City of Santa Barbara
California

III.

PLANNING COMMISSION
STAFF REPORT

REPORT DATE: May 10, 2012

AGENDA DATE: May 17, 2012

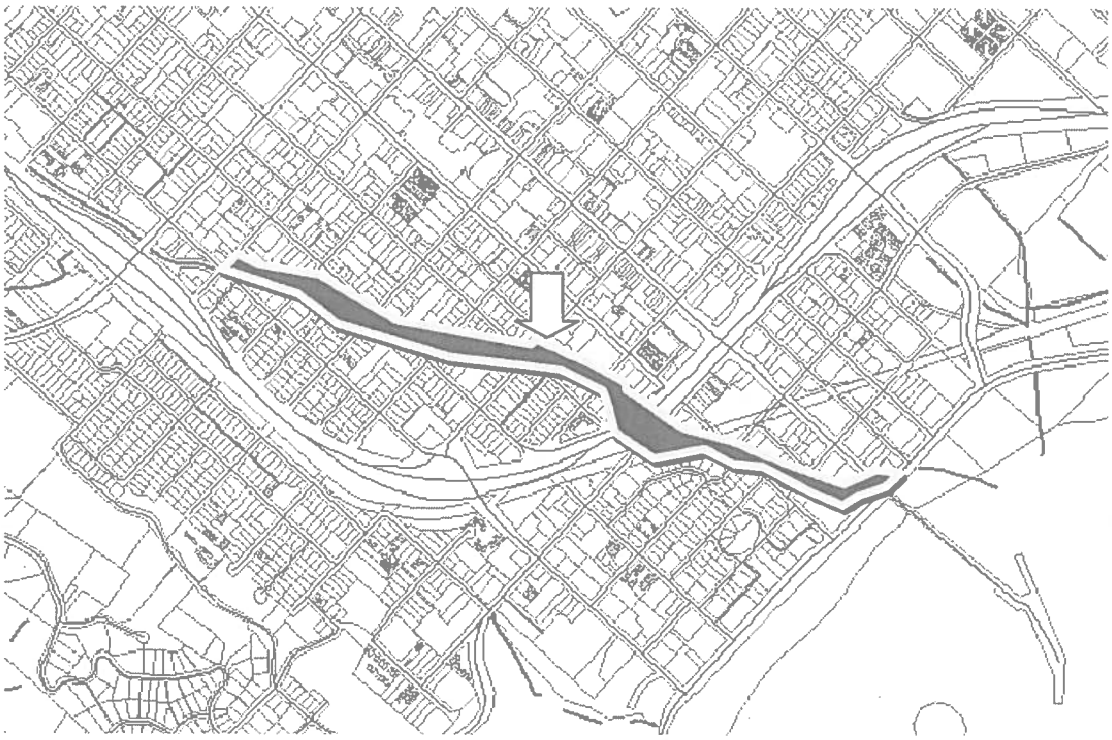
PROJECT ADDRESS: Mission Creek between Cabrillo Boulevard and Cannon Perdido (MST2008-00360/CDP2008-00012)
Lower Mission Creek Flood Control Project

TO: Planning Commission

FROM: Planning Division, (805) 564-5470
Danny Kato, Senior Planner DK
Michael Berman, Project Planner/Environmental Analyst MB

I. PROJECT DESCRIPTION

The purpose of this discussion meeting is to provide the Planning Commission (PC) with an update on the status of the previously approved Lower Mission Creek Flood Control Project (LMCFCP). The update comes from Engineering Division of Public Works for the project which is currently under construction. The project consists of widening of the Mission Creek channel, construction of a bypass culvert in the vicinity of the Railroad Depot, and the replacement of five bridges with new, wider bridges to increase hydraulic capacity on Mission Creek from Canon Perdido to Cabrillo Boulevard.



VICINITY MAP

II. BACKGROUND

City Council approved construction of the entire LMCFCP from Canon Perdido to State Street on December 5, 2001. The US Army Corps of Engineers (Corps) obtained a Federal Coastal Consistency Determination (Federal CCD) from the California Coastal Commission (Coastal Commission) that would have allowed them, as a Federal Agency, to construct the project. However, Corps funding never materialized so the Corps did not proceed with construction. The Federal CCD included conditions of approval that required studies that resulted in changes to or augmentation of the original project design.

The City and County decided to jointly implement the project (with Corps technical support). Because the City and County are subject to the California Coastal Act, unlike the federal government, the City and County were required to obtain a Coastal Development Permit (CDP) for the portion of the project that is south of Highway 101. Coastal jurisdiction of Mission Creek is split between the City (everything north of the estuary) and the Coastal Commission (the estuary); therefore, approvals by both the City and the Coastal Commission were required. As part of the Cabrillo Bridge replacement project, the PC recommended approval to the Coastal Commission for the segment of the creek between State Street and Cabrillo Boulevard on July 12, 2007. The Coastal Commission approved the CDP on April 9, 2009. The Planning Commission approved the portions of the Mission Creek project in the appealable jurisdiction on September 18, 2008. On April 9, 2009 the Coastal Commission approved a CDP for the creek channel segment from Highway 101 to State Street.

The LMCFCP was approved at the concept project level, as it is large and complex, and all of the project details were not yet finalized. As can be expected with any complex project, the project has been evolving as more information is available and more design details are developed. Changes have been made to the original project in response to agency approval (particularly the Coastal Commission), permit requirements from various State and Federal Agencies, and engineering cost analyses. Funding sources originally contemplated have not materialized, and alternative funding strategies have been developed that have required portions of the project to be pursued as funding becomes available, and out of the sequence originally contemplated when the project was approved.

Engineering staff in the Public Works Department has been working to describe the resulting changes in the project to City decision makers. Engineering staff has submitted a memorandum that describes the changes that have occurred in the project. The memorandum is attached to this staff report.

III. PROJECT CHANGES

a. Sequence of Construction

The original Corps funded project was to begin at the ocean and work upstream. Since the Corps funding never materialized, the City and County in partnership, using alternative funding sources, have constructed the channel segment between State Street and the pedestrian bridge at the Harbor View Inn, bypass culvert segment beneath the railroad tracks, Haley/De la Vina bridge and Ortega Street bridge. These project elements were constructed as funding became available from County Flood Control (for the channel) and CALTRANS (for the bridges). Since

the replacement bridges and new channel were wider than the adjacent channel a transition between these elements is necessary. Where bridge replacement occurs the creek bottom elevation sometimes could not be changed to the planned elevation, for hydrological reasons, until the adjacent channel improvements are constructed. Temporary adjustment in the creek width and creek bottom configuration and transitions to the existing creek banks were therefore required.

b. Distance Between Creek Banks

The Corps determined, based on modeling at the time the Final EIS/EIR was prepared, that the channel widths then proposed could accommodate flows of 3,400 cubic feet per second (cfs). Subsequently, a more recent hydrology study determined that the 3,400 cfs could be accommodated in a narrower channel. Since the narrower channel would be less expensive to construct, reaches of the creek were reduced in width when compared to the creek width described in the LMCFCP Final EIS/EIR.

c. Fish Facilities/Creek Bottom Configuration

A Coastal Commission condition of approval required convening a group of experts to review the proposed channel design north of Highway 101 and make recommendations about features of the project designed to accommodate fish. These recommendations were incorporated into the project. Instead of grading the creek bottom to have a low flow channel as originally proposed, rock weirs would be constructed periodically on the creek bottom. These weirs would control erosion, create fish pools, and allow the creek to make its own low flow path naturally.

The Tidewater Goby Management Plan was also required by the Coastal Commission. That plan provided that the fish features (fish ledges, fish refuges, and fish baffles) proposed in the Final EIS/EIR for the Mission Creek estuary to be installed. Cobble on the creek bottom would be replaced with sand that is suitable for goby reproduction. Dewatering and fish rescue plans were refined. These recommendations were also incorporated into the project.

The Coastal Commission also required a restoration plan for the lagoon south of Cabrillo Boulevard and landscape plans for private land located adjacent to Mission Creek. These plans were prepared and reviewed by the Coastal Commission and included in the project.

Other recommendations incorporated into the project include:

- Relocating fish baffles toward the center of the creek instead of on the edge, using boulder clusters between fish pools.
- Not using the fish ledges north of Highway 101.
- Reducing the area of rock energy dissipaters at De La Guerra and Gutierrez Bridges.
- Implementing an adaptive management plan for proposed creek improvements.

d. Creek Bank Configuration North of Highway 101

The original project had proposed a vertical wall at the base of the creek bank with a vegetated rock protected slope above, in the area north of Highway 101. The project now includes construction of creek banks that have a vertical wall at the top of the creek bank with a rock protected vegetated slope below at the edge of the creek bottom.

e. West Downtown Historic Study

The Final EIS/EIR included a mitigation measure that required a study of a portion of the West Downtown area to see if the area qualifies as a potential historic district. The study identified two potential historic districts. The study has been prepared and is being incorporated into the city historic resources data base and is in the process of being evaluated. Due to workload issues the evaluation of these historic districts will take some time.

IV. Conclusion

As this project progresses through the design review and construction process staff will continue to monitor it for consistency with the CDP and EIR/EIS. A comprehensive Mitigation Monitoring Program has also been developed that should be used to coordinate responsibilities of the various agencies under taking the project. Staff will continue to keep the Planning Commission informed of the progress of this important community project with periodic status reports.

Exhibit A: Public Works Memorandum, dated May 2, 2012
(Memorandum attachments can be viewed online in the electronic version of this Staff Report at www.SantaBarbaraCA.gov/PC. Printed copies are available upon request.

City of Santa Barbara
Public Works Department

Interoffice Memorandum

DATE: May 2, 2012

TO: Bettie Weiss, City Planner
Michael Berman, Environmental Analyst/Project Planner
Planning Division, Community Development

FROM: Pat Kelly, Assistant Public Works Director/City Engineer
Engineering Division, Public Works Department

SUBJECT: Lower Mission Creek Flood Control Project Design Conformance Update

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Preamble

Per the Planning Division's request, the following is a Lower Mission Creek Flood Control Project (Project) Design Conformance Update discussing the Project's activity and status.

Executive Summary

The Project's Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was certified by the Planning Commission in 2001 and anticipated a two-year Project construction schedule. When the anticipated federal funding was indefinitely delayed, the City of Santa Barbara (City) and the County Flood Control District (District) obtained the appropriate permits and initiated construction on portions of the Project in an effort to reduce construction cost inflation. Since the Project is now being built in increments over several years, instead of the originally anticipated two years, this memo is intended to show how the changes made to the Project still conform to the 2000 EIS/EIR and subsequent 2008 local Coastal Development Permit (CDP).

Project Location and Purpose

The Mission Creek Watershed, a total area of 11.38 square miles, drains off the southern slopes of the Santa Ynez Mountains and the urban area of Santa Barbara. Mission Creek extends through the City and unincorporated areas in the County of Santa Barbara (County), with the lower portions of the Creek flowing through the urbanized area of downtown Santa Barbara. The Project has been a long-term joint effort between the United States Army Corps of Engineers (Corps), the District, and the City, since the 1960s and addresses the last 1.3 miles of Lower Mission Creek (from just downstream of Canon Perdido Street to the Cabrillo Boulevard Bridge, just before the Creek enters the Pacific Ocean; see Attachment 1).

Currently, Mission Creek is estimated to accommodate a five to eight year storm event, or approximately 1,050-1,500 cubic feet per second (cfs), without overflowing the channel banks. After all Project (Alternative 12 in the EIS/EIR) improvements are completed, the channel capacity will be increased to carry 3,400 cfs, or an estimated 20-year plus storm event. In addition to improving water conveyance, the final channel improvements will enhance aquatic and riparian habitats. Improvements include:

- the replacement of four bridges along the Project reach (Haley/De La Vina Bridge, Ortega Bridge, Cota Bridge, and Mason Bridge),

- installation of a new culvert bypassing the Oxbow Railroad Historic Channel (Oxbow) below Highway 101, with the Oxbow being left in place as a low-flow channel (see Attachment 1),
- planting of native riparian species along structurally stabilized banks and the creation of additional riparian habitat areas,
- reconstruction of creek banks using either a vertical wall or a combination vertical wall and structurally stabilized bank,
- maintaining the existing natural stream bottom,
- reverting the concrete lined stream bottom section to natural conditions (except through the historic sandstone wall channel at the Railroad Depot Oxbow), and
- installing fish habitat improvements.

Project Status

The Project EIS/EIR was completed by the Corps in 2000, and alternative 12, the environmentally preferred alternative, was approved by the City Council in 2001. As a federal project, the Corps initially received a conditional Coastal Consistency Determination (CCD) in 2001 and then the final in 2006 after added studies were completed. Due to the inability of the Corps to obtain federal funding to begin construction, the City and District acquired a Coastal Development Permit (CDP) in 2008, which allows the City and District to move forward with the project using local funds in increments as grants and other funding becomes available. Since approval of this CDP, the City and District have worked together to construct various increments of the Project (see Attachment 2). In addition, the Corps has prepared three report updates related to the Project's NEPA documentation concerning biological resources, air quality, and cultural resources (see Attachment 3, Attachment 4, & Attachment 5).

Channel

The first increment of the Project construction was completed in late January 2009 when the District arranged for the Union Pacific Railroad (UPRR) to construct the Project's double box culvert under their railroad tracks at the Railroad Depot. Since then, the Haley/De la Vina Bridge and Ortega Bridge have been constructed by the City using federal bridge grants. Reach 1A – Phase 1 (approximately 230' of channel just north of State Street) has been constructed by the District using State Proposition 50 funding (see Attachment 1). All construction to date has been addressed in project specific Mitigation Monitoring and Reporting programs (see Attachment 6).

Channel Reaches 1A – Phase 2 (just south of Mason St) and 2B (the culvert thru the Railroad Depot) have been moved into the final design phase (90% engineering level drawings) by the District. The District plans to move forward with construction of Reach 2B – Phase 1 in Summer 2012. Phase 2 and Reach 1B (between Mason St and Chapala St) are scheduled for construction in Summer 2013. The remaining channel reaches are at a "60%" preliminary design level (see Attachment 7), accompanied by a new hydraulic model that was prepared by Tetra Tech working for the Corps. The Corps cannot complete the final design drawings on these remaining reaches until more funding is obtained.

Bridges

The two remaining bridge replacements at Mason and Cota Streets are currently in Preliminary Design. Mason Bridge is being reviewed by the Historic Landmarks Commission and is scheduled to move forward with Final Design this spring. No new environmental document is needed for Mason

Bridge. Cota Bridge is being scheduled for its first Architectural Board of Review meeting in April 2012. There was an EIS/EIR addendum prepared for Cota Bridge.

Through the Federal Highway Bridge Program, the City has been successful in obtaining funding to replace four other structurally deficient bridges along Lower Mission Creek (Cabrillo Bridge, Chapala/Yanonali Bridge, Gutierrez Bridge, and De la Guerra Bridge). Each of these bridges will require their own environmental documentation, as described in the following paragraphs.

Since Cabrillo Bridge was not planned to be replaced as part of the original Project in the EIS/EIR, a Mitigated Negative Declaration (MND) was prepared and adopted by the Planning Commission. The California Coastal Commission (CCC), who has permit jurisdiction over this bridge, relied on the City's MND for their environmental review. The CCC also issued a CDP on April 9, 2008. Although there are currently final design drawings for this location, the bridge review has been tied up in the right of way process due to continued negotiations with an adjacent property owner. Construction of Cabrillo Bridge is targeted to begin in May or June 2013.

Similarly, since Chapala/Yanonali Bridge was not planned to be replaced as part of the original Project in the EIS/EIR, staff took the bridge to the City's Planning Commission in February 2012 where the Coastal Development Permit was approved and the Mitigated Negative Declaration was adopted.

Gutierrez Bridge and De La Guerra Bridge are within the original Project limits, however they were not planned to be replaced as part of the original Project. Therefore, these bridges will require separate environmental documentation and approvals. Currently, these bridges are just beginning the initial design review process which includes Caltrans detailing what environmental reports are necessary. Depending on the potential impacts of these projects, Planning Commission review and approval may be required. Design review and other agency approvals would be required.

Changes

Since the completion of the EIS/EIR in September 2000, there have been some changes to the Project described in the 2000 EIS/EIR, many of which were a result of the 2006 Federal Coastal Consistency Determination (CCD),with the Corps as the applicant, and the 2009 CCC CDP, with the City and District as the applicants. Changes to the Project are not considered to be substantial; however, there have been refinements. The following sections describe the changes incorporated over the past eleven years.

1. ***Additions from Coastal Consistency Determination and Coastal Development Permit***

   Both the CCD and Coastal Development Review were necessary because the Project is located both within and inland of the coastal zone, and because the Commission does not have an administrative procedure for converting a Commission concurrence with a federal agency's Consistency Determination into a concurrence with a Consistency Certification authorizing a local agency to conduct the work. The following sections describe the modifications made to the Project as a result of these reviews.

   a. Tidewater Goby Studies and Management Plan

      The 2001 CCD included a condition addressing impacts of the Project on the endangered Tidewater goby, which occurs in the estuarine reach of the creek. The condition requires that the Corps and local sponsors consult with Tidewater goby experts to develop a plan to

minimize Project-specific and cumulative impacts to the goby through design elements and protective measures to be implemented during construction, and feasible short-term and long-term recommendations.

In response to the Coastal Commission requirement, the Tidewater Goby Management Plan was prepared in April of 2005. The plan was accepted by the Coastal Commission and includes fifteen action items to be incorporated during the design, construction, and post-construction phases of the Project. The three action items for the design phase are:

- Management Action 1 – Fish Features: The Project will incorporate the proposed fish ledges, fish refugia, and fish baffles, as described in the Final EIS/EIR and Biological Assessment for the Project.
- Management Action 2 – Substrate Modification: Existing cobble substrate from the channel will be removed to the extent feasible, and replaced with sandy substrate to provide a more natural channel bottom that may be used by gobies for spawning.
- Management Action 3 – Dewatering and Fish Rescue Plans: The preliminary and final engineering plans will include plans, details, and specifications on the placement/removal of cofferdams, dewatering operations, and fish capture and relocation procedures.

b. Lagoon Management Plan

In order to meet an additional condition of the CCC 2009 CDP, the Habitat Restoration, Enhancement, Monitoring, and Management Program (HREM&MP) was developed in conjunction with the Tidewater Goby Management Plan and accepted by the Coastal Commission. Please note that the Cabrillo Bridge Replacement Project (CDP 4-07-134) also had the same condition and provides for some of the planned improvements in the HREM&MP that are required of the Project. Because the conditions are related for both projects and the Project's lagoon restoration will be constructed at the same time as the Cabrillo Bridge Replacement's lagoon restoration, the Habitat Restoration, Enhancement, Monitoring and Management Program document was combined for both projects to eliminate any confusion for the contractor/biologists during the restoration effort and monitoring (see Attachment 8). The goals of the restoration are to establish native vegetation along the reconstructed banks of the lagoon south of Cabrillo Bridge, and to enhance vegetation along the creek banks between State Street and Cabrillo Boulevard. The Project's lagoon plan and Cabrillo Bridge's lagoon plan contains the necessary procedures for establishment of self-sustaining native vegetation that is appropriate to the site, aesthetically pleasing, and free of invasive non-native species.

c. Channel Design Recommendations

As part of the conditions of the conditional 2001 Coastal Zone Federal Consistency Determination (CD-117-99), the City, in concurrence with the Corps, convened a working group to address some channel design issues. The group included technical experts from the City, Corps, and District, as well as channel design and river geomorphology experts. As a result of the Channel Design working group's meeting, the Channel Design Recommendations (CDR) report was finalized in June 2005. Please note that this study does not consider the channel from Highway 101 to the ocean. CCC's approval of the 2006 final CCD, incorporated these recommendations.

The following are the CDR recommendations as well as their impacts to the Project:

- Recommendation No. 1 – Establish Pools: Pools should be established at the locations of the existing pools at the time of construction by excavating the channel below the design elevation for the channel bottom. To maintain these pools, a cross-vane rock weir should be installed at the head of each new pool. These weirs are grade control structures that narrow the width of the base flow channel and create scour pools downstream. The cross-vane weirs would reduce bank erosion, create a stable width-depth ratio, maintain channel capacity, and maintain sediment transport capacity. They decrease near-bank shear stress and increase energy in the center of the channel where they form and maintain pools. The cross-vane is used to improve fish habitat because it creates pools for holding and refuge, develops feeding zones by creating flow separation areas along the margins of the weir, and creates potential spawning habitat in the tail-out portion of the pool. (This has already been implemented for the Haley/De la Vina Bridge and Ortega Bridge, and is planned for all other construction north of Highway 101).
- Recommendation No. 2 – Initialize the Formation of a Low Flow Channel: The channel between pools should be graded with a slight cross slope that reflects the location of the existing thalweg, or natural channel direction of the watercourse, prior to construction. This action will enhance the formation of the low flow channel within the larger bankfull channel, or the point at which flooding begins. A low flow channel should not be graded, as it will form naturally after the first winter with average or above average runoff. Any attempt to create and maintain a specific low flow channel would likely be a futile effort. While this recommendation is not currently shown on the 60% Plans, the City and District will be following up with the Corps to ensure that this is incorporated into the Final Design Plans. (This has already been implemented by the City for the Haley/De la Vina Bridge and Ortega Bridge, and is planned for all other construction north of Highway 101).
- Recommendation No. 3 – Relocate Fish Baffles to Center of Channel: It is recommended that the rock be reconfigured as more numerous "rock clusters" in the center of the channel, placed at 100-150 foot spacing between pools. Placement of the rocks in the center of the bankful channel at the end of construction would maximize the potential for the rocks to occur in year-round flows, in contrast to the previously proposed locations at the edges of the channel bottom.
- Recommendation No. 4 – Remove Fish Ledges: It was concluded that the fish ledges that were part of the approved project in the EIS/EIR would not be effective and should be removed from the design. The ledges could become stranded over time if the low flow channel migrates to the other side of the larger channel, or the channel becomes lower. In these cases, the fish ledges would no longer be effective. The establishment of pools using the rock weirs would provide a greater amount of pool habitat that would be self-sustaining. Riparian and wetland plants are likely to persist or regularly colonize the channel bottom along the outside of the rock weir "arms" that extend downstream and form the pool, thereby creating cover for fish.

- Recommendation No. 5 – Reduce or Modify Rock Energy Dissipaters at Two Bridges: The rock energy dissipaters previously approved at the existing De La Guerra Bridge and Gutierrez Bridge have been removed from the Project. It is now planned that these bridges will be replaced as part of separate federally funded bridge replacement program projects due to structural deficiencies. Currently these two bridges are in conceptual design and these designs are anticipated to incorporate the larger future creek width, which will allow for further minimization of this feature. This change was a result of concerns about the overall lengths of the originally proposed rock lining at these two bridges, and the potential for this rock channel bottom to become a fish migration barrier. New bridge construction will provide an opportunity to lengthen the bridge which is anticipated to create new creek rehabilitation areas.
- Recommendation No. 6 – Implement Adaptive Management for Design Modifications: If, after several winters, a persistent low flow channel and series of pools are not forming or exhibiting persistence, then the City and the Corps, in consultation with the National Oceanic and Atmospheric Administration Fisheries, the California Department of Fish and Game, and members of the Channel Design Working Group, would review the performance of the proposed channel enhancements and consider modifications to the design, including but not limited to adding or removing weirs, modifying the size of in-stream boulders, and placement of additional boulders to encourage formation of a more stable and deeper low flow channel and series of pools.

d. Landscape Plan with Habitat Enhancement and Revegetation Monitoring Program

As part of the Corps' 2006 California Coastal Commission (CCC) Costal Development Permit (CDP) for the Project, a restoration plan and specifications for a monitoring plan for properties adjacent to Mission Creek was required. That plan would include a detailed monitoring plan for the native landscaping to be provided outside the creek bank edges, primarily in habitat expansion areas and on the sloped banks constructed as part of the Project. The responsible entity (District for the creek channel reaches, City for the bridges) would maintain the landscaping, including irrigation and weeding, for a minimum of five years with annual inspections. The entities shall retain a qualified biologist or restoration specialist to provide oversight on plant restoration planning, implementation, and monitoring.

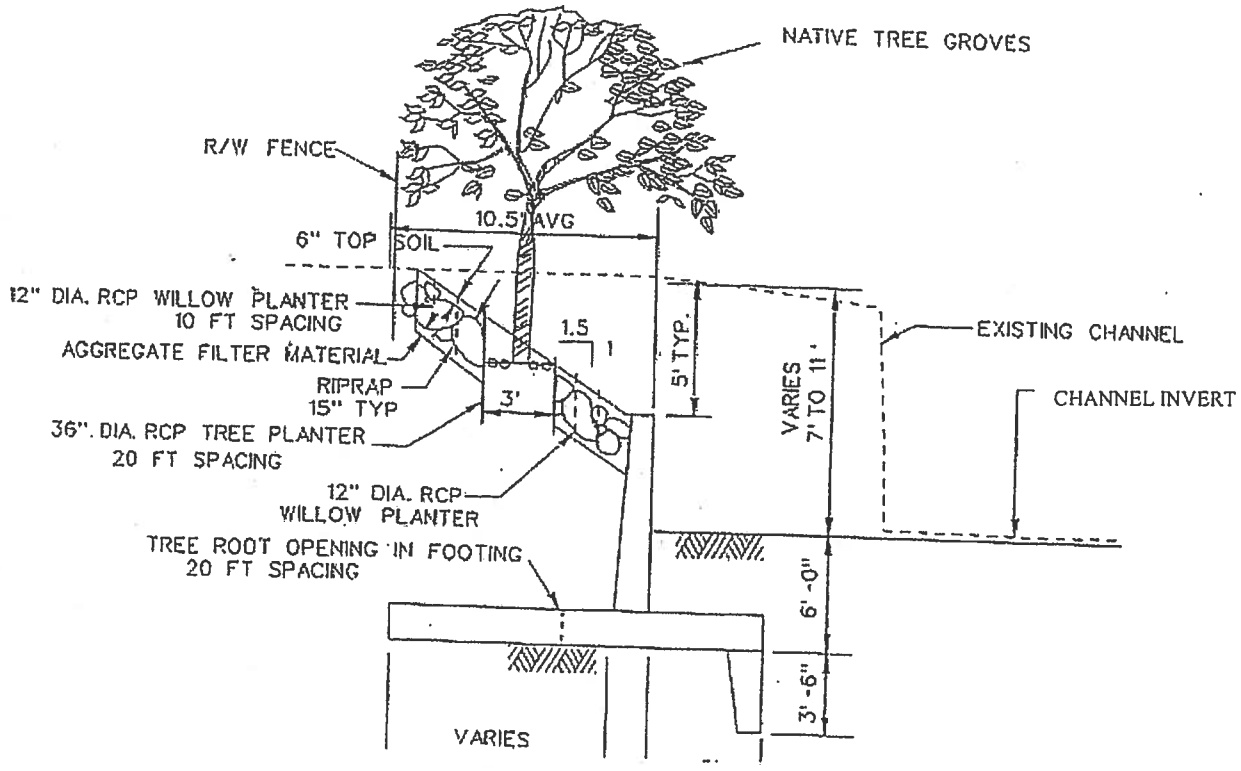
A Landscape Plan with Habitat Enhancement and Revegetation Monitoring Program have been submitted to the CCC (see Attachment 9) that illustrates the proposed habitat enhancement and restoration plan for portions of the Project within the habitat expansion areas and on the sloped banks constructed as a part of the Project. It should be noted that the Landscape Plan showed two alternative designs for the creek banks, both of which are discussed further in the next section (2. 2003 Value Engineering Recommendation). The Landscape Plan is enhanced with specifications, performance, and monitoring requirements included in The Habitat Restoration, Enhancement, Monitoring, and Management Program Applicable to the Areas Adjacent to the Creek Banks (see Attachment 10). There is also a voluntary planting program for private properties adjacent to the creek that facilitates landscape planning and implementation intended to provide assistance to private property owners with property on Lower Mission Creek. Please note the Landscape Plan for the creek

banks and Habitat Enhancement and Revegetation Monitoring Program are different from the Lagoon's Habitat Enhancement and Revegetation Monitoring Program .

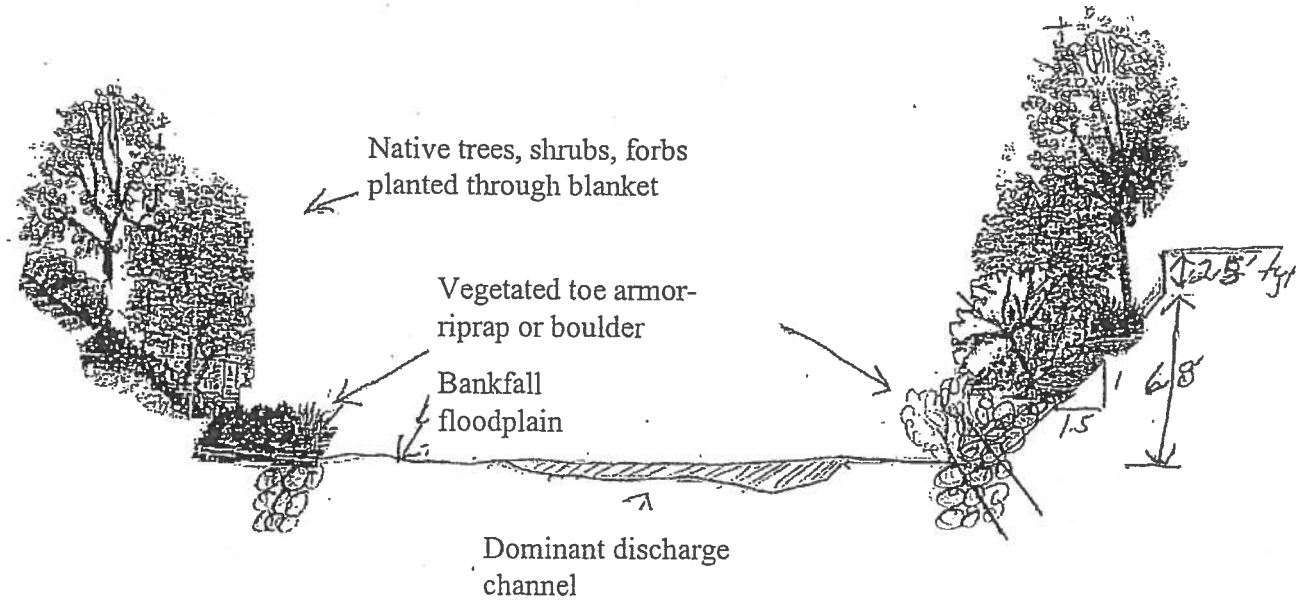
2. *2003 Value Engineering Recommendation*

In parallel with the Channel Design Recommendations, the Corps conducted a Value Engineering (VE) workshop for the proposed Project in July 2003. The VE process used engineers not associated with the Project to review the Project in an organized manner in order to identify alternative ways to meet the Project objectives with the lowest cost. One of the major alternatives identified during the VE process was an alternative channel configuration that would significantly reduce Project costs and provide many environmental and aesthetic benefits. The CDR document acknowledges that its six recommendations would be consistent with this alternative channel design.

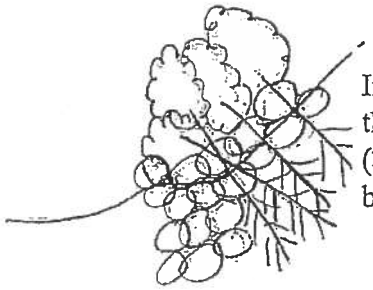
Under this alternative, the proposed vertical walls would be replaced with an earthen, vegetated bank (1.5:1 H:V) with boulders or rock rip-rap at the toe of the slope in areas with potential bank erosion. Vertical concrete walls would be constructed on the top of the earthen banks as necessary to meet the design capacity of 3,400 cfs. The average vertical wall height would be 2.5 feet. The proposed ungrouted rock rip-rap slope with tree plantings would not be included in this alternative. Sketches of the original and alternative channel designs are shown in Figures 1 and 2:



ORIGINAL CONCEPT SKETCH
FIGURE 1 – NOT TO SCALE



Toe detail



*Willows and other inundation – tolerant species that readily root from cuttings

RECOMMENDED CONCEPT - SKETCH
FIGURE 2 – NOT TO SCALE

Figure 2 is consistent with a self-sustaining dominant discharge channel. The slopes above the riprap toe are fully vegetated on native soil easing both installation and maintenance. Vertical walls are included only where required to meet capacity requirements and are placed at the top of the slope. The walls are screened by native trees and shrubs. As proposed in the 60% plans, the wall heights range from 2 feet to 13 feet. The average wall height is 8', with 54% of the wall being 7' or less.

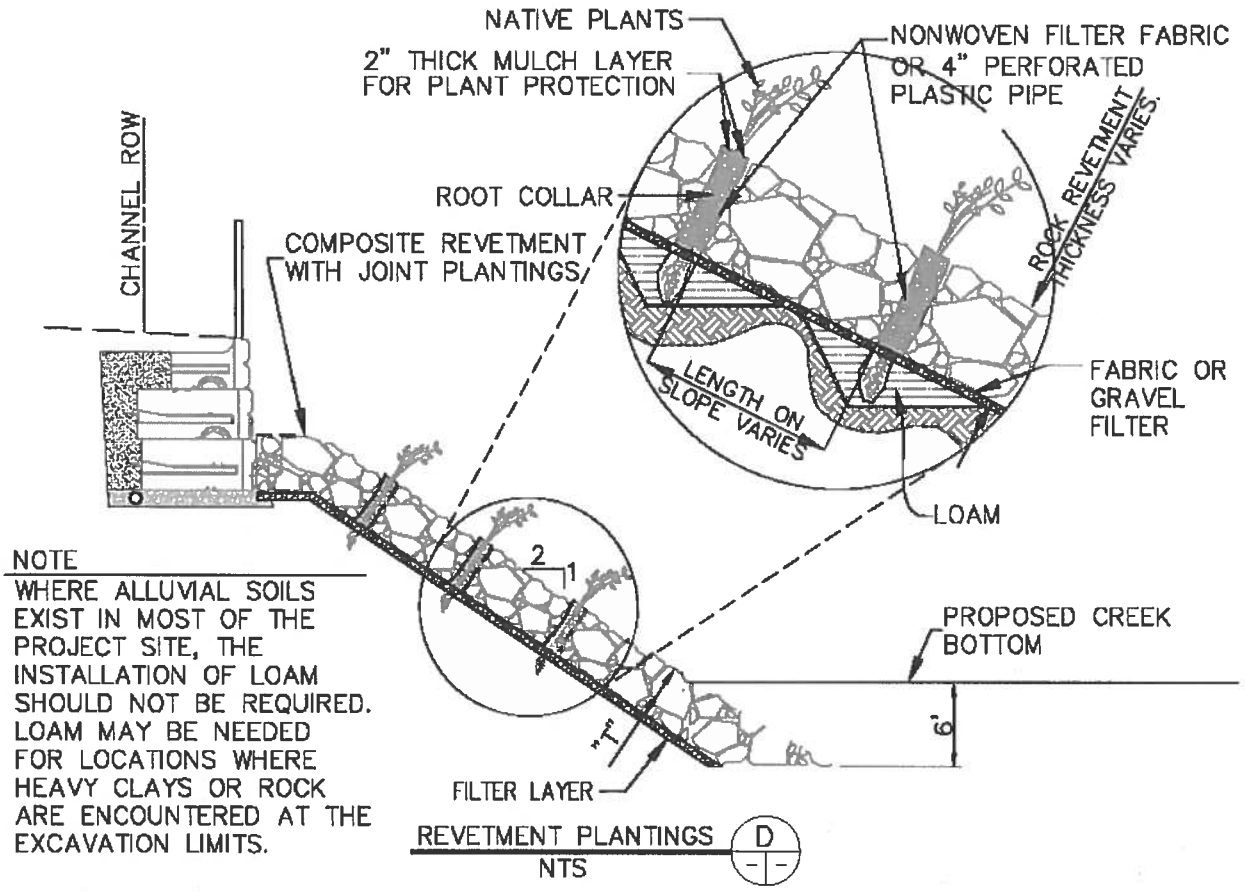
The recommended concept in Figure 2 provides a highly stable, fully vegetated stream bank that eliminates the need for extensive excavation, dewatering and shoring during toe wall construction. This concept includes habitat features integral to the slope. In addition to riprap or boulder toe protection, this recommendation includes willow plantings at the toe of the slopes.

The willows provide additional scour protection as well as shade and refuge for both aquatic and terrestrial wildlife.

The toe walls in the original concept, Figure 1, are an unnatural and potentially high maintenance feature. Consequently, the original concept requires that habitat features be added to the toe of the bank to compensate for the smooth vertical walls.

The toe of a stream bank is a particularly rich habitat zone inhabited by both terrestrial and aquatic species. The configuration and strength of the toe are also important for slope stability. Both requirements are addressed in Figure 2 by mimicking natural channel cross-sections. Stable natural channels tend to be steeper at the top and flatten towards the toe. The toes are often hydraulically rough. Hydraulic roughness at the toe of a stream bank shifts the distribution of velocity towards the thalweg of the channel. This maintains the dominant discharge channel and reduces the shear stress at the toe of the slope.

Due to the shear stresses exhibited in the HEC-RAS model, it is recommended that riprap or boulders be used for the lower three feet and vegetation be reinforced with biodegradable erosion control blanket for the slope above. As is the case with the toe protection, the size and height of the armor should vary according to the applied stress. The vegetation alone provides a shear resistance of a minimum of 200% of the applied shear. The erosion control blanket is important to provide surficial erosion protection and to conserve moisture for the first growing season until the ground cover vegetation is established. Figure 3 shows the current detail for the revetment plantings in the 60% drawings.



REVETMENT PLANTINGS DETAIL
FIGURE 3 – NOT TO SCALE

Diverse, self-managing habitat is integral to this approach. The toe vegetation, engineered ungrouted riprap and boulders provide shade, differential velocity and refugia for species ranging from macroinvertibrates to the larger fish in addition to foraging and resting area for birds. This recommendation includes rush and reed vegetation in the estuarine area, a more natural hiding place for larval goby than the concrete flutes. In addition, the local turbulence afforded by the hydraulically rough bank toes improves dissolved oxygen. Because the habitat features are integral to the slope and bed protection, they are present throughout the project reach.

The most unnatural feature of the channel, the vertical walls, are eliminated or reduced in height and moved to more unobtrusive locations. The recommended concept achieves a channel shape that is self-maintaining and capable of supporting more vigorous and diverse riparian vegetation. Where walls are required, their low height is amenable to rapid screening by vegetation. Alternatively, the walls may be constructed in such a way with native plantings incorporated into the wall that the hardscape is near-invisible.

In this recommendation, a stable riparian forest structure is achieved without hard armor (i.e. grouted rip-rap). Even at 3,400 cfs, the shear stress applied to the slope are very low and do

not require armor. The steel-reinforced concrete pipes used as planting rings are eliminated. In addition to being unnecessary, the reinforcing steel in concrete with the confining pressure of the soil in which it is buried, poses a potential threat to the canopy trees as they mature. Scoring the concrete ring will not solve that problem. The slope is most vulnerable immediately after construction. As vegetation establishes and the roots reinforce the soil, while the top growth dissipates scouring energy, the likelihood of scour on the slope becomes very small. This recommendation includes a fully biodegradable coconut blanket to provide shear protection until ground cover is established. Immediately before placing the blanket, the prepared slope is seeded with a mix of native herbaceous plants and grasses. A nurse crop could also be included to provide rapid cover. Shrubs and canopy trees are then planted through the blanket. In addition to providing protection from scour and from rill and gully erosion, the blanket conserves soil moisture and reduces the need for irrigation.

In this recommendation, fertilization is limited to formulas devised specifically for restoration purposes and having a controlled release coating to reduce the threat of additional nutrient loading to the stream. The VE Study recommends a fertilizer capable of providing nutrients over a period of one year. Amending the soil with mycorrhizal inoculums appropriate for the species selected should be considered.

As the canopy vegetation matures and shades out more of the slope, the species present will adjust so that the plant community present at the time of planting will be different from that present when the canopy trees are mature. This succession is desirable (so long as exotic species are excluded) and should be accounted for in the planting and maintenance plan.

Several important sycamore trees are established near the toe of the slope. Where those trees occur at particularly low stress sites, the VE Study recommends not placing armor immediately around the tree. In relatively higher stress sites, the armor should be hand-placed. In addition, flow should be directed away from the tree roots using a rock guide vane placed upstream of the tree.

The current 60% design that shows the majority of the banks with the channel wall above the vegetated slope allows for approximately 78,000 square feet of landscaped area. The Landscape Plan developed in 2006 (see Attachment 9) showed approximately 57,000 square feet of landscaped area. Neither of these areas include the voluntary planting on private property.

Through the process of moving the current 60% design into final design, both of these channel wall alternatives will be reviewed in more detail at each specific location throughout the Project. The final design may consist of either or both of these alternatives; regulatory agencies are comfortable supporting both designs.

3. Width of Channel

The current 60% Design Plans for the Project have the channel width shown differently in some locations than anticipated in the EIS/EIR. These changes are shown in the following table:

Channel Reach	EIS/EIR Top of Bank Width*	Current Proposed Top of Bank Width or Bridge Span	Status
Cabrillo – State	65'	65' – 80'	To be constructed with Cabrillo Bridge
State Street Bridge	N/A	N/A	To remain
Reach 1A – Phase 1 (State – Pedestrian Bridge)	60'	50'-58' (approx. average of 53')	Construction completed
Reach 1A – Phase 2 (Pedestrian Bridge – Mason)	60' between the vertical wall sides and 71 feet at the top of bank where the toe wall-riprap sideslope is found	52'-67' (approx. average of 59')	Scheduled to be constructed with Mason Bridge
Mason Bridge	N/A	60'	Scheduled to be constructed in 2013
Reach 1B (Mason – Chapala/Yanonali)	60' between vertical wall sides, 71' at the top of bank where the toe wall-riprap sideslope is used	55'-68' (approx. average of 59')	Scheduled to be constructed in 2013
Chapala/Yanonali Bridge	N/A	N/A	Proposed to be replaced as part of a separate but parallel grant funded project
Reach 2 (Overflow Culvert)	N/A	N/A	Phase 1 is schedule to be constructed in 2012; Phase 2 construction schedule is unknown
Reach 3 (Gutierrez – Highway 101)	71'	63'-88' (approx. average of 72')	Schedule unknown
Gutierrez Bridge	N/A	N/A	Proposed to be replaced as part of a future grant funded project
Reach 4 (Haley/De La Vina – Gutierrez)	71'	55'-72' (approx. average of 66')	Schedule unknown
Haley/De La Vina Bridge	N/A	52'	Construction completed
Reach 5 (Cota – Haley/De La Vina)	63' for the upper half of this reach, 55' for the downstream half	48'-61' for the upper half of this reach (approx. average of 56'), 43'-59' for the downstream half (approx. average of 51')	Schedule unknown

Cota Bridge	N/A	42'	Scheduled to be constructed in 2013
Reach 6A (Bath – Cota)	63'	65'-85' (approx. average of 75')	Schedule unknown
Bath Bridge	N/A	N/A	To remain
Reach 6B (Ortega – Bath)	63'	48'-73' (approx. average of 64')	Schedule unknown
Ortega Bridge	N/A	42'	Construction completed
Reach 7A (De La Guerra – Ortega)	63'	42'-65' (approx. average of 61')	Schedule unknown
De La Guerra Bridge	N/A	N/A	Proposed to be replaced as part of a future grant funded project
Reach 7B (Canon Perdido – De La Guerra)	63'	41'-61' (approx. average of 54')	Schedule unknown
***Top of Bank widths from the EIS/EIR did not consider locations adjacent to structures.**			

While the proposed channel widths are in some locations narrower than the EIS/EIR channel widths, the project channel can be expected to convey 3,400 cfs as analyzed in the Corps' recent 60% design and new hydraulic model.

4. ***Sequence of Construction***

Originally the Project was anticipated to be constructed within two years, beginning at the furthest down-stream reach and moving up-stream. However, when the anticipated federal funding source for the Project was delayed indefinitely, the City and District initiated construction on portions of the Project in an effort to reduce construction cost inflation. Since the City and District are only able to construct as funds become available for specific reaches/bridges, construction has not followed the intended path of beginning down-stream and moving up-stream. For example, the Haley/De la Vina Bridge, Ortega Bridge, the portion of the box culvert beneath the railroad tracks, and Reach 1A – Phase 1 have been constructed to date. Due to this sequencing of construction, temporary channel modifications have been incorporated at the locations that are being constructed out-of-order to accommodate future creek widening, specifically the Haley/ De la Vina Bridge and Ortega Bridge.

At the Haley/De la Vina Bridge, the south westerly channel wall includes a small portion of permanent wall adjacent to the abutment with the remaining wall length to be modified in the future. The south easterly transition wall was built along the future alignment and should remain during future widening. The north easterly transition wall may need to be replaced depending on final channel design. The north westerly transition wall only contains a short section of permanent wall while the remaining curved portion will need to be replaced and realigned. The creek bottom was maintained as a natural bottom but all remaining fish passage features as discussed in the EIS/EIR will need to be constructed with the creek widening project.

Similarly, the channel wall alignments at the Ortega Bridge were modified to transition between the new bridge abutments and existing channel walls. The Ortega Bridge Project includes permanent channel walls and a temporary wall that would likely be removed by the Project to accommodate the full channel width. The Ortega Bridge Project did not lower the creek bottom but was designed to accommodate the Project requirements including structural capacity, temporary wood posts that restrict the channel width, and two fish pools. The temporary wood posts were added along the approximate edge of the current bankfull condition to protect the temporary rock soil matrix along the new bridge abutments.

Along with making design changes to accommodate the out-of-order construction, the City and District continue to look for opportunities to construct channel reaches simultaneously with the adjacent bridge projects in order to limit the number of different times construction occurs within the Creek. For example, the western wall of Reach 1A – Phase 2 is planned to be constructed at the same time as the Mason Bridge. Similarly, Reach 2A is planned to be in construction simultaneously with the Chapala/Yanonali Bridge.

5. ***Bridge Additions and Opportunity Channel Construction***

In 2000, when the EIS/EIR was completed, the Project only included the reconstruction of four bridges (Haley/De La Vina Bridge, Ortega Bridge, Cota Bridge, and Mason Bridge). Since then, the City has been granted federal Highway Bridge Program funding for the reconstruction of the Chapala/Yanonali Bridge, De La Guerra Bridge, Gutierrez Bridge, and Cabrillo Bridges. Construction has already been completed on the Haley/De La Vina Bridge and the Ortega Bridge. All of the remaining bridges are scheduled to be built within the next five years (see Project Status for more detail on current status of these bridges).

The City and District are taking advantage of federal grant funds for bridge construction along Lower Mission Creek by trying to simultaneously construct channel reaches adjacent to bridge projects whenever possible. For example, channel construction north of Cabrillo Bridge has been added to that bridge project, portions of Reach 2A are planned to be constructed during the Chapala/Yanonali Bridge construction, and portions of Reach 1A – Phase 2 are planned to be constructed during the Mason Bridge construction.

6. ***Impact to Structures***

The EIS/EIR discussed the demolition of fourteen complete and two partial structures. Currently, at 60% design, there are three additional structures that may need to be removed to accommodate widening of the creek. As portions of the Project move into final design phase, the City and County will continue to evaluate whether or not these removals are necessary for creek widening.

Conclusion

The changes that have been made to the Project are considered enhancements to the design both environmentally and economically, while maintaining the spirit of the original EIS/EIR. Although the Corps has funding concerns, the City and District will continue to work with them to complete final design as timely implementation of the Project is a priority for both local agencies. Despite the timeline changes due to funding issues, the Project is considered to remain consistent with the EIS/EIR and with subsequent City, and CCC CDP conditions of approval and regulatory agency permits. For each element of project construction, consultation with all the appropriate regulatory

agencies is required. This provides an opportunity for these agencies to review any unique consideration for each increment of construction. The City and District will continue to keep the Planning Commission, Coastal Commission, and regulatory agencies apprised of any changes to the Project timeline.

The Project has been the number one priority for Federal Funding Requests for the City over the last few years, and has been the number two priority for the County. However, the County's current number one priority (Santa Maria River Levee-Reach 3 Extension of Improvements) is almost complete, which will move the Project into the County's number one priority position for federal funding requests.

JG/MR

Attachments:
1) Lower Mission Creek Project Map
2) Permitting Chronology of Lower Mission Creek Flood Control Project
3) Corps Biological Resources 2011 Update
4) Corps Air Quality 2011 Update
5) Corps Cultural Resources 2011 Update
6) Matrix for Mitigation Monitoring
7) Tetra Tech 60% Plans
8) Habitat Restoration, Enhancement, Monitoring and Management Program for the Cabrillo Bridge and Lower Mission Creek Flood Control Project
9) Landscape Plan with Habitat Enhancement and Revegetation Monitoring Program
10) Habitat Restoration, Enhancement, Monitoring, and Management Program Applicable to the Areas Adjacent to the Creek Banks

CC: Tom Fayram, Deputy County Public Works Director, Water Resources Division

CITY OF SANTA BARBARA
LOWER MISSION CREEK FLOOD CONTROL PROJECT - STATUS

TOTAL CONSTRUCTION COST:
$124,260,644

LEGEND:
- PROJECT CHANNEL REACH
- EXISTING OPEN CHANNEL
- CITY BRIDGE PROJECT
- COMPLETED CONSTRUCTION

	LOCATION	BRIDGES		CHANNEL REACHES	
		COST	STATUS & COMMENTS	COST	STATUS & COMMENTS
BELOW GUTIERREZ STREET	CABRILLO BRIDGE	$16,510,000	Scheduled for construction from Spring 2012 to Summer 2014.	-	Estimated $500,000 for project channel upstream of Cabrillo Bridge.
	REACH 1A	-	-	$10,126,000	Phase 1 (the section from State to the Harbor View pedestrian bridge) has been completed. Phase 2 (the remaining reach up to Mason Street) will be constructed along with the Mason Street Bridge Project, currently scheduled for Summer 2013.
	MASON STREET BRIDGE	$4,900,000	Scheduled for construction from Spring 2013 to Summer 2014.	-	-
	REACH 1B	-	-	$8,824,000	Construction scheduled for Summer 2013.
	REACH 2A	-	-	$1,876,000	Construction anticipated to be coordinated with construction of the Chapala/Yanonali Bridge.
	REACH 2B	-	-	$13,012,000	The culvert beneath the railroad tracks was constructed in Winter 2009.
	REACH 3	-	-	$4,721,000	
	SUBTOTAL	$21,410,000	-	$38,559,000	-
ABOVE GUTIERREZ STREET	GUTIERREZ STREET BRIDGE	$4,515,750	Scheduled for construction in 2015; not included in the 2000 EIR/EIS for the Lower Mission Creek Flood Control Project.	-	-
	REACH 4	-	-	$9,721,000	
	HALEY/DE LA VINA BRIDGE	$8,179,115	Construction has been completed.	-	-
	REACH 5	-	-	$10,604,000	
	COTA STREET BRIDGE	$2,800,000	Scheduled for construction from Spring 2013 to Summer 2014.	-	-
	REACH 6	-	-	$8,163,000	
	ORTEGA STREET BRIDGE	$3,985,779	Currently in construction, scheduled to be completed by the end of 2011.	-	-
	REACH 7	-	-	$12,138,000	
	DE LA GUERRA BRIDGE	$4,185,000	Scheduled for construction in 2014; not included in the 2000 EIR/EIS for the Lower Mission Creek Flood Control Project.	-	-
	SUBTOTAL	$23,665,644	-	$40,626,000	-
	GRAND TOTAL	$45,075,644	-	$79,185,000	-

0 0.5 1
SCALE: 1"=150'

Attachment 1
UPDATED
5/1/12

Chronology Lower Mission Creek Flood Control Project (LMCFCP)

Starting in 1986, City of Santa Barbara Council (Council) with the USACE consider proposal for lower mile of Mission Creek concrete channel.

1993 – USACE informs Council they will stop all work on a concrete channel project EIS/EIR. The concrete channel was infeasible to construct due to debris control issues at the ocean.

1994 – The Lower Mission Creek Consensus Group was formed to come up with recommended channel design alternatives. These alternatives were presented to Council and County Supervisors. In 1995 the ACOE completed the Reconnaissance Flood Control Study which recommended pursuing an optimum sized flood control project.

2000 - The ACOE LMCFCP Feasibility Study and Final EIR/EIS.

August 2, 2000 – US National Marine Fisheries Service provides Biological Opinion on Steelhead (Permit Number F-LB-00-23:KAJ)

September 2000 – USACE Feasibility Study and EIS/EIR completed.

June 1, 2001 – US Fish and Wildlife Service provides Biological Opinion on Tidewater Goby. (Permit Number 1-8-00-F-74).

June 28, 2001 – SB Planning Commission (PC) certifies LMCFCP EIS/EIR.

October 2001 – SB City Council approves LMCFCP (Resolution # 01-137).

October 9, (November 7 Addendum), 2001 – California Coastal Commission (CCC) approves conditional compliance with USACE Federal Coastal Consistency Determination (CCD) provided that the USACE develops and submits:

- A Management Plan for Tidewater Gobies in the Mission Creek Estuary that includes studies of goby genetics, allowing Laguna Channel and Mission Creek lagoons to merge under natural conditions (or as recommended by the team of biologists). The USACE to implement recommendations from the Management Plan in the Mission Creek Estuary,
- An adaptive management maintenance plan (included in Channel Design Recommendations),
- Final plans for the low flow or pilot channel, and
- Final landscape plans for planting native riparian species inland of the vertical walls.

May 2002 – USACE issues Record of Decision providing USACE approval of the LMCFCP Alternative #12.

April 2005, Tidewater Goby Management Plan completed that is a component of the Lagoon Management Plan.

June 2005 - Channel Design Recommendation report for LMCCP completed, and includes adaptive channel maintenance plan.

October 15, 2006 – CCC conditionally concurs under a phased approach (used where insufficient information is provided for an approval) with USACE Coastal Act Federal Consistency Determination (CCD) and noted that the following documents were submitted by the USACE (that satisfy the first phase in the process):

- Tidewater Goby Management Plan (April 2005) (The genetics study of gobies was included)
- Channel Design Recommendations (June 2005)
- Adaptive Channel Maintenance Plan
- Landscape Plan (2006)
- SB County Streams Hydraulic Technical Appendix, Sedimentation Engineering(November 1999)

The CCC CCD included conditions that required UAACE commitments to:

- Implement those portions of the "Lagoon Management Plan" provided in the Tidewater Goby Management plan
- Prohibits lagoon breaching
- Provision of a lagoon buffer
- Monitoring success of native riparian landscaping, and
- Water quality and habitat monitoring plans

2007 – City of SB PC approves (within the City's appealable Coastal jurisdiction) and recommends approval (within the CCC Permit Jurisdiction) of a CDP for the Cabrillo Bridge project that includes the channel from Cabrillo Boulevard to State Street that was a part of the LMCFCP to the CCC. This project also provided for the widening of the lagoon near the bridge, portions of a lagoon buffer, and restoration of the lagoon banks adjacent to the bridge.

February 2008 - PC approves CDP for construction of portion of bypass culvert under railroad line within prior Chapala Street alignment. This was constructed.

