. Pertinent foundation design information provided by the Designer, including Foundation Design Data and Foundation Design Loads, are tabulated in Tables 11.1 and 11.2.

TABLE 11.1 - FOUNDATION DESIGN DATA

Support	Design Method	Pile Type	Finish Grade Elev. (ft)	Pile Cut-off Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement (in)	No. of Piles per Support
					B	L		
Abut 1	WSD	Alt. "W" PP 16 x 0.5	115.02	105.02	2.5	41.07	1.0	5
Abut 2	WSD	Alt. "W" PP 16 x 0.5	115.01	105.01	2.5	41.07	1.0	5

TABLE 11.2 - FOUNDATION DESIGN LOADS

Support	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Load		Perm. Loads	Compression		Tension		Compression		Tension	
	Per Support	Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile
Abut 1	941.1	190	719.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Abut 2	941.1	190	719.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

11.3 Axial Capacity Analysis

The pile axial capacity was calculated based on guidelines by American Petroleum Institute (API) publication (2007). Computer program APILE PLUS V5.0 (Ensoft, Inc., 2007) was used for pile axial capacity calculation. The API method utilizes a K factor (K=0.8) for cohesionless soils, and α factor for cohesive soils where α is a function of undrained shear strength and effective overburden. The pile axial capacity is derived from frictional resistance along the outer surface of

the pipe pile and end bearing, assuming that plug will be developed at the toe of the pipe pile. Using empirical correlations between soil friction angle and SPT blow count (N_{60}), presented in Coduto (1999), internal friction angles ranging from 32 to 40 degrees were adopted for sand and gravel. Undrained shear strengths of clay were estimated based on lab test results, and correlation with N_{60} recommended by US Army Corps of Engineering (1992). Undrained shear strengths ranging from 1 to 3 ksf were used for clayey materials. Under the design service load, pile settlement is estimated to be less than 0.25 inch. The APILE computer calculation results are presented in Appendix C.

11.4 Downdrag Force

As discussed earlier in Section 9.3, if the medium dense gravel and sand encountered within the upper about 40 feet become saturated, the potential of liquefaction will increase and the post-liquefaction settlement was estimated to be about 2 to 4 inches. Liquefaction induced relative settlement of more than 0.6 inch will create downdrag force on the pile foundation according to NAVFAC DM 7.02 (1986). Downdrag force was estimated using correlation recommended in NAVFAC DM 7.02 (1986). The magnitude of negative skin friction on pile was calculated by multiplying the effective overburden above the liquefied sandy layer with an empirical factor that is 0.5 for sandy soils. Based on the top pile elevation at 105 feet and pile diameter of 16 inches, downdrag force was estimated to be about 70 kips per pile for the portion of pile above liquefied soils (Depth ~ 30 to 31 feet or Elev. ~79 to 80 ft). Donwdrag force was included into the pile axial capacity calculation. In our opinion, the liquefiable sand layers encountered between 36 and 39 feet in R-13-001, and from 38 to 43 feet in R-13-002 appear to be isolated, and since they are sandwiched by dense sand or clayey soils, liquefaction in these layers should not have significant impact to the foundations. However, the soil resistance between 36 and 39 feet in R-13-001 and 38 and 43 feet in R-13-002 should be neglected when calculating pile axial capacity for conservativeness.

11.5 Foundation Recommendations

The recommended pile tip elevations based on axial and lateral loads as well as downdrag force are

presented in Table 11.3. The computer calculation results of axial and lateral capacity analysis are presented in Appendix C.

TABLE 11.3 - FOUNDATION RECOMMENDATIONS

Support	Pile Type	Cut-off Elev. (ft)	LRFD Service-I Limit State Load (kips) per Support		LRFD Service-I Limit State Total Load (kips) per Pile (Compression)	Nominal Resistance (kips)	Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
			Total	Perm.					
Abut 1	Alt. "W" PP 16 x 0.5	105.02	941.1	719.6	190	380	25.0 (a) 75.0 (b) 25.0 (c)	25.0	550
Abut 2	Alt. "W" PP 16 x 0.5	105.01	941.1	719.6	190	380	25.0 (a) 75.0 (b) 25.0 (c)	25.0	550

Design tip elevations are controlled by (a) compression, (b) lateral, and (c) downdrag.

11.6 Lateral Capacity Analysis

The pile lateral capacity was analyzed using LPILE V6.0 program of Ensoft, Inc. (2012). The geotechnical parameters presented in Tables 11.4 and 11.5 were adopted for lateral capacity analysis. Based on the foundation design data provided by the Designer, the piles at both abutments are arranged in a single row with pile spacing greater than four times the pile diameter. For pile group efficiency, *p*-multiplier of 1.0 and *y*-multiplier of 1.0 were used for the loading direction perpendicular to the row when performing LPILE analysis. Groundwater was set at about 15 feet below the existing grade. Liquefiable sandy soils were assigned with residual shear strengths as recommended in Caltrans Guidelines on Foundation Loading and Deformation Due to Liquefaction Induced Lateral Spreading (January 2012). The pile lateral capacity was estimated under service load of 190 kips and free head condition. The lateral pile top displacement under Service Limit State Load is generally limited to 0.25 inch. However, the final allowable pile top movement may be determined by the Designer considering the overall design conditions.

TABLE 11.4 - LPILE PARAMETERS FOR ABUTMENT 1 (R-13-001)

Approx. Elevation (ft.)	Generalized Soil Profile	LPILE Soil Type	Soil Strength	K (pci)	E_{50} (in/in)	Effective Unit Wt. (pcf)
Above 105	Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 1,250 psf	N/A	Default	125
105 to 96	Well-Graded Gravel	Sand (Reese)	$\phi = 34°$	Default	N/A	125
96 to 88	Well-Graded Gravel	Sand (Reese) (without liquefaction)	$\phi = 34°$	20	N/A	60
		Soft Clay (Matlock) (with liquefaction)	C = 500 psf	N/A	0.05	60
88 to 80	Well- and Poorly-Graded Gravel / Silty Sand	Sand (Reese) (without liquefaction)	$\phi = 32°$	20	N/A	60
		Soft Clay (Matlock) (with liquefaction)	C = 350 psf	N/A	0.05	60
80 to 75	Sandy Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 1,000 psf	N/A	Default	60
75 to 72	Silty Sand	Sand (Reese) (without liquefaction)	$\phi = 32°$	20	N/A	60
		Soft Clay (Matlock) (with liquefaction)	C = 300 psf	N/A	0.05	60
72 to 67	Silty Sand	Sand (Reese)	$\phi = 38°$	Default	N/A	60
67 to 63	Sandy Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 3,000 psf	N/A	Default	60
63 to 25	Clayey Sand / Silty Sand / Poorly-Graded Sand / Sandy Silt	Sand (Reese)	$\phi = 36°$	Default	N/A	60
Below 25	Silty Sand	Sand (Reese)	$\phi = 38°$	Default	N/A	60

TABLE 11.5 - LPILE PARAMETERS FOR ABUTMENT 2 (R-13-002)

Approx. Elevation (ft.)	Generalized Soil Profile	LPILE Soil Type	Soil Strength	K (pci)	E_{50} (in/in)	Effective Unit Wt. (pcf)
Above 101	Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 1,000 psf	N/A	Default	125
101 to 95	Poorly-Graded Gravel	Sand (Reese)	ϕ = 36°	Default	N/A	125
95 to 90	Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 3,000 psf	N/A	Default	60
90 to 79	Silty Sand / Poorly-Graded Sand	Sand (Reese) (without liquefaction)	ϕ = 36°	Default	N/A	60
		Mod. Stiff Clay w/o Free Water (with liquefaction)	C = 800 psf	N/A	0.05	60
79 to 75	Silty Sand	Sand (Reese)	ϕ = 38°	Default	N/A	60
75 to 71	Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 1,000 psf	N/A	Default	60
71 to 66	Silty Sand	Sand (Reese) (without liquefaction)	ϕ = 34°	20	N/A	60
		Mod. Stiff Clay w/o Free Water (with liquefaction)	C = 700 psf	N/A	0.05	60
66 to 46	Lean Clay	Stiff Clay w/o Free Water (Reese)	C = 3,000 psf	N/A	Default	60
46 to 36	Clayey Gravel	Sand (Reese)	ϕ = 40°	Default	N/A	60
36 to 26	Silty Sand	Sand (Reese)	ϕ = 33°	Default	N/A	60
Below 26	Sandy Silt	Sand (Reese)	ϕ = 38°	Default	N/A	60

11.7 Lateral Earth Pressures

Abutment and wing walls should be designed to resist the following Applied Lateral Earth Pressures. These values assume no hydrostatic pore pressure buildup behind the walls. The walls should be provided with permanent drains to prevent the buildup of hydrostatic pressures. The

backfill materials should confirm to the structure backfill requirements contained in Section 19 of the Caltrans Standard Specifications (2010).

Active Condition	36 pcf Equivalent Fluid Pressure (EFP).
At-Rest Condition	55 pcf Equivalent Fluid Pressure.
Passive Resistance	5 ksf (ultimate) for seismic design of the abutment backwall (5.5 feet high or greater); for activated height less than 5.5 feet, modify proportionally, i.e. 5×(H/5.5) ksf per Caltrans Seismic Design Criteria (V1.6, 2010). A minimum lateral wall movement of 2% of wall height to mobilize the full ultimate passive pressure is required.

Cantilever walls which are free to rotate at least 0.004 radian may be assumed flexible for the active condition. Walls that are not capable of this movement should be assumed rigid and designed for the at-rest condition. The effect of any surcharges (dead or live loads) should be added to the preceding lateral earth pressures. An equivalent earth pressure of not less than 2 feet of uniform soil weight at 125 pcf should be used if the traffic is within a horizontal distance of the wall height. A coefficient of 0.3 and 0.5 may be used to determine the additional horizontal earth pressure resulting from the surcharge for active and at-rest conditions, respectively. The horizontal earth pressure in front of the abutment walls should be ignored.

12.0 PAVEMENT SECTIONS

Pavement design for flexible pavement sections using hot mix asphalt (HMA, formerly Asphalt Concrete) is based on the current Caltrans Highway Design Manual (2012). The R-value of the existing subgrade material is tested to be 22. However, the pavement design of the approach roadway is governed by the R-value of the planned embankment material. Since import fill material will be brought in for approach embankment, it is recommended to use an R-value of 15 for approach pavement design. Table 12.1 presents the recommendations for design of structural

pavement sections based on varying Traffic Indices (TI). The TIs represent 20 years of design life. Caltrans Standard Specifications (2010) should be referred for materials (HMA, AB and AS) to be used and their placement and compaction.

TABLE 12.1 - ALTERNATIVE STRUCTURAL PAVEMENT SECTIONS

TI	R-value	Structural Pavement Section (ft)					
		Option 1	Option 2		Option 3		
		Full-Depth HMA	HMA	AB	HMA	AB	AS
6	15	0.70	0.30	0.90	0.30	0.50	0.50
6.5	15	0.75	0.30	1.05	0.30	0.55	0.50
7.0	15	0.85	0.35	1.05	0.35	0.55	0.55
7.5	15	0.90	0.40	1.15	0.40	0.55	0.65
8.0	15	0.95	0.40	1.25	0.40	0.65	0.70

HMA: Hot Mix Asphalt (Type A);
AB: Aggregate Base (Class 2) with R-value equal to 78;
AS: Aggregate Sub-base (Class 2) with R-value equal to 50.

13.0 GRADING

All grading and compaction operations should be performed in accordance with the project specifications and Section 19 “Earthwork” of Caltrans Standard Specifications (2010). A representative from this office or regulating agency should observe all excavated areas during grading and perform moisture and density tests on prepared subgrade and compacted fill material.

Areas to receive embankment fill should be clean of vegetation, shrubs, trees, and their roots greater than 1.5 inches in diameter. If any soft or saturated soils are encountered during site grading, deeper excavation may be required to expose firm soils.

Any fill materials imported to the project site should be non-expansive, relatively granular material having a Plasticity Index (PI) of less than 15 and a minimum Sand Equivalent (SE) of 10. The maximum particle size of fill material should not be greater than 4 inches in largest dimension. It

should also be non-corrosive, free of deleterious material and should be reviewed by the Geotechnical Engineer. In addition, it is recommended that the material within 4 feet of the proposed pavement subgrade have a minimum R-value of 15. The on-site soils may be used as engineered fill, provided they meet the above criteria.

For permanent fill slope, a maximum slope gradient of 2H:1V (horizontal to vertical) is recommended. It should be noted that local irregularities such as loose layers and pockets and seepage might require flatter slopes. This office should review the final grading plans prior to grading to see that the intent of our recommendations is included in the plans.

14.0 CONSTRUCTION CONSIDERATIONS

14.1 General

To a degree, the performance of any structure is dependent upon construction procedures and quality. Hence, observation of pile construction and grading operations should be carried out by the geotechnical engineer. If the encountered subsurface conditions differ from those forming the basis of our recommendations, this office should be informed in order to assess the need for design changes. Therefore, the recommendations presented in this report are contingent upon good quality control and these geotechnical observations during construction.

14.2 Pipe Pile Installation

The contractor should furnish specific data of pile driving equipment, operating hammer and energy information. If unanticipated pile driving conditions are encountered during production driving, further consultation may be required.

Caltrans Standard Specifications (2010), Section 49 “Piling,” and standard special provisions (SSP) should be followed for construction of steel pipe piles. The contractor should carefully examine the subsurface conditions and make his own interpretation and perform independent study

on the constructability of the piles. Due to dense sand and hard silt and clay layers, moderate to hard driving conditions should be anticipated. Pile capacity is expected to develop after driving as a result of soil "freeze" and dissipation of excess pore water pressure. The gain of pile capacity after initial driving may be evaluated based on "redriving" after a minimum of 24-hour set-up. The Gates formula in Caltrans Standard Specifications (2010), Section 49-2.01A, may be used in the field for driving and capacity verification. All piles installation should be observed by the geotechnical engineer or regulation agency. In the event that unanticipated pile driving conditions are encountered, it is recommended that a Pile Driving Analyzer (PDA) be used to evaluate the pile capacity. Typical applications of the PDA include capacity evaluation during driving and re-striking.

14.3 Waiting Period

About 5 feet of fill for new approach embankments and roadway widening is expected, which needs to be confirmed once grading plan is made available. Since no saturated soft materials were encountered in our borings, the settlement due to fill is anticipated to be minor and should generally occur during construction. Waiting period is not required. However, it is recommended that the approach embankment be constructed before starting installation of pile foundation.

14.4 Construction Dewatering

Groundwater was not encountered during drilling. The historical groundwater level is about 15 to 30 feet below grade. Groundwater may cause instability of excavation walls and bottom (piping, erosion, blow-outs, etc.) and difficult working conditions. For excavation below the groundwater table, construction dewatering will be required. The contractor should evaluate the subsurface conditions before selecting a dewatering method, which may include shoring, sumps or tremie slabs. Groundwater should be lowered to at least 2 feet below the bottom of excavation to provide workable condition. Designing dewatering system should be the contractor's responsibility.

14.5 Temporary Excavation and Shoring

Excavation will be required for installation of foundations. It is possible that unknown old buried utilities are located at the site. It might require special equipment and additional efforts to remove these buried objects.

According to OSHA Safety Standards, temporary excavations with personnel working within the excavations should be sloped or shored if the excavations are deeper than 5 feet. All excavations for the project should be made and supported in accordance with OSHA standards. For excavations up to 20 feet deep in homogenous soils, OSHA guidelines state that the maximum allowable slope should be 3/4H:1V, 1H:1V and 1-1/2H:1V for Types A, B and C soil, respectively (In general, Type A soils are stronger; Type B soils are intermediate, and Type C soils are weaker). The on-site native soils should be considered as OSHA Type C materials. It should be noted that the slope ratio recommended by OSHA is for temporary, unsurcharged slopes and properly dewatered conditions. Traffic and surcharge loads should be set back at least 15 feet from the top of the excavations unless they are accounted for in the design.

The excavation should be closely monitored during construction to detect any evidence of instability, soil creep, settlement, etc. Appropriate mitigation measures should be implemented to correct such situations that may cause or lead to future damage to facilities, utilities and other improvements.

15.0 NOTES TO DESIGNER

The pile lateral and vertical capacity analyses and recommendations for pile design presented in this report are based on the information available at this time. It should be noted that the lateral resistance estimated is based on assumption that channel banks are protected from scour and erosion. Final design of the foundation system should be confirmed after the scour study and its mitigation and the foundation loads are confirmed. Pile group effect coefficient *p*-multiplier of 1.0 was used for pile lateral capacity analysis based on that pile spacing is greater than four times pile diameter. If pile spacing is less than four times the pile diameter, *p*-multiplier will be less than 1.0

and consequently, the pile lateral resistance will decrease.

Should there be any alterations of the proposed construction that will affect the stated bases of our recommendations, we should be informed so that we can review such changes and amend or submit additional recommendations.

16.0 PLAN REVIEW

This report is prepared for the proposed Shiells Road Bridge replacement project. It is recommended that the final foundation plans for the subject project be reviewed by this office prior to construction so that the intent of our recommendations is included in the project plans and specifications and to further see that no misunderstandings or misinterpretations have occurred.

17.0 INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our site reconnaissance and the assumption that the subsurface conditions do not deviate from observed conditions. All work done is in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings. The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the proposed project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our conclusions and recommendations shall not be considered valid unless the changes or variations are reviewed and our recommendations modified or approved by us in writing.

This report is issued with the understanding that it is the Designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the subsurface conditions can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Respectfully submitted,
PARIKH CONSULTANTS, INC.

Peter Haoli Wei, PE, GE 2922
Project Engineer

Y. David Wang, PhD. P.E. 52911
Project Manager

REFERENCES

1. American Petroleum Institute (API), 2007, Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms-Working Stress Design, (RP 2A-WSD).

2. Caltrans, 2010, Standard Plans.

3. Caltrans, 2010, Standard Specifications.

4. Caltrans, 2012, Highway Design Manual.

5. Caltrans, November 2012, Corrosion Guidelines, V2.0.

6. Caltrans, November 2010, Seismic Design Criteria, V1.6.

7. Caltrans, 2012, ARS Online, Version 2, (http://dap3.dot.ca.gov/ARS_Online/index.php).

8. Caltrans, November 2012, Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations.

9. Caltrans, 2010, Soil & Rock Logging, Classification, and Presentation Manual, Office of Structural Foundations California Department of Transportation.

10. Caltrans, August 2009, Geotechnical Services Design Manual, Version 1.0.

11. Caltrans, updated December 2009, Guidelines for Structure Foundation Reports, Version 2.0.

12. Caltrans, November 2011, California Amendments to AASHTO LRFD Bridge Design Specifications, 4th Edition.

13. Caltrans, January 2012, Guidelines on Foundation Loading and Deformation Due to Liquefaction Induced Lateral Spreading.

14. Caltrans, 2008, Memo to Designers 3-1.

15. California Geological Survey, 2010, Geologic Map of California, Geologic Data Map No. 2, Compilation and Interpretation by Jennings, C. W. (1977).

16. California Geological Survey, 2010, Fault Activity Map of California, Geologic Data Map No. 6, Compilation and Interpretation by Jennings, C. W. and Bryant, W. A.

17. Coduto, D. P., 1999, *Geotechnical Engineering, Principles and Practices*, Prentice-Hall, Inc., Upper Saddle River, NJ, p 511-512.

18. Daniel, C. R., Howie, J. A. and Sy, A., 2003, 'A Method for Correlating Large Penetration Test (LPT) to Standard Penetration Test (SPT) Blow Counts,' *Canadian Geotechnical Journal*, 40:66-77, 2003.

