Alviso Slough Pedestrian Bridge Feasibility Study

Bay Trail Reach 9B

T092005001SFO_Alviso cov.psd_3/9/06

March 2006

Prepared for:

Department of Parks,
Recreation and Neighborhood Services

Prepared by:

CH2MHILL

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Alviso Slough Pedestrian Bridge Feasibility Study

3/13/06

Prepared for
City of San José

CH2MHILL

March 2006

Contents

Alviso Slough Pedestrian Bridge Feasibility Study [Bay Trail Reach 9B]

Project Background

This study evaluates the feasibility of a pedestrian and bicycle bridge crossing the Alviso Slough/Lower Guadalupe River near Gold Street, in north San José. A river crossing at this location is a critical element in the South Bay segment of the San Francisco Bay Trail. The Bay Trail was established by the Association of Bay Area Governments in 1989, per the Bay Trail Master Plan, which described a 400-mile long recreational and transportation trail system forming a "ring" around the perimeter of the San Francisco and San Pablo Bays.

To add to the significance of this route, both the 1*996 Comprehensive Management and Use Plan for the Juan Bautista de Anza National Historic Trail* and the *Santa Clara Countywide Trails Master Plan* (November 1995) recommend routing Juan Bautista de Anza trail on the same alignment as the Bay Trail, through the County of Santa Clara.

The Santa Clara Valley Transportation Authority's Bicycle Plan also shows the Bay Trail alignment as a proposed cross-county Bicycle Corridor, which will provide an opportunity for bicycle commuters to travel between home and work away from congested streets and highways.

The City of San José took a major step in the development of the San Francisco Bay Trail by initiating a Master Plan in 1999 for portions of the trail within city limits. This Master Plan was completed in June 2002 and was developed with input from a Technical Advisory Committee and the community of Alviso. The Technical Advisory Committee was comprised of representatives from the various departments of the City of San José, adjacent cities, the Santa Clara Valley Water District (SCVWD), the County of Santa Clara, the Association of Bay Area Governments – San Francisco Bay Trail Project, and the Juan Bautista de Anza National Historic Trail.

The purpose of San Jose's Bay Trail planning effort was to develop a safe, environmentally sensitive, and interesting route through areas with heavy industrial uses, sensitive riparian and bayland habitat, pending research and development facilities, and an established residential community located in a designated historic district. The Bay Trail Master Plan includes 13.3 miles of Class I [1] shared use trail through north San José, divided into nine reaches, between Coyote Creek and San Tomas Aquino Creek.

Reach 9 of the Bay Trail extends from Gold Street in Alviso to San Tomas Aquino Creek. The master plan described three alternate routes. This feasibility study documents alternative Reach 9B, which includes a pedestrian/bicycle bridge across Alviso Slough (terminus of the Guadalupe River).

---

[1] Class I Trail: A trail that is completely separated from adjacent roadways for the exclusive use of bicycles and pedestrians with cross flow minimized.

The bridge alternative was proposed because it provides a more direct and scenic crossing of the Guadalupe River/Alviso Slough than the other two alternatives for Reach 9. The other alignment alternatives included an at-grade crossing of the Union Pacific Railroad (UPRR) tracks (Reach 9B), which was not likely to be permitted by the California Public Utilities Commission (agency with oversight of rail operations) and use of the existing Gold Street Bridge (Reach 9C), which has a narrow cross section inadequate for independent trail development.

The studied bridge would provide a direct link to the Bay Trail Reach 7A: Alviso Slough Levee, which extends to the Alviso County Marina and the Alviso Historic District. The City also has evaluated, as part of the Lower Guadalupe River Trail Master Plan, a short trail segment that would connect the Alviso Slough Levee (Reach 7A) to the Lower Guadalupe River Trail at the east side of Gold Street, via an undercrossing of the existing UPRR Bridge and the Gold Street Bridge.

The proposed bridge will provide continuity between Reaches 7A and 9 of the Bay Trail. Dependent upon funding, the City intends to develop permanent trail improvements along Reaches 7A and 9 simultaneously with the bridge project.

In the short-term, the City also seeks to work with the SCVWD to enter into an interim trail agreement for Reach 7A. Including Reach 7A within the City's trail system would require minor signage, fencing, and grading work.

The Alviso Slough Pedestrian Bridge is within City Council District 4, as shown on the Project Location Map (Figure 1, Project Location Map).

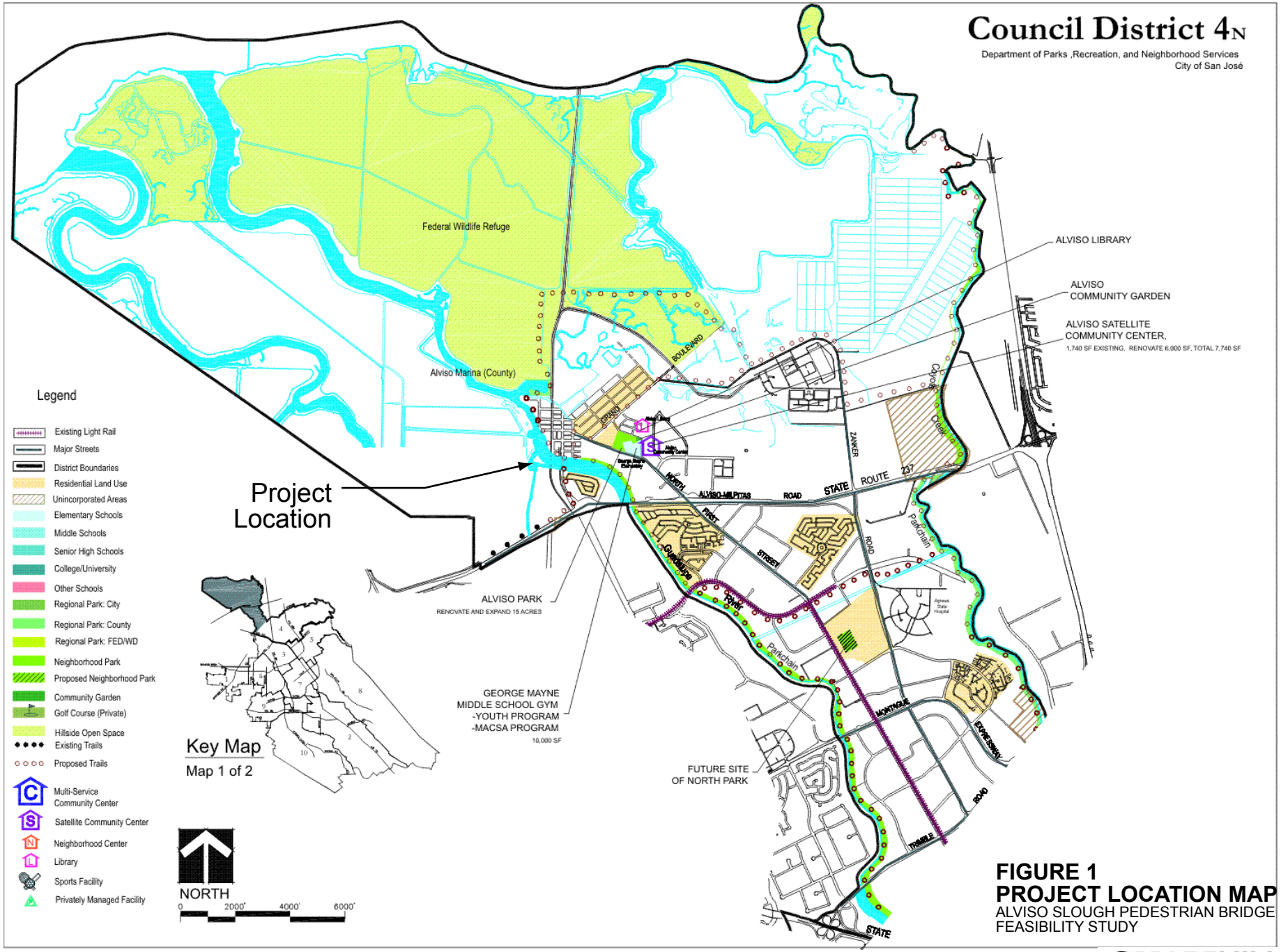


FIGURE 1
PROJECT LOCATION MAP
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

T092005001SFO_332226.T1.10_Alviso proj loc.ai_3/3/06_ez_bao

Project Description

The project site is located in the north San José community of Alviso, approximately 500 feet west of the Gold Street Bridge over Alviso Slough (Figure 2, Site Map). The proposed pedestrian bridge will cross the slough immediately downstream (west) of the Union Pacific Railroad Bridge, and will connect the north and south banks of the Alviso Slough Levee. The project site is adjacent to land known as the Legacy property (a former landfill site). Dirt and gravel surfaced maintenance roads currently exist where the proposed bridge abutments will be constructed. The levee/channel side slopes are covered predominantly with native grasses, weeds, and coyote brush. A few mature trees exist on the Legacy (southerly) side of the channel.

The Guadalupe River becomes Alviso Slough at the project site. The Slough is approximately 500 feet wide at this location, with a 50-foot wide low flow channel near the southerly channel bank and a wide, flat channel bench area between the low flow channel and the northern levee. The entire channel bottom and bench area is subject to inundation from daily tides from South San Francisco Bay.

No utilities that exist at the site would be affected by the proposed construction.

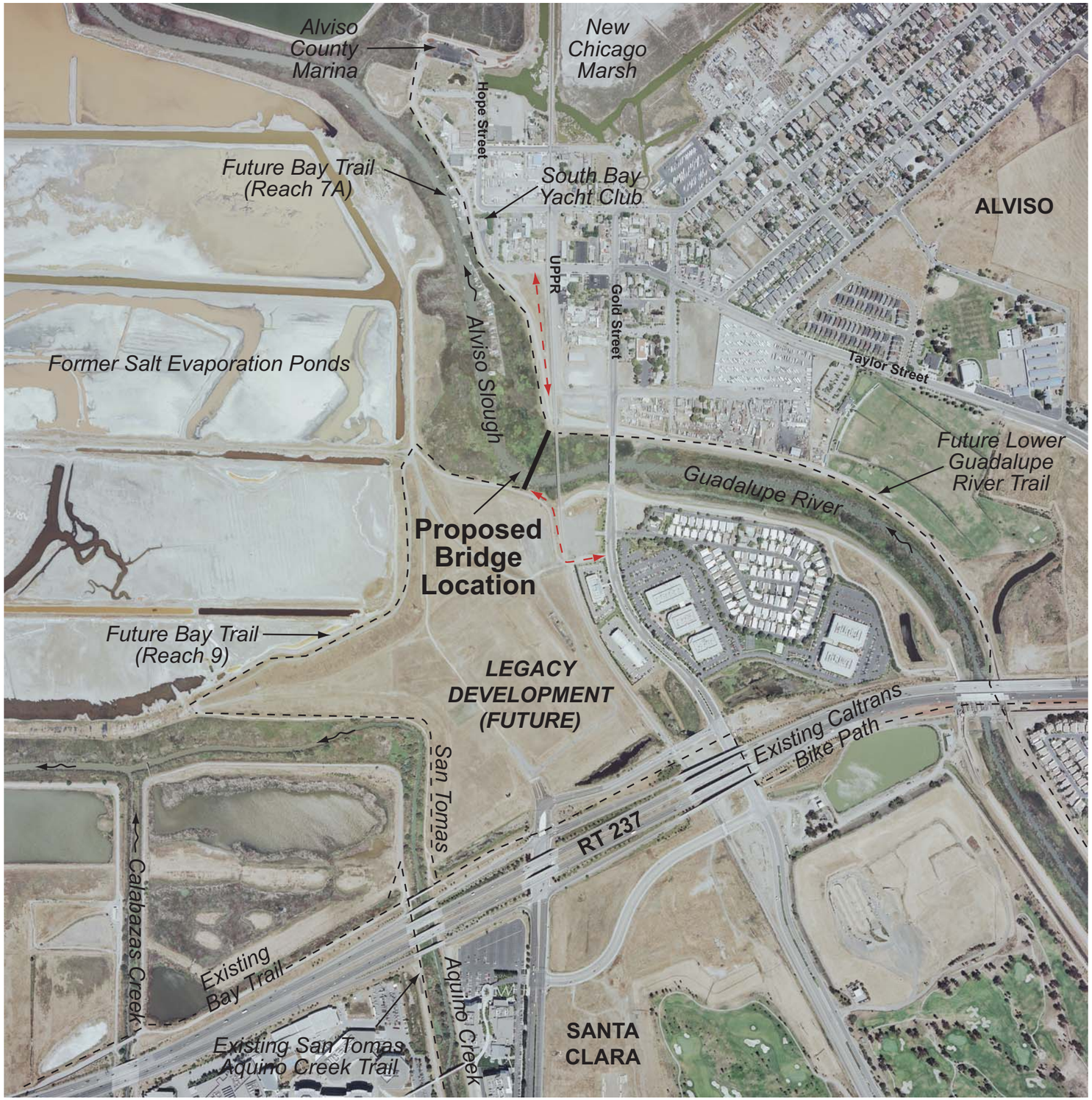


FIGURE 2
SITE MAP
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

T092005001SFO_332226.T1.10_Site Map_3/9/06_ez_bao

Alignment

The horizontal alignment for the proposed pedestrian bridge runs north-northeast to south-southwest and varies between 40 and 210 feet clear and downstream from the existing UPRR track and structure. The proposed alignment will remain clear of the UPRR right-of-way, while resulting in a minimum length of structure.

The north end of the alignment will tie into the Alviso Slough Levee (Reach 7A). The south end of the alignment terminates at the dirt road located on the north end of the Legacy property, known as Reach 9 (Figure 3, Site Context Map). The bridge alignment will not restrict access to existing maintenance roads.

The proposed vertical alignment has been determined based on maintaining a minimum of four feet of freeboard[2] from the design water surface elevation in Alviso Slough to the bottom of the proposed bridge truss. The design water surface elevation is described in the *Preliminary Hydraulic Analysis Technical Memorandum* contained in the Appendix.

The structure will be approximately 540 feet long and 12 feet wide, with approach ramps at both ends.

2 Freeboard: A hydraulic design factor of safety that is the vertical distance between the channel water surface elevation resulting from the design flow rate in the channel and the lowest point of a channel cross section at which water would overflow.

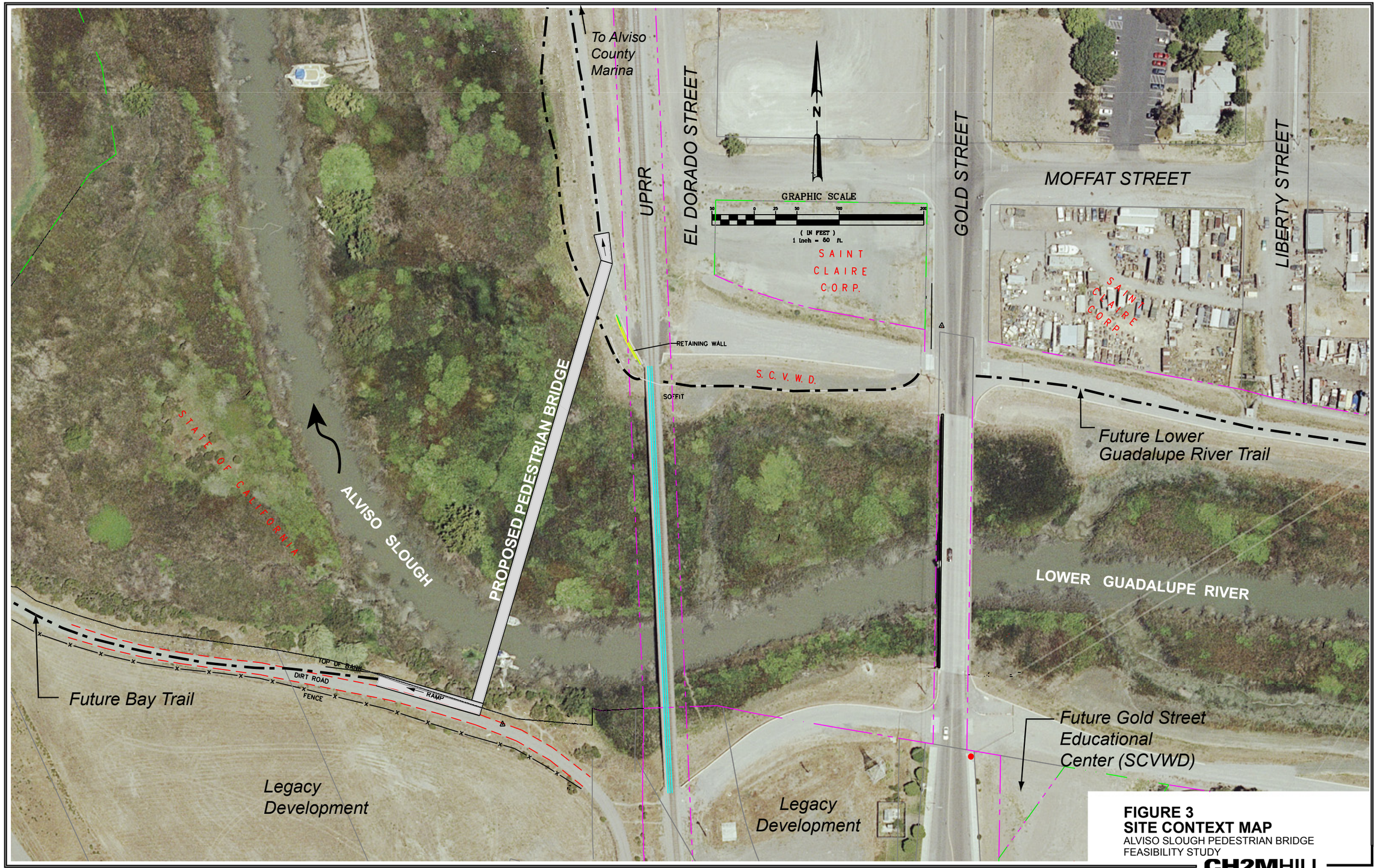


FIGURE 3
SITE CONTEXT MAP
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

10-Aug-2005 topo2 7-05.dwg

Concept Development

On August 11, 2005, CH2M HILL met with representatives of San José, Santa Clara County, the SCVWD, and Callander Associates at the Project Initiation Meeting to review site constraints, initial structural concepts, and aesthetic considerations in the context of the surrounding community. Based on that meeting, further investigation and concept development was conducted for three possible structure types, hereinafter referred to as the Box Truss, the Bowstring Truss, and Cable Stay alternatives. The results of a detailed evaluation of these three concepts are presented in this document. These include graphical representations of plan, elevation views, and details; a discussion of the features of each alternative; a construction cost estimate for each alternative; and a representative schedule for project development from feasibility study through completion of construction.

Alternatives Analysis

1. Box Truss

The Box Truss alternative consists of three 180-foot spans for a total crossing length of 540 feet. The structure depth (measured from top to bottom of structural steel members) is approximately 11 feet. The truss has a rectangular configuration with the two top longitudinal steel members of the box truss connected by horizontal perpendicular steel members, giving the structure a complete box configuration, which results in increased stability with minimum structure depth and the lowest profile of any alternative considered. Having the top of the truss enclosed with these members allows for the trail surface profile grade to be only 18 inches above the bottom of the truss. This option allows for the least fill at both abutments, the shortest approach ramps, and the lowest pier heights.

To enhance the experience of users of the structure, overlooks at the two pier locations can be accommodated. Details of this alternative are included in Figures 4 and 5.

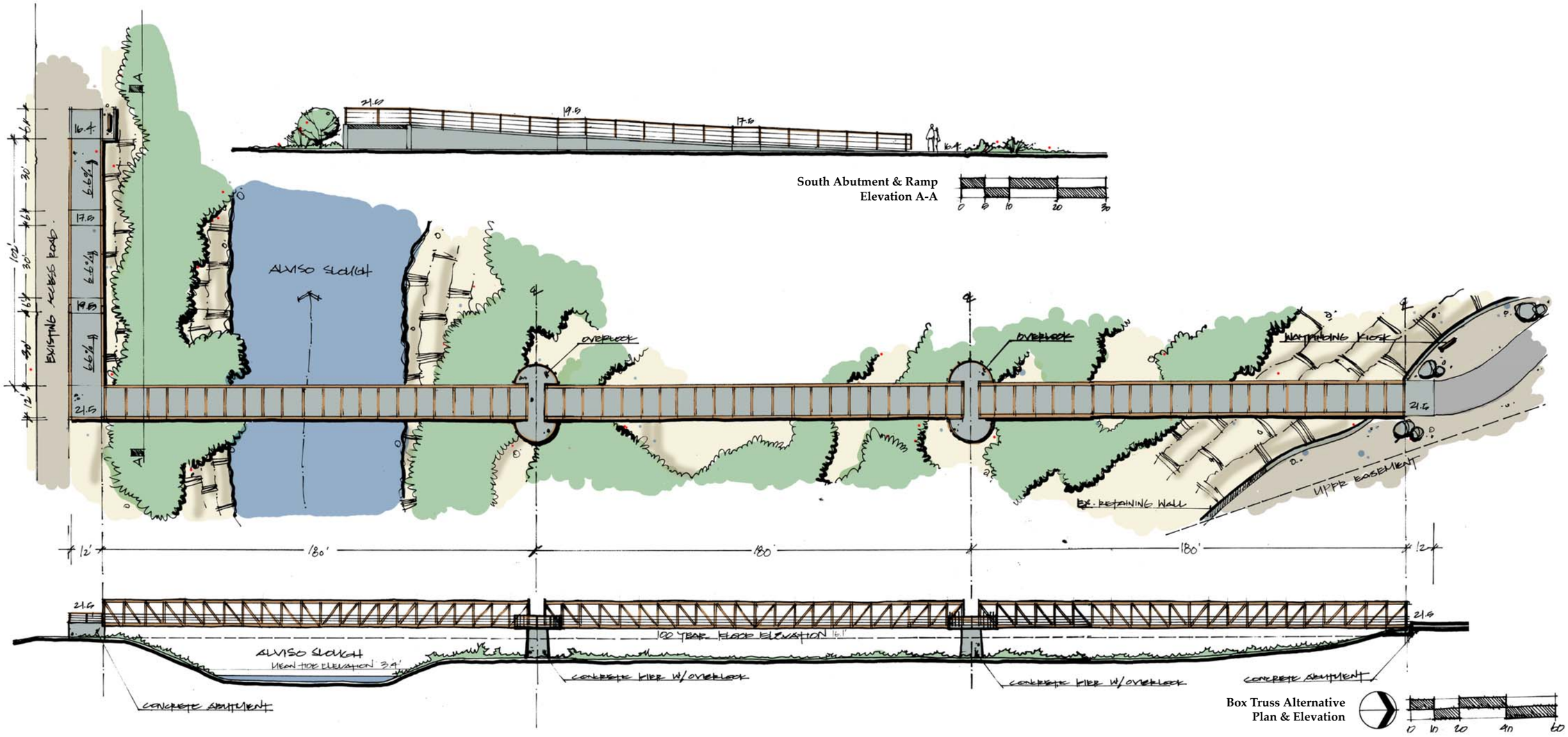


Figure 4
Alternative A(Box Truss) - Plan and Elevation
Alviso Slough Pedestrian Bridge Feasibility Study