September 18, 2008 – City of SB PC recommends approval (Resolution 036-08) to CCC of CDP for LMCFCP that includes the area from Cabrillo Boulevard to Highway 101.

September 4, 2008 – CCC approves CDP for Cabrillo Bridge that includes channel wall between State Street and Cabrillo Boulevard that is part of the

LMCFCP and is the last bridge before Mission Creek discharges onto the beach and ocean beyond.

2009 – CCC issues City and SB County Flood Control Coastal Development Permit (4-08-096) and certifies LMCFCP consistency with Coastal Act (CC-012-09) with 7 conditions that requires:

- Commitments in the Tidewater Goby Management plan to be binding,
- A prohibition of lagoon breaching,
- Provision of a lagoon buffer,
- Monitoring success of native riparian landscaping,
- Water quality and habitat monitoring plans,
- Incorporation of conditions from other permits, and
- City and County assume the risk.

August 12, 2009 – City/County submit a Section 401 Application to the Regional Water Quality Control Board. 401 Permit Certification was issued on January 26, 2010 (Permit 3409WQ22) and amended on September 20, 2010 to correct the project description and a mitigation requirement. Permit covers entire Project.

December 16, 2009 – City/County submit Streambed Alteration Agreement Application to the California Department of Fish and Game (CDFG). The Agreement expires on December 13, 2013. The Agreement Notification is #1600-2009-0370-R5 and covers entire Project.

2010- - CALTRANS completes NEPA environmental review for Haley/De la Vina Street Bridge. Haley/De la Vina Street Bridge EIS/EIR Addendum prepared (March 10, 2008) by the City with mitigation measures applied to bridge replacement and bridge is constructed. The City obtained permits from USACE, RWQCB, and CA Dept, F&G for the construction of this bridge.

April 28, 2010 – City submits the following to the CCC for condition compliance: 1) Form stating that the City and County agree to the terms of the conditions applied by the Coastal Commission to the Project. 2) Landscape Plan Adjacent to Mission Creek; 3.) Landscape Plan for Private Property; and 4.) Habitat Restoration, Enhancement, Monitoring, and Management Program Applicable to the Areas Adjacent to the Creek Banks. Items 2-4 satisfied Coastal Commission Special Condition #4.

July 29, 2010 – City/County submit a 404 Nationwide Permit Application to the Army Corps of Engineers for Lower Reach 1A. Permit issued on May 26, 2011. There has been no umbrella permit granted for entire Project.

January 2011 – City submitted the Lagoon Management and Lagoon Buffer Plans (Special Conditions No. I Lagoon Management Plan and No. 3-Lagoon Buffer) to the CCC to complete the condition compliance required prior to construction of the channel. Note that the Lagoon Management Plan was revised

by consultant to include both lagoon restorations by the LMCFCP and Cabrillo Bridge Projects since the lagoon restorations would be constructed at the same time and made sense to work off of one document.

2011 – CCC amends CDP for LMCFCP to allow piles to be driven between June 1 and December 1 provided piles for channel walls are cast in place and not driven.

March 8, 2011 – CCC grants LMCFCP a time extension of CC-012-09/CDP 4-08-096.

2011 – Reach 1A of LMCFCP channel from State Street to pedestrian bridge approximately 150 feet upstream is constructed using vertical walls.

2011 - CALTRANS completes NEPA environmental review for Ortega Street Bridge. Ortega Street Bridge EIS/EIR Addendum prepared (March 10, 2008) by City with Mitigation Measures applied to bridge replacement and bridge is constructed. The City obtained permits from USACE, RWQCB, and CA Dept, F&G for the construction of this bridge.

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Biological Resources

1. **Purpose**

This report is intended to serve as an update to the Affected Environment, Biological Resources (Section 10) of the *Lower Mission Creek Flood Control Project Final Environmental Impact Statement/Environmental Impact Report* (EIS/EIR) (U.S. Army Corps of Engineers, September 2000), and includes discussion of biological and physical (habitat) features, wildlife (including listed species), construction projects (from recent past to near future), and associated Federal environmental laws, regulations, and policies.

It should be noted that the length of the Lower Mission Creek Flood Control Project (Project) reach has been slightly reduced (0.2 mile) since completion of the Final EIS/EIR, as the City of Santa Barbara has elected to proceed separately with the design, permits, and construction of the downstream-most portion of the Project (State Street to Cabrillo Boulevard, including Cabrillo Boulevard Bridge). Consequently, the revised Project reach is 1.0 mile in length, while the Study Area includes the Project reach and its vicinity (i.e., up to 0.5 mile upstream, and up to 0.2 mile downstream to confluence with Pacific Ocean).

2. **Methods**

This report contains a compilation of information obtained from various sources on the physical and biological condition of the Project reach for a 15-year time period (1997- present day). Data sources include available literature, field surveys (including listed species), and database searches (e.g., California Natural Diversity Database (CNDDB), Corps Regulatory (ORM2) Project Database), and field visits by Corps biological staff in October and November 2011. In addition, this report contains comparisons between physical and biological conditions as they existed immediately prior to completion of the FEIS/EIR (1997-2000) and present day conditions.

3. **Environmental Setting**

a. General Conditions

The Study Area is located along the south coast of Santa Barbara County, with the Pacific Ocean to the south and the Santa Ynez Mountains to the north, a unique geographic alignment found in few places in North America. The Santa Ynez Mountains extend from Point Conception into western Ventura County; high peaks include La Cumbre Peak at 3,995 feet above Mission Canyon and Divide Peak at 4,787 feet elevation close to the Santa Barbara-Ventura County line. Most canyons on the south side of these mountains drain southward to the Pacific Ocean, including Mission Creek (*City of Santa Barbara Mission Creek Bridge Replacements- Natural*

Environmental Study, State of California, Department of Transportation (Caltrans), ARCADIS, December 2010).

Figure 1: Project Location

Mission Creek is a 7.5 mile-long perennial stream that drains an approximately 11.5-square-mile (7,786-acre) watershed on the south slope of the Santa Ynez Mountains. Its headwaters originate below the crest of the Santa Ynez Mountains, flanked by La Cumbre Peak (3,985 feet above mean sea level (msl)) to the west and an eastern ridge reaching over 3,440 feet above msl. Mission Creek and its major tributary, Rattlesnake Creek, descend from the steep slopes above to merge near the Santa Barbara Mission. Gradients above this location are approximately 1,000 vertical feet per mile (*Biological Opinion for Construction and Maintenance of Flood Control Channel on Lower Mission Creek, Santa Barbara County, CA* (F-LB-00-23:KAJ), National Marine Fisheries Service (NMFS), August 2000), and the creek corridor is lined with a dense canopy of riparian woodland and forest. Creek banks in this area have natural sides and support native vegetation, unless modified by private landowners. Trout have been observed in the upper reaches of Mission Creek and Rattlesnake Creek on numerous occasions (NMFS 2000). Along

the main branch of Mission Creek there are two manmade impoundments/barriers, the old Mission Dam in the Santa Barbara Botanic Garden, built in 1806, as well as a debris basin and dam upstream. Rattlesnake Creek also has a less noticeable dam built in 1806 along with a debris dam (ARCADIS, December 2010).

Below the Santa Barbara Mission, the Creek alignment likely follows the naturally incised channel, although that is not now evident. The creek banks and floodplain have been substantially modified for residential, commercial, and industrial purposes, including flood control and highway construction. For example, in order to maintain flood capacity (up to 1,900 cubic feet per second, an 8-year event), the Santa Barbara County Flood Control and Water Conservation District (County) must periodically remove accumulated sediments and obstructive vegetation and debris from this reach of the Creek, thus reducing the opportunity for development of topographic heterogeneity and mature riparian vegetation. Based upon the scale and permanency of these collective disturbances, opportunistic non-native vegetation predominates within the Study Area, displacing native species and reducing habitat quality and functions (ARCADIS, December 2010).

Creek channel bottom widths are generally uniform throughout this lower section (Study Area), ranging from 25 feet to 35 feet, and averaging 27 feet (see Figure 2 below).

Figure 2: Average Channel Bottom Widths, Project reach (*Channel Design Recommendations: Lower Mission Creek Flood Control Project*, URS Corporation, June 2005)

Section of Project Reach	Approximate Length (feet)	Channel Width (feet)
Canon Perdido to Haley Street	2,200	25
Haley Street to Highway 101	1,000	25
Highway 101 to Chapala/Yanonali Street	860	40
Chapala/Yanonali Street to State Street	1,030	27

Mission Creek bends to the right (west) just above Highway 101, creating a feature known locally as the oxbow. In very quick succession thereafter, the oxbow leads water beneath the freeway, Montecito Street, the railroad tracks, and then bends back to the left (east) at the upper end of a historic sandstone-lined channel. The sandstone channel has a concrete bottom and carries water as far (approximately 530 feet in length) as the Chapala/Yanonali Street Bridge. The transition from fresh to brackish water effectively begins directly beneath this Bridge where a sill/drop roughly 15 inches high spans the full width of the creek bed (entirely concrete at that point) and marks the upper limit of tidal influence, except perhaps during very severe winter storms (USACE 2000).

Mission Creek discharges to East Beach at Cabrillo Boulevard. As mentioned above, the lower portion of the creek is tidally influenced, and is therefore called Mission Creek Estuary. It extends from the beach up to Yanonali Street. The estuary includes two geographically

recognizable elements: 1) the lagoon on the beach, and 2) the confined creek channel from Cabrillo Boulevard to Yanonali Street. The term "lagoon" is defined in this report as the waterbody on the beach below Cabrillo Boulevard. However, it should be recognized that the lagoon is an integral part of the larger estuary (*Natural Environmental Study*, URS Consultants, December 2006).

Prior to 2011, the creek channel above Cabrillo Boulevard was about 70 to 90 feet wide from top of bank to top of bank, and the creek bed was from 30 to about 60 feet wide. The creek substrate varied from sand to remnants of a prior stone channel bottom (URS, December 2006). In 2011, the County began construction of the Lower Mission Creek Flood Control Project improvements within this portion of the Project reach (designated reach 1A), and is expected to complete construction of the first of two phases (phases 1 and 2) in December 2011. Phase 2 is expected to be completed during the dry season of 2013. Upon completion, the channel width will be 55 feet (vertical wall), and fish features will include ledges, boulder clusters, and roughened channel walls with grout lines/fish refugia. Channel substrate will consist of cobbles, boulder clusters, and silty sand.

The lagoon is typically present year-round at the beach. The size and configuration of the lagoon varies considerably due to runoff, waves, and beach sand management. In all but drought years, winter runoff is sufficient to enlarge the lagoon such that it breaks through the sandbar formed on the beach and discharges to the ocean. If there are large or frequent runoff events, the lagoon is absent and the creek flows across the beach. As the flows diminish, sand builds up from wave action. (URS, December 2006).

The process of forming the lagoon each winter is very dynamic. The lagoon may form and breach several times each winter. In addition, the beach sand management actions in the winter under the City's Sediment Management Program (SMP) affect the size and timing of lagoon formation. However, once a lagoon is formed, its size in the summer appears to be relatively similar from year to year, based on a review of historic aerial photographs Mission Creek generally flows year-round; hence, there is a base flow to the lagoon in the summer months that maintains the lagoon at a relatively constant size. The base flows in the summer are derived primarily from groundwater discharge in the lower watershed. The depth of the lagoon in the summer typically ranges from 5 to 8 feet. The water surface elevation in the lagoon is generally determined by the height of the sandbar, which is usually about 6 to 8 feet (NAVD 88). If water surface elevations increase above these levels, the lagoon will breach the sandbar (URS, December 2006).

b. Habitat Conditions, Project Reach

Natural habitat in both the riverine and the estuarine sections of Mission Creek is strongly limited by all aspects of urban development, including the follow persistent disturbances (USACE, 2000):

- Periodic clearance of vegetation and accumulated sediments from the channel
- Indiscriminate use of the channel as a dumping ground for refuse;
- Intermittent and private hard siding of its banks
- Housing on private property along both sides of the channel;
- Bridges carrying roads over the channel;
- Storm water outlets (discharging storm water and urban (nuisance) runoff) (especially underneath bridges); and,
- The concentration of business developments within or adjacent to residential neighborhoods.

Portions of lower Mission Creek contain concrete-lined channels and banks, as well as a variety of other bank stabilization infrastructure, including stacked burlap bags filled with concrete, cemented rocks, masonry walls, shot-crete walls, gabions, and other revetments. The native vegetation has largely been modified, with occasional presence of large sycamores *(Platanus racemosa),* coast live oak trees *(Quercus agrifolia),* and arroyo willows *(Salix lasiolepis).* Cottonwood *(Populus)* and white alder *(Alnus rhombifolia)* have also been reported in lower Mission Creek. However, once Mission Creek reaches the eastern edge of Highway 101 below Oak Park near Junipero Street, there is no contiguous native riparian canopy and no layer of native shrubs and herbs on the stream banks (USACE, 2000).

Apart from the bridges and sandstone channel, in both the freshwater and the estuarine segments the Creek's aquatic properties have been influenced to a very great degree by individual property owner's decisions to armor streambanks on their property, the toe of those banks, and even the creek bed itself in many locations against erosion. Where concrete was placed below the ordinary high water mark, the result can be a solid projection into the low flow path of the creek in some places, a uniformly broad, flat surface (e.g. upstream of the Gutierrez Street Bridge), or concrete edges that confine the creek's low flow route to a narrow course. Excluding the ~ 860 linear-foot section between Highway 101 and Yanonali Street (not to be disturbed by the Project), natural sediments (silty muds and gravels) compose the streambed for about 2/3 of the Project reach (approximately 3560 feet) (3560/5380= 0.66), while evident hardened surfaces cover roughly 1/3 the Project reach (1820/5380= 0.33) (USACE, 2000).

Hydrologically, Mission Creek should now be considered a seasonal watercourse in dry years. It was likely permanent before 1800, but removal of native vegetation throughout its watershed would have had potentially large effects. Man-made diversions considerably farther upstream also diminish its flow through this section. May through October are the driest months along this part of the coast, when total rainfall amounts to approximately 1.3 inches, on average. During the

months from late summer through fall, little to no water drains from this watershed. The small volume of surface water moving down the channel after mid-summer appears to arise primarily as urban runoff, entering Mission Creek via storm drains along its course. After the onset of winter rains it conveys runoff as surface flow to Santa Barbara Harbor (USACE, 2000).

It should be noted that a Habitat Evaluation Procedure (HEP) was completed for all Project Alternatives in December 1999 (Draft EIS/EIR), and an additional, separate HEP completed for the (revised) Preferred Alternative (Alternative 12) and the No Federal Action Alternative (baseline condition) was completed in September 2000 (Final EIS/EIR). The latter was conducted in order to account for substantial changes in the project design resulting from coordination with stakeholders following publication of the Draft EIS/EIR. Examples of such changes include: elongation of the bypass culvert, inclusion of additional structural features for fish, exclusion of a manufactured wetland, modification of habitat expansion zones, and modification of flood control maintenance procedures. For illustrative purposes, the comparison between HEP scores (measured in Habitat Units (HU)) for the (revised) Preferred Alternative and No Federal Action (Future Without Project) condition is provided below, for both aquatic habitat and streambank habitat (Figures 2 and 3) (USACE, 2000).

Figures 2 and 3: Habitat Evaluation Procedure (HEP) Scores, Future Without Project and Preferred Alternative (USACE, 2000)

Table C-2. Average of projections of habitat quality, in habitat units, of the aquatic habitat in Lower Mission Creek. Each is the average of 100 individual repetitions of the equations above.

REACH	PROPOSED FLOOD CONTROL DESIGN	FUTURE WITHOUT PROJECT
43 feet wide	0.55 HU	0.36 HU
50 feet wide	0.24 HU	0.11 HU
60 feet wide	0.29 HU	0.19 HU

Table C-3. Average of projections of habitat quality, in habitat units, of the stream bank habitat in lower Mission Creek.

REACH	PROPOSED FLOOD CONTROL DESIGN	FUTURE WITHOUT PROJECT
43 feet wide	0.45 HU	0.24 HU
50 feet wide	0.26 HU	0.11 HU
60 feet wide	0.10 HU	0.12 HU

For purposes of this report, an additional HEP evaluation was not conducted, based upon the similarity of conditions between year 2000 and present day, as well as the high degree of functional lift demonstrated through comparison of the (revised) Preferred Alternative and No Federal Action Alternative in 2000 (67 percent (67%) average increase in lift across all reaches

(1-3), and 83 percent (83%) average increase with exclusion of the estuary reach (reach 3, 60 feet wide)). The net yield from Alternative 12, 0.76 HU, can be ascribed to growth of trees and shrubs within the rip rap slopes and the habitat expansion zones, the aquatic habitat (mitigation) features, selective channel maintenance plan (i.e., allowing plant growth in a mosaic pattern), and preservation of a pilot channel (USACE, 2000). Accordingly, the respective scores are expected to remain very similar to those calculated in 1999 and 2000, including the No Federal Action Alternative (baseline), the focus of this report. If necessary, the Corps will revisit these original scores, and conduct an additional HEP evaluation for comparative purposes, during the next stage(s) of environmental review.

Vegetation (classification, structure)

During the Corps site visits in October and November 2011, the species and size of in-channel and streambank vegetation was noted, and then compared with observations recorded in the EIS/EIR, as well as subsequent reports prepared by the City and County. In summary, in-channel (aquatic) and streambank vegetative species and structure remains substantially similar to conditions reported by the Corps in 2000. Present conditions were most similar to conditions noted during surveys in 1999, a period when channel maintenance had been deferred by the County for several years (USACE, 2000). Representative photographs of stream conditions in 2011 are provided at the end of the report (pages 23-31).

A total of six habitat types occur within the Project reach. These include two upland communities (non-native grassland/ruderal and ornamental plantings) and three wetland habitat types (southern mixed riparian forest, coastal and valley freshwater marsh, coastal brackish marsh (estuary). In the California Natural Diversity Database (CNDDB) community classification system (Holland 1986), the southern mixed riparian forest observed in the overall project areas is part of the Southern Mixed Riparian Forest Community. This vegetation best fits into the *Platanus racemosa* Woodland Alliance or the *Salix lasiolepis* Woodland Alliance listed in the CNPS *Manual* of *California Vegetation* (Sawyer, Keeler-Wolf, and Evans 2009). Freshwater marsh vegetation onsite is part of the Coastal and Valley Freshwater Marsh Community (Holland 1986). In the CNPS *Manual* of *California Vegetation* (Sawyer, Keeler-Wolf, and Evans 2009), the freshwater marsh vegetation along most riparian corridors fits best into the *Typha latifolia* Herbaceous Alliance. CNDDB (2010) also lists two aquatic wildlife habitats as sensitive that applies to the Project reach, coastal steelhead trout stream and coastal brackish marsh (ARCADIS, 2010).

Aquatic Habitat

As described in the EIS/EIR, by May 1999, considerable growth of herbaceous and also perennial stream-bottom plants was evident. Many plant species had become established after the last channel maintenance. The great majority of species were still herbaceous (the most common

of them not already mentioned above including northern willowherb *(Epilobium adenocaulon),* water cress *(Rorippa nasturtium-aquaticu),* yellow sweet-clover *(Meliotus indicus),* black mustard *(Brassica nigra),* a coarse rye grass *(Lolium* sp.*),* rabbit's foot grass *(Polypogon monospeliensis),* sweet fennel *(Foeniculum vulgare),* smilo grass *(Piptatherum miliaceum),* and willow dock *(Rumex salicifolia),* but a few perennials had started as well (a blackberry *(Rubus ursinus),* white nightshade *(Solanum douglasii),* mulefat *(Baccharis salicifolia),* poison hemlock *(Conium maculatum),* sand-bar willow *(Salix exigua)* in a couple of places, and salt cedars *(Tamarix* sp.*)* growing in the sandstone channel). At several locations along the creek, seedling red willows *(Salix laevigata)* and western sycamores *(Platanus racemosa)* already had a good start (USACE, 2000).

The lateral extent of Clean Water Act Section 404 jurisdiction ("waters of the U.S."), as defined by the presence of an ordinary high water mark or adjacent wetlands, is expected to be similar to the channel bottom widths reported on page 2 (Figure 2), and is largely complementary to those areas defined as "aquatic habitat." Based upon the recorded length/width data, and excluding the 1.0 mile Project reach contains approximately 5.1 acres (222,210 square feet/43,560 square feet per acre) of waters of the U.S. For purposes of this Study, Corps'-defined ("three-parameter") wetlands were not delineated. However, based upon the evident (perennial) hydrology, the dominant presence of facultative (FAC) or more hydrophytic vegetation, the confined nature of the channel, the relatively uniform streambed surface, and the presence of riverwash (hydric) substrate, with the exclusion of (10) bridge crossings (including State Highway 101 and Railroad Bridges) and the historic sandstone channel, the portion of the Creek bottom located landward of open water (adjacent to low flow channel) has the potential to be considered wetland (*Regional Supplement to the Corps of Engineers Wetland Delineation Manual (Version 2.0),* USACE ERDC, September 2008).

Streambank Habitat

As described in the EIS/EIR, between Canon Perdido Street and Cabrillo Boulevard, Mission Creek passes through a highly urbanized section of the City of Santa Barbara. No gallery of tree tops exists within the project boundary, although stately western sycamores (*Platanus racemosa)* and a few other native trees, much smaller and less conspicuous than the sycamores, still thrive in isolation from each other at various locations along the creek. Similarly, no layer of shrubby native plants, such as would be found beneath a tree canopy in natural settings, grows along these sections of Mission Creek. Miscellaneous urban refuse scattered on the stream's banks is a very common sight throughout the project area. In summary, the creek retains little undisturbed quality. Residential properties line both banks and houses often overlook the creek directly. Commercial businesses have been established at the edge of the Creek in several locations as well. In numerous locations, private property owners have built structural walls that constitute parts of houses, garages, etc. and which actually form the bank itself. The building is the stream

bank. Additionally, private citizens have invested considerable labor and personal expense to create localized bank stabilization structures (USACE, 2000).

The banks of Lower Mission Creek sustain a coarse growth of opportunistic perennials in many locations. Invasive non-native species compose virtually the entire plant assemblage along the creek. Giant reed *(Arundo donax)* forms the most conspicuous element of stream bank vegetation, and probably would rank highest in biomass of anything growing along the creek In the main, this vegetation consists largely of giant castor bean *(Ricinis communis),* tree tobacco *(Nicotiana glauca),* and to a lesser extent, English ivy *(Hedera helix),* tree tobacco *(Nicotiana glauca),* shamel ash *(Fraxinus uhdel),* tree of heaven *(Ailanthus altissima),* salt cedar *(Tamarix* sp.) and pampas grass *(Cortaderia jubata).*The weedy growths lack the structural arrangement of the understory layer of plants which would prevail here if natural seral successional process had not been interrupted by urban development and channel maintenance (ARCADIS, 2010 and USACE, 2000).

Geomorphic features (pools, riffles, runs, sandbars)

During the Corps site visits in October and November 2011, the presence and dimensions of pools, riffles, runs, and sandbars was noted. Low-flow channel widths within the freshwater (non-estuarine) soft-bottom channel ranged from 6 feet to 24 feet, averaging 11 feet, and depths ranged from 0.5 feet to 5 feet (including pools). Length of pools ranged from 20 feet to 75 feet, averaging 34 feet. The dimensions of surface water features observed during these recent site visits are likely considered higher than the annual average for October/November, as the 2010/2011 wet season produced well above average precipitation (169% of normal rainfall), including the wettest late season on record (June 2011) for the City of Santa Barbara (*2010-11 Water Year Climate Summary For Southwestern California*, National Weather Service, November 2011). Representative photographs of stream conditions in 2011 are provided at the end of the report (pages 23-31).

Similar to vegetative species and structure, the location and abundance of these features remains substantially similar to those reported by the Corps in 2000 and URS in 2005 (see Figures 4, 5, and 6 below). In addition, geomorphic conditions were most similar to conditions noted by the Corps during surveys in 1999, a period when channel maintenance had been deferred by the County for several years. Maintenance is generally triggered when channel capacity is reduced by more than 15 percent.

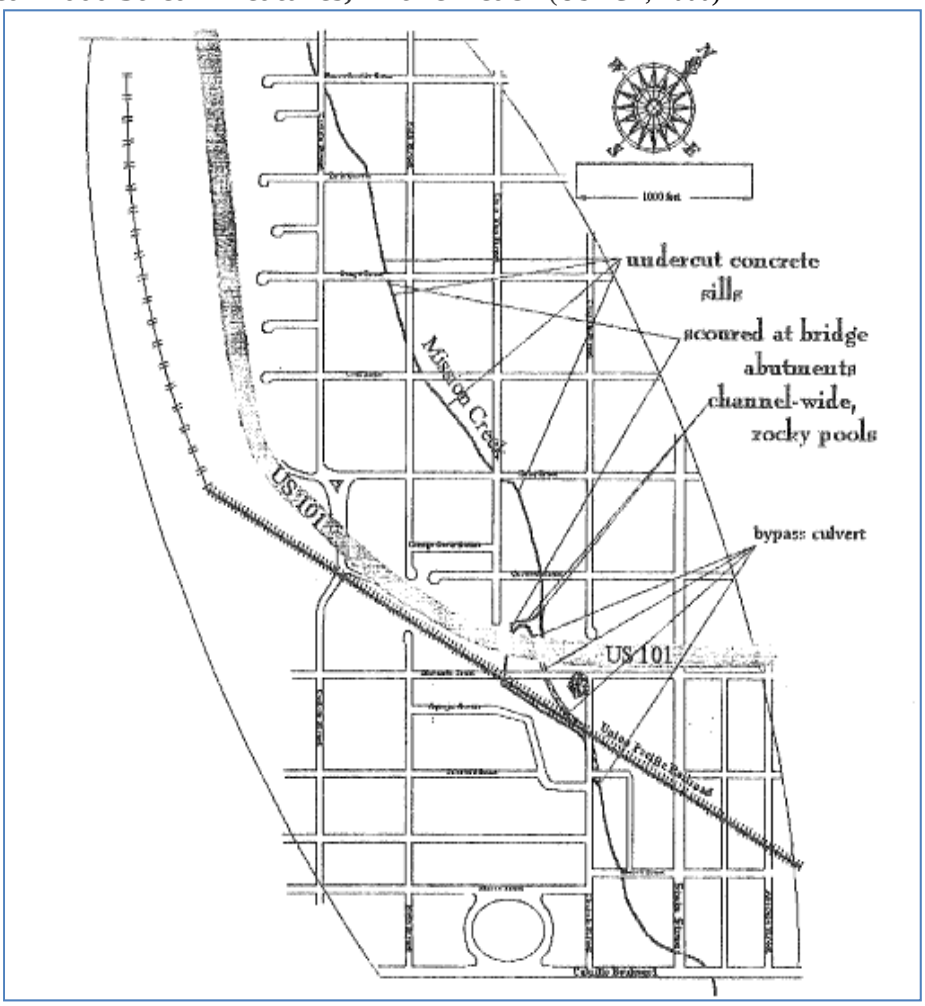
As described in the EIS/EIR, in May 1999 the streambed had reacquired moderate topographic variation. Rocky stretches and winding Creek prevailed in some parts. Elsewhere the bottom consisted of silty mud and gravels. All extant pools, except the pair in the upper part of the oxbow (beginning at State Highway 101), had formed where complex hydrological interactions

between man-made structures and currents caused differential erosion and sediment deposition patterns (USACE, 2000).

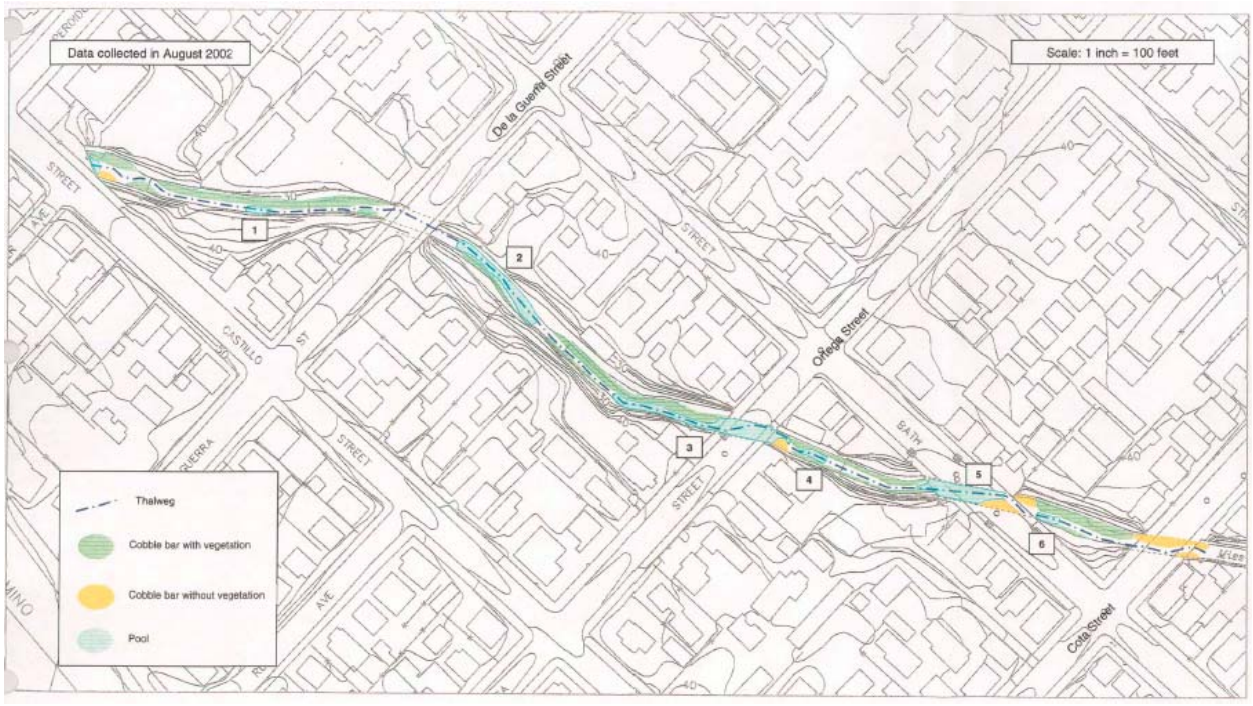
Other Environmental Factors Affecting Habitat

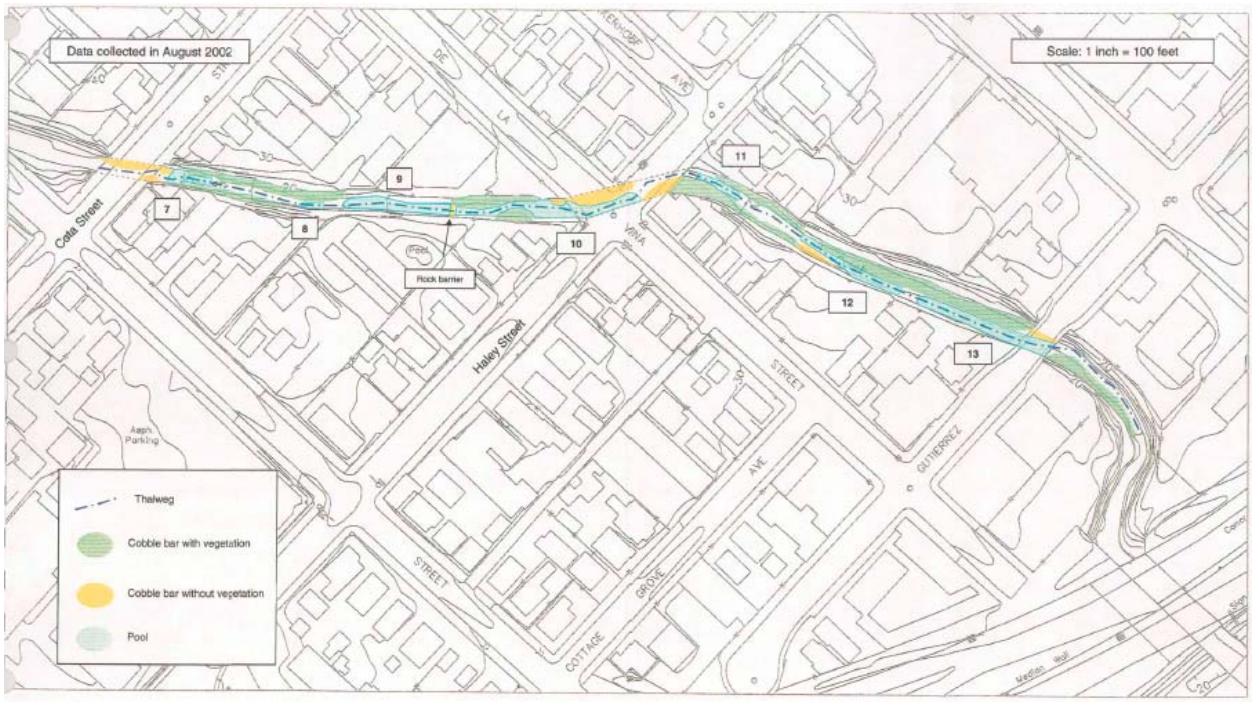
Please reference Section 10 of the EIS/EIR for discussion of water temperatures, salinity, turbidity, precipitation, sediment budget, and hydraulics.

Figure 4: Year 2000 Stream Features, Entire Reach (USACE, 2000)



Figures 5 and 6: Year 2005 Stream Features Upstream of State Highway 101 (URS Corporation, June 2005)


Data collected in August 2002
Scale: 1 inch = 100 feet
De la Guerra Street
Ortega Street
Cota Street
Thalweg
Cobble bar with vegetation
Cobble bar without vegetation
Pool


Data collected in August 2002
Scale: 1 inch = 100 feet
Cota Street
Haley Street
Rock barrier
Thalweg
Cobble bar with vegetation
Cobble bar without vegetation
Pool

Wildlife

A comprehensive summary of biota identified in the lower and upper reaches of Mission Creek includes 26 species of amphibians and reptiles combined, 108 bird species, 37 mammalian species, and 222 species of vascular plants (USACE, 1995). During field reconnaissance of the entire Lower Mission Creek channel in September 1997 (late summer) and May 1999 (late spring), for the most part, only birds were seen directly, being active during mid-day. Included were Anna's hummingbird, barn swallow, black phoebe, yellow warbler, common yellowthroat, snowy egret, green-backed heron, black-crowned night heron, hooded oriole, house sparrow, northern mockingbird, rock dove, scrub jay, red-shouldered hawk, mallards, and numerous shore birds on or around the lagoon on the south side of Cabrillo Boulevard. Local birding enthusiasts do not commonly scrutinize the lower reach because of the difficulties posed by access across private property. They thus have limited information about the importance of this reach as a sanctuary for birds in an urban setting. It may be important as a stopover focus for south-bound winter migrants. Tracks of house cats and domestic dogs were seen regularly in mud along the creek, and less frequently were those of racoons, opossums, and skunks. Pacific tree frogs *(Hyla regilla)* have been seen (or heard) in late summer and spring. Indeed, during late spring males could be heard calling from concealed perches above head height. No other amphibian species have been seen in Mission Creek. Fish species are not evidently numerous, although individuals of those which live there can be plentiful. For example, partially-armored sticklebacks *(Gasterosteus aculeatus microcephalus)* were quite abundant in many places above the freeway and ranged between very young to large adult sizes, 15 to 70 mm at least. A single prickly sculpin *(Cottus asper)* was found above the Mason Street bridge. Topsmelt *(Atherinops ajjinis)* swam in estuarine water to feed above Mason Street, but did not go as far as Yanonali in late spring. Striped mullet *(Mugil cephalus)* could be seen feeding closer to the State Street Bridge (USACE 2000 & ARCADIS 2010). The Federally listed southern steelhead *(Oncorhynchus mykiss)* and tidewater goby *(Eucyclogobius newberyi)* have also been observed within select sections of the Creek, most notably below Mason Street Bridge within the estuarine portion of the Creek. The presence and protections afforded to these species is discussed in greater detail below.

State and Federally-Listed Species

There are 13 sensitive species of concern that occur or have occurred historically in Mission Creek and the lagoon. They are listed in Figure 7 below, with an indication of suitable habitat presence and potential for occurrence in the study area and status of the species (*Final Initial Study/Environmental Checklist, Replacement of Cabrillo Street Bridge over Mission Creek*, City of Santa Barbara, June 2007). Most Federally protected animal species, which depend on the microhabitats associated with riverine and estuarine conditions and whose historical range may have included the Mission Creek watershed or at least the higher elevations of the Santa Ynez Mountains, have been displaced from the lower reach by urban expansion and the concomitant loss of suitable habitat (USACE 2000).

Figure 7: State and Federally-Listed Species within the Project Area (City of Santa Barbara, June 2007)

Common name	Habitat Presence	Potential for Occurrence	Status
Tidewater goby	Present	Expected	Federal Endangered, State Species of Special Concern
Southern Steelhead	Present	Expected	Federal Endangered, State Species of Special Concern
Southwestern pond turtle	Absent	Not expected	Federal Species of Concern, State Species of Special Concern
Red-legged Frog	Absent	Not expected	Federal Threatened
Western snowy plover	Present	Not expected	Federal Threatened, State Species of Special Concern
California Brown Pelican	Present	Transient	Federal Endangered, State Endangered
California least tern	Present	Likely	Federal Endangered, State Endangered, California Fully-protected
Peregrine falcon	Absent	Not expected	Federal Species of Concern, State Endangered
California Gull	Present	Unlikely	State Species of Special Concern
Long-billed curlew	Present	Likely	State Species of Special Concern
Double-crested cormorant	Present	Not expected	State Species of Special Concern
Elegant Tern	Present	Likely	State Species of Special Concern
Black skimmer	Present	Transient	State Species of Special Concern

- *Federally-listed species*

The lower part of Mission Creek affords significant habitat for two Federally endangered fish species, the tidewater goby and southern California steelhead. Adult steelhead use Mission Creek as a migration corridor to spawning beds upstream, while young steelhead swim the reverse when physiologically mature enough to return to the ocean. A coastal, tidal lagoon forms in the summer months where Mission Creek empties into the Pacific Ocean, on the beach side of Cabrillo Boulevard. It provides the principal habitat for gobies and is essentially a marine environment.

- *Validity of Original Biological Opinions* (USFWS, June 2001 & NMFS, August 2000)

Based upon the results of recent field surveys and review of previous reports prepared in support of the Lower Mission Creek Flood Control Project, the City of Santa Barbara determined that the compendium of biological information presented in previous (Corps) biological assessments for the Lower Mission Creek Flood Control Project is still applicable (ARCADIS, 2010 & *Addendum to Environmental Impact Report for Haley Street/De La Vina Street Bridge Replacement Project*, City of Santa Barbara, March 2008), and the associated (2) Biological Opinions (National Marine Fisheries Service, U.S. Fish and Wildlife Service) are still valid (*Addendum to Environmental Impact Report for the Cota Street Bridge Replacement Project*, City of Santa Barbara, July 2011).

Based upon the above information, in April 2011 the Corps determined that environmental conditions within the channel and its immediate vicinity had not changed in a manner that would result in new or additional adverse effects to tidewater goby beyond those described in the original (2001) Biological Opinion, and also determined that the flood control project may affect, but is not likely to adversely affect tidewater goby critical habitat, re-designated in January 2008. Accordingly, the Corps requested USFWS concurrence with these determinations on April 14, 2011, and subsequently received concurrence from the USFWS on May 13, 2011. The Corps has recently arrived at a similar determination with respect to southern steelhead and its critical habitat, and intends to seek concurrence from NMFS with respect to these determinations in the near future.

A discussion of recent surveys, site conditions, and critical habitat designations for these two Federally-listed species is provided below.

- *Tidewater Goby*

A large population of tidewater goby has recently been observed within the estuarine portion of Lower Mission Creek, which extends from the vicinity of the Chapala/Yanonali Street Bridge downstream to the lagoon at the beach (a distance of about 2,000 feet) (*USFWS Concurrence Request: Effects Upon Tidewater Goby and Critical Habitat*, USACE, April 2011 & Cardo-Entrix, July 2011). Just downstream of the Chapala/Yanonali Street Bridge, a 15-inch-tall, man-made sill/drop spans the entire channel and likely blocks gobies from swimming into the lower end of the sandstone channel except during high water events of the winter rainy season.

The extent of tidal influence is dependent upon conditions at the beach. In the summer and fall, a sand berm and lagoon typically forms on the beach near the mouth of the creek. In the winter, the sand berm is either eroded by natural forces (high flows & wave action) and/or artificial means (e.g., breaching of berm by City maintenance staff). The latter practice is no longer carried out by the City, due to concerns raised by resources agencies. When the Creek is open to the ocean, tidal influence can reach the sill at Chapala Street Bridge *(Tidewater Goby Management Plan: Lower Mission Creek Flood Control Project,* URS Consultants, April 2005).

Spawning by tidewater gobies generally peaks between April and July. The substrate upstream of the State Street Bridge is comprised of cobbles, which would preclude or limit spawning. The substrate downstream of State Street Bridge is comprised of fine to coarse sands, which is suitable for goby spawning. Emergent vegetation is sparse in most of the estuary and absent from the lagoon, which would limit overall goby abundance. (URS Consultants, 2005). While fine sediments would likely be transported from this reach during high flows, fine sediments are expected to re-deposit in the channel during lower flow conditions (USACE, April 2011). It is suspected that the majority of the fine sand and sediment which is an important component for tidewater goby reproduction (i.e., burrows) is derived from the ocean end of the lagoon and not from flows from Mission Creek (Swift, 2000).

Fish sampling and relocation conducted by Cardo-Entrix during construction of Project Reach 1A in July 2011 tallied several thousand individuals (*Technical Memorandum, Lower Mission Creek Flood Control Project – June/July Tidewater Goby Protection*, Cardo-Entrix, August, 2011). Fish sampling conducted by the City of Santa Barbara in May and August of 2008 tallied 774 and 770 individuals, respectively, at four sample sites. These sample sites were located in vicinity of the pedestrian bridge downstream of Mason Street Bridge, downstream of the Cabrillo Boulevard Bridge, at the southeast end of the lagoon, and at the Laguna tidegate. A separate survey in 2008 reported successful tidewater goby spawning in lower Mission Creek prior to May with primarily young fish present at the time of survey (*Preconstruction Tidewater Goby Surveys of Mission Creek and Arroyo Burro Estuaries*, Entrix, October 2008). In prior years, abundance within lower Mission Creek was reported to be greatest immediately below Cabrillo Boulevard in May and above State Street in August, with highest densities observed within the vicinity of the Laguna Channel tidegate *(*URS, April 2005).

The Mission Creek tidewater goby population is expected to be a source population for the regional metapopulation (CO3 subunit of the Conception Unit) due to its large size and long history of goby occurrence. Available data suggests that the size of lagoons is correlated with the persistence of this species. Mission Creek is the largest lagoon that is regularly inhabited by tidewater gobies in the CO3 subunit, and also has a more extensive upstream reach accessible to the species than other streams in the region (URS, April 2005).

For additional discussion tidewater goby behavior and historic presence within Mission Creek, please reference the EIS/EIR.

- *Tidewater Goby Critical Habitat*

According to the final rule (2008), the revised critical habitat designation is intended to conserve areas supporting primary constituent elements (PCEs) that are necessary to support life history

functions of the species. The PCEs are comprised of physical and biological features. The primary constituent elements identified for the tidewater goby are:

1. Persistent, shallow (in the range of about 0.1 to 2 meters (m)), still-to-slow-moving, aquatic habitat most commonly ranging in salinity from 0.5 parts per thousand (ppt) to about 10 to 12 ppt, which provides adequate space for normal behavior and individual and population growth;
2. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
3. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scripus* spp. That provides protection from predators; and
4. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby proving relatively stable water levels and salinity. (73 FR 5920)

The designation of units is based on sufficient PCEs being present to support at least one of the species' life history functions. Approximately 14 acres have been identified for Mission Creek and connecting Laguna Channel (known as Unit SB-9 Mission Creek-Laguna Channel). According to the final rule, Mission Creek-Laguna Channel possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary and thereby provides relatively stable conditions (PCE 4). PCE's 1, 2, and 3 occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The following is a description of critical habitat unit "SB-9: Mission Creek – Laguna Channel" as presented in the Federal Register (Volume 73, Number 21), Page 5919-6006:

Unit SB-9 consists of 14 acres located on the southern margin of the city of Santa Barbara. On an intermittent basis, SB-9 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary and thereby provides relatively stable conditions (PCE 4). PCEs 1, 2, and 3 occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. A portion of this unit is owned by the city of Santa Barbara, and remainder is privately owned.

SB-9 was occupied at the time of listing, is currently occupied, and is likely a source population for this region. SB-9 is the southernmost of the nine Santa Barbara County units and is located 2.8 miles (4.5 km) south of Arroyo Burro (SB-8). The unit is separated from the nearest extant population to the south, in Sycamore Creek (not designated as critical habitat), by 1.0 mile (1.5 km). This unit will support the recovery of the tidewater goby population along this portion of the coast and help facilitate colonization of currently unoccupied locations.

- *Southern Steelhead*

Southern steelhead *(Oncorhynchus mykiss),* use the lower end of Mission Creek as a migratory channel when flow conditions permit. Adults could swim upstream after steady winter rains have raised runoff rates. Assuming stream flow conditions are suitable, adult steelhead would most likely attempt to ascend (upmigrate) Mission Creek between mid-December and mid-March. Steelhead evidently spawn successfully in some in upper reaches of the watershed (USACE 2000). Juvenile steelhead use Mission Creek through the Project area predominantly as a migratory corridor to the ocean, but may rear within the lowest sections (DRAFT *Tidewater Goby Protection and Aquatic Species Management Plan, Cabrillo Bridge replacement project,* Science Applications International Corp (SAIC), October 2009). Habitat for steelhead smolts is present in the estuarine environment around the Mason Street Bridge. With suitable stream flows, juvenile steelhead would most likely attempt to descend (downmigrate) the Creek between mid-March and late May (USACE 2000).

In recent years, adult and juvenile steelhead have occasionally been observed within the Creek. During construction of Project Reach 1A this year, 20 juvenile steelhead were observed in mid-July immediately upstream of the State Street Bridge. A pair of steelhead were observed spawning near the Ortega Street Bridge in 2000, and additional observations of spawning steelhead have been noted upstream of the Project reach (U.S. Department of Transportation-California Department of Transportation (Caltrans), *City of Santa Barbara Mission Creek Bridge Replacements, Biological Assessment, Ortega Street Bridge and Haley/De La Vina Street Bridge*, May 2007). Steelhead were not observed during the ARCADIS 2010 surveys, conducted on June 16, July 8, and July 15, 2010 for Chapala Street bridge, Mason Street bridge, and Cota Street bridge and their immediate vicinity (ARCADIS, 2010).

For additional discussion of steelhead behavior and historic presence within Mission Creek, please reference the EIS/EIR.

- *Steelhead Critical Habitat*

The National Marine Fisheries Service designated the Mission Hydrologic Sub-area (including Mission Creek) as critical habitat for this species on March 3, 2008. The PCEs for this species are quite extensive, and are fully described in the Federal Register dated 9-02- 2005 (Vol. 70), pages 52487 – 52627. In summary, the PCEs consist of six (6) components, including suitable freshwater spawning sites, freshwater rearing sites, freshwater migratory corridors, estuarine areas, nearshore marine areas, and offshore marine areas. Mission Creek possesses all of the primary constituent elements (PCEs) of critical habitat for steelhead, and steelhead are inferred to be present in the creek at this time (ARCADIS, 2010).

c. Construction and Development Projects within Study Area

The City and County of Santa Barbara (Non-Federal Sponsors) have initiated construction, design, and/or regulatory approvals for numerous locations, sited throughout the ~1.0 mile Project reach, in advance of USACE approval of project design modifications occurring during the Project's Pre-construction Engineering and Design (PED) phase. The City and County will likely seek reimbursement for associated expenditures, excluding portions of the Project funded by other Federal entities/sources (e.g., Federal Highways Administration). In summary, these design modifications included: 1) a decrease in proposed channel width by about 5 feet in specific reaches; 2) revised channel wall configuration; 3) refined method of wall construction; 4) pilot channel design; and, 5) structural features for fisheries, and were developed pursuant to the *Value Engineering Study* (USACE, ….. 2003) and the *Channel Design Recommendations, Lower Mission Creek Flood Control Project* (USACE, June 2005).

Specifically, the City and County have completed or are nearing completion of construction at the following locations, described from downstream to upstream:

1) Reach 1A (County of Santa Barbara, 2011);
2) Union Pacific Railroad Culvert (City of Santa Barbara, 2009);
3) Haley Street Bridge (City of Santa Barbara, 2010); and,
4) Ortega Street Bridge (City of Santa Barbara, 2011).

In addition, the City and County are in the design, regulatory approval, and/or bidding phase for the following locations:

1) Cabrillo Boulevard Bridge (City of Santa Barbara);
2) Mason Street Bridge (City of Santa Barbara);
3) Chapala Street Bridge (City of Santa Barbara);
4) Gutierrez Street Bridge (City of Santa Barbara);
5) Cota Street Bridge (City of Santa Barbara); and,
6) De La Guerra Street Bridge (City of Santa Barbara).

Figure 8: Current City and County Projects within Lower Mission Creek (Santa Barbara County Flood Control and Water Conservation District, September 2011)

Figure 9: Construction of Reach 1A, Phase 1, Santa Barbara County

Within the Project reach and its vicinity (0.5 mile upstream, and 0.1 mile downstream to confluence with Pacific Ocean), the following additional (12) projects are on record with Corps Regulatory Division as having been completed between 2000 (date of final EIS/EIR) and present day, are under construction, or are to be constructed in the near future (ordered from upstream to downstream) (*Ombil Regulatory Module (ORM2) Database*, November 2011):

1) California Department of Transportation (Caltrans)- Water Resource Development Act (WRDA) Section 206 (Aquatic Ecosystem Restoration)- 1.5 mile reach, beginning at West Los Olivos Street and ending at Canon Perdido Street (pending);
2) Santa Barbara County Flood Control & Water Conservation District- routine vegetation and/or sediment removal, maintenance of existing bank protection, culverts, and outfall structures (complete, 2000);
3) Santa Barbara County Flood Control & Water Conservation District- Santa Barbara County Flood Control & Water Conservation District- routine vegetation and/or sediment removal (complete, 2006);
4) Private property- installation of approximately 100 linear feet of bank stabilization, including rock riprap, in vicinity of Ortega Street Bridge (complete, 2010);
5) Salvation Army- installation of an outfall pipe and riprap energy dissipator at Hospitality House (complete, 2000);
6) Caltrans- repair of wingwalls for State Highway 101 Bridge (complete, 2003);
7) Union Pacific Railroad (UPRR)- install two temporary support trestles under Union Pacific Railroad's bridge (complete, 2006);
8) Family Services Agency- installation of approximately 100 lieanr feet of pipe and wire revetment in vicinity of State Highway 101 (complete, 2000);
9) Private property- installation 100 linear feet of bank stabilization, including gabions, concrete bags, and concrete toe in vicinity of State Highway 101 (complete, ~2000);
10) City of Santa Barbara- replacement of Cabrillo Boulevard Bridge and restoration of adjacent Mission Creek Lagoon (pending);
11) Santa Barbara Waterfront Department- debris removal and sand grading on West Beach (complete, 2003); and,
12) City of Santa Barbara- Mission Creek Lagoon Management Plan- minor grading within vicinity of Lagoon (complete, 2006).

d. Environmental laws, regulations, and policies

Please reference EIS/EIR Sections 1.6 for a detailed description of applicable Federal, State, and local law, regulation, and policy. The following listing describes laws, regulations, and policies that have been enacted since completion of the EIS/EIR in 2000:

Executive Order (EO) 13112 - Invasive Species

Section 2(a)(3) of the Act directs federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere.

2007 Clean Air Plan: Santa Barbara County Air Pollution Control District
As approved by the California Air Resources Board, the 2007 Clean Air Plan provides updates to the 2004 Clean Air Plan and prior Plans, as well as the 1991 Air Quality Attainment Plan, as required by the California Clean Air Act. The 2007 Clean Air Plan includes previously adopted air pollution control measures and newly proposed/contingency emission control measures, including controls over ozone emissions.

2007 Storm Water Management Plan (SWMP): City of Santa Barbara
As approved by the Central Coast Regional Water Quality Control Board, The SWMP is a citywide, interdepartmental program that is coordinated and administered by the Creeks Division. The Creeks Division meets regularly with all City departments who are responsible for implementing Best Management Practices (BMPs) and/or who have been assigned specific actions in the SWMP to improve or protect water quality.

Photographs of Project reach, October 25, 2011 and November 9, 2011
(progressing from upstream to downstream)

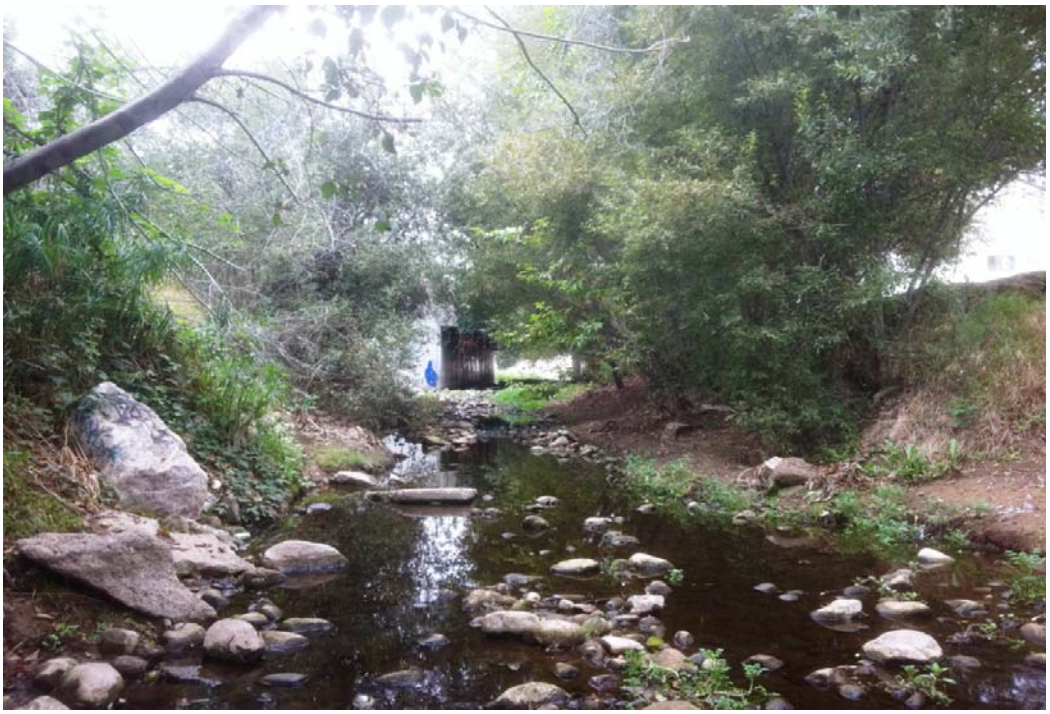


Photo 1: Upstream end of Project reach (Canon Perdido Bridge), upstream view

Photo 2: Immediately downstream of De La Guerra Bridge, upstream view

Photo 3: Between De La Guerra and Ortega Bridges, upstream view

Photo 4: Immediately upstream of Ortega Bridge, upstream view

Photo 5: Immediately downstream of Bath Bridge, upstream view

Photo 6: Immediately downstream of Cota Street Bridge, upstream view

Photo 7: Between Cota Street and Haley Street Bridges, upstream view

Photo 8: Underneath Haley Street Bridge, upstream view

Photo 9: Immediately downstream of Haley Street Bridge, upstream view

Photo 10: Underneath Gutierrez Street Bridge, upstream view

Photo 11: Immediately downstream of Gutierrez Street Bridge, upstream view

Photo 12: Immediately upstream of State Highway 101 Bridge, upstream view

Photo 13: Immediately downstream of State Highway 101 Bridge, upstream view

Photo 14: Immediately downstream of Railroad Bridge, upstream view

Photo 15: Between Railroad and Chapala/Yanonali Street Bridges, upstream view

Photo 16: Immediately downstream of Chapala/Yanonali Street Bridge, upstream view (upper end of tidal influence)

Photo 17: Immediately upstream of Mason Street Bridge, upstream view (high tide)

Photo 18: Downstream end of Project reach, Between Mason and State Street Bridges, downstream view (construction of Reach 1A, phase 1, Santa Barbara County)

References:

ARCADIS, Inc., *City of Santa Barbara Mission Creek Bridge Replacements, Biological Assessment, Mason Street Bridge, Chapala Street Bridge, Cota Street Bridge,* December 2010.