19. Ensoft, Inc., 2007, APILE Plus 5.0; 2012, LPILE 6.0.

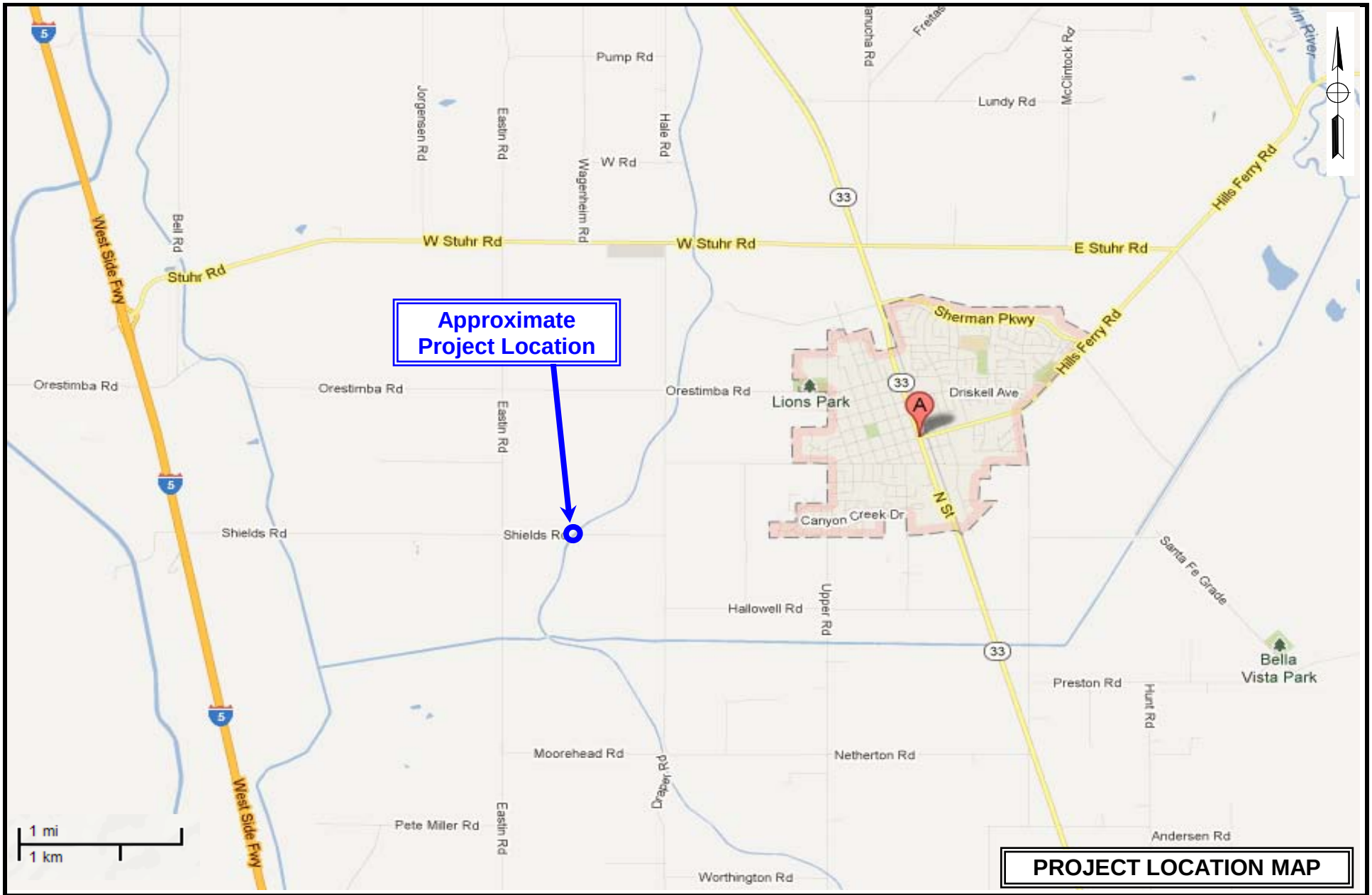
20. Martin, G. R. and Lew, M., Co-Chairs and Editor, 1999, Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Liquefaction Hazards in California.

21. NAVFAC, 1986, DM 7.2.

22. US Army Corps of Engineering, 1992, Engineering and Design – Bearing Capacity of Soils, EM 1110-1-1905.

23. USGS, 2008, Online Interactive Deaggregation Program (Beta), (https://geohazards.usgs.gov/deaggint/2008/).

24. Youd, T. L. and Idriss, I. M., Co-Chairs, 2001, 'Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils,' ASCE, *Journal of Geotechnical and Geoenvironmental Engineering*, V. 127, No. 4, p 297-313.



PROJECT LOCATION MAP

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SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN	PLATE NO.: 1

SITE PLAN

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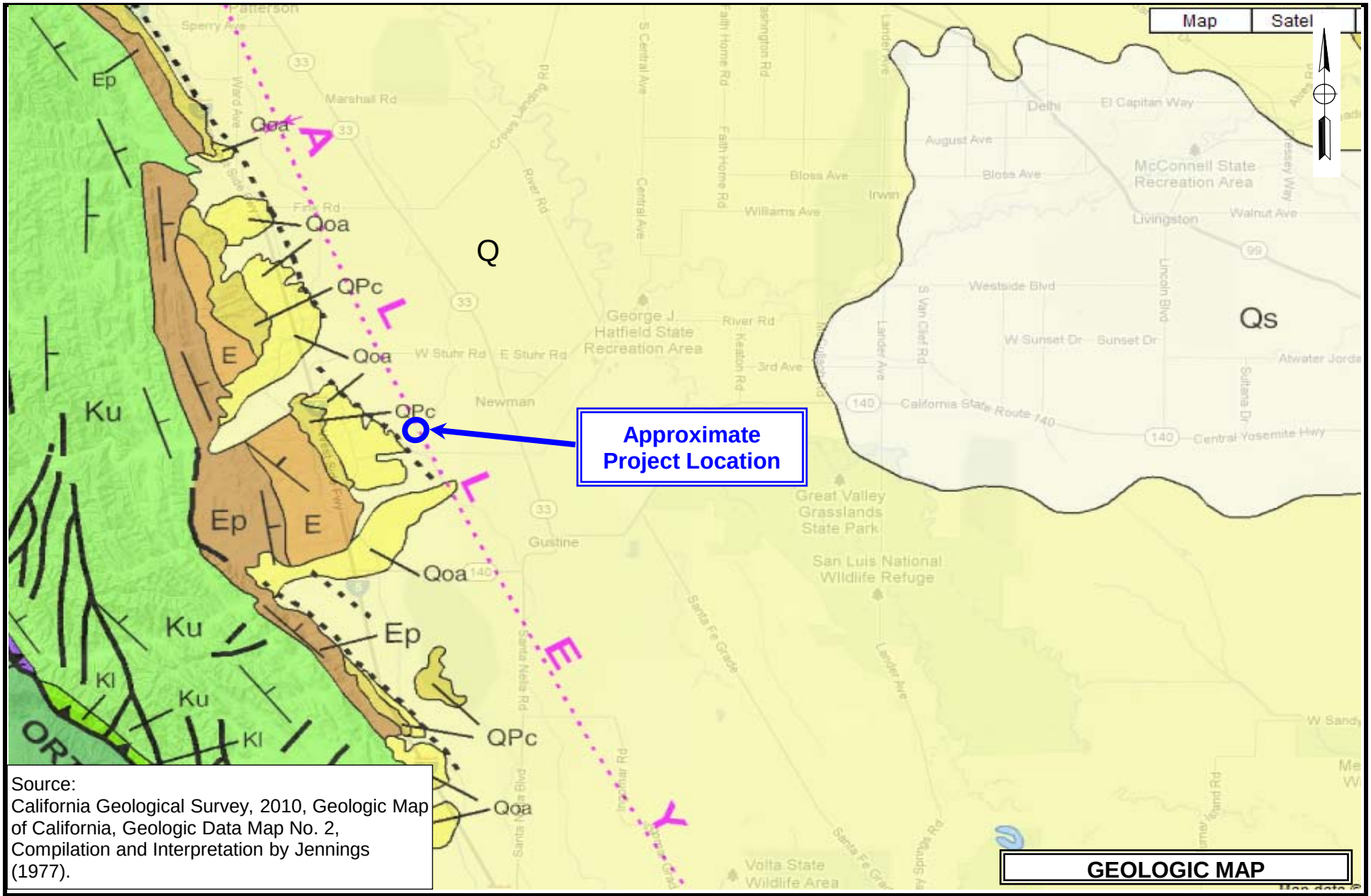
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN | **PLATE NO.: 2**



Source:
California Geological Survey, 2010, Geologic Map of California, Geologic Data Map No. 2, Compilation and Interpretation by Jennings (1977).

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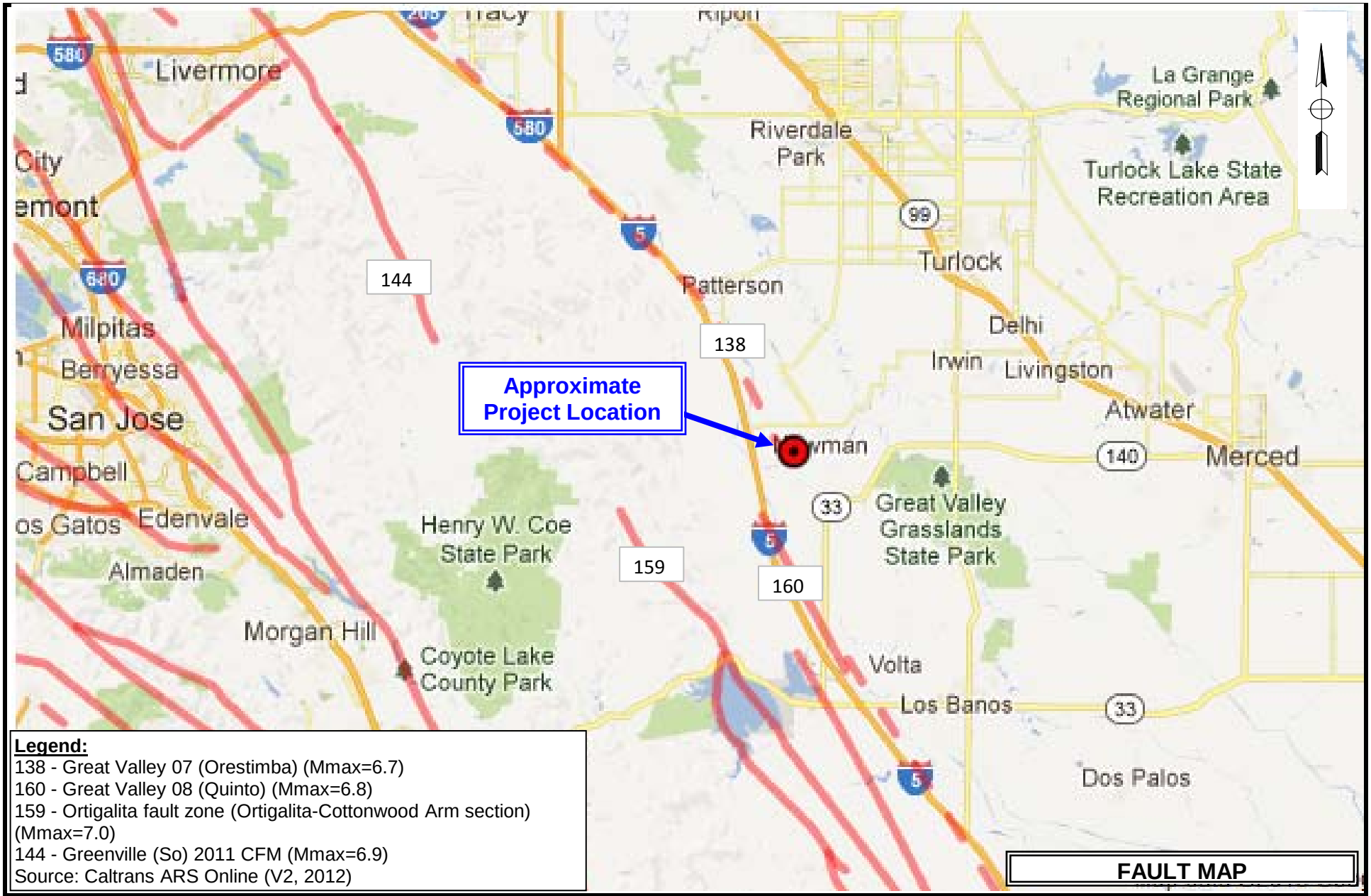
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN	PLATE NO.: 3



Legend:
138 - Great Valley 07 (Orestimba) (Mmax=6.7)
160 - Great Valley 08 (Quinto) (Mmax=6.8)
159 - Ortigalita fault zone (Ortigalita-Cottonwood Arm section) (Mmax=7.0)
144 - Greenville (So) 2011 CFM (Mmax=6.9)
Source: Caltrans ARS Online (V2, 2012)

FAULT MAP

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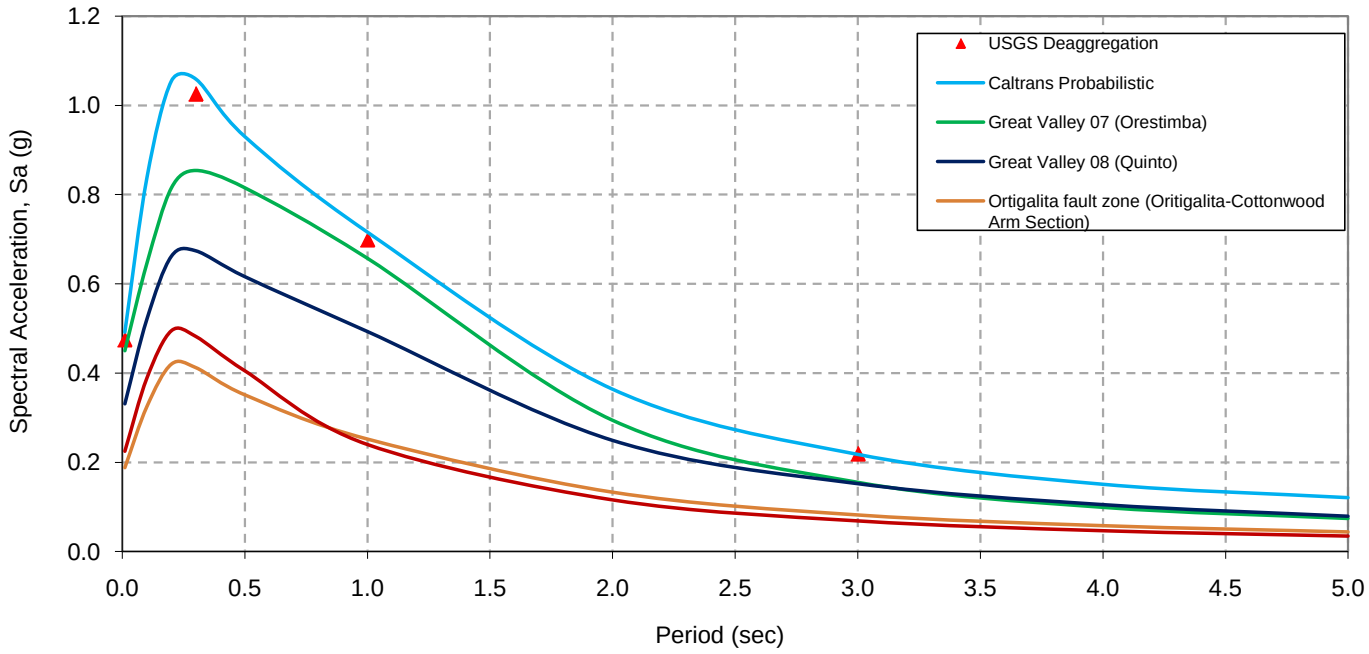
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN

PLATE NO.: 4

ACCELERATION RESPONSE SPECTRUM COMPARISON

(Deterministic & Probablistic Curves)



Site Information

Latitude:	37.3040
Longitude	-121.0595
V_{S30} (m/s) =	245
$Z_{1.0}$ (m) =	N/A
$Z_{2.5}$ (km) =	N/A
Near Fault Factor, Derived from USGS Deagg. Dist (km) =	7.5

Final Adjusted Spectral Accelerations (g)						
Period (sec)	Great Valley 07 (Orestimba)	Great Valley 08 (Quinto)	Ortigalita fault zone (Oritigalita-Cottonwood Arm Section)	Minimum Deterministic	Caltrans Probabilistic	USGS Deaggregation
0.0	0.450	0.331	0.188	0.225	0.492	0.475
0.1	0.646	0.521	0.325	0.389	0.838	
0.2	0.815	0.662	0.420	0.495	1.055	
0.3	0.854	0.674	0.412	0.482	1.059	1.026
0.5	0.815	0.616	0.351	0.405	0.930	
1.0	0.657	0.493	0.252	0.240	0.716	0.699
2.0	0.294	0.249	0.133	0.116	0.364	
3.0	0.155	0.152	0.082	0.069	0.218	0.219
4.0	0.099	0.105	0.058	0.047	0.151	
5.0	0.074	0.079	0.044	0.035	0.121	

Source:

1. Caltrans ARS Online tool (V2, http://dap3.dot.ca.gov/shake_stable/v2/index.php)
2. USGS Deaggregation 2008 beta (http://eqint.cr.usgs.gov/deaggint/2008/index.php)
3. Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012

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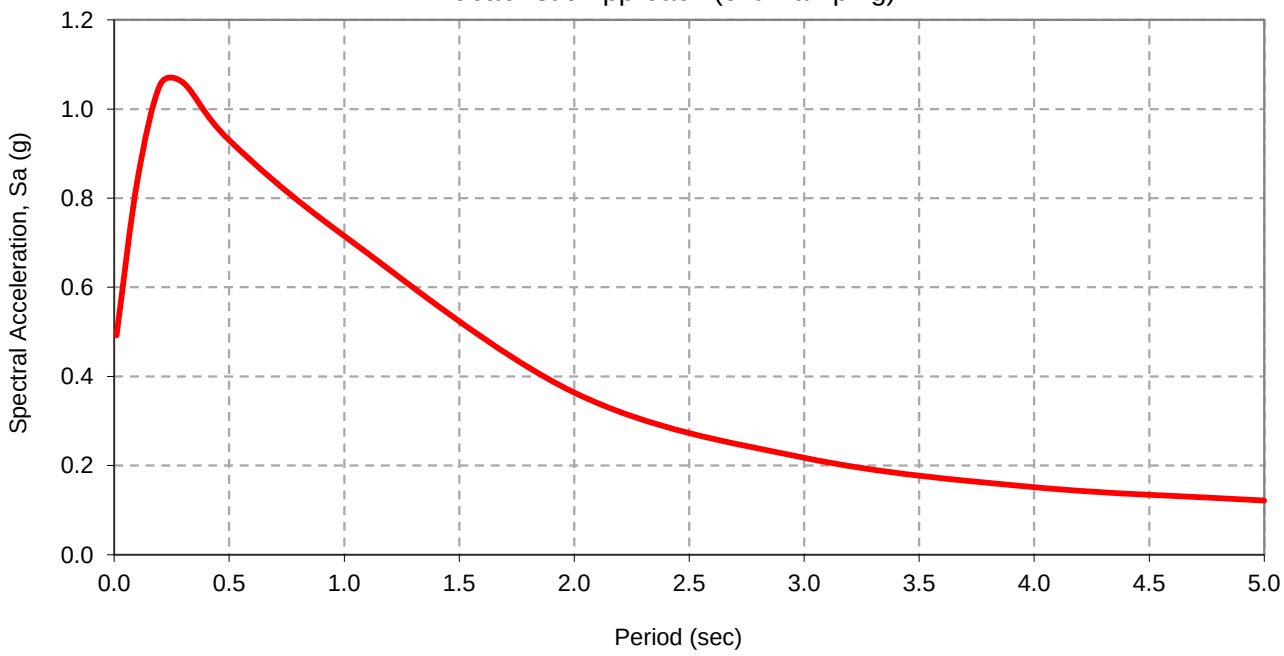
Shiells Road Bridge Replacement
Stanislaus County, California

Project No.: 2013-112-FDN | **Plate No.: 5A**

RECOMMENDED ACCELERATION RESPONSE SPECTRUM

Probabilistic Approach (5% Damping)



Site Information

Latitude:	37.3040
Longitude	-121.0595
V_{S30} (m/s) =	245
$Z_{1.0}$ (m) =	N/A
$Z_{2.5}$ (km) =	N/A
Near Fault Factor, Derived from USGS Deagg. Dist (km) =	7.5

Governing Curve:

Caltrans Online Probabilistic ARS

Recommended Response Spectrum				
Period (sec)	Caltrans Online Probabilistic Spectral Acceleration (g)	Adjusted for Near Fault Effect	Adjusted For Basin Effect	Final Adjusted Spectral Acceleration (g)
0.0	0.492	1	1	0.492
0.1	0.838	1	1	0.838
0.2	1.055	1	1	1.055
0.3	1.059	1	1	1.059
0.5	0.930	1	1	0.930
1.0	0.596	1.2	1	0.715
2.0	0.303	1.2	1	0.364
3.0	0.181	1.2	1	0.217
4.0	0.126	1.2	1	0.151
5.0	0.101	1.2	1	0.121

Note:

The curve has been modified to account for the proximity of the site to the fault. The spectral acceleration in periods of 1.0 sec. and longer has been increased by 20%. A linear interpolation is used for periods between 0.5 and 1.0 sec.