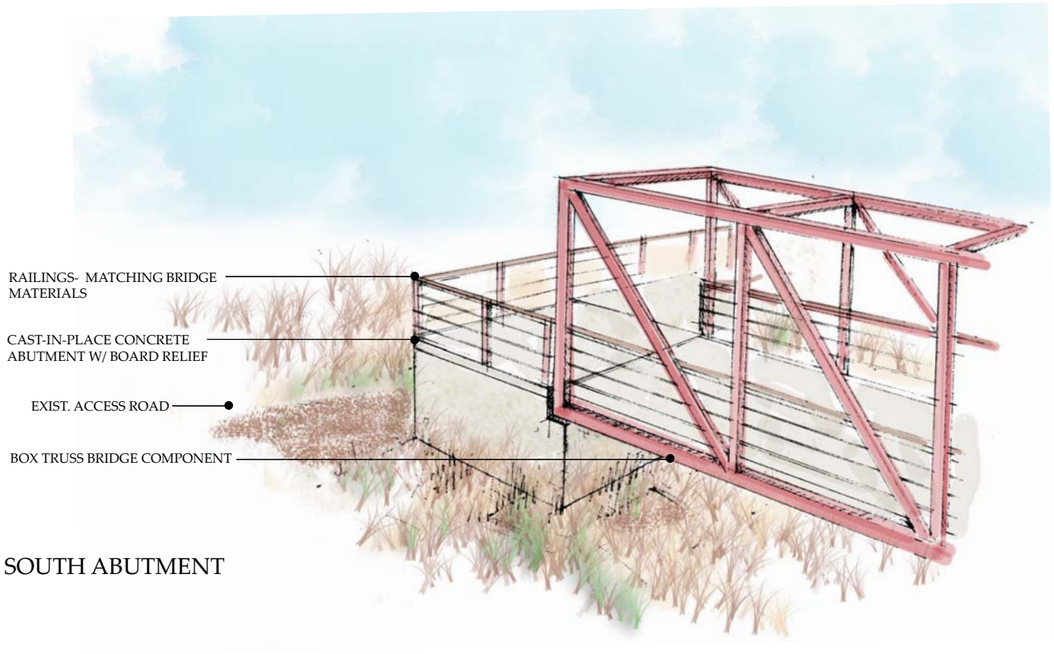
Callander Associates

Park and Recreation Design
Landscape Architecture

City of San José
Department of Parks, Recreation and Neighborhood Services

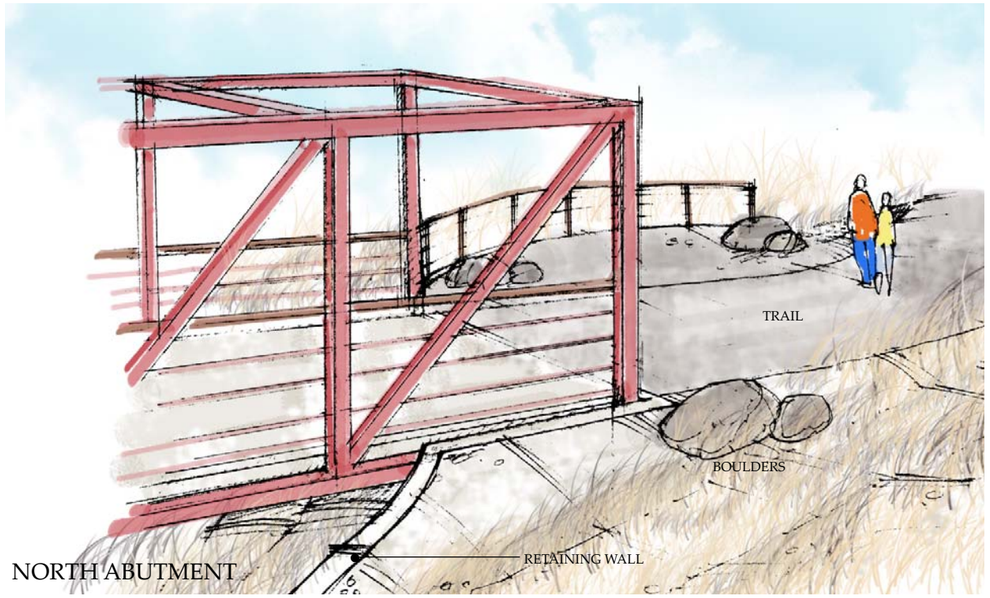
05051

10.14.05



SOUTH ABUTMENT

PIER WALL



NORTH ABUTMENT

Figure 5
Alternative A (Box Truss) - Details

Alviso Slough Pedestrian Bridge Feasibility Study

Callander Associates
Park and Recreation Design
Landscape Architecture

City of San José
Department of Parks, Recreation and Neighborhood Services

05051
10.14.05

2. Bowstring Truss

The Bowstring Truss alternative also consists of three 180-foot spans (540 feet total) with a maximum structure depth of approximately 12 feet. Because this option does not allow for horizontal steel members to be placed between the top longitudinal steel members of the truss, the trail surface profile grade must be approximately three feet above the bottom of the truss. Additional fill at each abutment, as well as a longer approach ramp at the southern abutment, will be required for this option.

To enhance the experience of users of the structure, overlooks at the two pier locations can be accommodated. Of the three structure types contemplated, the Bowstring Truss design provides the most unimpaired views from the overlooks. The bridge structure (bows) drops below eye level at the overlooks, thereby permitting views across the bridge deck in addition to the views looking outward from the overlooks. Details of this alternative are included in Figures 6 and 7.

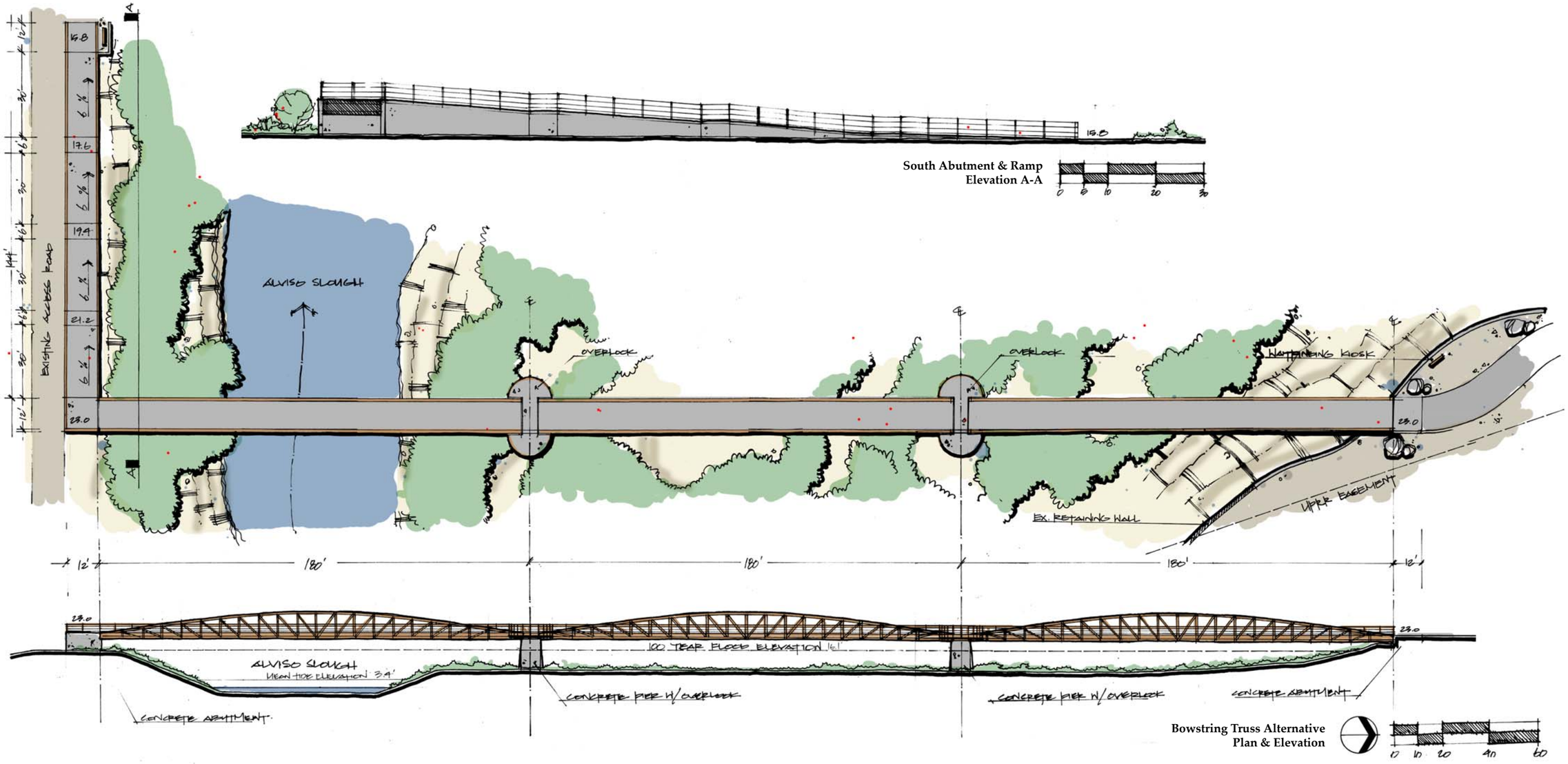


Figure 6
Alternative B (Bowstring Truss) - Plan and Elevation
Alviso Slough Pedestrian Bridge Feasibility Study

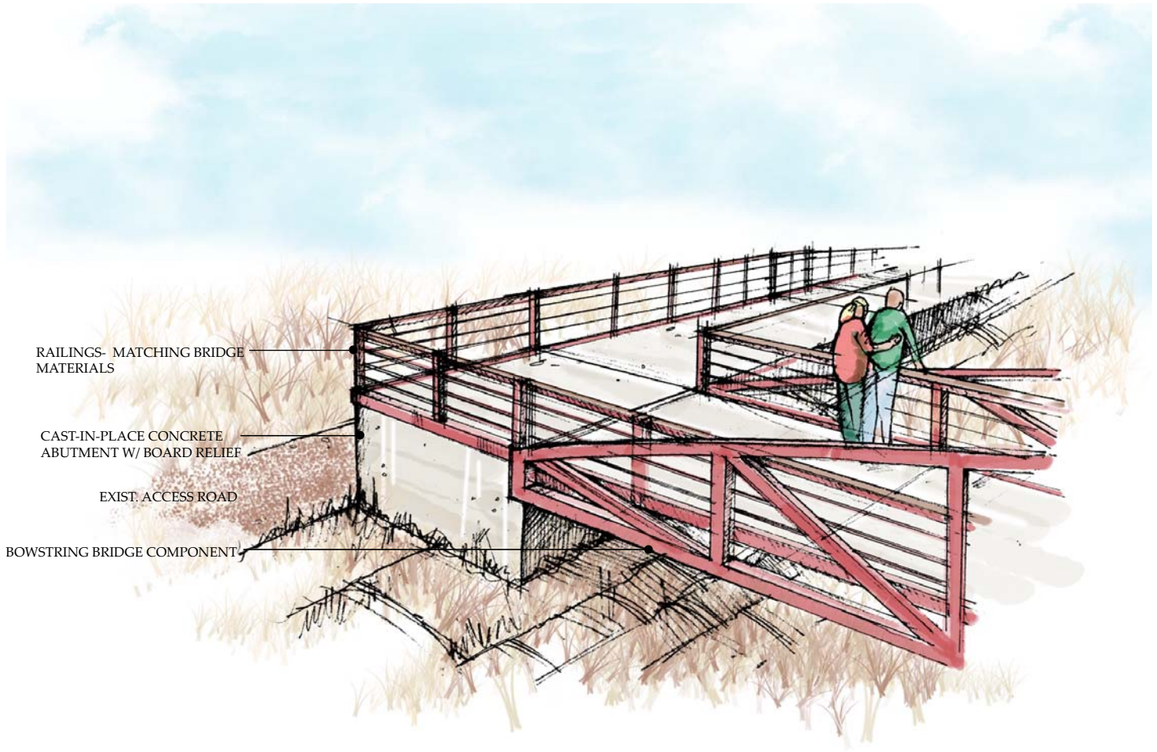
Callander Associates

Park and Recreation Design
Landscape Architecture

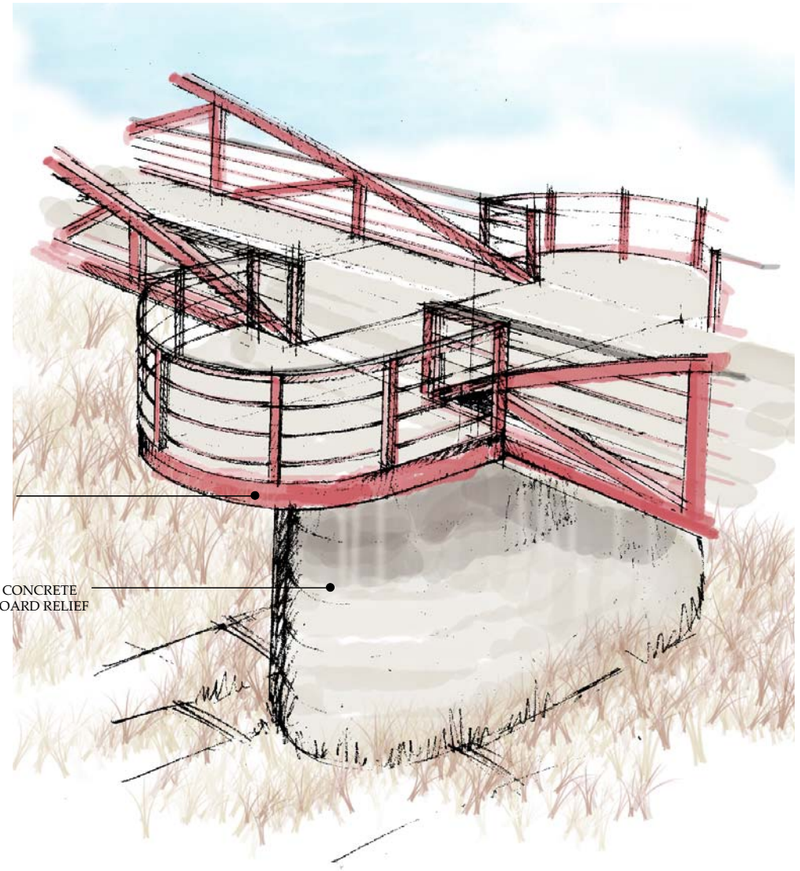
City of San José
Department of Parks, Recreation and Neighborhood Services

05051

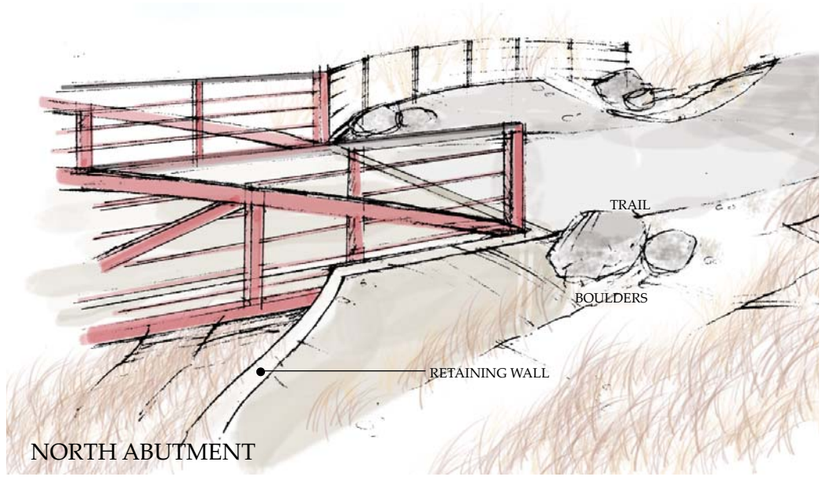
10.14.05



SOUTH ABUTMENT



PIER WALL



NORTH ABUTMENT

Figure 7
Alternative B (Bowstring Truss) - Details
Alviso Slough Pedestrian Bridge Feasibility Study

Callander Associates
Park and Recreation Design
Landscape Architecture

City of San José
Department of Parks, Recreation and Neighborhood Services

05051
10.14.05

3. Cable Stay

The Cable Stay alternative consists of two towers approximately 70 feet high supporting two side spans of 130 feet each and a main span of 260 feet for a total length of 520 feet. The structure depth for the Cable Stay alternative is approximately eight feet. Placement of the southern-most pier outside of the deep water channel, while still maintaining balanced spans, results in the overall difference in bridge length from the other alternatives. This layout is accommodated by moving the southern abutment approximately 20 feet to the west and further down the river bank from the location presented in the other two options. The profile elevation for the Cable Stay alternative is the same as required for the Bowstring Truss alternative, approximately three feet above the bottom of the truss. As a result of the shorter span length and higher profile grade, the southern abutment will be larger than the other options. In addition, the approach ramp will be similar to the Bowstring Truss and longer than the Box Truss approach ramp.

Because of the structural configuration inherent in this type of bridge, pier overlooks are not possible. Details of this alternative are included in Figures 8 and 9.

Perspective drawings of each bridge alternative are included in the Appendix.

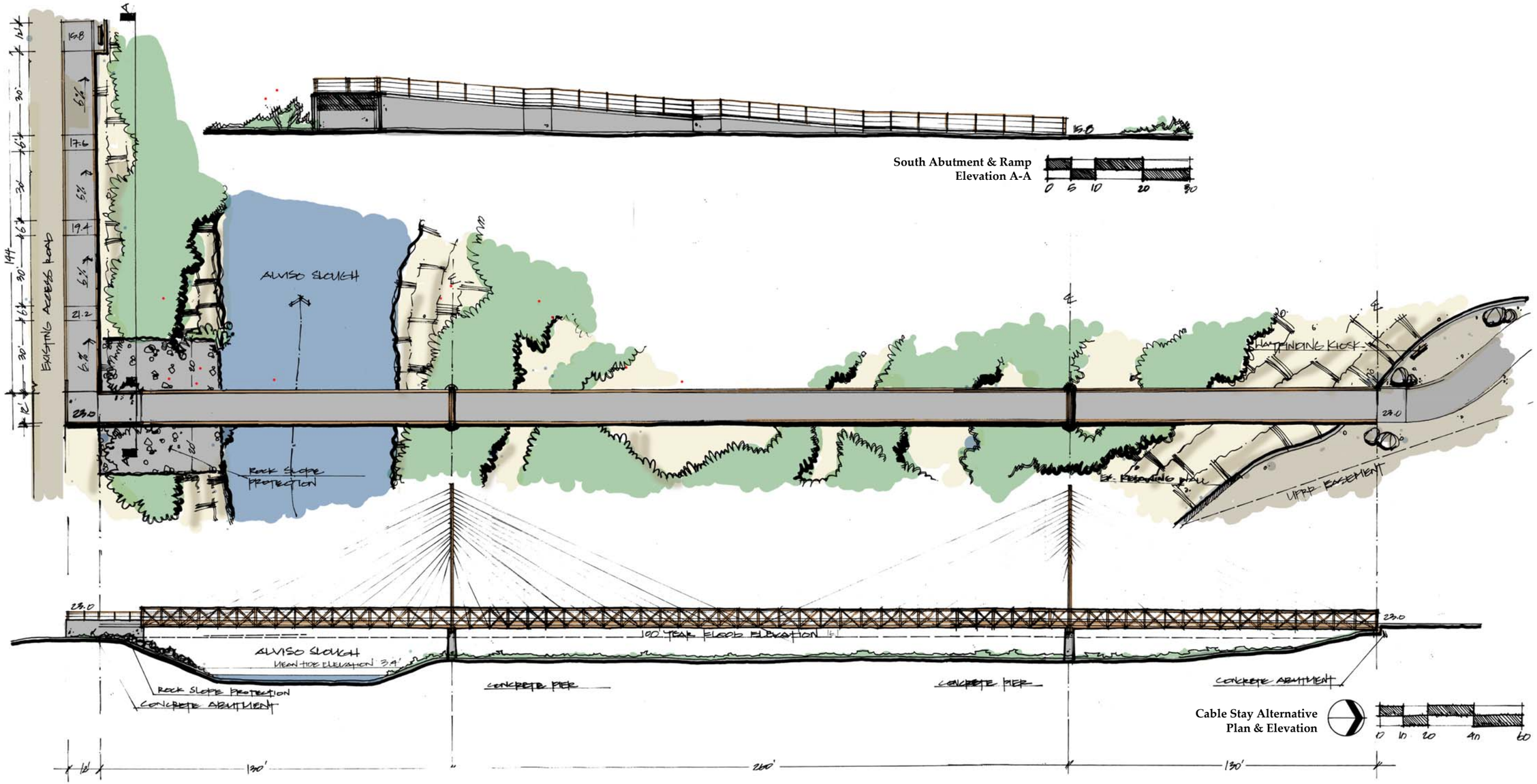


Figure 8
Alternative C (Cable Stay) - Plan and Elevation
Alviso Slough Pedestrian Bridge Feasibility Study

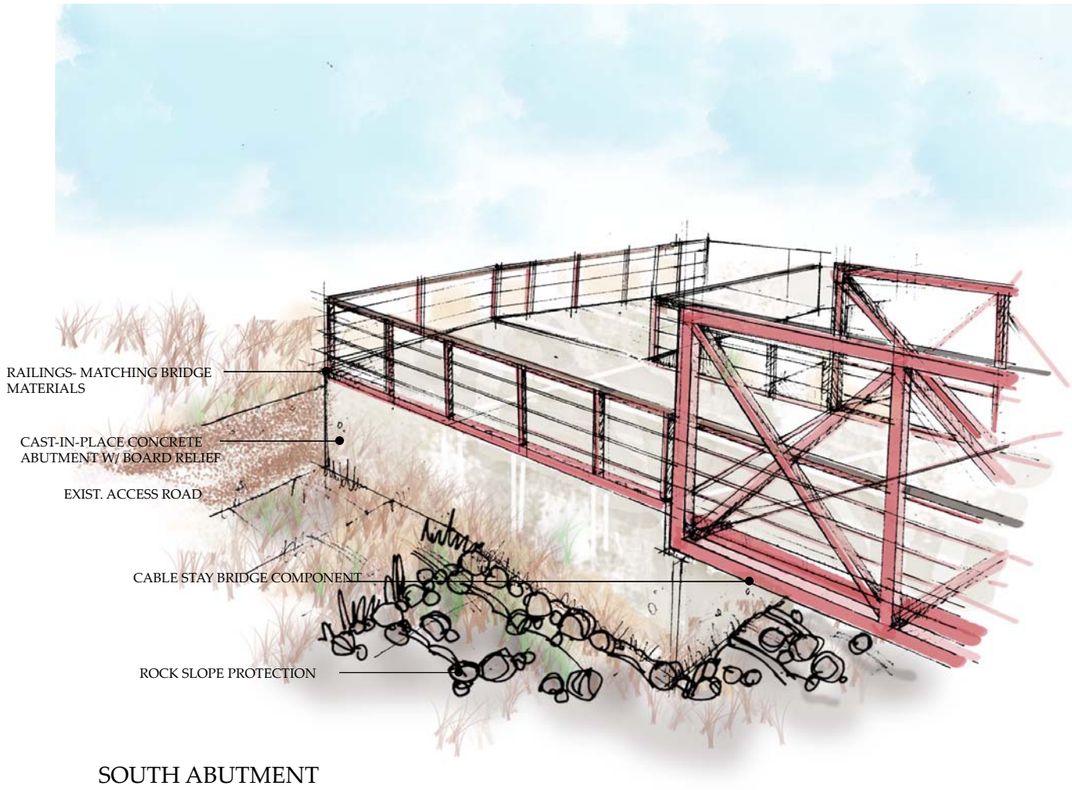
Callander Associates

Park and Recreation Design
Landscape Architecture

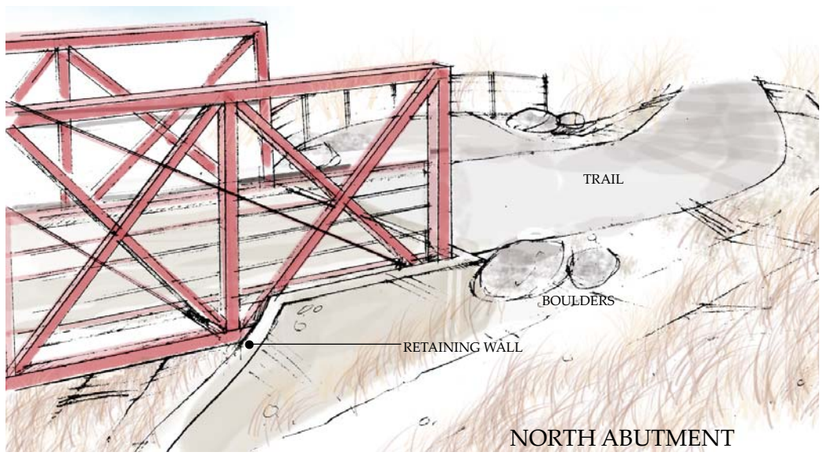
City of San José
Department of Parks, Recreation and Neighborhood Services

10.14.05

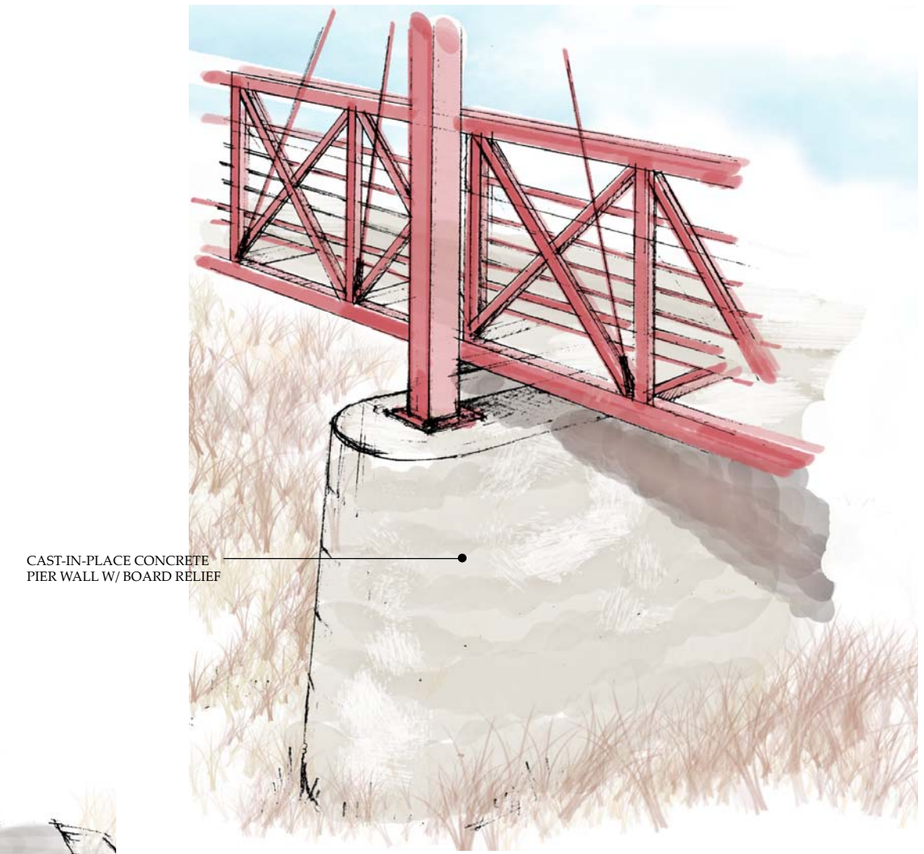
05051



SOUTH ABUTMENT



NORTH ABUTMENT



PIER WALL

Figure 9
Alternative C (Cable Stay) - Details
Alviso Slough Pedestrian Bridge Feasibility Study

Callander Associates
Park and Recreation Design
Landscape Architecture

City of San José
Department of Parks, Recreation and Neighborhood Services
10.14.05

05051

Common Features

Prefabricated Steel Truss Superstructure

The proposed pedestrian bridge crossing will consist of a three-span pre-manufactured steel truss bridge with approach ramps at both ends. This type of construction will be more economical and will be more rapidly constructed than either cast-in-place reinforced concrete or precast concrete structures.