ARCADIS, Inc., *City of Santa Barbara Mission Creek Bridge Replacements- Natural Environmental Study, State of California, Department of Transportation*, December 2010.

California Department of Fish and Game, California Natural Diversity Database (CNDDB), Field Survey Form for *Onchorynchus mykiss* (southern steelhead), Cardo-Entrix, July 2011.

Cardo-Entrix, *Technical Memorandum, Lower Mission Creek Flood Control Project – June/July Tidewater Goby Protection*, August 26, 2011.

City of Santa Barbara, *Addendum to Environmental Impact Report for the Cota Street Bridge Replacement Project*, July 2011.

City of Santa Barbara, *Addendum to Environmental Impact Report for Haley Street/De La Vina Street Bridge Replacement Project*, March 2008.

City of Santa Barbara, *Addendum to the Environmental Impact Report for Lower Mission Creek Flood Control Project, Coastal Development Permit*, September 2008.

City of Santa Barbara, *Addendum to Environmental Impact Report for Ortega Street Bridge Replacement Project*, March 2008.

City of Santa Barbara, *Initial Study/Environmental Checklist, Chapala/Yanonali Streets Bridge Replacement,* July 25, 2011

City of Santa Barbara, *Final Initial Study/Environmental Checklist, Replacement of Cabrillo Street Bridge over Mission Creek*, June 2007.

Entrix, *Preconstruction Tidewater Goby Surveys of Mission Creek and Arroyo Burro Estuaries, Cabrillo Bridge Replacement Project, Santa Barbara CA*, Prepared for City of Santa Barbara, October 2008.

National Marine Fisheries Service, *Biological Opinion for Construction and Maintenance of Flood Control Channel on Lower Mission Creek, Santa Barbara County, CA* (F-LB-00-23:KAJ), August 2000.

National Marine Fisheries Service, *Endangered and Threatened Species; Designation* of *Critical Habitat for Seven Evolutionarily Significant Units* of *Pacific Salmon and Steelhead in California; Final Rule*, Federal Register 9 - 02- 2005 (VoI.70); pp.52487 – 52627, September 2005.

National Oceanic and Atmospheric Administration (NOAA), National Weather Service, *2010-11 Water Year Climate Summary For Southwestern California*, http://www.wrh.noaa.gov/lox/archive/pns_2010-11summary.pdf, November 2011.

Swift, Camm, *Assessment of the Lower Mission Creek Flood Control Project, U.S. Army Corps of Engineers, for City of Santa Barbara, with special reference to tidewater goby and steelhead, 1999-2000*, October 10, 2000.

URS Consultants, *Natural Environmental Study*, December 2006.

URS Consultants, *Tidewater Goby Management Plan. Lower Mission Creek Flood Control Project,* April 2005.

U.S. Army Corps of Engineers, *Mission Creek 206, Section 206 Draft Preliminary Restoration Plan (PMP),* April 2003.

U.S. Army Corps of Engineers, *Revised Biological Assessment, Tidewater Goby, Lower Mission Creek Flood Control Project*, September 2000.

United States Army Corps of Engineers, *Revised Biological Assessment, Steelhead, Lower Mission Creek Flood Control Project, Santa Barbara,* CA, September 2000.

U.S. Army Corps of Engineers, *Channel Design Recommendations, Lower Mission Creek Flood Control Project*, June 2005.

U.S. Army Corps of Engineers, *Final Environmental Impact Statement/Environmental Impact Report, Santa Barbara County Streams, Lower Mission Creek Flood Control Feasibility Study*, September 2000.

Regional Supplement to the Corps of Engineers Wetland Delineation Manual (Version 2.0), USACE ERDC, September 2008.

U.S. Army Corps of Engineers, *Santa Barbara County Streams- Lower Mission Creek Reconnaissance Flood Control Study, Draft Reconnaissance Report*, September 1995.

U.S. Army Corps of Engineers, *Value Engineering (VE) Study*, 2003.

U.S. Department of Transportation-California Department of Transportation (Caltrans), *City of Santa Barbara Mission Creek Bridge Replacements, Biological Assessment, Ortega Street Bridge and Haley/De La Vina Street Bridge*, May 2007.

U.S. Fish and Wildlife Service, *Biological Opinion for the Lower Mission Creek Flood Control Project, Santa Barbara County, California* (1-8-00-F-74). June, 2001.

United States Fish and Wildlife Service, *Endangered and Threatened Wildlife and Plants. Revised Designation* of *Critical Habitat for the Tidewater Goby (Eucyclogobius newberryi)*, Final rule. Federal Register 73(21): 5919-6006, January 2008.

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Air Quality

1. Purpose

This report is intended to serve as an update to the Affected Environment, Air Quality (Section 8) section of the *Lower Mission Creek Flood Control Project Final Environmental Impact Statement/Environmental Impact Report* (EIS/EIR) (U.S. Army Corps of Engineers, September 2000), and includes discussion of air quality, construction projects (from recent past to near future), and associated Federal environmental laws, regulations, and policies.

It should be noted that the length of the Lower Mission Creek Flood Control Project (Project) reach has been slightly reduced (0.2 mile) since completion of the Final EIS/EIR, as the City of Santa Barbara has elected to proceed separately with the design, permits, and construction of the downstream-most portion of the Project (State Street to Cabrillo Boulevard, including Cabrillo Boulevard Bridge). Consequently, the revised Project reach is 1.0 mile in length, while the Study Area includes the Project reach and its vicinity (i.e., up to 0.5 mile upstream, and up to 0.2 mile downstream to confluence with Pacific Ocean).

2. Methods

This report contains a compilation of information obtained from various sources on regional and global air quality for a 15-year time period (1997- present day). Data sources include available literature and database searches ([insert references]). In addition, this report contains comparisons between conditions as they existed immediately prior to completion of the FEIS/EIR (1997-2000) and present day conditions.

3. Environmental and Regulatory Setting

a. General Conditions

The Study Area is located along the south coast of Santa Barbara County, with the Pacific Ocean to the south and the Santa Ynez Mountains to the north, a unique geographic alignment found in few places in North America. The Santa Ynez Mountains extend from Point Conception into western Ventura County; high peaks include La Cumbre Peak at 3,995 feet above Mission Canyon and Divide Peak at 4,787 feet elevation close to the Santa Barbara-Ventura County line. Most canyons on the south side of these mountains drain southward to the Pacific Ocean, including Mission Creek (*City of Santa Barbara Mission Creek Bridge Replacements- Natural Environmental Study, State of California, Department of Transportation (Caltrans)*, ARCADIS, December 2010).

Figure 1: Project Location

Mission Creek is a 7.5 mile-long perennial stream that drains an approximately 11.5-square-mile (7,786-acre) watershed on the south slope of the Santa Ynez Mountains. Its headwaters originate below the crest of the Santa Ynez Mountains, flanked by La Cumbre Peak (3,985 feet above mean sea level (msl)) to the west and an eastern ridge reaching over 3,440 feet above msl. Mission Creek and its major tributary, Rattlesnake Creek, descend from the steep slopes above to merge near the Santa Barbara Mission. Gradients above this location are approximately 1,000 vertical feet per mile (*Biological Opinion for Construction and Maintenance of Flood Control Channel on Lower Mission Creek, Santa Barbara County, CA* (F-LB-00-23:KAJ), National Marine Fisheries Service (NMFS), August 2000), and the creek corridor is lined with a dense canopy of riparian woodland and forest. Creek banks in this area have natural sides and support native vegetation, unless modified by private landowners. Trout have been observed in the upper reaches of Mission Creek and Rattlesnake Creek on numerous occasions (NMFS 2000). Along the main branch of Mission Creek there are two manmade impoundments/barriers, the old Mission Dam in the Santa Barbara Botanic Garden, built in 1806, as well as a debris basin and

dam upstream. Rattlesnake Creek also has a less noticeable dam built in 1806 along with a debris dam (ARCADIS, December 2010).

Below the Santa Barbara Mission, the Creek alignment likely follows the naturally incised channel, although that is not now evident. The creek banks and floodplain have been substantially modified for residential, commercial, and industrial purposes, including flood control and highway construction. For example, in order to maintain flood capacity (up to 1,900 cubic feet per second, an 8-year event), the Santa Barbara County Flood Control and Water Conservation District (County) must periodically remove accumulated sediments and obstructive vegetation and debris from this reach of the Creek.

b. *Climate and Meteorological Conditions*

The climate of the Lower Mission Creek project area located in the City of Santa Barbara is Mediterranean, characterized by warm, dry summers and cooler, relatively damp winters. The major influence on the regional climate is the Eastern Pacific High, a strong persistent high-pressure area. Seasonal variations in the position and strength of this system are a key factor in producing weather changes in the area.

Ground-level fog limits visibility to less than one-quarter of a mile on an average of 20 days per year at the Airport (NOAA 1994). These conditions are most frequent during the fall and early winter months.

Due to the moderating effect of the Pacific Ocean and lower elevation, temperatures are less extreme along the coastal sections of the project area compared to more inland locations. Maximum temperatures during the summer months average in the 70s (degrees Fahrenheit) along the coast to the high 80s in the interior valleys. Minimum summer temperatures average in the 50s to low 60s over most of the project area. Maximum temperatures during the winter months average in the 60s. Minimum winter temperatures are usually in the 30s and 40s in the project area.

The prevailing wind flow along the coast of Central California is from the northwest. However, due to the blocking effect of the Santa Ynez Mountains and deflection of these winds around Point Conception, daytime sea breezes are usually from the southeast to southwest along the southern Santa Barbara County coast. Light northeasterly land breezes usually occur at night. These land breezes may extend many miles offshore during the colder months of the year until daytime heating reverses the flow back onshore. High pollutant impacts can occur during these conditions, when pollutants transported offshore at night combine with local emissions onshore the following morning with the onset of the sea breeze.

Another situation that can lead to high pollutant concentrations in the project area results from the buildup of high pressure in the Great Basin and is known as a “Santa Ana” condition. This

condition can produce strong northeast winds in Southern California, but, in general, light southerly winds occur in the project area. Santa Ana conditions frequently transport pollutant-laden air from the Los Angeles urban area to Santa Barbara County. Since stagnant atmospheric conditions often occur in Santa Barbara County during a Santa Ana, local emissions combined with pollutants transported from Los Angeles can lead to significant O3 impacts in the region.

Over 90 percent of the total annual precipitation in the project area occurs from November through April. Annual precipitation is approximately 18 inches at the coast and increases to 30+ inches in the Santa Ynez Mountains. Although the overwhelming majority of precipitation in the project area is produced by winter storm systems from the north Pacific, summer tropical moisture can also produce clouds and rainfall. However, precipitation from tropical air masses is rare and usually occurs only from July through September.

c. *Regulatory Setting*

The federal Clean Air Act (CAA) and its subsequent amendments established air quality regulations and the NAAQS, and delegated enforcement of these standards to the states. In California, the California Air Resources Board (CARB) is responsible for enforcing air pollution regulations. CARB has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agencies. In the project area, the local regulatory air agency is the Santa Barbara County Air Pollution Control District (SBCAPCD).

- *Federal Regulations*

State Implementation Plan

The CAA requires that states prepare a State Implementation Plan (SIP) that details how the federally designated nonattainment areas will achieve the NAAQS. In California, each air district prepares an air quality management plan (AQMP) to incorporate into the state's SIP. SBAPCD developed the 2007 Clean Air Plan, an AQMP, for inclusion into the SIP.

Conformity Rule

Section 176(c) of the CAA states that a federal agency cannot issue a permit for or support an activity unless the agency determines it would conform to the most recent EPA-approved SIP. This means that projects using federal funds or requiring federal approval must not (1) cause or contribute to any new violation of a NAAQS, (2) increase the frequency or severity of any existing violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone (EPA 2010b).

Based on the present NAAQS attainment status of the SCAB, a federal action would conform to the SIP if its annual emissions remain below 100 tons of CO and PM2.5, 70 tons of PM10, and 10 tons of NOX or VOCs (EPA 2010c). These de minimis thresholds apply to the proposed

construction and operation activities pertaining to the federal action. If the proposed action exceeds one or more of the de minimis thresholds, a more rigorous conformity determination is the next step in the conformity evaluation process. SCAQMD Rule 1901 adopts the guidelines of the General Conformity Rule. A comparison of the federal action to the de minimis thresholds is presented in Appendix 5-A.

- *State Regulations*

California Clean Air Act

The California Clean Air Act of 1988, as amended in 1992, outlines a program to attain the CAAQS by the earliest practical date. Because the CAAQS are more stringent than the NAAQS, attainment of the CAAQS will require more emissions reductions than what would be required to show attainment of the NAAQS. Consequently, the main focus of attainment planning in California has shifted from the federal to state requirements. Similar to the federal system, the state requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

- *Regional Regulations*

Santa Barbara County Air Pollution Control District

Through the attainment planning process, SBCAPCD has developed and adopted regional rules and regulations to address stationary sources of air pollution in the air shed. Applicable rules are indicated below:

Rule 303 - Nuisance. This rule states that a person shall not discharge air contaminants from any source that causes injury, detriment, nuisance, or annoyance to any considerable number of persons or that endanger the comfort, repose, health, or safety of any such persons or their business or property. The APCD considers emissions of air pollution to be a significant nuisance if five or more complaints are received from different individuals/ households within 20 hours or 10 such complaints are received within 10 days.

Rule 702 - General Conformity. This rule adopts the Federal conformity rule and includes requirements to enforce mitigation measures used to support a positive conformity determination.

d. *Existing Air Quality*

Table 1 below indicates the SBCAPCD attainment status with respect to state and federal ambient air quality standards.

Table 1: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Period	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone (ppm)	8 hour	0.070	N	0.075	N
	1 hour	0.09	A	Revoked	A
Carbon Monoxide (ppm)	8 hour	9	A	9	A
	1 hour	20	A	35	A
Nitrogen Dioxide (ppm)	8 hour	0.030	A	53	UA
	1 hour	0.18	A	100	UA
Sulfur Dioxide (ppm)	Annual Average	---	---	Revoked	---
	24 hour	0.04	A	Revoked	---
	1 hour	0.25	A	75 ppb	---
Particulate Matter (PM 10, $\mu g/m^3$)	Annual Arithmetic Mean	20	N	Revoked	A
	24 hour	50	N	150	A
Particulate Matter (PM 2.5, $\mu g/m^3$)	Annual Arithmetic Mean	12	U	15	UA
	24 hour	---	---	35	UA
Sulfates ($\mu g/m^3$)	24 hour	25	A		
Lead ($\mu g/m^3$)	Calendar Quarter			1.5	A
	30-day average	1.5	A		---
	Rolling 3-month Average			0.15	U

A=Attainment

N=Nonattainment

U=Unclassified

U/A=Unclassifiable/Attainment

In 2010, Santa Barbara County met the federal standards for all measured pollutants except for the 8-hour ozone standard. The 8-hour ozone standard of 0.075 ppm (75 ppb) was exceeded on 4 days. Santa Barbara County also met the California state standards for all pollutants except for the 8-hour ozone standard and the 24-hour particulate matter less than 10 microns (PM10)

standard. The state 8-hour ozone standard of 0.070 ppm (70 ppb) was exceeded on 7 days. The California state PM10 standard of 50 micrograms per cubic meter (µg/m3) was exceeded on 10 days. The California state arithmetic mean PM10 standard of 20 micrograms per cubic meter (µg/m3) was exceeded at 2 of the 6 stations collecting PM10 data.

- *Ozone*

Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants called precursors. Ozone precursors are mainly reactive organic gases (ROGs) in the form of hydrocarbons, and nitrogen oxides (NOX). ROGs are gaseous forms of reactive organic compounds (ROCs) and do not include methane or other non-reactive methane and ethane derivatives. NOX is the designation given to the group of oxygenated nitrogen species, with nitric oxide (NO) and NO2 being the most commonly occurring compounds in the atmosphere. The major sources of ozone precursor emissions in Santa Barbara County are motor vehicles, the petroleum industry and solvent usage (paints, consumer products and certain industrial processes). Additional information on ozone is provided in the latest CAP.

On December 10, 1997, the USEPA reclassified the Santa Barbara County 1-hour ozone non-attainment area status from "moderate" to "serious." That action precipitated the requirement to establish a Photochemical Assessment Monitoring Station (PAMS) program. Of the three different types of PAMS sites, the SBCAPCD was initially required to install a Type II site on the south coast of Santa Barbara County. The objective of a Type II site is to monitor for maximum ozone precursor emissions.

On August 8, 2003 Santa Barbara County had was re-designated as a Federal ozone attainment area for the 1-hour ozone NAAQS. The USEPA also approved the 1-hour ozone maintenance plan and motor vehicle emissions budgets in the 2001 CAP as revisions to the Santa Barbara portion of the SIP.

The region of influence for ozone may extend much farther downwind than for inert pollutants. In the presence of solar radiation, the maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted and, therefore, many miles from the source. Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentration. Therefore, depending on the meteorological conditions, the region of influence for ozone could include much of Santa Barbara County.

Measured ozone concentrations continue to decline. On an average over the 20 year period from 1988 through 2008, Santa Barbara County experienced between approximately 10 and 42 days per year on which the state ozone standard was exceeded and between approximately 1 to 9 days per year on which the Federal 1-hour standard was exceeded.

- *Particulate Matter*

On July 18, 1997, USEPA revised the primary and secondary air quality standards for particulate matter by establishing annual and 24-hour PM2.5 standards and revising the form of the existing 24-hour PM10 standard. The new standards for PM2.5 are set at 65 ug/m3 for 24-hour and 15 ug/m3 for an annual average.

PM10 levels have been measured consistently at monitoring stations since 1986. Both the state 24-hour and annual PM10 standards are violated in the county. However, the county is in compliance with the Federal 24-hour PM10 standard.

Inhalable particulate matter (PM10) levels exhibit an improving trend. The number of exceedences of the state PM10 standard has declined from a high of 17 in 1989 to only 9 in 1993, 1994 and 1995. In 1986 and 1987, the PM10 monitoring network was incomplete.

e. *Global Climate Change (GCC) and Greenhouse Gases (GHGs)*

Global Climate Change (GCC), particularly with regard to the generation of greenhouse gases (GHGs) for the Lower Mission Creek project, is described below. Worldwide concerns about GCC and GHGs have increased substantially in the past decade.The affected environment and regulatory setting is discussed below on GCC and potential effects that could occur in the U.S., California, Santa Barbara County, and the City of Santa Barbara.

- *Global Climate Change*

Global Climate Change (GCC) is a change in the average climatic conditions of the earth,as characterized by changes in wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. Many of the recent concerns over global climate change use this data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (e.g., the Industrial Age) that differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission projections of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC predicted that the range of global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.4 to 5.8º Celsius (C) [IPCC, 2001]. Regardless of analytical methodology, global average temperature and mean sea level are expected to rise under all scenarios.

Climate models applied to California's conditions project that, under different scenarios, temperatures in California are expected to increase by 3 to 10.5 degrees Fahrenheit (°F) (California Climate Change Center, 2006). Almost all climate scenarios include a continuing trend of warming through the end of the century given the substantial amounts of GHGs already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2006 California Climate Action Team Report, the following

climate change effects are predicted in California over the course of the next century (CALEPA, 2006):

- A diminishing Sierra snowpack declining by 70 to 90 percent, threatening the state's water supply.
- Increasing temperatures, as noted above, of up to approximately 10 °F under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas.
- Coastal erosion along the length of California and seawater intrusion into the Sacramento-San Joaquin Delta (Delta) from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the state's important agricultural industry from limited water shortage, increasing temperatures, and saltwater intrusion into the Delta.
- Increased electricity demand, particularly in the hot summer months.

As such, temperature increases would lead to adverse environmental impacts in a wide variety of areas, including: sea level rise, reduced snowpack resulting in changes to existing water resources, increased risk of wildfires and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality. The potential adverse effects of climate change would affect the entire state, including Santa Barbara County and the City of Santa Barbara.

- *Greenhouse Gases*

Parts of the earth's atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called GHGs. These gases - water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) - all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities such as producing electricity and driving vehicles have elevated the concentration of these gases in the atmosphere. Many scientists believe that these elevated levels, in turn, are causing the earth's temperature to rise. A warmer earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Climate change is driven by "forcings" and "feedbacks." A feedback is "an internal climate process that amplifies or dampens the climate response to a specific forcing." Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. The global warming potential (GWP) is the potential of a gas or aerosol to trap heat in the

atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." Individual GHG species have varying GWP and atmospheric lifetimes. The carbon dioxide equivalent (CO2e) -- the mass emissions of an individual GHG multiplied by its GWP -- is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent metric. The reference gas for GWP is CO2 therefore CO2 has a GWP of 1. Compared to methane's GWP of 21, methane has a greater global warming effect than CO2 on a molecule-per-molecule basis. Table 3.3.2. identifies the GWP of several select GHGs.

- *Applicable Policies and Regulations*

The United States Environmental Protection Agency (USEPA) and the state of California Air Resources Board (CARB) regulate air quality in California. Air Pollution Control Districts or Air Quality Management Districts (APCD and AQMD, respectively) including Santa Barbara County Air Pollution Control District (SBCAPCD) manage air quality at the local level. The following sections describe the regulatory setting at the Federal, state, and local level.

International and Federal Regulations and Directives

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess "the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation."

On March 21, 1994, the United States joined other countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

The USEPA currently does not regulate GHG emissions; however, Massachusetts v. USEPA(549 U.S. 497 [2007]) was argued before the U.S. Supreme Court on November 29, 2006, in which it was petitioned that USEPA regulate four GHGs, including carbon dioxide, under §202(a)(1) of the Clean Air Act. The Court issued an opinion on April 2, 2007, in which it held that petitioners have standing to challenge the USEPA and that the USEPA has statutory authority to regulate emissions of GHGs from motor vehicles. USEPA released a finding on April 17, 2009 that GHGs are hazardous to human health and welfare and that motor vehicles contribute to the atmospheric concentrations of GHGs. USEPA also issued a proposed mandatory reporting rule for GHGs on March 10, 2009, requiring facilities and organizations in certain sectors of the economy and that emit above a certain level of GHGs to report their

emissions on an annual basis to USEPA. Both the GHG endangerment finding and reporting rule were published in the Federal Register in 2009.

On October 30, 2009, the USEPA published the "Final Mandatory Reporting of Greenhouse Gases Rule," which requires all sources from certain sectors, such as fuel suppliers, as well as large industrial sources emitting over 25,000 metric tons carbon dioxide equivalent2 (MTCO2e) to report their annual emissions to USEPA. In order to regulate GHGs under the CAA, the USEPA must finalize their proposed endangerment finding, published on April 17, 2009. The proposed finding does not include any proposed regulations, and before taking any steps to reduce GHGs under the CAA, USEPA would conduct an appropriate process and consider stakeholder input. [Note: "Carbon dioxide equivalent" or "CO2e" means a measure for comparing carbon dioxide with other GHGs, based on the quantity of those gases multiplied by the appropriate global warming potential (GWP) factor and commonly expressed as metric tonnes of carbon dioxide equivalents (MTCO2e)].

On September 30, 2009, USEPA released a proposed rule titled "Prevention of Significant Deterioration/Title V Greenhouse Gas Tailoring Rule" (USEPA, 2009c). The rule would limit GHGs from major industrial sources by setting a threshold of significance of 25,000 MTCO2e for GHGs under the CAA. Also on September 30, 2009, the U.S. Senate released its version of the U.S. House of Representative's American Clean Energy and Security Act (ACESA) (United States Senate 2009). The Senate bill, titled the "Clean Energy Jobs and American Power Act," has two major divisions. The first defines various GHG reduction standards and energy efficiency programs and the second describes a nationwide GHG cap-and-trade program aimed initially at reducing nationwide emissions three percent below 2005 levels by 2012.

In November 2007 and August 2008, the Ninth Circuit U.S. Court of Appeals ruled that a NEPAdocument must contain a detailed GHG analysis. (Center for Biological Diversity v. National Highway Safety Administration 508 F. 3d 508 [2007] was vacated and replaced by Center for Biological Diversity v. National Highway Safety Administration 2008 DJDAR 12954 [August 18, 2008]). Despite the Supreme Court and circuit court rulings, to date there are no promulgated Federal regulations limiting GHG emissions.

State of California Regulations and Directives

Title 24 Energy Standards: Although not originally intended to reduce GHG emissions, California's Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The latest amendments were made in October 2005. The premise for the standards is that energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water

heating) results in GHG emissions. Therefore, increased energy efficiency in buildings results in fewer GHG emissions on a building-by-building basis.

California Assembly Bill No. 1493 (AB 1493): Enacted on July 22, 2002, this bill required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce GHG emissions from the light duty/ passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030, compared to recent years.

Executive Order S-3-05: Former California Governor Arnold Schwarzenegger announced on June 1,2005, through Executive Order S-3-05, GHG emission reduction targets for all of California are as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels.

California Assembly Bill 32 (AB 32): CARB has jurisdiction over several air pollutant emission sources that operate in the state. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management districts to develop stationary source emission standards, issue air quality permits, and enforce permit conditions.

AB 32, titled The California Global Warming Solutions Act of 2006, signed by former Governor Schwarzenegger in September 2006, requires CARB to adopt regulations to require the reporting and verification of statewide GHG emissions and to monitor and enforce compliance with the program. In general, the bill requires CARB to reduce statewide GHG emissions to the equivalent of those in 1990 by 2020. CARB adopted regulations in December 2007 for mandatory GHG emissions reporting and adopted a scoping plan in December 2008 indicating how emission reductions will be achieved. Major rulemakings for reducing GHGs must be developed by January 1, 2011, while the rules and market mechanisms adopted by CARB do not take effect until January 1, 2012. Since CARB is still in the rulemaking process for AB 32, information about project compliance at the state-level is currently not available.

Executive Order S-01-07: This Order was set forth by former Governor Schwarzenegger on January 18, 2007. The Order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least ten percent by 2020. It also requires that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California. The LCFS was adopted by CARB on April 23, 2009.

California Senate Bill 375: Senate Bill 375 (SB 375), signed by the former Governor Schwarzenegger in 2008, requires the CARB to set regional targets for the purpose of reducing greenhouse gas emissions from passenger vehicles, for 2020 and 2035. The Board appointed on January 23, 3009 a Regional Targets Advisory Committee (RTAC) to provide recommendations on factors to be considered and methodologies to be used in the ARB target setting process, as

required under SB 375. The Committee must provide its recommendations in a report to ARB by September 30, 2009.

California Senate Bill 97: Senate Bill 97 (SB 97) requires the Office of Planning and Research (OPR) to prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The California Resources Agency is required to certify and adopt these revisions to the state CEQA Guidelines by January 1, 2010. The Guidelines will apply retroactively to any incomplete environmental impact report, negative declaration, mitigated negative declaration, or other related document.

Executive Order (EO) S-13-08: Given the serious threat of sea level rise to California's water supply and coastal resources and the impact it would have on our state's economy, population and natural resources, former Governor Arnold Schwarzenegger issued an Executive Order (EO) S-13-08 to enhance the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events.

There are four key actions in the EO S-13-08 including: (1) initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009; (2) request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts; (3) issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and (4) initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

Local Regulations

Santa Barbara County Air Pollution Control District (SBCAPCD)

The SBCAPCD 2010 Clean Air Plan has a chapter (Chapter 9) on climate protection that includes climate change. The chapter will be informational, and not regulatory, and will include an inventory of carbon dioxide (CO2) emissions in the county. CO2 is the most prevalent greenhouse gas, and also the one for which the SBCAPCD has the most accurate data.

SBCAPCD public workshop on CEQA and Climate Change

The SBCAPCD staff is in the process of developing a proposal to adopt GHG thresholds of significance for stationary source projects. A public workshop was held on February 24, 2011 in Buellton. The public notice, February 24, 2011workshop presentation, and a list of questions and answers, entitled "CEQA Significance Thresholds for GHGs - Questions and Answers" provides further insight on this topic and can be found on the SBAPCD website http://www.sbcapcd.org/apcd/ceqa-ghg-faq.pdf. As the public review process for consideration and adoption of greenhouse gas thresholds moves forward, additional data and analysis may be

developed, and the information from the February 24 workshop may be revised and/or supplemented.

City of Santa Barbara

The City of Santa Barbara generates a Sustainability Report that discusses the City's efforts, projects, and future investments that include reduction in GHG (City of Santa Barbara, 2011). [http://www.santabarbaraca.gov/Documents/Sustainable_Santa_Barbara/In_the_News/00_Annual_Report/2010-01-01_2010_Sustainability_Achievement_Report.pdf].

4. Construction and Development Projects within Study Area

The City and County of Santa Barbara (Non-Federal Sponsors) have initiated construction, design, and/or regulatory approvals for numerous locations, sited throughout the ~1.0 mile Project reach, in advance of USACE approval of project design modifications occurring during the Project's Pre-construction Engineering and Design (PED) phase. The City and County will likely seek reimbursement for associated expenditures, excluding portions of the Project funded by other Federal entities/sources (e.g., Federal Highways Administration). In summary, these design modifications included: 1) a decrease in proposed channel width by about 5 feet in specific reaches; 2) revised channel wall configuration; 3) refined method of wall construction; 4) pilot channel design; and, 5) structural features for fisheries, and were developed pursuant to the *Value Engineering Study* (USACE, ….. 2003) and the *Channel Design Recommendations, Lower Mission Creek Flood Control Project* (USACE, June 2005).

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i) Reach 1A (County of Santa Barbara, 2011);
ii) Union Pacific Railroad Culvert (City of Santa Barbara, 2009);
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iv) Ortega Street Bridge (City of Santa Barbara, 2011).

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i) Cabrillo Boulevard Bridge (City of Santa Barbara);
ii) Mason Street Bridge (City of Santa Barbara);
iii) Chapala Street Bridge (City of Santa Barbara);
iv) Gutierrez Street Bridge (City of Santa Barbara);
v) Cota Street Bridge (City of Santa Barbara); and,
vi) De La Guerra Street Bridge (City of Santa Barbara).

Figure 3: Current City and County Projects within Lower Mission Creek (Santa Barbara County Flood Control and Water Conservation District, September 2011)

Within the Project reach and its vicinity (0.5 mile upstream, and 0.1 mile downstream to confluence with Pacific Ocean), the following additional (12) projects are on record with Corps Regulatory Division as having been completed between 2000 (date of final EIS/EIR) and present day, are under construction, or are to be constructed in the near future (ordered from upstream to downstream) (*Ombil Regulatory Module (ORM2) Database*, November 2011):

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ii) Santa Barbara County Flood Control & Water Conservation District- routine vegetation and/or sediment removal, maintenance of existing bank protection, culverts, and outfall structures (complete, 2000);

iii) Santa Barbara County Flood Control & Water Conservation District- Santa Barbara County Flood Control & Water Conservation District- routine vegetation and/or sediment removal (complete, 2006);

iv) Private property- installation of approximately 100 linear feet of bank stabilization, including rock riprap, in vicinity of Ortega Street Bridge (complete, 2010);

v) Salvation Army- installation of an outfall pipe and riprap energy dissipator at Hospitality House (complete, 2000);
vi) Caltrans- repair of wingwalls for State Highway 101 Bridge (complete, 2003);
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ix) Private property- installation 100 linear feet of bank stabilization, including gabions, concrete bags, and concrete toe in vicinity of State Highway 101 (complete, ~2000);
x) City of Santa Barbara- replacement of Cabrillo Boulevard Bridge and restoration of adjacent Mission Creek Lagoon (pending);
xi) Santa Barbara Waterfront Department- debris removal and sand grading on West Beach (complete, 2003); and,
xii) City of Santa Barbara- Mission Creek Lagoon Management Plan- minor grading within vicinity of Lagoon (complete, 2006).

References:

Association of Environmental Professionals (AEP), Final Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents, 2007.

1) Brekke, L. D., J. E. Kiang, J. R. Olsen, R. S. Pulwarty, D. A. Raff, D. P. Turnipseed, R. S. Webb, K. D. White, Climate Change and Water Resources Management—A Federal Perspective, USGS Circular 1331, 2009 (http://pubs.usgs.gov/circ/1331/).
2) California Air Resources Board (CARB) Preliminary Staff Report -- Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act. October 24 2004.
3) California Climate Change Center. 2006. Our Changing Climate: Assessing the Risks to California.
4) California Climate Change Center. 2009. The Impacts of Sea Level Rise on the California Coast. Accessed: May 2009. Available at: http://www.pacinst.org/reports/sea_level_rise/report.pdf

5) California Environmental Protection Agency (CALEPA). 2006. 2006 Climate Action Team, Report to Governor Schwarzenegger and the California Legislature, March.

6) "California's Estimated Gross Greenhouse Gas Emissions Without Forestry Or Land Use" (emissions or sinks) as reported by the California Energy Commission (CEC) on January 23, 2007 in Revisions to the 1990 to 2004 Greenhouse Gas Emissions Inventory Report, (CEC-600-2006-013), December 2006.

7) California Governor's Office of Planning and Research (OPR). 2008. CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review. June 19.

8) California Governor's Office of Planning and Research (OPR). 2009. Proposed CEQA Guideline Amendments for Greenhouse Gas Emissions. April 13.

9) "California's Water Crisis", Aquafornia, 2007.

10) City of Santa Barbara, 2007. Circulation Element.

11) City of Santa Barbara, 2011. 2010 Sustainability Achievement Report. http://www.santabarbaraca.gov/Documents/Sustainable_Santa_Barbara/In_the_News/00_Annual_Report/2010-01-01_2010_Sustainability_Achievement_Report.pdf].

12) Environmental Defense Fund, "Southern California Faces Increased Threat from Global Warming", 2001.

13) Federal Register, Volume 74, Number 68, Pages 16609-16731. 2009. Mandatory Greenhouse Gas Reporting Rule. April 10.

14) Federal Register, Volume 74, Number 78, Pages 18886-18910. "Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act", April 24, 2009.

15) Glick, P., B. A. Steinard, N. A. Edelson, (eds), Scanning the Conservation Horizon; A Guide to Climate Change Vulnerability Assessment, National Wildlife Federation, 2011.

16) Greenhouse Gas Reporting Rule, April 10, 2009.

17) Intergovernmental Panel on Climate Change (IPCC), Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, 2001.

18) Intergovernmental Panel on Climate Change (IPCC). 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the ntergovernmental Panel on Climate Change. Section 2Affected Environment/Baseline Conditions, December 2009.

19) Karl, Thomas R., Jerry M. Melillo, and Thomas C. Peterson, (eds), Global Climate Change Impacts in the United States, Cambridge University Press, 2009.

20) Natural Resources Defense Council (NRDC). 2011. "Health Facts. Climate and Your Health: Addressing the most serious health effects of climate change." March 2011. http://www.nrdc.org/health/files/climatehealthfacts.pdf

21) National Weather Service, Available at http://www.nws,noaa.gov

22) Shepherd, Peggy. Cecil Corbin-Mark, (eds.). 2009. "Climate Justice", Environmental Justice, Vol. 2, No. 4, 2009.

23) Shonkoff, Seth B., Rachel Morello – Frosch, Manuel Pastor, and James Sadd, (eds.). 2009." Minding the Climate Gap: Environmental Health and Equity Implications of Climate Change Mitigation Policies in California", Environmental Justice, Vol. 2, No. 4, 2009.

24) U. S. Army Corps of Engineers and Bureau of Reclamation, Addressing Climate Change in Long-Term Water Resources Planning and Management, 2011.

25) U.S. Conference of Mayors, U.S. Conference of Mayors Climate Protection Agreement, 2005, http://www.usmayors.org/climateprotection/agreement.htm

26) USEPA. 2009a. Mandatory Reporting of Greenhouse Gases. EPA-HQ-OAR-2008-0508.

27) USEPA. 2009b. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. EPA-HQ-OAR-2009-0171.

28) USEPA. 2009c. Prevention of Significant Deterioration/Title V Greenhouse Gas Tailoring Rule. EPA-HQ-OAR-2009-0517.

29) US Senate. 2009. Clean Energy Jobs and American Power Act. Available online at:

http://kerry.senate.gov/cleanenergyjobsandamericanpower/pdf/bill.pdf October 6, 2009.

30) White-Newsom, Jalonne, Marie S. O'Neill, et al. (eds.), "Climate Change, Heat Waves, and Environmental Justice: Advancing Knowledge and Action", Environmental Justice, Vol. 2, No.4, 2009.

Document Prepared by: Kirk Brus, Environmental Coordinator

Document Reviewed by: Kenneth Wong, Chief, Regional Planning Section, Planning Division
Tawny Tran, Project Manager, Program and Project Management Division

Cultural Resources

1. Purpose

This report is intended to serve as an update to the Affected Environment, Cultural Resources (Section 18) of the *Lower Mission Creek Flood Control Project Final Environmental Impact Statement/Environmental Impact Report* (EIS/EIR) (U.S. Army Corps of Engineers, September 2000), and includes discussion of cultural resources, construction projects (from recent past to near future), and associated Federal environmental laws, regulations, and policies.

It should be noted that the length of the Lower Mission Creek Flood Control Project (Project) reach has been slightly reduced (0.2 mile) since completion of the Final EIS/EIR, as the City of Santa Barbara has elected to proceed separately with the design, permits, and construction of the downstream-most portion of the Project (State Street to Cabrillo Boulevard, including Cabrillo Boulevard Bridge). Consequently, the revised Project reach is 1.0 mile in length, while the Study Area includes the Project reach and its vicinity (i.e., up to 0.5 mile upstream, and up to 0.2 mile downstream to confluence with Pacific Ocean).

2. Methods

This report contains a compilation of information obtained from various sources on the physical and biological condition of the Project reach for a 15-year time period (1997- present day). Data sources include available literature, field surveys, and database searches ([insert references]), and field visits by Corps cultural resources specialists in [insert date]. In addition, this report contains comparisons between conditions as they existed immediately prior to completion of the FEIS/EIR (1997-2000) and present day conditions.

3. Environmental Setting

a. General Conditions

The Study Area is located along the south coast of Santa Barbara County, with the Pacific Ocean to the south and the Santa Ynez Mountains to the north, a unique geographic alignment found in few places in North America. The Santa Ynez Mountains extend from Point Conception into western Ventura County; high peaks include La Cumbre Peak at 3,995 feet above Mission Canyon and Divide Peak at 4,787 feet elevation close to the Santa Barbara-Ventura County line. Most canyons on the south side of these mountains drain southward to the Pacific Ocean, including Mission Creek (*City of Santa Barbara Mission Creek Bridge Replacements- Natural Environmental Study, State of California, Department of Transportation (Caltrans),* ARCADIS, December 2010).

Figure 1: Project Location

Mission Creek is a 7.5 mile-long perennial stream that drains an approximately 11.5-square-mile (7,786-acre) watershed on the south slope of the Santa Ynez Mountains. Its headwaters originate below the crest of the Santa Ynez Mountains, flanked by La Cumbre Peak (3,985 feet above mean sea level (msl)) to the west and an eastern ridge reaching over 3,440 feet above msl. Mission Creek and its major tributary, Rattlesnake Creek, descend from the steep slopes above to merge near the Santa Barbara Mission. Gradients above this location are approximately 1,000 vertical feet per mile (*Biological Opinion for Construction and Maintenance of Flood Control Channel on Lower Mission Creek, Santa Barbara County, CA* (F-LB-00-23:KAJ), National Marine Fisheries Service (NMFS), August 2000), and the creek corridor is lined with a dense canopy of riparian woodland and forest. Creek banks in this area have natural sides and support native vegetation, unless modified by private landowners. Trout have been observed in the upper reaches of Mission Creek and Rattlesnake Creek on numerous occasions (NMFS 2000). Along the main branch of Mission Creek there are two manmade impoundments/barriers, the old Mission Dam in the Santa Barbara Botanic Garden, built in 1806, as well as a debris basin and dam upstream. Rattlesnake Creek also has a less noticeable dam built in 1806 along with a debris dam (ARCADIS, December 2010).

Below the Santa Barbara Mission, the Creek alignment likely follows the naturally incised channel, although that is not now evident. The creek banks and floodplain have been substantially modified for residential, commercial, and industrial purposes, including flood control and highway construction. For example, in order to maintain flood capacity (up to 1,900 cubic feet per second, an 8-year event), the Santa Barbara County Flood Control and Water Conservation District (County) must periodically remove accumulated sediments and obstructive vegetation and debris from this reach of the Creek.

b. Cultural and Historic Setting

Prehistorically, the Lower Mission Creek project area was inhabited by the Chumash. Various Chumash groups inhabited a territory from San Luis Obispo in the north to Malibu in the south. The Chumash were missionized between 1771 and 1834, which had a devastating effect on their population and native culture. The Chumash and/or other Native American groups would have occupied the area as long ago as 9,000 years before the present.

The Chumash were generally a coastal dwelling people who exploited marine resources for subsistence and other material culture needs. Although they used balsa and plank canoes, most of the marine food sources were obtained near shore, rather than by deep water fishing.

An exhaustive culture history of Native Americans in the area is contained in the Lower Mission Creek Flood Control Project Environmental Impact Statement/Environmental Impact Report and will not be repeated here (USACE 2000).

4. Record and Literature Search

A records and literature search was conducted for the Lower Mission Creek Flood Control Project Environmental Impact Statement/Environmental Impact Report through the Central Coast Information Center (CCIC) at the University of California, Santa Barbara (USACE 2000). This facility is part of the California Historical Resources Information System (CHRIS), which is a statewide system for managing information on prehistoric and historical resources identified in California. It is authorized and directed by the state Office of Historic Preservation (OHP) with eleven regional Information Centers. In-house Corps of Engineers documents were also reviewed.

The information available at the Information Centers consists of hardcopy of both current and historic records and maps. The main body of the information is in individual site record forms, copies of archeological and historical survey reports, and copies of historic maps. Using this information, the location and description of known historic and prehistoric resources can be determined. It also is possible to determine if a field survey has been conducted on a particular

piece of property. An analysis of this information makes it possible to evaluate the potential for resources to be located in areas that have not yet been surveyed. The information also is useful in planning for future studies of an area.

The CCIC conducted a records search for all previously recorded cultural resources sites and surveys within a one-quarter mile radius around the area of potential effects (APE). In addition the CCIC did a search of the following inventories:

- State Historic Property Files
- National Register of Historic Places
- National Register of Determined Eligible Properties
- California Historical Landmarks
- California Points of Historical Interest
- California OHP Archaeological Determinations of Eligibility
- Caltrans State and Local Bridge surveys.

The complete record search is available in the Lower Mission Creek Flood Control Project Environmental Impact Statement/Environmental Impact Report (USACE 2000). This baseline cultural resources report is concerned with the implementation of a revision to the EIS/EIR preferred alternative (alternative 12) within the Project Reach. There were no cultural resources within the APE of this reach eligible for or listed on the National Register of Historic Places (NRHP) (USACE 2000).

Since over a decade has passed since the record search was done, the Corps has requested a new record search from CCIC of the one-quarter mile radius around the APE which will be available upon completion. During the time that has passed since the last record search, the train depot, known historically as the Southern Pacific Train Depot and currently as the Santa Barbara Railroad Station (depot), has been listed on the NRHP (NRHP 2006). The depot building was not in the APE then or now, but as a part of listing the depot on the NRHP, the two small, triangular parks in front of the depot were deemed to be part of the depot and the corner of the park nearest Lower Mission Creek is in the APE and will be impacted. While there have been alterations to the depot itself, mostly interior, the building retains its integrity. The parks, however, fell into disuse and completely lost their integrity. The parks were restored to their original appearance some time before the listing on the NRHP. Since the restoration was only a decade ago, the Corps suggests that while they are part of the listing, they are not contributing elements to the significance of the depot and the corner of the park nearest Lower Mission Creek can be easily restored again after construction.

Other than the depot park, there are no cultural resources within the APE of this reach that are eligible for or listed on the NRHP. The structure at15 West Mason Street was originally recommended as eligible for the California Register of Historic Resources or the City Landmark

or Structure of Merit in the Lower Mission Creek Flood Control Project Environmental Impact Statement/Environmental Impact Report, but has since been determined ineligible (Morlet 2011:10).

5. Native American Concerns

The Corps has also requested an updated Sacred Lands File search and a Native American Contacts List from the California Native American Heritage Commission (NAHC) will also be requested. Records indicate the presence of several Native American cultural resources in the general areas of the project area. The NAHC provided a list of federally recognized and non-federally recognized groups and individuals. These groups and individuals will be contacted to provide their comments and concerns on the project.

6. Significance Criteria

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, cultural resources must be identified and evaluated, effects to historic properties are reduced to acceptable levels through mitigation measures or agreements among consulting and interested parties. Historic properties are those resources that are listed in or are eligible for the NRHP per the criteria paraphrased below (36 CFR 60.4; Advisory Council on Historic Preservation 2000).
The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

i) are associated with events that have made a significant contribution to the broad patterns of our history; or
ii) are associated with the lives of persons significant in our past; or
iii) embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
iv) have yielded, or may be likely to yield, information important in prehistory or history.

Impacts of a project to significant cultural resources that effect the characteristics of any resource that qualify it for the NRHP are considered a significant effect on the environment. Under 36 CFR 800.5(a)(2), adverse effects on historic properties include, but are not limited to:

i) physical destruction of or damage to all or part of the property;
ii) alteration of a property;
iii) removal of the property from it's historic location;
iv) change of the character of the property's use or of physical features within the property's setting that contribute to it's historic significance;
v) introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
vi) neglect of a property, which causes it's deterioration; or
vii) transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

7. Construction and Development Projects within Study Area

The City and County of Santa Barbara (Non-Federal Sponsors) have initiated construction, design, and/or regulatory approvals for numerous locations, sited throughout the ~1.0 mile Project reach, in advance of USACE approval of project design modifications occurring during the Project's Pre-construction Engineering and Design (PED) phase. The City and County will likely seek reimbursement for associated expenditures, excluding portions of the Project funded by other Federal entities/sources (e.g., Federal Highways Administration). In summary, these design modifications included: 1) a decrease in proposed channel width by about 5 feet in specific reaches; 2) revised channel wall configuration; 3) refined method of wall construction; 4) pilot channel design; and, 5) structural features for fisheries, and were developed pursuant to the *Value Engineering Study* (USACE, ….. 2003) and the *Channel Design Recommendations, Lower Mission Creek Flood Control Project* (USACE, June 2005).

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Figure 3: Current City and County Projects within Lower Mission Creek (Santa Barbara County Flood Control and Water Conservation District, September 2011)

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xi) Santa Barbara Waterfront Department- debris removal and sand grading on West Beach (complete, 2003); and,
xii) City of Santa Barbara- Mission Creek Lagoon Management Plan- minor grading within vicinity of Lagoon (complete, 2006).

8. Recommendations

Since no significant cultural resources, other than the depot park, are known to exist within the APE, no further cultural resources investigations are necessary. There will be no adverse effects to historic properties. Due to the possibility that buried resources may exist in the APE because of the close proximity to the creek and the fact that the Chumash village known as *Syuxtun* was excavated nearby producing literally tons of artifacts and 300 burials and other prehistoric sites exist in and near the APE, monitoring is recommended during construction (USACE 2000). The monitoring will be conducted by an archaeologist who meets, at a minimum, the Standards of the Secretary of the Interior, as well as a Native American monitor who can demonstrate descent from the Barbareño Chumash.

9. Environmental laws, regulations, and policies [Insert additional items as necessary for cultural resources]

Please reference EIS/EIR Sections 1.6 for a detailed description of applicable Federal, State, and local law, regulation, and policy. The following listing describes laws, regulations, and policies that have been enacted since completion of the EIS/EIR in 2000:

Executive Order (EO) 13112 - Invasive Species
Section 2(a)(3) of the Act directs federal agencies to not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere.

2007 Clean Air Plan: Santa Barbara County Air Pollution Control District
As approved by the California Air Resources Board, the 2007 Clean Air Plan provides updates to the 2004 Clean Air Plan and prior Plans, as well as the 1991 Air Quality Attainment Plan, as required by the California Clean Air Act. The 2007 Clean Air Plan includes previously adopted air pollution control measures and newly proposed/contingency emission control measures, including controls over ozone emissions.

2007 Storm Water Management Plan (SWMP): City of Santa Barbara
As approved by the Central Coast Regional Water Quality Control Board, The SWMP is a citywide, interdepartmental program that is coordinated and administered by the Creeks Division. The Creeks Division meets regularly with all City departments who are responsible for implementing Best Management Practices (BMPs) and/or who have been assigned specific actions in the SWMP to improve or protect water quality.

References:

1) Morlet, Aubrie 2011 *Replacement of the Mason Street Bridge Over Mission Creek (51C0287), City of Santa Barbara, Santa Barbara County, California.* Prepared by Aubrie Morlet, Applied Earth Works, Inc., Lompoc, California for City of Santa Barbara Public Works Department, Santa Barbara, California.