Source:

1. Caltrans ARS Online tool (V2, http://dap3.dot.ca.gov/shake_stable/v2/index.php)
2. USGS Deaggregation 2008 beta (http://eqint.cr.usgs.gov/deaggint/2008/index.php)
3. Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012

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Shiells Road Bridge Replacement
Stanislaus County, California

Project No.: 2013-112-FDN | **Plate No.: 5B**

APPENDIX A

Notes:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

See Caltrans 2010 Standard Plans A10F, A10G and A10H for Soil and Rock Legends.

All dimensions are in feet unless otherwise shown

Base map was provided by NOLTE VERTICAL FIVE.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
10	Sta				

GEOTECHNICAL PROFESSIONAL DATE

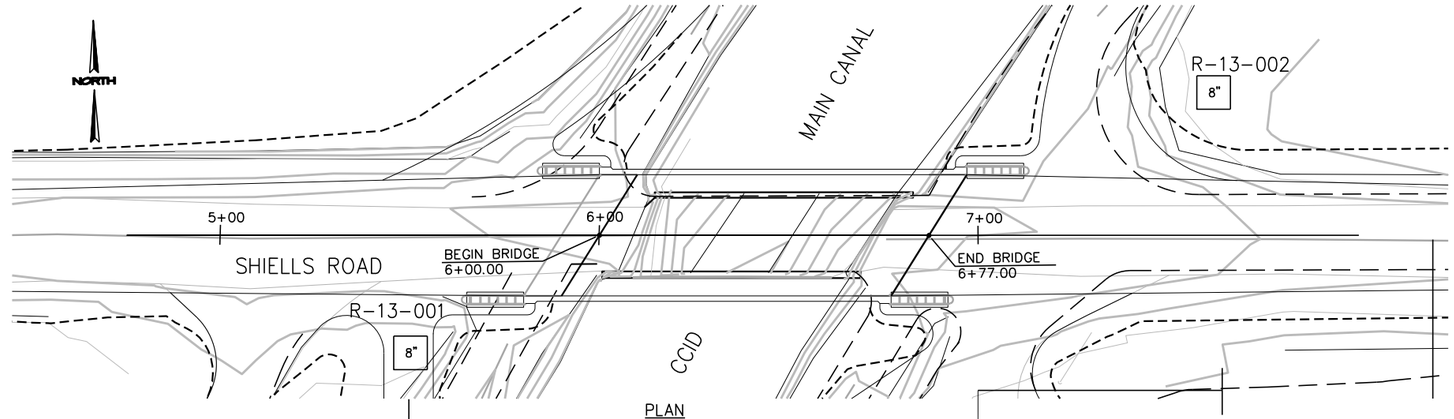
PLANS APPROVAL DATE

The County of Stanislaus or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

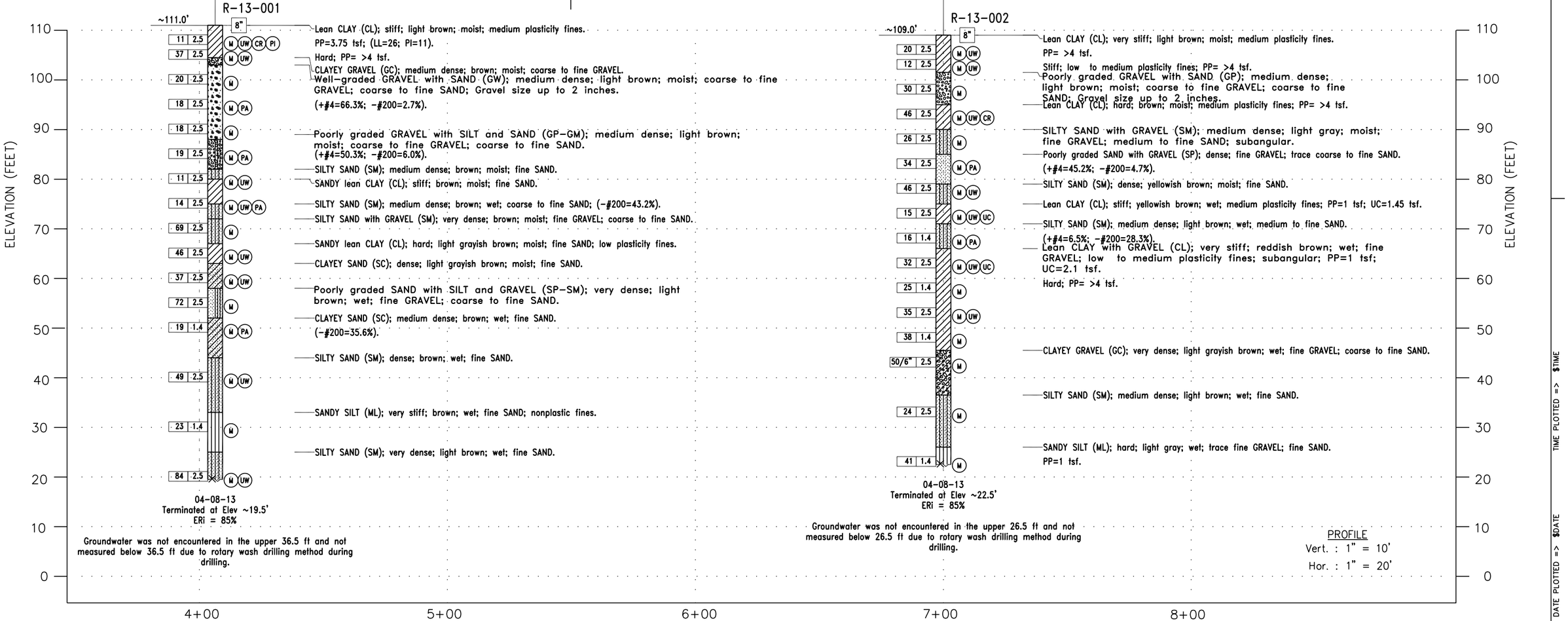
REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/13
GEOTECHNICAL
STATE OF CALIFORNIA

NOLTE VERTICAL FIVE
2495 NATOMAS PARK DRIVE, 4TH FLOOR
SACRAMENTO, CA 95833

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
1" = 20'



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

DESIGN OVERSIGHT	DRAWN BY	O. GOUTHIER	A. BAKANE	PREPARED FOR THE COUNTY OF STANISLAUS DEPARTMENT OF PUBLIC WORKS	PETER WEI	BRIDGE NO. 38C0180	SHIELLS ROAD BRIDGE REPLACEMENT
SIGN OFF DATE	CHECKED BY	P. WEI	FIELD INVESTIGATION BY: DATE: APRIL 2013		PROJECT ENGINEER	POST MILES X	LOG OF TEST BORINGS

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 7/16/10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: X
PROJECT NUMBER & PHASE: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES | SHEET | OF

CONTRACT NO.: X PROJECT ID: X

FILE => $REQUEST

USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

APPENDIX B

LABORATORY TESTS

Classification Tests
The field classification of the samples was visually verified in the laboratory according to the Unified Soil Classification System. The results are presented in "Log of Test Borings", Appendix A.

Moisture-Density
The natural moisture contents and dry unit weights were determined for selected undisturbed samples of the soils in general accordance with ASTM D 2216. This information was used to classify and correlate the soils. The results are presented in the summary table on Plate B-2.

Atterberg Limits
The Atterberg Limits (ASTM D 4318) were determined on selected samples of the fine-grained materials. These results were used to classify the soils, as well as to obtain an indication of the effective strength characteristics and expansion potential. The tests results are presented on Plate B-3, Plasticity Chart.

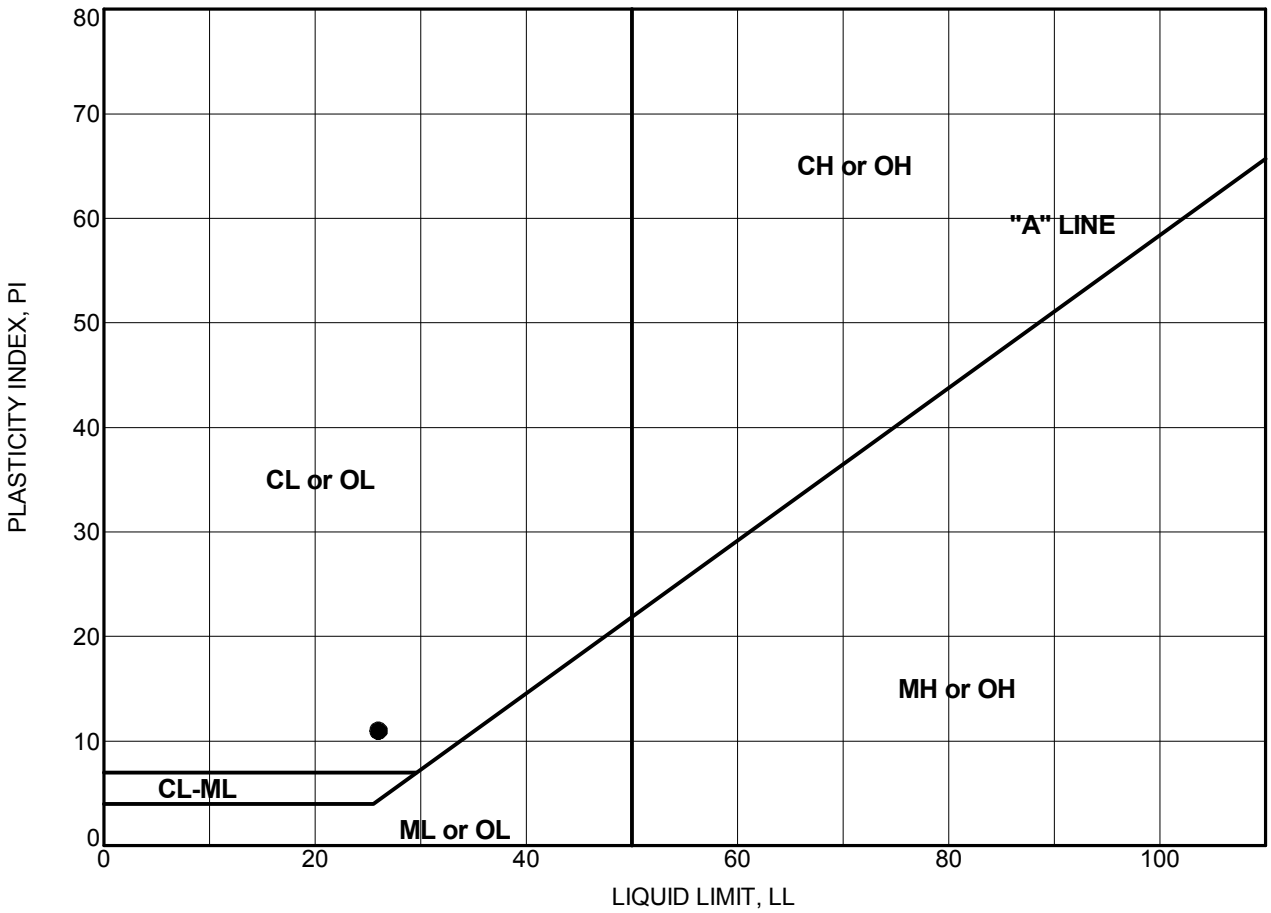
Grain Size Classification
Grain size classification tests (ASTM D 422) were performed on selected samples of granular soil to aid in the classification. The results are presented on Plates B-4A and B-4B, Grain Size Distribution Curves.

Unconfined Compression Tests
Strength tests were performed on selected undisturbed samples. Unconfined compression tests were performed in general accordance with ASTM D 2166. The results are presented on Plates B-5A and B-5B.

Corrosion Tests
Corrosion tests were performed on selected samples to determine the corrosion potential of the soils according to California Test Methods 643, 417 and 422. The tests were performed by Sunland Analytical. The test results are presented on Plates B-6A and B-6B.

R-value Test
R-value test was performed on representative bulk sample for pavement design. The test was performed according to California Test Method 301. The test results are presented on Plate B-7.

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Compressive Strength (tsf)
R-13-001	1	3.0	CL	14.6	117.8	26	15	11			
R-13-001	2	6.0	CL	14.5	120.4						
R-13-001	3	11.0	GW	1.9	-						
R-13-001	4	16.0	GW	2.2	-				66.3	2.7	
R-13-001	5	21.0	GW	2.7	-						
R-13-001	6	26.0	GP-GM	3.7	-				50.3	6.0	
R-13-001	7	31.0	CL	13.6	119.7						
R-13-001	8	36.0	SM	20.7	108.4					43.2	
R-13-001	9	41.0	SM	3.4	-						
R-13-001	10	46.0	CL	15.1	116.9						
R-13-001	11	51.0	SC	14.4	114.5						
R-13-001	12	56.0	GP	8.8	-						
R-13-001	13	61.0	SC	17.0	-					35.6	
R-13-001	14	71.0	SM	20.2	102.1						
R-13-001	15	81.0	ML	35.9	-						
R-13-001	16	91.0	SM	20.5	108.4						
R-13-002	1	3.0	CL	13.6	120.0						
R-13-002	2	6.0	CL	13.2	109.0						
R-13-002	3	11.0	GP	1.9	-						
R-13-002	4	16.0	CL	16.2	115.4						
R-13-002	5	21.0	SM	4.8	-						
R-13-002	6	26.0	SP	2.4	-				45.2	4.7	
R-13-002	7	31.0	SM	14.6	120.0						
R-13-002	8	36.0	CL	24.0	101.6						1.45
R-13-002	9	41.0	SM	14.8	-				6.5	28.3	
R-13-002	10	46.0	CL	18.3	110.0						2.1
R-13-002	11	51.0	CL	20.9	-						
R-13-002	12	56.0	CL	19.0	111.0						
R-13-002	13	61.0	CL	15.6	-						
R-13-002	14	66.0	GC	9.6	-						
R-13-002	15	76.0	SM	28.7	-						
R-13-002	16	86.0	ML	32.5	-						



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
R-13-001		3.0	●		26	15	11	Lean CLAY

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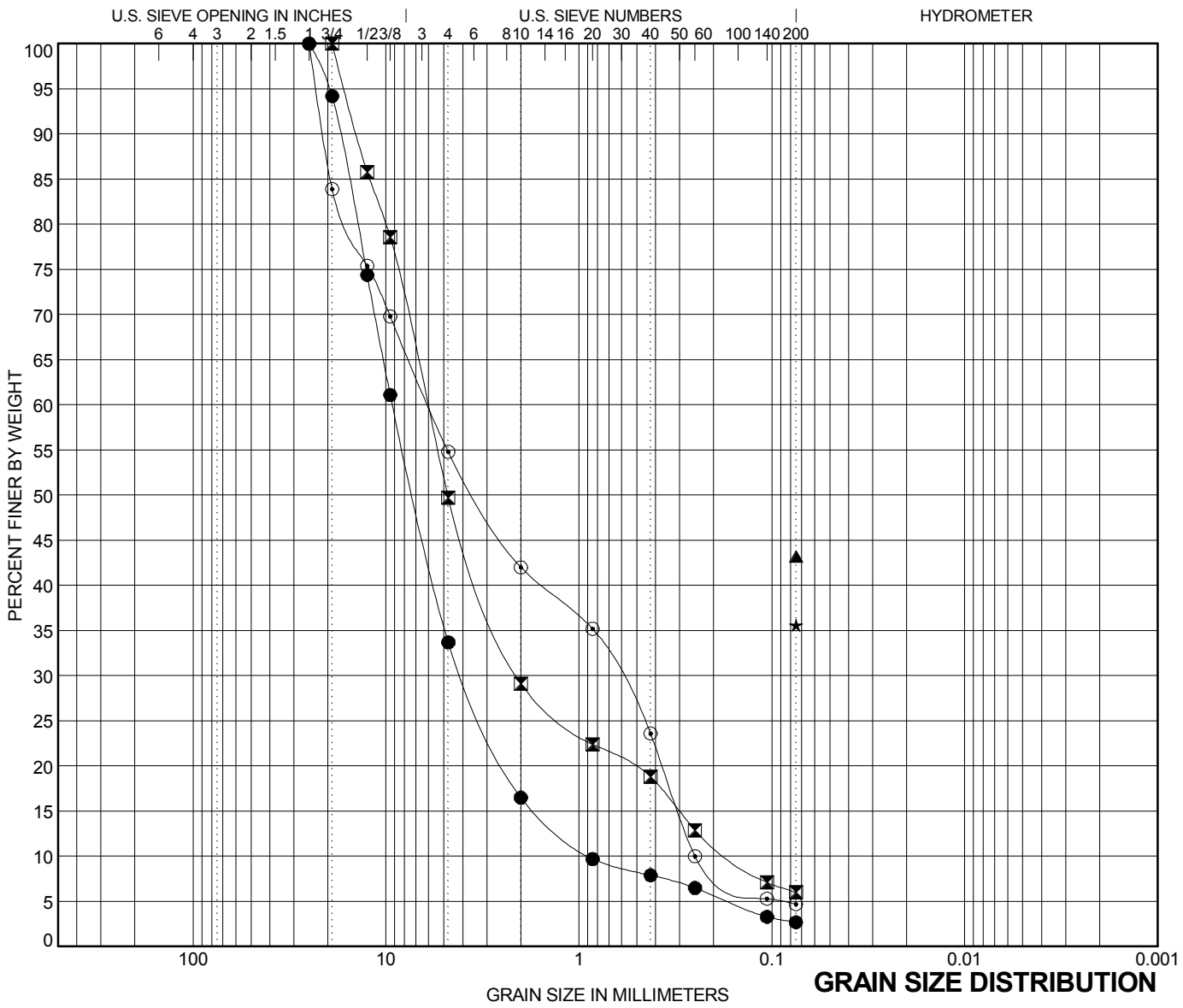
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO: 2013-112-FDN | PLATE NO: B-3



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-13-001	4	16.0	Well-graded GRAVEL with SAND				1.91	10.47
⧓	R-13-001	6	26.0	Poorly graded GRAVEL with SILT and SAND				4.36	37.36
▲	R-13-001	8	36.0	SILTY SAND					
★	R-13-001	13	61.0	CLAYEY SAND					
⊙	R-13-002	6	26.0	Poorly graded SAND with GRAVEL				0.26	24.16

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-13-001	4	16.0	25	9.239	3.944	0.883	66.3	31.0	2.7	
⧓	R-13-001	6	26.0	19	6.081	2.077	0.163	50.3	43.7	6.0	
▲	R-13-001	8	36.0	0.075						43.2	
★	R-13-001	13	61.0	0.075						35.6	
⊙	R-13-002	6	26.0	25	6.04	0.623	0.25	45.2	50.1	4.7	