Bridge Deck

Each structure type considered will provide a 12-foot-wide travel path for pedestrians and bicycles. The bridge deck surface will be reinforced concrete construction supported by a steel deck for minimal maintenance.

The bridge may be accessed with a maintenance vehicle from the north end of the structure. The ninety degree turn at the south end of the structure will not allow for through access of a maintenance vehicle.

Ramps at the structure approaches will be ADA compliant.

Bridge Aesthetics

Unpainted weathering steel is recommended for use on all three bridge types. This steel readily forms a surface layer of rust that inhibits long-term corrosion and minimizes maintenance by eliminating painting. A byproduct of the use of this material can be surface rust staining on supporting concrete elements. In practice, this staining can be avoided by painting the end portions of the structure, by detailing to minimize the flow of run-off water to the supports, or by use of protective coatings on supporting concrete surfaces. In this case, the staining of substructure elements is considered to be desirable to lend an aged look to the structure. The bridge is intended to be evocative of the surroundings, and the weathered steel, in combination with the resultant staining of the supporting concrete, emulates the time worn character of the historic Alviso neighborhood.

Wide pier walls with rounded ends are proposed for the Box Truss and Bowstring Truss alternatives so as to provide a sense of mass, suggestive of construction practices common before the advent of pre-stressed, post-tensioned concrete. The historical appearance of the massive pier walls, classic bridge forms, and weathered steel appearance will integrate the structure with the surroundings. Concrete formwork will be deliberately left rough, or board formwork may be simulated using formliners. Seams and ridges in the concrete and grain from the forms will enhance the organic appearance of the structure. In lieu of detailed design and crisp forms, it is intended that the shadow and texture from the rough finish will imply construction practices typical of an older bridge. For the Cable Stay alternative, more slender, tapered pier walls will be used to support the bridge in the channel and will help tie the bridge into the other structural elements identified in the area during the site reconnaissance phase of the feasibility study. The delicacy of the cable stay bridge is complemented by the thinner pier walls.

Coloring of the cast-in-place concrete used for the piers, bridge deck, approach ramps, and walls is recommended to enhance the weathered look of the structure and to blend with the surrounding environment. Recently completed improvements at the Alviso County Marina,

approximately one-half mile north of the bridge site, will be used as a guide for concrete colors and textures. The Marina also presents examples of signage structures, paving, and fencing that can be incorporated into the bridge approach aesthetics.

The bridge will include a public art component in accordance with City Council Resolution No. 64284. The City of San Jose Office of Cultural Affairs will provide input on this project component.

Bridge Foundations

The two pier foundations, along with each of the abutments, will be founded on deep, driven pile-supported foundations. As noted in the *Preliminary Geotechnical and Foundation Recommendations Technical Memorandum* contained in the Appendix, considerable fill material and soft, highly compressible deposits of Young Bay Mud extending to depths up to -38 feet exist at the site. Below the fill and bay mud lies older alluvial material capable of supporting piles. Due to the difficulty of installing drilled shafts, driven piles are recommended at this site.

The approach ramp at the south end of the structure may be supported on shallow foundations. Back-to-back Caltrans Type 1 Retaining Walls, as well as a hollow box structure, were considered as options for supporting this ramp.

Bridge Lighting

City of San José trails are open from sunrise to one hour after sunset, hence lighting of the Alviso Slough Bridge is not necessary. Furthermore, the environmental sensitivity of the site to the addition of lighting is significant. Presently, the site suffers only a modest amount of skyglow from adjacent improvements and is thus relatively unimpacted. The addition of lighting would have a substantially greater impact on the environment surrounding this structure than on the environment surrounding an equivalent structure within a developed area. Adding lighting also would increase the capitol, maintenance, and utility costs of the project.

Hydraulics and Hydrology Considerations

A preliminary hydraulic analysis was performed to predict design water surface elevation and stream flow velocity impacts due to the proposed bridge features. As summarized in the *Preliminary Hydraulic Analysis Technical Memorandum*, contained in the Appendix, the proposed bridge will have no significant hydraulic impacts on flow conditions in Alviso Slough/Guadalupe River. The existing and post-construction water surface elevation is approximately 16.1 ft (NAVD88) and the corresponding velocity approximates 5.4 fps[3], for a 100-year flow rate[4] of 18,325 cfs[5]. Four feet of freeboard, above the 100-year water surface elevation, will be provided. The expected localized scour potential at the piers is significant, but manageable. During final design, a detailed scour analysis will be required and any impacts due to scour will be addressed.

---

3 fps: Feet per second

4 100-year flow rate: A volume of water flowing in the river, that has a 1% chance of occurring in any given year.

5 cfs: Cubic feet per second

Seismic Considerations

Because of the potentially liquefiable soils at the project site, a Soil Profile Type F, per Caltrans Seismic Design Criteria, has been proposed in the Preliminary Geotechnical and Foundation Recommendations. Site-specific acceleration (ARS) curves will need to be developed and used during the design phase.

For this Feasibility Study comparison of structure types, the site-specific ARS curve developed as part of the SR 237 Guadalupe River Bridge Replacement Project upstream was assumed. The potential for liquefaction in the soil above the older alluvial material, in which the shafts will be founded, was considered during the evaluation of the piles.

Environmental Clearance

A Mitigated Negative Declaration was adopted by the City of San José in 2002 for the Bay Trail Master Plan. This master plan included a pedestrian and bicycle bridge across Alviso Slough as Alignment Alternative 9B. However, because detailed plans for the bridge were not available during the master plan process, additional impact evaluation and analysis is required for environmental clearance and regulatory permits for construction of the bridge. Due to the environmentally sensitive nature of Alviso Slough because of the potential presence of endangered species of plants and animals, and anticipated public interest in this project, it is recommended that a California Environmental Quality Act (CEQA) Checklist be completed to identify potential impacts from construction and operation of the bridge. It is anticipated that this study would lead to a Mitigated Negative Declaration for the Project, provided that any significant impacts can be sufficiently mitigated. Refer to the *Technical Memorandum: Bay Trail Crossing at Alviso Slough – Potential CEQA and Permitting Issues*, in the Appendix, for additional information about the CEQA clearance process.

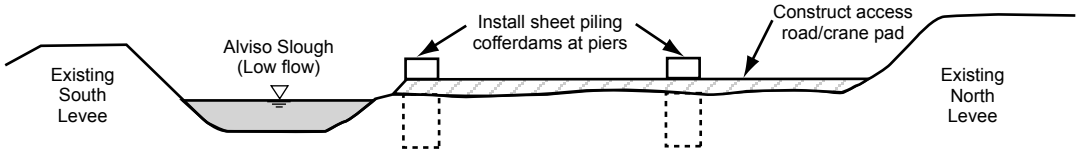
Constructability Issues

Construction access to the project site on the north likely will be via Taylor Street, west of the UPRR tracks, onto the Alviso Slough Levee, which is owned by the SCVWD and private parties. Temporary construction access agreements will likely be required from all parties. A maintenance ramp exists from the top of the levee to the channel bench area, approximately 500 feet north of the UPRR bridge abutment. This ramp will provide the primary access point for construction within the channel. From the south, access will be from Gold Street and across the UPRR tracks, through two locked gates on private property. Permits from the UPRR and California Public Utilities Commission (CPUC) likely will be required for access during construction, over the private, temporary, at-grade crossing of the UPRR tracks.

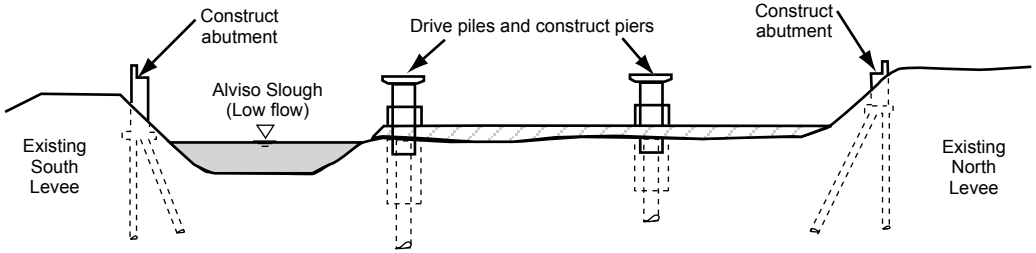
The proposed bridge structure alignment is sufficiently clear from the centerline of UPRR tracks (greater than 25 feet) so that no permit for the bridge is required. A railroad agreement with the construction contractor still will be required to address construction activities that could influence railroad operations and trigger railroad flagging requirements, such as pile handling and driving at the northerly abutment.

Construction of the truss that spans over the low flow channel is expected to be done using temporary support bents between the abutment and southerly pier. The weight of the completed truss segment prohibits lifting the entire span with one crane. These temporary supports might consist of driven steel piles, which would subsequently be removed once construction is complete. Sections of the truss will be lifted into place and field spliced. For the two northern spans of the bridge, temporary bents also may be utilized. As an alternative, the contractor may elect to assemble the trusses adjacent to the alignment and then lift each completed span into place using two cranes.

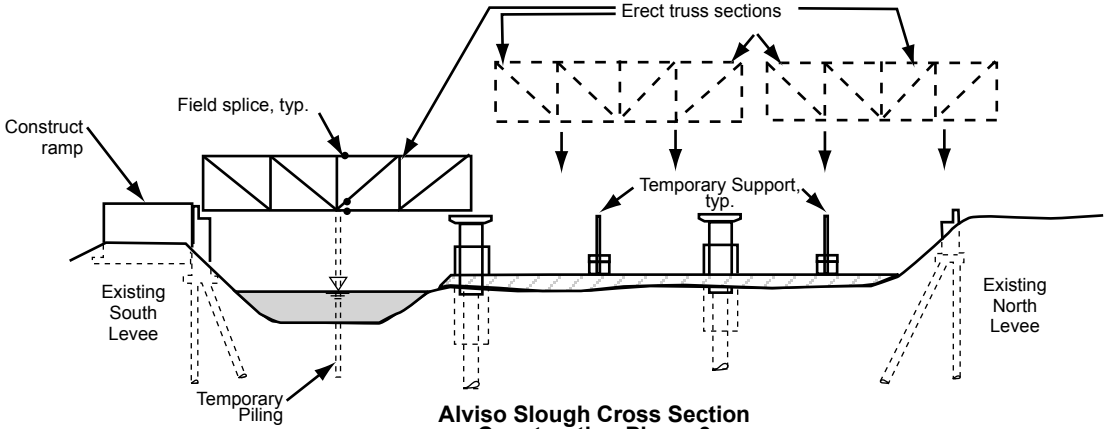
During construction, it is likely the contractor will construct a temporary timber or gravel surfaced access road parallel to and west of the bridge alignment. This road will provide construction access to piers and crane access for truss erection. This access road would be removed upon completion of construction (Figure 10, Construction Phases).



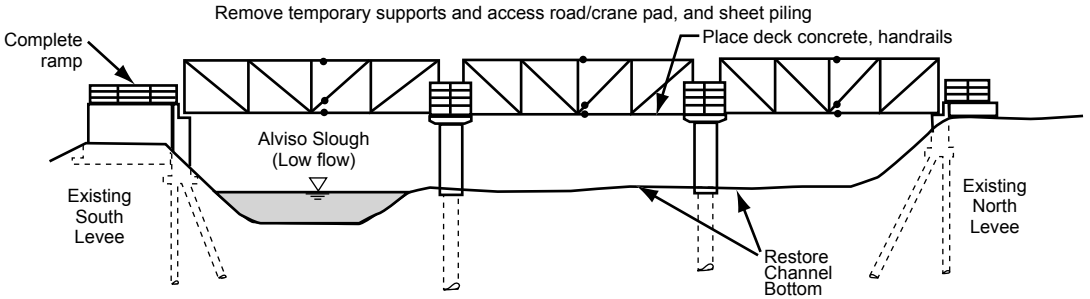
Alviso Slough Cross Section
Construction Phase 1



Alviso Slough Cross Section
Construction Phase 2



Alviso Slough Cross Section
Construction Phase 3



Alviso Slough Cross Section
Construction Phase 4

FIGURE 10
CONSTRUCTION PHASES
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

Right-of-Way Requirements

The proposed bridge is located in the Alviso area of north San José and crosses the Guadalupe River/Alviso Slough. The current river/slough alignment is the result of modifications over time, as development has encroached onto the lower floodplain and adjacent land uses have changed. In the 1960s, the Guadalupe River was re-aligned and connected to Alviso Slough to form the general waterway alignment present today. Based on current County of Santa Clara Assessor's maps, shown as Figures 11 through 14, property ownership in and adjacent to the project area is summarized in Table 1.

Table 1

Property Ownership

APN	Project Feature	Ownership	Area
15-41-003	North bridge abutment and approach	SCVWD	Alviso Slough East Levee
-	Bridge spans and piers; South bridge abutment and approach	State of California	Alviso Slough and West Levee
15-03-023	Construction Access	SCVWD	Alviso Slough East Levee
15-03-025	Construction Access	Earl, Helen, and William Pellegrini	Vacant parcel behind Alviso Slough East Levee
15-03-029	Construction Access	Earl, Helen, and William Pellegrini	Vacant parcel behind Alviso Slough East Levee
15-34-125	Construction Access	Gold Team, LLC	Existing Access Road off Gold Street
15-45-013	Construction Access	San Jose Alviso Youth Foundation	Existing Access Road, West Levee
15-45-024	Construction Access	San Jose Alviso Youth Foundation	Existing Access Road, West Levee

Table 1: Property Ownership

In the early 1970s, the UPRR Bridge was constructed to its current configuration. Based on past correspondence between the SCVWD and the UPRR relative to the Lower Guadalupe River Flood Protection Project, the railroad does not have fee title ownership of its track alignment in the project area. As a practical work limit for purposes of this project, we have established a railroad "easement" that is 50-feet wide, centered on the existing rails. This represents a typical single-track railroad corridor and allows for a 25-foot setback from centerline of tracks for construction of the proposed pedestrian bridge. The proposed north bridge abutment and approach ramp will be constructed on the eastern Alviso Slough Levee, outside of the UPRR easement previously described and shown on Figure 3, Site Context Map. Therefore, no rights-of-way are expected to be required from the UPRR.

The Guadalupe River and Alviso Slough are historic "waters of the State." The SCVWD, through a license with the State Lands Commission, has authority to construct/maintain flood protection improvements on the river/slough. The SCVWD also owns and maintains the Alviso Slough Levee. Therefore, the City must secure appropriate rights-of-way, construction easements, and agreements with both the State Lands Commission and the SCVWD prior to construction of the proposed bridge.

Construction access to the Alviso Slough Levee and the north bridge abutment location can be achieved from the Alviso County Marina, approximately one-half mile from the bridge site. However, it is recommended that a primary access route be developed from Taylor Street, which is much closer to the work area and provides easy access to the top of the levee. Rights-of-entry and /or construction easements will have to be obtained from the property owners identified in Table 1.

The south bridge abutment and approach ramp is located on the west bank/levee of Alviso Slough. Ownership of this land is undetermined, pending a detailed boundary survey of the property line separating lands of the state from lands of adjacent owners. This property line is described in the *Boundary Line and Settlement Agreement* (K850 p. 1676 to 1696: please refer to the Appendix for a copy of this document) executed between the State and Marshland Developments, Inc. (assumed predecessor of current fee title owners) recorded in February 1989. Locating this property line precisely on the ground is beyond the scope of this Feasibility Study. It is therefore concluded, based on readily available data, that the project will encroach on both State and private lands.

The previously referenced agreement also establishes a 25-ft wide easement for public right-of-way in the project area, along with provisions for connecting this public right-of-way to a public street (e.g., Gold Street). This easement is not monumented in the field, nor has it been re-traced based on available record data. The general location seems to be apparent as a gravel maintenance road extending from Gold Street, across the UPRR tracks, and then along the west top of the levee of Alviso Slough. The right-of-way was established for temporary use by utilities and other agencies servicing the Legacy site and is not intended for public traffic. Locked gates exist on this road but can be opened by SCVWD, PG&E, and other agencies. The proposed bridge south abutment and approach ramp has been located to preserve access along this existing maintenance road that is accessed from the UPRR crossing.

Construction of the proposed bridge and adjoining trail will require rights-of-entry, construction easements, and operation/maintenance easements on properties presented in Table 1, near the west bank of Alviso Slough. Additional right-of-way research is required to verify any City rights to construct/maintain a multi-use bridge and trail within the 25-ft wide public easement identified above. Also, City use of the public easement from the bridge site to Gold Street should be verified. If it is determined that the existing easements are not adequate or appropriate for City use, new rights-of-way from the property owners must be acquired.

For purposes of this Feasibility Study, it is assumed that the existing easements are adequate, or that new ones can be acquired at both the north and south ends of the bridge for minimal cost.

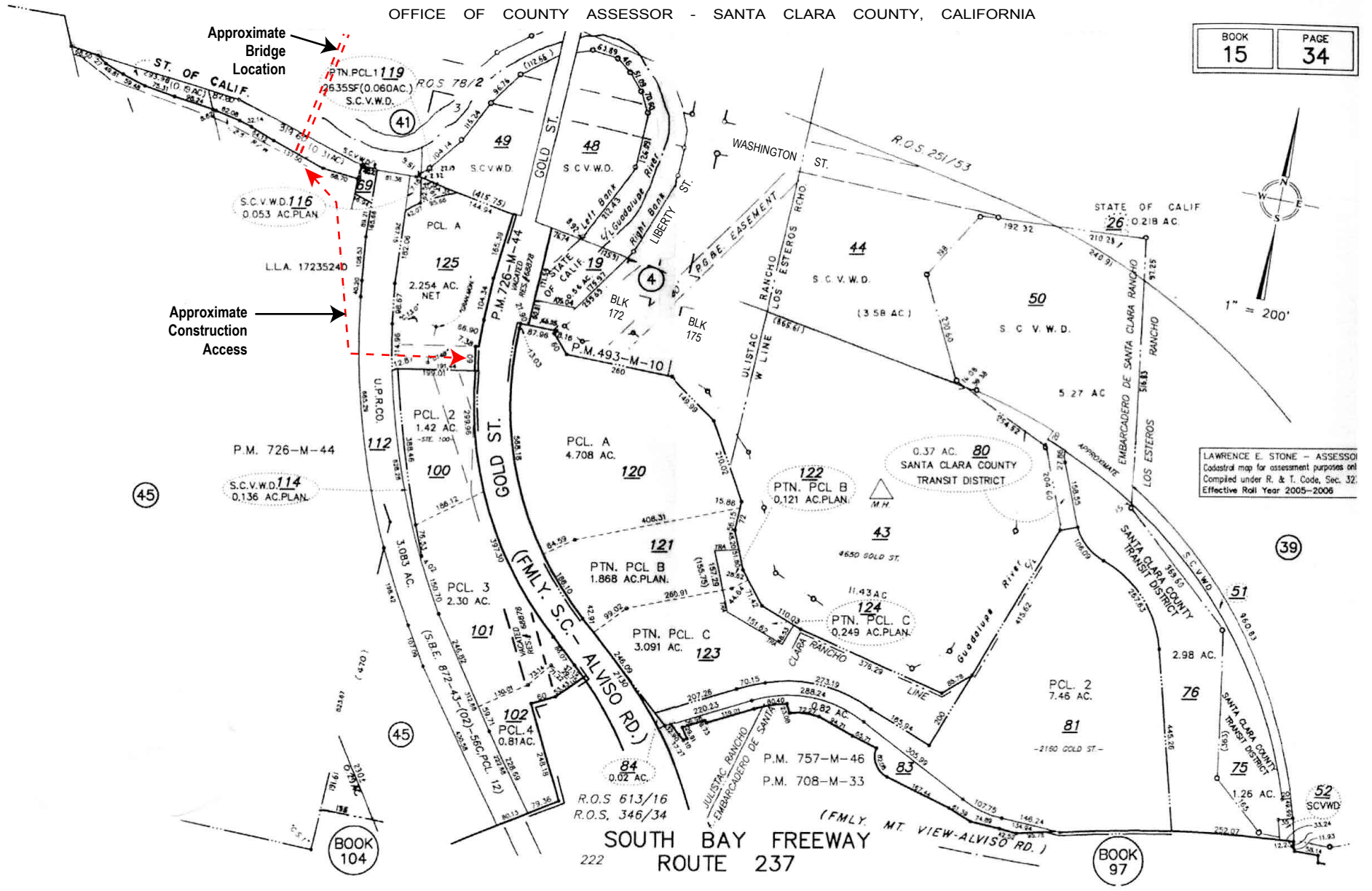


FIGURE 11
ASSESSOR'S PARCEL MAP - 1
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