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Document Reviewed by: Kenneth Wong, Chief, Regional Planning Section, Planning Division
Tawny Tran, Project Manager, Program and Project Management Division

LMCFCP MMRP TEMPLATE - County/City of Santa Barbara
Environmental Compliance Monitoring Program

Week ___			Permit type	Condition No.	Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes *SEE ALSO DAILY MONITORING REPORT*
		Permit condition description			NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																														
BMPs	Erosion	Install/maintain erosion control/sediment detention devices to minimize sediment discharge	RB/NMFS	IV.1.K																										
		Apply erosion control measures to all disturbed earth surfaces, stabilize disturbed soil slopes	RB/ FG	2.33																										
		Use silt fences and/or straw wattles around construction areas to control and eliminate erosion and sedimentation	RB																											
		Sediment collected in erosion control shall be disposed of off-site and will not be allowed to reenter creek channel	NMFS/ACOE	2A/special condition 11																										
	Dust	Cover material transported in haul trucks	EIR/PC	AQ1/PC-D.16																										
		Water site, storage piles and unpaved roads twice each day (AM/PM)	EIR/PC	AQ1/PC-D.12																										
		Water from the stream shall not be used for dust control or other use	FG	2.38																										
		Gravel pads shall be installed at all access points	PC	PC-D.17																										
		Cease grading and earth movement when wind speeds > 15mph	RB/EIR/PC	AQ3/PC-D.15																										
	Spoils	Cover any material stockpiled during construction with plastic	RB/PC	PC-D.18																										
		Any const. materials that could be washed downstream or could be deleterious to aquatic life shall be removed from site prior to inundation by	FG/ACOE	2.32/special condition 11																										
		Permanent spoil storage sites shall not be located within a stream or that could be washed downstream	FG	2.31																										
		Notify ACOE is any accidental spill of hazardous materials occurs within 12 hours of detection	ACOE	special condition 19																										
	Traffic/Noise/ConstrHours	No truck trips between 7-9am and 4-6pm	PC/EIR	PC-D.8, PC-D35/N-2																										
		Construction (including prep work) shall be limited to the "Working Hours" of Section 01200, no weekends/holidays	PC/EIR	PC-D.34, PC-D35/N-1																										
		The construction contractor shall follow the noise ordinance established by the City of Santa Barbara.	PC/EIR	PC-D.36/N-3																										
		Public shall be kept out of the 120 dB peak noise level area during pile installation	PC/EIR	PC-D.41/N-8																										
	Trash	Obey all litter and pollution laws	FG	2.4																										
		No equipment shall be operated in the stream	EIR/PC	BIO-1/PC-D.31																										
		No operation of equipment in wetted areas (ponded/flowing/ wetland) without FG approval	FG	2.16																										
		Stationary equipment located within/adjacent to stream shall be over drip pans	FG	2.42																										
		Speed limit-15mph max	EIR/PC	AQ2/PC-D.14																										
		Heavy-duty diesel-powered construction equipment manufactured after 1996 shall be utilized wherever feasible.	PC	PC-D.22																										
		The engine size of construction equipment shall be the minimum practical size.	PC	PC-D.23																										
		The number of construction equipment operating simultaneously shall be minimized	PC/EIR	PC-D.24/TRAN5																										

Environmental Compliance Monitoring Program

Week ___				Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes
	Permit condition description	Permit type	Condition No.	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	*SEE ALSO DAILY MONITORING REPORT*
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																												
BMPs	Vehicles/ Equipment	Construction equipment shall be maintained in tune per the manufacturer's specifications.	PC	PC-D.25																								
		Constr equipment operating onsite shall be equipped with two to four degree engine timing retard or pre-combustion chamber engines.	PC	PC-D.26																								
		Catalytic converters shall be installed on gasoline-powered equipment, if feasible.	PC	PC-D.27																								
		Diesel catalytic converters, diesel oxidation catalysts and diesel particulate filters shall be installed, if available.	PC	PC-D.28																								
		Diesel powered equipment should be replaced by electric equipment whenever feasible.	PC	PC-D.29																								
		Idling of heavy-duty diesel trucks during loading and unloading shall be limited to five minutes	PC	PC-D.30																								
		Any equipment used during night hours must be less than 50 dBA.	PC/EIR	PC-D.38/N-5																								
		All equipment used in the project shall be equipped with factory standard or better silencing features in proper working condition.	PC/EIR	PC-D.39/N-6																								
		Identify damage caused by construction vehicles and repair damaged facilities.	PC/EIR	PC-D.45/TRAN4																								
		All constr. vehicles and equip. used on site must be well maintained and checked daily for fuel/hydraulic fluid leaks/toxic materials.	RB/NMFS	IV.1.L																								
		Check equipment daily for leaks	FG	2.41																								
		All equipment shall be washed and free of weed seeds prior to delivery to the site.	FG	2.25																								
		No equipment shall be operated within the dripline of oaks. Protective fencing shall be placed around the dripline of oaks.	FG	2.10																								
		Equipment working in wetlands shall be placed on mats (or equivalent) to minimize soil disturbance and compaction.	ACOE	special condition 12 special condition 14																								
	Stage/Fuel/Wash/Maint.	Areas for equipment/vehicle fueling/storage shall be at least 100' from waterways	RB/ACOE																									
		Staging/storage areas for equipment and materials shall be located outside of stream and outside of right of way	FG/PC/NMFS	2.36/PC-D.12/IV.1.J																								
		Refueling of vehicles/equipment shall be in contained designated area, ≥ 100' from waterway	RB																									
		Silt/mud/polluted water from equipment washing or other activity shall not enter the stream	FG/CCC/EIR	2.34/CC-B.5/WQ-5																								
		Check/maintain equipment/vehicles to prevent leaks into stream; not done in or near stream	PC/CCC/FG	PC-D.1/CCC-B5/2.44																								
		The work area shall be flagged or marked to identify its limits within the stream and reservoir. Vegetation shall not be removed or intentionally damaged beyond these limits	FG?ACOE	2.7/special condition 6																								
		Access to the work site shall be via existing roads and access ramps. If no ramps. can construct a temp ramp in the footprint of the project.	FG	2.24																								
		All or any repairs made to structures, shall be of the same design and location.	FG	2.53																								
	Spills	Clean up spills immediately and notify FG for consultation regarding clean-up procedures	FG	2.37																								
		Oil absorbent pads must be onsite in case of spill	RB																									
		Contractor shall develop and implement a spill prevention and remediation plan.	PC/EIR	PC-D.50/WQ2/HAZ																								
		Vacuum trucks/pumps used to clean contamination, etc. shall have hose placed in 3-4 sq ft area, protected by exclusionary fence	FG	2.37																								
	Storm Drain/Culvert	Label storm drains with warnings re no dumping drains to creek/ocean	FG	2.39																								
		Bottoms of culverts shall be at (temporary) or below (temp and perm) stream channel grade	FG	2.27/2.28																								
		Storm drains would be sized to carry peak storm flows; aligned to prevent erosion; have outfall energy dissipater	FG	2.29																								

Environmental Compliance Monitoring Program

Week ___		Permit type	Condition No.	Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes *SEE ALSO DAILY MONITORING REPORT*
				NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																												
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																												
Concrete and Pours	No concrete or concrete type material shall be poured if rain is forecasted within 15 days	FG/NMFS	2.35/3A																									
Vegetation Removal	Disturbance or removal of native vegetation shall not exceed the limits approved by the Department.	FG	2.6																									
	In areas of temp. disturbance, where veg. is removed, native trees and shrubs (DBH of 3 inches or less) shall be cut to ground level by hand or	FG	2.8																									
	No native veg shall be removed from channel, bed or bank of stream except as authorized	FG	2.45																									
	Remove any non-native vegetation (tree tobacco, castor bean, giant cane, cape ivy, periwinkle, etc.) from the work area	FG/ACOE	2.48/special condition 13																									
	Remove all non-native aquatic animals from the work area	FG	2.5																									
	Remove veg. and debris, including sediment and rocks, which directly interfere with the proper function and operation of existing devices	FG	2.51																									
	Herbicides/surfactants shall be aquatic use approved, not permitted where T/E species occur or on native veg unless approved	FG	8, 9, 10, 11																									
	Any native trees removed shall be replaced. Any replacement trees which die within the first five years shall be removed and replaced by the same species from 1-gallon stock. The applicant shall maintain the planted vegetation for the life of the project. Said replacement	PC/EIR	II.F.9/BIO11																									
	Tree Protection Excavation: All excavation on the channel near the Moreton Bay Fig Tree shall be made from the side of the culvert opposite from the Moreton Bay Fig Tree. [BIO-19]	PC/EIR	II.H.4/BIO19																									
	Tree Protection Mulching: Prior to the initiation of culvert construction, remove all turf grass between the edge of the excavation trench and the drip line of the Moreton Bay Fig Tree and mulch the entire area with two-inch deep composted organic mulch to be approved by the City	PC/EIR	II.H.5/BIO20																									
	Install a construction fence as near as possible to the limit of the excavation trench on the Moreton Bay Fig Tree buffer side. No parking or storage of construction equipment would be allowed in the buffer area. [BIO-18]	PC/EIR	II.H.3/BIO18																									
	Herbicide use shall be restricted to the use of Glyphosate AquamasterTM for the elimination of non-native and invasive vegetation located within upland and transitional areas of the project site for purposes of habitat restoration only. No use of any herbicide shall occur during the rainy	CDP	IIII.4																									
	No vegetation removal during migratory bird nesting from Feb 15th through August 31st. Vegetation could be removed during that timeframe if biologist determines there are no nesting birds	ACOE	special condition 9																									
General	Unanticipated Archaeological Resources Contractor Notification. Prior to the start of any vegetation or paving removal, demolition, trenching or grading, contractors and construction personnel shall be alerted to the possibility of uncovering unanticipated subsurface	PC/EIR	II.H.2/CR1																									
	Conditions/permits shall be provided to all contractors, supervisors, subcontractors, etc.	PC																										
Notifications and Submittal	Notify RWQCB when project begins	RB	19																									
	Notify ACOE 30 days prior to construction	ACOE																										
	Notify DFG in writing at least 5 days prior to completion of construction	FG	41																									
	Agencies can go out to the site anytime (make note of visit dates)	ACOE/FG/ RWQCB																										
IN STREAM - INITIATED _____																												
General **Creek work**	Work in creek allowed: 6-15-12/1 (PC/CCC); 5/15/-10/15 (or rainy season for RB) and 5/1-12/15 (FG) and 6/1 to 11/30 (NMFS/ACOE…see condition for upstream Yanonali)	EIR/PC/CCC /RB/FG/NM FS	BIO3/WQ3/PC-D.32-33,51/CCC-B.6/BOIV.1.A																									
	Notify agencies if there are any changes to the permit or violations of the permit immediately																											
	If arch resources are encountered or suspected, work shall be halted immediately, the City shall be notified and the applicant retain an archaeologist	PC/EIR/ACO E	PC-D.2/CR1/Amed ned condition 7																									
	Work in creek shall be performed during periods when the channel is dry or flows are absent or minimal. Work within waterways with perennial flow shall be performed during the driest period of the year and during low flow conditions (May thru October). Standards BMPs apply	ACOE	Special condition 17																									

Environmental Compliance Monitoring Program

Week ___				Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes
Permit condition description			Permit type	Condition No.	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	*SEE ALSO DAILY MONITORING REPORT*
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																													
IN STREAM -																													
Steelhead and Tidewater Goby	**General**	Stop work if T/E species are found within 500 ft of work area and contact FG	FG	2.13																									
		Contact ACOE/NOAA/NMFS /FWS and CDFG if steelhead are found dead/injured or more than 5 tidewater gobies killed or injured	FG/NMFS/FWS	2.21/1C/IV.1.I																									
		No work shall be conducted within the flowing or ponded water within the river, which has potential to support steelhead. Adult steelhead are	FG	2.20																									
		No diversion/other work if steelhead are present	FG/NMFS	2.2/IV.1.F																									
		Biologist shall capture any steelhead located in project area and relocate to suitable in stream habitat in Mission Creek and follow up with monitoring report	NMFS	IV.1.G																									
	Surveys and Reports	Fishery bio will survey prior to any activities (const/diversion/ maintenance), monitor const/ in stream habitat/diversion for adverse affects	FG/NMFS	2.22/1B/IV.1.H																									
		Qual bio will monitor critical times (dewatering, pipe installation); every week at beginning of construction, every other week after completion	EIR	BIO3/PC-D.33																									
		Qualified fishery biologist survey the proposed work area to verify the presence/absence of the tidewater goby.	FG	2.23																									
Water Diversion and Dewatering		No construction shall occur in flowing water, if water is present it shall be diverted	FG/PC	2.46/PC-D.33																									
		Stream turbidity/siltation shall be minimized and methods installed prior to construction	FG/PC/EIR/ACOE	2.43,2.47/PC-D.52 (WQ-																									
		Isolate and dewater only one side of the channel at time to allow normal tidal flushing (differ for upstream Yanonali)	NMFS	1.d																									
		Exclusionary fencing or sheet piling shall be erected to prevent the migration into or the return of species into the work site.	FG	2.15																									
		Any temp dam or other artificial obstruction shall at all times be allowed to pass downstream water to maintain aquatic life below dam.	FG	2.18																									
		Any temp dam shall only be built from materials such as clean gravel/rock/boulders which will cause little or no siltation and pump shall have fish screens/netting	FG/NMFS	2.3/2B																									
		Sand bags shall be filled with clean gravel	RB																										
		Bottoms of culverts shall be at (temporary) or below (temp and perm) stream channel grade	FG	2.27																									
		Structures/materials not designed to withstand high flows shall be removed prior to such flows	FG	2.30																									
		Bio monitor shall isolate the work area upstream with mech size 0.5 inches or less. Do conditioned steelhead survey	NMFS	1.A																									
		Isolate and dewater only one side of the channel at time to allow normal tidal flushing (differ for upstream Yanonali)	NMFS	IV.1.D																									
		Intake on pumps used for water diversion shall be floated to prevent killing of gobies, who live on the estuary bottom	FWS	4																									
		Mesh size on pump intake shall be 1.8 inch or less	FWS	5																									
		Temporary fill in special aquatic sites are not allowed unless approved by ACOE. Temp fills must be removed at end of construction	ACOE	special condition 15																									

Environmental Compliance Monitoring Program

Week ___		Permit type	Condition No.	Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes
	Permit condition description			NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	*SEE ALSO DAILY MONITORING REPORT*
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																												
POST CONSTRUCTION																												
Planting and Seeding	Replace damaged/removed oaks, CA black walnut and sycamore in kind at 10:1 ratio; valley oaks 15:1; elderberry, cottonwood, willows 5:1.	FG	2.10																									
	Provide irrigation when natural moisture conditions are inadequate to ensure survival of plants. Irrigation shall be provided for a period of at least two years from planting.	FG	2.3																									
	Seed entire site with approved grass seed mix and place stabilization erosion control blankets	RB																										
	Any replacement tree stock, which cannot be grown from cuttings or seeds, shall be obtained from a native plant nursery, and shall be ant free.	FG	2.4																									
	Restoration shall include the revegetation and/or reseeding of all stripped or exposed work areas with vegetation native to the area.	FG	2.5																									
	Plant vines on vertical walls and fencing, cover concrete with natural color and texture	EIR	AES2																									
	ACOE shall implement a full re-vegetation plan of at least 120 on channel side slopes and 330 in habitat expansion and hydroseeding with native grass	NMFS	IV.2.F																									Applies to entire LMCFCP
Monitoring and Maintenance	Photograph project site before, during and immediately after project for reference of instream and riparian habitat characteristics	NMWS	IV.2.A																									
	RB requires visual monitoring post const. and after first two rainy seasons. 1st report due 30 days after project completion. Reports 2 and 3 are due at the end of each monitoring year. See permit for details. Similar reporting to ACOE but it is a 45 day requirement	RB/ACOE	Special conditions 20-21																									
	Maintenance may occur when sedimentation or debris in any given reach, exceeds 15% of the flow capacity.	FG	2.52																									
	All maint. shall be done when flows are at the seasons lowest, or under a flood emergency. A bio monitor shall be on site for any maintenance.	FG	2.52																									
	Provide written monitoring report to NMFS withing 15 days following each fish relocation effort	NMFS	IV.4.A																									
	Bio monitor shall provide monitoring report to NMFS within 20 days of completion	NMFS	IV.4.B																									
	County shall complete all maintenance between Aug 1st and Oct 31st in any given year	NMFS	IV.1.C																									
	County shall insure that representative types and sizes of substrate (rocks/boulders) are present in channel following maintenance	NMFS	IV.2.B and C																									
	ACOE/County shall construct a lowflow channel that extends the length of project area and that reflects would be formed thru natural process	NMFS	IV.2.D and E																									
	Five year follow up of results to NMFS on the Streamflow Monitoring Plan. Access whether data yields suitability for steelhead (yearly studies are required by Aug 15th every year)	NMFS	IV.3.B and C/IV.4.E																									Needed for entire implementation of LMCFCP
	After consttuction phase of the project, biologist shall conduct tidewater goby surverys every year for five years (see condition for details). Due Jan 31st every year	FWS	3																									
	Invasive Plants. Invasive weeds (principally giant reed, castor bean, salt cedar, and sweet fennel) shall be removed at least twice a year for the first two years and annually for the next three years following final accentance of contractor contract completion for each phase of the	PC/EIR	II.F.9/BIO10																									
	Vegetation Establishment. A temporary, above ground irrigation system shall be installed and maintained for five years to ensure that planted vegetation is established. [BIO-9]	PC/EIR	II.G.7/BIO9																									
	Routine maintenance shall be accomplished between August 1st and October 31st. A front end loader or road grader working together with dump trucks (10 cubic yards) would be used for the bulk of sediment and vegetation removal	PC	II.I.1.a																									
	A pair of silt curtain fences (straw bales) shall be set across the low flow channel not more than 100 yards downstream of the work area; the fences shall be approximately 10 yards apart.	PC	II.I.1.b																									

Environmental Compliance Monitoring Program

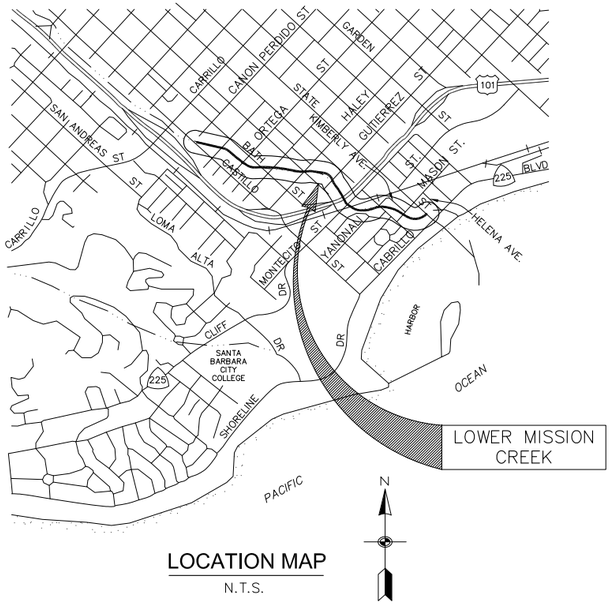
Week ___	Permit condition description	Permit type	Condition No.	Inspection Date					Inspection Date					Inspection Date					Inspection Date					Inspection Date					Notes *SEE ALSO DAILY MONITORING REPORT*
				NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	NA	CM	CO	IN	NC	
GENERAL BMPS, CONCRETE POURS, VEGETATION REMOVAL, and PRE-CREEK SUBMITTALS																												
	Any trout present shall be captured by techniques dictated by National Marine Fisheries Service and California Department of Fish and Game and relocated promptly to a suitable refuge. A written report describing in detail any such relocation shall be submitted to National Marine	PC	II.I.1.c																									
	Mechanized equipment shall enter the creek immediately adjacent to the oxbow. A front end loader would scoop all materials directly from the channel to trucks waiting above adjacent to the railroad lines	PC	II.I.1.d																									
	Sediments and vegetation shall be removed when channel capacity has been reduced by more that 15%. The full width of 33 feet would be cleaned of obstructive materials in the oxbow bypass and would continue to follow current practices. If storm events do not reduce	PC	II.I.1.e																									
	During those maintenance cycles when the County determines silt removal has become necessary, all plants and deposits would be removed. As the final step during maintenance, the pilot channel would be rebuilt following the path where the natural channel had gradually come	PC	II.I.1.f																									
	If sediment removal is not needed the next year, then the other half of the channel shall be mowed and brushed. The pilot channel shall not be disturbed.	PC	II.I.1.g																									
	If storm events of the next winter rains leave enough sediment to warrant their removal, then during the following summer the full width of that section of the creek shall be groomed to remove obstructing sediments and plants. The pilot channel shall be rebuilt where a natural	PC	AES2																									
	Any work shall not cause more than minimal degradation of water quality or changes to flow characteristics of stream, or increased flooding on adj properties	ACOE	Special condition 18																									
Vegetation Reporting	All planting shall have a minimum of 80% survival the first year and 100% survival thereafter and/or shall attain 75% cover after 3 years and 90%	FG	2.2																									
	An annual report shall be submitted to the FG by Jan. 1 of each year for 5 years after planting. Copy ACOE and NMFS and FWS	FG/NMFS	4.1/IV.4.D																									
	Final construction report to FG no later than two weeks after the project is fully completed with total impact areas, # of trees removed or damaged, if any spills occurred, mortality of any species, and if any species were relocated. Copy ACOE and NMFS and FWS	FG/NMFS	4.2/IV.4.C																									
	Yearly for 5 years provide interim monitoring report. See condition for details. (copy all agencies too)	CDP	IIII.4																									
	Final Report. At the end of the five-year period, a final detailed report on the restoration shall be submitted for the review and approval of the Exe Director.	CDP/NMFS	IIII.4/IV.2.G																									
	Monitoring Period and Mid-Course Corrections. During 5 yr monitoring period, all artificial inputs (e.g., irrigation, soil amendments, plantings) shall be removed except for the purposes of providing mid-course corrections or maintenance	CDP	IIII.4																									
	Growth Monitoring. The growth rates of the trees and shrubs planted as a part of this project shall be monitored biannually for five years or until vegetation has been established. If the plants do not meet pre-determined growth and survival rates, actions shall be taken to improve	PC/EIR	II.F.9/BIO12																									
	Performance criteria for on-restoration or revegetation shall be a minimum of 70 percent native cover after 5 years. Or, native vegetation cover after 5 years shall be based on a reference site located within one mile of project site, as approved by ACOE	ACOE	special condition 3																									
Fish Maintenance	Sediments shall be removed from among boulder clusters and large rocks of the side baffles only as needed to prevent them from being covered completely.	PC	II.I.2.a																									
	If necessary, sediments shall be dug from the downstream side of boulders with a backhoe equipped with a 3 foot bucket, then dragged toward the center of the creek to be combined with streambed sediments being removed as described previously.	PC	II.I.2.b																									
	Any individual boulders that might have been dislodged mechanically or displaced by currents would be pushed back into a suitable vacant spot in the baffle and reset.	PC	II.I.2.c																									
	Any propagules of giant reed or salt cedar that have taken root shall be eliminated. A combination of foliar application of glyphosate or digging out rhyzomes with hand tools could be employed. Application of herbicides shall be very limited, confined to only those small locations where the most persistent and aggressive weedy plants begin to reinvade the creek bottom.	PC	II.I.2.d																									
	The remaining growth shall be cut back using a brush hog, or similar mowing attachment passed a couple feet over the tops of the rocks. The intent is to cut down woody species before they attain much height or stem expansion, but not to eradicate low-growing herbaceous plants that offer negligible friction to water currents. [BIO-17]	PC	II.I.2.e																									

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY, CALIFORNIA

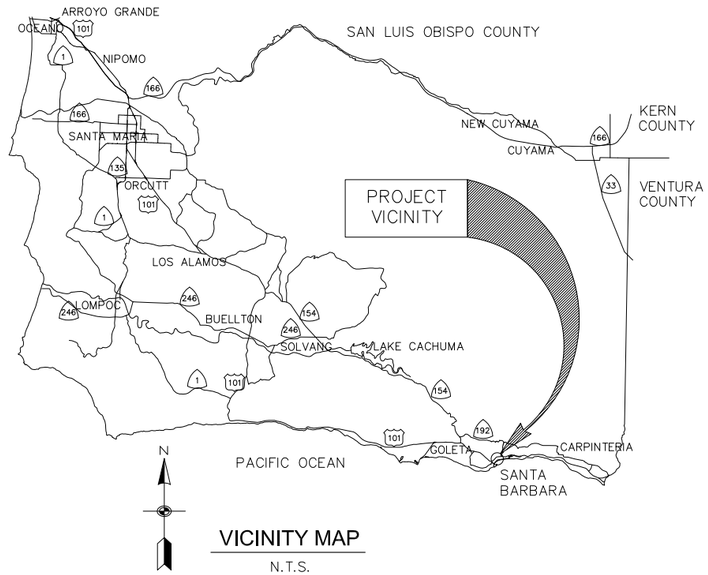
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK

REACH 1B & 3-7
STA. 17+00 TO STA. 24+00
STA. 31+00 TO STA. 61+50



LOCATION MAP
N.T.S.



VICINITY MAP
N.T.S.

SHEET INDEX	SHEET NO.
TITLE	CF-001
NOTES	CF-002
NOTES, SYMBOLS & ABBREVIATIONS	CF-003
HORIZONTAL CONTROL	CF-004
HORIZONTAL CONTROL	CF-005
HORIZONTAL CONTROL	CF-006
HORIZONTAL CONTROL	CF-007
CHANNEL PLAN & PROFILE	CF-108
CHANNEL PLAN & PROFILE	CF-109
CHANNEL PLAN & PROFILE	CF-110
CHANNEL PLAN & PROFILE	CF-111
CHANNEL PLAN & PROFILE	CF-112
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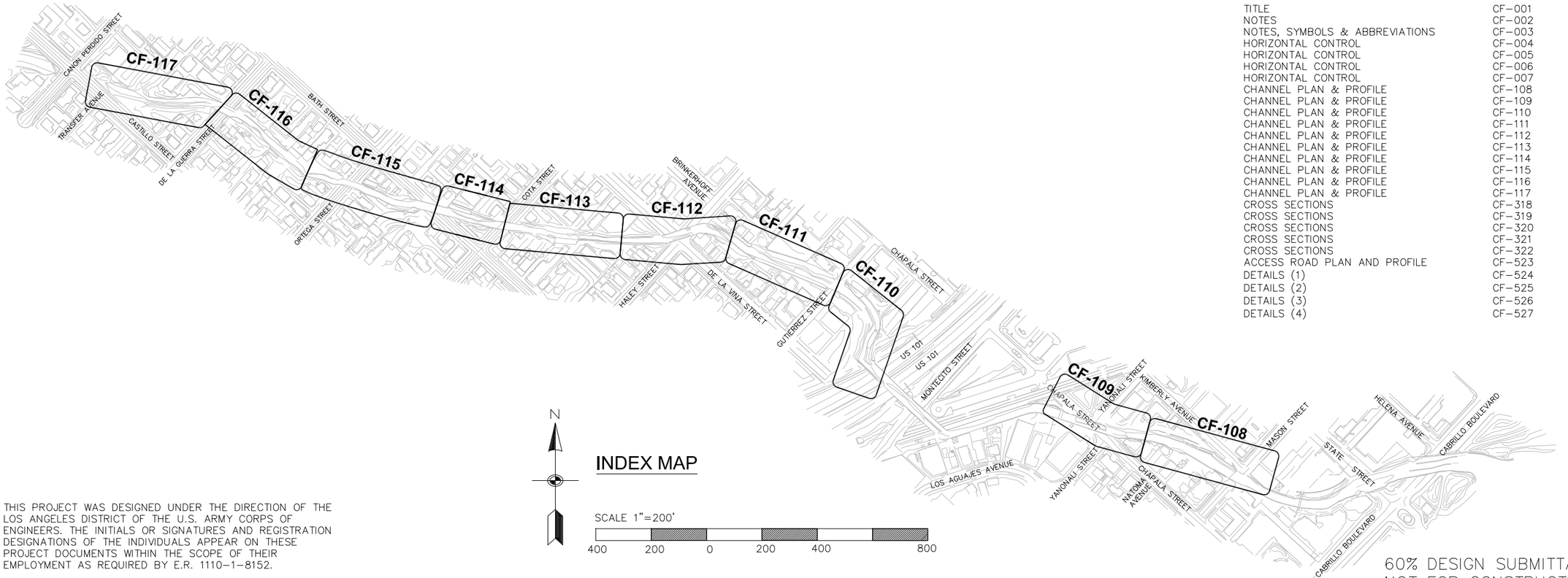
CROSS SECTIONS	CF-318
CROSS SECTIONS	CF-319
CROSS SECTIONS	CF-320
CROSS SECTIONS	CF-321
CROSS SECTIONS	CF-322
ACCESS ROAD PLAN AND PROFILE	CF-523
DETAILS (1)	CF-524
DETAILS (2)	CF-525
DETAILS (3)	CF-526
DETAILS (4)	CF-527



INDEX MAP

SCALE 1"=200'
400 200 0 200 400 800

THIS PROJECT WAS DESIGNED UNDER THE DIRECTION OF THE LOS ANGELES DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF THE INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY E.R. 1110-1-8152.

60% DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

US Army Corps of Engineers

REVISIONS
SYMBOL | DESCRIPTION | DATE | APPR.

DESIGNED BY: A.T. | DRAWN BY: T.W. | CHECKED BY: A.T. | PROJECT ENGINEER
DATE: 09-01-09 | SCALE: AS SHOWN | DWG FILE: 13216CF001TL | DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
LOS ANGELES, CALIFORNIA 90017
TEL. (213)327-0800 FAX. (213)612-0246

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK

TITLE SHEET

SHEET REFERENCE NUMBER:
CF-001
SHEET 1 OF 27

P:\WATR\T24732 LOWER MISSION CREEK\06_DESIGN\T24732CF001.DWG 7/11/2011 9:49 AM

GENERAL NOTES

1. EXISTING UTILITIES INFORMATION WAS ASSEMBLED FROM EXISTING UTILITY COMPANY MAPS.
2. REFERENCE DRAWINGS LISTED ON THE PLANS ARE AVAILABLE TO THE CONTRACTOR (SEE SPECIFICATIONS). THESE REFERENCE DOCUMENTS ARE NOT CONSIDERED EXHAUSTIVE AND COMPLETE, AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT THOROUGH AND COMPLETE RESEARCH ON EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND LOCATION AND SIZE OF UNDERGROUND UTILITIES AS SHOWN ON THE DRAWINGS AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING WORK.
4. ALL FEES AND PERMITS SHALL BE PAID FOR BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL NOTIFY, IN WRITING, ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO EXCAVATION WORK AND CALL DIG ALERT, PRIOR TO COMMENCING WORK.
6. FOR BORING LOGS AND OTHER GEOTECHNICAL INFORMATION, SEE PROJECT GEOTECHNICAL REPORTS BY BENGAL ENGINEERING, INC. DATED JULY, 2011. CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL GEOTECHNICAL REPORT UPDATES.
7. CONTRACTOR IS ADVISED ADDITIONAL WORK BY OTHER CONTRACTORS WILL TAKE PLACE WITHIN AND ADJACENT TO THE PROJECT LIMITS. CONTRACTOR IS TO COORDINATE AND COOPERATE WITH OTHER CONTRACTORS AND GOVERNING AGENCIES AS REQUIRED.
8. SITE SECURITY DURING CONSTRUCTION SHOULD CONSIST OF TEMPORARY FENCING TO BE INSTALLED AND MAINTAINED BY THE CONTRACTOR DURING THE ENTIRE CONSTRUCTION OF THE PROJECT.
9. iT IS THE RESPONSIBILITY OF THE CONTRACTOR TO THOROUGHLY INSPECT ALL ADJACENT STRUCTURES PRIOR TO AND UPON COMPLETION OF CONSTRUCTION PER SPECIFICATION XXXXXXX AND THE CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR ANY DAMAGE OCCURRED.

ENVIRONMENTAL CONTROL AND MAINTENANCE OF SITE CONDITIONS

1. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL AS REQUIRED THROUGHOUT CONSTRUCTION AND INSPECT EROSION CONTROLS ON A MINIMUM WEEKLY BASIS.
2. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION PHASE THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL AND MAKE ANY REPAIRS REQUIRED AS WELL AS CONFIRM THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL WHICH IS SPECIFIC TO ANY CONSTRUCTION PHASE.
3. THE CONTRACTOR'S STAGING AND STORAGE AREA SHALL CONFORM TO ALL EROSION CONTROL DETAILS AND SPECIFICATIONS. IF TEMPORARY DRAINAGE IS REQUIRED WITHIN THE STAGING AND STORAGE AREA IT SHALL CONFORM TO ALL EROSION CONTROL SPECIFICATIONS AND DETAILS AND APPROVED BY THE GOVERNING AGENCY PRIOR TO INSTALLATION.
4. ALL SOILS STORED WITHIN THE CONTRACTOR STAGING AND STORAGE AREA SHALL BE SURROUNDED BY A SINGLE ROW OF STAKED HAY BALES AND COVERED TO PREVENT WIND EROSION.
5. ALL TREE PROTECTION SHALL BE MAINTAINED AND INSPECTED THROUGHOUT CONSTRUCTION.
6. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED AS SOON AS POSSIBLE. CONTRACTOR SHALL WATER AS REQUIRED BY CONTRACT DOCUMENTS TO ASSURE PROPER GROWTH.
7. PRECAUTIONS SHALL BE TAKEN TO PREVENT AND CONTROL DUST FROM CONSTRUCTION OPERATIONS BECOMING A NUISANCE TO ADJACENT AREAS. SURROUNDING STREETS AND WALKWAYS SHALL BE SWEPT AND WASHED CLEAN ON A DAILY BASIS OR AS DIRECTED BY GOVERNING AGENCY. STOCKPILES AND UNSTABILIZED SURFACES SHALL BE KEPT MOIST.
8. CONTRACTOR SHALL MAINTAIN VEHICULAR AND PEDESTRIAN TRAFFIC IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
9. UPON COMPLETION OF TRENCH BACKFILLING OR OTHER INDIVIDUAL ITEMS OF CONSTRUCTION, ALL SURPLUS MATERIALS AND EQUIPMENT NO LONGER NEEDED SHALL BE IMMEDIATELY REMOVED, LEAVING THE CONSTRUCTION SITE AND SURROUNDINGS FREE AND CLEAN.
10. AFTER WORK IS COMPLETE, SEWERS, DRAINS, MANHOLES, CATCH BASINS AND OTHER STRUCTURES SHALL BE CAREFULLY CLEANED OF DIRT, BROKEN MASONARY, MORTAR AND OTHER DEBRIS AND LEFT READY FOR USE.

CONSTRUCTION PHASING

PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL:

3. INSTALL VERTICAL AND HORIZONTAL SURVEY CONTROL IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR SHALL PROVIDE LOCATIONS AND ELEVATIONS OF ALL SURVEY CONTROL IN A ELECTRONIC CAD FORMAT.
4. SUBMIT PLAN OF PROPOSED CONTRACTOR STAGING AND STORAGE AREA FOR REVIEW AND APPROVAL BY GOVERNING AGENCY.
5. SUBMIT FOR APPROVAL A TRAFFIC PLAN SHOWING HOW ALL TRUCK MOVEMENTS TO AND FROM THE SITE ARE TO BE ACCOMPLISHED.
6. REVIEW ALL EXISTING UTILITY INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS AND CONDUCT ALL OTHER ADDITIONAL RESEARCH REQUIRED TO CONFIRM EXISTING UTILITIES. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED.
7. MARK OUT ALL EXISTING UTILITIES ON THE SITE AND COORDINATE WITH EACH UTILITY OWNER OR OPERATOR ON THE WORK THAT WILL AFFECT EACH UTILITY. THE GOVERNING AGENCY SHALL BE NOTIFIED THAT THE UTILITY OWNERS/OPERATORS HAVE BEEN CONTACTED AND SHALL BE PRESENTED FOR ALL SITE MEETINGS.
8. SUBMIT TO THE GOVERNING AGENCY COMPLETE PHASING PLANS FOR REVIEW AND APPROVAL.

SITE PREPARATION AND DEMOLITION

1. CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED MATERIAL AND DEBRIS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS HAVING JURISDICTION.
2. CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ANY AREAS ADJACENT TO AND OUTSIDE THE LIMIT OF WORK WHICH ARE DISTURBED DURING CONSTRUCTION, AT THE CONTRACTOR'S OWN EXPENSE.
3. CONTRACTOR SHALL SAW CUT PAVEMENT WHERE PAVEMENT TO BE REMOVED ABUTS PAVEMENT WHICH IS TO REMAIN.
4. CONTRACTOR SHALL STOCKPILE ALL STRIPPED TOPSOIL OFFSITE.
5. UTILITY SERVICES SHALL BE MAINTAINED TO ALL BUILDINGS BEING OCCUPIED AT ALL TIMES.
6. CONTRACTOR SHALL PROVIDE ADEQUATE DRAINAGE AT ALL TIMES WITHIN THE LIMIT OF WORK. THERE SHALL BE NO PONDING OF WATER OR EROSION OF LANDSCAPED AREAS AT ANY TIME.
7. EXISTING UTILITIES, INDICATED TO REMAIN, SHALL BE PROTECTED IN PLACE, AND MAINTAINED IN GOOD WORKING CONDITION.

LAYOUT

1. THE CONTRACTOR SHALL MAINTAIN ALL HORIZONTAL AND VERTICAL CONTROL THROUGHOUT CONSTRUCTION. ALL INITIAL CONTROL, AS WELL AS ANY ADDITIONAL CONTROL OR RE-ESTABLISHING OF DISTURBED CONTROL, SHALL BE PROVIDED TO THE GOVERNING AGENCY IN ELECTRONIC CAD FORMAT WITHIN 24 HOURS OF THE COMPLETION OF THE WORK. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS RELATED TO ESTABLISHING AND MAINTIANING SURVEY AND LAYOUT CONTROL ON THE SITE.
2. LABELED DIMENSIONS SUPERSEDE SCALED DIMENSIONS FOR ALL LAYOUT WORK.
3. AT ALL LOCATIONS, STATION AND OFFSETS ARE GIVEN TO REVEAL SIDE OF CURB OR EDGE OF PAVEMENT AS APPROPRIATE.
4. ALL LINES ARE PARALLEL OR PERPENDICULAR UNLESS OTHERWISE INDICATED.
5. ALL HORIZONTAL DRAWING DIMENSIONS SHALL BE MEASURED IN A TRUE VERTICAL PLANE, EXCEPT AS OTHERWISE NOTED.

GRADING

1. THE CONTRACTOR SHALL PROVIDE UNIFORM SLOPE BETWEEN SPOT GRADES AND CONTOURS.
2. THE CONTRACTOR SHALL ADJUST ALL EXISTING UTILITY CASTINGS TO LINE AND GRADE, UNLESS OTHERWISED NOTED.

UTILITY

1. CONTRACTOR SHALL VERIFY LOCATIONS, ELEVATIONS AND SIZES OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. CALL 48-HOUR DIG ALERT, A MINIMUM OF TWO (2) FULL WORKING DAYS PRIOR TO EXCAVATING.
2. CONTRACTOR SHALL FIELD VERIFY EXISTING SEWER AND STORM DRAIN ELEVATIONS WHICH MAY REQUIRE POT-HOLING.
3. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.
4. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL UTILITY WORK WITH THE APPROPRIATE GOVERNING AGENCIES.

STRUCTURAL NOTES

1. REINFORCED CONCRETE MEMBERS ARE DESIGNED IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", AMERICAN CONCRETE INSTITUTE, (ACI 318M) STRENGTH DESIGN METHOD.
2. STRUCTURAL STEEL MEMBERS ARE DESIGNED IN ACCORDANCE WITH "MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN", AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
3. DESIGN LOADS: DEAD LOADS/MATERIAL DENSITIES

NORMAL WEIGHT CONCRETE	150 PCF
STRUCTURAL STEEL	490 PCF
BACKFILLED SOIL	120 PCF
WATER AND BUOYANCY	62.4 PCF
ALUMINUM	170 PCF
VEHICULAR LIVE LOADS:	AASHTO HS-20 VEHICLE
	AASHTO HS-25 VEHICLE

4. FOR GEOTECHNICAL DATA, SEE PROJECT GEOTECHNICAL REPORTS FROM BENGAL ENGINEERING, INC. DATED JULY, 2011.
5. ALL DIMENSIONS TO REINFORCING SHOWN ON THE DRAWINGS ARE TO CENTERLINES OF BARS UNLESS OTHERWISE NOTED.

FOUNDATIONS:

1. ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR BACKFILL.
2. BACKFILL SHALL BE PLACED AND COMPACTED ON SIDES OF STRUCTURES SIMULTANEOUSLY IN ACCORDANCE WITH THE SPECIFICATIONS.
3. TOP OF ROCK ELEVATION IS DEFINED BY THE GEOTECHNICAL DATA REPORT AT DISCRETE BORING LOCATIONS ONLY.

CONCRETE

1. STRUCTURAL CONCRETE, INCLUDING ALL PRECAST COMPONENTS, SHALL ATTAIN A 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI AND SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION 03310.
2. PROVIDE A 3/4" CHAMFER AT ALL EXPOSED CONCRETE EDGES UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
3. CONCRETE WORK SHALL BE COORDINATED AND VERIFIED WITH ALL OTHER WORK TO ENSURE PROPER PROVISIONS FOR DOWELS, INSERTS, EMBEDMENTS, PIPING AND MANHOLE REQUIREMENTS PRIOR TO CONCRETE PLACEMENT.
4. CONSTRUCTION JOINTS SHOWN ON THE DRAWINGS SHALL NOT BE OMITTED WITHOUT PRIOR APPROVAL.
5. CONSTRUCTION JOINTS, IN ADDITION TO THOSE SHOWN ON THE DRAWINGS, SHALL NOT BE PERMITTED UNLESS ACCEPTED IN WRITING BY THE GOVERNING AGENCY.

REINFORCEMENT

1. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615, GRADE 60 UNLESS OTHERWISE NOTED.
2. WELDED BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM, A706, GRADE 60.
3. EPOXY-COATED REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A775.
4. THE MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE 2", EXCEPT IT SHALL BE 3" FOR CONCRETE CAST DIRECTLY AGAINST EARTH.
5. SEE STRUCTURAL SPECIFICATIONS FOR SPECIFIC REINFORCEMENT GUIDELINES
6. BARS SHALL BE MECHANICALLY SPLICED WHERE INDICATED ON THE DRAWINGS AND AS OTHERWISE REQUIRED TO ACCOMMODATE CONSTRUCTION SEQUENCING. MECHANICAL SPLICES SHALL DEVELOP 125% OF THE YIELD STRENGTH OF THE BAR.
7. MECHANICAL SPLICES SHALL BE STAGGERED A MINIMUM OF 12" ADJACENT BARS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STREEL FOR BUILDINGS AND THE CODE OF STANDARD PRACTICE FOR BUILDING.
2. ALL STRUCTURAL STEEL SHAPES, PLATES AND BARS SHALL CONFORM TO ASTM 436, YIELD STRENGTH 36 KSI, UNLESS OTHERWISE NOTED. ALL TUBES SHALL CONFORM TO ASTM A500 COLD FORMED, ASTM A501 HOT FORMED, YIELD STRENGTH 50 KSI.
3. ALL WELDING SHALL CONFORM TO ANSI/AWS D1.1-90 "STRUCTURAL WELDING CODE".
4. ALL WELDING SHALL BE DONE BY APPROVED CERTIFIED WELDERS WITH E70XX ELECTRODES. WELDS SHALL DEVELOP THE FULL STRENGTH OF THE MATERIALS BEING CONNECTED UNLESS NOTED OTHERWISE. FILLET WELDS SHALL BE A MINIMUM OF 5mm.

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. | DATE: 07-27-10
DRAWN BY: T.W. | SCALE: AS SHOWN
CHECKED BY: B.H. | DWG FILE:
PROJECT ENGINEER | DATE

U.S. ARMY ENGINEER DISTRICT
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK

NOTES

SHEET REFERENCE NUMBER:
CF-002
SHEET 2 OF 27

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STRUCTURAL STEEL CONT.

5. ALL BOLTS AND RELATED HARDWARE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325 AND SHALL BE IN STANDARD HOLES UNLESS OTHERWISE NOTED.

6. ALL STEEL TO BE INSTALLED IN THE UTILITY CHASE, SHALL BE PREPARED AND FINISHED IN ACCORDANCE WITH SPECIFICATION 05501.

7. ALL ANCHOR BOLTS AND RELATED HARDWARE SHALL BE ASTM F1554, YIELD STRENGTH 55KSI, UNLESS OTHERWISE NOTED.

8. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED.

CONSTRUCTION-RELATED MITIGATION MEASURES:

1. WATER RESOURCES

1.1. THE CONSTRUCTION CONTRACTOR SHALL COMPLY WITH SECTION 402 OF "CLEAN WATER ACT" AND OBTAIN A "NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM" (NPDES) PERMIT. A STORM-WATER POLLUTION PREVENTION PLAN SHALL BE PREPARED TO MEET STATE REQUIREMENTS.

1.2. THE CREEK CHANNEL UPSTREAM OF CONSTRUCTION ACTIVITY SHALL BE DAMMED TEMPORARILY TO PREVENT WATER FROM ENTERING THE REACH UNDER CONSTRUCTION. A COFFERDAM WILL BE CONSTRUCTED TO DIVIDE THE CREEK LONGITUDINALLY TO PROVIDE A "DRY" WORK AREA AND TO MAINTAIN FLOW IN THE OTHER HALF OF THE CREEK AS DESCRIBED BELOW:

DIVERSION AND HANDLING OF STREAM

THE FOLLOWING CONSTRUCTION REQUIREMENTS ARE EXCERPTED FROM "APPENDIX A", BIOLOGICAL ASSESSMENTS LOWER MISSION CREEK FLOOD CONTROL PROJECT SANTA BARBARA, CALIFORNIA" PREPARED BY US ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT, JUNE 2000:

A. CONSTRUCTION BETWEEN CABRILLO BOULEVARD AND YANONALI STREET:

A.1. NO CONSTRUCTION WORK ANYWHERE IN THE ESTUARY IN REACH 1A BETWEEN STATE STREET AND MASON STREET FROM MID-DECEMBER TO MID-JUNE;

A.2. DIVIDE A SUITABLE LENGTH OF THE ESTUARY DOWN THE MIDDLE WITH AN IMPERMEABLE BARRIER, PERHAPS SHEET PILING. THE LENGTH SHOULD BE AS LONG AS PRACTICABLE TO MINIMIZE REPETITION OF THIS DIVIDE AND DRY PROCEDURE FOR MAKING TEMPORARY CONSTRUCTION ENCLOSURES. A LATERAL COFFERDAM IN MID-STREAM SHALL NOT BE ACCEPTABLE BECAUSE OF TURBIDITY AND FINE SEDIMENTS THAT WOULD BE CONVEYED DOWNSTREAM TO THE COASTAL LAGOON.

A.3. DAM HALF THE ESTUARY AT THE UPPER END OF THE CENTER-LINE BARRIER WITH SHEET PILING;

A.4. QUALIFIED COUNTY BIOLOGISTS WALK DOWNSTREAM IN A ZIGZAG PATTERN TO HERD AS MANY FISH AS POSSIBLE FROM THE INCIPIENT ENCLOSURE;

A.5. DAM THE LOWER END OF THE ENCLOSURE WITH SHEET PILING IMMEDIATELY AFTER FISH ARE HERDED DOWNSTREAM;

A.6. COUNTY FISH BIOLOGISTS SEINE THE ENTIRE CONFINED HALF THOROUGHLY TO REMOVE ANY GOBIES AND OTHER LARGE ORGANISMS TO THE ESTUARINE WATER FLOWING BY OUTSIDE THE CONSTRUCTION ENCLOSURE AFTER THE FISH IS HERDED DOWNSTREAM;

A.7. COMMENCE PUMPING WATER FROM THE ENCLOSURE WITH INTAKES TO THE PUMP FITTED WITH 1/8" OR LESS MESH SCREENS;

A.8. COUNTY FISH BIOLOGISTS MONITOR THE DRYING ENCLOSURE AND SEINE IT THOROUGHLY AT LEAST TWICE A WEEK.

A.9. WHEN CONSTRUCTION ON ONE SIDE HAS BEEN COMPLETED, THE DOWNSTREAM WALL OF THE ENCLOSURE SHALL BE REMOVED FIRST, FOLLOWED BY THE UPPER END;

A.10. REPETITION OF THE STEPS ABOVE ON THE OPPOSITE BANK

A. THESE CRITERIA MEAN THAT CHANNEL CONSTRUCTION IN THE ESTUARY CAN ONLY BE DONE DURING THE PERIOD FROM MID JUNE TO MID DECEMBER.

C. IN ORDER TO EXECUTE THIS PLAN FOR CONTROL OF THE STREAM IT WILL BE NECESSARY TO INSTALL LONG LENGTHS OF STEEL OR VINYL SHEET PILING (POSSIBLY 30 – 40 FT). THESE LENGTHS OF SHEET PILING WILL BE NECESSARY TO DRIVE THE SHEET PILING DEEP ENOUGH TO CUT OFF UNDER FLOW INTO THE WORK AREA, ESPECIALLY AT HIGH TIDE. THIS WILL PUT THE BOTTOM OF THE CUT-OFF ABOUT 20 TO 30 FEET BELOW THE BOTTOM OF THE STREAM BED. THE TOP OF THE COFFERDAM SHOULD BE AT ELEVATION 14 TO 15 FEET.

1.4 HAZARDOUS TOXIC AND RADIOACTIVE WASTE (HTRW)

1.4.1 CONSTRUCTION EQUIPMENT SHALL BE KEPT IN PROPER WORKING CONDITION AND INSPECTED FOR LEAKS AND DRIPS ON A DAILY BASIS PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL DEVELOP, SUBMIT, AND IMPLEMENT A SPILL PREVENTION AND REMEDIATION PLAN AND WORKERS SHALL BE INSTRUCTED AS TO ITS REQUIREMENTS. CONSTRUCTION SUPERVISORS AND WORKERS SHALL BE INSTRUCTED TO BE ALERT FOR INDICATIONS OF EQUIPMENT-RELATED CONTAMINATION SUCH AS STAINS AND ODORS. CONSTRUCTION SUPERVISORS AND WORKERS SHALL BE INSTRUCTED TO RESPOND IMMEDIATELY WITH APPROPRIATE ACTIONS AS DETAILED IN THE SPILL PREVENTION AND REMEDIATION PLAN IF INDICATIONS OF EQUIPMENT-RELATED CONTAMINATION ARE NOTED.

1.4.3 PRIOR TO THE COMMENCEMENT OF EXCAVATION ACTIVITIES, SAMPLES OF CREEK SEDIMENTS SHALL BE TAKEN TO THE DEPTH OF PLANNED EXCAVATION AND THE SAME SUITE OF ANALYSES USED TO CHARACTERIZE THE SHALLOW SEDIMENTS WOULD BE USED TO ANALYZE THE DEEP SEDIMENTS. IN THE EVENT ACTIONABLE CONCENTRATIONS OF CONTAMINANTS ARE DETECTED BY THE ANALYSES, THE APPLICANT SHALL DEVELOP A PLAN TO IDENTIFY THE EXTENT OF CONTAMINATION. A PLAN SHALL THEN BE DEVELOPED AND IMPLEMENTED TO COMPLY WITH APPLICABLE LAWS AND REGULATIONS RELATED TO THE IDENTIFIED CONTAMINATION SO THAT EXCAVATION ACTIVITIES DO NOT RESULT IN RELEASES OF ACTIONABLE LEVELS OF HAZARDOUS MATERIALS TO THE ENVIRONMENT.

ABBREVIATIONS

ABAND.	ABANDONED
ABC	AGGREGATE BASE COURSE
AC	ASPHALTIC CONCRETE
APPROX	APPROXIMATE
AVE	AVENUE
BC	BEGIN CURVE
BLDG	BUILDING
CL	CENTERLINE
C	CURVE DATA
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CH	CHANNEL
C.J.	CONSTRUCTION JOINT
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
COE	CORPS OF ENGINEERS
CONC	CONCRETE
CONST.	CONSTRUCT
CY	CUBIC YARD
DIA	DIAMETER
DR	DRIVE
E	EAST, EASTING
EA	EACH
EC	END CURVE
EG	EXISTING GRADE
EL	ELEVATION
EX	EXISTING
EOP	EDGE OF PAVEMENT
FG	FINISH GRADE
FL	FLOWLINE
FS	FINISH SURFACE
FT	FEET
FWY	FREEWAY
GALV	GALVANIZED
GB	GRADE BREAK
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HOR	HORIZONTAL
HT	HEIGHT
INV	INVERT ELEVATION
L	LINE DATA
LBS	POUNDS
LF	LINEAR FEET
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MWD	METROPOLITAN WATER DISTRICT
N	NORTH, NORTHING
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NTS	NOT TO SCALE
OC	ON CENTER
PED	PEDESTRIAN
PERF.	PERFORATED
PCC	POINT OF COMPUND CURVE
PI	POINT OF INTERSECTION
PIP	PROTECT IN PLACE
PRC	POINT OF REVERSE CURVE
PROP	PROPOSED
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RET	RETAINING
ROW	RIGHT-OF-WAY
S=	SLOPE
S	SOUTH
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FEET
SHT	SHEET
SS	SANITARY SEWER
STA	STATION
STD	STANDARD
STR	STRUCTURE
TBD	TO BE DETERMINED
TF	TOP OF FOOTING
TOB	TOP OF BANK
TOW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
VERT	VERTICAL
VLF	VERTICAL LINEAR FEET
W	WEST
WS	WATER SURFACE

LEGEND & SYMBOLS

- G — GAS
- IRR — IRRIGATION
- UT — UNDERGROUND TELEPHONE
- UE — UNDERGROUND ELECTRIC
- W — WATER
- SD — STORM DRAIN
- SS — SANITARY SEWER
- CENTERLINE
- EXISTING
- ABANDONED IN PLACE
- CONTOUR GRADE LINE
- RIP-RAP
- PROPOSED CONCRETE
- SOIL
- WATER SURFACE
- SLOPE
- CENTERLINE
- FIRE HYDRANT
- SDMH STORM DRAIN MANHOLE
- SSMH SANITARY SEWER MANHOLE
- TMH TELEPHONE MANHOLE
- EMH ELECTRICAL MANHOLE
- 985 EXISTING ELEVATION
- RIGHT-OF-WAY (R/W)
- CENTER LINE/CONTROL LINE
- TCE — TEMPORARY CONSTRUCTION EASEMENT (TCE)
- LIMITS OF CONSTRUCTION
- (1) LINE DATA CALLOUT

US Army Corps of Engineers

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SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. | DATE: 07-27-10
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
NOTES, SYMBOLS, & ABBREVIATIONS

SHEET REFERENCE NUMBER:
CF-003
SHEET 3 OF 27

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CHANNEL CONTROL LINE	①	②	③	④	⑤	⑥	⑦	⑧
BEGINNING STATION	17++00.00	18+10.78	18+66.17	19+53.73	20+43.96	20+88.54	23+46.78	23+88.86
BEGINNING NORTHING	1976780.63	1976833.81	1976859.05	1976896.77	1976924.77	1976935.85	1977015.85	1977036.79
BEGINNING EASTING	6051666.12	6051568.94	6051519.64	6051440.63	6051355.11	6051311.96	6051066.42	6051030.28
ENDING STATION	18+10.78	18+66.17	19+53.73	20+43.96	20+88.54	23+46.78	23+88.86	24+80.43
ENDING NORTHING	1976833.81	1976859.05	1976896.77	1976924.77	1976935.85	1977015.85	1977036.79	1977098.25
ENDING EASTING	6051568.94	6051519.64	6051440.63	6051355.11	6051311.96	6051066.42	6051030.28	6050962.40
LINE BEARING	N61°18'29"W	–	N64°28'55"W	–	–	N71°57'14"W	–	N47°50'40"W
CURVE DELTA	–	3°10'26"	–	14°46'15"	03°10'26"	–	24°06'35"	–
LENGTH	110.78	55.39	87.56	90.23	44.59	258.24	42.08	91.56
CURVE RADIUS	–	1000	–	350	350	–	100	–
CURVE TANGENT	–	27.70	–	45.37	22.32	–	21.36	–
CURVE CHORD	–	55.39	–	89.98	44.56	–	41.77	–
PI STATION	–	19+38.48	–	19+99.09	20+66.28	–	23+68.14	–
PI NORTHING	–	1976847.11	–	1976916.31	1976928.93	–	1977015.85	–
PI EASTING	–	6051544.64	–	6051399.68	6051333.18	–	6051066.42	–

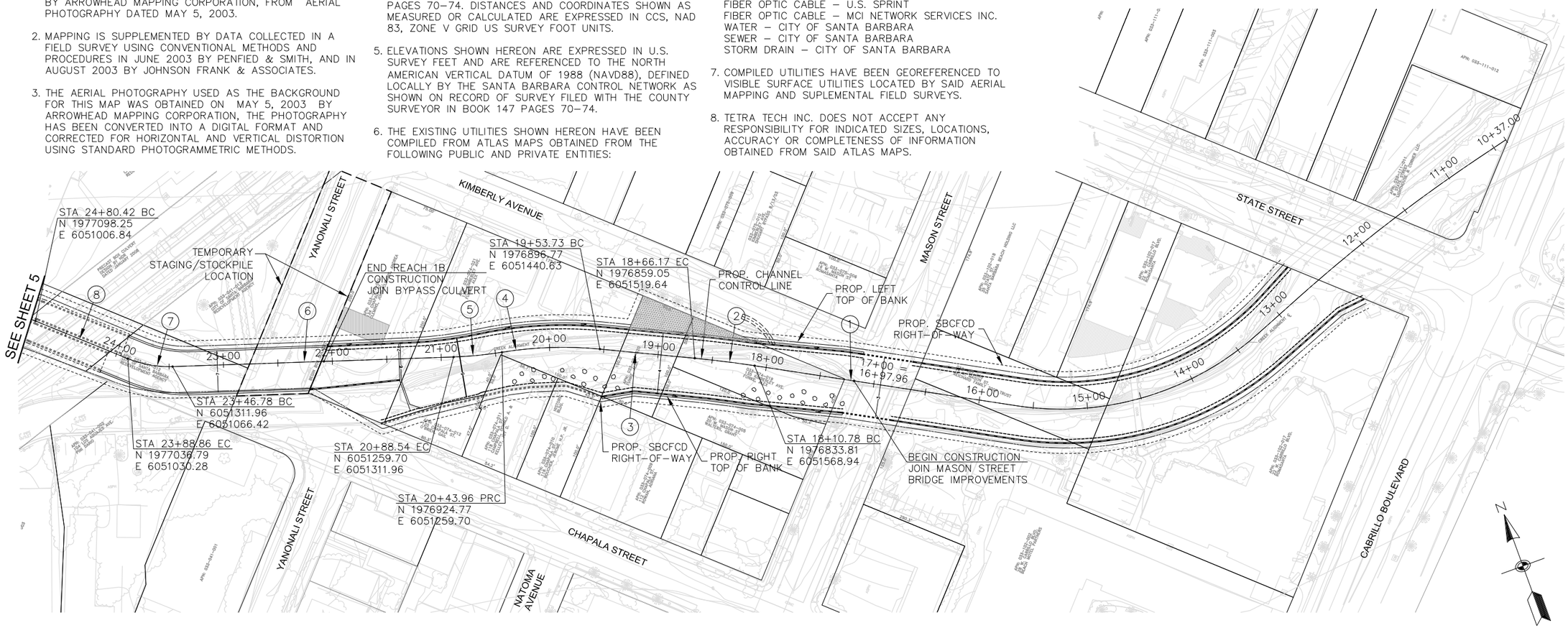
SURVEY CONTROL

1. TOPOGRAPHIC MAPPING WAS COMPILED AT A SCALE OF 1"=200', WITH A 1 FOOT CONTOUR INTERVAL, USING STANDARD PHOTOGRAMMETRIC METHODS AND PROCEDURES BY ARROWHEAD MAPPING CORPORATION, FROM AERIAL PHOTOGRAPHY DATED MAY 5, 2003.
2. MAPPING IS SUPPLEMENTED BY DATA COLLECTED IN A FIELD SURVEY USING CONVENTIONAL METHODS AND PROCEDURES IN JUNE 2003 BY PENFIED & SMITH, AND IN AUGUST 2003 BY JOHNSON FRANK & ASSOCIATES.
3. THE AERIAL PHOTOGRAPHY USED AS THE BACKGROUND FOR THIS MAP WAS OBTAINED ON MAY 5, 2003 BY ARROWHEAD MAPPING CORPORATION, THE PHOTOGRAPHY HAS BEEN CONVERTED INTO A DIGITAL FORMAT AND CORRECTED FOR HORIZONTAL AND VERTICAL DISTORTION USING STANDARD PHOTOGRAMMETRIC METHODS.
4. BEARINGS SHOWN ON THIS MAP ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM, NAD 83, ZONE 5 GRID (EPOCH 1991.35), DEFINED LOCALLY BY THE SANTA BARBARA CONTROL NETWORK AS SHOWN ON RECORD OF SURVEY FILED WITH THE COUNTY SURVEYOR IN BOOK 147 PAGES 70–74. DISTANCES AND COORDINATES SHOWN AS MEASURED OR CALCULATED ARE EXPRESSED IN CCS, NAD 83, ZONE V GRID US SURVEY FOOT UNITS.
5. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN U.S. SURVEY FEET AND ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), DEFINED LOCALLY BY THE SANTA BARBARA CONTROL NETWORK AS SHOWN ON RECORD OF SURVEY FILED WITH THE COUNTY SURVEYOR IN BOOK 147 PAGES 70–74.
6. THE EXISTING UTILITIES SHOWN HEREON HAVE BEEN COMPILED FROM ATLAS MAPS OBTAINED FROM THE FOLLOWING PUBLIC AND PRIVATE ENTITIES:

ELECTRIC – SOUTHERN CALIFORNIA EDISON COMPANY
GAS – SOUTHERN CALIFORNIA GAS COMPANY
CATV – COX COMMUNICATIONS
TELEPHONE COMMUNICATIONS – VERIZON
FIBER OPTIC CABLE – AT&T
FIBER OPTIC CABLE – U.S. SPRINT
FIBER OPTIC CABLE – MCI NETWORK SERVICES INC.
WATER – CITY OF SANTA BARBARA
SEWER – CITY OF SANTA BARBARA
STORM DRAIN – CITY OF SANTA BARBARA

7. COMPILED UTILITIES HAVE BEEN GEOREFERENCED TO VISIBLE SURFACE UTILITIES LOCATED BY SAID AERIAL MAPPING AND SUPLEMENTAL FIELD SURVEYS.
8. TETRA TECH INC. DOES NOT ACCEPT ANY RESPONSIBILITY FOR INDICATED SIZES, LOCATIONS, ACCURACY OR COMPLETENESS OF INFORMATION OBTAINED FROM SAID ATLAS MAPS.