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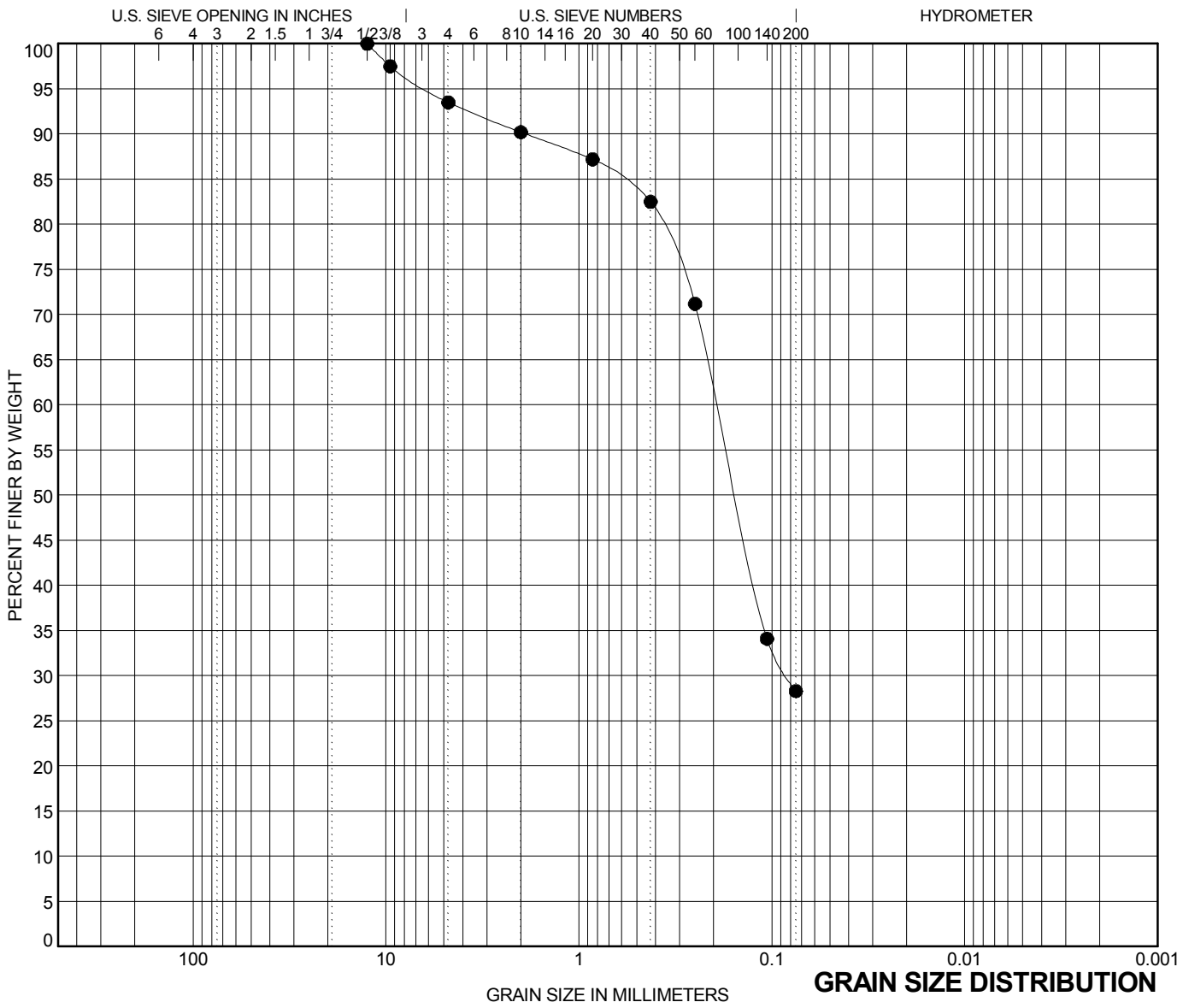
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO: 2013-112-FDN

PLATE NO: B-4A



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-13-002	9	41.0	**SILTY SAND**					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-13-002	9	41.0	12.5	0.193	0.083		6.5	65.2	28.3	

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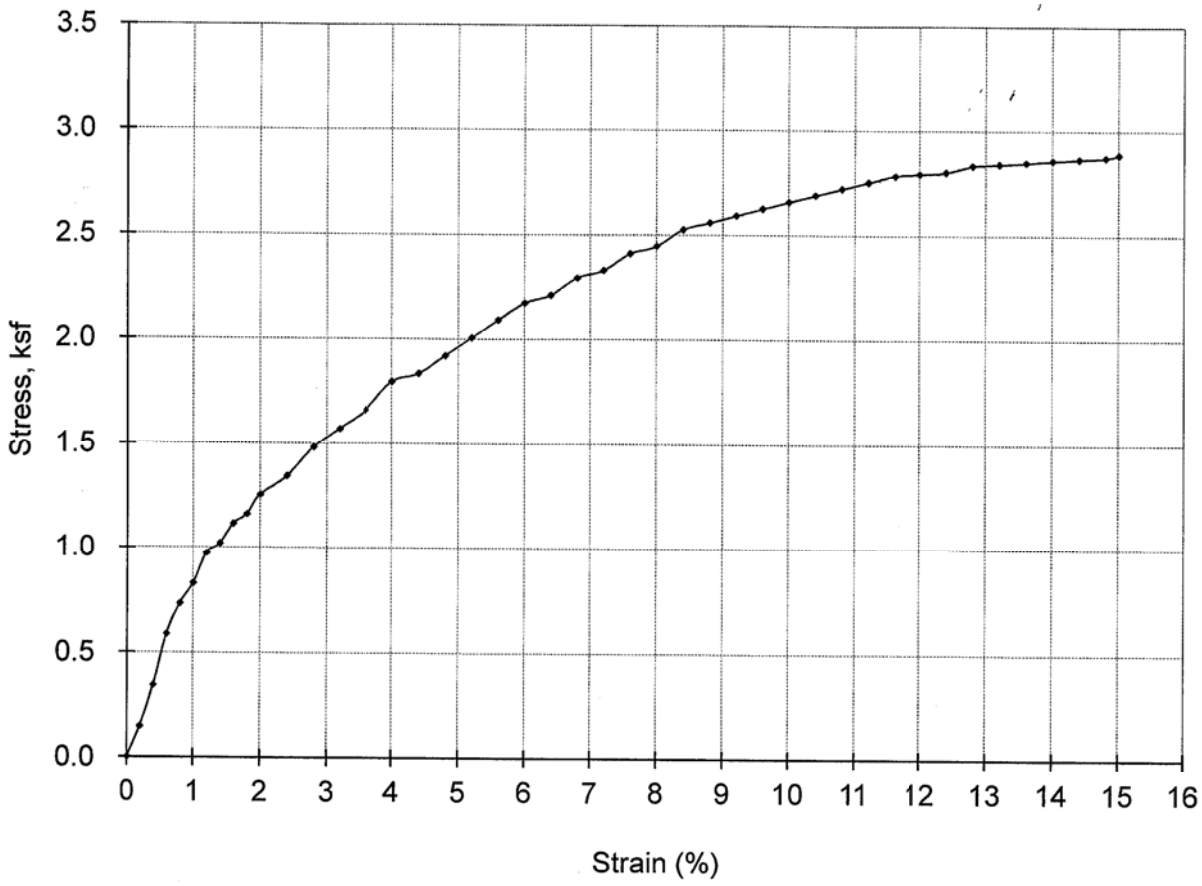
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO: 2013-112-FDN

PLATE NO: B-4B

UNCONFINED COMPRESSION TEST



Boring No.: R-13-002

Sample No. : 8 **Strength (ksf):** 2.89

Depth (feet): 36 **Strain (%):** 15.00

Material Description:
Stiff, Lean Clay

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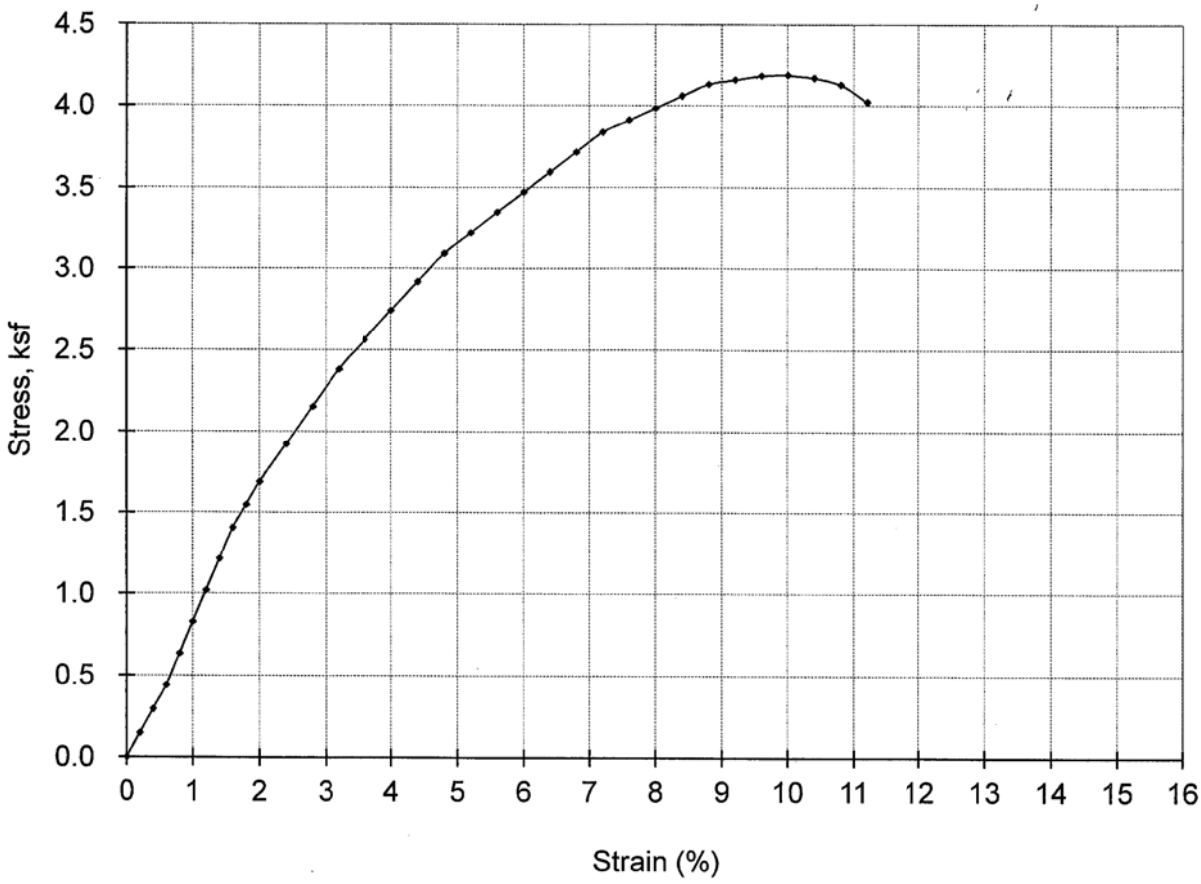
SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN | PLATE NO.: B-5A

UNCONFINED COMPRESSION TEST



Boring No.: R-13-002

Sample No. : 10 **Maximum Strength (ksf):** 4.19

Depth (feet): 46 **Strain @ Failure (%):** 10.00

Material Description:
Stiff, Lean Clay

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SHIELLS ROAD BRIDGE REPLACEMENT
STANISLAUS COUNTY, CALIFORNIA

JOB NO.: 2013-112-FDN **PLATE NO.:** B-5B

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/08/2013
Date Submitted 05/01/2013

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2013-112-FDN Site ID : R13-001#1 @ 3.
Thank you for your business.

* For future reference to this analysis please use SUN # 64491-133342.

EVALUATION FOR SOIL CORROSION

Soil pH	6.92	
Minimum Resistivity	1.21 ohm-cm (x1000)	
Chloride	19.4 ppm	00.00194 %
Sulfate	10.1 ppm	00.00101 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO. B-6A

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 05/08/2013
Date Submitted 05/01/2013

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2013-112-FDN Site ID : R13-002#4 @ 16.
Thank you for your business.

* For future reference to this analysis please use SUN # 64491-133343.

EVALUATION FOR SOIL CORROSION

Soil pH	7.22	
Minimum Resistivity	0.72 ohm-cm (x1000)	
Chloride	69.1 ppm	00.00691 %
Sulfate	10.7 ppm	00.00107 %

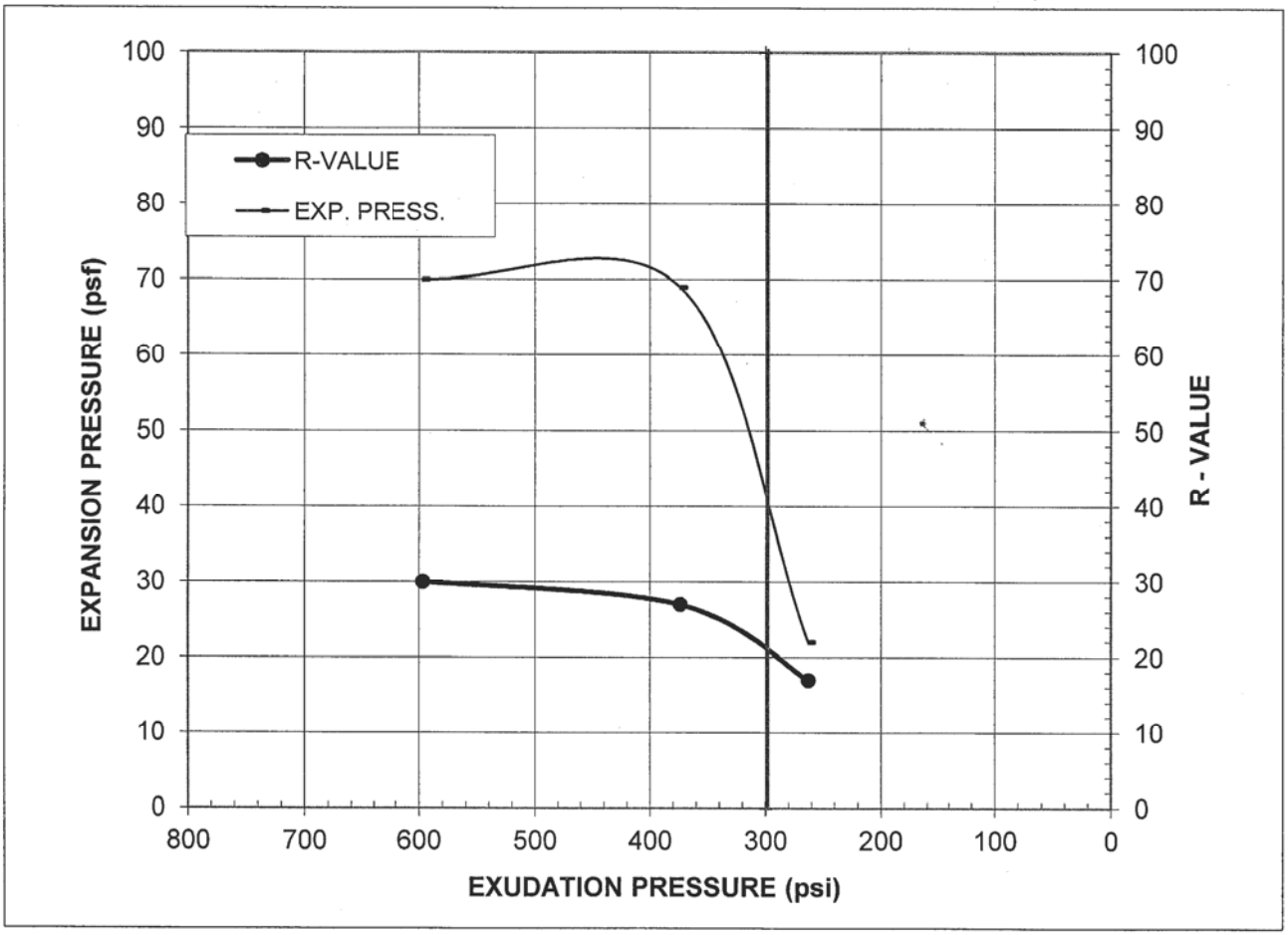
METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO. B-6B

R-VALUE REPORT

Parikh Consultants, Inc | ASTM D2844 or CTM 301 | (408) 452-9000

Project Name:	Shiells Rd Bridge Replacement			Date:	4/18/2013
Client:	NVS			Project #:	2013-112-FDN
Sample #:	R-13-001	Depth:	0'-5'	Lab #:	G816
Location / Source:		Onsite / Native		Sample Date:	
Material :	Lean Clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	263	374	597
Expansion Pressure, psf	22	69	70
R-Value	17	27	30
Moisture Content at Test, %	16.4	15.5	14.5
Dry Density at Test, pcf	109.8	111.9	114.8

R-Value @ 300 psi Exudation Pressure = 22

Expansion Pressure @300 psi Exudation, psf = **40**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

RVALUE with calcs pdp

PLATE NO. B-7

APPENDIX C

LIQUEFACTION POTENTIAL ANALYSIS

PROJECT NAME **Shiells Road Bridge Replacement**
PROJECT NO. **2013-112-FDN**
BORING NO. **R-13-001**

BOREHOLE DIA (in) 5
GW DEPTH (ft)= 20

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

HAMMER ENERGY = 85%

FAULT INFO
a_{max} *(g)=* 0.49
FAULT M_w = 6.6
MSF = 1.39

					CYCLIC STRESS RATIO (CSR				*LIQUEFACTION RESISTANCE (CRR 7.5)*												*S.=(CRR 7.5/CSR)*MSF*K σ*K*			
Sample No	Depth (ft)	Soil Type	Blow Count	Sampl Type	σ_v (psf)	σ_v' (psf)	γ_d	CSR	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60, CS}$	$CRR_{7.5}$	Kσ	Kα	F.S.	Volumetric Strain (%)
1	2	2	11	MC	250	250	1.00		7.2	1.4	0.75	1.0	1.0	7.6	1.66	12.6				1.00	1		
2	5	2	37	MC	625	625	0.99		24.1	1.4	0.75	1.0	1.0	25.6	1.45	37.2				1.00	1		
3	10	1	20	MC	1250	1250	0.98	0.31	13.0	1.4	0.80	1.0	1.0	14.7	1.21	17.8		17.8	0.19	1.00	1		
4	15	1	18	MC	1875	1875	0.97	0.31	11.7	1.4	0.85	1.0	1.0	14.1	1.03	14.5	3%	14.5	0.16	1.00	1		
5	20	1	18	MC	2500	2494	0.96	0.31	11.7	1.4	0.95	1.0	1.0	15.7	0.90	14.2	5%	14.2	0.15	0.93	1	0.64	2
6	25	1	19	MC	3125	2806	0.94	0.33	12.4	1.4	0.95	1.0	1.0	16.6	0.85	14.0	6%	14.1	0.15	0.90	1	0.57	2
7	30	1	11	MC	3750	3119	0.92	0.35	7.2	1.4	1.00	1.0	1.0	10.1	0.80	8.1	15%	11.0	0.12	0.90	1	0.43	2.5
8	35	1	14	MC	4375	3431	0.89	0.36	9.1	1.4	1.00	1.0	1.0	12.9	0.75	9.7	43%	16.7	0.18	0.87	1	0.59	1.8
9	40	1	69	MC	5000	3744	0.85	0.36	44.9	1.4	1.00	1.0	1.0	63.5	0.72	45.5		45.5		0.78	1		
10	45	2	46	MC	5625	4056	0.80		29.9	1.4	1.00	1.0	1.0	42.4	0.68	28.9				0.76	1		
11	50	1	37	MC	6250	4369	0.75	0.34	24.1	1.4	1.00	1.0	1.0	34.1	0.65	22.1	35%	31.6		0.75	1		
12	55	1	72	MC	6875	4681	0.70	0.33	46.8	1.4	1.00	1.0	1.0	66.3	0.62	41.2		41.2		0.71	1		
13	60	1	19	SPT	7500	4994	0.66	0.32	19.0	1.4	1.00	1.2	1.0	32.3	0.60	19.2	36%	28.1	0.37	0.75	1	1.22	
14	70	1	49	MC	8750	5619	0.59	0.29	31.9	1.4	1.00	1.0	1.0	45.1	0.55	24.8	15%	28.4	0.39	0.68	1	1.24	
15	80	1	23	SPT	10000	6244	0.55	0.28	23.0	1.4	1.00	1.2	1.0	39.1	0.51	19.9	35%	28.9	0.40	0.69	1	1.39	
16	90	1	84	MC	11250	6869	0.52	0.27	54.6	1.4	1.00	1.0	1.0	77.4	0.47	36.7		36.7		0.61	1		
																			Total Liquefaction Settlement (in.)=				3.9