332226.T1.10_Figure 11_11/4/05_ccc_sfo

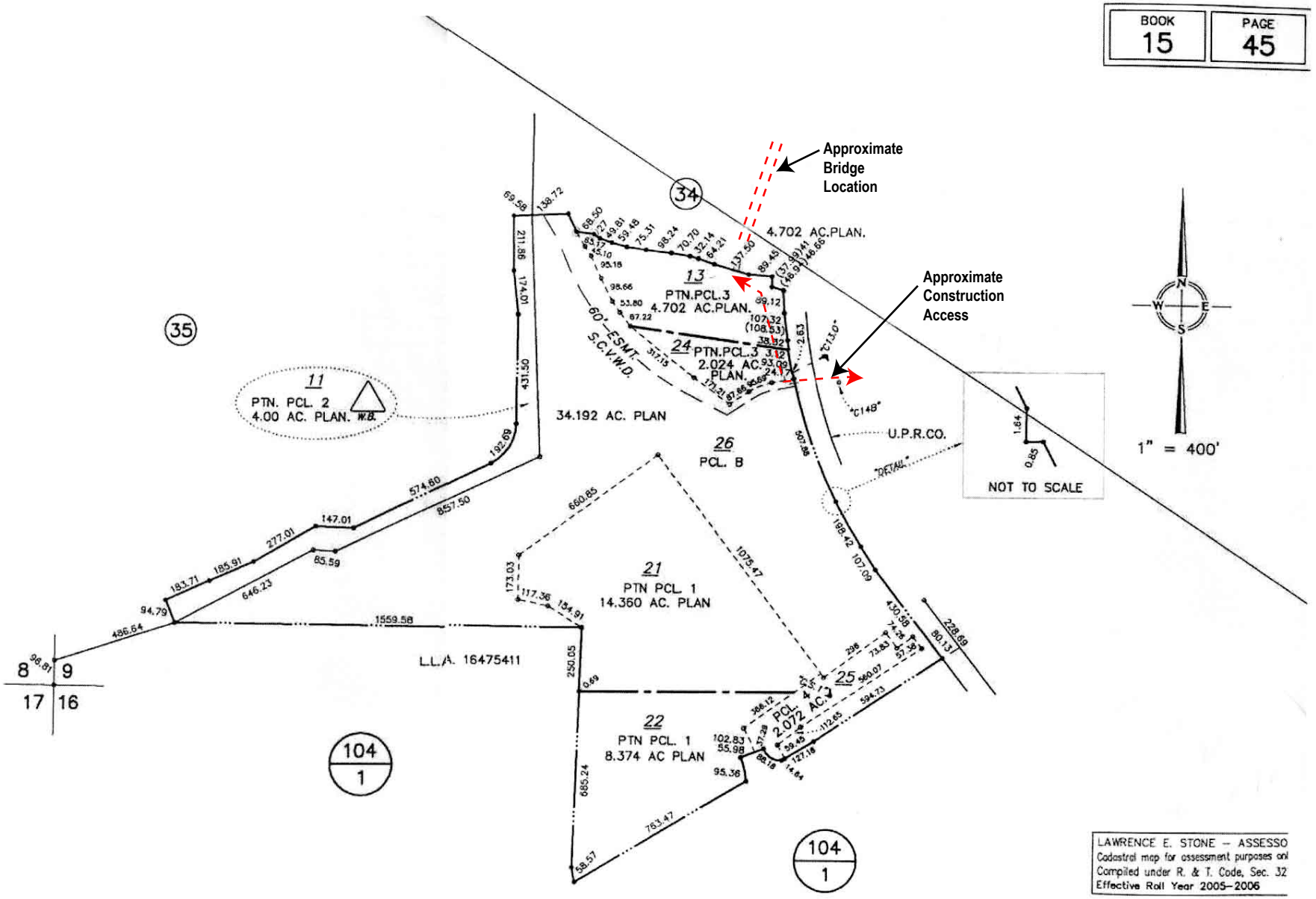


FIGURE 12
ASSESSOR'S PARCEL MAP - 2
ALVISO SLOUGH PEDESTRIAN BRIDGE FEASIBILITY STUDY

Not to scale

CH2MHILL

332226.T1.10_Figure 12_11/4/05_ccc_sfo

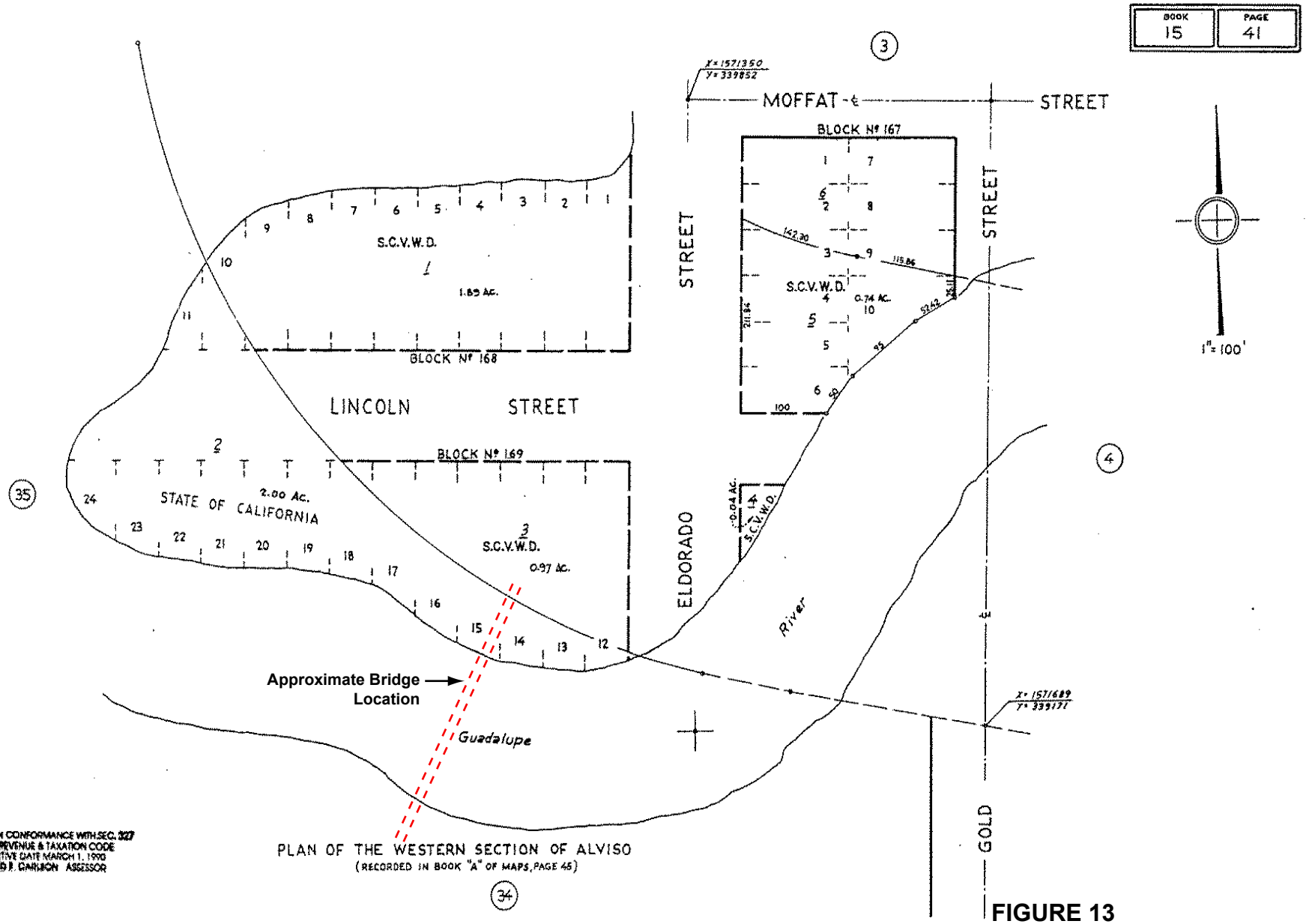


FIGURE 13
ASSESSOR'S PARCEL MAP - 3
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

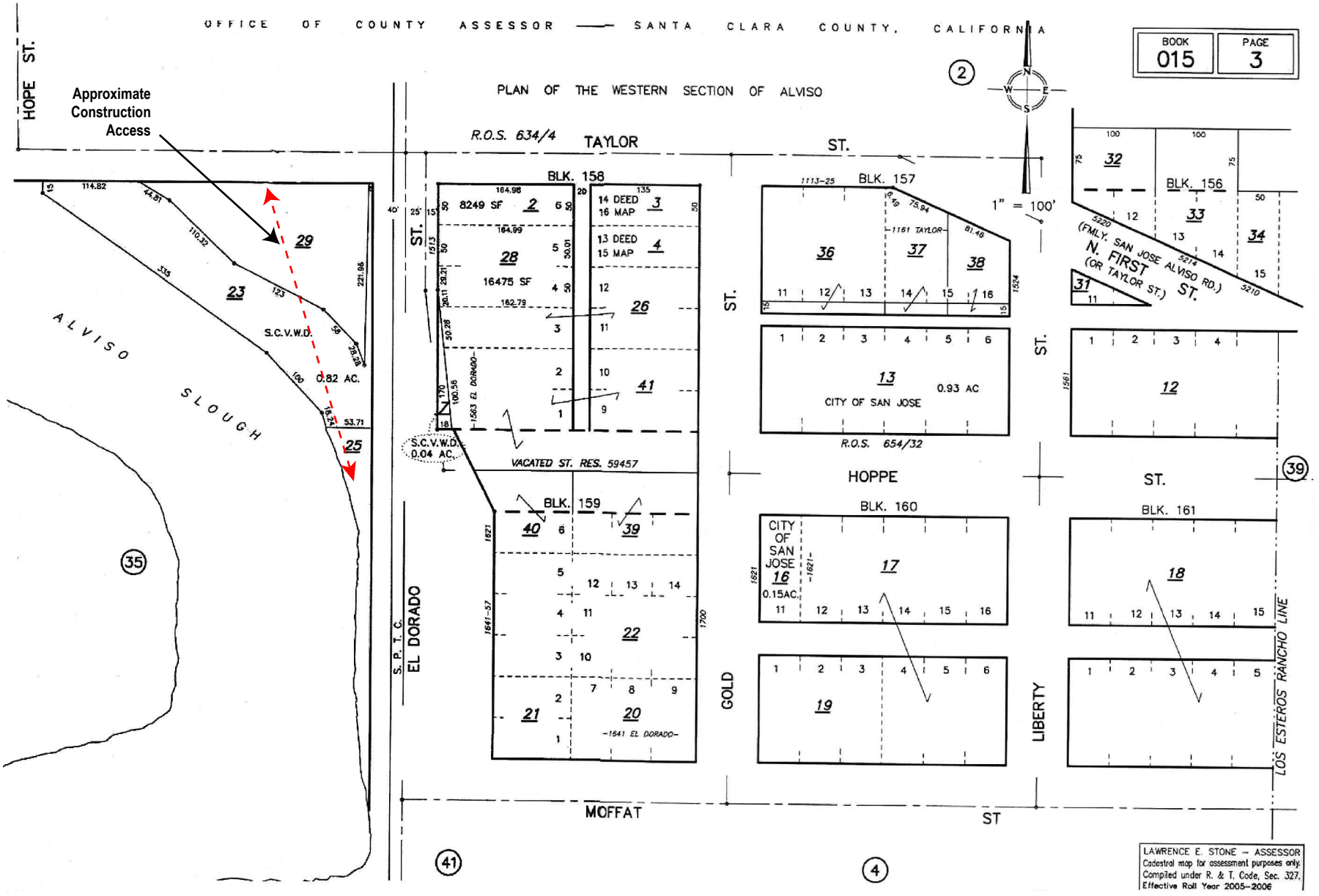


FIGURE 14
ASSESSOR'S PARCEL MAP - 4
ALVISO SLOUGH PEDESTRIAN BRIDGE
FEASIBILITY STUDY

CH2MHILL

Permitting Requirements

The following is a summary of permits that may be required from various local, state, and federal agencies to construct the bridge. Included is a description of the agency, its purpose, its jurisdiction, and why the project may or may not trigger the agency's permit requirements. A list of the relevant permit application requirements is shown in Table 2: Permitting Requirement Matrix.

Local Permits

Santa Clara Valley Water District (SCVWD): The SCVWD manages watercourses within Santa Clara County for purposes of watershed stewardship, flood protection, water supply and quality protection, water supply distribution, and maintenance. Project proponents must secure an Encroachment and Construction Permit from the SCVWD before construction of any project within 50 feet of top of bank of SCVWD facilities. A SCVWD permit will be required because the proposed northern bridge ramp and abutment are located on the eastern Alviso Slough Levee, which is SCVWD property, and the bridge will cross Alviso Slough, which is a designated watercourse under SCVWD jurisdiction.

PERMIT REQUIRED

Union Pacific Railroad (UPRR): The UPRR owns and operates the mainline tracks adjacent to the project site. The tracks are used for hauling freight, in addition to passenger service on AMTRAK, Capitol Corridor, and Altamont Corridor Express (ACE) routes. Construction operations immediately adjacent to UPRR right-of-way and/or tracks are carefully scrutinized by the UPRR to ensure safe operation of railroad activities at all times. For this project, it is anticipated that a construction agreement will be necessary between the construction contractor and the UPRR in order to provide flag persons and related construction safety measures during construction. It also is likely that permission from the UPRR and the California Public Utilities commission (CPUC) will be required for the City's contractor to use the existing, private, signal-controlled, at-grade railroad crossing between Gold Street and the construction site.

AGREEMENT REQUIRED

State Permits

California Department of Fish and Game (CDFG): The CDFG is charged with the protection and conservation of fish and wildlife resources under Section 1601-1607 of the California Fish and Game Code. The CDFG must be notified of any activity that impacts riparian corridors and wetlands so that they may conduct an onsite investigation to review the impacts of the project on any wildlife resources that may exist. Project proponents are required to enter into a Streambed Alteration Agreement with CDFG before construction of any project that will change the flow, bed, channel, or bank of any river, stream, or lake, or use materials from the streambed. Installation of the proposed bridge abutments and piers will impact the existing riparian vegetation and potentially may alter the banks of Alviso Slough, triggering CDFG involvement and requiring a Streambed Alteration Agreement.

PERMIT REQUIRED

Regional Water Quality Control Board (RWQCB): The RWQCB is charged with protecting the water supply quality by managing construction-related discharge of stormwater runoff and the discharge of materials into "waters of the State." Project proponents are required to file a Notice of Intent under the General Permit for Stormwater Discharges Associated with Construction Activity with the State Water Resource Control Board. They also must prepare a Storm Water Pollution Prevention Plan before construction of any project whose storm water runoff would disturb one or more acres of land. Since the area that will be impacted by the bridge construction will be approximately one acre of land, use of the General Permit should be anticipated. Project proponents are required to secure a Section 401 Water Quality Certification from the RWQCB before any fill activity can begin within "waters of the State." Alviso Slough is considered a "water of the State," so it is anticipated that a Section 401 Water Quality Certification will be required for the bridge construction.

PERMIT AND CERTIFICATION REQUIRED

State Lands Commission: The State Lands Commission may lease sovereign tidelands, submerged lands, and beds of navigable waterways under its jurisdiction. The SCVWD has a long-term lease with the State Lands Commission that covers Alviso Slough. Correspondence from the State Lands Commission, provided in October 2002, in response to the City's Bay Trail Master Plan Mitigated Negative Declaration, indicates that a lease will be required for the proposed bridge.

LEASE REQUIRED

San Francisco Bay Conservation and Development Commission (BCDC): The BCDC regulates nearly all work located within the San Francisco Bay, up to the highest tide levels in channels and sloughs, including a 100-foot shoreline band. Therefore, a permit from BCDC will be required for the proposed bridge.

PERMIT REQUIRED

Federal Permits

United State Army Corps of Engineers (USACE): The USACE is charged, under Section 404 of the Clean Water Act, with protecting the "waters of the United States" to preserve interstate or foreign commerce. Project proponents are required to secure a Department of the Army permit for work that results in the discharge of dredged or fill material into "waters of the United States." Because the bridge piers are to be located within the slough channel, below the high tide line, fill material is anticipated within "waters of the United States" and a USACE. permit will be required.

PERMIT REQUIRED

United States Fish and Wildlife Services (USFWS): The USFWS, under the direction of the United State Endangered Species Act, is charged with regulating federal activities that impact endangered or threatened species beyond the marine environment. Federal agencies are required to request a Section 7 Consultation with USFWS representatives if their project may potentially impact species listed under the Endangered Species Act. The California clapper rail and the salt-marsh harvest mouse are endangered species known to exist in the Alviso Slough area, but may not be present at the Project site according to available survey results. It is anticipated that the Project can be designed to avoid impacts to endangered species, so a special consultation is not anticipated.

CONSULTATION NOT LIKELY TO BE REQUIRED

National Marine Fisheries Service (NMFS): The NMFS, under the direction of the United States Endangered Species Act, is charged with regulating federal activities that impact endangered or threatened species within a marine environment. Federal agencies are required to request a Section 7 Consultation with NMFS representatives if their project may potentially impact marine species listed under the Endangered Species Act as endangered, threatened, or as a candidate for listing. Steelhead and the Chinook salmon are federally listed species known to migrate in Alviso Slough and are expected to be present between November 1 and June 1 of every year. It is anticipated that the Project can be designed to avoid impacts to endangered species, so a special consultation is not anticipated.

CONSULTATION NOT LIKELY TO BE REQUIRED

United States Coast Guard: The Guadalupe River/Alviso Slough, from Coyote Creek to mile 5.5, is presently considered navigable by Coast Guard standards. However, the nature of the waterway at the project site prevents navigation by anything larger than small motorboats. Therefore, the Guadalupe River conforms to advance approval criteria under Title 33, Code of Federal Regulations, Part 115.70 at the project site.

The General Bridge Act of 1946 requires the approval of the location and plans of bridges by the United States Coast Guard, prior to start of construction (33 U.S.C. 525). The Commandant has given advance approval to the location and plans of bridges to be constructed across reaches of waterways considered navigable, but not actually navigated by other than logs, log rafts, rowboats, canoes, and small motorboats. In such cases, the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation.

Provided there is no development of significant controversy concerning navigational or environmental issues, and there is no significant impact, an individual Coast Guard Bridge Permit should not be required for the proposed pedestrian bridge.

PERMIT NOT LIKELY TO BE REQUIRED

Table 2: Permitting Requirements Matrix for Alviso Pedestrian Bridge Feasibility Study

Agency Name	Type of Permit	Activity Requiring Permit	Jurisdiction	Reference	Address	Application Fee
Santa Clara Valley Water District (SCVWD)	SCVWD Encroachment and Construction Permit	Bridge construction within Alviso Slough and on adjacent levees	Alviso Slough, including levees	SCVWD Ordinance 83-2	Santa Clara Valley Water District 5150 Almaden Expressway San Jose, CA 95118 (408) 265-2600	N/A
Union Pacific Railroad (UPRR)	Construction Agreement	North abutment construction adjacent to railroad tracks	Construction activity on, or adjacent to railroad tracks.	N/A	Union Pacific Railroad Real Estate Dept. 1400 Douglas Street, Stop 1690 Omaha, NE 68179-1690 Fax: (402) 501-0340	N/A
California Department of Fish and Game (CDFG)	Streambed Alteration Agreement	Modification of streambed or bank within Alviso Slough	Alviso Slough, from top of bank (levee) to top of bank (levee).	Section 1602 of Fish and Game Code	California Department of Fish and Game, Region 3 Post Office Box 47 Yountville, CA 94599 (707) 944-5500	Fee ranges from $200 to $4,000 according to the estimated cost of the project.
Regional Water Quality Control Board (RWQCB)	NPDES General Permit for Discharges of Storm Water Associated with Construction Activity	Construction on one acre of land, or more. Construction-related discharge of surface or groundwater in Alviso Slough.	Construction sites of one or more acres	Clean Water Act, Section 402	San Francisco Bay Regional Water Quality Control Board 1515 Clay Street, Suite 1400 Oakland, CA 94612 (510) 622-2300	Fee ranges from $237 to $2,607 per year for construction areas of <1 acre to >100 acres (for 1 acre fee is $261)
	Water Quality Certification	Discharge of dredged or fill material in Waters of the State.	Waters of the State.	Clean Water Act, Section 401	(same as above)	$500 Base Price + (Discharge area in hundredths of an acre x $21.50)
State Lands Commission	Land Use Lease for encroachments on docks, crossings on tide and submerged lands.	Construction in/around Alviso Slough	Historical boundary of Alviso Slough/Guadalupe River	Public Resource Code, Section 6,000	100 Howe Ave, Suite 100 South Sacramento, CA 95825-8202 (916)-574-1900 Fax: (916) 574-1810	Depends on complexity of project. A minimum deposit of $800 is requested upon filing, plus a $25 non-=reimbursable filing fee.
San Francisco Bay Conservation and Development Commission (BCDC)	Major Permit	Construction within 100-foot of San Francisco Bay shoreline	San Francisco Bay , including certain tributaries and wetlands adjacent to the Bay	McAteer-Petris Act and San Francisco Bay Plan	50 California Street, Suite 2600 San Francisco, CA 94111 (415)-352-3600	0.45 % of total project cost, minimum of $1,100.

Agency Name	Type of Permit	Activity Requiring Permit	Jurisdiction	Reference	Address	Application Fee
United States Army Corps of Engineers (USACE)	Department of Army Permit or Nationwide Permit	Discharge of dredged or fill material into Alviso Slough	Waters of the United States	Section 10 of the Rivers and Harbors Act or Section 404 of the Clean Water Act	United States Army Corps of Engineers, South Pacific Division 333 Market Street, 8th Floor San Francisco, CA 94105-2197 Attn: SPNCO-R (415) 977-8462	N/A
United States Fish and Wildlife Services	Section 7 Consultation	Work impacting plant or wildlife species listed by the Endangered Species Act	Projects requiring a USACE Permit affecting threatened/endangered species beyond marine environment	U.S. Endangered Species Act	United States Fish and Wildlife Service, Sacramento Field Office 2800 Cottage Way Room W-2605 Sacramento, CA 95825 (916) 414-6600	N/A
National Marine Fisheries Service	Section 7 Consultation	Work impacting wildlife species listed by the Endangered Species Act, notably salmon.	Project requiring a USACE permit affecting threatened/endangered species within marine environment, including anadromous fish	U. S. Endangered Species Act	Nation Marine Fisheries Service 777 Sonoma Avenue Room 325 Santa Rosa, CA 95404 (707) 575-6050	N/A
US Coast Guard	Approval Letter	Bridge construction in Alviso Slough	Navigable waterways in USA	Title 33, United States Code, Section 525	Eleventh Coast Guard Dist. Bldg 50-6, Coast Guard Island Alameda, CA 94501-5100 (510) 437-5836	N/A

Project Funding

Funding for design and construction of this project has yet to be identified. The City would likely seek local, as well as State and Federal, grant sources.

Estimate of Project Costs

Cost estimates were developed based on historical Caltrans Cost Data from 2004 extended to midyear 2005. Costs for furnishing the various truss alternatives were developed based on vendor quotes. Costs for truss erection were based on input from general contractors. A contingency of 25% was applied to overall project costs to reflect uncertainties associated with this level of design development. This level of contingency may not be sufficient, nor was there any attempt made, to estimate the influence of currently rising energy prices and possible impacts from natural disasters on the overall future costs of construction.

The cost estimates also include: a 30% allowance for City design management, construction management, and inspection; a 15% allowance for engineering design, including construction document preparation, geotechnical and hazardous material investigations, CEQA clearance, biological studies, and permits; a 2% allowance for consultant construction support and a 2% allowance for public art.

A lump sum allowance is shown for Pedestrian Gateway Enhancements, which could include: decorative paving at base of bridge approach ramps, wayfinding kiosks, top of bank fencing, historical signage, and pedestrian amenities.

Cost estimates do not include either right-of-way acquisition or environmental mitigation. Costs for these items are unknown at this time and could be significant. These items will be further evaluated in subsequent phases of project development.

Estimated project costs are as follows for the three bridge alternatives:

Alternative A: Box Truss	$ 4,092,000
Alternative B: Bowstring Truss	$ 4,135,000
Alternative C: Cable Stay	$ 4,950,000

Project Implementation Schedule

A preliminary project implementation schedule for Alternative A, Box Truss Bridge is included as Figure 15. This schedule includes approximately two years for project design, CEQA clearance, and regulatory permits after completion of this Feasibility Study. Construction of the bridge would follow completion of the construction documents and receipt of all construction permits, and would take approximately one year to complete. Schedules for the other alternatives are expected to be very similar.