BUILDING STRUCTURE TO BE REMOVED PRIOR TO CONSTRUCTION



US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY:	A.T.	DATE:	07-27-10
DRAWN BY:	T.W.	SCALE:	AS SHOWN
CHECKED BY:	B.H.	DWG FILE:	
PROJECT ENGINEER		DATE	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
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LOS ANGELES, CALIFORNIA 90017
TEL. (213)327-0800 FAX. (213)612-0246

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK

HORIZONTAL CONTROL

SHEET REFERENCE NUMBER: CF-004

SHEET 4 OF 27

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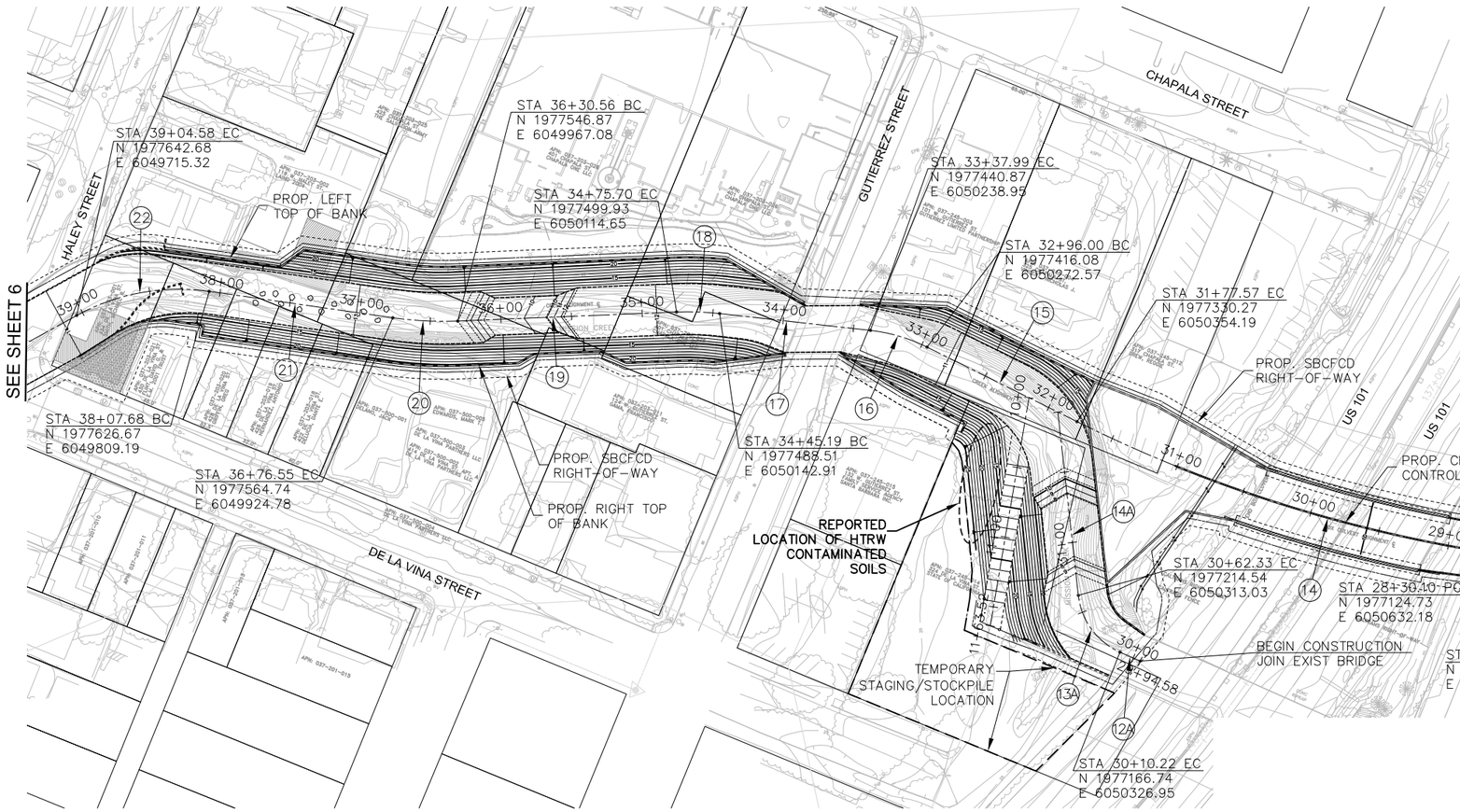
CHANNEL CONTROL LINE

	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒
BEGINNING STATION	24+80.43	25+71.27	26+35.24	27+04.90	27+80.28	28+30.10	31+77.56	32+96.00	33+37.99	34+45.19	34+75.70	36+30.55	36+76.54	38+07.68
BEGINNING NORTHING	1977098.25	1977112.63	1977087.74	1977084.23	1977106.28	1977124.73	1977330.27	1977416.08	1977440.87	1977488.51	1977499.93	1977546.87	1977564.74	1977626.67
BEGINNING EASTING	6050962.40	6050877.58	6050818.65	6050750.48	6050678.39	6050632.18	6050354.19	6050272.57	6050238.95	6050142.91	6050114.65	6049967.08	6049924.78	6049809.19
ENDING STATION	25+71.27	26+35.24	27+04.90	27+80.28	28+30.10	31+77.56	32+96.00	33+37.99	34+45.19	34+75.70	36+30.56	36+76.54	38+07.67	39+04.57
ENDING NORTHING	1977112.63	1977087.74	1977084.23	1977106.28	1977124.73	1977330.27	1977416.08	1977440.87	1977488.51	1977499.93	1977546.87	1977564.74	1977626.68	1977642.68
ENDING EASTING	6050877.58	6050818.65	6050750.48	6050678.39	6050632.18	6050354.19	6050272.57	6050238.95	6050142.91	6050114.65	6049967.08	6049924.78	6049809.19	6049715.32
LINE BEARING	–	N67°05'49"E	–	N72°59'27"W	–	–	N43°34'04"W	–	N63°37'01"W	–	N72°21'30"W	–	N61°49'06"W	–
CURVE DELTA	65°03'31"	–	39°54'44"	–	09°30'54"	19°54'29"	–	20°02'58"	–	08°44'29"	–	10°32'24"	–	37°00'40"
LENGTH	90.84	63.98	69.66	75.38	49.82	347.46	118.43	41.99	107.20	30.51	154.86	45.99	131.14	96.89
CURVE RADIUS	80	–	100	–	300	1000	–	120	–	200	–	250	–	150
CURVE TANGENT	51.02	–	36.31	–	24.97	175.50	–	21.21	–	15.29	–	23.06	–	50.21
CURVE CHORD	86.04	–	68.26	–	49.76	345.72	–	41.78	–	30.48	–	45.92	–	95.22
PI STATION	25+31.45	–	26+71.55	–	28+05.25	30+05.60	–	33+17.21	–	34+60.47	–	36+53.61	–	38+57.89
PI NORTHING	1977132.49	–	1977073.61	–	1977113.58	1977203.11	–	1977431.45	–	1977495.30	–	1977553.85	–	1977650.39
PI EASTING	6050924.58	–	6050785.20	–	6050654.52	6050475.15	–	6050257.95	–	6050129.22	–	6049945.10	–	6049764.93

CHANNEL CONTROL LINE

	⑫A	⑬A	⑭A
BEGINNING STATION	29+94.58	30+10.22	30+62.33
BEGINNING NORTHING	1977155.89	1977166.74	1977214.54
BEGINNING EASTING	6050338.22	6050326.95	6050313.03
ENDING STATION	30+10.22	30+62.33	31+92.71
ENDING NORTHING	1977166.74	1977214.54	1977341.25
ENDING EASTING	6050326.95	6050313.03	6050343.75
LINE BEARING	N45°05'22"W	–	N13°37'30"E
CURVE DELTA	–	59°42'52"	–
LENGTH	15.64	52.11	130.38
CURVE RADIUS	–	50.00	–
CURVE TANGENT	–	28.70	–
CURVE CHORD	–	49.78	–
PI STATION	–	30+38.92	–
PI NORTHING	–	1977186.64	–
PI EASTING	–	6050306.27	–



US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY:	A.T.
DRAWN BY:	T.W.
CHECKED BY:	B.H.
DATE:	07-27-10
SCALE:	AS SHOWN
DWG FILE:	
PROJECT ENGINEER	DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
HORIZONTAL CONTROL

SHEET REFERENCE NUMBER:
CF-005
SHEET 5 OF 27

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CHANNEL CONTROL LINE

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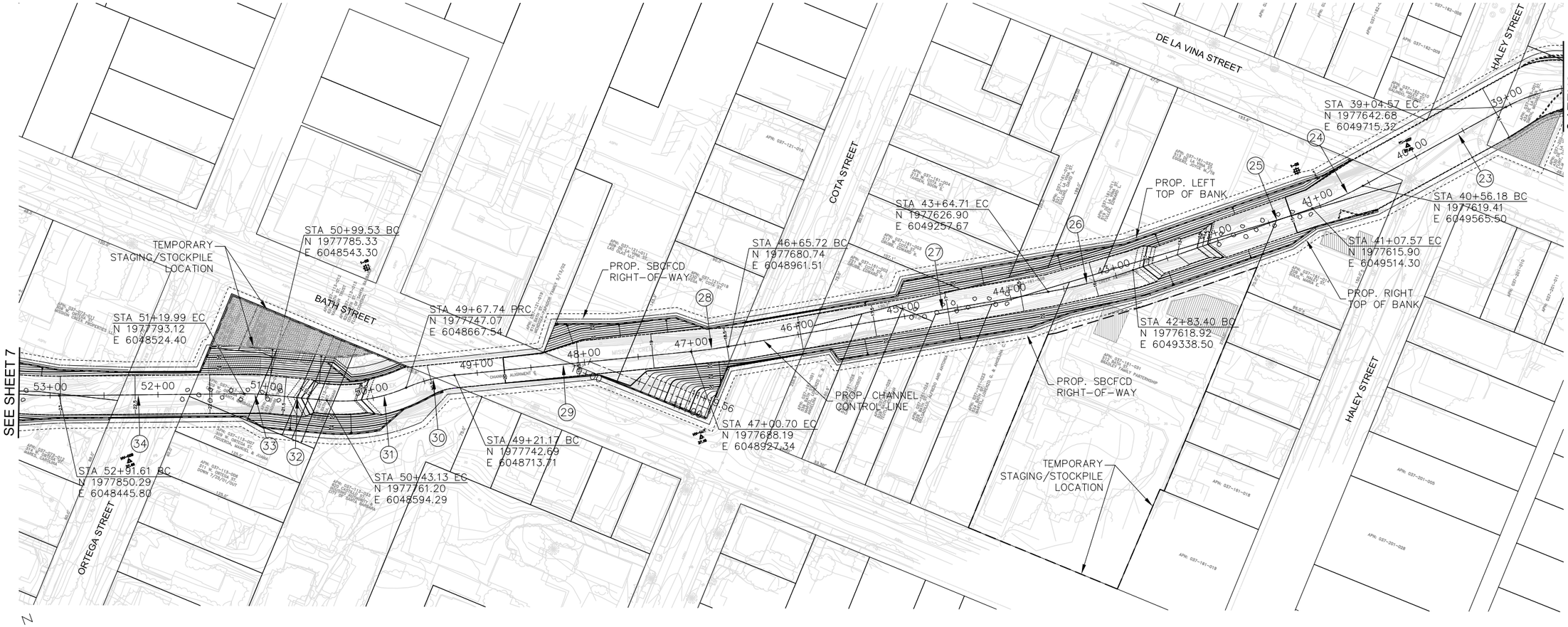
BEGINNING STATION	39+04.57	40+56.18	41+07.57	42+83.40	43+64.71	46+65.72	47+00.70	49+21.17	49+67.73	50+43.13	50+99.53	51+19.99
BEGINNING NORTHING	1977642.68	1977619.41	1977615.90	1977618.92	1977626.90	1977680.74	1977688.19	1977742.69	1977747.07	1977761.20	1977785.33	1977793.12
BEGINNING EASTING	6049715.32	6049565.50	6049514.30	6049338.50	6049257.67	6048961.51	6048927.34	6048713.71	6048667.54	6048594.29	6048543.30	6048524.40
ENDING STATION	40+56.18	41+07.57	42+83.40	43+64.71	46+65.72	47+00.70	49+21.17	49+67.73	50+43.13	50+99.53	51+19.99	52+91.61
ENDING NORTHING	1977619.41	1977615.90	1977618.92	1977626.90	1977680.74	1977688.19	1977742.69	1977747.07	1977761.20	1977785.33	1977793.12	1977850.29
ENDING EASTING	6049565.50	6049514.30	6049338.50	6049257.67	6048961.51	6048927.34	6048713.71	6048667.54	6048594.29	6048543.30	6048524.40	6048362.58
LINE BEARING	S81°10'14"W	–	N89°00'56"W	–	N79°41'52"W	–	N75°41'21"W	–	–	N64°40'42"W	–	N70°32'21"W
CURVE DELTA	–	09°48'50"	–	09°19'04"	–	04°00'31"	–	17°47'11"	28°47'51"	–	10°32'24"	–
LENGTH	151.62	51.39	175.83	81.31	301.01	34.98	220.47	46.56	75.39	56.41	20.46	171.62
CURVE RADIUS	–	300	–	500	–	500	–	150	150	–	200	–
CURVE TANGENT	–	25.76	–	40.75	–	17.50	–	23.47	38.51	–	10.24	–
CURVE CHORD	–	51.32	–	81.22	–	34.97	–	46.38	74.60	–	20.45	–
PI STATION	–	40+81.95	–	43+24.15	–	46+83.23	–	46+44.65	50+06.25	–	51+09.78	–
PI NORTHING	–	1977615.45	–	1977619.62	–	1977683.87	–	1977748.49	1977744.73	–	1977789.71	–
PI EASTING	–	6049540.05	–	6049297.76	–	6048944.29	–	6048690.97	6048629.10	–	6048534.05	–



SCALE 1"=50'

50 0 50 100 200

BUILDING STRUCTURE TO BE REMOVED PRIOR TO CONSTRUCTION

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY:	A.T.
DRAWN BY:	T.W.
CHECKED BY:	B.H.
PROJECT ENGINEER	
DATE:	07-27-10
SCALE:	AS SHOWN
DWG FILE:	
DATE	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
HORIZONTAL CONTROL

SHEET REFERENCE NUMBER: CF-006

SHEET 6 OF 27

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CHANNEL CONTROL LINE

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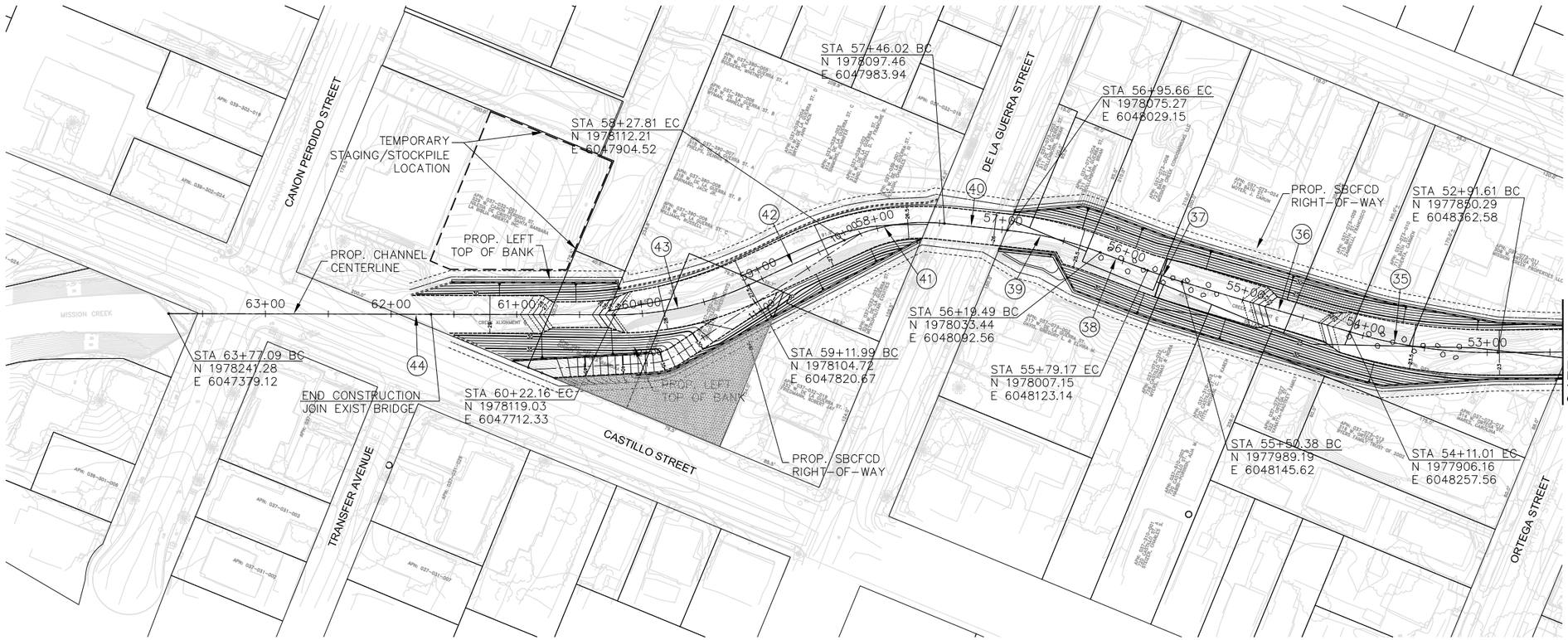
BEGINNING STATION	52+91.61	54+11.01	55+50.38	55+79.17	56+19.49	56+95.66	57+46.03	58+27.81	59+11.99	60+22.16
BEGINNING NORTHING	1977850.29	1977906.16	1977989.19	1978007.15	1978033.44	1978075.27	1978097.46	1978112.21	1978104.72	1978119.03
BEGINNING EASTING	6048362.58	6048257.56	6048145.62	6048123.14	6048092.56	6048029.15	6047983.94	6047904.52	6047820.67	6047712.33
ENDING STATION	54+11.01	55+50.38	55+79.17	56+19.49	56+95.66	57+46.03	58+27.81	59+11.99	60+22.16	63+77.09
ENDING NORTHING	1977906.16	1977989.19	1978007.15	1978033.44	1978075.27	1978097.46	1978112.21	1978104.72	1978119.03	1978241.28
ENDING EASTING	6048257.56	6048145.62	6048123.14	6048092.56	6048029.15	6047983.94	6047904.52	6047820.67	6047712.33	6047379.12
LINE BEARING	–	N53°26'10"W	–	N49°18'46"W	–	N63°51'36"W	–	S84°83'56"W	–	N69°51'09"W
CURVE DELTA	17°06'11"	–	04°07'23"	–	14°32'50"	–	31°14'27"	–	25°14'54"	–
LENGTH	119.40	139.37	28.79	40.32	76.17	50.36	81.79	84.18	110.17	354.93
CURVE RADIUS	400	–	400	–	300	–	150	–	250	–
CURVE TANGENT	60.15	–	14.40	–	38.29	–	41.94	–	55.99	–
CURVE CHORD	118.96	–	28.78	–	75.96	–	80.78	–	109.28	–
PI STATION	53+51.77	–	55+64.79	–	55+57.78	–	57+87.96	–	59+67.99	–
PI NORTHING	1977870.33	–	1977997.77	–	1978058.40	–	1978115.93	–	1978099.74	–
PI EASTING	6048305.87	–	6048134.05	–	6048063.53	–	6047946.29	–	6047764.90	–



US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
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PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
HORIZONTAL CONTROL

SHEET REFERENCE NUMBER:
CF-007
SHEET 7 OF 27

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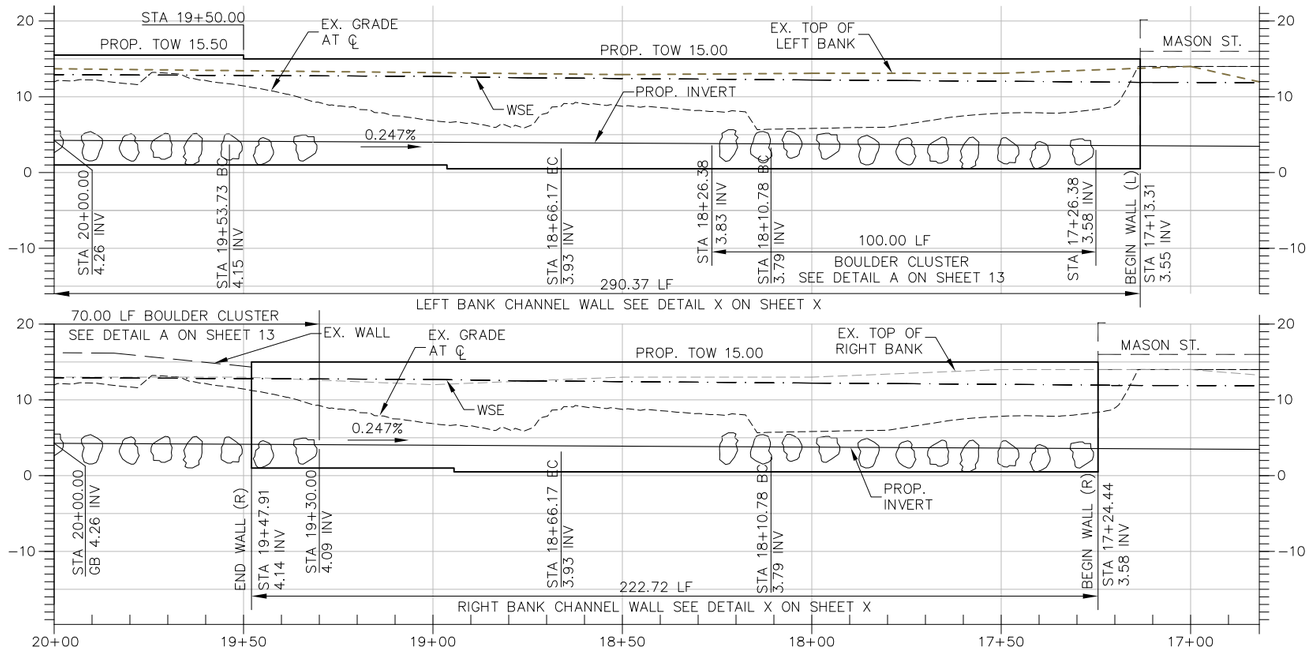
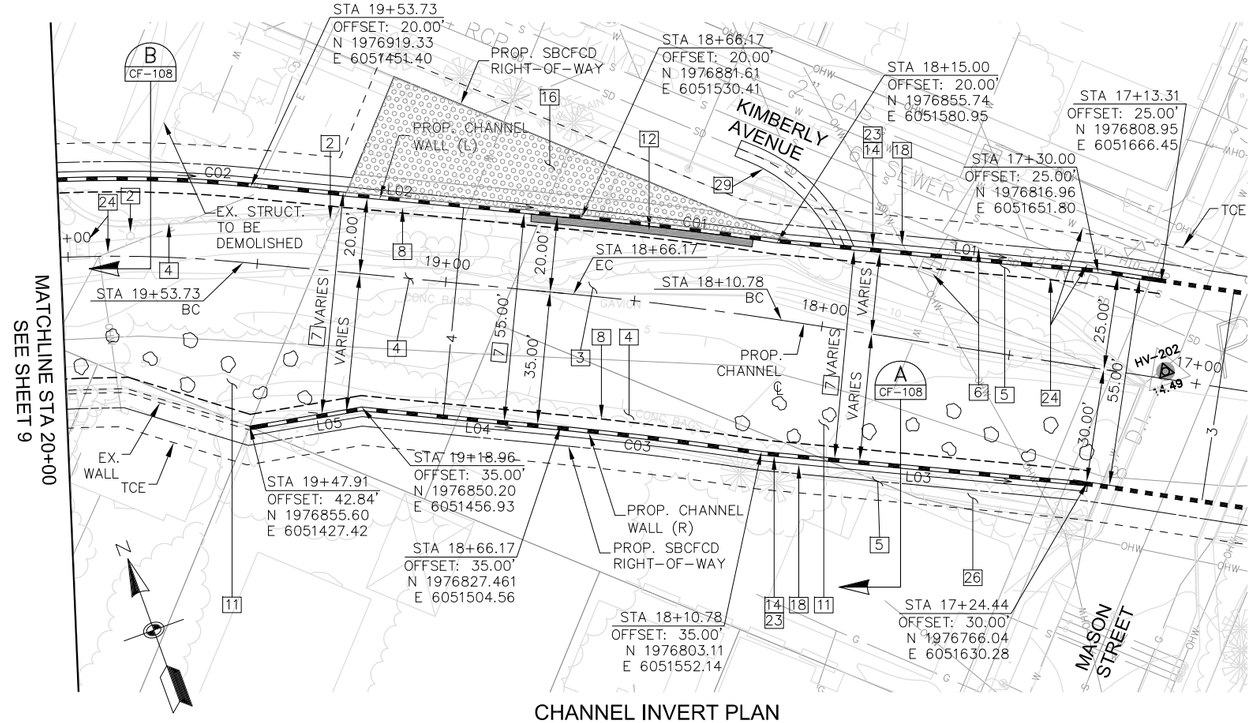


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

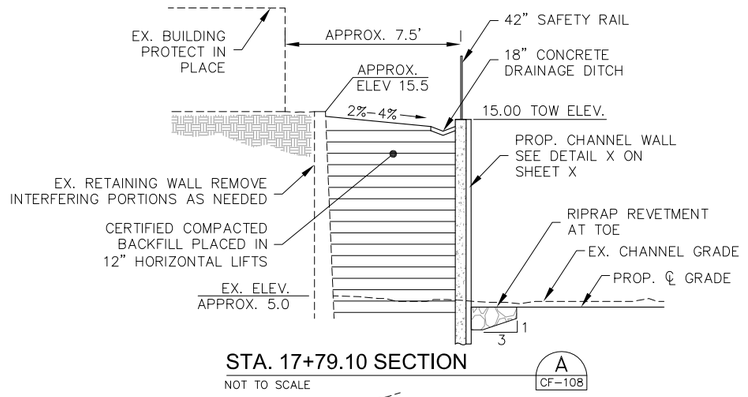


CHANNEL INVERT PLAN

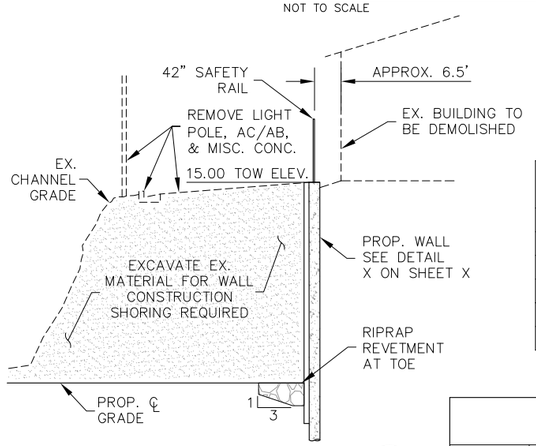
SCALE: 1"=20'

CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
2. EXISTING UTILITY STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
5. EXISTING AC PAVEMENT TO BE REMOVED
6. REMOVE INTERFERING PORTIONS OF EXISTING STORM DRAIN
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
8. PLACE RIPRAP TOE REVETMENT PER DETAIL X ON SHEET X
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
12. CONSTRUCT FISH LEDGE PER DETAIL X ON SHEET X
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
16. CONSTRUCT EXPANDED HABITAT ZONE (PER LANDSCAPE PLANS)
18. CONSTRUCT REINFORCED GUTTER PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
24. RELOCATE EXISTING UTILITY
26. PLACE COMPACTED FILL
29. CONSTRUCT 54" RCP (D-1500)



STA. 17+79.10 SECTION (A, CF-108)
NOT TO SCALE



STA. 19+86.49 SECTION (B, CF-108)
NOT TO SCALE

SCALE 1"=20'
20 0 20 40 60

LINE TABLE		
LINE	BEARING	LENGTH
L01	N61°18'29"W	97.47'
L02	N64°28'55"W	87.56'
L03	S64°37'21"E	86.48'
L04	S64°28'55"E	52.79'
L05	N79°37'50"W	30.00'

CURVE TABLE				
CURVE	LENGTH	TAN	DELTA	RADIUS
C01	56.78'	28.40'	03°10'26"	1025.00'
C02	49.58'	58.17'	17°38'04"	375.00'
C03	53.45'	26.73'	03°10'26"	965.00'

US Army Corps of Engineers

REVISIONS

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DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
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U.S. ARMY ENGINEER DISTRICT
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-108
SHEET 8 OF 27

7/11/2011 10:57 AM
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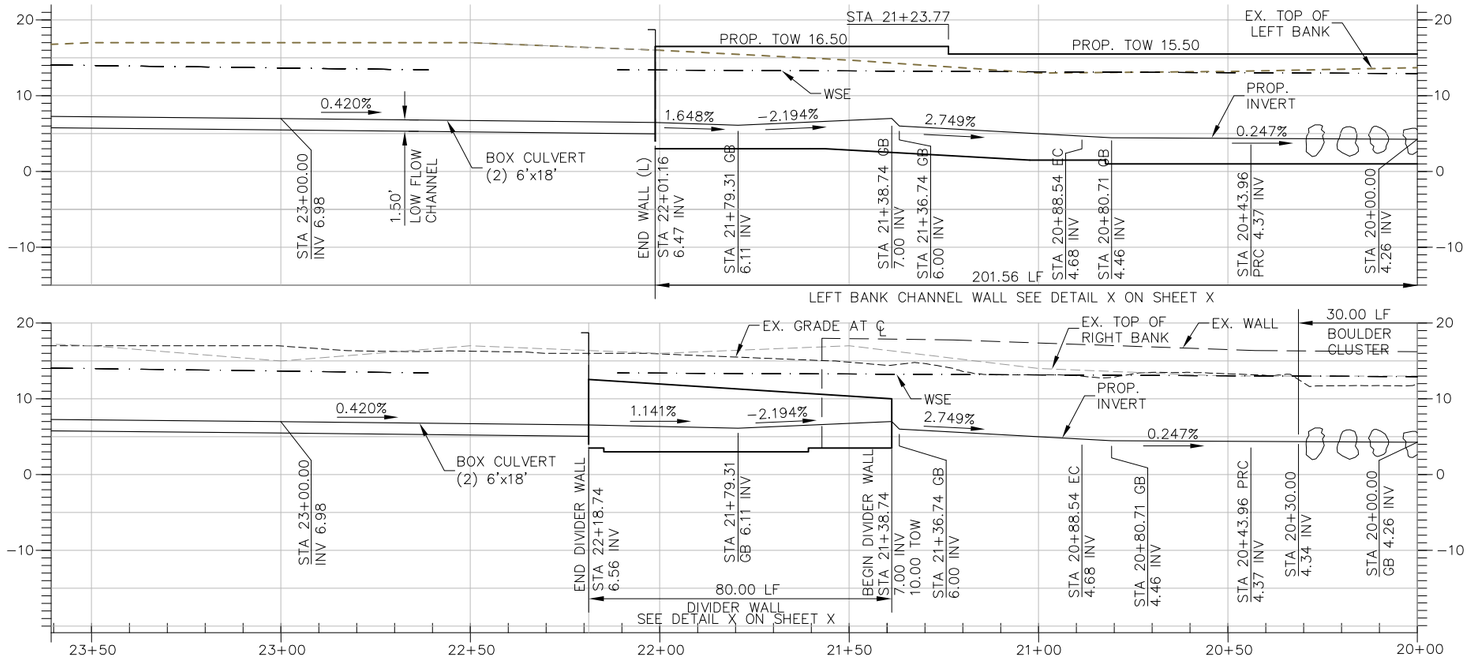
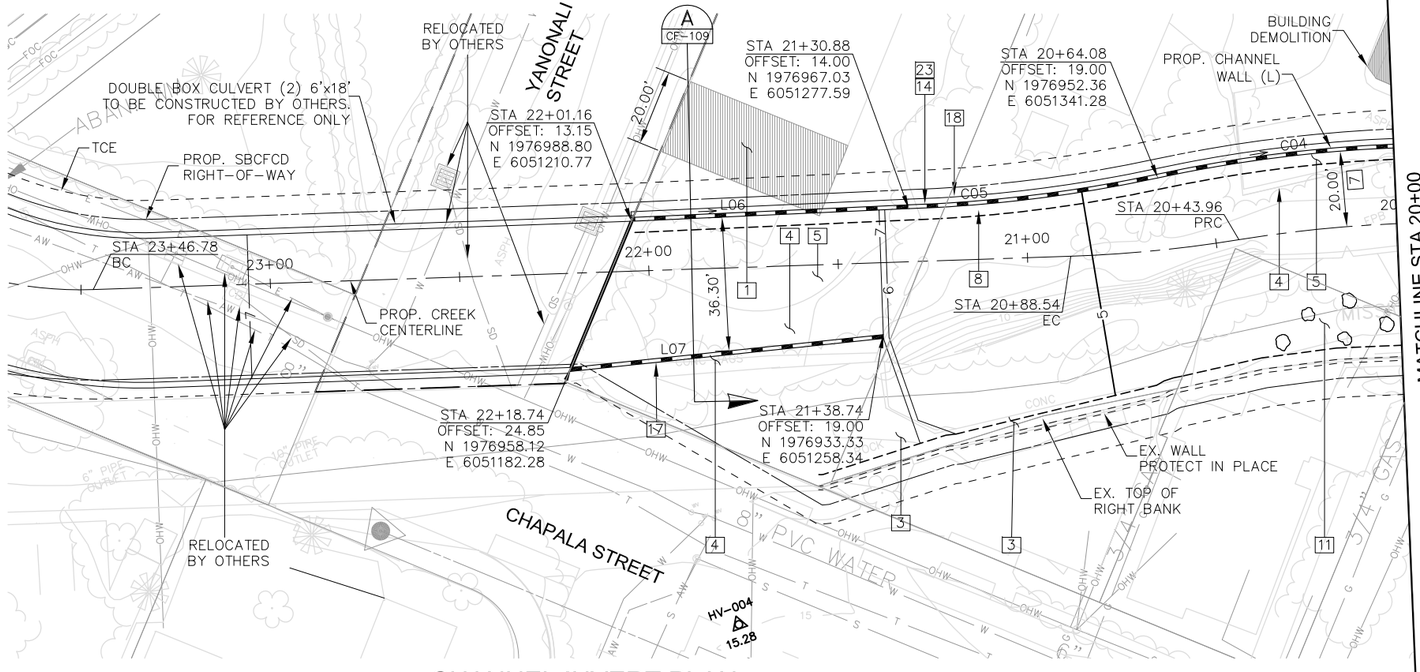


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

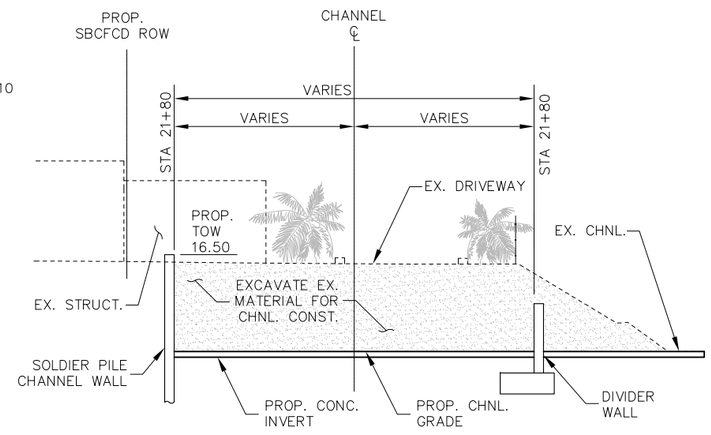


CHANNEL INVERT PLAN

SCALE: 1"=20'

CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
5. EXISTING AC PAVEMENT TO BE REMOVED
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLA
8. PLACE RIPRAP TOE REVETMENT PER DETAIL X ON SHEET X
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
17. CONSTRUCT TYPE 4 CHANNEL WALL (DIVIDER) PER DETAIL X ON SHEET X
18. CONSTRUCT REINFORCED GUTTER PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X



STA: 21+80 SECTION

NOT TO SCALE

A CF-109

LINE TABLE		
LINE	BEARING	LENGTH
L06	S71°57'14"E	70.28'
L07	S71°57'14"E	80.00'

CURVE TABLE				
CURVE	LENGTH	TAN	DELTA	RADIUS
C04	65.84'	58.17'	17°38'04"	375.00'
C05	65.45'	32.81'	10°09'44"	369.00'

SCALE 1"=20'
20 0 20 40 60

US Army Corps of Engineers

REVISIONS

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CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS LOS ANGELES, CALIFORNIA

TETRA TECH 800 WEST SIXTH STREET, SUITE 380 LOS ANGELES, CALIFORNIA 90017 TEL. (213)327-0800 FAX. (213)612-0246

CITY OF SANTA BARBARA SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER: CF-109
SHEET 9 OF 27

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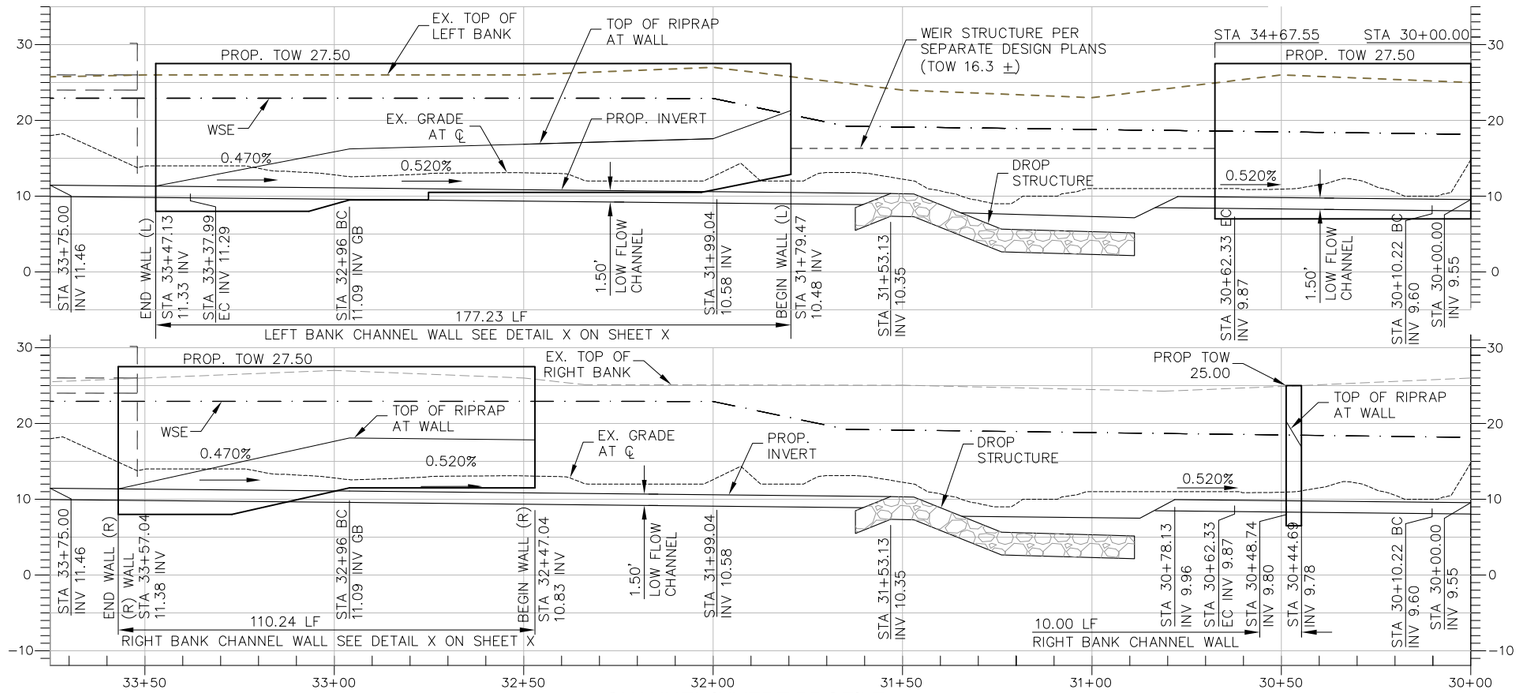
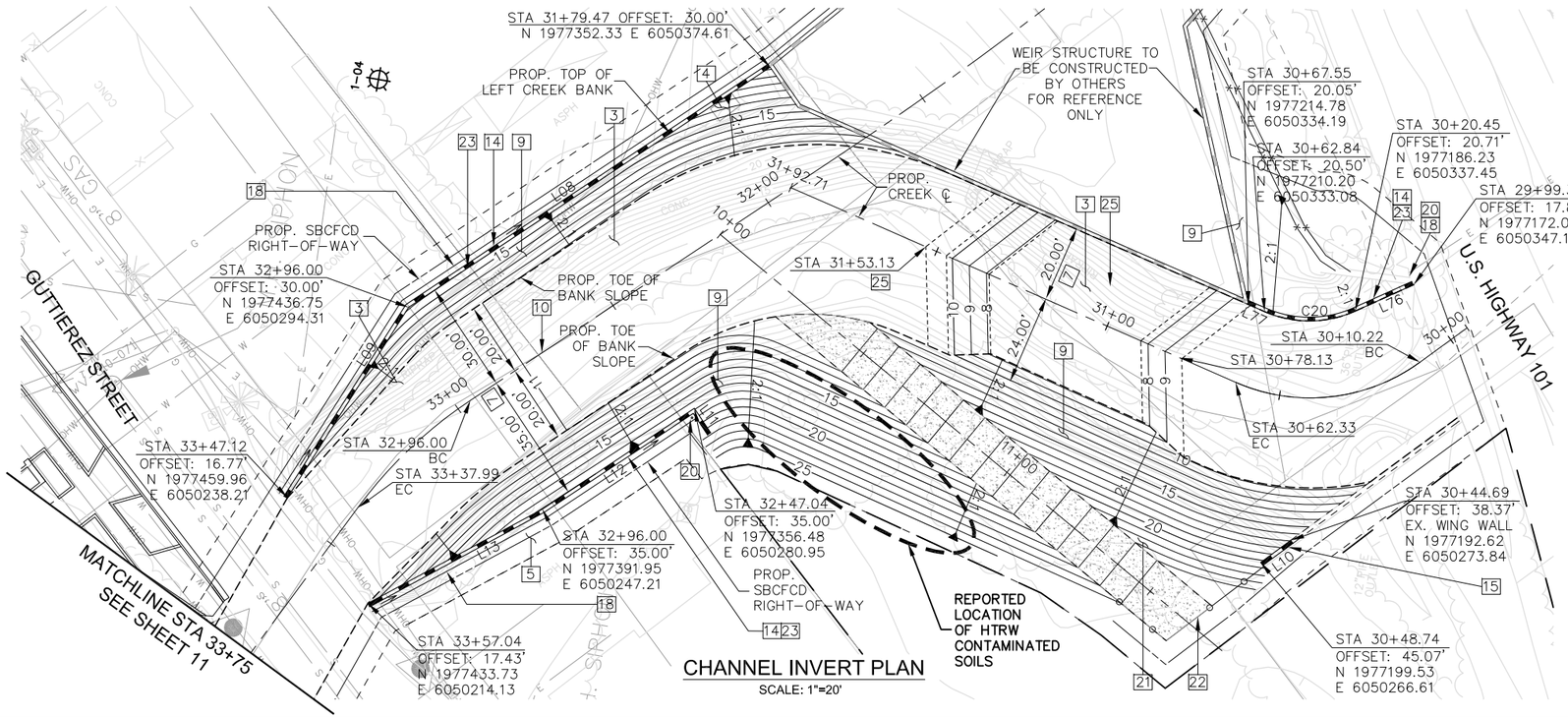


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

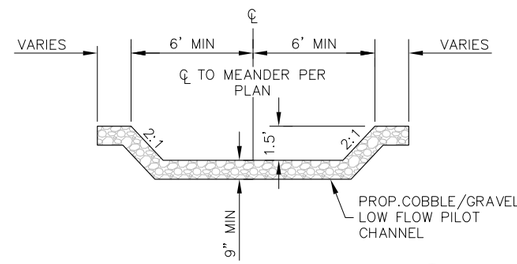


CHANNEL INVERT PLAN

SCALE: 1"=20'

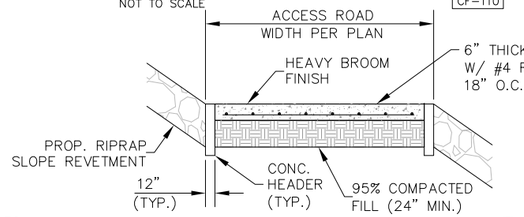
CONSTRUCTION NOTES

- 3 EXISTING CHANNEL STRUCTURE TO BE REMOVED
- 4 EXISTING MISC. CONCRETE TO BE REMOVED
- 5 EXISTING AC PAVEMENT TO BE REMOVED
- 7 CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
- 9 PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X
- 10 CONSTRUCT LOW FLOW CHANNEL PER DETAIL A HEREON
- 14 CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
- 15 CONSTRUCT TYPE 2 CHANNEL WALL (SPREAD) PER DETAIL X ON SHEET X
- 18 CONSTRUCT REINFORCED GUTTER PER DETAIL X ON SHEET X
- 20 CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
- 21 CONSTRUCT ACCESS ROAD PER DETAIL B HEREON
- 22 CONSTRUCT ACCESS FENCE/GATE PER DETAIL X ON SHEET X.
- 23 CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
- 25 CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X



LOW FLOW CHANNEL SECTION (A / CF-110)

NOT TO SCALE



TYPICAL ACCESS ROAD SECTION (B / CF-110)

NOT TO SCALE

LINE TABLE		
LINE	BEARING	LENGTH
L08	N43°34'04"W	116.52'
L09	N67°31'29"W	60.71'
L10	N46°18'29"W	10.00'
L11	N46°25'56"E	8.00'
L12	N43°34'04"W	48.95'
L13	N38°22'22"W	53.29'
L76	N34°17'58"W	17.22'
L77	N13°37'30"E	4.71'

CURVE TABLE				
CURVE	LENGTH	TAN	DELTA	RADIUS
C20	25.09'	13.33'	47°55'28"	30.00'

SCALE 1"=20'
20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
LOS ANGELES, CALIFORNIA 90017
TEL: (213)327-0800 FAX: (213)612-0246

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-110
SHEET 10 OF 27

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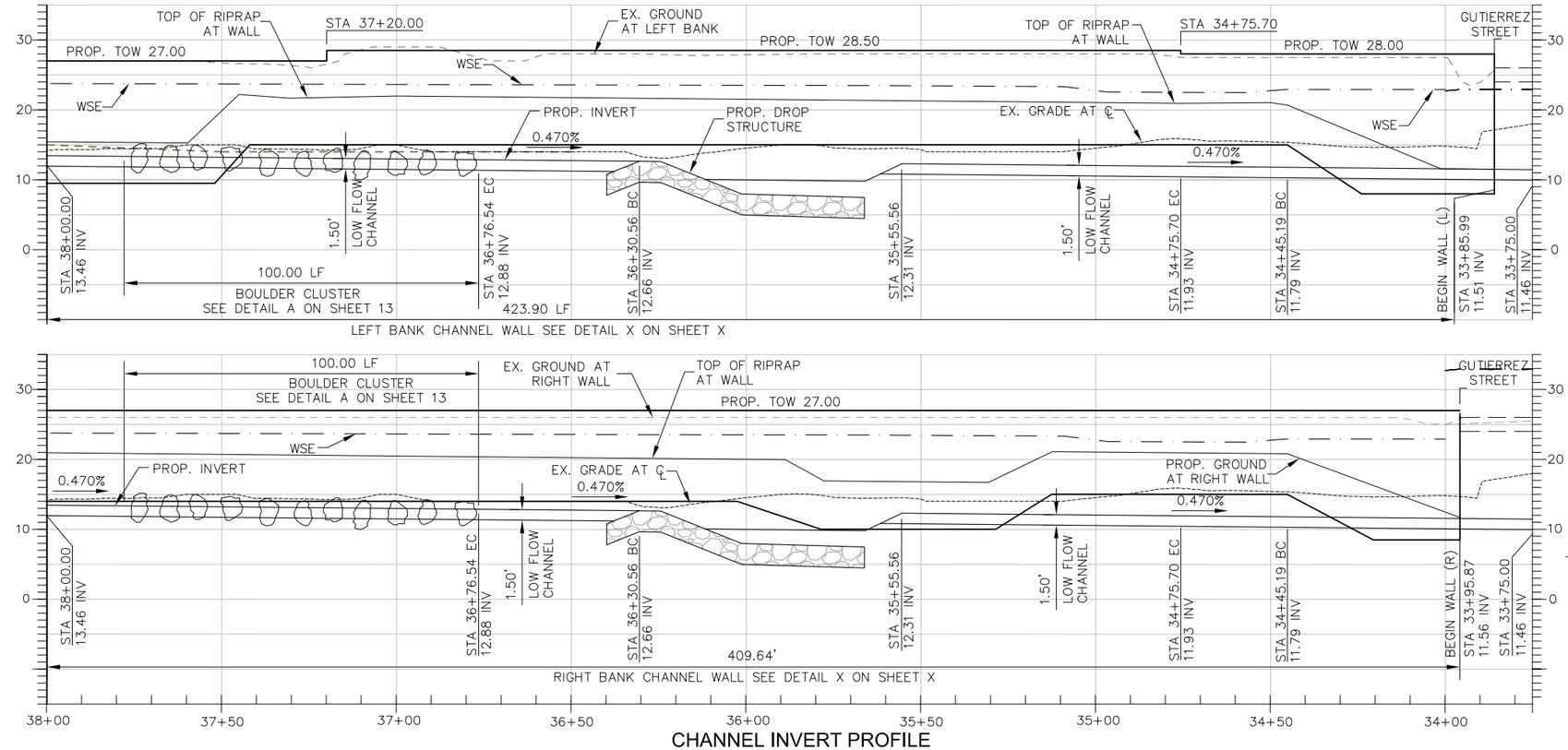
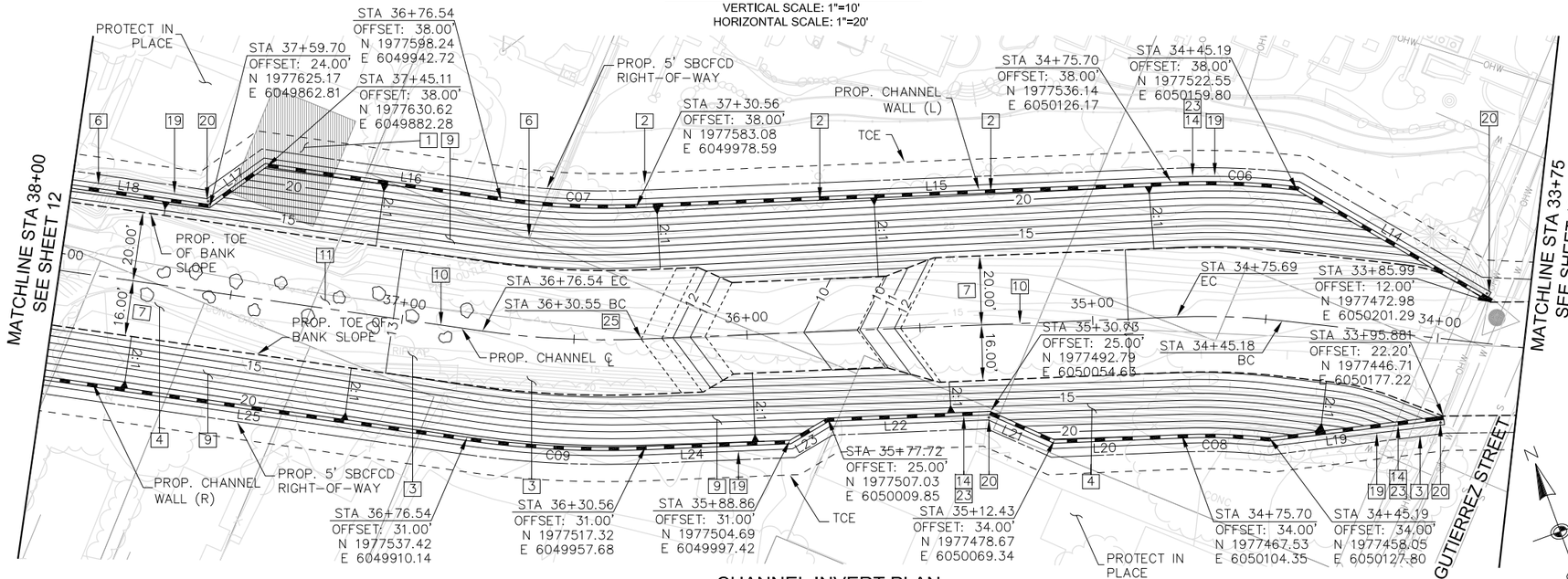