1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = 2.2/(1.2 + \sigma_v'/P_a)$ with a maximum value of 1.7 per Kayen et al. (1992) as cited in Youd et al. (2001).
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = \alpha + \beta\ (N_1)_{60}$

   where α and β = coefficients determined from the following relationships

   for FC $\leq$ 5% $\alpha = 0$, $\beta = 1.0$

   for 5% < FC < 35% $\alpha = \exp(1.76-(190/FC^2))$, $\beta = (0.99+(FC^{1.5}/1000))$

   for FC $\geq$ 35% $\alpha = 5.0$, $\beta = 1.2$

Reference: Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS

PROJECT NAME **Shiells Road Bridge Replacement**
PROJECT NO. **2013-112-FDN**
BORING NO. **R-13-002**

BOREHOLE DIA (in) 5
GW DEPTH (ft)= 20

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

HAMMER ENERGY = 85%

FAULT INFO
a_{max} *(g)=* 0.49
FAULT M_w = 6.6
MSF = 1.39

					CYCLIC STRESS RATIO (CSR				*LIQUEFACTION RESISTANCE (CRR 7.5)*												*S.=(CRR 7.5/CSR)*MSF*K σ*K*			
Sample No	Depth (ft)	Soil Type	Blow Count	Sampl Type	σ_v (psf)	σ_v' (psf)	γ_d	CSR	SPT-$N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60, CS}$	$CRR_{7.5}$	Kσ	Kα	F.S.	Volumetric Strain (%)
1	2	2	20	MC	250	250	1.00		13.0	1.4	0.75	1.0	1.0	13.8	1.66	22.9				1.00	1		
2	5	2	12	MC	625	625	0.99		7.8	1.4	0.75	1.0	1.0	8.3	1.45	12.1				1.00	1		
3	10	1	30	MC	1250	1250	0.98	0.31	19.5	1.4	0.80	1.0	1.0	22.1	1.21	26.6		26.6	0.33	1.00	1		
4	15	2	46	MC	1875	1875	0.97		29.9	1.4	0.85	1.0	1.0	36.0	1.03	37.1				1.00	1		
5	20	1	26	MC	2500	2494	0.96	0.31	16.9	1.4	0.95	1.0	1.0	22.7	0.90	20.4	15%	23.9	0.27	0.93	1	1.14	1.3
6	25	1	34	MC	3125	2806	0.94	0.33	22.1	1.4	0.95	1.0	1.0	29.7	0.85	25.1	5%	25.1	0.29	0.88	1	1.07	1.2
7	30	1	46	MC	3750	3119	0.92	0.35	29.9	1.4	1.00	1.0	1.0	42.4	0.80	33.8		33.8		0.84	1		
8	35	2	15	MC	4375	3431	0.89		9.8	1.4	1.00	1.0	1.0	13.8	0.75	10.4				0.86	1		
9	40	1	16	SPT	5000	3744	0.85	0.36	16.0	1.4	1.00	1.2	1.0	27.2	0.72	19.5	28%	26.8	0.33	0.82	1	1.04	1.0
10	45	2	32	MC	5625	4056	0.80		20.8	1.4	1.00	1.0	1.0	29.5	0.68	20.1				0.78	1		
11	50	2	25	SPT	6250	4369	0.75		25.0	1.4	1.00	1.2	1.0	42.5	0.65	27.6				0.75	1		
12	55	2	35	MC	6875	4681	0.70		22.8	1.4	1.00	1.0	1.0	32.2	0.62	20.0				0.74	1		
13	60	2	38	SPT	7500	4994	0.66		38.0	1.4	1.00	1.2	1.0	64.6	0.60	38.4				0.69	1		
14	65	1	80	MC	8125	5306	0.62	0.30	52.0	1.4	1.00	1.0	1.0	73.7	0.57	42.1		42.1		0.68	1		
15	75	1	24	MC	9375	5931	0.57	0.29	15.6	1.4	1.00	1.0	1.0	22.1	0.53	11.7	15%	14.7	0.16	0.73	1	0.56	
16	85	1	41	SPT	10625	6556	0.53	0.27	41.0	1.4	1.00	1.2	1.0	69.7	0.49	34.2		34.2		0.62	1		
																			Total Liquefaction Settlement (in.)=				2.4

1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = 2.2/(1.2 + \sigma_v'/P_a)$ with a maximum value of 1.7 per Kayen et al. (1992) as cited in Youd et al. (2001).
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = \alpha + \beta\ (N_1)_{60}$

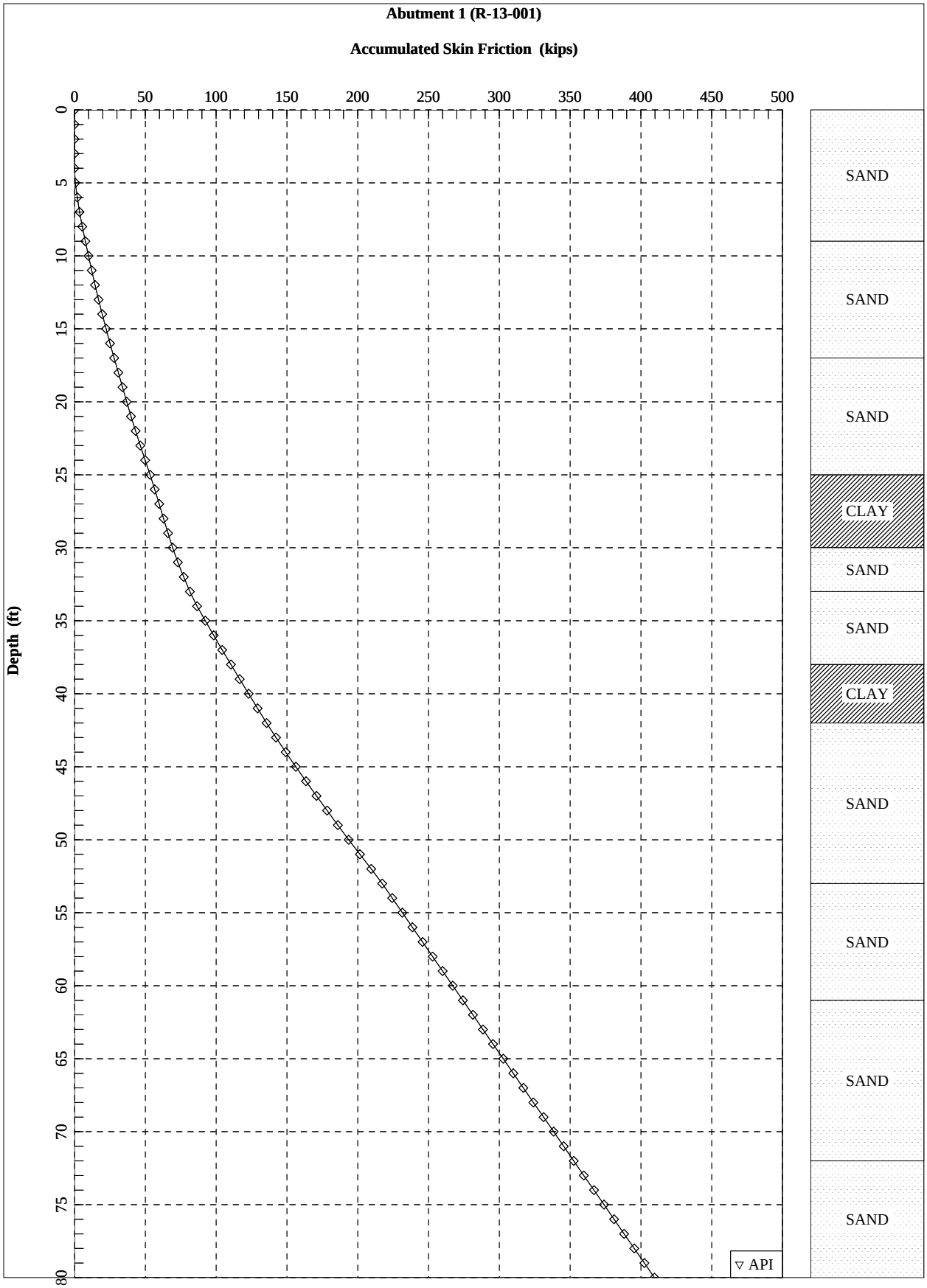
   where α and β = coefficients determined from the following relationships

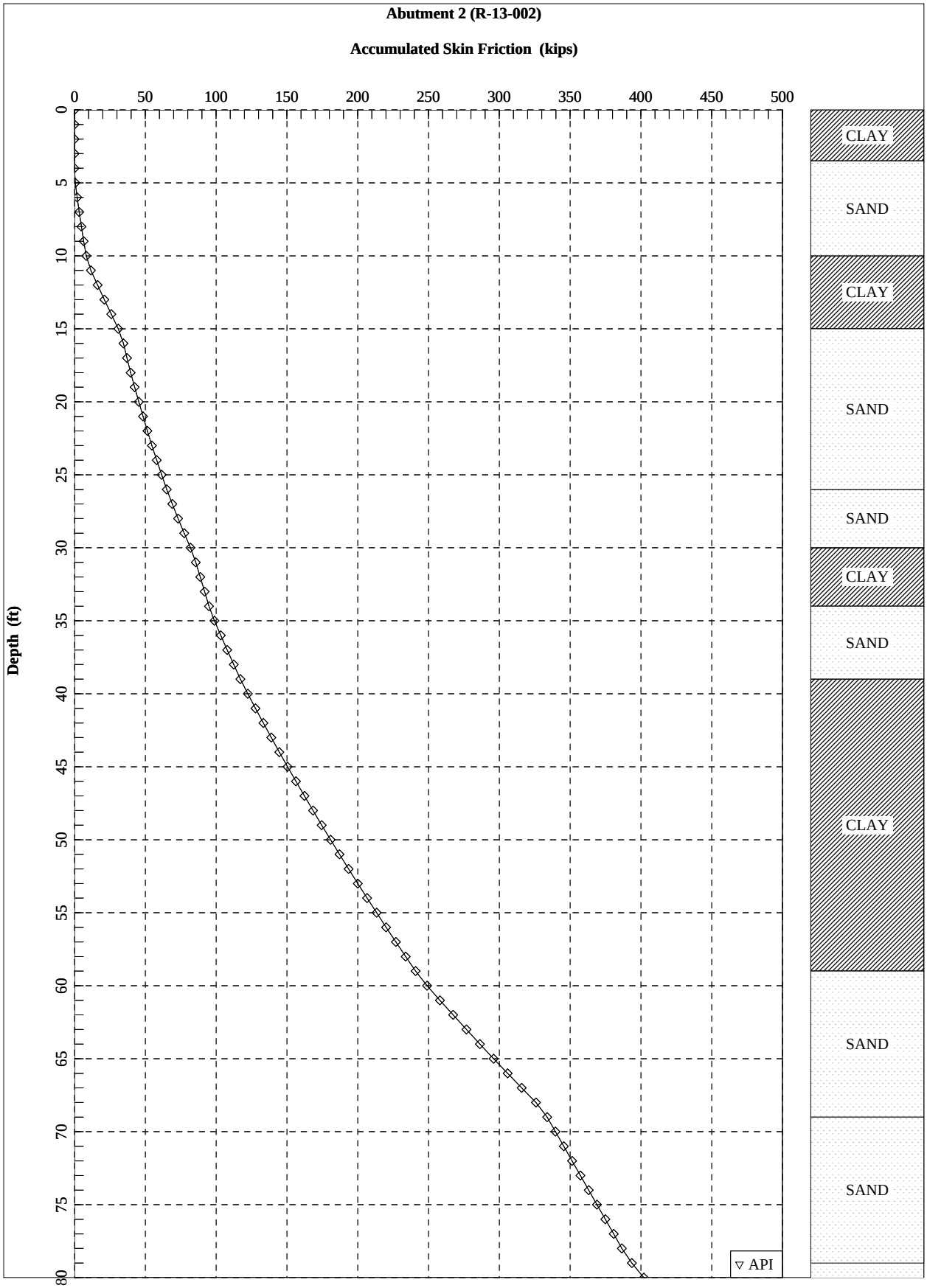
   for FC $\leq$ 5% $\alpha = 0$, $\beta = 1.0$

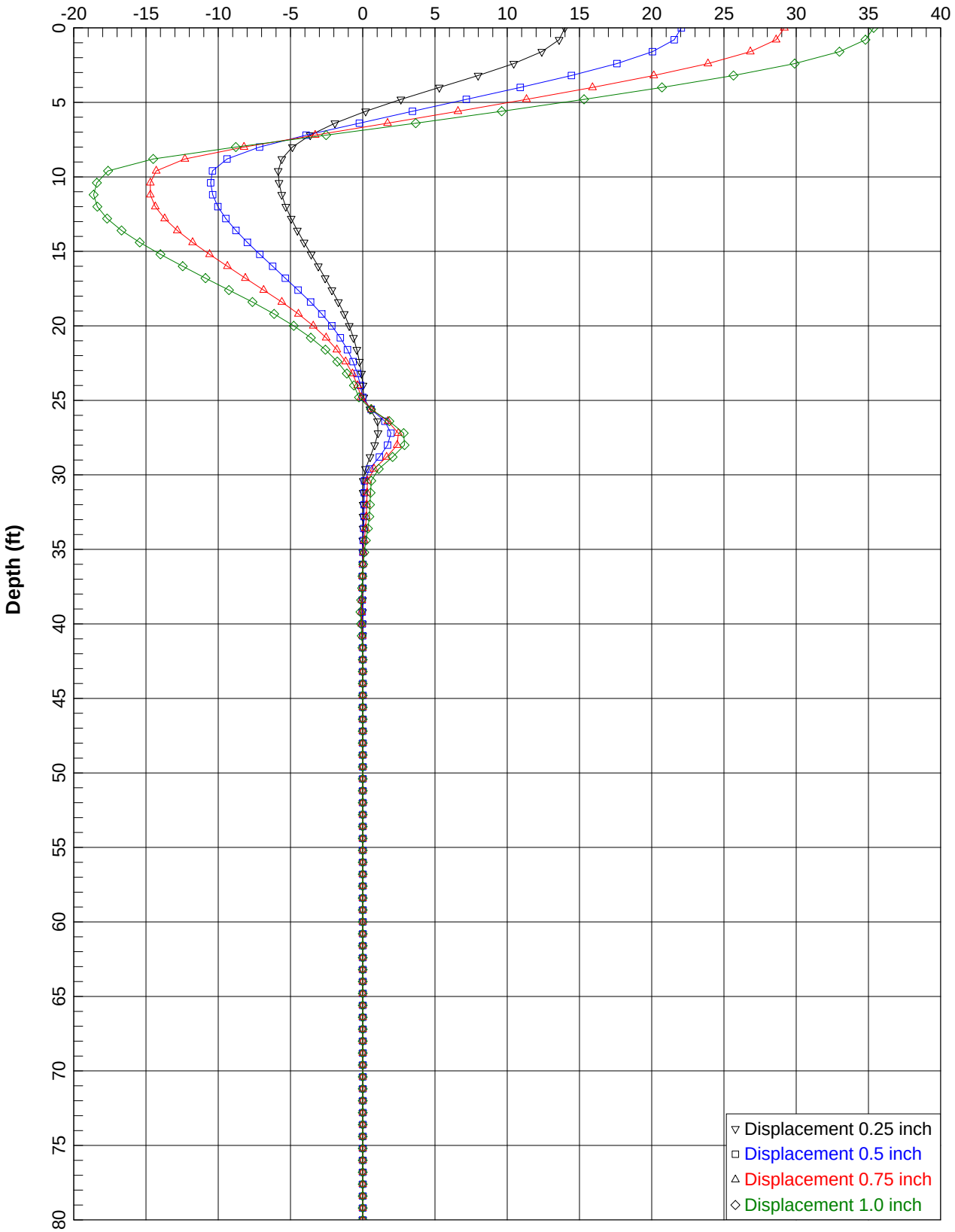
   for 5% < FC < 35% $\alpha = \exp(1.76-(190/FC^2))$, $\beta = (0.99+(FC^{1.5}/1000))$

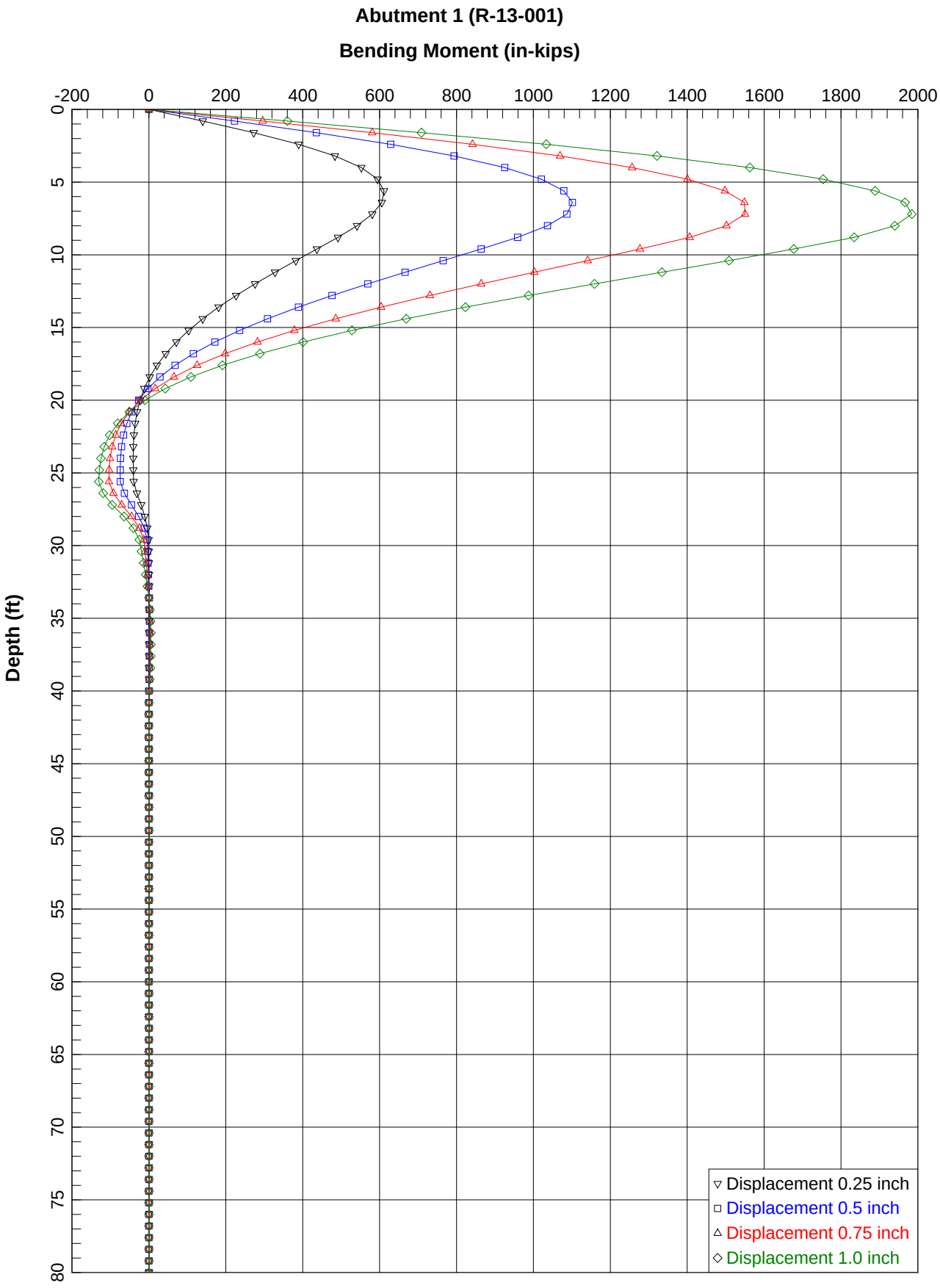
   for FC $\geq$ 35% $\alpha = 5.0$, $\beta = 1.2$