The Preliminary Project Schedule includes the following assumptions:

- Schedule assumes funding available, as needed
- Supplemental CEQA task includes preparation of an Initial Study and City Council adoption of a Mitigated Negative Declaration for this project
- Bird Exclusion Measures include: pre-construction surveys, netting soffit of UPRR Bridge, mowing tulles in channel, and maintenance of these measures throughout construction duration
- Design and construction of off-site environmental mitigation is not anticipated

Preferred Alternative

In early November 2005, a meeting was held at the project site with members of the Alviso community to discuss the findings of the preliminary Feasibility Study and the three proposed Bridge Alternatives. Subsequently, the three Bridge Alternatives were presented to the Alviso and Lower Guadalupe River Collaborative at its meeting on November 8, 2005.

Based on these public outreach presentations and the community response, Alternative B: Bowstring Truss Bridge is the preferred alternative for this project. The three-span, 540-ft. long by 12-ft. wide Bowstring Truss Bridge was selected because of its appearance and cost relative to other alternatives.

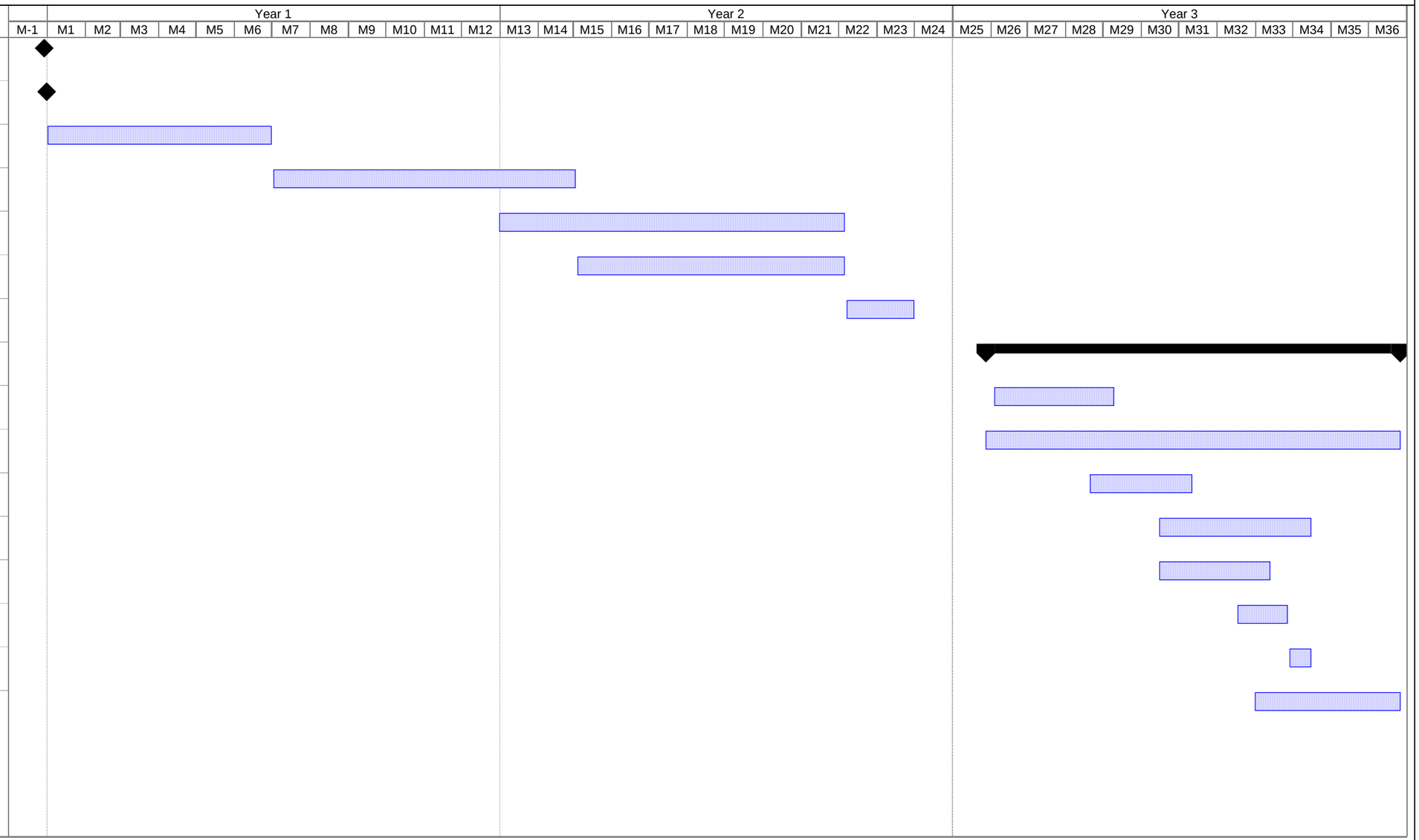
It is therefore recommended that Design Development activities, including detailed geotechnical, hazardous material, and right-of-way investigations, be conducted as soon as funding is available.

ALVISO SLOUGH PEDESTRIAN BRIDGE FEASIBILITY STUDY
PROJECT IMPLEMENTATION SCHEDULE

Project #: 332226.T1

Figure 15

ID	Task Name	Duration *
1	Complete Feasibility Study	0
2	***Secure Funding to Proceed***	TBD
3	Design Development	130
4	Supplemental CEQA	175
5	Permitting	200
6	Final Design	155
7	Advertise & Award	40
8	**Construction**	**240**
9	Mobilization	70
10	Bird Exclusion Measures	240
11	Truss Fabrication	60
12	Work Allowed in Channel	88
13	Foundations	65
14	Truss Erection	30
15	Restore Channel Bottom	13
16	Misc.Work Outside Channel (Ramps/Trails/etc.)	85



* working days

Project: Alviso
Date: Mon 3/13/06

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

CH2MHILL

Appendix

Alternative A: Box Truss, Perspective
Alternative B: Bowstring Truss, Perspective
Alternative C: Cable Stay, Perspective
Project Initiation Meeting (Final Summary)
Site Reconnaissance Memorandum
Preliminary Hydraulic Analysis
Preliminary Geotechnical and Foundation Recommendations
Applicable Structural Design Criteria
Bay Trail Crossing at Alviso Slough: Potential CEQA and Permitting Issues
Cost Estimates: Alternatives A, B, and C
Boundary and Line Settlement Agreement

PERSPECTIVE

Callander Associates

Park and Recreation Design
Landscape Architecture

05051

Alternative A (Box Truss) - Perspective
Alviso Slough Pedestrian Bridge Feasibility Study

City of San José
Department of Parks, Recreation and Neighborhood Services
10.14.05

PERSPECTIVE

Callander Associates

Park and Recreation Design
Landscape Architecture

Alternative B (Bowstring Truss) - Perspective
Alviso Slough Pedestrian Bridge Feasibility Study

City of San José
Department of Parks, Recreation and Neighborhood Services

10.14.05

05051

PERSPECTIVE

Callander Associates

Park and Recreation Design
Landscape Architecture

05051

Alternative C (Cable Stay) - Perspective
Alviso Slough Pedestrian Bridge Feasibility Study

City of San José
Department of Parks, Recreation and Neighborhood Services
10.14.05

Alviso Slough Pedestrian Bridge, Task 1.2

Project Initiation Meeting (Final Summary)

August 11, 2005

ATTENDEES:	Jeff Aldrich/CH2M Hill, Colleen Haggerty/SCVWD, Jane Mark/Santa Clara County, Jan Palajac/City of San Jose,	Mark Slichter/Callander Associates, Dave Von Rueden/CH2M HILL, Yves Zsutty/City of San Jose
COPIES:	Attendees, Dave Chesteman/SCVWD, Andrew Crabtree/CSJ, Mark Frederick/SCC, Michelle Levinson/BCDC,	Brian Mendenhall/SCVWD, Michael Rhoades/CSJ, Laura Thompson/ABAG File
FROM:	CH2M HILL	
DATE:	August 25, 2005	
PROJECT NUMBER:	332226.T1.02	

Attendees:

Jane Mark, Park Planner, Santa Clara County; Yves Zsutty, Trail Program Manager, City of San Jose; Jan Palajac, Project Manager, City of San Jose, Colleen Haggerty, SCVWD; David Von Rueden, CH2MHill, Jeff Aldrich, CH2MHill, Mark Slichter, Callander Associates.

Action Items:

Yves – coordinate with Arlene to provide CH2M-Hill with copy of guidelines for trail development along railroad alignments.
Dave – Review project alignment plans with UPRR to confirm right of way.

Yves – Attend upcoming GWIWG meeting, present project and obtain comments.

Yves – Send Mark photographs of Alviso for historical references.

Yves – Verify if Juan Bautista de Anza Trail Plan overlaps bridge alignment.

Jane – Share maps of Juan Bautista de Anza Trail Plan with CH2M-Hill.

Yves – Obtain input from community regarding desired amenities at and around bridge.

Issues Discussed:

Yves started off by describing the Bay Trail link/opportunity that a bridge crossing of Alviso Slough represents.A discussion followed as to who was not present at this meeting who should be included on future project notification distributions. This included: Michelle Levinson/ BCDC, ABAG, permitting agencies, Alviso Water Task Force (George Trevino).

Dave stated that the goal of this Project is to complete a bridge feasibility study; gave a project site orientation, and discussed trail links to the Lower Guadalupe River Trail, the San Tomas Aquino Creek Trail, the Caltrans SR 237 Bike Path and the Bay Trail. The feasibility study will include examination of hydrologic feasibility, property issues (existing easements and obtaining access rights), and geotechnical and structural engineering considerations. The study will include an update of the cost estimate included in the Bay Trail Master Plan. The cost estimate will be useful in establishing a project budget and for applications for funding. Anticipated regulatory oversight includes NMFS, CDFG, USFW, BCDC, SCVWD and USACE.

Jane mentioned that consultation with UPRR should occur and that they have guidelines available that address clearance requirements (horizontal separation). **Yves stated that Arlene Nakagawara/CSJ possessed guidelines from a project along the Guadalupe River and that he would coordinate with her to furnish the guildelines to CH2MHill.**

Dave mentioned that the UPRR ROW is somewhat unclear in the Project area, as the railroad bridge was relocated in the early 1970's within the ROW, but it is not known if an equivalent adjustment to the ROW was prepared/recorded. There appears to be a 50' wide ROW corridor for the existing track/bridge. Plans will be shared with UPRR for review and comment.

Jan mentioned that all Reaches of the San Tomas Aquino / Saratoga Creek Trail are now under construction and the Alviso Slough Bridge will provide a critical link to this nearly complete system of over 12 miles of trails.

Jane mentioned that the Alviso Marina County Park is a regional trailhead and a portal to the S. F. Don Edwards Wildlife Refuge. The Marina is also a trailhead to the San Francisco Bay Trail and Juan Bautista de Anza National Historic trail's Bay Recreation Route that links to the City's Bay Trail portion .

Yves mentioned that it is his belief that Alviso residents are more receptive than in prior years to improvements of this type, as they potentially revitalize the community and add economic stimulus.

Dave went on to say that the Bay Trail CEQA document is complete and it is possible that the bridge could be adequately addressed as an amendment or supplement to this EIR. It is anticipated that mitigation for wetland impacts due to bridge construction will be a complicated issue as this Project develops. It may be desirable to investigate use of City's 'Pond 18' as a potential mitigation site. Another environmental issue will be mitigation for Salmon and Steelhead habitat impacts, which will likely include timing construction so as not to coincide with fish migrations.

Yves mentioned that studies by others are underway to evaluate restoration of Alviso Slough so that more saline water occurs farther upstream, thus restoring native plants in the process and causing demise of freshwater invasives, such as bulrushes, that currently exist in the Slough.

Jane suggested that the Project be brought before the next Guadalupe Watershed Integrated Working Group (GWIWG), where many of the regulatory agencies like the Regional Water Quality Control Board, Army Corps, NOAAA Fisheries, and others convene every few months to discuss recent projects within their jurisdictions. The GWIWG is chaired by Dave Chesterman and Al Guerevich of the Water District. Plans should be made available to Colleen or Vincent Stephens, depending upon who at the Water District will be the point of contact for the Project duration. Rick Callender is the liaison between the Water District and the Alviso resident's action group (Alviso Water Task Force). **Yves to see that the GWIWG is appraised of Project and input solicited.** This may be accomplished by direct attendance, or provision of plans to Al or Dave Chesterman for sharing with GWIWG

Jeff described physical considerations for the bridge. Bridge soffit height will be approximately equal to top of UPRR rail (4 feet above 100-year flood elevation, or approximately elevation 21 feet, NAVD88 Datum). Bridge width is anticipated to be 12 feet. Due to grade differential between levees at ends of bridge, the abutment on the south side will be approximately 6 feet above surrounding grade at it's highest point. An economical bridge configuration will result in 2 or 3 spans for the 540 foot length of the bridge. The preliminary geotechnical evaluation indicates soft soils are present and pile support is required. Foundation alternatives include either multiple small concrete piles or fewer, larger steel piles filled with concrete. Corrosion may be a concern, although the UPRR bridge piles are uncoated steel and are performing well.

Mark described aesthetic considerations: Character of site is defined by the Alviso community and '3Com' industries nearby. Bridge could be a synthesis of influences. Bridge will be prominent as it will be higher than adjacent railroad trestle, so will have prominence within the area. Suspension span type may be inappropriate, as it would have a much greater visual impact. Examples of bridge styles and materials were presented.

Yves suggested emphasizing Alviso heritage over 'Silicon Valley', as meeting will be hosted in Alviso and likely a majority of folks will want a structure that reflects their community aesthetics. The proximity of future development would introduce the "Silicon Valley" influence in time. Overlooks of the Slough/Baylands should be incorporated into design of the bridge piers.

Three (3) alternative structure types (cable stay, bow truss, rectangular truss) could be presented at a public meeting. Cable stay (suspension) span may still be shown as a point of reference for community input. **Yves has some photographic images of Alviso that he will send to Mark.** Yves anticipates a follow-up community meeting, prior to going to City Parks and Recreation Commission, as the Commission will want to know that project has received community support. Project does not have to go to City Council. A display board to show materials options (concrete, brick, paint, Corten steel, etc.) is anticipated. Another display board to show other amenities (viewing platforms, abutment treatments, signage, seating, etc.) is also contemplated.

Handicap access will be a significant community issue. Community members are older. Benches may be a priority as well for same reason.

Jan indicated that closure of an old landfill at the south end of the bridge (Legacy Property) was incomplete and landfill gas considerations may come into play. She also indicated that the preferred bridge deck material is concrete, as minimal deck maintenance should be anticipated. The only wood suitable for use comes from South America and sustainable harvesting practices must be verified before material can be used. (Wood is Ipe) Structure should require minimal maintenance – should not be painted steel.

Yves mentioned that retail land use is anticipated to occupy a portion of the Legacy Property, closest to the southerly bridge approach. He suggested consideration of a see-through approach ramp (structural span) at south abutment. Jeff noted that this may not prove to be economically justifiable. Andrew Crabtree/City Planning is the point of contact for status of the retail development. Yves suggested emulating worn concrete or brick material found in Alviso for materials used on the bridge. A 40's style appearance may be appropriate. Yves mentioned that north of bridge it appears that the Bay Trail may project out straight northwest along a levee between two former salt evaporation ponds. Dave pointed out that ponds are subject to flooding and trail will more likely bend southwest, rather than proceeding northwest. This area is also a Snowy Plover habitat and as such cannot be disturbed. The Juan Bautista de Anza National Historic Trail Plan may not reflect our anticipated alignment.

NPS Superintendent Stan Bond is the Program Manger for the Juan Bautista de Anza Trail. The Program Manager will be sending maps to **Jane Mark, who will forward to CH2M HILL**. Jane mentioned that the community will be keen on amenities to go with bridge. Extensive exploration of amenities is beyond the scope of this Project and will be done by Yves independently with community, but discussion of desired amenities will likely be a component of the first community meeting.

Dave concluded the meeting by discussing the Project Schedule. Schedule highlights include: completion of the Draft Feasibility Study in early October 2005 for City and Water District review; a community meeting to present preliminary Study results in mid-February 2006, and presentation of the completed Feasibility Study to the City Parks and Recreation Commission in April 2006.









Callander Associates

Park and Recreation Design
Landscape Architecture

Alviso Slough Bridge Feasibilty Study

City of San Jose
Department of Public Works

P1583











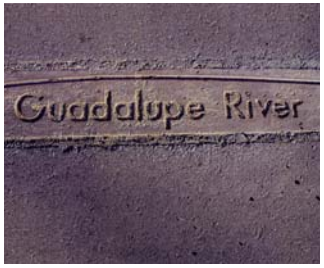
Callander Associates

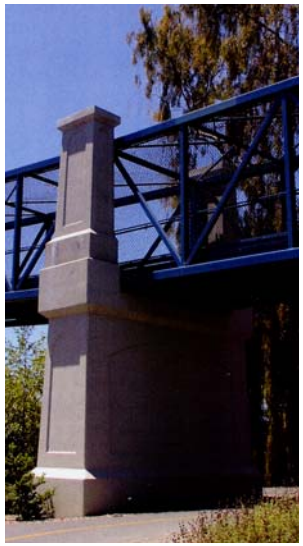
Park and Recreation Design
Landscape Architecture

Alviso Slough Bridge Feasibilty Study

City of San Jose
Department of Public Works

P1583





Callander Associates

Park and Recreation Design
Landscape Architecture

Alviso Slough Bridge Feasibilty Study

City of San Jose
Department of Public Works

P1583

Alviso Slough Pedestrian Bridge Feasibility Study - Site Reconnaissance Memorandum, Task 1.4

PREPARED FOR:	Jan Palajac/City Of San Jose
PREPARED BY:	Jeff Aldrich/CH2M HILL
COPIES:	Jeff Aldrich, Dennis Boschetti, Jan Palajac, Dave Ritzman, Mark Slichter, Wendy Swenson, Dave Von Rueden
DATE:	July 15, 2005
PROJECT NUMBER:	332226.T1.04

The following individuals visited the project site on Wednesday June 29, 2005:

City of San Jose: Jan Palajac

CH2M HILL: Jeff Aldrich, Dennis Boschetti, Dave Ritzman, Dave Von Rueden,

Callander Associates: Mark Slichter, Wendy Swenson

The project site is located in the north San Jose community of Alviso, approximately 500 feet westerly of the Gold Street Bridge over Alviso Slough. The proposed pedestrian bridge will cross the Slough immediately westerly (downstream) of the UPRR Bridge, and will connect the easterly Alviso Slough levee to the Legacy property, which borders the southwesterly bank of the Slough. Dirt and gravel-surfaced maintenance roads currently exist on the Alviso Slough levee top and on the Legacy property, where the proposed bridge abutments will be constructed. The levee/channel sideslopes are predominantly covered with grass, weeds and brush (coyote brush). A few mature trees exist on the Legacy (southerly) side of the channel. It appears that the proposed bridge can be constructed without impacting any existing trees.

The Guadalupe River becomes Alviso Slough at the project site. The Slough is approximately 500 feet wide at this location, with a 50-foot wide low flow channel near the southerly channel bank and a wide, flat channel bench area between the low flow channel and the northerly levee. Channel vegetation is primarily fresh-water tules. The entire channel bottom/bench area is subject to inundation from daily tides from south San Francisco Bay.

Construction access to the project site on the north will likely be via El Dorado Street onto the Alviso Slough levee, which is owned by the Santa Clara Valley Water District (SCVWD). A maintenance ramp exists from top of levee to the channel bench area, approximately 500 feet north of the UPRR Bridge abutment. From the south, access will be from Gold Street and across the UPRR tracks, through two locked gates on the Legacy property. City of San Jose access rights over the Legacy property to the bridge site will need to be verified.

The Legacy property is a closed, former landfill. The precise location of the northerly limits of the landfill is unknown. It was reported that hazardous and non-hazardous landfill materials were discovered by the SCVWD immediately west of the project site.

Site conditions were observed at the anticipated north and south touchdown points for the pedestrian bridge. Photographs were taken and are attached.

The conditions on or near the northerly UPRR abutment were observed. The embankment appears to be stable -- no sloughing of the embankment slope was observed. Weed growth in the channel and wet conditions prevented access to probable bridge pier locations, but access appears possible on foot for the surveyors with boots/waders.

The conditions at or near the southerly pedestrian bridge abutment were observed. The embankment grading is not as well defined, is less uniform, and is partially obscured by brush. One inhabited anchor-out sailboat appears to be permanently located at the southerly channel bank. It is assumed that this boat will be removed by others, prior to project construction.

Dave Von Rueden and Dennis discussed survey needs:

At northerly UPRR touchdown, survey UPRR bridge soffit and top of new flood wall extending to west of UPRR and do ground shots on levee to the north within 300' from the UPRR abutment. At southerly pedestrian bridge touchdown, do ground shots within 500 ' from the likely touchdown point to the west as limited by the fence to the south and within 100' to the east along the access road.

Jan provided Jeff with prefabricated cable-stay bridge information provided to the City in 2001. Jan provided a copy of a Title Report with Assessor Parcel Maps for the project area, dated 1999.

No utilities were observed at the immediate project site.

Evidence of site survey crosses were observed on some of the nearby floodwall structures (near the southerly UPRR abutment). One photogrammetry target was observed on the unpaved access road to the east of the southerly pedestrian bridge touchdown. The survey crosses appear to have been established by Kier & Wright. A CH2M HILL survey control marker, #800, was observed near the northwest abutment of the Gold Street Bridge.

After review of the bridge location, Mark and Wendy conducted a site inventory of the Alviso area. Photographs were taken as a reference for site character, existing conditions, building materials, and cultural/public art examples. Sites visited included the South Bay Yacht Club, the levee trail adjacent to Alviso County Marina Park, Bayside Cannery, historic buildings on Elizabeth Street, and other distinctive elements.

Looking south from approximate pedestrian structure northerly touchdown point, UPRR structure to east.

Looking north at approximate pedestrian structure northerly touchdown point, UPRR to east.

Looking north on approximate pedestrian structure alignment from southerly touchdown point.

Looking north from approximate pedestrian structure southerly touchdown point.

Alviso Slough Pedestrian Bridge – Task 1.5

Preliminary Hydraulic Analysis

PREPARED FOR: Jan Palajac/City of San Jose

PREPARED BY: Erika E. Powell/CH2M HILL
Meabon Burns/CH2M HILL
Dave Von Rueden/CH2M HILL

COPIES: Jeff Aldrich/CH2M HILL

DATE: October 11, 2005

PROJECT NUMBER: 332226.T1.05

Introduction

CH2M HILL has been retained by the City of San Jose to develop preliminary plans for a proposed pedestrian bridge across the Guadalupe River. The proposed bridge, located near the community of Alviso, is approximately 540 feet long and crosses the river just downstream of an existing Union Pacific Railroad (UPRR) bridge. Support for the pedestrian bridge will be derived from abutment structures at each end of the bridge and up to two intermediate piers within the river channel (Exhibit 1).

This memorandum discusses the preliminary results from the hydraulic analysis of this reach of the Guadalupe River and the Alviso Slough using the existing Lower Guadalupe River River Flood Protection Project HEC-RAS model, provided by the Santa Clara Valley Water District. The model was used to identify the impacts to the Guadalupe River and the Alviso Slough as a result of the future construction of the Alviso Slough Pedestrian Bridge. The resulting velocities are similar to those documented in the State Route 237 Eastbound Bridge Hydraulic & Design Report, which indicates that a scour analysis may be necessary in the next phase of design for the Alviso Slough Pedestrian bridge.

It should be noted that channel cross-sections are facing downstream in HEC-RAS. Therefore, in this report all references to the channel banks will be made as the north bank or the south bank.

Location and Setting

The northern abutment of the proposed bridge is located at the crest of the existing Alviso Slough east levee, approximately 40 feet west of the existing UPRR tracks. The southern abutment is located at the crest of the slough's southwesterly levee, approximately 150 feet west of the UPRR tracks. The bridge will provide access between the pedestrian trails that run along the levees on both sides of the Alviso Slough and will be part of the San Francisco Bay Trail system.

Existing Conditions

Existing project features include a retaining wall adjacent to the abutment that supports the UPRR bridge on the north bank, and a high natural bank on the south bank. A well defined low flow channel meanders toward the south bank, before making a sharp turn to the north (downstream). The channel is 500 feet wide at this location, is in a tidally influenced area, and is characterized by a well defined, 50 foot wide low flow channel, and a wide overbank or bench section dense with bulrush and similar brackish water vegetation.