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

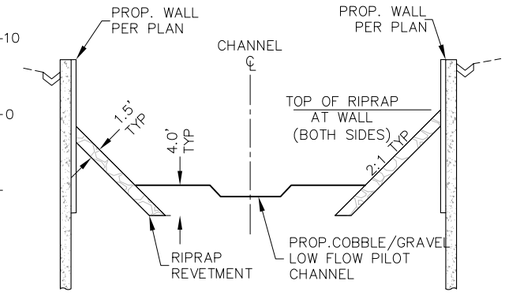


CHANNEL INVERT PLAN

SCALE: 1"=20'

CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
2. EXISTING UTILITY STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
5. EXISTING AC PAVEMENT TO BE REMOVED
6. REMOVE INTERFERING PORTIONS OF EXISTING STORM DRAIN
7. CONSTRUCT CHANNEL PER DETAIL A HEREON CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL A ON SHEET 10
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
25. CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X



TYPICAL CHANNEL SECTION

A CF-111

NOT TO SCALE

LINE DATA

LINE	BEARING	LENGTH
L14	N39°55'38"W	64.65'
L15	N72°21'30"W	154.86'
L16	N61°49'06"W	68.57'
L17	N74°21'40"E	20.22'
L18	N61°52'02"W	40.30'
L19	N77°04'12"W	50.70'
L20	N72°21'30"W	36.73'
L21	N46°10'22"W	20.40'
L22	N72°21'30"W	46.98'
L23	N79°20'15"E	12.65'
L24	N72°21'30"W	41.70'
L25	N61°49'06"W	123.46'

CURVE TABLE

CURVE	LENGTH	TAN	DELTA	RADIUS
C06	36.31'	18.19'	8°44'29"	238.00'
C07	39.00'	19.55'	10°32'24"	212.00'
C08	25.33'	12.69'	8°44'29"	166.00'
C09	51.69'	25.92'	10°32'24"	281.00'

SCALE 1"=20'
20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
LOS ANGELES, CALIFORNIA 90017
TEL: (213)327-0800 FAX: (213)612-0246

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER: CF-111
SHEET 11 OF 27

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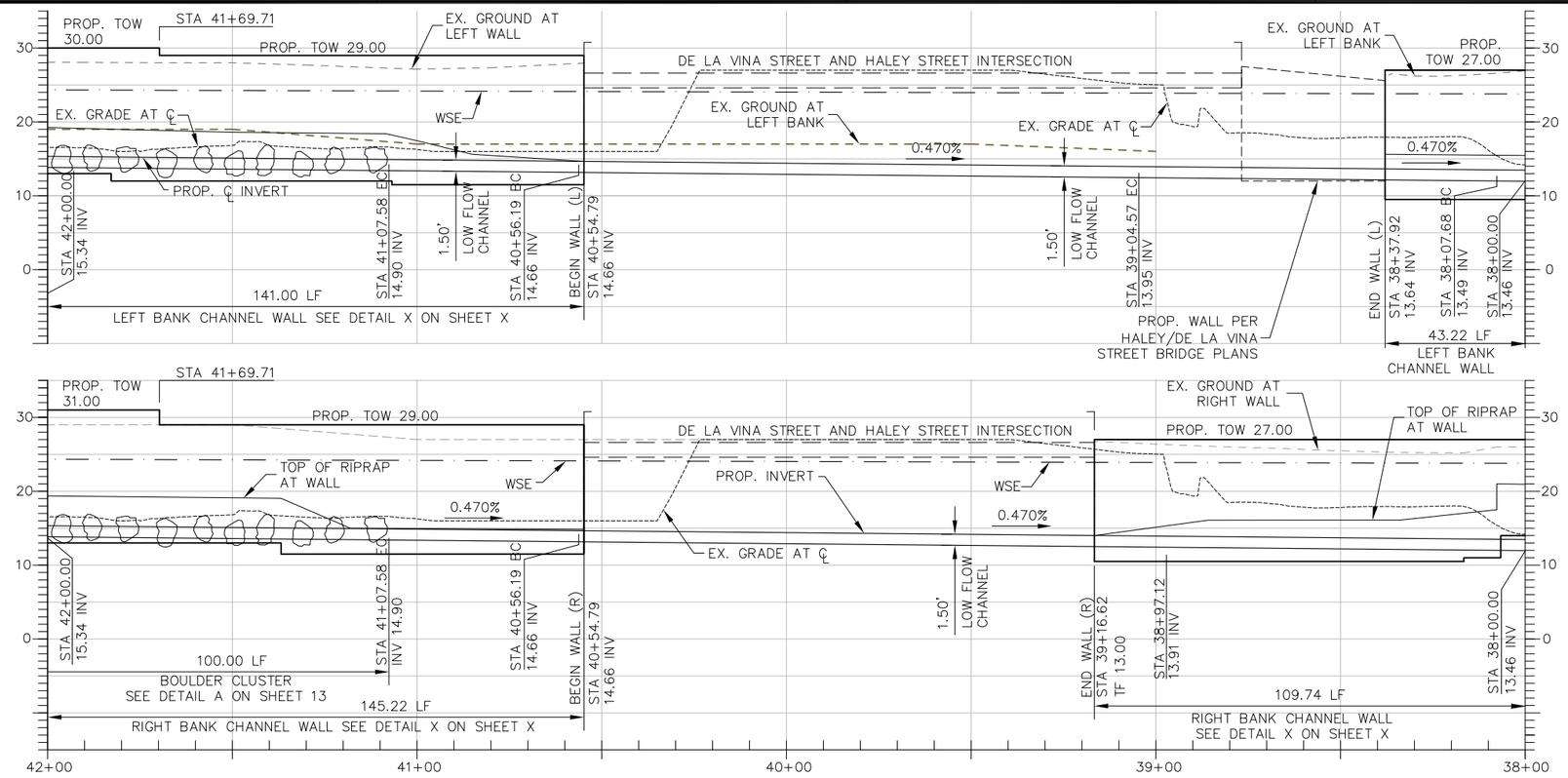
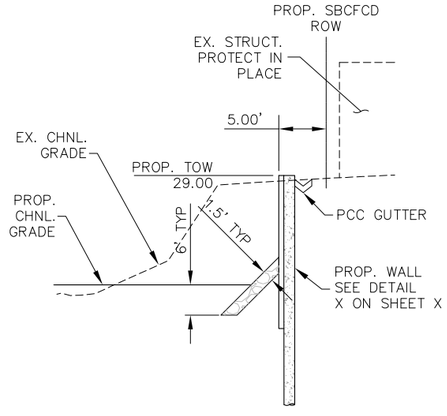


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

CONSTRUCTION NOTES

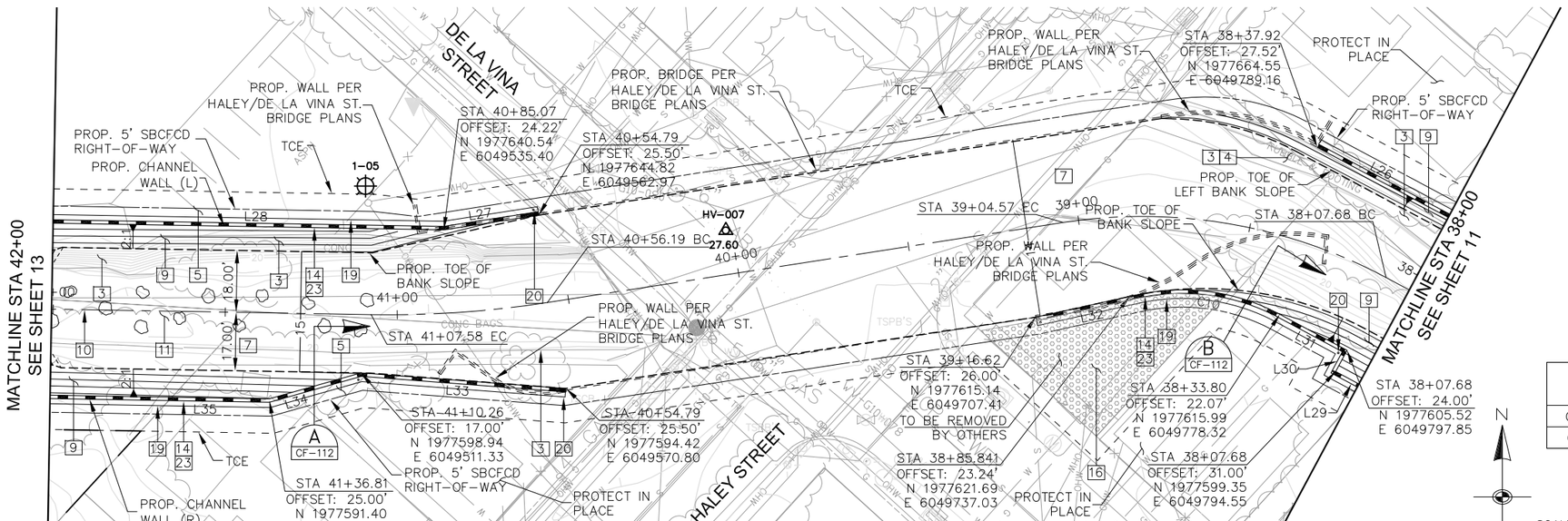
1. EXISTING BUILDING STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
5. EXISTING AC PAVEMENT TO BE REMOVED
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL X ON SHEET X
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
16. CONSTRUCT EXPANDED HABITAT ZONE (PER LANDSCAPE PLANS)
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X



STA: 41+25 SECTION

NOT TO SCALE

A CF-112



CHANNEL INVERT PLAN

SCALE: 1"=20'

LINE DATA		
LINE	BEARING	LENGTH
L26	N61°52'02"W	43.22'
L27	N81°10'15"E	27.91'
L28	N89°00'56"W	113.09'
L29	N61°49'06"W	7.68'
L30	N28°10'54"E	7.00'
L31	N61°49'06"W	22.16'
L32	N77°32'11"E	30.34'
L33	N85°39'09"W	59.64'
L34	N74°13'03"E	27.73'
L35	N89°00'56"W	63.19'

CURVE DATA				
CURVE	LENGTH	TAN	DELTA	RADIUS
C10	42.56'	22.22'	40°38'43"	60.00'

N

SCALE 1"=20'
20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T.
DRAWN BY: T.W.
CHECKED BY: B.H.
DATE: 07-27-10
SCALE: AS SHOWN
DWG FILE:
PROJECT ENGINEER
DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-112
SHEET 12 OF 27

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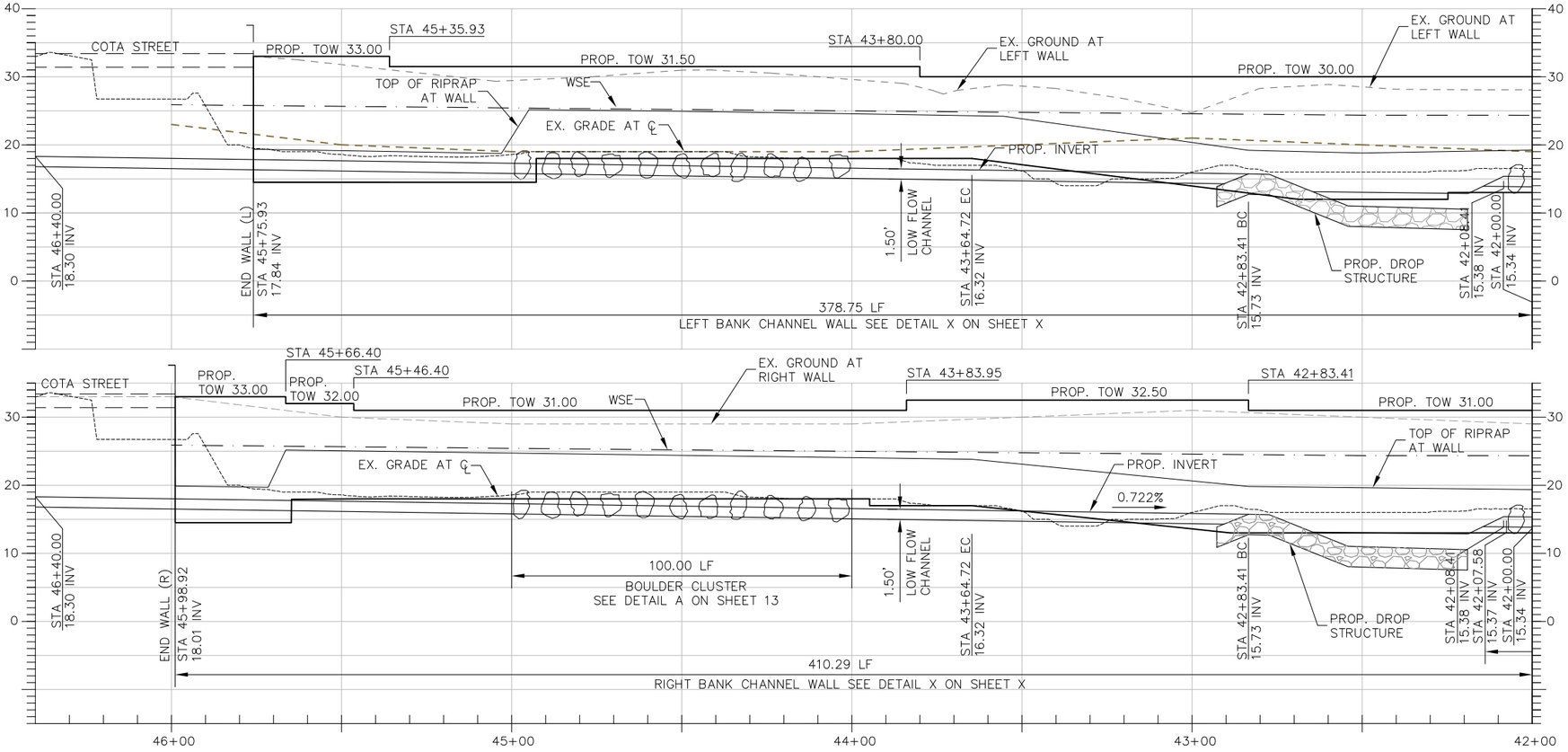
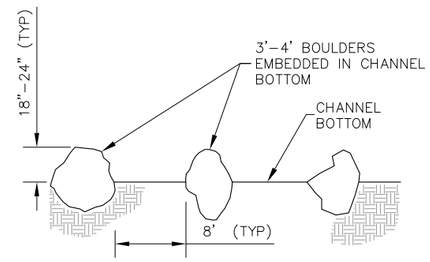


CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
2. EXISTING UTILITY STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
5. EXISTING AC PAVEMENT TO BE REMOVED
6. REMOVE INTERFERING PORTIONS OF EXISTING STORM DRAIN
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL A ON SHEET 10
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
25. CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X



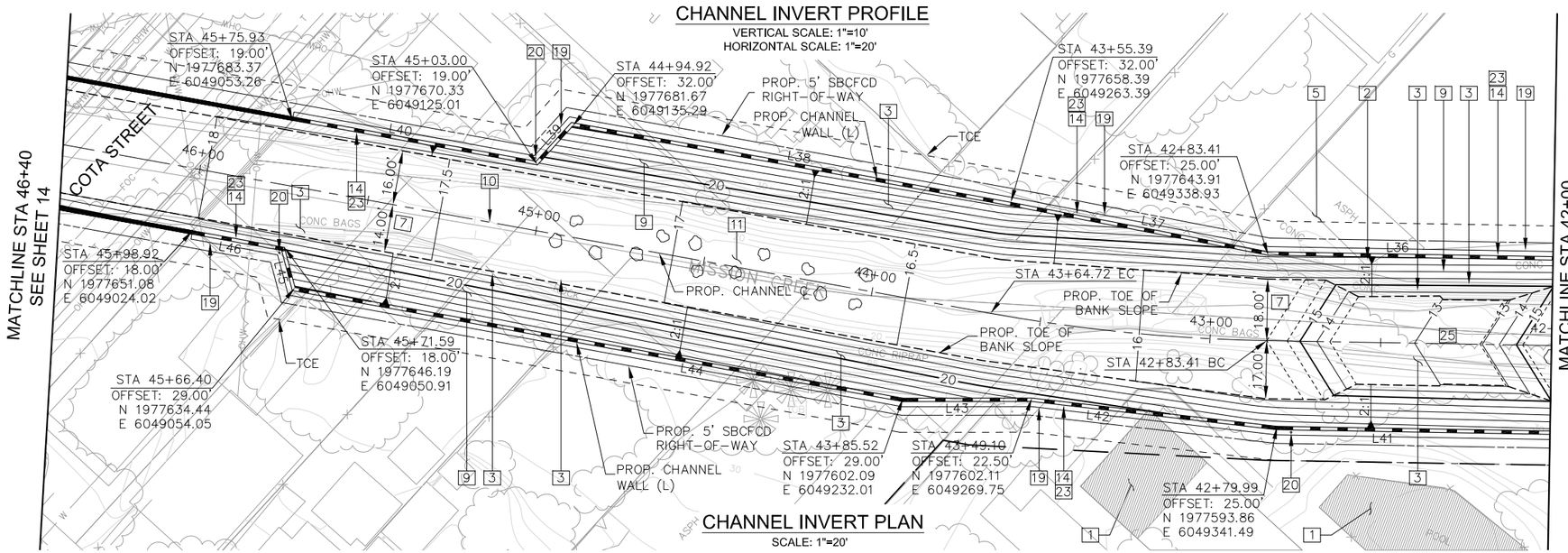
BOULDER CLUSTER DETAIL

NOT TO SCALE

A CF-113

CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'



CHANNEL INVERT PLAN

SCALE: 1"=20'

LINE DATA		
LINE	BEARING	LENGTH
L36	N89°00'56"W	83.41'
L37	N79°09'08"W	76.91'
L38	N79°41'52"W	130.20'
L39	N42°10'57"E	14.31'
L40	N79°41'52"W	72.92'
L41	N89°00'56"W	79.99'
L42	N83°26'33"W	72.21'
L43	N89°58'29"W	37.73'
L44	N79°41'52"W	180.88'
L45	N14°57'23"W	12.16'
L46	N79°41'52"W	27.33'

SCALE 1"=20'
20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
LOS ANGELES, CALIFORNIA 90017
TEL. (213)327-0800 FAX. (213)612-0246

CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-113
SHEET 13 OF 27

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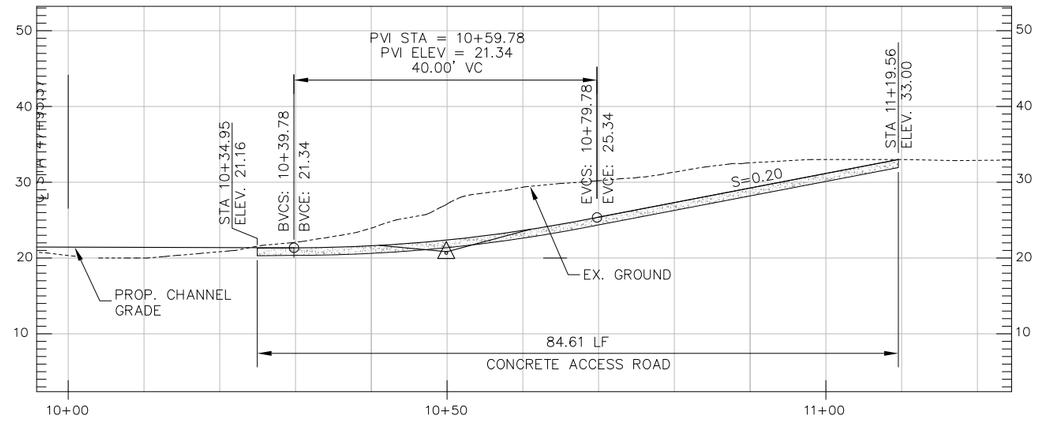
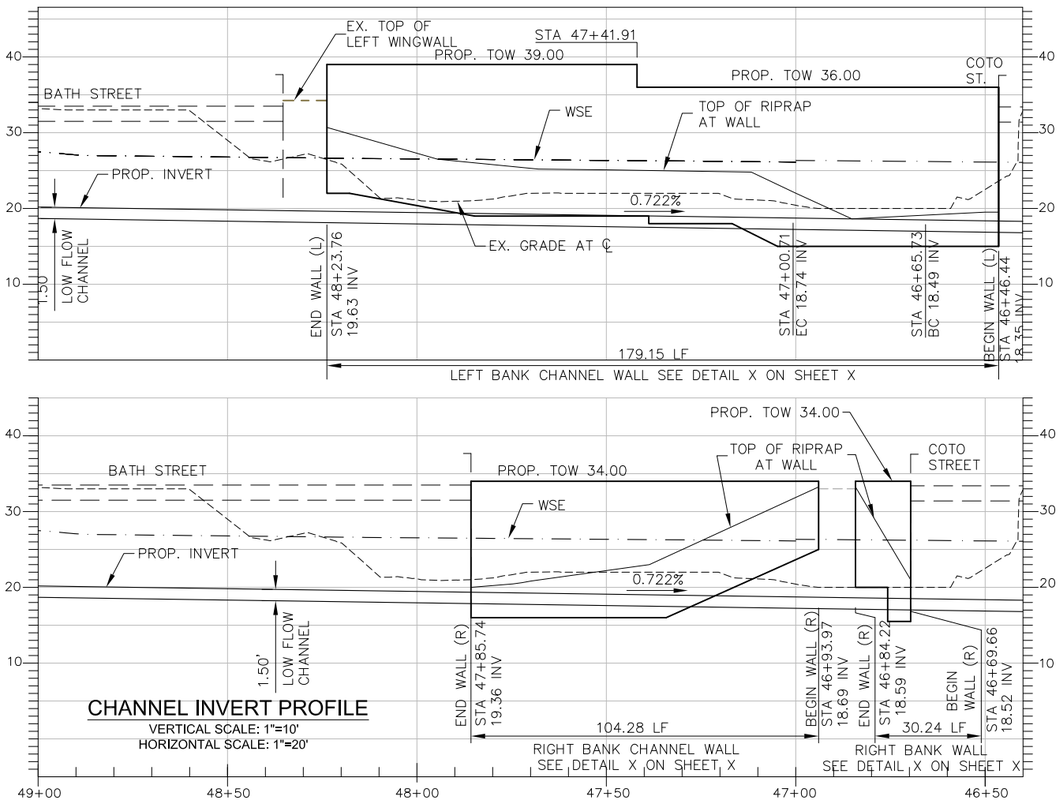


STA 48+00 ACCESS ROAD PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=10'

CONSTRUCTION NOTES

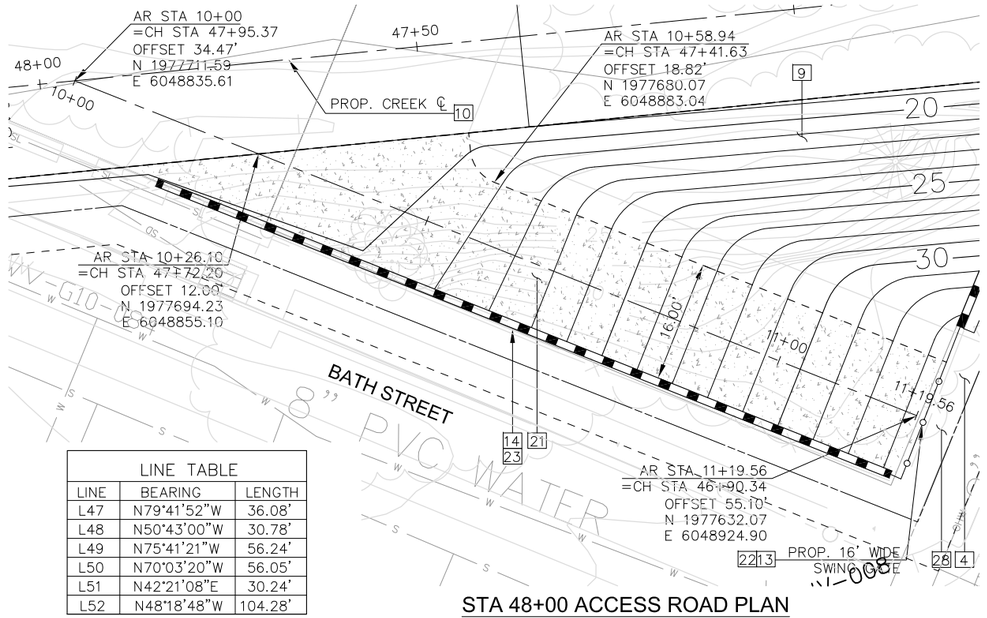
1. EXISTING BUILDING STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
6. REMOVE INTERFERING PORTIONS OF EXISTING STORM DRAIN
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X.
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL X ON SHEET X.
13. REMOVE EXISTING FENCE
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
21. CONSTRUCT ACCESS ROAD PER DETAIL HEREON
22. CONSTRUCT ACCESS FENCE/GATE PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
25. REMOVE AND REPLACE EXISTING FENCE
28. CONSTRUCT DRIVEWAY APPROACH PER CITY OF SANTA BARBARA STD PLAN NO. 1-003.1-06



CHANNEL INVERT PROFILE

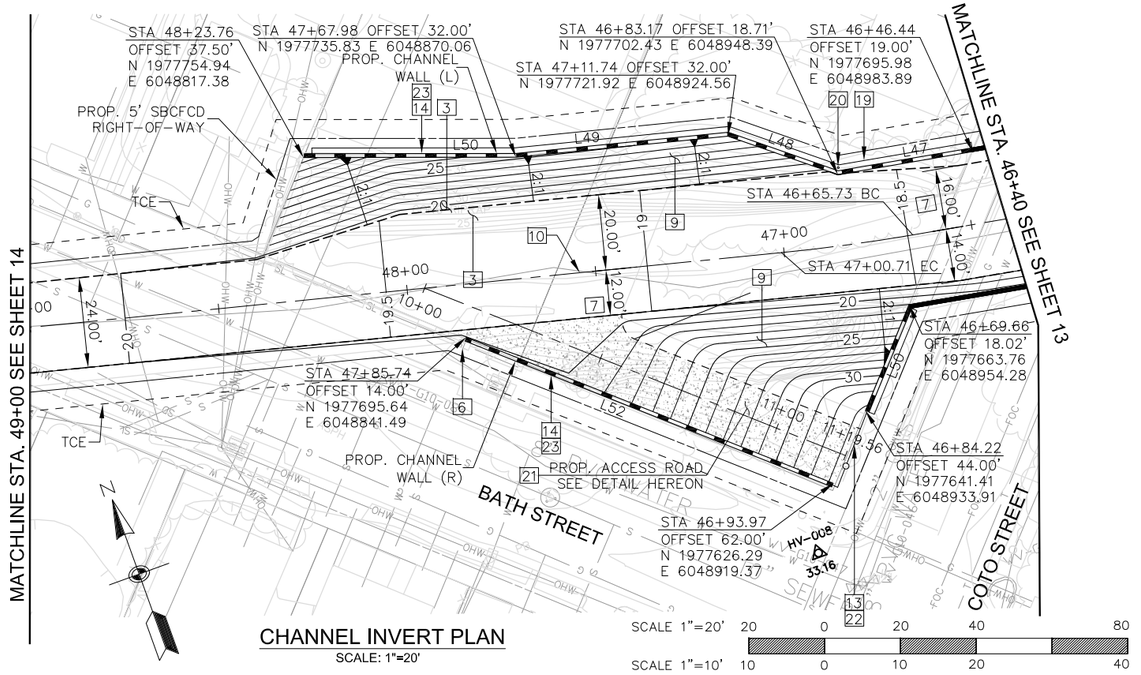
VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

LINE TABLE		
LINE	BEARING	LENGTH
L47	N79°41'52"W	36.08'
L48	N50°43'00"W	30.78'
L49	N75°41'21"W	56.24'
L50	N70°03'20"W	56.05'
L51	N42°21'08"E	30.24'
L52	N48°18'48"W	104.28'



STA 48+00 ACCESS ROAD PLAN

SCALE: 1"=10'



CHANNEL INVERT PLAN

SCALE: 1"=20'

SCALE 1"=20' 20 0 20 40 80
SCALE 1"=10' 10 0 10 20 40

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T.
DRAWN BY: T.W.
CHECKED BY: B.H.
PROJECT ENGINEER
DATE: 07-27-10
SCALE: AS SHOWN
DWG FILE:
DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-114
SHEET 14 OF 27

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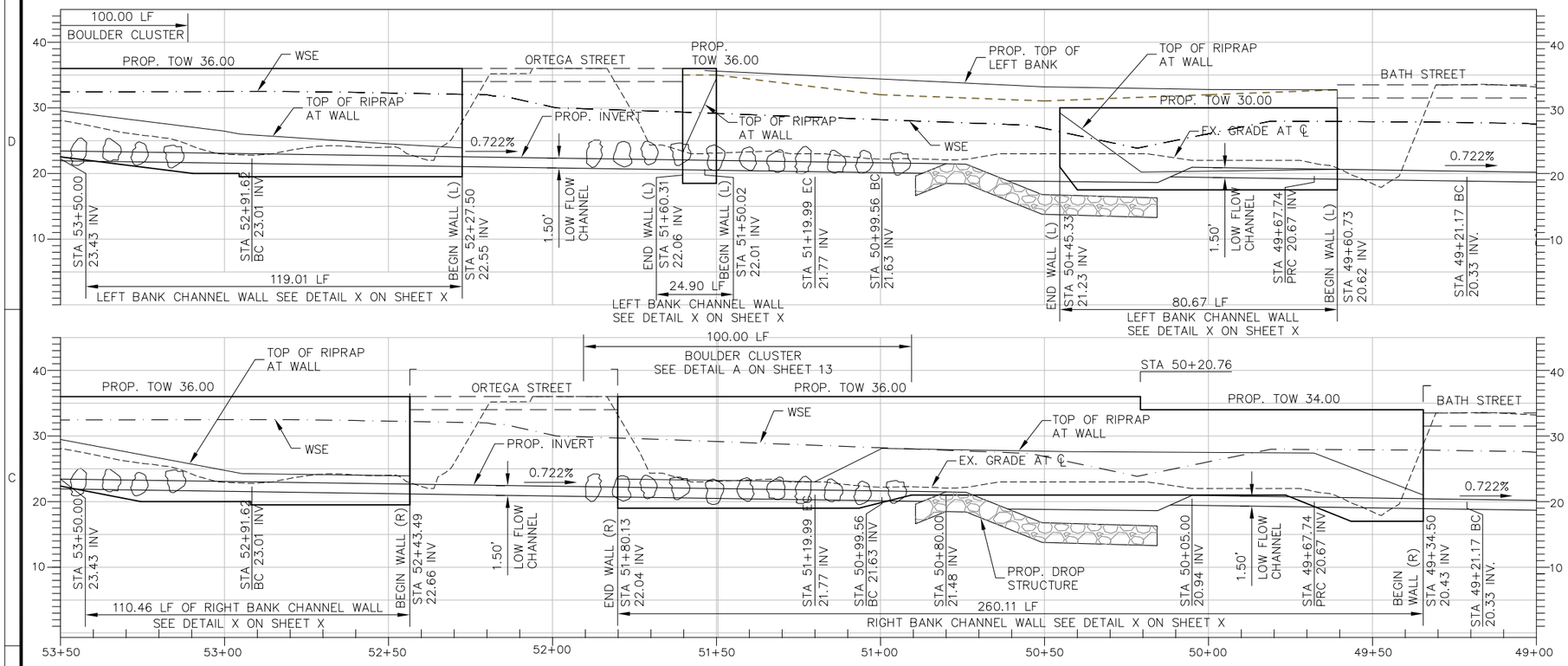
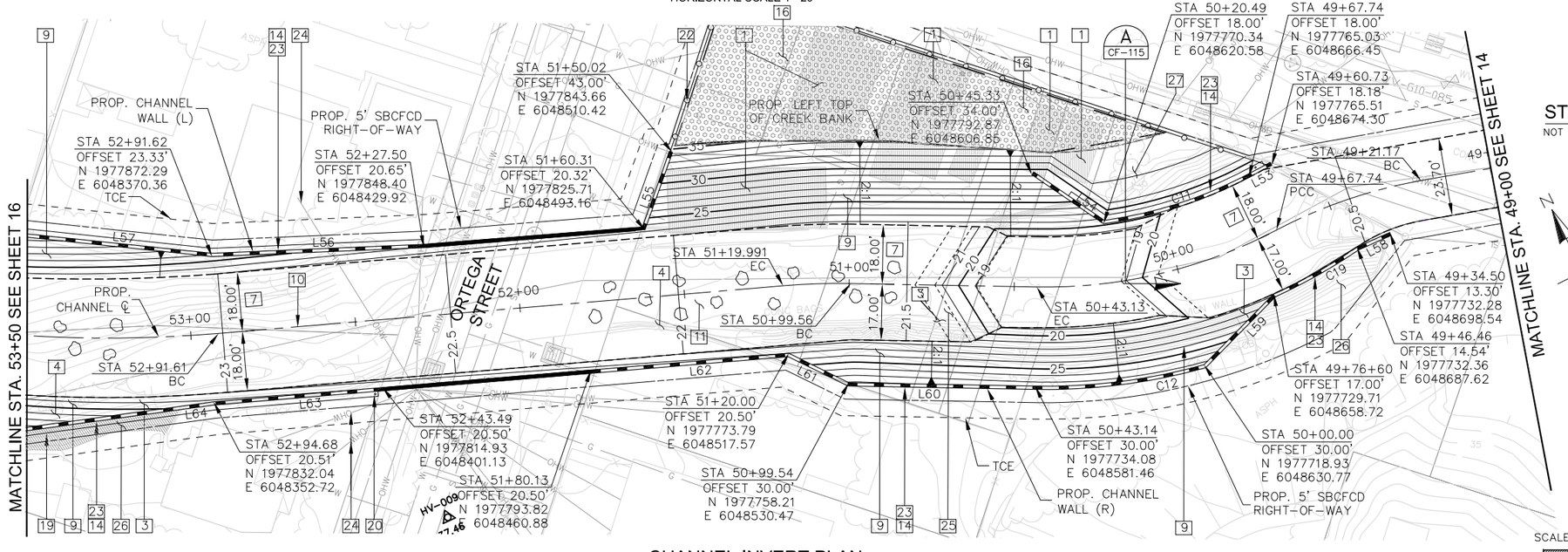


CHANNEL INVERT PROFILE

VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=20'

16

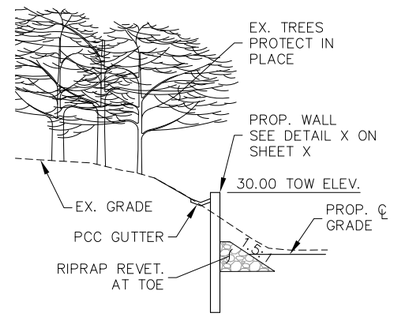


CHANNEL INVERT PLAN

VERTICAL SCALE 1"=10'

CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
3. EXISTING CHANNEL STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
7. CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X.
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL X ON SHEET X.
11. PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
16. EXPANDED HABITAT (PER LANDSCAPE PLANS)
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X.
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X.
22. CONSTRUCT ACCESS FENCE/GATE PER DETAIL X ON SHEET X.
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
24. RELOCATE EXISTING UTILITY
25. CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X
26. PLACE COMPACTED FILL
27. PROTECT IN PLACE EXISTING TREES



STA: 50+20 SECTION

NOT TO SCALE

A CF-115

LINE TABLE		
LINE	BEARING	LENGTH
L53	N86°31'27"E	7.86'
L54	N31°21'08"W	26.39'
L55	N43°52'21"E	24.90'
L56	N68°08'32"W	64.18'
L57	N59°44'38"W	54.83'
L58	N89°34'27"W	10.89'
L59	N68°50'41"E	30.09'
L60	N64°40'42"W	56.41'
L61	N39°38'27"W	20.23'
L62	N70°32'21"W	60.13'
L63	N70°32'21"W	51.34'
L64	N73°31'01"W	59.12'

CURVE DATA				
CURVE	LENGTH	TAN	DELTA	RADIUS
C11	46.42'	23.45	20°08'52"	132.00'
C12	90.36'	46.16	28°45'50"	180.00'
C19	28.94'	14.51	9°55'46"	167.00'

SCALE 1"=20'

20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

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800 WEST SIXTH STREET, SUITE 380
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-115
SHEET 15 OF 27

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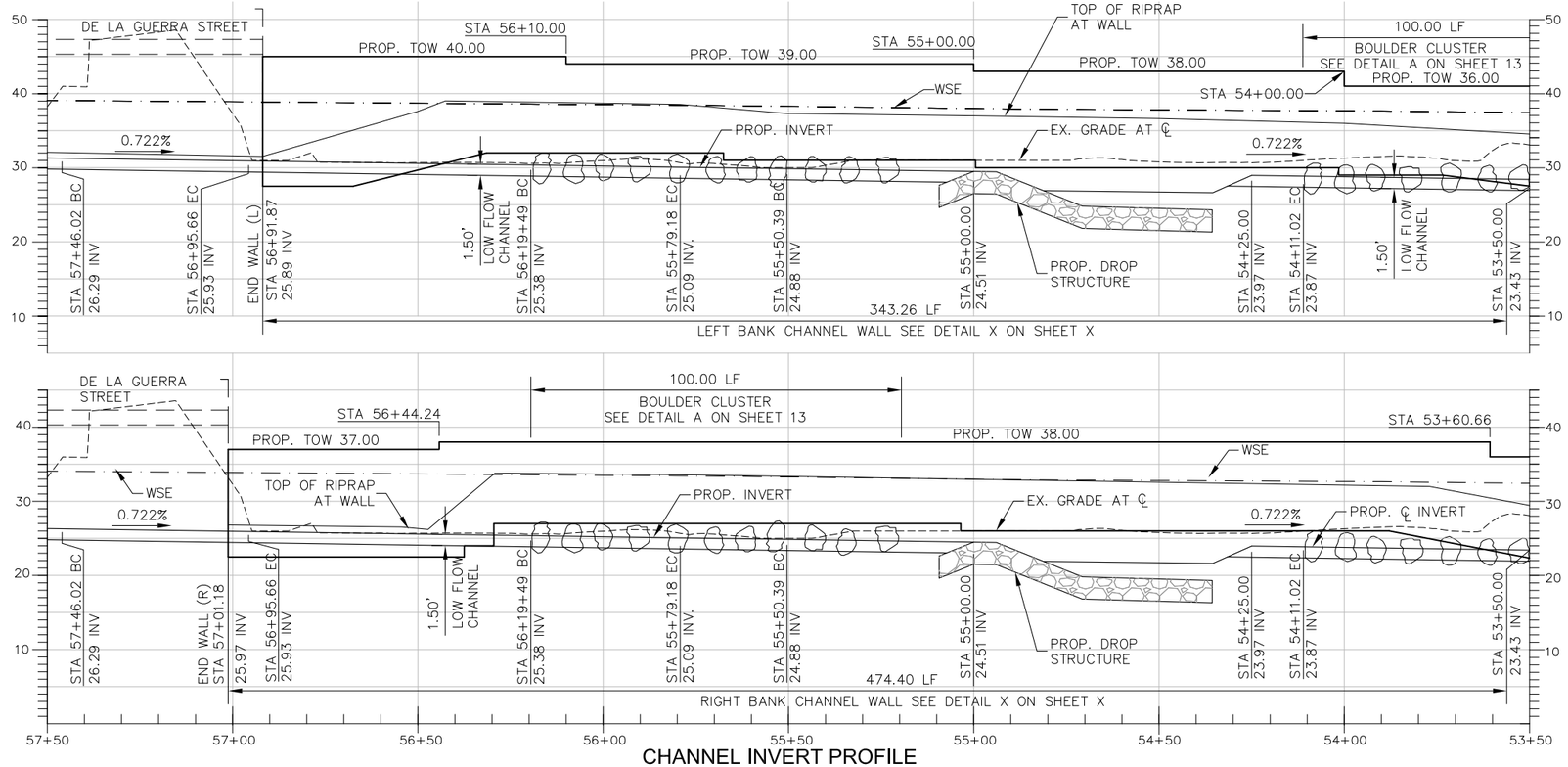
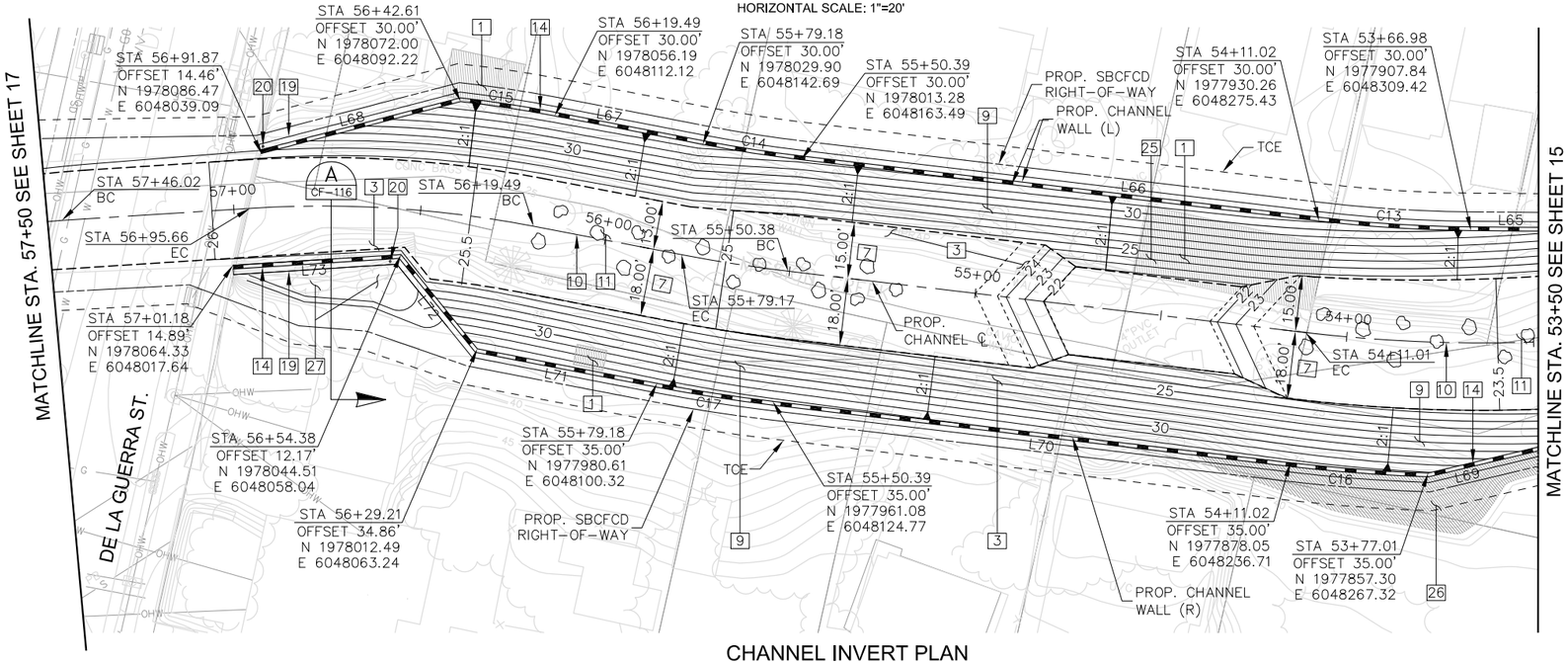


CHANNEL INVERT PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

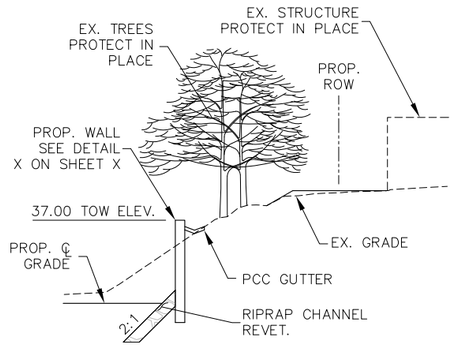


CHANNEL INVERT PLAN

SCALE: 1"=20'

CONSTRUCTION NOTES

1 EXISTING BUILDING STRUCTURE TO BE REMOVED
3 EXISTING CHANNEL STRUCTURE TO BE REMOVED
7 CONSTRUCT CHANNEL PER DETAIL X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
9 PLACE RIPRAP CHANNEL REVETMENT PER DETAIL X ON SHEET X.
10 CONSTRUCT LOW FLOW CHANNEL PER DETAIL X ON SHEET X.
11 PLACE BOULDER CLUSTERS PER DETAIL A ON SHEET 13
14 CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X.
19 CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X.
20 CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X.
23 CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
25 CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X
26 PLACE COMPACTED FILL
27 PROTECT IN PLACE EXISTING TREES



STA: 56+75 SECTION

NOT TO SCALE

A CF-116

LINE TABLE		
LINE	BEARING	LENGTH
L65	N59°44'38"W	14.72'
L66	N53°26'10"W	139.37'
L67	N49°18'46"W	40.32'
L68	N74°46'03"W	55.07'
L69	N73°31'01"W	29.93'
L70	N53°26'10"W	139.37'
L71	N49°18'46"W	48.90'
L72	N09°13'15"W	32.43'
L73	N63°51'36"W	45.00'

CURVE DATA				
CURVE	LENGTH	TAN	DELTA	RADIUS
C13	40.73'	20.39	6°18'28"	370.00'
C14	26.63'	13.32	04°07'23"	370.00'
C15	25.42'	12.72	04°24'51"	330.00'
C16	36.99'	18.51	04°52'20"	435.00'
C17	31.30'	14.66	04°07'23"	435.00'

SCALE 1"=20'
20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

TETRA TECH
800 WEST SIXTH STREET, SUITE 380
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-116
SHEET 16 OF 27

7/11/2011 9:52 AM
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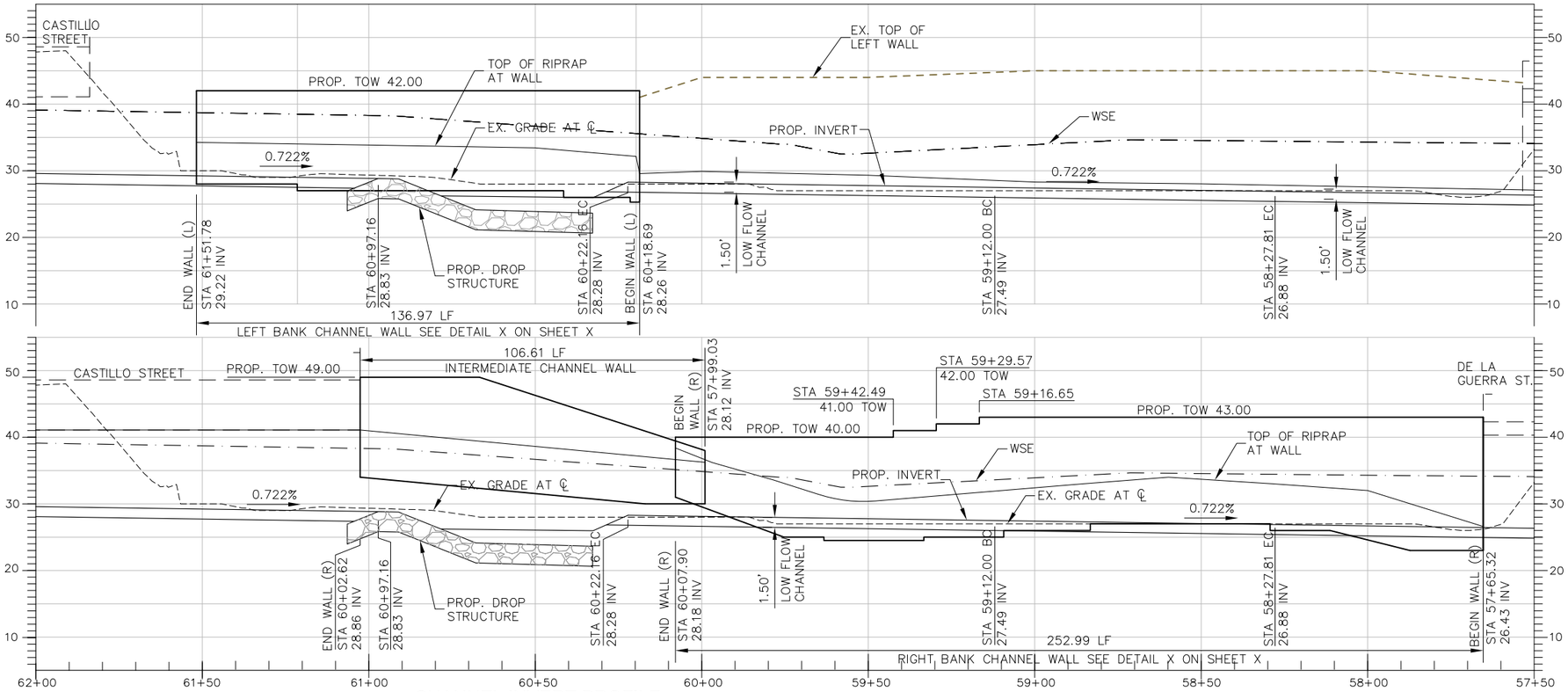


CHANNEL INVERT PROFILE

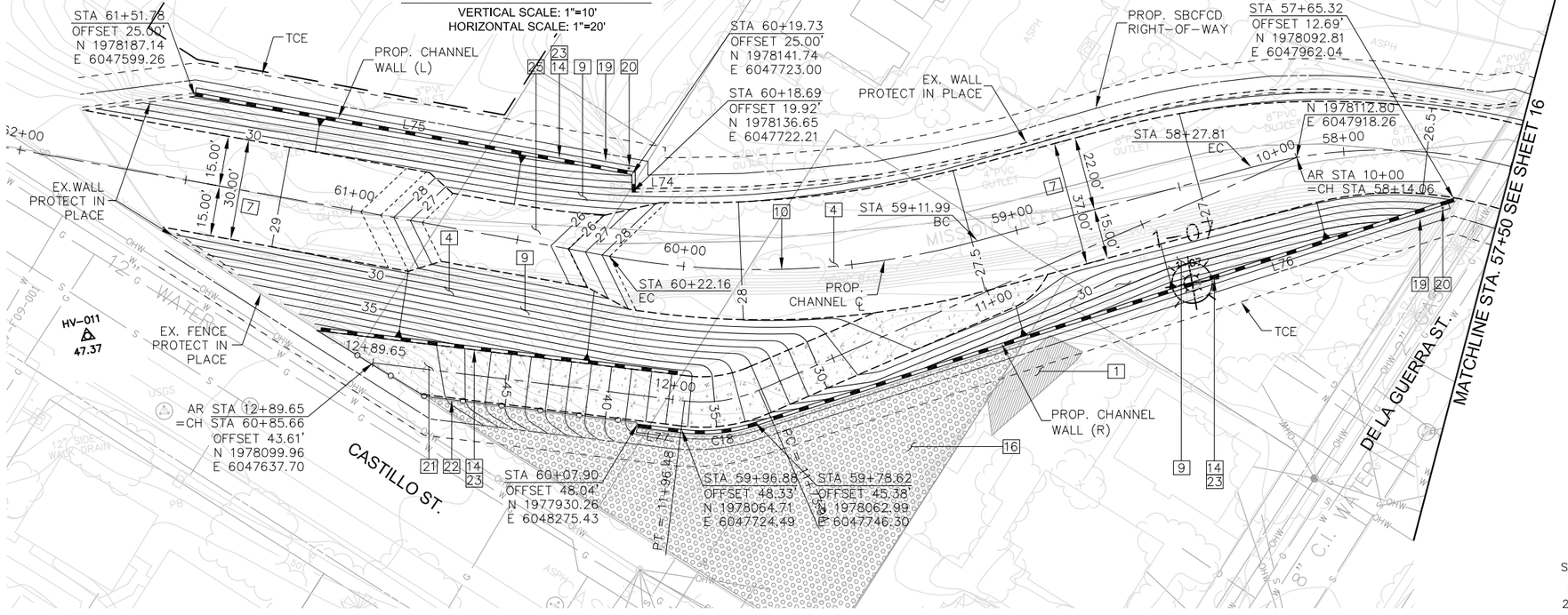
VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

CONSTRUCTION NOTES

1. EXISTING BUILDING STRUCTURE TO BE REMOVED
4. EXISTING MISC. CONCRETE TO BE REMOVED
7. CONSTRUCT CHANNEL PER DETAIL ON X ON SHEET X. CHANNEL WIDTH VARIES PER PLAN
9. PLACE RIPRAP CHANNEL REVETEMENT PER DETAIL X ON SHEET X
10. CONSTRUCT LOW FLOW CHANNEL PER DETAIL X ON SHEET X
14. CONSTRUCT TYPE 1 CHANNEL WALL (SOLDIER) PER DETAIL X ON SHEET X
16. EXPANDED HABITAT (PER LANDSCAPE PLANS)
19. CONSTRUCT PCC GUTTER PER DETAIL X ON SHEET X
20. CONSTRUCT DRAINAGE INLET PER DETAIL X ON SHEET X
21. CONSTRUCT ACCESS ROAD PER DETAIL D ON SHEET 26
22. CONSTRUCT ACCESS FENCE/GATE PER DETAIL X ON SHEET X
23. CONSTRUCT SAFETY FENCE/RAILING PER DETAIL X ON SHEET X
25. CONSTRUCT DROP STRUCTURE PER DETAIL X ON SHEET X

LINE TABLE		
LINE	BEARING	LENGTH
L74	N08°50'09"E	5.16'
L75	N69°51'09"W	132.43'
L76	N82°07'47"E	217.79'
L77	N73°06'01"W	13.15'

CURVE DATA				
CURVE	LENGTH	TAN	DELTA	RADIUS
C18	22.05'	11.20	24°46'11"	51.00'



US Army Corps of Engineers

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SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CHANNEL PLAN & PROFILE

SHEET REFERENCE NUMBER:
CF-117
SHEET 17 OF 27

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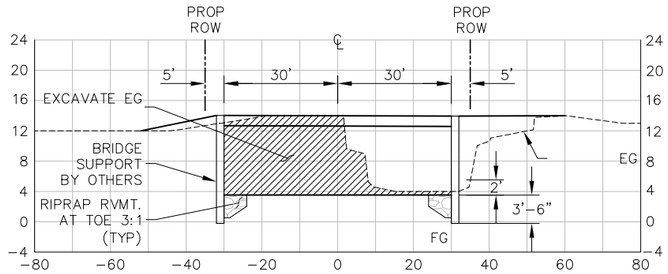

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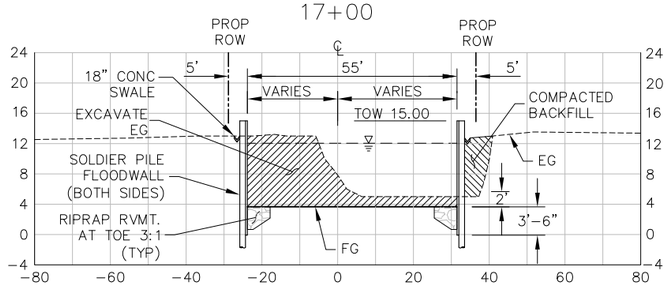