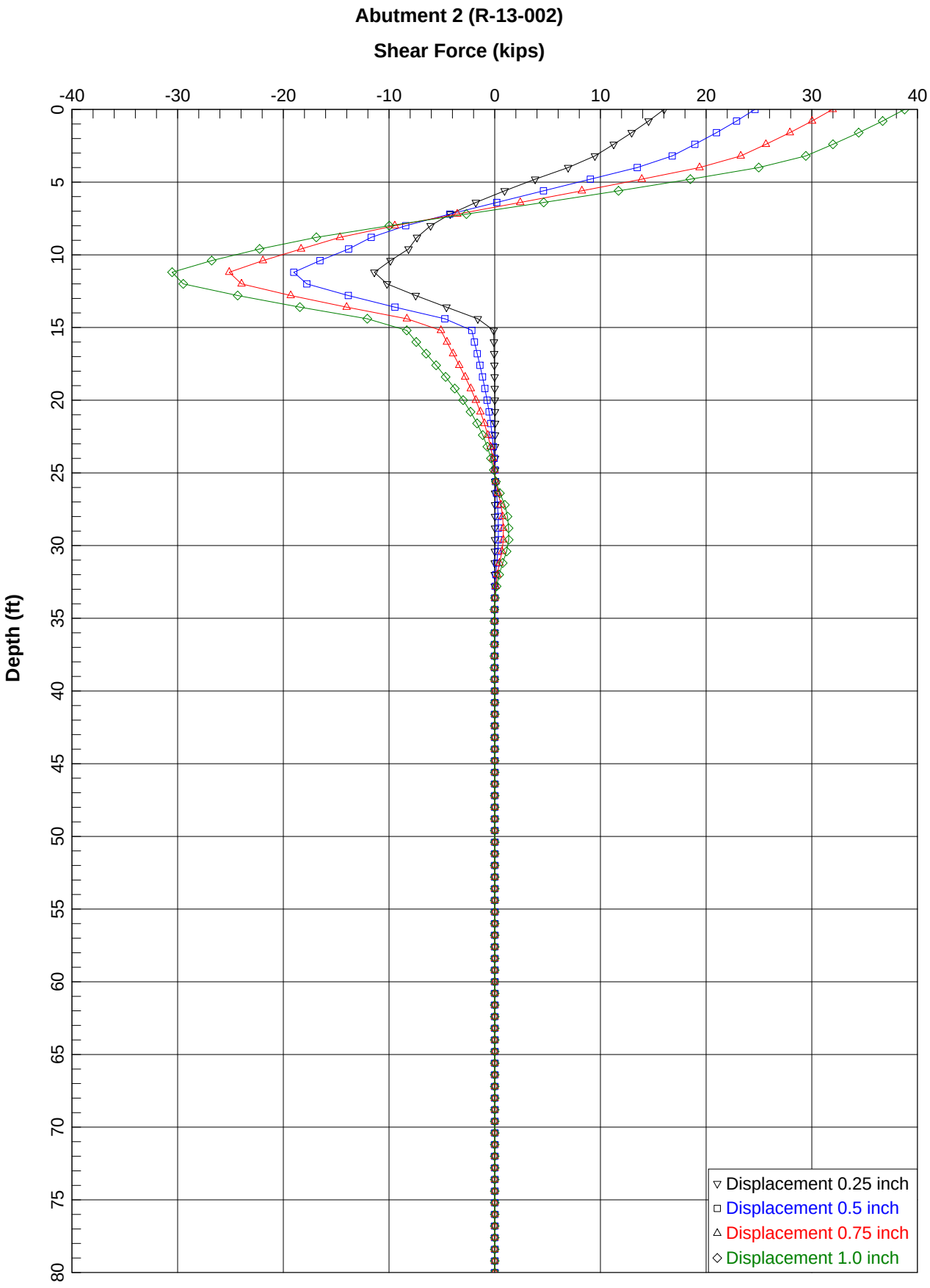
Reference: Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

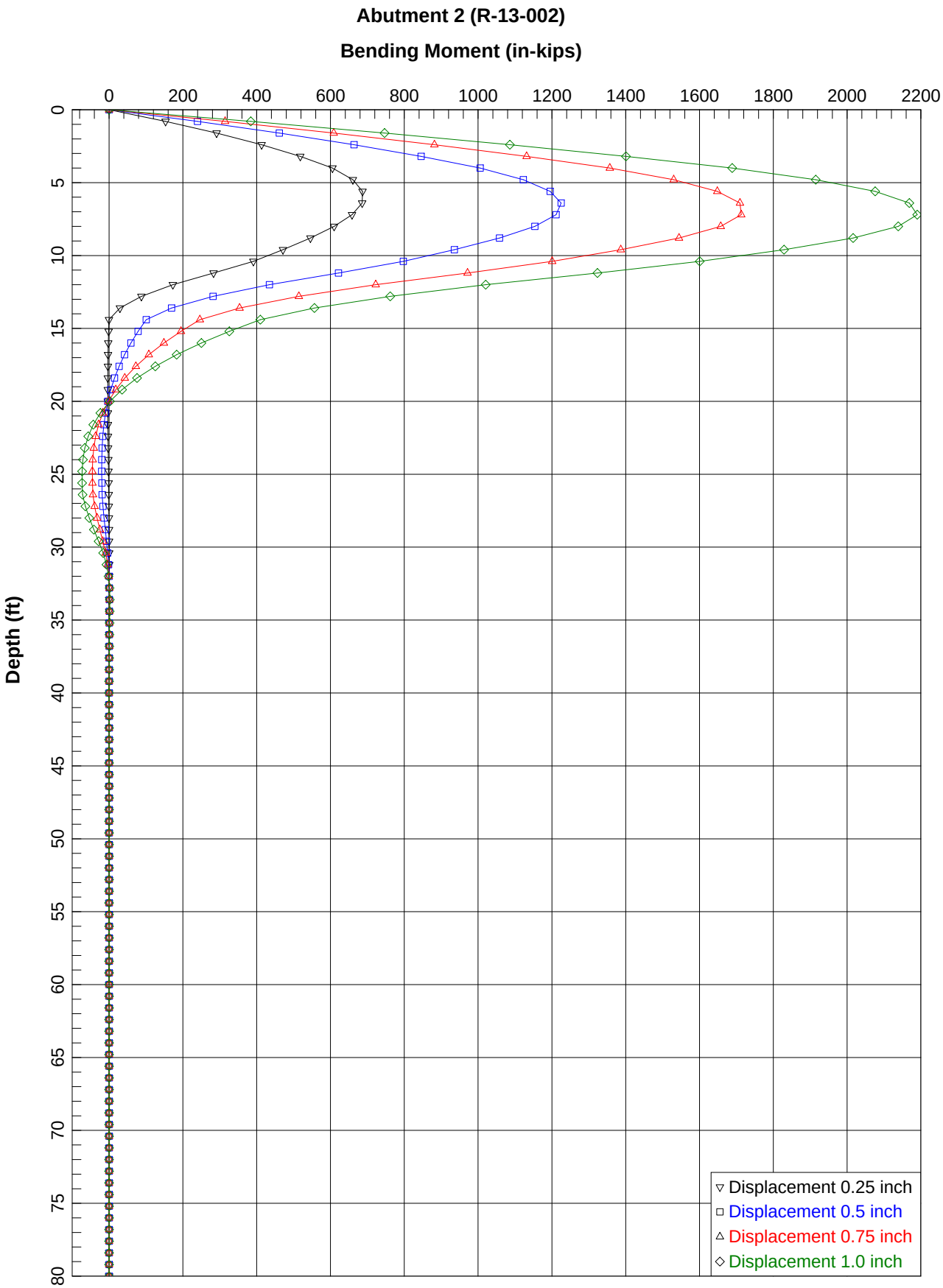

Abutment 1 (R-13-001)
Accumulated Skin Friction (kips)
0
50
100
150
200
250
300
350
400
450
500
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
SAND
SAND
SAND
CLAY
SAND
SAND
CLAY
SAND
SAND
SAND
SAND
▽ API


Abutment 2 (R-13-002)
Accumulated Skin Friction (kips)
0
50
100
150
200
250
300
350
400
450
500
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
CLAY
SAND
CLAY
SAND
SAND
CLAY
SAND
CLAY
SAND
SAND
▽ API


Abutment 1 (R-13-001)
Shear Force (kips)
Depth (ft)
-20
-15
-10
-5
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Displacement 0.25 inch
Displacement 0.5 inch
Displacement 0.75 inch
Displacement 1.0 inch


Abutment 1 (R-13-001)
Bending Moment (in-kips)
-200
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Displacement 0.25 inch
Displacement 0.5 inch
Displacement 0.75 inch
Displacement 1.0 inch


Abutment 2 (R-13-002)
Shear Force (kips)
Depth (ft)
-40
-30
-20
-10
0
10
20
30
40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Displacement 0.25 inch
Displacement 0.5 inch
Displacement 0.75 inch
Displacement 1.0 inch


Abutment 2 (R-13-002)
Bending Moment (in-kips)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
Depth (ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Displacement 0.25 inch
Displacement 0.5 inch
Displacement 0.75 inch
Displacement 1.0 inch

APPENDIX D
HYDRAULICS TECHNICAL MEMORANDUM

TECHNICAL MEMORANDUM

DATE: August 2, 2013

TO: Stanislaus County Department of Public Works

FROM: Wen Chen – Nolte Vertical Five (NV5)

PROJECT: Shiells Road Over C.C.I.D Main Canal Bridge Replacement

PROJECT #: SAB048800

SUBJECT: Bridge Hydraulics and Evaluation of the Existing Condition

Stanislaus County (County) has contracted NV5 to provide engineering design and surveying services for the Shiells Road bridge replacement project. This technical memorandum will document the hydrologic and hydraulic assessment for Shiells Road Bridge under the existing conditions and present the results of the hydraulic analysis and any unusual aspects of the design that require special attention. The procedures, methodology and criteria used in the analysis will also be discussed.

PROJECT BACKGROUND

The Project site is located on the south end of Stanislaus County, just east of Eastin Road and west of Draper Road near Newman, CA. The Shiells Road Bridge carries local and farming traffic over the Central California Irrigation District (C.C.I.D.) Main Canal. The clear width of the existing concrete bridge (19'-4") does not meet minimum AASHTO standards for a two lane local rural facility. The existing bridge (constructed in 1928) is a continuous three span reinforced concrete T-beam girder structure (approximately 62 feet long) on diaphragm abutments and two reinforced concrete pier walls, supported by spread footings. The existing structure is functionally obsolete (FO), too narrow for a two lane facility, and in need of replacement. As a result, the existing bridge is currently programed for replacement under the Federal Highway Bridge Program (HBP).

The proposed replacement bridge will have a 24-foot clear roadway width with two 10-foot lanes and two 2-foot shoulders. The vertical roadway profile will be dictated by the soffit elevation of the replacement bridge, designed to accommodate the maximum anticipated flow in the CCID Main Canal plus minimum freeboard of 1 (one) foot.

FEMA Flood Insurance Rate Map (FIRM) panel 06099C0945E indicates that a 100-year floodplain exists north of Shiells Road along the CCID Main Canal. The floodplain, due to overflow from nearby Orestimba Creek, is shown in FEMA mapping as a shallow flood zone (Zone AH) defined as flood depths of one to three feet (usually areas of ponding). A 100-year flood water surface elevation of 111 feet based on the North American Vertical Datum of 1988 (NAVD88) is provided. From NV5 survey data, the top of bank for the canal is about 114 feet (NAVD88). Based on these elevations, the canal embankments effectively contain 100-yr flows with approximately 3 feet of freeboard. Although 100-year flows are contained within the embankments of the canal, the channel was designed for agricultural use, not for flood control. Therefore, the profile of the roadway will be set so that the soffit of the replacement bridge passes the canal's maximum irrigation flows, not the 100-yr storm event.

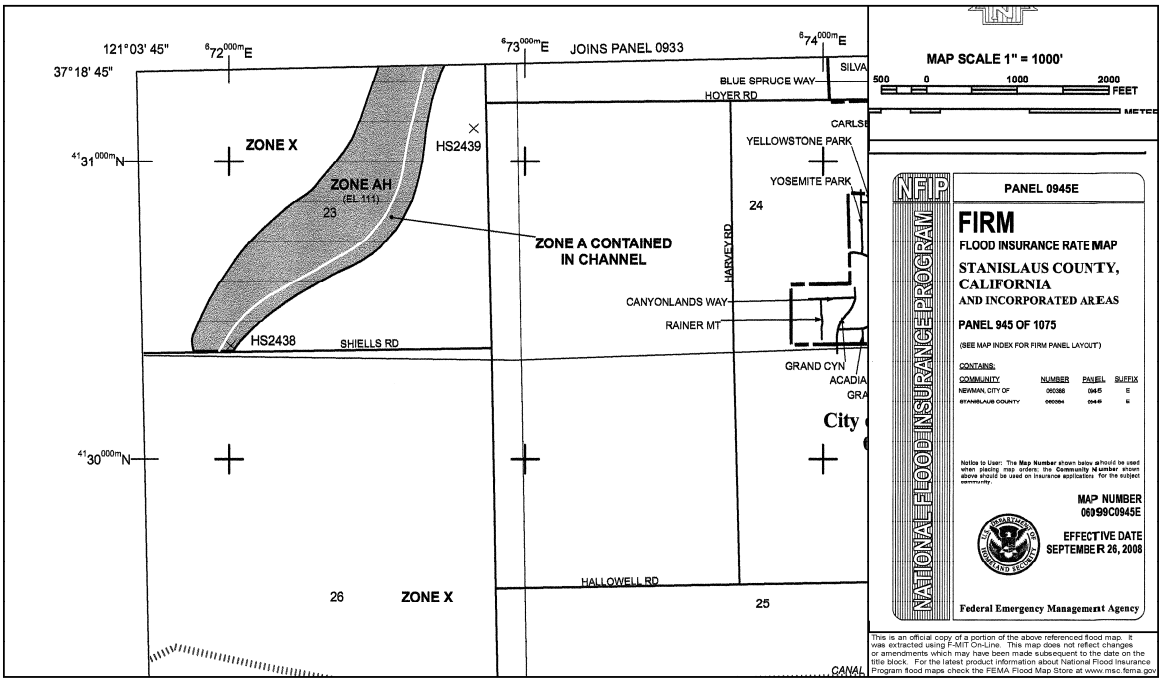


Figure 1 FEMA Flood Insurance Rate Map for Shiells Road

HYDROLOGY

Based on discussions with CCID, the maximum flow in the canal is 300 cfs. The existing bridge is located over CCID Main Canal which generally flows from south to north. The soffit of the existing bridge is below the top of the canal and under normal flow conditions (300cfs) the soffit is right at the water level. The proposed structure profile will be raised so that the elevation of the proposed soffit is 6-inches above the high water elevation of 111.82-feet as surveyed. During construction the existing abutments will be left in place to retain the existing approach slopes and assist with canal water control. In order to leave the existing abutments in place, the new structure will be extended to 75-feet in order to place the new abutments behind the existing abutments. Once the new abutments are in place the existing abutments can be removed.

For the hydraulic analysis, the irrigation design flow of 300 cfs will be used.

HYDRAULIC ANALYSIS

A bridge hydraulic analysis was performed using the Bentley Haestad programs FlowMaster. NV5 used FlowMaster to simulate a steady-state water surface profile for the CCID canal at the existing bridge. Our field surveyed water elevation at the bridge is 111.28 feet (NAVD88 datum). Based on verification by Central California Water District (CCWD), the following parameters were used to develop the hydraulic models:

- Maximal flow of 300 cfs (conservative estimate based on typical flows of 230-250 cfs)
- Roughness coefficient of 0.02
- Channel bottom elevation of 106.5 feet

- Canal bed slope of 0.02%, measured from topographic map
- Cross section geometry based on NV5 topographic map and bridge as-built

RESULTS AND RECOMMENDATIONS

The results of the hydraulic analysis indicated a normal depth of 4.62 feet under the design flow condition at the bridge location. The normal depth is equivalent to a water surface elevation of 111.12 feet (NAVD88). The water surface elevation is slightly less than the surveyed water elevation of 111.28 feet because the existing soffit elevation creates a ponding condition at the bridge.

Per discussions with CCWD staff, the canal loses flow capacity due to sediment accumulation. Sediment accumulation is caused by the slow velocity in the canal, as confirmed from our hydraulic analysis. The canal dredging will drop the canal bed elevation up to 2 feet.

Based on the above information, a soffit elevation of 111.78 feet, six (6) inches above the surveyed water surface elevation is recommended for the replacement bridge. This soffit elevation should satisfy the CCWD freeboard requirement of one (1) foot with canal dredging.

REFERENCES

1. *Stanislaus County, California and Incorporated Areas, Number 06099C0945E, Flood Insurance Study*, Federal Emergency Management Agency, September 26, 2008.

2. *Bentley FlowMaster V8i*, Bentley Systems, Inc., 2009.