The existing conditions HEC-RAS model used extends from the Alviso weir (426 feet downstream of the UPRR bridge) to Interstate 880 and reflects the 2004 as-built conditions for the channel. The channel roughness for existing conditions downstream of UPRR, within the footprint of the new Alviso Pedestrian Bridge is 0.03 in the channel and 0.03 in the overbanks. This is consistent with the levels of maintenance considered acceptable from 100 feet upstream to 100 feet downstream of any bridge within the Guadalupe River Project limits, as indicated in the Lower Guadalupe River Flood Protection Project FEIR dated July, 2002.

Proposed Project Conditions

The proposed pedestrian bridge will be located at a skew to the existing UPRR bridge and approximately 80 feet downstream, at it's midpoint. The bridge abutment on the north bank will be located on the landside of the levee and the abutment on the south bank will extend approximately 20 feet into the water side of the channel bank, maximum. The centerline of the low flow channel is 65 feet from the south bank of the river and 435 feet from the north bank of the channel. The low flow channel meanders south near the footprint of the proposed bridge before making a sharp turn north farther downstream.

Three bridge configurations were considered and evaluated. Two of the three alternatives have piers with an 8 foot pier width, and the abutment on the south bank does not encroach into the channel. The third alternative has 4 foot wide piers; however the abutment on the south bank encroaches into the channel. The bridge used for the hydraulic analysis is a composite of all three alternatives, which includes the wider piers and the south abutment channel encroachment. The southern most bridge pier is located 130 feet from the south river bank. The second (northern most) pier is located at 260 feet from the first pier. A pier width of eight feet was used for the preliminary hydraulic analysis. It was assumed that using this width in the hydraulic analysis would provide a preliminary worse case scenario under flood conditions. Given the angle of the bridge in reference to the channel, the piers

were skewed to the direction of stream flow to account for that variance. It was also assumed that in addition to the eight foot diameter, up to three feet of debris could accumulate on the entire submerged area of each pier during flood conditions.

The upstream channel roughness was left unchanged from existing conditions (0.03) for the analysis, because the proposed bridge was found to be within the boundary of the UPRR bridge that is expected to be continuously maintained by the SCVWD. The downstream channel roughness was changed to 0.07. It was assumed that the channel dowstream of the proposed bridge may not be maintained regularly, and therefore the wide overbank section would have a higher roughness. A roughness of 0.07 is appropriate for the type of vegetation that thrives in this area of the channel.

HEC-RAS model results

Installation of the Alviso Slough Pedestrian Bridge in the HEC-RAS model produced a water surface elevation of 16.1 feet (NAVD88). This water surface elevation is essentially the same as the current channel design/existing conditions, and therefore does not alter the function of the existing Lower Guadalupe River Project (Exhibit 2).

The soffit of the new bridge should be set at a minimum of 20.1 feet to include 4.0 feet of freeboard necessary to meet FEMA and SCVWD requirements for the construction of new bridges within a leveed channel condition (Exhibit 3).

The model resulted in a channel velocity of 5.4 fps during high flow conditions. This velocity remains within an acceptable range for the design of flood control channels of this type, as indicated in the US Army Corps of Engineers EM1110-2-1601. Because no sloughing of the embankment was observed during a site visit, it was assumed that the banks are stable and erosion is not expected to occur. In addition, scour analysis results for the State Route 237 Eastbound Bridge, indicated that although long term scour was expected to be minimal, local scouring at the piers could be expected to a depth of 8.5 feet. The design of the piers should account for these findings. The SR 237 Eastbound Bridge, located approximately 8000 feet upstream of the Alviso Slough Pedestrian Bridge project site is also within a tidally influence area. Because the new bridge is located within the limits of a well defined bend in the channel and the low flow channel swings very close to it, rock slope protection should be added to the south abutment. Further analysis of the sediments in the channel, may indicate that velocities are higher than acceptable, and a scour analysis may be necessary.

Conclusion and Recommendations

Hydraulic results provided in this memorandum are based on a preliminary bridge design. However, given the ratio of area in flow to the total area of the abutment on the south bank that encroaches into the channel and the area blocked by the piers, the differences between pre- and post-project water surface elevation (WSE) is minimal and will not negatively impact the existing flood protection project. The dimensions of the piers and the bridge abutment are preliminary and therefore subject to change during the next phase of design. However, it is expected that changes in WSE associated with a different pier configuration

would be similar to that found for this analysis. A scour analysis was not performed as part of the preliminary hydraulic analysis. However, if upon further review of the subsurface geotechnical conditions it is found that the existing soils are prone to scouring during high flow conditions, a scour analysis may become necessary.

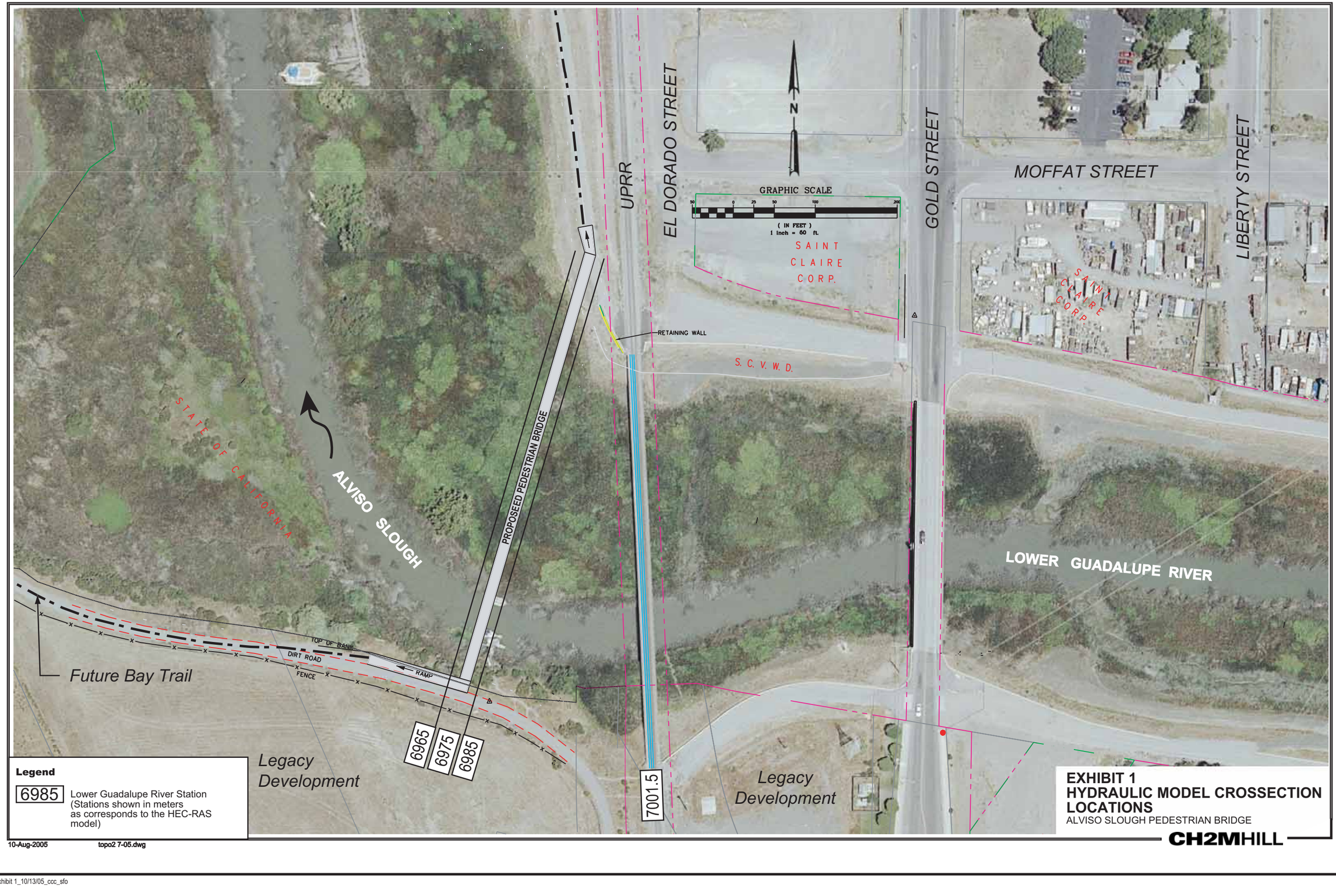
References

Lower Guadalupe River EIR, July 2002

U.S. Army Corps of Engineers EM 1110-2-1601

Bridge Hydraulic & Design Report, State Route 237 Eastbound Bridge Crossing Guadalupe River, April 2002

Northwest Hydraulics Consultants (NHC), March 2000. "History of Basin and Channel and Baseline Hydraulic Evaluation," Santa Clara Valley Water District Existing Conditions Report, San Jose, CA



332226.T1.10_Exhibit 1_10/13/05_ccc_sfo

Exhibit 2
Alviso Slough Pedestrian Bridge Hydraulic Conditions as Modeled in HEC-RAS

River Station	Total Flow Rate	Water Surface Elevation		Channel Velocity	
		Proposed	Existing	Proposed	Existing
(m)	(ft^3/s)	(ft)	(ft)	(ft/s)	(ft/s)
7170	18325.13	16.6	16.6	6.7	6.7
7121.5	18325.13	16.5	16.5	6.2	6.2
7115.5	**Gold Street Bridge**				
7109.5	18325.13	16.4	16.4	6.2	6.2
7080	18325.13	16.4	16.4	6.1	6.1
7050	18325.13	16.4	16.3	6.2	6.2
7007	18325.13	16.4	16.4	5.2	5.2
7004.25	**UPRR bridge**				
7001.5	18325.13	16.2	16.2	5.3	5.3
6975	18325.13	16.1	16.1	5.3	5.3
6970	**Alviso Pedestrian Bridge**				
6965	18325.13	16.1	16.1	5.4	5.4
6900	18325.13	15.7	15.7	7.1	7.1
6871	**Alviso Slough Weir**				
6780	17722.35	15.0	15.0	8.6	8.6
6660	16366.11	13.5	13.5	11.4	11.4

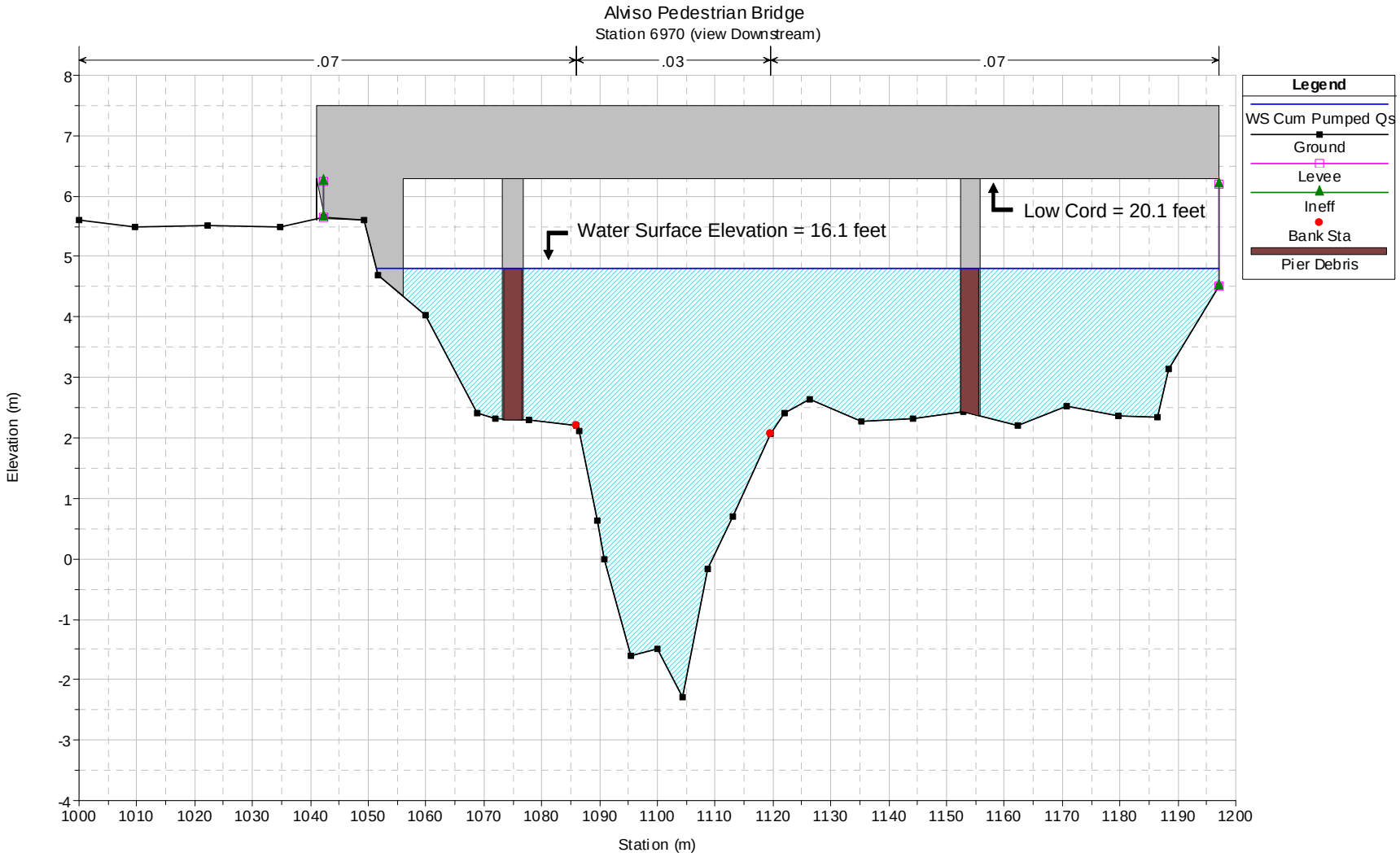


Exhibit 3 Alviso Slough Pedestrian Bridge Channel Crossection (Lower Guadalupe River stations shown in meters as corresponds to the HEC-RAS model)

Alviso Slough Pedestrian Bridge – Task 2.6

Preliminary Geotechnical and Foundation Recommendations

PREPARED FOR: Jeff Aldrich/CH2M HILL

PREPARED BY: Dave Ritzman/CH2M HILL

REVIEWED BY: Ana Demorest/CH2M HILL

COPIES: Jan Palajac/City of San Jose DPW CFAS Division

Dave Von Rueden/CH2M HILL

DATE: August 22, 2005

PROJECT NUMBER: 332226.T1.06

Introduction

CH2M HILL has been retained by the City of San Jose to develop preliminary design plans for a proposed pedestrian bridge across the Guadalupe River (Alviso Slough). The proposed bridge, located near the community of Alviso, is approximately 500 feet long and crosses the river just downstream of an existing Union Pacific Railroad (UPRR) bridge. Support for the bridge will be derived from abutment structures at each end of the bridge and up to two intermediate piers within the river channel. Retaining walls, up to approximately 10 feet high will support earthfill approaches to the bridge.

This memorandum discusses subsurface conditions in the project area and provides preliminary seismic and foundation design recommendations for the proposed bridge and retaining walls. Subsurface conditions described in this memorandum are based on information collected during previous geotechnical investigations in the project area. Final design of foundation systems for the proposed bridge and retaining walls should be based on a project-specific geotechnical investigation including subsurface exploration at proposed abutment and intermediate pier locations.

Location and Setting

The proposed bridge is located at the northern end of the Santa Clara Valley, a broad, northwesterly trending basin filled with alluvial, fluvial, and estuarine sediments. Prior to historical development, the Guadalupe River meandered through the project area as it approached the limits of a vast tidal wetland at the southeastern end of San Francisco Bay. The river has since been straightened and confined by levees, and large portions of the

former natural channel have been filled for levee construction and development of land outside the levees.

Existing structures in the vicinity of the proposed bridge include the existing UPRR and Gold Street bridges. Located immediately upstream of the proposed crossing, the UPRR bridge is approximately 500 feet long and was constructed in the late 1960s. The UPRR bridge includes approximately seventeen individual, pier-supported spans. The piers are founded on exposed steel pipe piles. Approximately 350 feet upstream of the railroad crossing, the Gold Street bridge crosses the river channel in five, 60-foot spans for a total length of 300 feet.

The northern abutment of the proposed bridge is located at the crest of the existing river levee, approximately 40 feet west of the railroad. The southern abutment is located at the crest of a fill slope, approximately 150 feet west of the railroad. The bridge will provide access between pedestrian trails that run along the levees on both sides of the river and will be part of the San Francisco Bay Trail system.

Subsurface Conditions

Subsurface exploration in the vicinity of the proposed bridge was performed by URS for the Santa Clara Valley Water District's Lower Guadalupe River Flood Control Project (URS 2002a, 2002b). Exploration for the flood control project included nine soil borings within approximately 1000 feet of the proposed crossing. The borings, designated CB-01, CB-14, CB-15, CB-16, CB-17, CB-18, EB-18, EB-19 and EB-27, were performed between May 1998 and January 2002. The borings were completed to depths between approximately 30 and 85 feet below the existing ground surface.

As a result of earthfill and grading associated with historical modifications to the Guadalupe River channel, levee construction, waste disposal and other earthwork activities, subsurface conditions in the project area may not be consistent with existing topographic features. Based on available information, it appears that the existing river channel at the location of the proposed bridge crossing roughly follows the natural river channel. However, meanders in the natural river channel immediately upstream and downstream of the proposed crossing appear to have been cut off and filled as part of efforts to straighten the river. As a result, buried channel deposits may exist beneath or outside the existing levees. Historical waste disposal and landfill operations, particularly along the southern bank of the existing river channel, may also influence the type and variability of materials that exist beneath the ground surface.

Based on logs of borings performed by URS, subsurface conditions in the project area are highly variable. Soils encountered in the vicinity of the proposed crossing include a variety of earthfill materials, soft estuarine clay (Young Bay Mud), young stream channel deposits and older alluvial deposits. The nature, location and extent of these deposits are discussed in the following sections. Bedrock appears to underlie the site at depths greater than 500 feet below the ground surface (Rogers and Williams, 1974).

Fill Materials

With the exception of the current low-flow river channel, surficial soils in the vicinity of the proposed bridge appear to primarily consist of fill materials. Beneath the existing levees and embankments on either side of the river channel, fill materials were encountered to depths between approximately 12 and 17 feet below the ground surface. Fill materials underlying the high water channel were encountered to depths between approximately 3 and 8 feet below the ground surface. Native soils underlying fill materials were generally encountered at elevations between approximately +3 and -3 feet (NAVD 88).

Levee fill materials encountered on the north and east banks of the river generally consist of stiff to very stiff lean (low plasticity) clay with gravel and sand. Fill materials encountered within the high water channel are more variable and include soft fat clay, soft to stiff lean clay and medium dense clayey sand with gravel. Fill materials encountered on the west bank of the river approximately 700 feet west of the proposed crossing include concrete, wood, asphalt, refuse and other debris.

Based on conditions encountered in similar locations along the historical margins of San Francisco Bay, it is likely that much of the fill beneath the site, particularly the oldest material directly above native soils, was placed in an uncontrolled, unengineered manner. As a result, residual marsh deposits, consisting of decaying plant material and organic soils, are likely present beneath fill materials.

Young Bay Mud

Most borings in the vicinity of the proposed project encountered Young Bay Mud beneath artificial fill materials. Where borings penetrated to the bottom of the layer, Young Bay Mud was encountered as deep as approximately 48 feet below the ground surface. In general, Young Bay Mud was present between approximately elevations +2 and -38 feet (all elevations referenced to NAVD 88). It is likely that deposits of Young Bay Mud in the vicinity of the proposed bridge occupy an ancestral river channel carved into older (pre-Holocene) alluvial deposits. During Holocene time (approximately the past 10,000 years), rising sea levels caused inundation of the area and Young Bay Mud deposits gradually filled the channel.

Young Bay Mud encountered beneath the site generally consists of high plasticity clay and silt with occasional shells, bits of plant material and lenses of fine sand. The Young Bay Mud is typically very soft to firm, with undrained shear strengths measured during the URS investigation ranging from approximately 150 to 650 pounds per square foot (psf). Young Bay Mud is also highly compressible and subject to significant settlement under loading.

Young Stream Channel Deposits

In some borings, young stream channel deposits were encountered above and embedded within Young Bay Mud deposits. Consisting of coarse-grained material ranging from silty and clayey gravel to fine silty sand, young stream channel deposits encountered in the vicinity of the proposed bridge generally range from very loose to medium dense. However the presence of gravel material in the deposits may cause them to appear denser than they actually are. Based on available information, young stream channel deposits underlying the project area appear highly susceptible to liquefaction in the event of a major earthquake.

Young channel deposits encountered near the proposed bridge site appear largely discontinuous, but may be greater than 15 feet thick in some areas. Based on available subsurface information, it appears that young stream channel deposits may extend as deep beneath the ground surface as Young Bay Mud deposits, to an elevation of approximately -38 feet.

Older Alluvial Deposits

Two types of older alluvial material were encountered in borings performed by URS within the project vicinity. In boring EB-18, located along the existing northern levee between the UPRR and Gold Street bridges, approximately 25 feet of firm to stiff lean clay was encountered immediately beneath levee fill materials, to an elevation of -27 feet. In contrast, Young Bay Mud and stream channel deposits were encountered at similar depths in nearby borings. Based on available information, it appears likely that lean clay encountered in boring EB-18 is pre-Holocene alluvium located outside the ancestral Guadalupe River channel.

Across the project area, borings extending deeper than an elevation of approximately -38 feet encountered coarse-grained alluvial deposits composed primarily of medium dense to dense sand with some silt, clay and gravel. During the URS field investigation, standard penetration test (SPT) blow counts within these deep, older alluvial deposits ranged from approximately 16 to 45, with most values between approximately 25 and 35. Coarse-grained, older alluvial deposits were encountered to the greatest depth explored during the URS investigation, approximately 81.5 feet below the ground surface (elevation -71 feet).

Assumed Subsurface Profile

Based on available information, soils underlying the proposed bridge are likely to consist of fill materials underlain by soft, highly compressible deposits of Young Bay Mud and loose, potentially liquefiable young stream channel deposits. The presence and potential thickness of Young Bay Mud and channel deposits is controlled by the location of the ancestral Guadalupe River channel. Based on available information, it appears that most, if not all of the proposed bridge alignment is located within the area of the ancestral channel.

Within the ancestral Guadalupe River channel, Young Bay Mud and channel deposits may extend as deep as elevation -38 feet. This elevation is approximately 55 to 60 feet below the existing ground surface at the proposed bridge abutments and approximately 45 to 50 feet below the existing ground surface at potential pier locations within the river's high-flow channel. Young Bay Mud and channel deposits are likely underlain by coarse-grained older alluvial soils.

Outside of the ancestral channel, Young Bay Mud and channel deposits may be relatively thin or even nonexistent beneath fill materials. In these areas, fine-grained older alluvial soils may be present below an elevation of approximately +1 foot. This elevation is approximately 15 to 20 feet below the ground surface at proposed abutment locations and approximately 5 to 10 feet below the ground surface at potential pier locations. Below an elevation of approximately -27 feet, fine-grained older alluvial soils may be underlain by coarse-grained alluvial material similar to that encountered below nearby Young Bay Mud and channel deposits.

Preliminary Geotechnical Recommendations

Foundations

Due to the presence of loose and variable fill materials, soft and compressible Young Bay Mud and potentially liquefiable stream channel deposits, it appears that deep foundations will be necessary for the proposed bridge and retaining wall structures. Deep foundations should be designed to derive their support from older alluvial materials underlying the site. Deep foundation alternatives include driven piles and drilled shafts.

Based on available subsurface information, it appears that driven piles will be the most suitable and economically favorable foundation alternative for the proposed bridge structure. Driven piles also appear to be the most suitable foundation alternative for retaining walls of sufficient height to require deep foundations. Steel or concrete piling may be used. However, due to variable soil conditions and the presence of potential obstructions in fill materials beneath the site, steel piling appears to be more suitable than concrete piling. Steel pipe piles supporting the nearby UPRR bridge appear to be in good condition after nearly forty years of service. Similar piles should be considered for support of the proposed pedestrian bridge and retaining walls.