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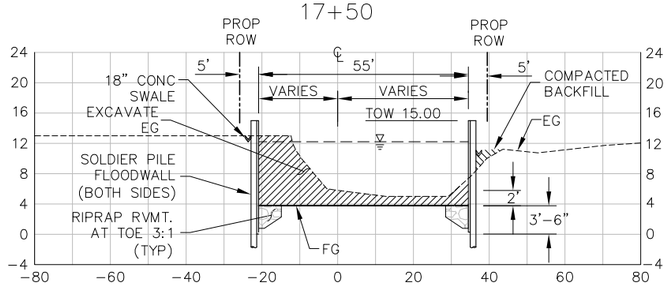

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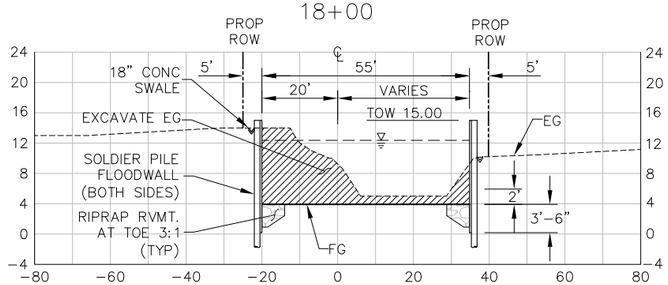

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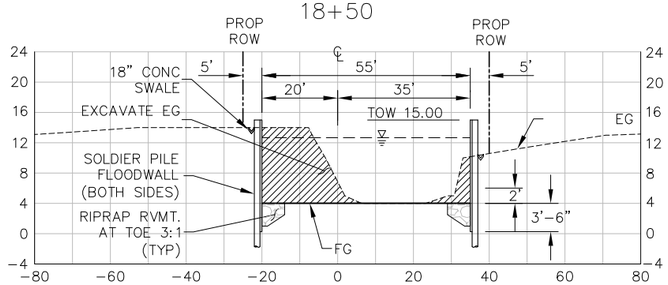

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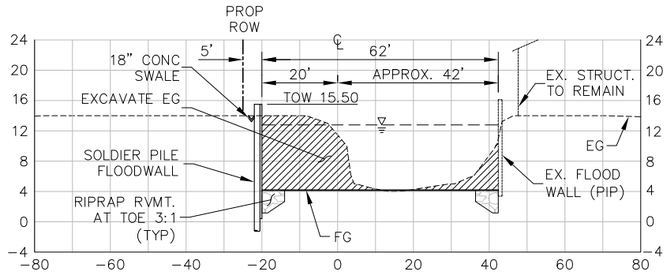

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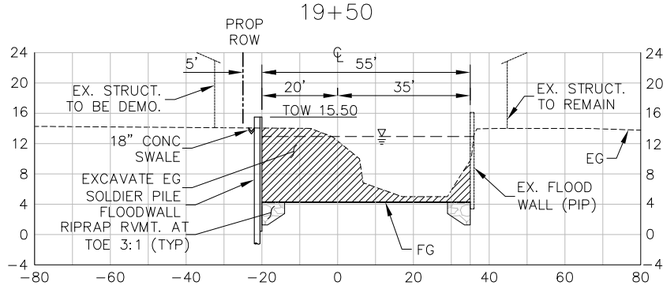

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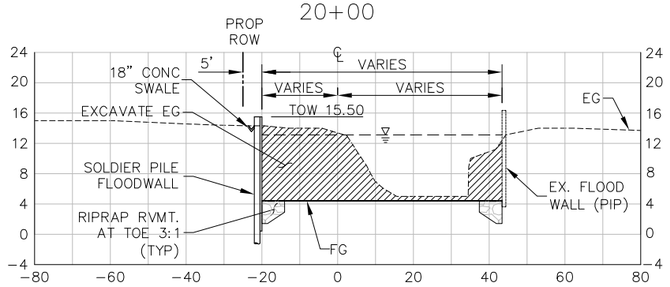

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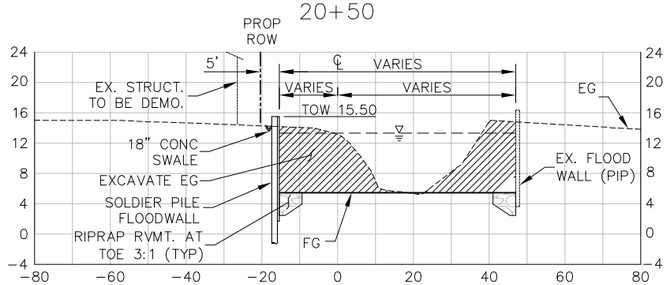

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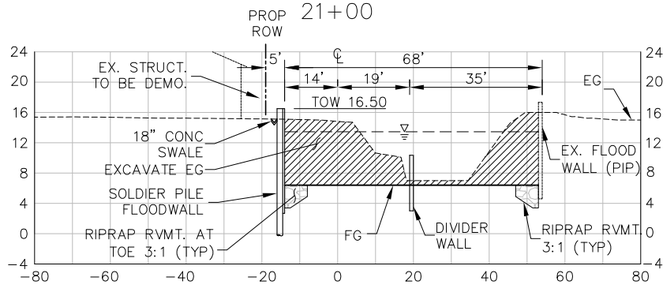

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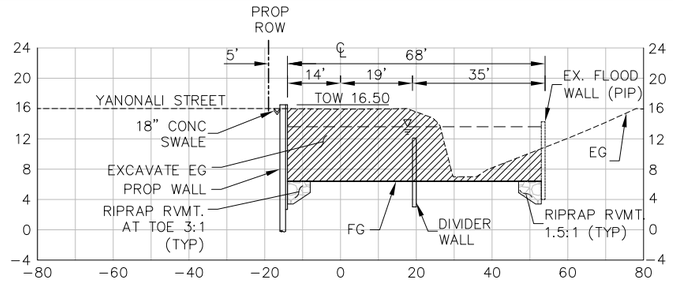

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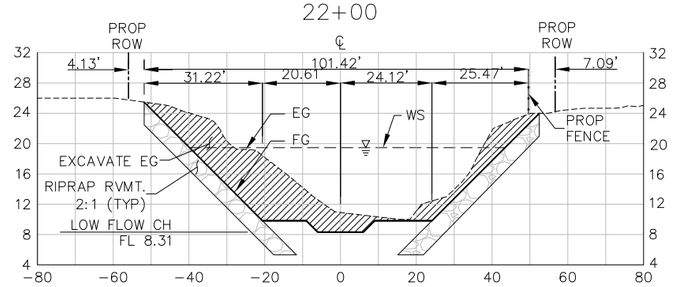

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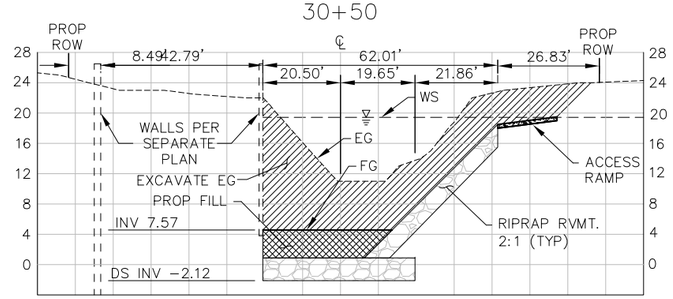

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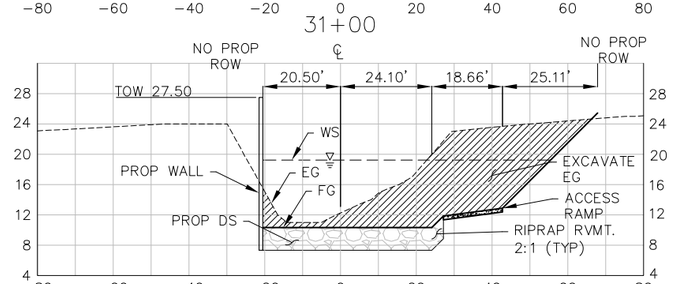

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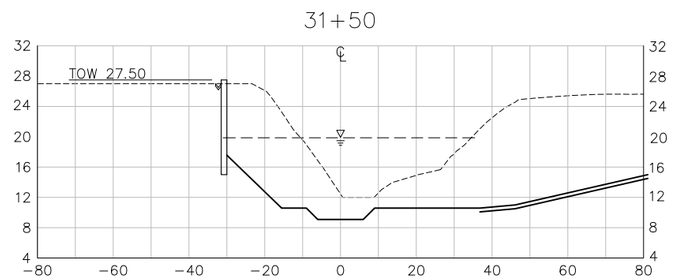

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US Army Corps of Engineers

REVISIONS

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PROJECT ENGINEER			DATE

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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CROSS SECTIONS

SHEET REFERENCE NUMBER:
CF-318
SHEET 18 OF 27

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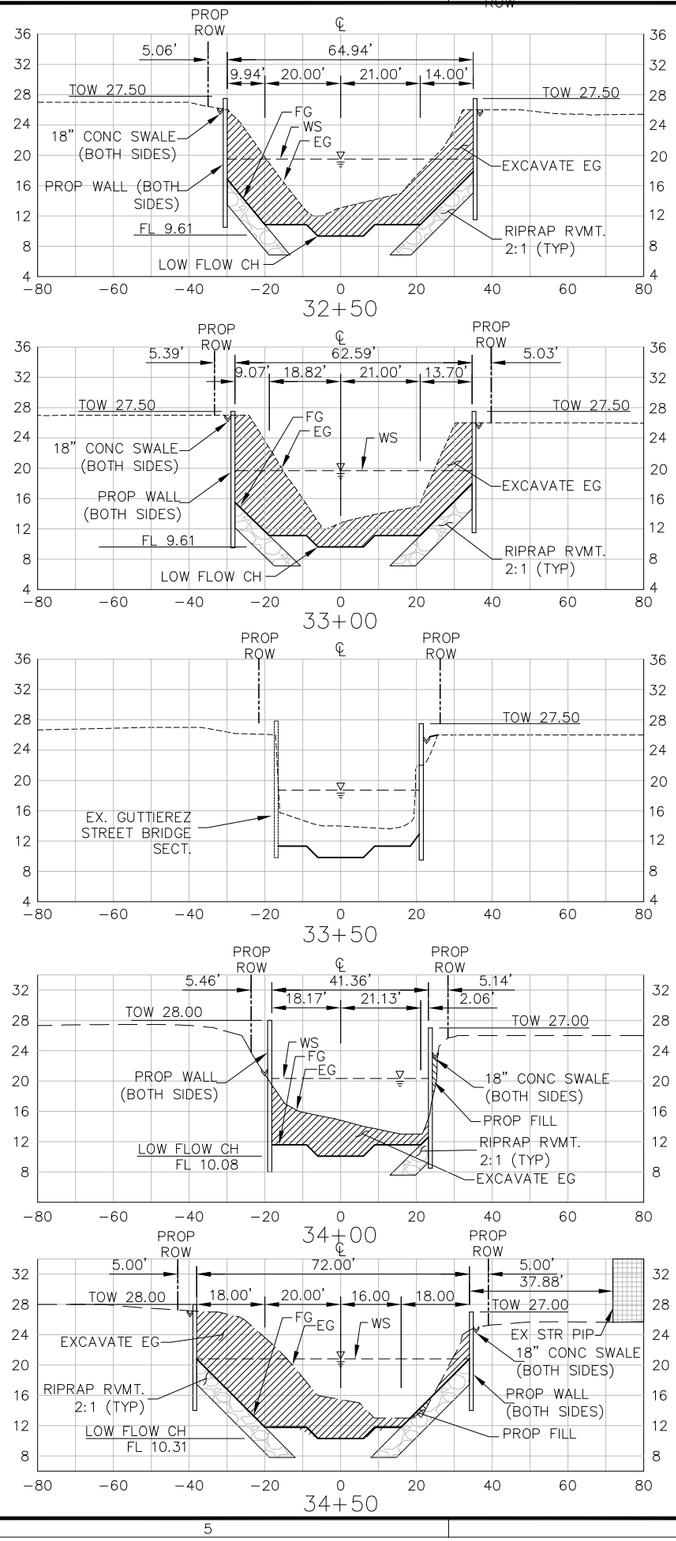

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LOWER MISSION CREEK
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SHEET REFERENCE NUMBER:
CF-319
SHEET 19 OF 27

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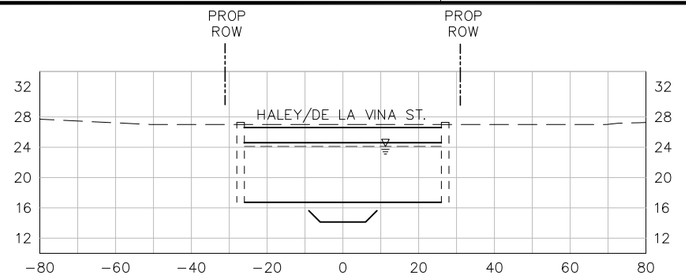

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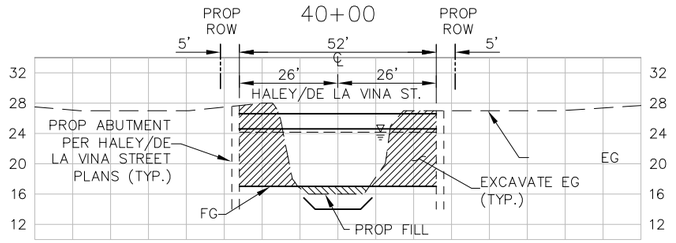

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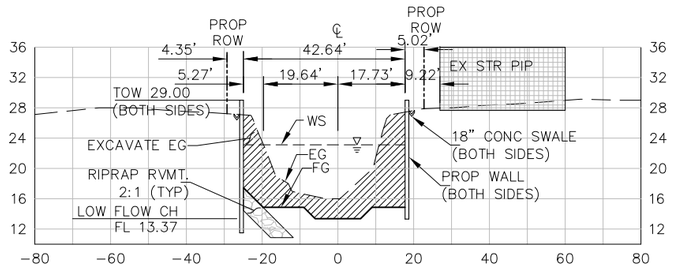

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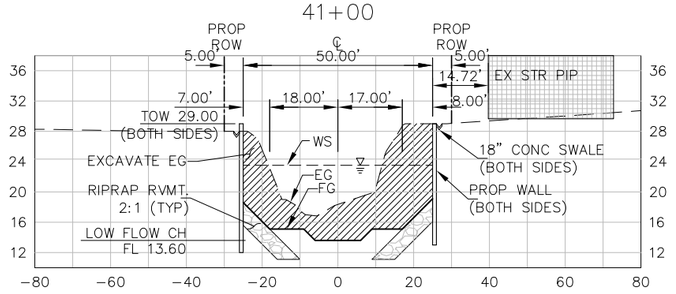

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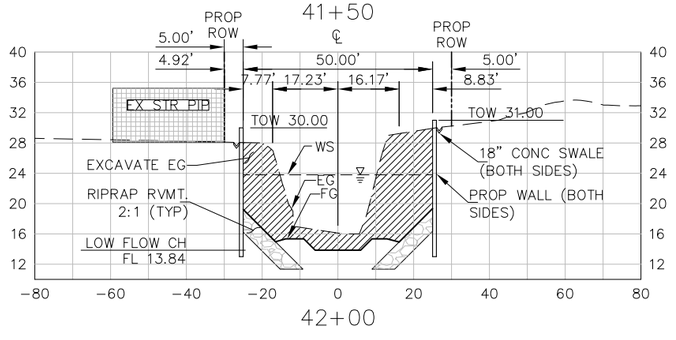

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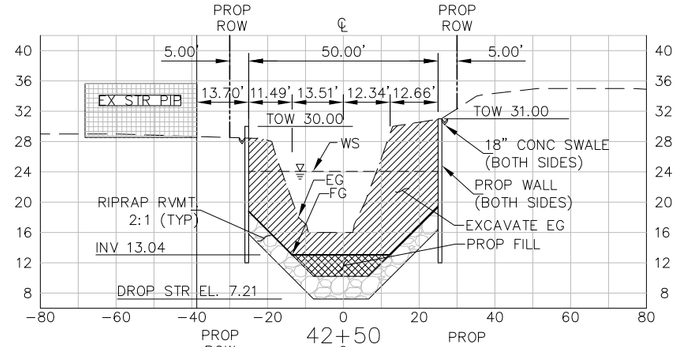

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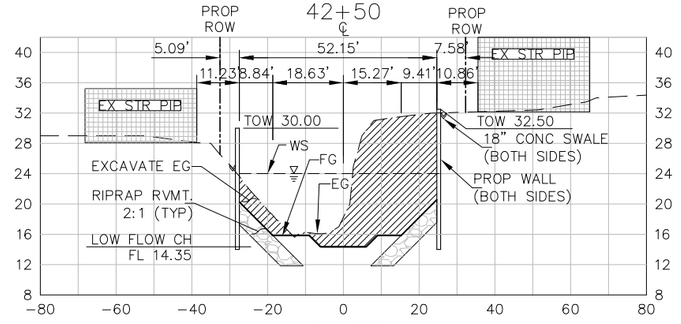

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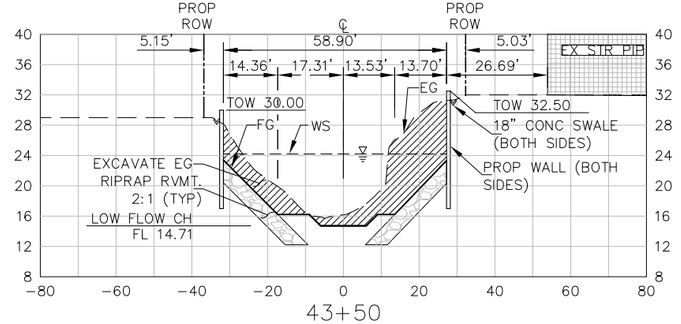

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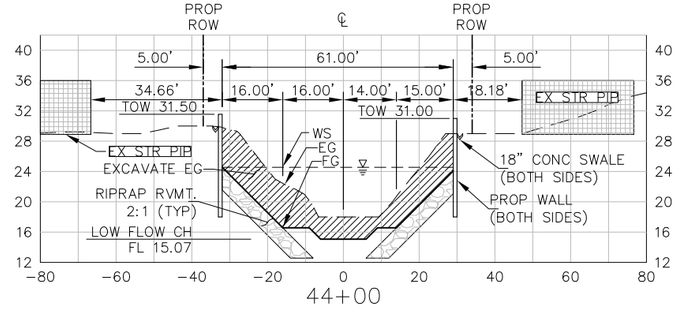

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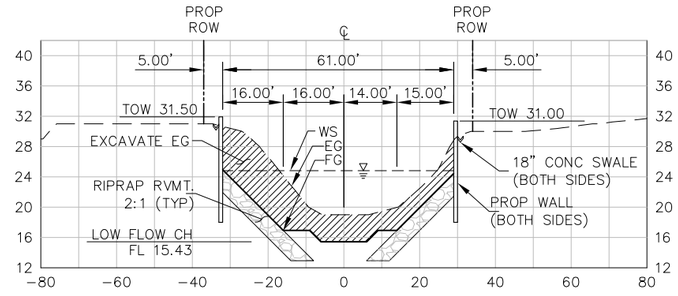

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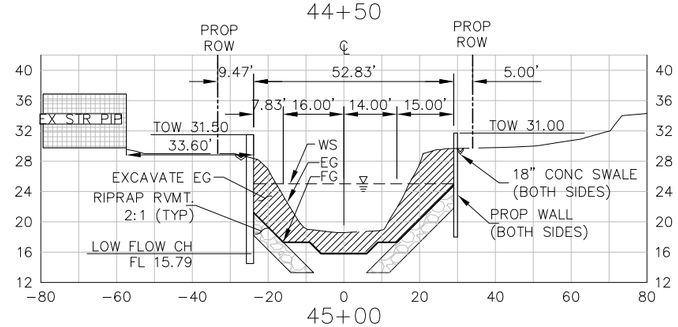

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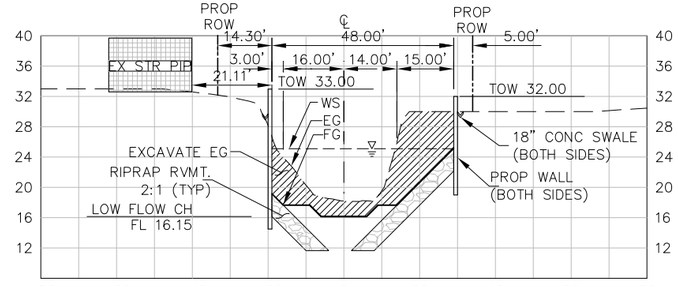

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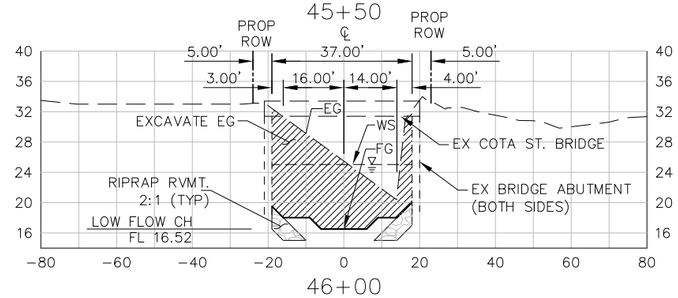

46+00

US Army Corps of Engineers

REVISIONS

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LOWER MISSION CREEK
CROSS SECTIONS

SHEET REFERENCE NUMBER:
CF-320
SHEET 20 OF 27

7/11/2011 9:52 AM
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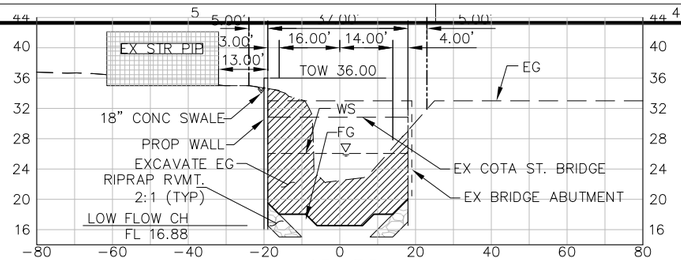

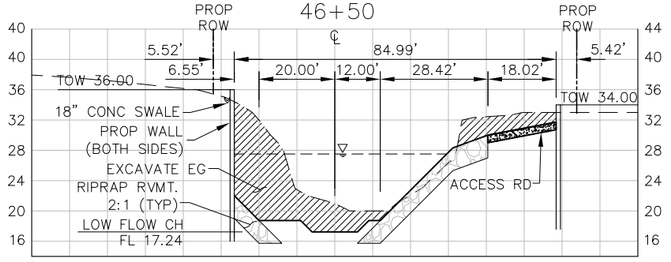

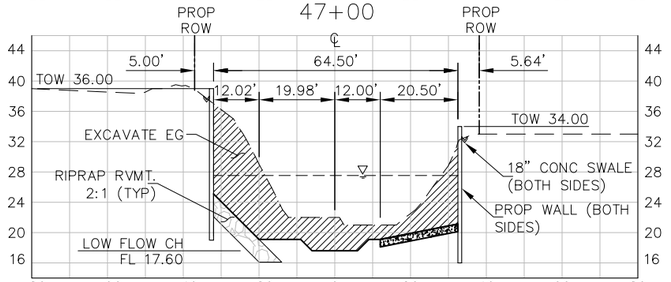

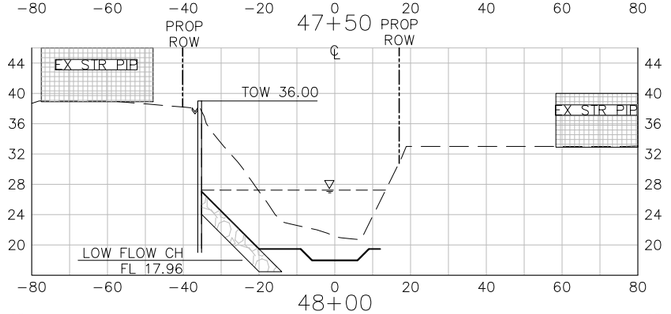

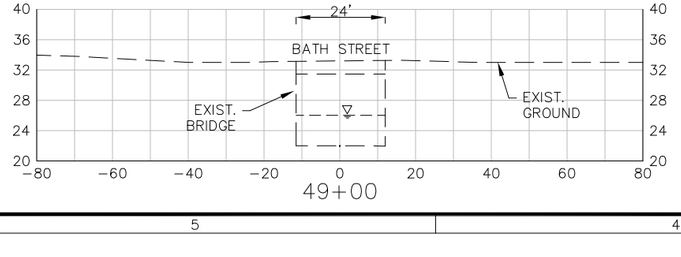

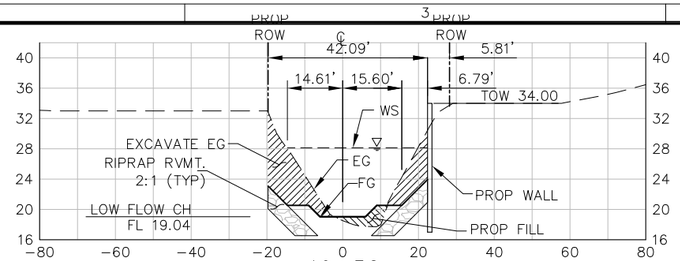

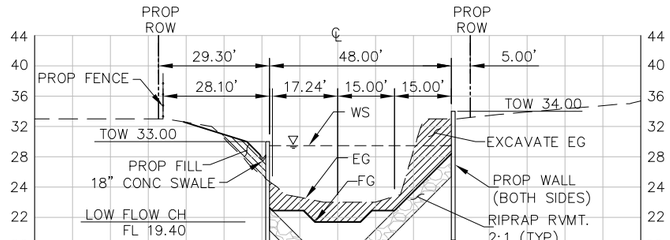

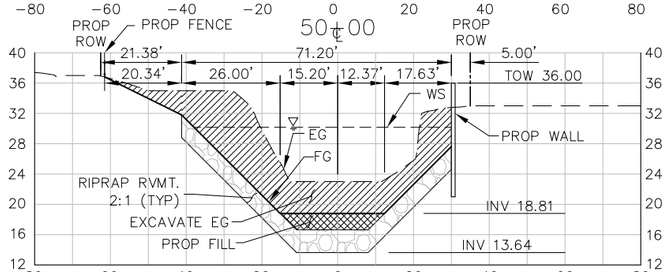

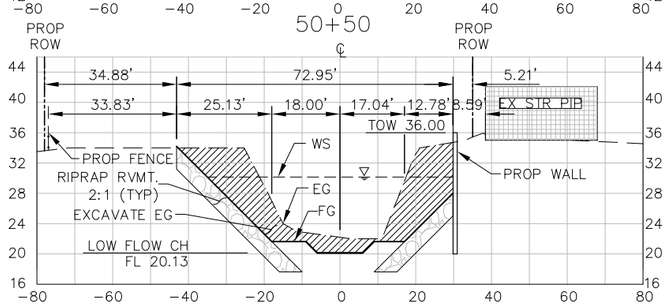

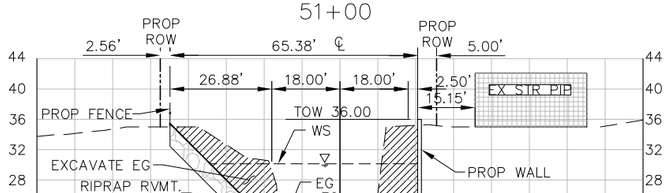

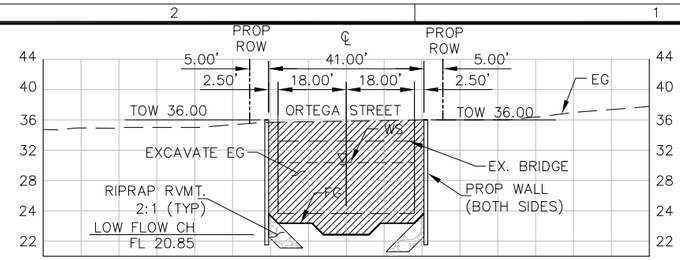

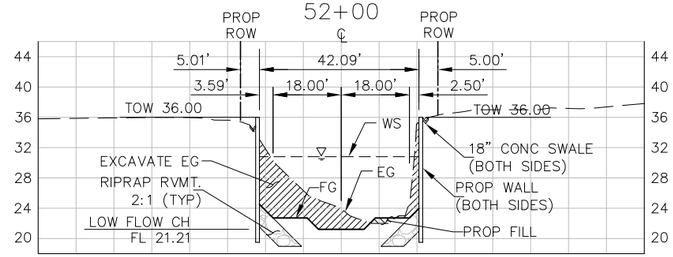

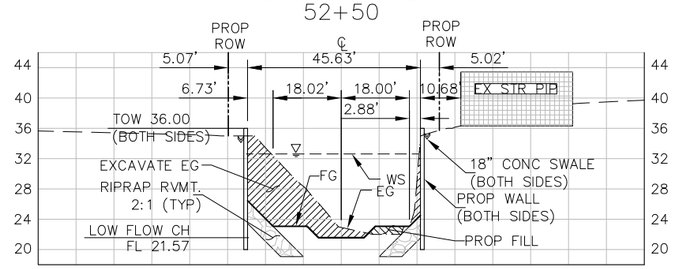

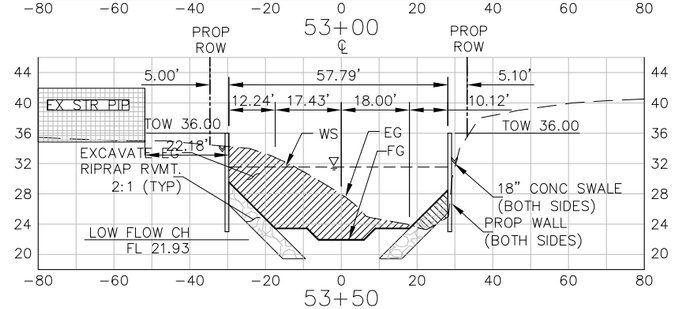

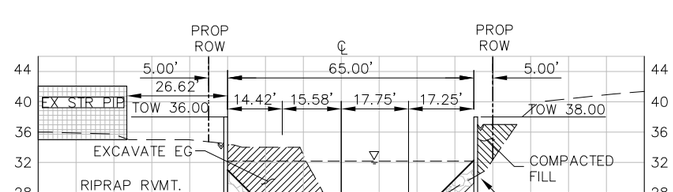

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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TETRA TECH
800 WEST SIXTH STREET, SUITE 350
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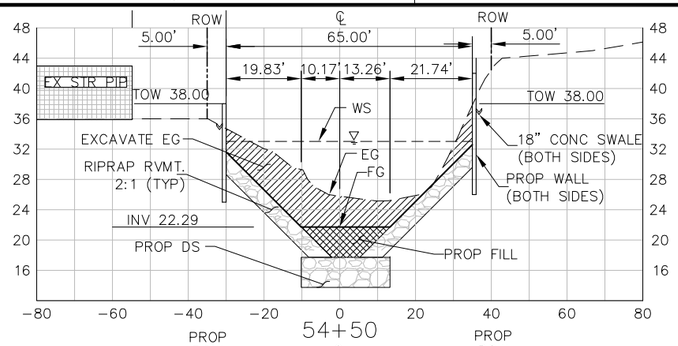
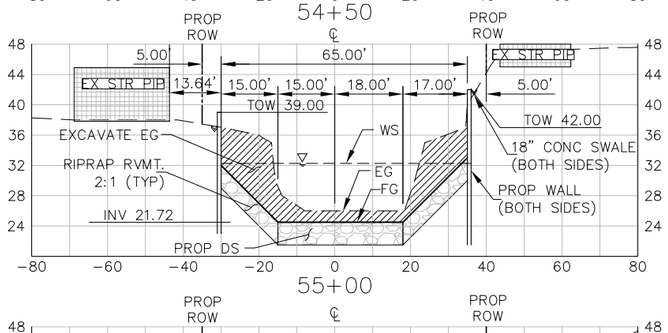
CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

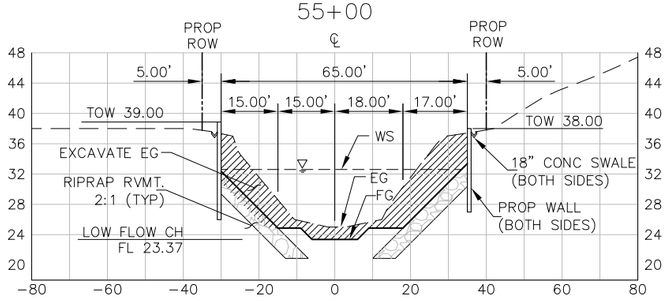
LOWER MISSION CREEK
CROSS SECTIONS

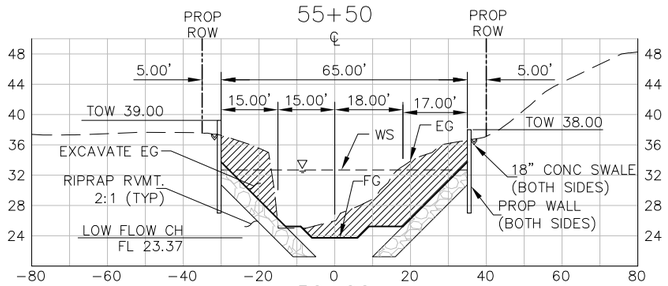
SHEET REFERENCE NUMBER:
CF-321
SHEET 21 OF 27

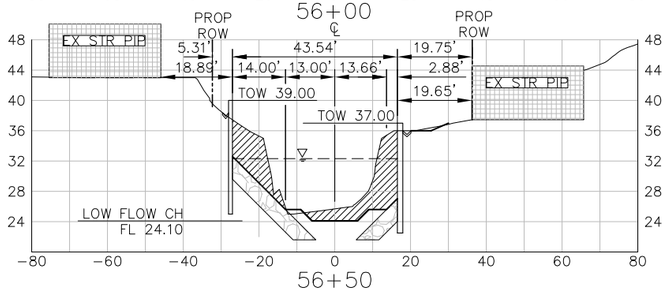
P:\WATR\T24732 LOWER MISSION CREEK\06_DESIGN\T24732CF321.DWG 7/11/2011 9:52 AM

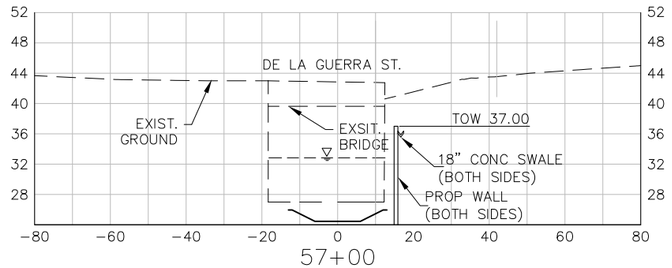


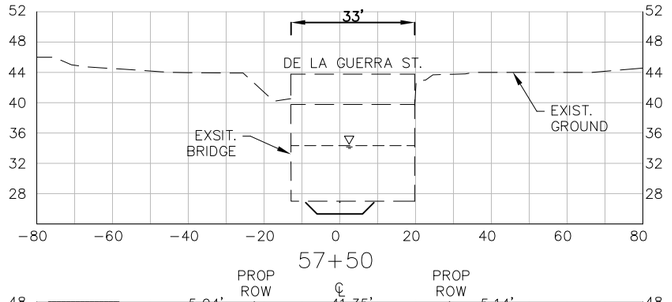


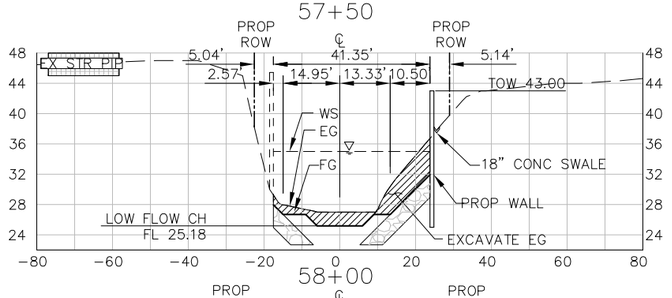


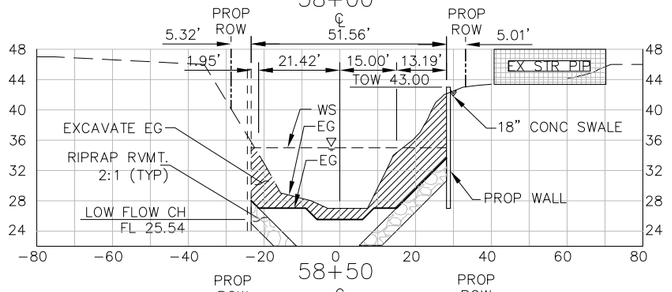


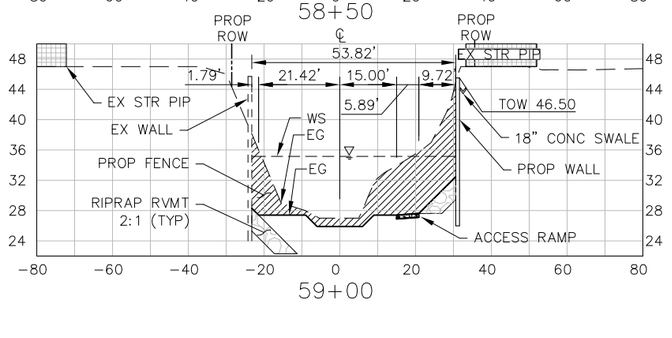


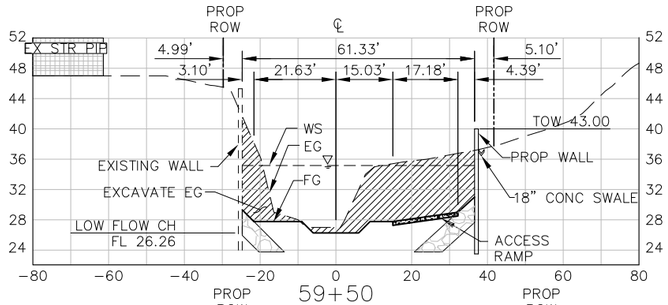


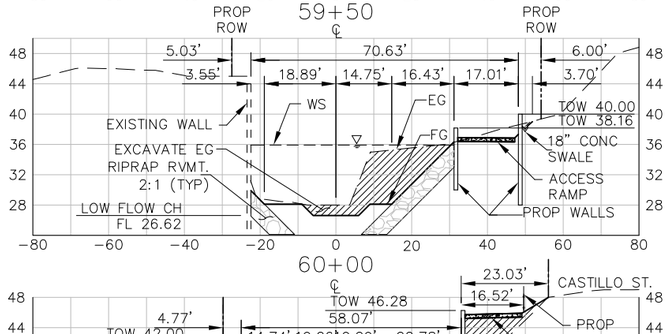


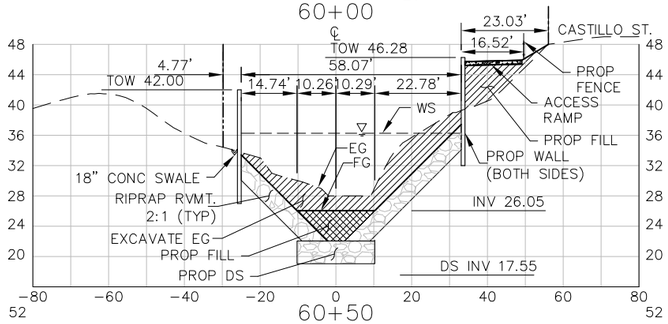


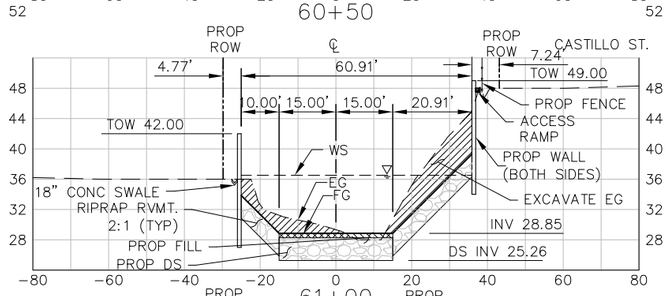


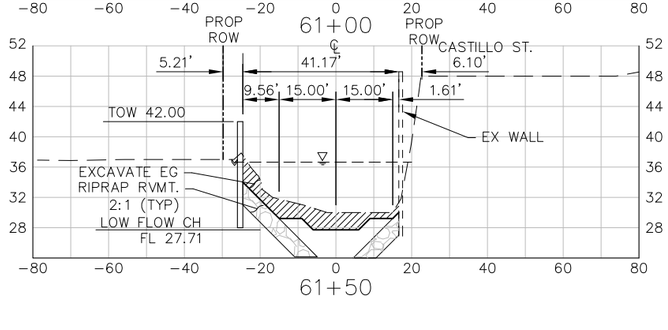












US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. | DATE: 07-27-10
DRAWN BY: T.W. | SCALE: AS SHOWN
CHECKED BY: B.H. | DWG FILE:
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U.S. ARMY ENGINEER DISTRICT
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
CROSS SECTIONS

SHEET REFERENCE NUMBER:
CF-322
SHEET 22 OF 27

7/11/2011 9:53 AM
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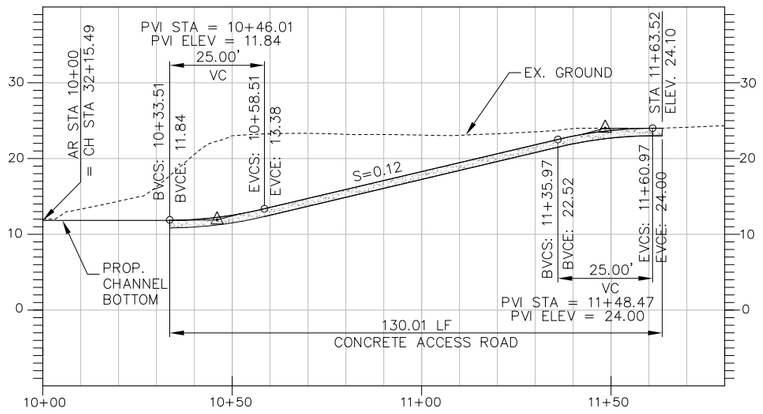
CONSTRUCTION NOTES

9 PLACE RIPRAP CHANEL REVETMENT PER DETAIL X ON SHEET X

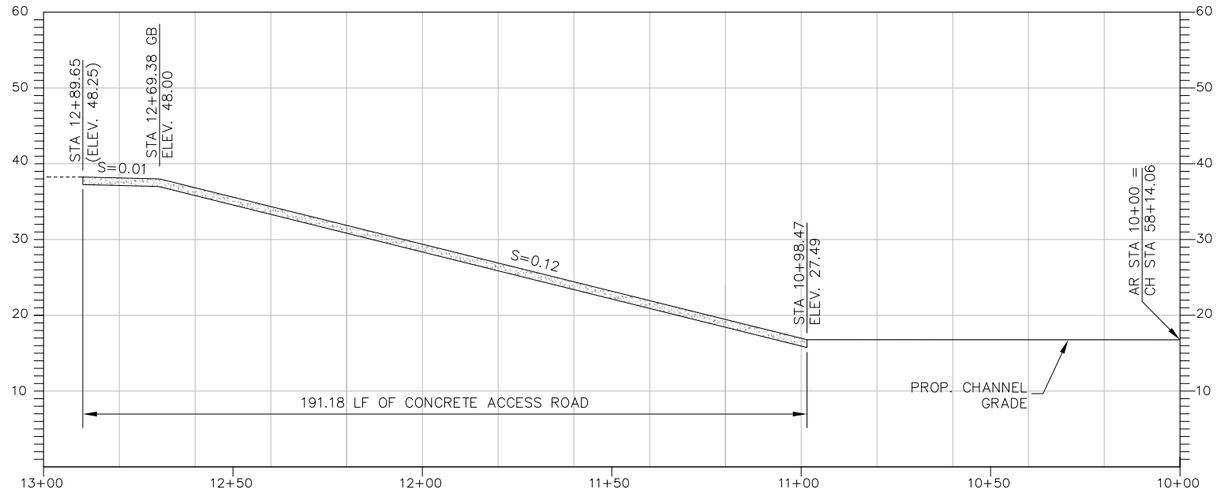
21 CONSTRUCT ACCESS RAMP PER DETAIL D ON SHEET 26

22 CONSTRUCT ACCESS FENCE/GATE PER DETAIL X ON SHEET X.



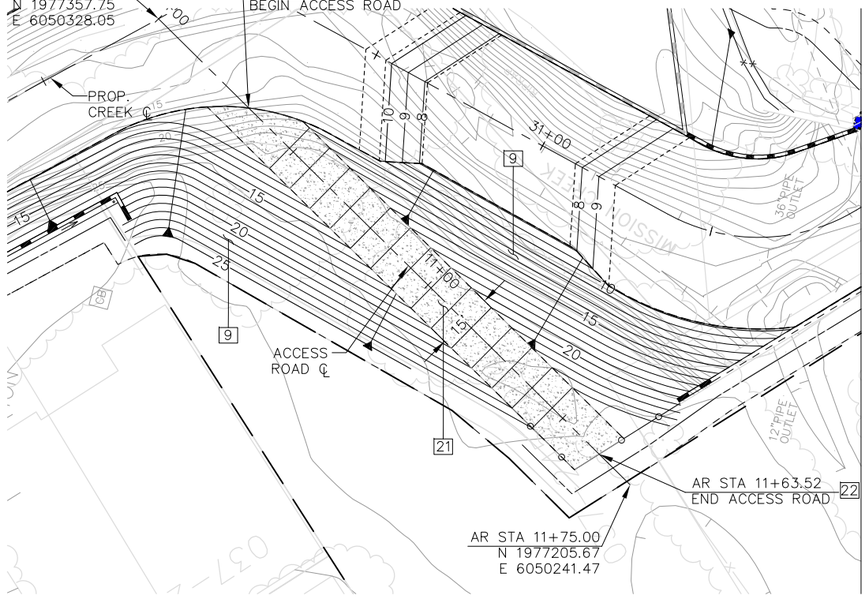
32+00 ACCESS ROAD PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'



61+00 ACCESS ROAD PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=20'

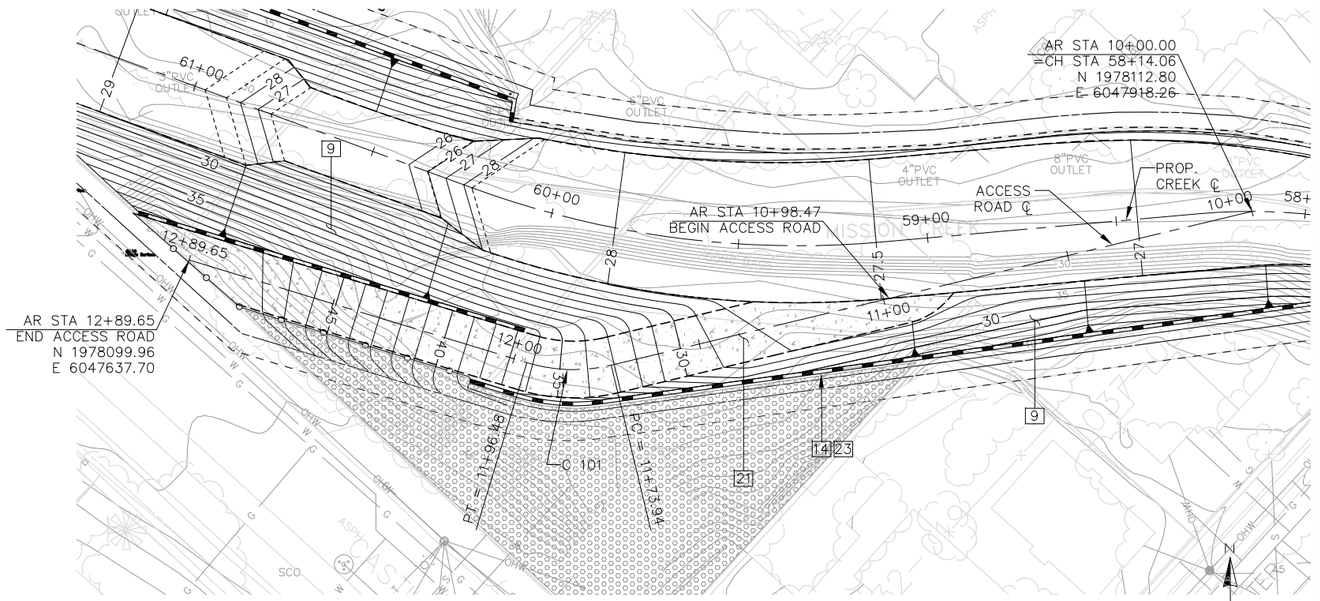


STA 32+00 ACCESS ROAD PLAN

SCALE: 1"=20'

SCALE 1"=20'

20 0 20 40 80



CURVE DATA				
CURVE	LENGTH	TAN	DELTA	RADIUS
C100	22.54'	11.54'	30°23'32"	42.50'

STA 61+00 ACCESS ROAD PLAN

SCALE: 1"=20'

SCALE 1"=20'

20 0 20 40 80

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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800 WEST SIXTH STREET, SUITE 380
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
ACCESS ROAD PLAN AND PROFILE

SHEET REFERENCE NUMBER:
CF-523
SHEET 23 OF 27

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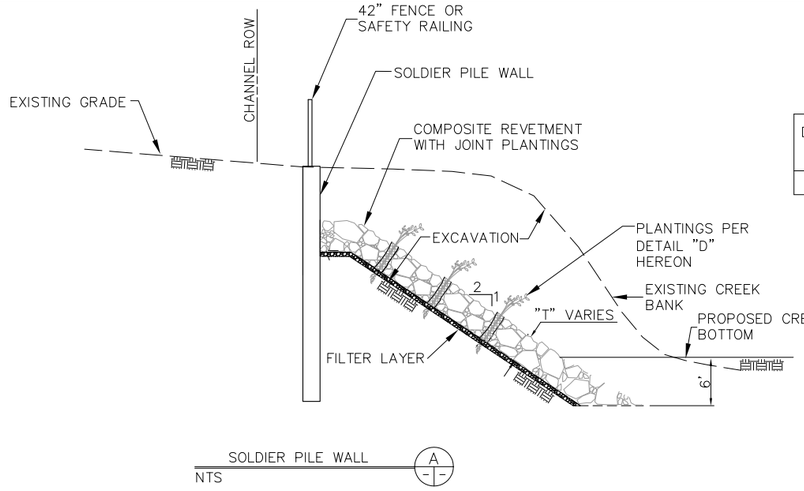
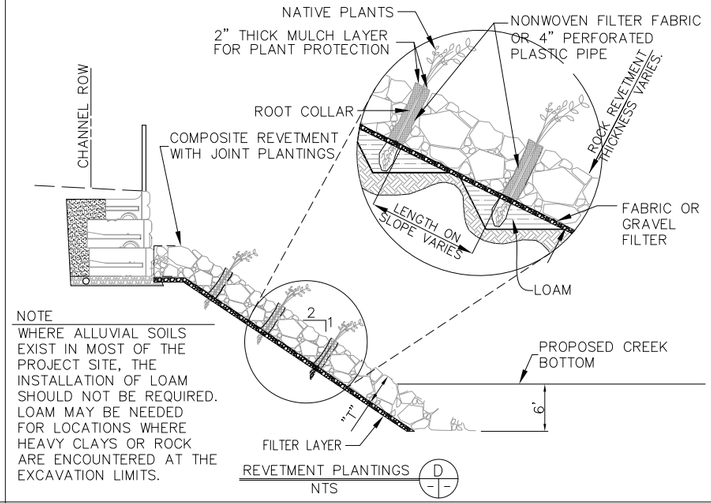


SOLDIER PILE WALL
NTS
A

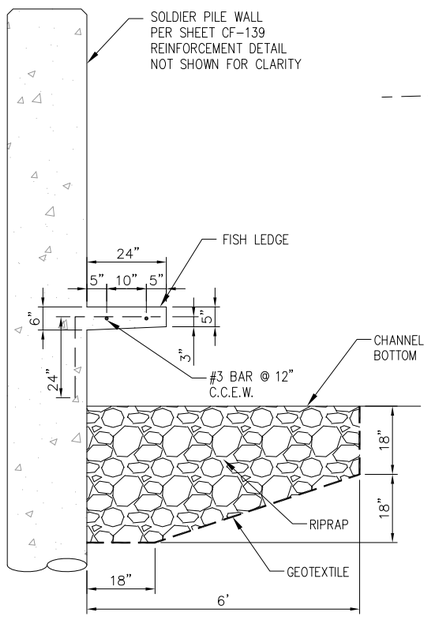
RIPRAP GRADATION

D100 (MAX) [IN]	LIMITS OF STONE WEIGHT [LB] FOR PERCENT LIGHTER BY WEIGHT						D30 (MIN) [IN]	D90 (MIN) [IN]
	100%		50%		15%			
18	265	106	78	53	39	17	9	13

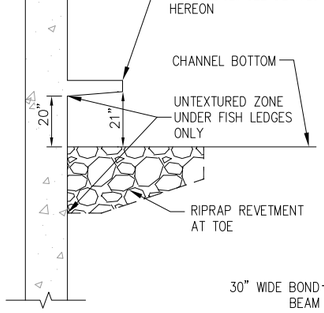


NOTE
WHERE ALLUVIAL SOILS EXIST IN MOST OF THE PROJECT SITE, THE INSTALLATION OF LOAM SHOULD NOT BE REQUIRED. LOAM MAY BE NEEDED FOR LOCATIONS WHERE HEAVY CLAYS OR ROCK ARE ENCOUNTERED AT THE EXCAVATION LIMITS.