Cross Section for Irregular Section with piers, n=0.02

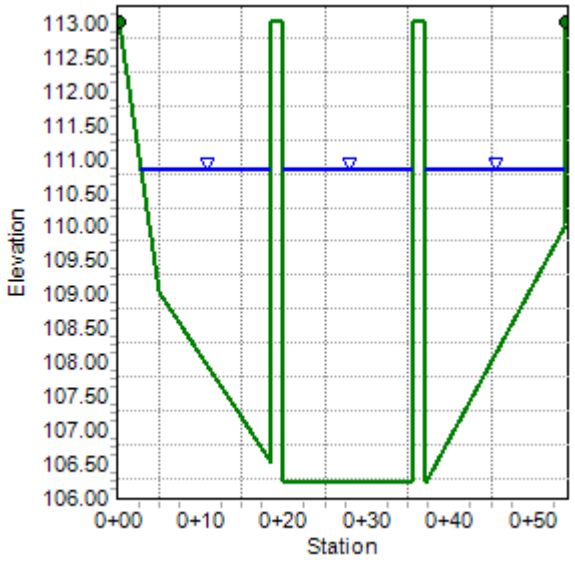
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

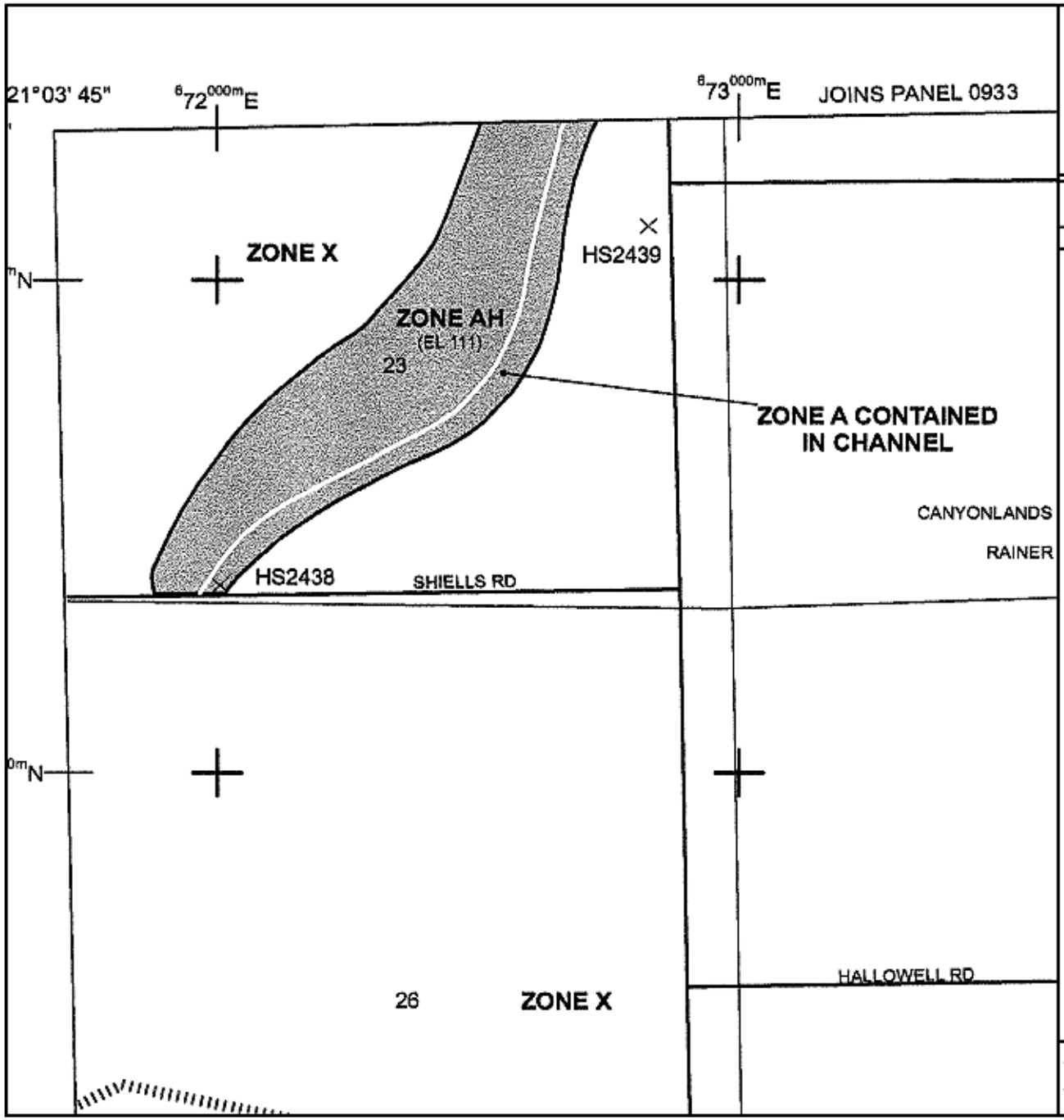
Input Data

Channel Slope	0.00020	ft/ft
Normal Depth	4.62	ft
Discharge	300.00	ft³/s

Cross Section Image



APPENDIX E
FLOODPLAIN MAP



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METE

PANEL 0945E

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

STANISLAUS COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 945 OF 1075

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NEWMAN, CITY OF	060368	0945	E
STANISLAUS COUNTY	060384	0945	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
06099C0945E

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

APPENDIX F
CONSTRUCTION NOISE TECHNICAL MEMORANDUM

CONSTRUCTION NOISE TECHNICAL MEMORANDUM

Shiells Road Bridge over CCID Main Canal Replacement Project

The Stanislaus County Department of Public Works (Stanislaus County), in coordination with the California Department of Transportation District 10 (Caltrans District 10), as assigned by the Federal Highway Administration (FHWA), proposes the Shiells Road Bridge over Central California Irrigation District (CCID) Main Canal Replacement Project, near Newman, in unincorporated Stanislaus County, California. The proposed Project includes the replacement of the CCID Main Canal Bridge (No. 39C-0180) and improvement of road approaches on Shiells Road and the CCID access roads. **Figure 1: Project Vicinity Map** shows the location of the proposed Project site.

The construction of the Shiells Road Bridge replacement structure and associated roadway approaches would be completed on essentially the same horizontal alignment as the existing bridge and roadway. The new bridge structure would be single span and approximately 77 feet long with a total deck width of 34.8 feet. The roadway profile of the replacement bridge would be on a higher vertical alignment in order to improve the hydraulic performance of the canal crossing and allow debris to flow under the bridge. In order for the replacement structure to provide equal or greater hydraulic capacity, the soffit of the replacement bridge would be set 12 inches higher than the high water elevation, which increases the roadway profile by about 20 inches. The roadway approach work would extend approximately 200 feet east and west of the new bridge along Shiells Road. Roadway improvements associated with Project implementation include:

- A 34.8-foot wide bridge cross section to accommodate two 12-foot wide lanes of through traffic (one each direction), two 4-foot wide shoulders, and two Type 732 concrete barriers;
- Roadway approach fill slopes at each end of the bridge would be similar to the existing roadway approaches;
- Implementation of 32-foot wide paved roadway approaches to accommodate two 12-foot wide lanes of through traffic (one each direction), and two 4-foot wide shoulders;
- Realignment and modification of existing CCID maintenance/access roads adjacent to the Project site; and,
- Post construction erosion control seeding.

The anticipated method of construction for this Project would include the full closure of the existing Shiells Road Bridge so that development can be conducted without using staged construction. Staged construction would require as much as 8 months of time to fully develop the proposed Project. A full road closure with a local detour would reduce the required Project development down to 4 months.

During development of the proposed Project the following construction equipment is expected to be used: one mobile crane; one excavator; one grader; one loader; one backhoe; and, one dozer. **Figure 2: Project Design** shows the proposed Project design.

Fundamentals of Noise and Vibration

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness.

Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted sound level is the basis for a number of various sound level metrics, including the day/night sound level (L_{dn}) and the Community Noise Equivalent Level (CNEL), both of which represent how humans are more sensitive to sound at night.[1] In addition, the equivalent continuous sound level (L_{eq}) is the average sound energy of time-varying noise over a sample period and the L_{max} is the maximum instantaneous noise level occurring over a sample period. The percentile-exceeded sound level (L_{xx}) is the sound level exceed "x" percent of a specific time period. For example, L_{10} is the sound level exceeded 10 percent of the time.

Construction Noise Fundamentals. Noise levels generated by individual pieces of construction equipment and specific construction operations form the basis for the prediction of construction-related noise levels. Two types of sources generate noise during construction activities: Stationary Equipment and Mobile Equipment. Stationary equipment consists of equipment that generates noise from one general area and includes items such as pumps, generators, compressors, etc. These types of equipment operate at a constant noise level under normal operation and are classified as non-impact equipment. Other types of stationary equipment such as pile drivers, jackhammers, pavement breakers, and blasting operations

[1] L_{dn} is the 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m. CNEL is the 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m. Source: Harris, Cyril M. 1998. *Handbook of Acoustical Measurement and Noise Control.*

produce variable and sporadic noise levels and often produce impact-type noises. Impact equipment is equipment that generates impulsive noise, where impulsive noise is defined as noise of short duration (generally less than one second), high intensity, abrupt onset, rapid decay, and often rapidly changing spectral composition. For impact equipment, the noise is produced by the impact of a mass on a surface, typically repeating over time. Mobile equipment such as bulldozers, scrapers, graders, loaders, and mobile cranes may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power. Other equipment, such as compressors, although generally considered to be stationary when operating, can be readily located to another location for the next operation. **Table A: Noise Levels of Construction Equipment** shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

Table A: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Impact Pile Driver	Yes	95
Auger Drill Rig	No	85
Vibratory Pile Driver	No	95
Jackhammers	Yes	85
Pneumatic Tools	No	85
Pumps	No	77
Scrapers	No	85
Cranes	No	85
Portable Generators	No	82
Rollers	No	85
Dozers	No	85
Tractors	No	84
Front-End Loaders	No	80
Backhoe	No	80
Excavators	No	85
Graders	No	85
Air Compressors	No	80
Dump Truck	No	84
Concrete Mixer Truck	No	85
Pickup Truck	No	55

Source: FHWA, 2006. *Highway Construction Noise Handbook*, August.

During development of a project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Two types of short-term noise impacts typically occur during construction of a project. The first type include noise generated by construction crew commutes and the transport of construction equipment and materials to and from a project site. This activity would incrementally increase noise levels on access roads (or roadways in the vicinity) leading to a project site. Typically, pieces of heavy equipment would be moved on-site to a construction staging area and would remain for the duration of each necessary construction phase. This equipment would not add to the daily traffic volume on roadways in the vicinity of a project. The second type of short-term noise impact is related to noise generated during on-site construction. Specifically for the proposed Project, bridge construction is performed in discrete steps; each step of bridge repair has its own mix of equipment and, consequently, its own noise characteristics. These various repair operations would change the character of the noise generated at the project site and, therefore, the noise levels as construction progresses.

Ground-borne Vibration Fundamentals. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby

buildings. In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving and operating heavy earthmoving equipment.

When assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB." However, construction vibration impacts on building structures are generally assessed in terms of peak particle velocity (PPV). Therefore, for purposes of this analysis, project related impacts are expressed in terms of PPV. Typical vibration source levels from construction equipment are shown in **Table B: Vibration Levels of Construction Equipment**.

Existing Conditions

The proposed Project site is located in a rural portion of Stanislaus County that is characterized by agricultural and rural residential land uses. Vehicles traveling along Shiells Road and agricultural activities are the main noise generators in the area of the proposed Project site. Additionally some noise is generated by rural residential activities such as landscape maintenance, children playing, and domestic animals. Rural residential and agricultural areas typically have a daytime noise level of about 50.0 dB (A) CNEL.

Sensitive Receptors. Noise can impact and affect daily activities for humans and activities occurring on different types of land uses. Schools, hospitals, and places of worship are sensitive uses that rely on the maintenance of adequate quiet to be able to carry on indoor speech and communication and to have minimum disturbances for people using such facilities to sleep at night. Residential areas require low noise levels to allow residents to perform daily activities with little annoyance from loud noise levels and to sleep during nighttime hours. The nearest sensitive receptor to the proposed Project is a single-family residential unit located approximately 260 feet southwest of the Project site. **Figure 3: Nearest Sensitive Receptor** shows the location of the nearest sensitive receptor.

Table B: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Air Compressor	0.090	87.0
Backhoe	**0.040**	**80.0**
Caisson drilling	0.089	86.9
Clam shovel drop (slurry wall)	0.202	94.1
Compactor	0.050	82.0
Compressor	0.045	81.0
Concrete Mixer	0.040	80.0
Concrete Pump	0.028	77.0
Concrete Vibrator	0.014	71.0
Crane (Derrick)	0.057	83.0
Crane (Mobile)	**0.057**	**83.0**
Generator	0.018	73.0
Excavator	**0.040**	**80.0**
Hydromill (slurry wall-in soil)	0.008	66.0
Hydromill (slurry wall-in rock)	0.017	72.6
Jackhammer	0.035	78.8
Large Bulldozer	**0.089**	**86.9**
Loaded Trucks	0.076	85.6
Water Trucks	0.076	85.6
Loader	**0.071**	**85.0**
Pavement Breaker	0.100	88.0
Paver	0.063	84.0
Pile Driver (impact-upper range)	1.518	111.6
Pile Driver (impact-typical)	0.644	104.1
Pile Driver (sonic-upper range)	0.734	105.3
Pile Driver (sonic-typical)	0.170	92.6
Pneumatic Tool	0.040	80.0
Pump	0.014	71.0
Roller	0.020	74.0
Saw	0.018	73.0
Scraper/Grader	**0.057**	**83.0**
Shovel	0.028	77.0
Tub Grinder	0.252	96.0
Small Bulldozer	0.001	48.5

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), May 2006, Table 12-2, pg. 12-12.
Notes: **Bold** indicates the type of construction equipment that would be used during development of the proposed Project.

Regulatory Information

23 CFR 772

23 Code of Federal Regulations (CFR) 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. The Federal Highway Administration defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway that substantially changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

Stanislaus County Noise Ordinance

Stanislaus County regulates noise and ground-borne vibration related to construction activities through Chapter 10.46 Noise Control of its Noise Ordinance (see **Exhibit 1**). According to the Noise Ordinance, it is prohibited to operate any construction equipment so as to cause at or beyond the property line of any property upon which a dwelling unit is located an average sound level greater than 75 dBA between the hours of 7:00 p.m. and 7:00 a.m. It should be noted that the proposed Project is exempt from the Stanislaus County Noise Ordinance per Chapter 10.46 Noise Control Section 10.46.080(J) Exemptions.

Stanislaus County vibration ordinance (Chapter 10.46 Section 10.46.070 Vibration) prohibits the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public space or public right-of-way. The County defines “vibration perception threshold” to mean the minimum ground-borne or structure-borne vibration motion necessary to cause a reasonable person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects, or a measured motion velocity of 0.01 PPV in/sec over the range of 1 to 100 Hertz.

Noise and Vibration Impact Assessment

The following provides an assessment on construction and operational noise generation and construction related ground-borne vibration due to implementation of the proposed Project.

Construction Noise Impact Assessment

As discussed above, construction at a Project site typically generates noise from two source types, including: construction workers and equipment arriving and departing from the Project site; and, construction equipment being used on the Project site.

Construction workers and equipment being used on the Project site would arrive via trucks using Shiells Road. There is a potential for a high single-event noise exposure at a maximum level of 87.0 dBA (L_{max}) from trucks passing as measured 50 feet from the centerline of Shiells Road. Considering that the nearest sensitive receptor is located 260 feet south of the centerline of Shiells Road, residents at this sensitive receptor would be exposed to a single-event maximum noise level of 72.7 dBA (L_{max}) from trucks passing. The projected construction traffic would be short-term (primarily for construction worker commutes and delivery and removal of construction equipment) and intermittent. The associated short-term noise increase along Shiells Road and at the nearest sensitive receptor would be perceptible; however, such a noise increase would be instantaneous and short-term as a truck passes by. A steady increase in the ambient noise level in the Project area would not occur due to construction workers and equipment arriving and departing from the Project site along Shiells Road.

The second type of short-term noise impact is related to noise generated during bridge construction. Bridge construction would be performed in discrete steps; each step of bridge repair has its own mix of equipment and, consequently, its own noise characteristics. These various repair operations would change the character of the noise generated at the Project site and, therefore, the ambient noise level as construction progresses. As shown above in **Table A**, the following types of equipment (and their estimated noise level as measured at 50 feet from the operating equipment) would be used during on-site construction activities: Backhoe (80 dBA L_{max}); Mobile Crane (83 dBA L_{max}); Dozer (85 dBA L_{max}); Excavator (81 dBA L_{max}); Grader (85 dBA L_{max}); and, Loader (85 dBA L_{max}). Construction operations could occur as close as 260 feet from the residential unit southwest of the proposed Project site. Under a worst case scenario, if all of the pieces of construction equipment were operating simultaneously within the project construction area approximately 260 feet from the residential unit, residents at this sensitive receptor would be exposed to maximum noise levels of up to approximately 77 dBA L_{max}.

To minimize the construction noise impact for the sensitive receptor near the Project site, construction noise is regulated by the California Department of Transportation (Caltrans) Standard Specification Section 14-8.02, “Noise Control,” and also by Caltrans Standard Special Provisions S5-310, “Noise Control.” These regulations state that noise levels generated during construction shall comply with applicable local, state, and federal regulations; therefore, compliance with the construction noise level exposure of residential units and the hours specified in local ordinances would be required. Construction noise would be short-term and intermittent. Further, implementation of the following measures would minimize the temporary noise impacts from construction on the sensitive receptor near the proposed Project:

- The construction contractor shall comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract;

- Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without a muffler;

- Between the hours of 7:00 p.m. and 7:00 a.m. (night work), the noise level from the Contractor's operations shall not exceed 86 dBA at a distance of 50 feet; or shall not exceed an average sound level greater than 75 dBA $L_{eq}(h)$ as measured on the property of any residential dwelling unit. Work is permitted Monday through Saturday, but not allowed on Sundays, unless specifically permitted by contract. This requirement shall not relieve the Contractor from responsibility for complying with local ordinances (Exhibit 1) regulating construction noise levels. The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel; and,

- As directed by Caltrans and the County, the construction contractor shall implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources if needed.

Construction Vibration Impact Assessment

During development of the proposed Project, construction equipment such as cranes, excavators, graders, loaders backhoes, and bulldozers may be used as close as 260 feet from the sensitive receptor located southwest of the Project site. As shown in above in **Table B,** the construction equipment that would be used during Project development would generate vibration levels between 0.04 and 0.089 PPV as measured at a distance of 25 feet from the operating machinery. Based on the distance the sensitive receptor is from the nearest area on-site where construction activity would occur, residents may be exposed to ground-borne vibration levels ranging up to 0.003 PPV. These levels are well below the Stanislaus County ground-borne vibration exposure threshold of 0.01 PPV for residential units. Construction related ground-borne vibration generation would not be a concern with Project implementation.

Traffic Noise Impact Assessment

The Shiells Road Bridge over CCID Main Canal Replacement Project consists of demolition of an existing bridge, approach roadway work, and development of a new bridge across the CCID Main Canal on Shiells Road and is not anticipated to result in an increase in vehicular trips on Shiells Road. The referenced project meets the criteria for a Type III project established in 23 CFR 772. Therefore, the project requires no analysis for highway traffic noise impacts. This project (i.e., Type III project) does not involve an increase in traffic volumes, does not involve construction of new through lanes or auxiliary lanes, substantial

changes in the horizontal or vertical alignment of the roadway, or exposure of noise sensitive land uses to a new or existing highway noise source. Stanislaus County acknowledges that a noise analysis is required if changes to the proposed project results in reclassification to a Type I project.