Pile driving operations typically generate a significant amount of noise and may result in localized vibration of the ground within and adjacent to the work area. The amount of noise and vibration generated during driven pile installation is a function of subsurface soil conditions; hammer size, type and configuration; and pile material, size and type. Potential noise and vibration impacts during construction should be evaluated as part of future design efforts. Mitigation of these potential noise and vibration impacts may be necessary for compliance with future California Environmental Quality Act (CEQA) requirements associated with the project.

Drilled shafts are not recommended as a potential foundation alternative due to anticipated subsurface conditions and challenges associated with storage, handling and disposal of drilling fluids and spoils. The presence of variable subsurface conditions, high groundwater and loose sandy materials may lead to instability of shaft excavations and disruption of construction operations. It is likely that significant effort will be necessary to mitigate potential environmental impacts associated with the use of drilling fluids within the river channel. The potential presence of debris and refuse in fill materials beneath the site may also present challenges in disposing of drilling spoils. Although drilled shafts may be feasible with implementation of appropriate design and construction measures, it is not anticipated that they will provide an economical alternative to driven piles.

Earthwork and Grading

Deposits of soft, highly compressible Young Bay Mud underlie the project area and may be up to approximately 35 feet thick. Loosely dumped fill materials may also be subject to compaction under loading. As a result, if placement of earthfill material is necessary to raise existing grades for proposed bridge abutments and approaches, potential settlement of underlying soils should be evaluated and mitigated as part of future design efforts.

Seismic Design Considerations

Based on the Caltrans Seismic Hazard Map (Mualchin, 1996a), the acceleration factor (design peak ground acceleration on rock) for the proposed bridge site is approximately 0.5g. The controlling fault for seismic hazards at the site is the Hayward fault, located approximately 5 miles to the northeast. A maximum credible earthquake (MCE) event of magnitude 7.5 is estimated by Caltrans for the Hayward fault (Mualchin, 1996b).

Due to the presence of potentially liquefiable soils in the project area, it appears that Soil Profile Type F, per Caltrans Seismic Design Criteria (SDC, Version 1.3, February 2004), is appropriate for seismic design of the proposed bridge structure. Soil Profile Type F requires development of site-specific spectral acceleration curves. If potentially liquefiable soils did not exist at the site, it appears that Soil Profile Type E would be appropriate for design of the proposed bridge. However, Caltrans standard spectral acceleration curves for Soil Profile Type E are only available for peak bedrock accelerations up to 0.4g. As a result, it is anticipated that a site-specific seismic response analysis will be necessary for design of the proposed pedestrian bridge. Such an analysis is beyond the scope of this technical memorandum.

Corrosion Considerations

The Guadalupe River is tidally influenced at the location of the proposed bridge. As a result, surface water and groundwater within the project area likely contains elevated chloride concentrations. Based on conditions in similar areas along the margins of San Francisco Bay, soil and groundwater within the project area be corrosive to buried metal and concrete structures. The potential for corrosion of foundation structures should be evaluated and mitigated as part of future design efforts.

Geotechnical Investigation

Due to the high variability of subsurface conditions in the project area, borings should be completed at each proposed abutment and intermediate pier location. Soil samples should be collected from the borings and tested for material characteristics and engineering properties. Subsurface information collected during the investigation should be used in design of foundations and development of plans and specifications for the proposed bridge.

Limitations

Geotechnical recommendations provided in this memorandum are based on existing subsurface information collected for previous projects in the vicinity of the proposed pedestrian bridge. The recommendations provided herein are for development of preliminary design alternatives for the proposed bridge. Geotechnical recommendations for final design of the proposed bridge should be developed based on subsurface information collected as part of a site- and project-specific geotechnical investigation and laboratory testing program.

References

Mualchin, L. (1996a). *California Seismic Hazard Map 1996 (Based on Maximum Credible Earthquakes)*. Prepared for the State of California Department of Transportation (Caltrans). July 1996.

Mualchin, L. (1996b). *A Technical Report to Accompany the Caltrans California Seismic Hazard Map 1996 (Based on Maximum Credible Earthquakes)*. Prepared for the State of California Department of Transportation (Caltrans). July 1996.

Rogers, T.H. and J.W. Williams (1974). *Potential Seismic Hazards in Santa Clara County, California*. State of California, Division of Mines and Geology (CDMG) Special Report 107.

URS. (2002a). *Geotechnical Engineering Report, Lower Guadalupe River Flood Control Project Task 2.4.4 – UPRR to Route 237, Santa Clara County, California*. Prepared for CH2M HILL. July 5, 2002.

URS. (2002a). *Geotechnical Engineering Report, Lower Guadalupe River Flood Control Project Task 2.4.6 – Baylands, Santa Clara County, California*. Prepared for CH2M HILL. November 8, 2002.

Alviso Slough Pedestrian Bridge –Task 1.7

Applicable Structural Design Criteria

PREPARED FOR: Jeff Aldrich/CH2M HILL

PREPARED BY: Matt Negrete/CH2M HILL

REVIEWED BY: Jeff Aldrich/CH2M HILL

COPIES: Jan Palajac/City of San Jose DPW CFAS Division
Dave Von Rueden/CH2M HILL

DATE: October 11, 2005

The purpose of this memorandum is to summarize applicable design codes, loading criteria, minimum vertical clearance, and review agencies for the structural design of Alviso Slough Pedestrian Bridge. Below is a summary of this information.

DESIGN CODES

1997 AASHTO Guide Specifications for Design of Pedestrian Bridges
(Caltrans Bridge Design Specifications shall be used in lieu of references to AASHTO Standard Specifications for Highway Bridges)

Caltrans Bridge Design Specifications, Current Edition

Caltrans Seismic Design Criteria (SDC), Version 1.3, February 2004

LOADING

Dead Loads

Unit weight of reinforced concrete is assumed to be 150 pcf.

Structural steel is assumed to be 490 pcf.

Live Loads

Live loading will be as specified in the 1997 AASHTO Guide Specifications for Design of Pedestrian Bridges.

City to specify a design vehicle for use in the determination of the vehicle load. In lieu of a specific design vehicle, the bridge shall be designed for an H-10 Truck.

Wind Loads

Wind loading will be as specified in the 1997 AASHTO Guide Specifications for Design of Pedestrian Bridges.

Thermal Forces

The temperature ranges used for determining structural deformations and corresponding thermal-induces stresses are as follows:

Assumed Temp. at time of Construction	80 °F
Temperature Rise	+40 °F
Temperature Fall	-40 °F

Seismic Loading

Seismic design of the bridge will be performed according to the Caltrans SDC based on project specific geotechnical analysis to be performed during final design. Consideration of seismic loading during the Feasibility Study has been based on the Preliminary Geotechnical and Foundation Recommendations.

Combination of Loadings

Loads will be combined as specified in Section 3.22 of the Caltrans Bridge Design Specification Manual.

MATERIAL SPECIFICATIONS

Concrete

The 28-day concrete strength shall be 4000 psi. The modulus of elasticity shall be 3605 ksi.

Steel

Reinforcing steel will conform to ASTM A706, Grade 60 for all bar sizes.

Structural Steel

Structural steel shall be A588 weathering steel subject to verification during final design that site exposure characteristics are sufficiently non-corrosive to enable use of this material. For the Feasibilty Study, the prevalence of salt laden fog has been assumed to be minimal and therefore weathering steel is considered to be a viable alternative.

Piling

Steel piling is assumed based on the Preliminary Geotechnical and Foundation Recommendations.

For seismic and corrosion considerations, pipe piles have been assumed. Pipe piles are to be as per ASTM A252, Grade 2, with yield strength of 35,000 psi at a minimum. Grade 3, 45,000 psi piles may be used if required for driving.

Anchor Bolts

Use Type 316 stainless steel for superior corrosion resistance over galvanized steel bolts.

REQUIRED FREEBOARD

Freeboard provided at the bridge location will be 4 feet, as specified in Title 44, Section 65.10 of the Code of Federal Regulations. This is consistent with recent levee improvements in the area, as well as other new structures along the Lower Guadalupe River.

Vertical clearance at the north abutment will be sufficient for a proposed trail extension under Gold Street Bridge, the UPRR Bridge, and this structure.

OTHER REFERENCES

Preliminary Geotechnical and Foundation Recommendations – Alviso Slough Pedestrian Bridge, CH2M HILL, August 22, 2005

Preliminary Hydraulic Analysis – Alviso Slough Pedestrian Bridge, CH2M HILL, October 11, 2005

UPRR As-built plans

Lower Guadalupe River Flood Proetection Project Plans

REVIEWING AGENCIES

City of San Jose
Jan Palajac – Project Manager

Santa Clara Valley Water District
Colleen Haggerty

Bay Trail Crossing at Alviso Slough - Potential CEQA and Permitting Issues

PREPARED FOR: Dave Von Rueden

PREPARED BY: Rene Langis

DATE: March 5, 2006

PROJECT NUMBER: 332226.T1.13

This memorandum discusses the probable requirements for completing the CEQA review for allowing construction of the proposed new pedestrian/bicycle bridge at Alviso Slough.

The December 2001 Initial Study/Mitigated Negative Declaration for the City of San Jose Bay Trail Master Plan (IS/MND) included a discussion of the proposed new bridge as alternative B on Reach 9. The document briefly mentions the project's potential impact on sensitive species such as California clapper rail, salt marsh common yellowthroat, and tri-colored blackbird, as well as its potential adverse effect on these species and other fauna resulting from providing new perching habitat for predatory birds. The IS/MND did not, however, fully address specific bridge impacts or consider potential impacts to other Guadalupe River resources, such as steelhead, but concluded that the project has a potential for having significant impacts and will require a separate environmental review.

These potential impacts will need to be further assessed before one can determine the type of environmental review required for the bridge project. Any impact that cannot be mitigated to a level of non-significance will likely trigger the preparation of an Environmental Impact Report (EIR), however if all impacts can be sufficiently mitigated, a Negative Declaration should suffice.

The first step will be to take the project description through the CEQA Environmental Checklist to identify potential impacts during both construction and the operation of trail and bridge and work with the design team to avoid or mitigate potentially significant impacts.

The IS/MND points out that biological resources are the most probable target for potentially significant impacts. To adequately assess the significance of potential biological impacts, further analysis will be necessary to evaluate potential effects to wetlands and sensitive species and, more importantly, determine if the impact can be fully mitigated. These studies should review and update the potential for presence of sensitive species starting with the examination of the most current US Fish and Wildlife Service and California Department of Fish and Game species list for the project area.

Priority should be put on determining the absence or presence of sensitive species, with special focus on the endangered California clapper rail. Surveys conducted for the Lower Guadalupe River Flood Protection Project showed that the California clapper rail was likely absent from the area located upstream of the UPRR Bridge, but these surveys need to be

expanded downstream to cover the actual proposed pedestrian/bicycle bridge area. If surveys show that the California clapper rail is likely to be present in the new bridge area, avoidance or mitigation measure will need to be developed and coordinated with resource agencies to reduce the impact to a less than significant level.

In the case of species that are already known to be present, such as steelhead, efforts should be put on developing and coordinating avoidance and/or mitigation measures with the National Marine Fisheries Service. Based on our experience with steelhead issues, if the proposed bridge is designed to avoid impacts to the live channel (piers would be placed in the floodplain but not in flowing channel) and construction activities are set to occur outside of the steelhead migratory period, which occurs from November 1 to June 15, no significant impacts to steelhead or other migratory fish are anticipated.

The potential for creating new perches for predatory birds will also need to be studied in more detail because of its potential adverse effect on sensitive species if these are found to be present in the bridge area. If this impact cannot be avoided through bridge design or cannot, otherwise, be reduced to a level of non-significance, it may be necessary to prepare an EIR.

Alviso Slough Pedestrian Bridge Feasibility Study
Alternative A (Box Truss) Cost Estimate

Date: February 28, 2006
By: Matt Negrete/CH2M HILL
Proj: 332226.T1

CONTRACT ITEMS		Estimated Quantity	Units	Unit Price	Total
Construction Access Road		1	LS	$50,000	$50,000
Structure Excavation (Bridge)		122	CY	$80	$9,760
Structure Excavation (Type D)		44	CY	$300	$13,260
Structure Excavation (Retaining Wall)		177	CY	$50	$8,840
Structure Backfill (Bridge)		67	CY	$150	$10,020
Structure Backfill (Retaining Wall)		309	CY	$100	$30,900
Furnish 16" Steel Pipe Piling		1,400	FT	$60	$84,000
Drive 16" Steel Pipe Piling		14	EA	$2,000	$28,000
Furnish 48" Cast-In-Steel-Shell Pile		400	FT	$250	$100,000
Drive 48" Cast-In-Steel-Shell Pile		4	EA	$7,500	$30,000
Structural Concrete		429	CY	$650	$278,655
Furnish 180' Box Truss		3	EA	$310,000	$930,000
Erect 180' Box Truss		3	EA	$50,000	$150,000
Bar Reinforcing Steel (Bridge)		42,870	LB	$0.75	$32,200
Ornamental Railing 4' 6" high		346	FT	$200	$69,200
Hydroseeding/Work Area Restoration		1	LS	$20,000	$20,000
Pedestrian Gateway Enhancements		1	LS	$100,000	$100,000
Bird Exclusion Measures		1	LS	$20,000	$20,000

SUBTOTAL	**$1,964,835**
MOBILIZATION (@ 10 %)	**$218,315**
SUBTOTAL BRIDGE ITEMS	**$2,183,150**
CONTINGENCIES (@ 25%)	**$545,788**
BRIDGE CONSTRUCTION COST	**$2,728,938**
CITY DESIGN MANAGEMENT & CONSTRUCTION INSPECTION (30%)	**$818,681**
ENGINEERING DESIGN (15%)	**$409,341**
ENGINEERING SERVICES DURING CONTRUCTION (2%)	**$54,579**
SUBTOTAL ESTIMATED COST	**$4,011,538**
PUBLIC ART (2%)	**$80,231**
FOR BUDGET PURPOSES - SAY	**$4,092,000**

Note: Cost estimate does not include right-of-way acquisition or environmental mitigation

Alviso Slough Pedestrian Bridge Feasibility Study
Alternative B (Bowstring Truss) Cost Estimate

Date: February 28, 2006
By: Matt Negrete/CH2M HILL
Proj: 332226.T1

CONTRACT ITEMS		Estimated Quantity	Units	Unit Price	Total
Construction Access Road		1	LS	$50,000	$50,000
Structure Excavation (Bridge)		122	CY	$80	$9,760
Structure Excavation (Type D)		44	CY	$300	$13,260
Structure Excavation (Retaining Wall)		266	CY	$50	$13,320
Structure Backfill (Bridge)		67	CY	$150	$10,020
Structure Backfill (Retaining Wall)		450	CY	$100	$44,980
Furnish 16" Steel Pipe Piling		1,600	FT	$60	$96,000
Drive 16" Steel Pipe Piling		16	EA	$2,000	$32,000
Furnish 48" Cast-In-Steel-Shell Pile		400	FT	$250	$100,000
Drive 48" Cast-In-Steel-Shell Pile		4	EA	$7,500	$30,000
Structural Concrete		497	CY	$650	$322,985
Furnish 180' Bowstring Truss		3	EA	$283,333	$850,000
Erect 180' Bowstring Truss		3	EA	$50,000	$150,000
Bar Reinforcing Steel (Bridge)		49,690	LB	$0.75	$37,300
Ornamental Railing 4' 6" high		430	FT	$200	$86,000
Hydroseeding/Work Area Restoration		1	LS	$20,000	$20,000
Pedestrian Gateway Enhancements		1	LS	$100,000	$100,000
Bird Exclusion Measures		1	LS	$20,000	$20,000

SUBTOTAL	**$1,985,625**
MOBILIZATION (@ 10 %)	**$220,625**
SUBTOTAL BRIDGE ITEMS	**$2,206,250**
CONTINGENCIES (@ 25%)	**$551,562**
BRIDGE CONSTRUCTION COST	**$2,757,812**
CITY DESIGN MANAGEMENT & CONSTRUCTION INSPECTION (30%)	**$827,344**
ENGINEERING DESIGN (15%)	**$413,672**
ENGINEERING SERVICES DURING CONTRUCTION (2%)	**$55,156**
TOTAL ESTIMATED COST	**$4,053,984**
PUBLIC ART (2%)	**$81,080**
FOR BUDGET PURPOSES - SAY	**$4,135,000**

Note: Cost estimate does not include right-of-way acquisition or environmental mitigation

Alviso Slough Pedestrian Bridge Feasibility Study
Alternative C (Cable Stay) Cost Estimate

Date: February 28, 2006
By: Matt Negrete/CH2M HILL
Proj: 332226.T1

CONTRACT ITEMS		Estimated Quantity	Units	Unit Price	Total
Construction Access Road		1	LS	$50,000	$50,000
Structure Excavation (Bridge)		122	CY	$80	$9,760
Structure Excavation (Type D)		23	CY	$300	$7,020
Structure Excavation (Retaining Wall)		306	CY	$50	$15,320
Structure Backfill (Bridge)		64	CY	$150	$9,630
Structure Backfill (Retaining Wall)		539	CY	$100	$53,870
1/2 Ton Rock Slope Protection		500	TON	$100	$50,000
Furnish 16" Steel Pipe Piling		1,600	FT	$60	$96,000
Drive 16" Steel Pipe Piling		16	EA	$2,000	$32,000
Furnish 48" Cast-In-Steel-Shell Pile		400	FT	$250	$100,000
Drive 48" Cast-In-Steel-Shell Pile		4	EA	$7,500	$30,000
Structural Concrete		423	CY	$650	$275,210
Furnish 260' Cable Stay		2	EA	$550,000	$1,100,000
Erect 260' Cable Stay		2	EA	$150,000	$300,000
Bar Reinforcing Steel (Bridge)		42,340	LB	$0.75	$31,800
Ornamental Railing 4' 6" high		382	FT	$200	$76,400
Hydroseeding/Work Area Restoration		1	LS	$20,000	$20,000
Pedestrian Gateway Enchancemts		1	LS	$100,000	$100,000
Bird Exclusion Measures		1	LS	$20,000	$20,000

SUBTOTAL	**$2,377,010**
MOBILIZATION (@ 10 %)	**$264,112**
SUBTOTAL BRIDGE ITEMS	**$2,641,122**
CONTINGENCIES (@ 25%)	**$660,281**
BRIDGE CONSTRUCTION COST	**$3,301,403**
CITY DESIGN MANAGEMENT & CONSTRUCTION INSPECTION (30%)	**$990,421**
ENGINEERING DESIGN (15%)	**$495,210**
ENGINEERING SERVICES DURING CONTRUCTION (2%)	**$66,028**
TOTAL ESTIMATED COST	**$4,853,062**
PUBLIC ART (2%)	**$97,061**
FOR BUDGET PURPOSES - SAY	**$4,950,000**

Note: Cost estimate does not include right-of-way acquisition or environmental mitigation

100443

10012045

Recorded at the request of:
State of California
State Lands Commission

WHEN RECORDED mail to:
State Lands Division
180? - 13th Street
Sacramento, California 95814

REC FEE	NO FEE
RMF	
MICRO	
LIEN NOT	
SMPF	
PCOR	

Recorded at the Request of
First American Title Guaranty Co.
FEB 16 1989 8.00 A.M.
LAURIE KANE, Recorder
Santa Clara County, Official Records

K850 PAGE 1676

STATE OF CALIFORNIA
OFFICIAL BUSINESS - DOCUMENT
entitled to free recordation
pursuant to Government Code
Section 27383

S.L.C. - B.L.A. No. 224
W 22492

NO TAX DUE No Consideration

Above Space for Recorder's Use

INSTRUCTIONS TO THE COUNTY RECORDER OF THE COUNTY OF SANTA CLARA

This document includes both a State Quitclaim Deed of certain real property to a private party and Deeds of certain other real property to the State of California. Therefore, please index this document as follows:

	Grantor	Grantee	Property
1)	Marshland Developments, Inc.	State of California	Real property described in Exhibit B, and easements, Exhibit D and E hereto
2)	State of California	Marshland Developments, Inc.	Real property described in Exhibit C hereto

ote: State Acceptance and Consent to Recording on page 13.

BOUNDARY LINE AND SETTLEMENT AGREEMENT

THE PARTIES TO THIS BOUNDARY LINE AGREEMENT, dated _____, are the STATE OF CALIFORNIA, acting by and through the STATE LANDS COMMISSION, hereinafter sometimes referred to as STATE, and MARSHLAND DEVELOPMENTS, INC. hereinafter sometimes referred to as MARSHLAND.

WITNESSETH:

WHEREAS, the State of California, by virtue of its sovereignty, received title to sovereign tide and submerged lands located within said State at the time of its admission to the Union and the jurisdiction over and administration of all said lands was and is vested in the STATE LANDS COMMISSION as the successor in interest of all previous State agencies having such jurisdiction and administrative powers;

WHEREAS, although all of the lands affected by this agreement are sovereign tide and submerged lands, the parties hereto are not in agreement as to the extent of such lands within the area affected by this agreement; and

WHEREAS, GUADALUPE SLOUGH and GUADALUPE RIVER, being a part of the SAN FRANCISCO BAY estuarine system, hereinafter referred to as "SAID SLOUGH", as it is bounded by the line of the natural ordinary high water mark hereinafter described and referred to as "SAID ORDINARY HIGH WATER MARK", was at the time of the admission of the State of California as a state of the United States of America, and at all times thereafter has been a tidal and navigable waterway within the State of California, County of Santa Clara, and, as such, the bed thereof, below and adjoining SAID ORDINARY HIGH WATER MARK, consists of tidelands and submerged lands, owned by the STATE OF CALIFORNIA

in its sovereign capacity; and

WHEREAS, MARSHLAND claims some right, title, and interest in the littoral and riparian lands, hereinafter referred to as SAID UPLANDS, the same being upland from and adjoining and bounded by SAID ORDINARY HIGH WATER MARK and being a portion of the Rancho Ulistac; and

WHEREAS, MARSHLAND claims as a successor in interest to the heirs of J. D. Hoppe, Patentees of the Rancho Ulistac, a Patent dated October 12, 1868, being issued for said lands and recorded in Book "A" of Patents at page 189 in the office of the County Recorder of Santa Clara County, and, as such, MARSHLAND is the owner of lands upland from and bounded by the SAID ORDINARY HIGH WATER MARK OF SAID SLOUGH; and

WHEREAS, the SAID ORDINARY HIGH WATER MARK constitutes the common boundary between the SAID UPLANDS of MARSHLAND and the tide and submerged lands of STATE, which boundary is located at the line of mean high water as it last naturally existed, and which boundary does not necessarily coincide with the present line of mean high water by reason of artificial changes in the location of the mean high tide line which have occurred; and

WHEREAS, it appears that the SAID ORDINARY HIGH WATER MARK since 1850 has been subject to fluctuation, the nature, extent, and causes of which are the subject of substantial uncertainty and bona fide dispute between the parties; and

WHEREAS, the true location of the boundary between the lands of STATE and MARSHLAND, being the SAID ORDINARY HIGH WATER MARK, is not known and cannot be established without agreement or court judgment; and

WHEREAS, it is in the parties' interest and they mutually desire to establish the location of their boundary (being SAID ORDINARY HIGH WATER MARK) by agreement, thereby avoiding the costs, delays, and uncertainties necessary to the establishment of such boundary by litigation; and

WHEREAS, the parties hereto deem it expedient and necessary and in their respective interests to permanently fix and establish the location of SAID ORDINARY HIGH WATER MARK by this agreement; and

WHEREAS, Section 6357 of the Public Resources Code of the STATE OF CALIFORNIA authorized the STATE LANDS COMMISSION to establish the ordinary high water mark of tide lands or submerged lands of this State by Agreement, arbitration, or action to quiet title, whenever it is deemed expedient or necessary; and

WHEREAS, there is a bona fide dispute based on questions of law and fact, and the parties hereto intend to finally resolve and settle by compromise agreement, such questions, and to fix and establish such boundary at the SAID ORDINARY HIGH WATER MARK as herein agreed to; and

NOW, THEREFORE, the parties mutually agree, as follows:

1. The location of SAID ORDINARY HIGH WATER MARK is hereby established to be located along and upon that certain fixed line more particularly described in the attached EXHIBIT A which is incorporated herein and is made a part hereof by reference.

2. Such line of SAID ORDINARY HIGH WATER MARK, the location of which is herein agreed to, depicts the location of the boundary between the STATE'S ownership in its sovereign capacity of the tidelands and submerged lands within SAID SLOUGH and the SAID UPLANDS of MARSHLAND.

3. The SAID ORDINARY HIGH WATER MARK hereby agreed to as the parties' boundary is not intended as a meander line. It is intended as a fixed and certain boundary line according to the courses and distances set forth in the within description of the AGREED ORDINARY HIGH WATER MARK (EXHIBIT A) and shall not move as a result of accretion, avulsion, reliction, erosion or any other natural or unnatural causes or events.

4. MARSHLAND DEVELOPMENTS, INC., which took title as Marshland Development, Inc., HEREBY REMISES, RELEASES, AND QUITCLAIMS TO STATE any and all of the right, title, and interest in that certain real property in the County of Santa Clara, State of California, comprising the tidelands and submerged lands below and waterward (northerly) of said AGREED ORDINARY HIGH WATER MARK, and being more particularly described in EXHIBIT B hereto attached which is incorporated herein and made a part hereof by reference.

5. STATE HEREBY REMISES, RELEASES, AND QUITCLAIMS TO MARSHLAND DEVELOPMENTS, INC., any and all its right, title, and interest in SAID UPLANDS (bounded on the north by the agreed line of said AGREED ORDINARY HIGH WATER MARK). SAID UPLANDS are more particularly described in EXHIBIT C hereto and made a part hereof by reference.

6. MARSHLAND DEVELOPMENTS, INC., which took title as Marshland Development, Inc., HEREBY GRANTS TO STATE, a twenty-five-foot-wide (25 ft) easement for a public right-of-way more particularly described in EXHIBIT D hereto which is incorporated herein by reference, lying landward (southerly) to said AGREED ORDINARY HIGH WATER MARK, which is to be connected by another easement to a public street or way.

7. MARSHLAND DEVELOPMENTS, INC., which took title as Marshland

Development, Inc., HEREBY GRANTS TO STATE, an easement for a public right(s)-of-way more particularly described in EXHIBIT E hereto attached which is incorporated herein by reference thereto, the purpose of which is to connect the aforementioned 25-foot-wide easement to a public street, way or easement.

The right(s)-of-way herein granted may be relocated from time to time at Grantor's sole discretion to a different location to provide the same use whereupon all rights in the herein described right(s)-of-way shall be extinguished and terminated. Relocation shall occur when Grantor delivers to Grantee a deed conveying a non-exclusive relocatable right(s)-of-way to the new location, and Grantee shall thereupon deliver to Grantor a quitclaim of the former right(s)-of-way location.

8a. MARSHLAND agrees to remove rubble fill materials that have been placed on State tideland and submerged land, above the natural gradient of Guadalupe Slough. The fill material is that referenced in the San Francisco Bay Conservation and Development Commission Cease and Desist Order 5-79.

The location and extent of fill material to be removed is shown on the plan entitled "Grading Plan for Marshland Development Co. & Hoxie Enterprises Properties on Gold Street in Alviso, California" which is attached hereto as Exhibit F and made a part hereof by reference.

8b. MARSHLAND also agrees to remove said rubble fill described in Paragraph 8a, above, to an elevation of one foot below the grading lines shown on said Exhibit F and then to cover the remaining said rubble fill with a one-foot (minimum) thick covering of clean earthen fill free of debris.

MARSHLAND is authorized to remove sufficient amounts of said

clean earthen material from the adjacent State-owned Guadalupe Slough at no charge or cost for the purpose of capping the slopes for revegetation purposes. The material is to be placed on the 25-foot-wide public access area, described in said Exhibit D, and on the 4:1 slope and the 1:1 slope adjacent thereto as shown on said Exhibit F. Such material shall not be used on the uplands of Marshland except as provided above, unless the prior written permission of the State has been obtained. Necessary permits must be obtained from other public agencies having jurisdiction.

9. The STATE does not assume and shall have no liability or duty whatsoever to maintain or repair any presently existing or future levee affecting lands described in EXHIBIT C. Further, the STATE shall have no liability or responsibility whatever for any damages, injuries, causes of action or otherwise, resulting now or hereafter from any defect of the levee including but not limited to its condition, state of repair or maintenance, state of development, design height, weakness, or any other defect whatsoever; and MARSHLAND, its successors and assigns, hereby waives any claims, demands, or causes of action against STATE, therefor, and agrees to indemnify and hold and save STATE harmless from any such claims, demands, causes of action of MARSHLAND, its successors in interest, or any other person or entities.

10. Any and all unpaid taxes on the real property described in EXHIBIT B hereto shall be discharged by MARSHLAND as of the recording date of this agreement.

11. MARSHLAND, at its sole expense, shall obtain and deliver to State, a CLTA Standard Form Policy of Title Insurance insuring STATE, as the beneficiary of said policy, against loss or damage of up to $10,000 as to the rights, title, and interests to be confirmed in or conveyed to STATE

pursuant to the provisions of paragraphs 4, 6 and 7 above. Said policy shall include only those exceptions approved by STATE in its escrow instructions.

12. This agreement, after execution, shall become binding and effective upon its being duly recorded in the office of the County Recorder of Santa Clara County.

13. It is expressly understood by the parties hereto that the provisions set forth herein have been agreed upon for purposes of compromising and settling the respective disputed interests and boundary line of the parties hereto. This agreement shall not constitute any expression on the part of the STATE as to the extent or location of any other interest or boundary of the lands of the STATE OF CALIFORNIA except as may be expressly provided for herein. It is further agreed that this agreement shall in no way establish or otherwise affect the location of any other portion of the ORDINARY HIGH WATER MARK.

14. STATE will issue to MARSHLAND a General Lease in accordance with the State Lands Commission's rules and regulations for Marshland's existing facilities including two floating docks with ramps and four mooring piles, located in Guadalupe Slough and River, subject to the approval of other public agencies as required. At such time the facilities are to be enlarged, reconstructed or otherwise changed, MARSHLAND will apply for an amendment to the lease.

15. As used herein, whenever the context so requires, the neuter gender includes the masculine and feminine, and the singular includes the plural and vice versa. Defined terms are to have their defined meaning regardless the grammatical form, number or tense of such terms.

16. This agreement shall inure to the benefit of and shall be binding the heirs, executors, administrators, successors, and assigns of the

parties hereto.

17. All provisions of paragraphs 7, 8a, 8b, 9, 10, 11 and 14 of this agreement shall be severable, separate and distinct from the other provisions of this agreement. Should any party fail to comply with any or all of such provisions of said paragraphs 7, 8a, 8b, 9, 10, 11 and 14 after recordation of this agreement, such failure shall in no way affect the consideration supporting this agreement or the validity or binding nature thereof. Nothing herein, however, shall affect or diminish the rights of any party hereto at law or equity, or both, to enforce the provisions of paragraphs 7, 8a, 8b, 9, 10, 11 and 14, against any other party hereto.

IN WITNESS WHEREOF, each party hereto has caused this Agreement to be executed.

MARSHLAND DEVELOPMENTS, INC.

By: David B. Hoxie

David B. Hoxie

President

STATE OF CALIFORNIA
STATE LANDS COMMISSION

By:

Title: EXECUTIVE OFFICER

Approved:

JOHN K. VAN DE KAMP
ATTORNEY GENERAL

By:

Title: Assistant Attorney General

STATE OF CALIFORNIA)
COUNTY OF SANTA CLARA) ss.

On this 14th day of SEPT., in the year 1984, before me PATRICIA M. SWEENEY a Notary Public, State of California, duly commissioned and sworn, personally appeared DAVID B. HOXIE and known to me to be the President and known to me to be the of the corporation that executed the within instrument, and the officer who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its board of directors.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the City of San Jose, County of Santa Clara, the day and year in this certificate first above written.

OFFICIAL SEAL
PATRICIA M. SWEENEY
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires SEP 26, 1986

Patricia M. Sweeney
Notary Public, State of California
My Commission Expires 9-26-1986

STATE OF CALIFORNIA)
COUNTY OF SACRAMENTO) ss.

On October 19, 1984, before me, the undersigned, a Notary Public in and for said State, with principal office in Sacramento County personally appeared CLAIRE T. DEDRICK, known to me to be the EXECUTIVE OFFICER to the STATE LANDS COMMISSION, STATE OF CALIFORNIA, the Commission that execute the within instrument, known to me to be the person who executed the within Instrument on behalf of the Commission therein named, and acknowledged to me that such Commission executed the within Instrument pursuant to a resolution of its Commissioners unanimously adopted on August 26, 1982, at a regular meeting thereof.

Witness my hand and official seal:

JANE EVELYN SMITH
NOTARY PUBLIC—CALIFORNIA
COUNTY OF SACRAMENTO
My Commission expires Oct. 7, 1986

Jane Evelyn Smith
Notary Public in and for the
County of Sacramento,
State of California

IN APPROVAL WHEREOF, I, George Deukmejian, Governor of the State of California, have set my hand and caused the Seal of the State of California to be hereunto affixed pursuant to Section 6107 of the Public Resources Code of the State of California. Given under my hand at the City of Sacramento this, the 20th day of November, in the year of the Lord one thousand nine hundred and eighty-four.

George Deukmejian
GOVERNOR
STATE OF CALIFORNIA

Attest:

March Fong Eu
Secretary of State

By Marjorie Hershberger
Deputy Secretary of State

CERTIFICATE OF ACCEPTANCE AND
CONSENT TO RECORDING OF DEED
TO THE STATE OF CALIFORNIA

K850 PAGE 1688

This is to certify that the interest in real property conveyed by this instrument from MARSHLAND DEVELOPMENTS, INC., to the STATE LANDS COMMISSION, a governmental agency, is hereby accepted effective upon recording by the undersigned officer or agent on behalf of the State Lands Commission pursuant to authority conferred by the State Lands Commission on AUG 26 1982, and the grantee consents to recordation thereof by its duly authorized officer.

STATE LANDS COMMISSION

By Claire T. Dedrick
EXECUTIVE OFFICER

STATE OF CALIFORNIA)
COUNTY OF SACRAMENTO) ss.

On this 19th day of October, 1984, before me, the undersigned, a Notary Public in and for the State of California, with principal office in the County of Sacramento, personally appeared CLAIRE T. DEDRICK, known to me to be the EXECUTIVE OFFICER of the STATE LANDS COMMISSION, STATE OF CALIFORNIA, the Commission that executed the within instrument, on behalf of the Commission therein named, and acknowledged to me that such Commission executed the within instrument pursuant to action taken at a regular meeting of the State Lands Commission.

WITNESS my hand and official seal.

Jane Evelyn Smith
JANE EVELYN SMITH
Notary Public in and for the
STATE OF CALIFORNIA

JANE EVELYN SMITH
NOTARY PUBLIC—CALIFORNIA
COUNTY OF SACRAMENTO
My Commission expires Oct. 1, 1986

ine located at Alviso, in the City of San Jose, County of Santa Clara, te of California, described as follows:

COMMENCING at the northwesterly corner of Parcel 1 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of commencement being the northwesterly corner of that parcel described in the corporation grant deed from Bay Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County; thence from said point of commencement along the northerly line of said Parcel 1, S 82° 19' 11" E, 68.50 feet; thence leaving said northerly line, the following ten (10) courses:

1. S 54° 14' 26" E, 27.00 feet;
2. S 70° 37' 53" E, 49.81 feet;
3. S 73° 22' 08" E, 59.48 feet;
4. S 81° 34' 36" E, 75.31 feet;
5. S 82° 57' 34" E, 98.24 feet;
6. S 79° 22' 52" E, 70.70 feet;
7. S 74° 38' 33" E, 32.14 feet;
8. S 70° 24' 43" E, 64.21 feet;
9. S 73° 04' 25" E, 137.50 feet; and
10. S 85° 09' 11" E, 89.45 feet to a point in the easterly line of Parcel 3 as shown on the above mentioned map, said point being distant 21.00 feet southerly along said easterly line from the northeasterly corner of said Parcel 3, and the end of the herein described line.

ings and distances in the above description are based on the California dinate System, Zone 3. On that basis, the bearing S 68° 49' 28" E of line having as its easterly terminus Station SBDA3, as shown on that rd of survey map filed September 24, 1974, in Book 346, Page 34, of in the office of the Recorder of Santa Clara County, was taken as the s of bearings for this description. The bearings as shown on the record irvey map filed in Book 406, Page 37, of Maps were rotated clockwise igh an angle of 0° 56' 19" for this description.

END DESCRIPTION

of that real property situate in the City of San Jose, County of Santa a, State of California, described as follows:

COMMENCING at the northwesterly corner of Parcel 1 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of commencement being the northwesterly corner of that parcel described in the corporation grant deed from Bay Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County; thence from said point of commencement along the northerly line of said Parcel 1, S 82° 19' 11" E, 68.50 feet; thence leaving said line the following ten (10) courses:

1. S 54° 14' 26" E, 27.00 feet;
2. S 70° 37' 53" E, 49.81 feet;
3. S 73° 22' 08" E, 59.48 feet;
4. S 81° 34' 36" E, 75.31 feet;
5. S 82° 57' 34" E, 98.24 feet;
6. S 79° 22' 52" E, 70.70 feet;
7. S 74° 38' 33" E, 32.14 feet;
8. S 70° 24' 43" E, 64.21 feet;
9. S 73° 04' 25" E, 137.50 feet; and
10. S 85° 09' 11" E, 89.45 feet to a point in the easterly line of Parcel 3 as shown on the above mentioned map, said point being distant 21.00 feet southerly along said easterly line from the northeasterly corner of said Parcel 3; thence along said line, N 0° 02' 32" E, 21.00 feet to said northeasterly corner of Parcel 3; thence continuing, N 0° 02' 32" E to the centerline of Guadalupe River as said river existed in its last natural condition; thence westerly, northwesterly, and northerly along the centerline of said Guadalupe River to a point which bears East from a station in the easterly boundary of Parcel SC-8 in the settlement agreement between the State of California and the Leslie Salt Co., a Delaware Corporation, recorded February 1, 1968, in Book 8013, Page 394, of Official Records of said County, said station bears N 8° 10' 41" E, 198 feet from station C.S. 3 on the easterly boundary of Parcel SC-8; thence leaving the centerline of Guadalupe River, West to said station on the easterly boundary of Parcel SC-8; thence along the easterly boundary of Parcel SC-8, S 8° 10' 41" W, 198 feet to station C.S. 3; thence S 24° 33' 41" E, 76.56 feet to the northwesterly corner of the hereinabove mentioned Parcel 1 and the point of commencement.

ngs and distances in the above description are based on the California inate System, Zone 3. On that basis, the bearing S 68° 49' 28" E of ine having as its easterly terminus Station SBDA3, as shown on that d of survey map filed September 24, 1974, in Book 346, Page 34, of Maps e office of the Recorder of Santa Clara County, was taken as the basis arings for this description. The bearings as shown on the record of y map filed in Book 406, Page 37, of Maps were rotated clockwise gh an angle of 0° 56' 19" for this description.

END DESCRIPTION

W 22492

K850PAGE1691

EXHIBIT "C"

at portion of the Rancho Ulistac, in the City of San Jose, County of nta Clara, State of California, described as follows:

COMMENCING at the northwesterly corner of Parcel 1 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of commencement being the northwesterly corner of that parcel described in the corporation grant deed from Bay Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County; thence from said point of commencement along the northerly line of said Parcel 1, S 82° 19' 11" E, 68.50 feet; thence leaving said line, the following ten (10) courses:

1. S 54° 14' 26" E, 27.00 feet;
2. S 70° 37' 53" E, 49.81 feet;
3. S 73° 22' 08" E, 59.48 feet;
4. S 81° 34' 36" E, 75.31 feet;
5. S 82° 57' 34" E, 98.24 feet;
6. S 79° 22' 52" E, 70.70 feet;
7. S 74° 38' 33" E, 32.14 feet;
8. S 70° 24' 43" E, 64.21 feet;
9. S 73° 04' 25" E, 137.50 feet; and
10. S 85° 09' 11" E, 89.45 feet to a point in the easterly line of Parcel 3 as shown on the above mentioned map, said point being distant 21.00 feet southerly along said easterly line from the northeasterly corner of said Parcel 3; thence along said easterly line S 0° 02' 32" W, 41.00 feet, to the northwesterly corner of Parcel 5 as shown on the above-mentioned map; thence along the northerly line of Parcel 5, S 73° 19' 36" E, 46.94 feet; thence along the easterly line of said Parcel 5, S 2° 17' 38" E, 89.22 feet; thence S 7° 01' 53" E, 107.08 feet to the beginning of a tangent curve concave easterly; thence southerly 38.40 feet along said curve with a radius of 1,949.91 feet, through a central angle of 1° 07' 42" to the southeasterly corner of said Parcel 5; thence on a non-tangent line along the southerly line of said Parcel 5, N 80° 03' 41" W, 55.78 feet to the northeasterly corner of Parcel 2, as shown on the above mentioned map, said corner being on a non-tangent curve concave easterly, a radial to said corner bears S 82° 41' 49" W; thence southerly along the easterly line of said Parcel 2, 127.78 feet along said curve with a radius of 1457.00 feet, through a central angle of 5° 01' 29" to the southeasterly corner of said Parcel 2; thence along the southerly line of said Parcel 2, on a non-tangent line, S 61° 25' 51" W, 132.66 feet; thence N 89° 18' 22" W, 150.07 feet; thence N 50° 40' 38" W, 461.72 feet to the southwesterly corner of said Parcel 1, as shown on the above mentioned map; thence along the westerly line of said Parcel 1, N 24° 33' 41" W, 379.50 feet to the point of commencement.

AUG 10 1982

EXHIBIT "C"
(continued)

Bearings and distances in the above description are based on the California Coordinate System, Zone 3. On that basis, the bearing S 68° 49' 28" E of the line having as its easterly terminus Station SBDA3, as shown on that record of survey map filed September 24, 1974, in Book 346, Page 34, of Maps in the office of the Recorder of Santa Clara County, was taken as the basis of bearings for this description. The bearings as shown on the record of survey map filed in Book 406, Page 37, of Maps were rotated clockwise through an angle of 0° 56' 19" for this description.

END DESCRIPTION

EXHIBIT "D"

at portion of the Rancho Ulistac, in the City of San Jose, County of Santa ara, State of California, described as follows:

A strip of land 25 feet in width, the northerly line of said strip being described as follows:
COMMENCING at the northwesterly corner of Parcel 1 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of commencement being the northwesterly corner of that parcel described in the corporation grant deed from Bay Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County; thence from said point of commencement along the northerly line of said Parcel 1, S 82° 19' 11" E, 68.50 feet; thence, leaving said line, the following ten (10) courses:

1. S 54° 14' 26" E, 27.00 feet;
2. S 70° 37' 53" E, 49.81 feet;
3. S 73° 22' 08" E, 59.48 feet;
4. S 81° 34' 36" E, 75.31 feet;
5. S 82° 57' 34" E, 98.24 feet;
6. S 79° 22' 52" E, 70.70 feet;
7. S 74° 38' 33" E, 32.14 feet;
8. S 70° 24' 43" E, 64.21 feet;
9. S 73° 04' 25" E, 137.50 feet; and
10. S 85° 09' 11" E, 89.45 feet to a point in the easterly line of Parcel 3 as shown on the above mentioned map, said point being distant 21.00 feet southerly along said easterly line from the northeasterly corner of said Parcel 3, and the end of said northerly line.

The southerly line of said strip to be shortened or lengthened to terminate at the easterly and westerly lines of the lands described in the above mentioned deed from Bay Shell Company to Marshland Development, Inc.

ıgs and distances in the above description are based on the California inate System, Zone 3. On that basis, the bearing S 68° 49' 28" E of ne having as its easterly terminus Station SBDA3, as shown on that of survey map filed September 24, 1974, in Book 346, Page 34, of Maps office of the Recorder of Santa Clara County, was taken as the basis ıings for this description. The bearings as shown on the record of map filed in Book 406, Page 37, of Maps were rotated clockwise through le of 0° 56' 19" for this description.

END DESCRIPTION

ı 1982

EXHIBIT "E"

Parcel 1

That portion of the Rancho Ulistac, in the City of San Jose, County of Santa Clara, State of California, described as follows:

BEGINNING at the most easterly corner of Parcel 2 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of beginning being the southeasterly corner of that parcel described in the corporation grant deed from Bay Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County; thence from said point of beginning, along the southerly line of said Parcel 2, S 61° 25' 51" W, 32.50 feet; thence leaving said southerly line, N 9° 54' 57" W, 142.75 feet to the beginning of a tangent curve concave to the southeast; thence northeasterly 53.07 feet along said curve with a radius of 28.00 feet, through a central angle of 108° 35' 33"; thence S 81° 19' 24" E, 13.54 feet to the beginning of a tangent curve concave to the northwest; thence northeasterly 26.22 feet along said curve with a radius of 14.00 feet, through a central angle of 107° 18' 18"; thence N 8° 37' 42" W, 65.45 feet; thence N 3° 37' 41" W, 47.08 feet; thence S 81° 20' 04" E, 19.19 feet to a point in the easterly line of Parcel 5 as shown on the above mentioned map, said point being distant 69.50 feet southerly along said easterly line from the northerly terminus of the course, on said map, having a bearing of N 3° 13' 57" W; thence along said easterly line, S 2° 17' 38" E, 19.72 feet; thence S 7° 01' 53" E, 107.08 feet to the beginning of a tangent curve concave easterly; thence southerly 38.40 feet along said curve with a radius of 1,949.91 feet, through a central angle of 1° 07' 42" to the southeasterly corner of said Parcel 5; thence on a non-tangent line along the southerly line of said parcel 5, N 80° 03' 41" W, 55.78 feet to the northeasterly corner of Parcel 2, as shown on the above mentioned map, said corner being on a non-tangent curve concave easterly, a radial to said corner bears S 82° 41' 49" W; thence southerly along the easterly line of said Parcel 2, 127.78 feet along said curve with a radius of 1457.00 feet, through a central angle of 5° 01' 29" to the point of beginning.

:el 2

portion of the Rancho Ulistac, in the City of San Jose, County of Santa a, State of California, described as follows:

COMMENCING at the northeasterly corner of Parcel 3 as shown on that record of survey map filed October 28, 1977, in Book 406, Page 37, of Maps in the office of the Recorder of said County, said point of commencement being the northwesterly corner of that parcel described in the corporation grant deed from Bay

EXHIBIT "E"
(continued)

Shell Company, a Corporation, to Marshland Development, Inc., a California Corporation, dated October 12, 1979, recorded October 16, 1979, in Book E869, Page 317, of Official Records of said County: thence from said point of commencement, along the easterly line of said Parcel 3, S 0° 02' 32" W, 46.09 feet to the POINT OF BEGINNING; thence continuing along said easterly line, S 0° 02' 32" W, 15.91 feet to the northwesterly corner of Parcel 5 as shown on the above mentioned map; thence along the northerly line of said Parcel 5, S 73° 19' 36" E, 46.94 feet to the northeasterly corner of Parcel 5; thence along the easterly line of Parcel 5, S 2° 17' 38" E, 69.50 feet; thence, leaving said easterly line, N 81° 20' 04" W, 19.19 feet; thence N 70° 57' 12" W, 15.34 feet; thence N 49° 03' 43" W, 29.77 feet; thence N 34° 38' 20" W, 57.14 feet; thence N 47° 27' 56" W, 21.04 feet to the beginning of a tangent curve concave to the southwest; thence northwesterly 29.05 feet along said curve with a radius of 65.00 feet, through a central angle of 25° 36' 32"; thence N 73° 04' 27" W, 13.21 feet; thence S 85° 09' 07" E, 94.20 feet to the point of beginning.

Bearings and distances in the above description are based on the California Coordinate System, Zone 3. On that basis, the bearing S 68° 49' 28" E of the line having as its easterly terminus Station SBDA3, as shown on that record of survey map filed September 24, 1974, in Book 346, Page 34, of Maps in the office of the Recorder of Santa Clara County, was taken as the basis of bearings for this description. The bearings as shown on the record of survey map filed in Book 406, Page 37, of Maps were rotated clockwise through an angle of 0° 56' 19" for this description.

5 1664

W 22492

K850PAGE1696