Prepared By: _____ Date: 3/7/2014

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Attachments: Figure 1: Project Vicinity Map
Figure 2: Project Design
Figure 3: Nearest Sensitive Receptor
Exhibit 1: Stanislaus County Noise Control Regulations

Caltrans

LEGEND

Project Site Boundary

FIGURE 1

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

N

0 500 1000
FEET

Project Vicinity Map

SOURCE: Microsoft Bing Aerial (2011)

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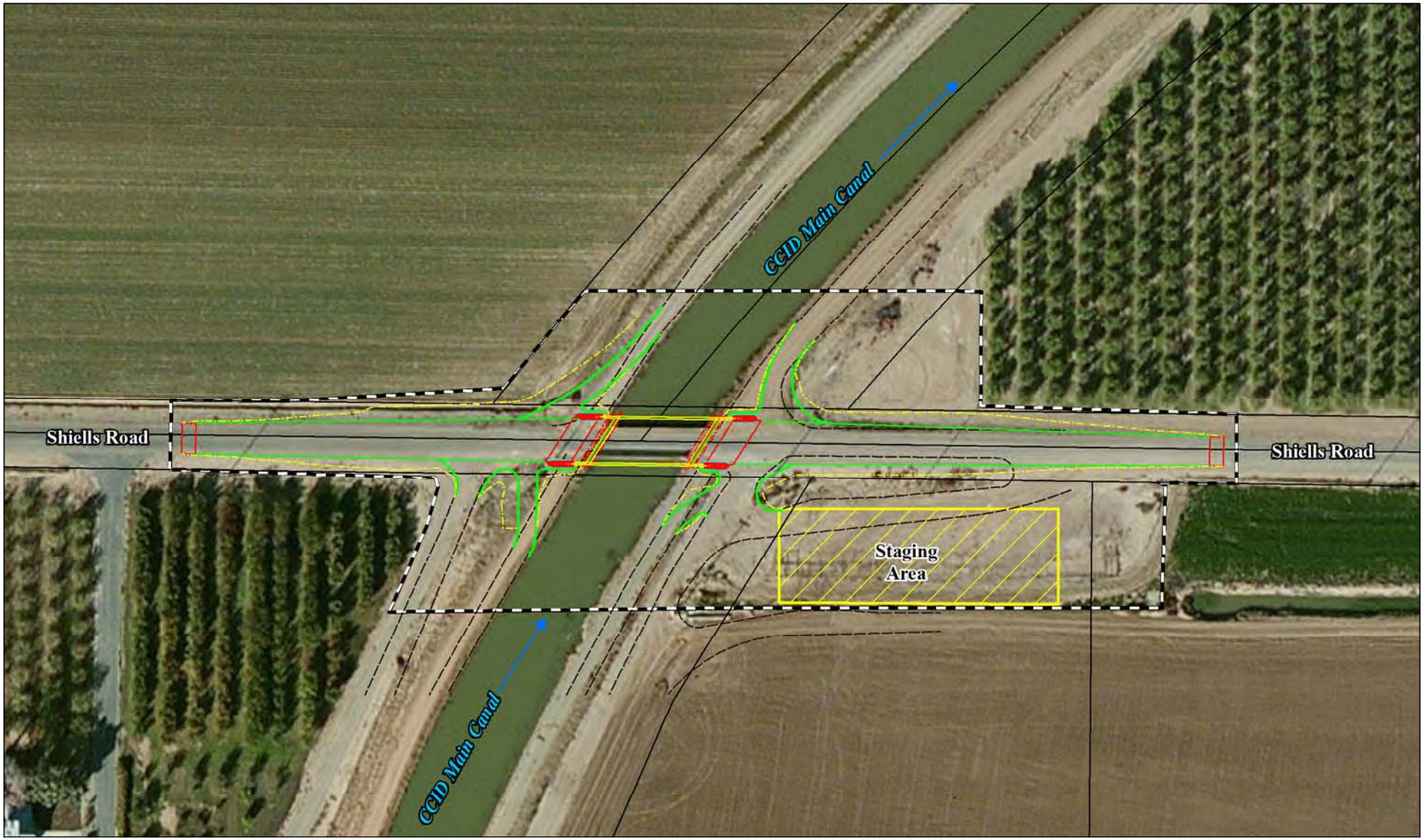

Caltrans

LEGEND

Project Site Boundary

FIGURE 2

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

0 50 100
FEET

Project Design

SOURCE: Basemap - Microsoft Bing Aerial (2011); Mapping - Nolte Engineering (2013)

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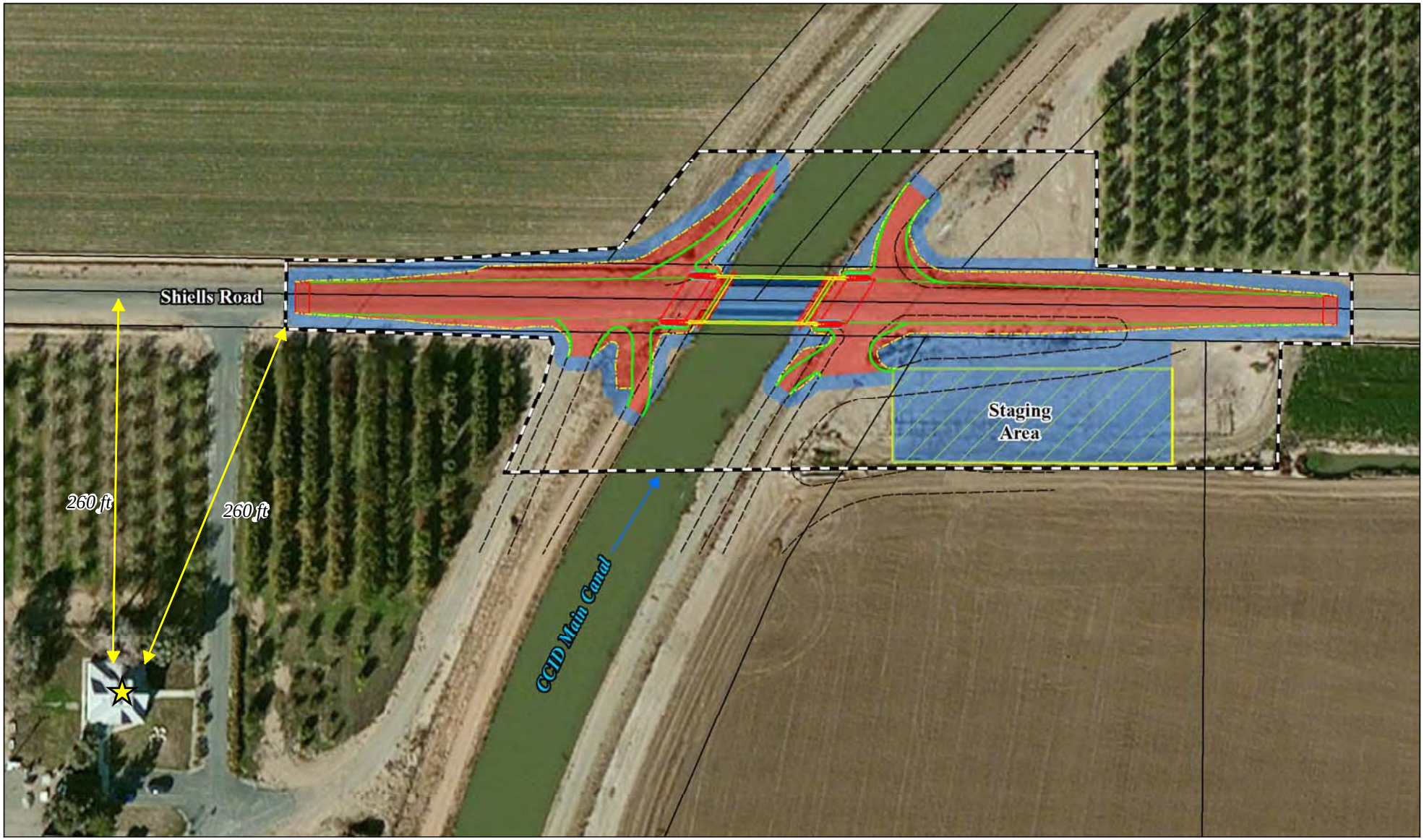

Caltrans

LEGEND

- Project Boundary
- Sensitive Receptor
- Permanent Impacts
- Temporary Impacts

0 50 100
FEET

SOURCE: Basemap - Microsoft Bing Aerial (2011); Mapping - Nolte Engineering (2013)

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FIGURE 3

Shiells Road Bridge (38C0180) Replacement
at CCID Main Canal
Federal Project No. BRLO-5938 (192)

Nearest Sensitive Receptor

Chapter 10.46 NOISE CONTROL

10.46.010 Title.

The ordinance codified in this chapter may be cited as the "Stanislaus County Noise Control Ordinance." (Ord. CS 1070 §2, 2010).

10.46.020 Findings and policy.

The Stanislaus County board of supervisors hereby finds that every person is entitled to an environment in which the noise is not detrimental to his or her life, health, and enjoyment or property; that the peace, health, safety, and welfare of its citizens require protection from disturbing, excessive, offensive and loud noises from any and all sources in the unincorporated areas of the county; and the establishment of maximum permissible noise levels will further the public health, safety, welfare and peace and quiet of county inhabitants.

In order to control unnecessary, excessive and annoying noise in the county, it is hereby declared to be the policy of the county to prohibit such noise generated from or by all sources as specified in this chapter. It shall be the policy of the county to maintain quiet in areas that exhibit low noise levels and to implement programs aimed to reduce noise in those areas within the county where noise levels are above acceptable values.

It is determined that certain noise levels are detrimental to the public health, welfare and safety, and are contrary to public interest. Therefore, the board of supervisors declares that creating, maintaining, causing or allowing to be created, caused or maintained, any noise in a manner prohibited by or not in conformity with the provisions of this chapter, is a public nuisance and shall be punishable as such. (Ref. California Noise Control Act of 1973, Division 28, Sections 46000 et seq., of the California Health and Safety Code.) (Ord. CS 1070 §2, 2010).

10.46.030 Definitions.

A. "Ambient noise level" means the all encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

B. "A-weighted sound level" means the total sound level in decibels of all sound as measured with a sound level meter with a reference pressure of twenty microPascals using the A-weighted network (scale) at slow response. The unit of measurement shall be defined as dB(A).

C. "Construction equipment" means any machine used in the construction, erection, enlargements, alteration, conversion or movement of any building, structures or land together with any scientific surveys associated therewith.

D. "Decibel (dB)" means a unit for measuring the amplitude of sounds, equal to twenty times the logarithm to the base ten of the ratio of the pressure of the sound measured to the reference pressure, which is twenty microPascals.

E. "Dwelling unit" means a single unit providing complete independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

F. "Impulsive noise" means a noise of short duration with an abrupt onset and rapid decay.

G. "Lmax" means the maximum A-weighted sound level recorded during a noise event.

H. "Person" means a person, firm, association, partnership, joint venture, corporation or any entity, public

or private in nature.

I. "Pure tone noise" means any noise that is distinctly audible as a single pitch (frequency) or set of pitches. A pure tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by five decibels for center frequencies of five hundred Hertz and above and by eight decibels for center frequencies of between one hundred sixty and four hundred Hertz and fifteen decibels for center frequencies less than or equal to one hundred twenty-five Hertz.

J. "Sound level meter" means an instrument used for measurement of sound levels, which at a minimum meets the American National Standards Institute (ANSI) Standard S1.4-1983 (R2006) or S1.4a-1985 (R2006) "Specifications for Sound Level Meters," Type 2, or most recent version thereof.

K. "Sound level" in decibels, means twenty times the logarithm to the base ten of the ratio of the pressure of the sound to a reference pressure that is twenty microPascals. (Ord. CS 1070 §2, 2010).

10.46.040 Sound level measurement.

A. Sound level measurements may be made anywhere within the boundaries of a property. Where practical, the point of measurement should be positioned three to five feet above the ground and away from reflective surfaces. The actual location of a sound level measurement shall be at the discretion of the enforcement official.

B. Sound level measurements shall be made with a sound level meter which has been certified as meeting the standards of the American National Standards Institute within the last twelve months and the measurement shall be performed by an enforcement official trained in the use of the sound level meter. (Ord. CS 1070 §2, 2010).

10.46.050 Exterior noise level standards.

A. It is unlawful for any person at any location within the unincorporated area of the county to create any noise or to allow the creation of any noise which causes the exterior noise level when measured at any property situated in either the incorporated or unincorporated area of the county to exceed the noise level standards as set forth below:

1. Unless otherwise provided herein, the following exterior noise level standards shall apply to all properties within the designated noise zone:

Table A

EXTERIOR NOISE LEVEL STANDARDS

Designated Noise Zone	Maximum A-Weighted Sound Level as Measured on a Sound Level Meter (LMAX)	
	7:00 a.m.—9:59 p.m.	10:00 p.m.—6:59 a.m.
Noise Sensitive	45	45
Residential	50	45
Commercial	60	55
Industrial	75	75

2. Exterior noise levels shall not exceed the following cumulative duration allowance standards:

Table B

CUMULATIVE DURATION ALLOWANCE STANDARDS

Cumulative Duration	Allowance Decibels
Equal to or greater than 30 minutes per hour	Table A plus 0 dB
Equal to or greater than 15 minutes per hour	Table A plus 5 dB
Equal to or greater than 5 minutes per hour	Table A plus 10 dB
Equal to or greater than 1 minute per hour	Table A plus 15 dB
Less than 1 minute per hour	Table A plus 20 dB

3. Pure Tone Noise, Speech and Music. The exterior noise level standards set forth in Table A shall be reduced by five dB(A) for pure tone noises, noises consisting primarily of speech or music, or reoccurring impulsive noise.

4. In the event the measured ambient noise level exceeds the applicable noise level standard above, the ambient noise level shall become the applicable exterior noise level standard.

B. Noise Zones Defined.

1. Noise Sensitive. Any public or private school, hospital, church, convalescent home, cemetery, sensitive wildlife habitat, or public library regardless of its location within any land use zoning district.

2. Residential. All parcels located within a residential land use zoning district.

3. Commercial. All parcels located within a commercial or highway frontage land use zoning district.

4. Industrial. All parcels located within an industrial land use zoning district.

5. The noise zone definition of any parcel not located within a residential, commercial, highway frontage, or industrial land use zoning district shall be determined by the director of Stanislaus County planning and community development department, or designee, based on the permitted uses of the land use zoning district in which the parcel is located. (Ord. CS 1070 §2, 2010).

10.46.060 Specific noise source standards.

The following sound sources are subject to the following additional standards. The failure to comply with these additional standards constitutes a separate violation of this chapter:

A. Motor Vehicle Sound Systems. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of ten p.m. and seven a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than fifty feet from the vehicle. (Ref. California Vehicle Code Section 27007.)

B. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of ten p.m. and seven a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the

human ear at a distance greater than one hundred feet from the power tools or equipment.

C. Audio Equipment. No person shall operate any audio equipment, whether portable or not, between the hours of ten p.m. and seven a.m. such that the equipment is audible to the human ear inside an inhabited dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than fifty feet from the equipment.

D. Sound-Amplifying Equipment and Live Music. No person shall install, use or operate sound-amplifying equipment, or perform, or allow to be performed, live music unless the sound emanating from the sound-amplifying equipment or live music shall not be audible to the human ear at a distance greater than two hundred feet. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control.

E. Construction Equipment. No person shall operate any construction equipment so as to cause at or beyond the property line of any property upon which a dwelling unit is located an average sound level greater than seventy-five decibels between the hours of seven p.m. and seven a.m.

F. Burglar Alarms. Any building burglar alarm must have an automatic cutoff, capable of terminating its operation within fifteen minutes of the time it is activated. Notwithstanding the requirements of this provision, any member of the sheriff's department shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm during the period of its activation. Any structure upon which a burglar alarm has been installed shall prominently display the telephone number at which communication may be made with the owner of such structure.

G. Vehicle Alarms. No owner of a motor vehicle shall have in operation an audible burglar alarm therein unless such burglar alarm shall be capable of terminating its operation within fifteen minutes of the time it is activated. Notwithstanding the requirements of this provision, any member of the sheriff's department of Stanislaus County shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed on a motor vehicle at any time during the period of its activation. (Ref. California Vehicle Code Section 22651.5.) (Ord. CS 1070 §2, 2010).

10.46.070 Vibration.

Operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at one hundred fifty feet from the source if on a public space or public right-of-way is prohibited. For the purpose of this section, "vibration perception threshold" means the minimum ground-borne or structure-borne vibration motion necessary to cause a reasonable person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects, or a measured motion velocity of 0.01 in/sec over the range of one to one hundred Hertz. (Ord. CS 1070 §2, 2010).

10.46.080 Exemptions.

The following sources are exempt from the provisions of this chapter:

A. Sounds for the purpose of alerting persons to the existence of an emergency;

B. Radios, sirens, horns, and bells on police, fire, and other emergency response vehicles;

C. Parades, fireworks displays, and other special events for which a permit has been obtained from the county are exempted provided there is compliance with all conditions that have been noted in writing on the permit. Noise produced as a result of noncompliance with any condition specified on the permit is not exempted from the requirements of this chapter;

D. Activities on or in publicly owned property and facilities, or by public employees while in the authorized

discharge of their responsibilities, are exempt provided that such activities have been authorized by the owner of such property or facilities or its agent or by the employing authority;

E. Religious worship activities, including, but not limited to, bells, organs, singing, and preaching;

F. Locomotives and other railroad equipment, and aircraft;

G. The collection of solid waste is exempted to the extent that the noise of such collection is regulated by the Stanislaus County refuse ordinance (Chapters 9.02, 9.04, 9.08, 9.09, 9.10 and 9.12). Noise not covered by the Stanislaus County refuse ordinance is not exempted from the requirements of this chapter.

H. Agricultural activity, as such term is defined in Section 9.32.010(B), and any operation, facility or appurtenances thereof, that are conducted or maintained on agricultural lands for commercial purposes in a manner consistent with proper and accepted customs and standards as established and followed by similar agricultural operations in Stanislaus County.

I. Federal or State Preempted Activities. This chapter shall not apply to any activity to the extent regulation thereof has been preempted by state or federal law.

J. Public Entity or Public Utility Activity. This chapter shall not apply to construction or maintenance activities performed by or at the direction of any public entity or public utility.

K. Residential Maintenance Activity. Noise associated with the maintenance of residential property, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such activity occurs between the hours of seven a.m. and ten p.m. (Ord. CS 1070 §2, 2010).

10.46.090 Waiver.

A. Application. The property owner may request a permit for a waiver from any provision of this chapter.

1. The application for a waiver shall be filed with the department of planning and community development for presentation to the planning commission in writing, on a form prescribed by the director and shall be signed by the owner or authorized agent.

2. The application shall include the information deemed necessary by the director, including, but not limited to:

a. The nature and location of the noise source for which such application is made;

b. The reason for which the waiver is requested, including the hardship that will result to the applicant, or the public if the permit of waiver is not granted;

c. The level of noise that will occur during the period of the waiver;

d. The section or sections of this chapter for which the waiver shall apply;

e. A description of interim noise control measures to be taken for the applicant to minimize noise and the impacts of such noise control measures; and

f. A specific schedule of the noise control measures that shall be taken to bring the source into compliance with this chapter within a reasonable time.

B. A filing fee, in such amount as may be fixed from time to time by resolution of the board of supervisors, shall be paid at the time the application is filed.

C. Notice. The director shall give notice of the request for waiver to all the surrounding properties that would be impacted by the exception, for example, those properties that would experience a noise level at their property line that exceeds the standards as set forth in this chapter.

D. Standard for Issuance of Waiver. A permit to allow a waiver from the provisions contained in all or a portion of this chapter may be issued by the planning commission if the commission determines that:

1. Noise levels occurring during the period of the waiver will not constitute a danger to public health;

2. Compliance with the ordinance would impose an unreasonable hardship on the applicant without equal or greater benefits to the public; and

3. Strict compliance would be unreasonable due to the circumstances of the requested exception.

E. Factors considered for all requests for waiver, other than construction or special events, shall include, but not be limited to, the following:

1. Conformance with the intent of this chapter and general plan policies;

2. Uses of property and existence of sensitive receptors within the area affected by sound;

3. The ability of the applicant to apply the best practical noise control measures;

4. Age and useful life of the existing sound source;

5. The time of the day or night the waiver or waivers will occur;

6. The duration of the waiver; and

7. The general public interest, welfare and safety.

F. Within thirty days of receipt of a completed application, the director shall refer the request directly to the planning commission for action at the next available board meeting. The planning commission may impose reasonable conditions that minimize the public detriment and may include, but are not limited to, restrictions on sound level, sound duration and operating hours, an approved method of achieving compliance and a time schedule for its implementation.

G. Where a request for waiver is associated with a discretionary permit, the waiver shall be processed concurrently with the discretionary permit. In which case the planning commission shall be the approving authority for the exception. The planning commission must consider those factors identified above. The planning commission shall either: (1) approve or conditionally approve such request in whole or in part; or (2) deny the request. The planning commission may impose reasonable conditions that minimize the public detriment and may include, but are not limited to, restrictions on sound level, sound duration and operating hours, an approved method of achieving compliance and a time schedule for its implementation.

H. Where a waiver has been approved by the planning commission and verified complaints are received related to the waiver the commission has the authority to amend, condition or revoke the waiver, as the commission deems necessary so as to secure the purpose of this chapter.

I. Any person aggrieved by the decision of the planning commission may appeal to the board of supervisors by filing written notice of appeal with the director within ten days of the decision. The board of supervisors' decision shall be final and shall be based upon the considerations set forth in this section. All appeals shall be accompanied by an appeal fee as established from time to time by resolution of the board of supervisors. (Ord. CS 1070 §2, 2010).

10.46.100 Enforcement.

Stanislaus County sheriff officers shall have the primary responsibility for enforcement of this chapter. Violations may be prosecuted as described in Section 10.46.120 of this chapter, but nothing in this chapter shall prevent the sheriff from engaging in efforts to obtain voluntary compliance by means of warnings, notices, educational programs or any other means. (Ord. CS 1070 §2, 2010).

10.46.110 Duty to cooperate.

No person shall refuse to cooperate with, or obstruct, the enforcement officials identified herein when they are engaged in the process of enforcing the provisions of this chapter. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this chapter. (Ord. CS 1070 §2, 2010).

10.46.120 Violations and penalties.

A. Any person violating provisions of this chapter is guilty of an infraction, and, upon conviction thereof, shall be punished as an infraction as set forth in Stanislaus County Code Section 1.36.020. Every violation of any provision of this chapter shall be construed as a separate offense for each day during which such violation continues and shall be punishable as provided in this section.

B. All violations of this chapter constitute a public nuisance which, in addition to or in lieu of the penalty provisions set forth above, may be abated in any manner set forth in the Stanislaus County Code, including Chapter 2.92, which may include, but is not limited to, abatement or issuance of administrative citations. (Ord. CS 1070 §2, 2010).