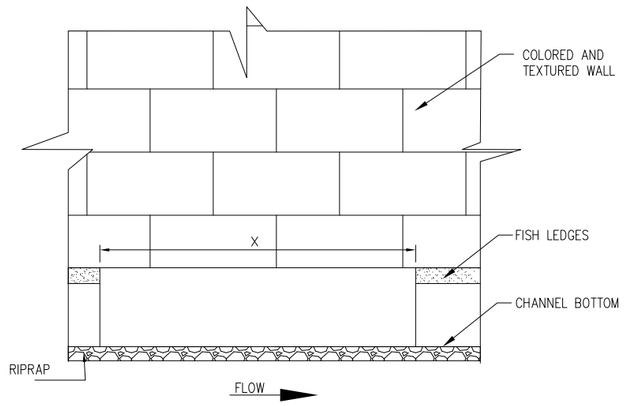
REVETMENT PLANTINGS
NTS
D

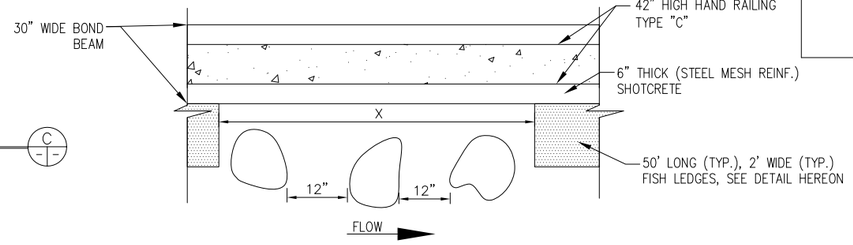


FISH LEGDE DETAIL
NTS
B



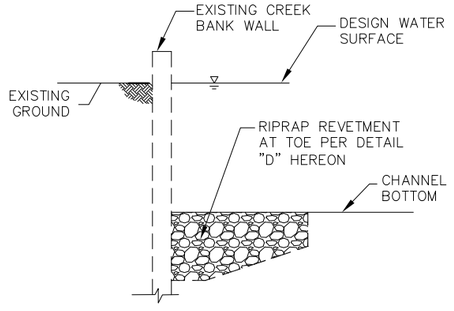
TEXTURE ZONES DETAIL
NTS
C





FISH LEDGE – PLANVIEW

DROP STRUCTURE DETAIL
D



EXISTING CREEK WALL WITH PROPOSED RIPRAP
NTS
H

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T.
DRAWN BY: T.W.
CHECKED BY: B.H.
DATE: 07-27-10
SCALE: AS SHOWN
DWG FILE:
PROJECT ENGINEER
DATE

U.S. ARMY ENGINEER DISTRICT
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LOS ANGELES, CALIFORNIA

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800 WEST SIXTH STREET, SUITE 380
LOS ANGELES, CALIFORNIA 90017
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
DETAILS (1)

SHEET REFERENCE NUMBER:
CF-524
SHEET 24 OF 27

7/11/2011 9:56 AM
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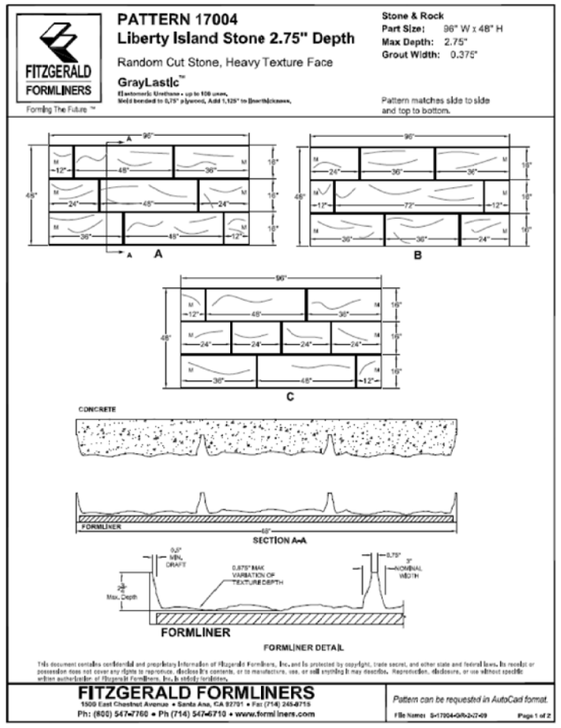
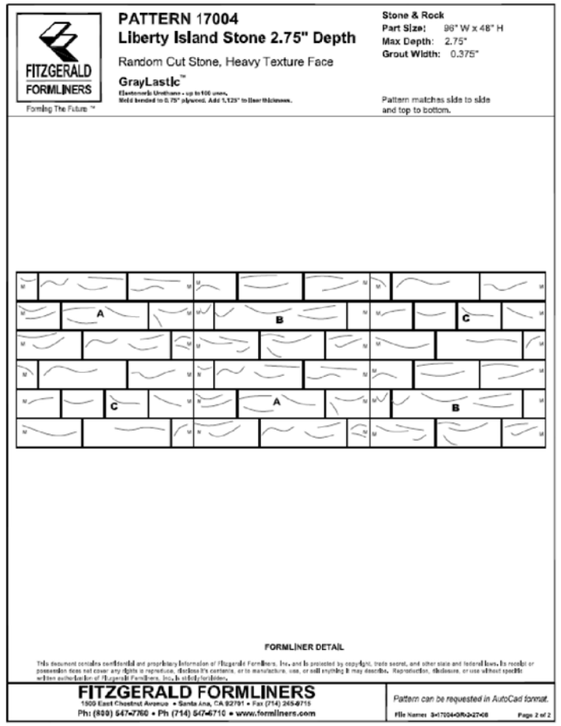
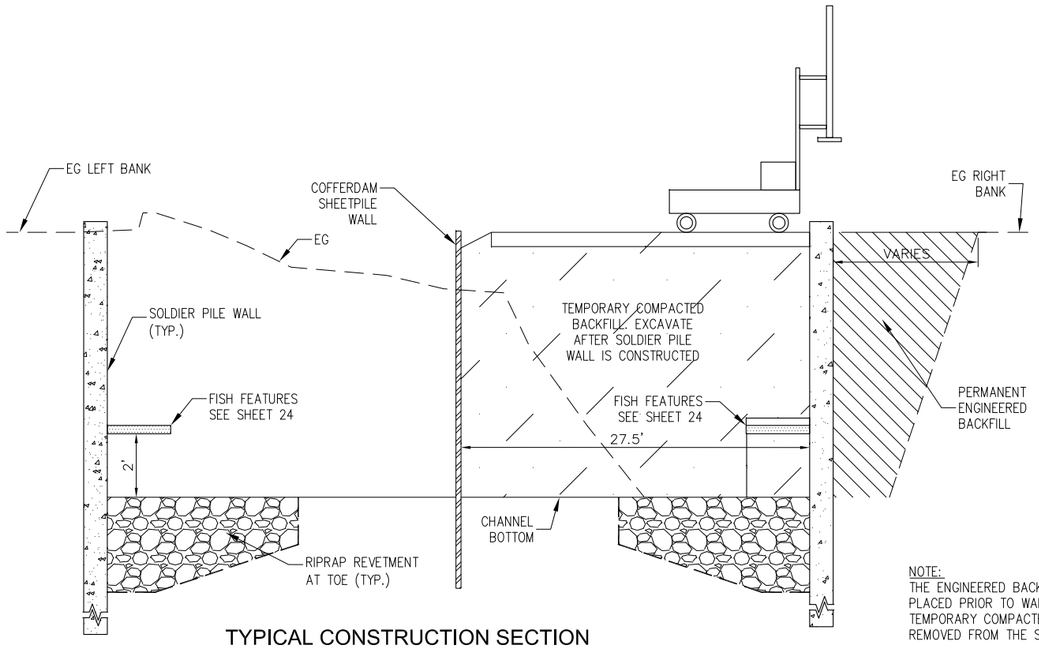
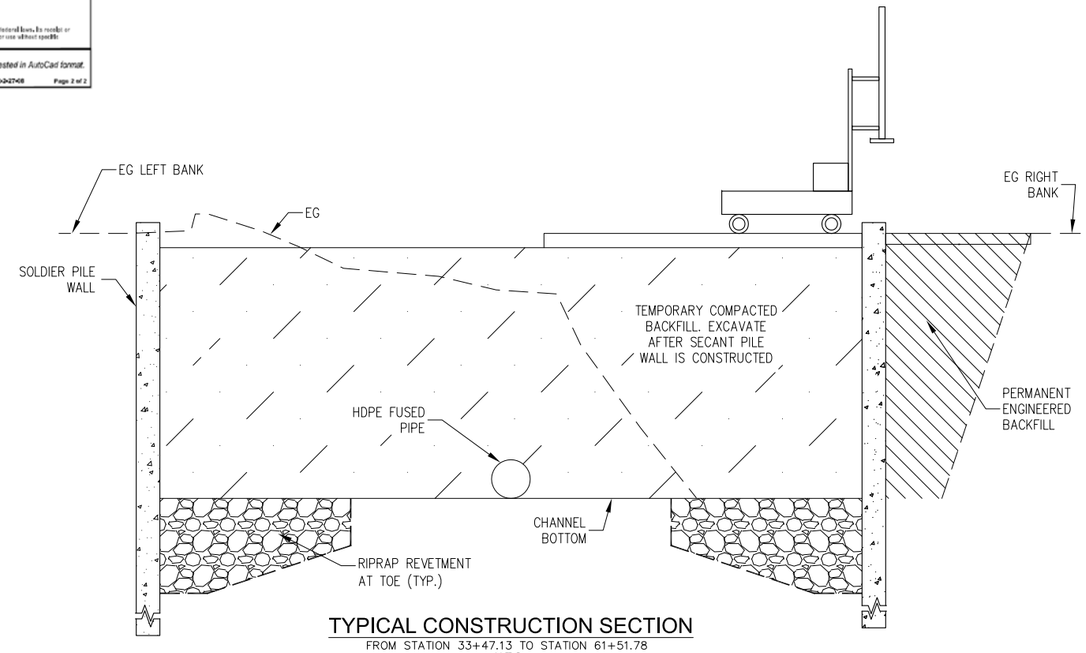






TYPICAL CONSTRUCTION SECTION

FROM STATION 17+12.30 TO STATION 22+18.74
N.T.S



TYPICAL CONSTRUCTION SECTION

FROM STATION 33+47.13 TO STATION 61+51.78
N.T.S

NOTE:
THE ENGINEERED BACKFILL BEHIND THE WALL IS PART OF THE TEMPORARY BACKFILL, PLACED PRIOR TO WALL CONSTRUCTION. AFTER THE NEW WALL IS IN PLACE, THE TEMPORARY COMPACTED BACKFILL, BETWEEN THE NEW WALL AND THE COFFERDAM, IS TO BE REMOVED FROM THE SITE.

NTS

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
CHECKED BY: B.H. DWG FILE:
PROJECT ENGINEER DATE

U.S. ARMY ENGINEER DISTRICT
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
DETAILS (2)

SHEET REFERENCE NUMBER:
CF-525
SHEET 25 OF 27

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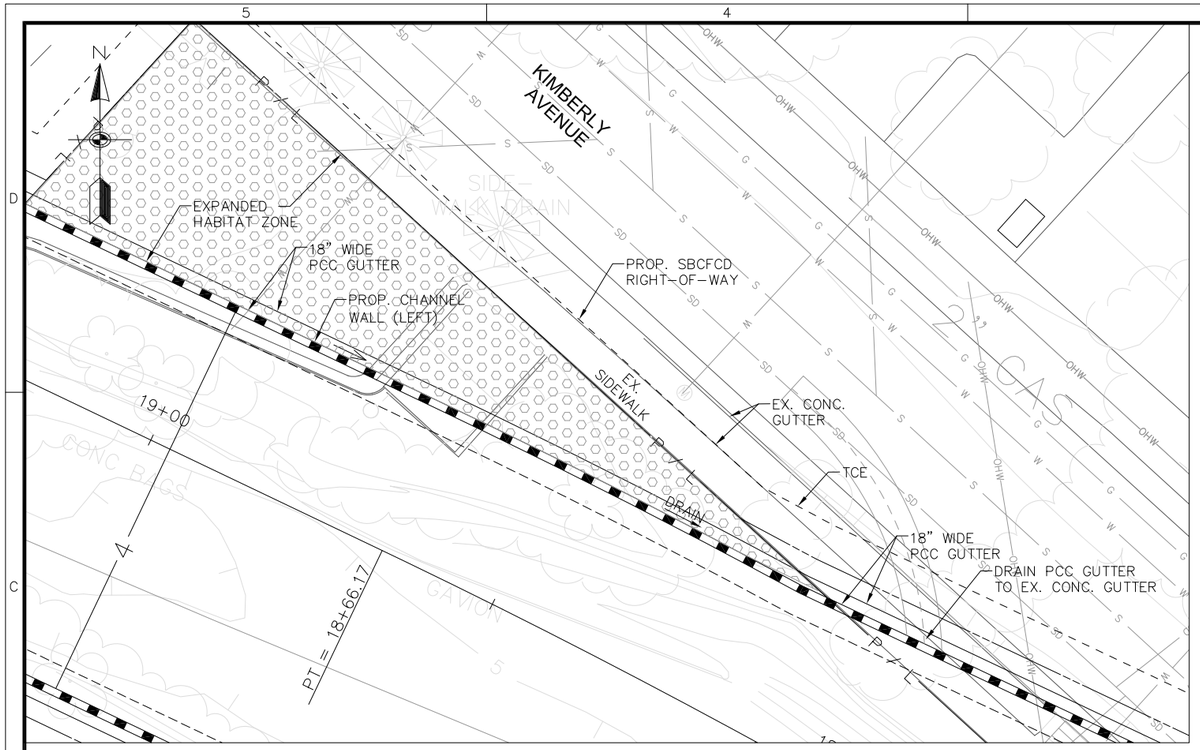
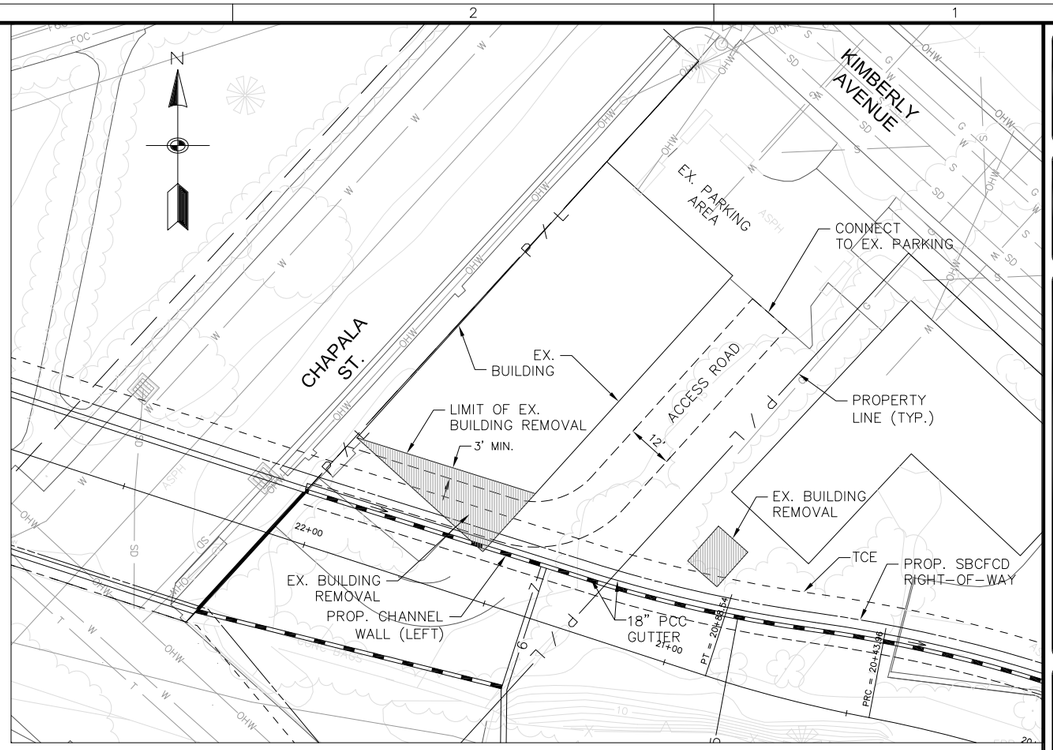


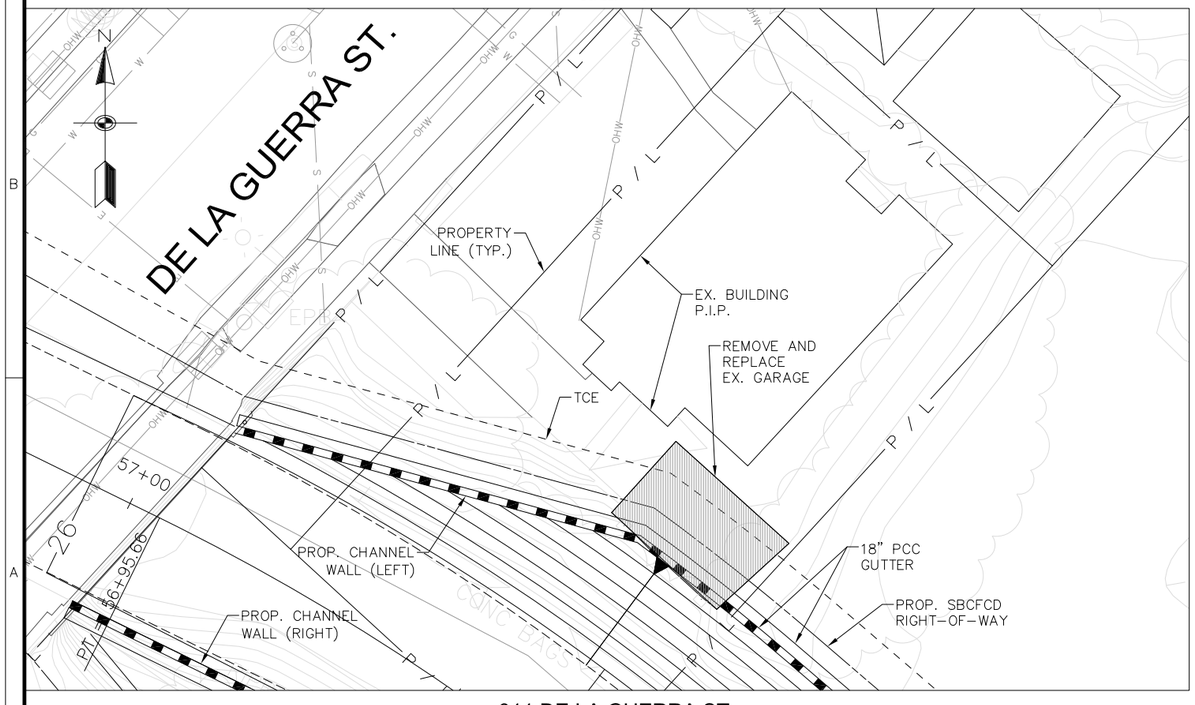
135 KIMBERLY AVE

SCALE: 1"=10'



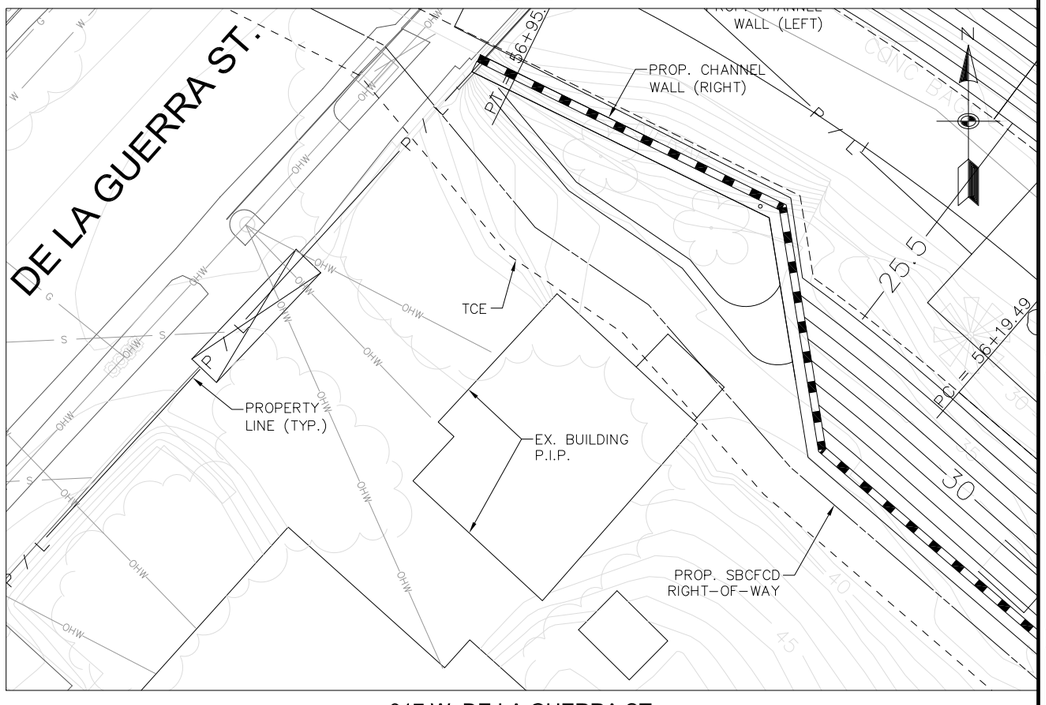
134 CHAPALA ST

SCALE: 1"=20'



311 DE LA GUERRA ST.

SCALE: 1"=10'



317 W. DE LA GUERRA ST.

SCALE: 1"=10'

US Army Corps of Engineers

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. | DATE: 07-27-10
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CHECKED BY: B.H. | DWG FILE:
PROJECT ENGINEER | DATE

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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
DETAILS (3)

SHEET REFERENCE NUMBER:
CF-526
SHEET 26 OF 27

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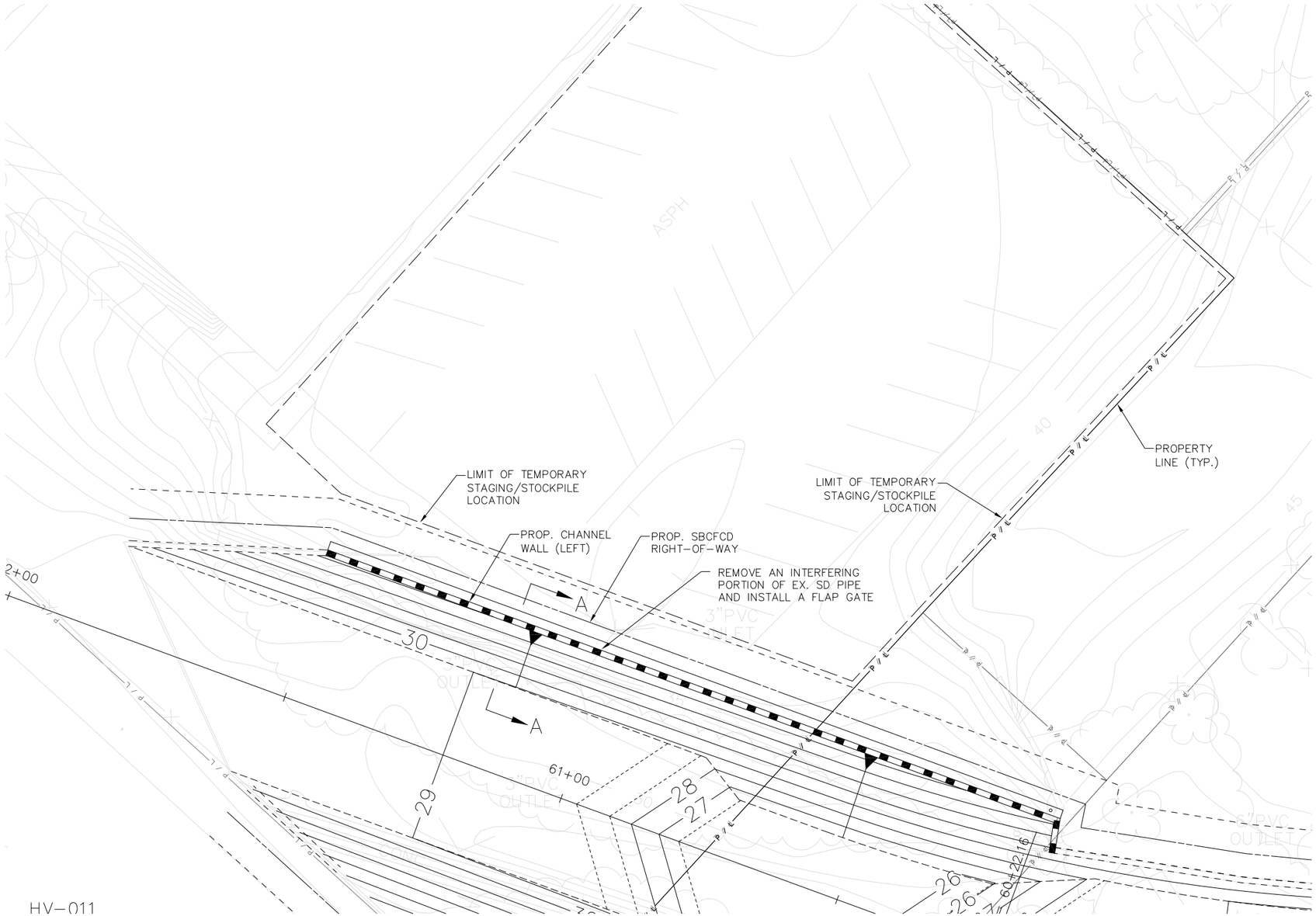
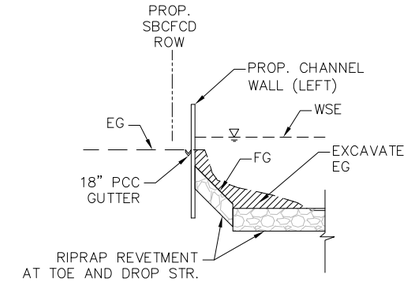


329 W. CANON PERDIDO ST.

SCALE: 1"=10'



SECTION A-A

SCALE: 1"=10'

SCALE 1"=10'

10 0 10 20 40

N

US Army Corps of Engineers

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DESIGNED BY: A.T. DATE: 07-27-10
DRAWN BY: T.W. SCALE: AS SHOWN
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CITY OF SANTA BARBARA
SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

LOWER MISSION CREEK
DETAILS (4)

SHEET REFERENCE NUMBER:
CF-527
SHEET 27 OF 27

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Cardno ENTRIX

Shaping the Future

Revised Draft

Habitat Restoration, Enhancement, Monitoring, and Management Program for the Cabrillo Bridge and Lower Mission Creek Projects

January 2011

Prepared For

David Black and Associates

Revised Draft

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1.0 Introduction

The Cabrillo Bridge Replacement Project (Project) is located near the confluence of Mission Creek with the Pacific Ocean in Santa Barbara, within the Mission Creek estuary. Mission Creek is perennial and has a drainage area of approximately 7,000 acres. While the creek is relatively degraded at the project location due to development and channelization, the intent of the Project, in addition to increasing the flow capacity of the creek, is to restore and/or enhance the creek banks to a more natural condition. These enhancements are intended to improve the overall natural environment and to improve habitat for fish species that inhabit the creek.

Flooding from lower Mission Creek is an issue being addressed by the Lower Mission Creek Flood Control Project that extends from Canon Perdido Street to Cabrillo Boulevard. The Project is one part of a larger project to improve the hydraulic conveyance of lower Mission Creek to the Pacific Ocean. The Project area (Figure 1) encompasses Mission Creek and its lagoon, from State Street to the beach as well as the immediately adjacent areas along the top of the creek banks where revegetation with native riparian plant species will occur. In addition, staging areas, areas where the temporary beachway is to be located, and areas where existing palm trees will be relocated and turf grass replanted are part of the overall Project area.

Existing non-native vegetation at the top of the banks between State Street and Cabrillo Boulevard will be removed during reconstruction of the creek banks in this area and will be replaced with native plants. The reconstructed banks from Cabrillo Boulevard to the beach will also be planted with native species to provide bank stabilization and to improve habitat for aquatic species in the enlarged lagoon.

This Plan addresses mitigation for impacts on wetland and transitional habitats for the Cabrillo Bridge Project and for the Lower Mission Creek Project, in part. It describes the existing conditions, goals and objectives for the restoration, methods for establishing and maintaining the plants (e.g., planting, irrigation, and weed control), performance criteria, monitoring and performance evaluation, remedial actions (if needed), and reporting.

2.0 Existing Conditions

This general habitat description is based on information contained in the Initial Study (City of Santa Barbara 2007), a Natural Environment Study (URS 2006), and site reconnaissance surveys conducted by SAIC in July 2009 and Cardno ENTRIX in December 2010. A map with notes on existing vegetation and photopoints (as discussed below) is shown in Attachment A. No sensitive plant species have been observed in the treatment area.

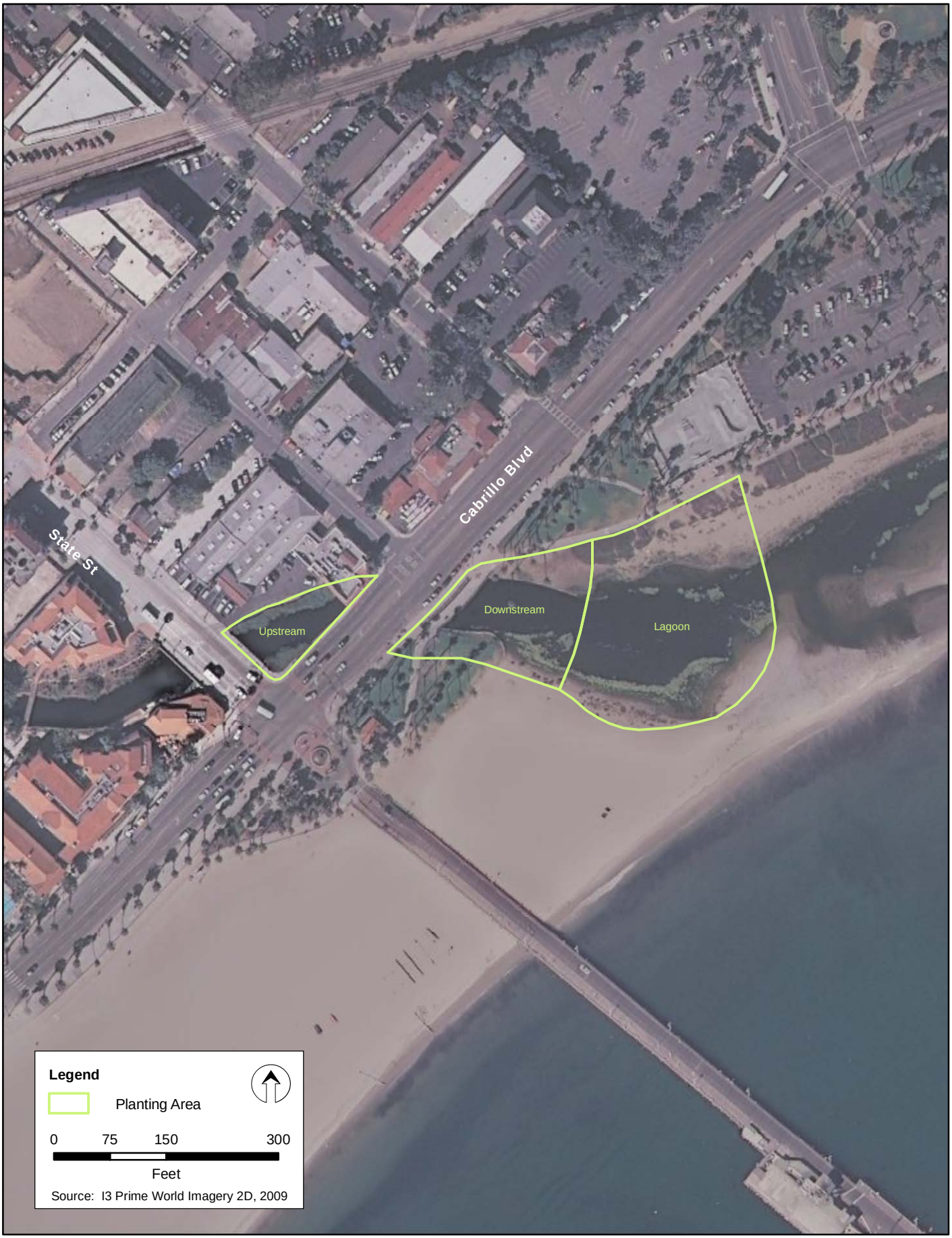


Figure 1 : Approximate Restoration Area Planting Locations

The Project site is divided into three major areas for the purposes of this Plan: upstream between Cabrillo Boulevard and State Street, from Cabrillo Boulevard to 200 feet on the east bank and 100 feet on the west bank downstream, and the coastal lagoon to the ocean. These areas are referred to as the upstream planting area, the downstream planting area, and the lagoon planting area in this Plan. The upstream portion of the creek has wooden retaining wall on either side of the approximately 50-foot wide channel. Above the wooden retaining walls are bands of planted and naturalized vegetation that are about 15 to 20 feet wide. Vegetation in this area is almost entirely myoporum (*Myoporum laetum*), a non-native invasive species. The myoporum is low in stature (generally less than six feet in height) and overhangs the creek.

Downstream of Cabrillo Boulevard for approximately 100 to 200 feet the creek widens onto East Beach. Adjacent to the creek, near Cabrillo Boulevard, the banks are primarily covered in turf, mostly Bermuda grass (*Cynodon dactylon*) with scattered planted fan palm trees (*Washingtonia* spp.). Further south, the creek banks are have limited vegetation including dune scrub species, such as beach-bur (*Ambrosia chamissonis*) and sea rocket (*Cakile maritima*) as well as wetland transition species such as sedge (*Cyperus* sp.) and tamarisk (*Tamarix* sp.). Tamarisk is a non-native invasive species and is discussed in more detail below.

Further downstream, Mission Creek widens into the lower lagoon area. Vegetation along margins of the lagoon is limited due to sandy soil, and heavy human use of the adjacent beach area. Existing vegetation consists of patches of beach bur, sea rocket, and beach saltbush (*Atriplex leucophylla*).

The lagoon is dynamic and periodically breaks the sandbar during storm runoff events and empties into the Pacific Ocean. The lagoon supports a variety of fish and invertebrates which in turn provide forage for a variety of bird species. The lagoon varies in size from month to month and from year to year. The area surrounding the lagoon is primarily sandy beach habitat that has been degraded by trampling and various construction projects with landscaped areas (turf grass and palm trees) near Cabrillo Boulevard. See photographs in Attachment A for current conditions of the estuary.

3.0 Goals and Objectives of the Plan

The purpose of this Plan is to provide the methodology to restore and enhance exposed ground disturbed by Cabrillo Bridge Project construction activities and removal of non-native plants, and to provide mitigation for impacts of the Lower Mission Creek Project along downstream lagoon areas. This Plan only addresses areas to be landscaped and/or restored with native vegetation. Other portions of the Project that will be planted with turf, palm trees, or other non-native species are handled separately in the landscape plans and specifications.

The goals of the restoration are (1) to establish native vegetation along the reconstructed banks of the lagoon, and (2) to enhance vegetation along the creek banks between State Street and Cabrillo Boulevard. This Plan contains the necessary procedures for establishment of self-sustaining native vegetation that is appropriate to the site, is aesthetically pleasing, and is free of

invasive non-native species. These objectives are provided in detail in section 9.0 Performance Evaluation

4.0 Implementation Schedule

Slope stabilization is scheduled to be implemented in the summer and fall of 2012 with planting to begin as soon as work is complete. This schedule is subject to project delays of one year. Irrigation, weed control, and other maintenance will continue for at least five years or when all performance criteria are met, whichever is later.

5.0 Personnel

This Plan refers to several stakeholders for this Project. They include:

- The City of Santa Barbara. The City is the lead agency for the Project and the primary point of contact for all aspects of the Project.
- The Restoration Biologist. The Restoration Biologist is a component of the Project Environmental Coordinator (PEC) consulting team to the City and will monitor, provide recommendations, and report on the status/success of the program, as required by various resource agencies.
- The Construction Contractor. The Construction Contractor is responsible for making sure that construction is completed as detailed in Project plans and specifications. He is also responsible for installation of plants with associated irrigation devices and development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), and compliance with Erosion Control Plan as shown on Project plans.
- Landscape Maintenance Sub-Contractor. A landscape sub-contractor will be responsible for maintaining the plantings and irrigation system until the Project is completed. At the City's discretion, the landscape sub-contractor may continue to maintain the Project site until performance criteria are met, or the City may elect to conduct the necessary maintenance.

6.0 Project Plans

A complete set of Plans for the Project is available by request at the City. Components of those Plans applicable to restoration are discussed below.

6.1 Surface Stabilization and Sediment Control

Erosion and sediment control is an integral part of the Project, and both permanent and temporary Best Management Practices (BMPs) are included in the Project Plans. Temporary erosion control BMPs are required during the wet season (October 1 through April 30), and sediment control is required all year. Permanent erosion control in the form of vegetation is required in all areas disturbed by construction that will not be paved or covered with structures and on all slopes steeper than 10:1. Sediment control is required where water from Project activities would drain into sensitive areas or areas with existing vegetation. As mentioned above, a SWPPP will be prepared to address specific concerns regarding soil stabilization and runoff from the Project site.

Coconut fiber fabric/mats will be used in upstream and downstream Project planting areas to reduce soil loss after construction is complete, except where the brush mattress (described below) is required. On sloping areas, they will be tied in at the top of the slope and anchored as appropriate. In addition, subsurface rock and a brush mattress, as described below, will be installed on the banks downstream of Cabrillo Boulevard to reduce erosion. No special soil stabilization measures are planned for the lagoon planting area.

6.2 Planting Plan

To preserve the integrity of local plant gene pools, to ensure adaptation to site-specific conditions, and to avoid inadvertent introduction of inappropriate species or pathogens, all seed and plant materials (cuttings, etc.) to be used for revegetation will be native and have originated from the Santa Barbara area. Suggested locations for collection of cuttings and seed to use in propagation include: Santa Barbara Airport, Coal Oil Point Reserve, and University of California at Santa Barbara. Other locations in and near the City of Santa Barbara that are south of the crest of the Santa Ynez Mountains from Goleta to Carpinteria may be used as well. No horticultural varieties will be used.

If feasible, container plant installation will be planned for cooler, moister months (November through February). This will lessen stress to newly establishing plants. However, planting timing will be adjusted as necessary to accommodate Project schedules.

All container plantings will be installed in the manner described in the Project Plans. A hole two times the diameter of the rootball will be excavated. A gopher basket will be installed for root protection for each plant installed in the upstream planting area. The plant will be placed in the hole with the crown about one inch above grade. A fertilizer planting tablet will be placed on either side of the plant, and the hole will be backfilled, leaving a two inch temporary berm around the planting. Wire mesh protective fencing, four feet in height and painted green, will be installed around the planting area to prevent trampling and other damage, except where the fencing could be subject to tidal action or stream/lagoon flooding. The fencing will be removed when the performance criteria are met.

Container plantings will be installed on the banks both upstream and downstream. Each planting area consists of plantings on both sides of the creek. Project landscape plan pages showing the layout of these planting areas are included as Attachment B.

6.2.1 Upstream Planting Area

On the north side of the bridge, all non-native vegetation will be removed from the planting area as described below. Native species typical of coastal bluff scrub and a few species present in riparian habitats will be planted. See Table 1 for a complete list of plants that will be installed in this area. Locations for container plantings are provided on page LP-3 of the Project Plans and in Attachment B.

Table 1. Plant Species for Upstream Planting Area

Scientific Name	Common Name	Size	Number
Platanus racemosa	California sycamore	1 gallon	1
Atriplex lentiformis	Brewer's saltbush	1 gallon	30
Encelia californica	California encelia	1 gallon	8
Eriogonum parvifolium	Seaside buckwheat	1 gallon	15
Isocoma menziesii	Menzies goldenbush	1 gallon	3
Leymus condensatus	Giant wild rye	1 gallon	29
Limonium californica	Coastal status	1 gallon	66
Rhus integrifolia	Lemonadeberry	1 gallon	14
Rosa californica	California wild rose	1 gallon	12
Salix lasiolepis	Arroyo willow	1 gallon	4
Suaeda taxifolia	Wooly sea-blite	1 gallon	25

Note:

1 * Pounds per acre assuming minimum pure live seed (PLS) based on seed laboratory tests. Actual poundage applied may be greater due to inclusion of non-live seed materials such as chaff that may be impractical to separate from the live seed.

The planting palette for the upstream planting area was selected based on the likelihood that the species will thrive on the site and aesthetics. All species are native and grow in the Santa Barbara vicinity. The species are a combination of plants well suited to riparian areas and to coastal bluff scrub. These native species are expected to be self-sustaining and require little irrigation or other maintenance after the establishment period.

6.2.2 Downstream Planting Area

The downstream planting area will be installed in layers. Rock slope protection will be installed to an elevation of 8.8 feet above the mean high tide line. The rock slope protection will be covered with fill to the finished grade elevations contained in Project Plans, except where the brush mattress (described below) is to be installed. The entire slope will be covered with coconut fiber fabric/mat from the top of the slope to the creek bottom. Brush mattresses will be installed on the portion of the restoration between eight and ten feet in elevation as shown on the Project Plans. Brush mattresses will consist of the following elements:

- Coconut fiber mat with coconut fiber roll at base of slope.

- Fascines placed parallel to the flowline and staked in place in rows approximately three feet apart. Fascines are eight- to ten-inch diameter bundles of mulefat stakes four to six feet in length tied with twine.

- Loose mulefat cuttings, one half to one inch in diameter, placed on the slope perpendicular to the flow line. A network of wooden stakes and live mulefat stakes held together with twine will hold the brush mattress to the slope.

- Fill to cover the mulefat and leave three to four inches of brush mattress stakes exposed.

Following placement of erosion control described above, a concrete curb will be installed on the west side of the creek to separate the turf grass from the native plantings. The curb will be four inches wide and eight inches tall, recessed six and a half inches into the ground. After installation of the curb, the landscape plantings will be installed. Due to past alteration of the soils for various improvements, the soils may not be consistent with naturally occurring habitats of similar water regime and proximity to the ocean. For that reason, the plantings specified in this Plan are varied such that the best adapted plants will be expected to thrive. This restoration plan includes four zones of planting:

- Coastal dune scrub on the upper slope between ten and 13.5 feet in elevation.

- Riparian scrub on the upper mid slope between eight and ten feet in elevation.

- Transitional wetlands on the lower mid slope between six and 8.6 feet in elevation.

- Emergent wetlands on the lower mid slope between five to seven feet in elevation.

Some of the elevation ranges for the different zones overlap somewhat to allow blending of the habitats. Plants to be installed for the different zones of the downstream planting areas are presented in Tables 2 through 5. This planting palette may be adjusted by the Restoration Biologist as necessary to accommodate field conditions. Any changes or substitutions will be grown from stock from the same collecting area described above.

Table 2. Downstream Planting Area: Coastal Dune Scrub

Scientific Name	Common Name	Size	Number
Abronia umbellata ssp. umbellata	Purple sand verbena	1 gallon	36
Ambrosia chamissonis	Beach bur	1 gallon	37
Atriplex lentiformis	Saltbush	1 gallon	37
Atriplex leucophylla	Beach saltbush	1 gallon	36
Calystegia soldanella	Dune morning glory	1 gallon	37
Camissonia cheiranthifolia	Beach evening primrose	1 gallon	67
Distichlis spicata	Saltgrass	1 gallon	67
Eriogonum parvifolium	Coastal buckwheat	1 gallon	37
Isocoma menziesii var. vernonioides	Coastal goldenbush	1 gallon	37
Leymus condensatus	Giant wild rye	1 gallon	38

Table 3. Downstream Planting Area: Riparian Scrub and Mulefat Mattress			
Scientific Name	Common Name	Size	Number
Artemisia douglasiana	Mugwort	1 gallon	9
Atriplex watsonii	Watson's saltbush	1 gallon	8
Baccharis douglasii	Marsh baccharis	1 gallon	9
Baccharis salicifolia	Mulefat	Cuttings	
Distichlis spicata	Saltgrass	1 gallon	9
Isocoma menziesii var. vernonioides	Coastal goldenbush	1 gallon	9
Leymus triticoides	Blue wild rye	1 gallon	10

Table 4. Downstream Planting Area: Transitional Wetlands			
Scientific Name	Common Name	Size	Number
Arthrocnemum subterminale	Pariah's glasswort	1 gallon	52
Atriplex californica	Saltbush	1 gallon	52
Cressa truxillensis var. truxillensis	Alkali weed	1 gallon	52
Distichlis spicata	Saltgrass	1 gallon	77
Euthamia occidentalis	Western goldentop	1 gallon	28
Frankenia salina	Alkali heath	1 gallon	78
Jaumea carnosa	Jaumea	1 gallon	53
Juncus patens	Common rush	1 gallon	53
Malvella leprosa	Alkali mallow	1 gallon	53
Monanthochloe littoralis	Shoregrass	1 gallon	53
Salicornia virginica	Pickleweed	1 gallon	78
Suaeda taxifolia	Wooly sea-blite	1 gallon	47

Table 5. Downstream Planting Area: Emergent Wetlands			
Scientific Name	Common Name	Size	Number
Jaumea carnosa	Jaumea	1 gallon	150
Scirpus maritimus	Seaside bulrush	1 gallon	200
Scirpus robustus	Sturdy bulrush	1 gallon	200
Salicornia virginica	Pickleweed	1 gallon	215

Note:

1 * Pounds per acre assuming minimum pure live seed (PLS) based on seed laboratory tests. Actual poundage applied may be greater due to inclusion of non-live seed materials such as chaff that may be impractical to separate from the live seed.

6.2.3 Lagoon Planting Area

The lagoon planting area was designed to blend with the downstream planting area. The planting palette is similar, and layout of the plantings will be determined in the field to maximize the continuity of the project. Although the lagoon margins change based on creek outflows, tides,

and storm surges, no grading of the project site is anticipated, and the natural lagoon configuration will not be altered. However, prior to planting, topography in the coastal dunes planting area will be "micro-graded" to create natural-looking dune hummocks of 24 inches in height.

Container plantings will be installed as described above, shown on detailed plans, and listed in Tables 6 through 9, below. In addition to container plantings, seed will be distributed on site in the fall following installation of container plantings. Seed will be hand-broadcast and raked in to a depth of 0.25 inch. The seed mix is provided in Table 10.

Due to the dynamic nature of the lagoon environment, the plantings specified in this Plan are varied such that the best adapted plants will be expected to thrive. This restoration plan includes four zones of planting:

- Coastal dune scrub on the upper slope between ten and 13.5 feet in elevation.
- Riparian scrub on the upper mid slope between eight and ten feet in elevation.
- Transitional wetlands on the lower mid slope between six and 8.6 feet in elevation.
- Emergent wetlands on the lower mid slope between five to seven feet in elevation.

Some of the elevation ranges for the different zones overlap somewhat to allow blending of the habitats. Plants to be installed for the different zones of the downstream planting areas are presented in Tables 2 through 5. This planting palette may be adjusted by the Restoration Biologist as necessary to accommodate field conditions. Any changes or substitutions will be grown from stock from the same collecting area described above.

Table 6. Lagoon Planting Area: Coastal Dune Scrub

Scientific Name	Common Name	Size	Number
Abronia umbellata ssp. umbellata	Purple sand verbena	1 gallon	92
Ambrosia chamissonis	Beach bur	1 gallon	93
Atriplex lentiformis	Saltbush	1 gallon	61
Atriplex leucophylla	Beach saltbush	1 gallon	92
Calystegia soldanella	Dune morning glory	1 gallon	31
Camissonia cheiranthifolia	Beach evening primrose	1 gallon	93
Distichlis spicata	Saltgrass	1 gallon	61
Eriogonum parvifolium	Coastal buckwheat	1 gallon	30
Isocoma menziesii var. vernonioides	Coastal goldenbush	1 gallon	60

Table 7. Lagoon Planting Area: Riparian Scrub			
Scientific Name	Common Name	Size	Number
Artemisia douglasiana	Mugwort	1 gallon	103
Baccharis douglasii	Marsh baccharis	1 gallon	82
Baccharis salicifolia	Mulefat	Cuttings	20
Distichlis spicata	Saltgrass	1 gallon	125
Isocoma menziesii var. vernonioides	Coastal goldenbush	1 gallon	40
Leymus triticoides	Blue wild rye	1 gallon	40

Table 8. Lagoon Planting Area: Transitional Wetlands			
Scientific Name	Common Name	Size	Number
Atriplex californica	Saltbush	1 gallon	203
Cressa truxillensis var. truxillensis	Alkali weed	1 gallon	101
Distichlis spicata	Saltgrass	1 gallon	405
Frankenia salina	Alkali heath	1 gallon	405
Jaumea carnosa	Jaumea	1 gallon	203
Monanthochloe littoralis	Shoregrass	1 gallon	101
Salicornia virginica	Pickleweed	1 gallon	405
Suaeda taxifolia	Wooly sea-blite	1 gallon	203

Table 9. Lagoon Planting Area: Emergent Wetlands			
Scientific Name	Common Name	Size	Number
Jaumea carnosa	Jaumea	1 gallon	256
Scirpus maritimus	Seaside bulrush	1 gallon	385
Scirpus robustus	Sturdy bulrush	1 gallon	256
Salicornia virginica	Pickleweed	1 gallon	385

Table 10. Lagoon Planting Area: Seed Mix		
Scientific Name	Common Name	Quantity (PLS lbs/acre)
Abronia maritima	Red sand verbena	1
Abronia umbellata	Pink sand verbena	1
Ambrosia chamissonis	Beach bur	4
Calystegia soldanella	Dune morning glory	0.5
Camissonia cheiranthifolia	Beach evening primrose	4
Escholzia californica var. maritima	California poppy	3
PLS lbs/ acre is pure live seed pounds per acre that the seed is applied. To attain this, th amount of seed is increased to account for impurities.		

6.3 Irrigation

Irrigation systems will be installed as shown on the Project Plans. In the upstream planting area, a drip system will be installed with one one-gallon per hour emitter per planting. A diagrammatic plan for the layout of the irrigation piping is provided in the Project Plans. Actual layout of the piping will be determined based on the layout of the plantings.

A sprinkler system will be installed at the downstream and lagoon planting area. It will consist of sprinkler heads with five on the west side of the creek and ten east side of the creek. Sprinkler heads will be "pop-up" type, meaning they will be flush to the ground when not in use and pop up to 12 inches in height when in use.

Irrigation systems will be maintained for two complete summers, unless container plants over grow the sprinklers in that time. When irrigation is discontinued, container plantings should be able to survive without additional irrigation. However, if irrigation is extended beyond two years during normal or wet years, the monitoring program will be extended for an equal length of time to ensure survival of the restoration site for three years without water. If conditions are unusually dry (defined as 80 percent or less than average) during any month between October and March of the monitoring period, supplemental irrigation may be used the following month without extending the monitoring program.

6.4 Replacement Plants

Because Project soils have been altered by various improvements in the past, survivorship of the plantings is difficult to predict. For this reason, a large number of species and plant types (e.g. spreading grasses and herbs in addition to erect shrubs) are planned for the different planting areas, especially in the downstream planting area. If survival and/or cover have met minimum criteria by the third year, replacement plants will be installed, or other action will be taken to improve survivorship. Replacement plants may not be the same species that perished. Rather, the Restoration Biologist will determine which species are best suited at the locations needed. Replacement plants are not limited to the existing plant palette, but will be native species that are subject to the same collection area restriction described above.

6.5 Removal of Pests

Gophers, ground squirrels, voles, rats, and other rodents could damage the habitat restoration plantings and/or irrigation system and cause a nuisance at the Project site. However, due to the sensitivity of the habitat, rodenticides containing any anticoagulant compounds (including, but not limited to, Warfarin, Brodifacoum, Bromadiolone, or Diphacinone) shall not be used.

6.6 Removal of Invasive Non-Native Species

Prior to construction in the upstream portion of the Project (north of Cabrillo Bridge) non-native invasive species, primarily myoporum *(Myoporum laetum)*, will be removed. This species currently occupies all of the natural soil on the banks of the creek and overhangs the creek, dropping leaves and seeds into the estuary. All plants will be pulled or dug out to remove the

roots. This will require heavy equipment, as the existing vegetation is mature. Following the removal of weeds, the site will be heavily watered to a depth of at least 12 inches. After a minimum of ten days, a second weed removal event will occur. The second weed removal event will be conducted only by hand, in compliance with conditions from the California Coastal Commission.

Non-native invasive species will be removed from the entire native planting areas of the Project. The treatment area will be maintained relatively free of invasive species for the entire five-year monitoring period. For the purposes of this Plan, non-native invasive species are defined as species that may invade native habitats and inhibit or preclude the establishment of native plants in that area. Removal will focus on plants rated as a high threat by the California Invasive Plant Council (CIPC), and other species identified as problematic by the Restoration Biologist on the particular site under consideration. Common and widespread non-native species, such as annual grasses, will not be targeted for removal.

A preliminary list of target species is provided in Table 11. This list includes all non-native invasive species that are currently present on or near the Project site. In addition, Table 11 includes those invasive species that are common in the Goleta/Santa Barbara/Carpinteria wetlands and dunes in similar habitats that could be introduced by increased human presence on the Project site. In other words, the list in Table 11 represents those species that are considered probable to occur on the Project site. Removal is not limited to the species in Table 11, but this list will serve as a starting point for determining species for removal and will be augmented by the Restoration Biologist if other invasive species are found during monitoring.

Priority for weed removal will be placed on particularly problematic invaders (e.g., pampas grass [*Cortaderia* spp.]). This group includes mostly perennial species, but also includes certain annual species that can invade undisturbed native habitat (such as yellow star-thistle [*Centaurea solstitialis*]). Other species that are invasive, such as black mustard (*Brassica nigra*) and milk thistle (*Silybum marianum*), will be removed as well.

Individual invasive exotic plants will be removed by a variety of methods, depending on the size of the problem, tools that are readily at hand, sensitivity of the site, and preference/experience of the contractor. Preliminary methods for each species are provided in Table 11 but will be refined based on site conditions. Methods will include hand removal (pulling, hoeing, etc.) and treatment with herbicide. Use of herbicides for this Project is highly restricted, as described in more detail below. However, most non-native invasive species can be removed by hand if the infestation is addressed early. For that reason, monitoring and maintenance need to be conducted in a timely manner.

Generally, small infestations will be removed by hand by the restoration monitor during monitoring and larger infestations will be removed by a landscaper or other specialist. The City of Santa Barbara has strict policies on the use of herbicides and these policies will be strictly followed for the duration of the Project. In addition, requirements from the California Coastal Commission specify that no herbicides will be used within the wetland creek habitat (i.e., all herbicide use is restricted to uplands and the wetland transition areas). Herbicide use will be restricted to Glyphosate Aquamaster (previously Rodeo) and will be limited to hand painting on cut stems. No spraying will be permitted. Further restrictions on herbicide use include:

- Limited to non-rainy season (1 April to 31 October).
- Not permitted in wind speeds exceeding 5 m.p.h.
- Not permitted within 48 hours of predicted rain.
- Not permitted within 72 hours after rain.

All herbicide use will be conducted with the recommendation of a Pest Control Advisor and all restrictions on the product labeling will be strictly followed. Weed pieces containing material that could reestablish on site (e.g., seeds of tree tobacco or sections of cape ivy) will be removed from the site in plastic bags and disposed of appropriately.

Table 11 will be updated throughout the Project, and the city will continue to remove non-native invasive species for the life of the Project, as required by the California Coastal Commission.

Table 11. Preliminary List of Invasive Exotic Species for Removal

Scientific Name/ Common name	Priority	Present on or near Site	Timing and methods for removal*	Comments
Arundo donax/ Arundo or giant reed	Very High	No	Anytime 1. Dig up entire plant (may require several attempts to be effective) 2. Cut stems and paint with herbicide	Highly invasive species of riparian systems throughout southern California.
Asphodelus fistulosus/ Onionweed	High	No	Spring is preferred timing 1. Dig up plant and dispose offsite. 2. Spot spray with herbicide (glyphosate or similar)	Typically occurs in ruderal areas (e.g., roadsides) but can spread into adjacent undisturbed habitat, coastal scrub. Could easily spread offsite.
Brassica nigra/ Black mustard	Moderate	No	Timing should be prior to seed maturation (March/April) 1. Hand pull individual plants 2. Cut plants to within three inches of the ground (may require several treatments in the spring)	Tends to establish in disturbed sites and spreads easily into open habitats.
Carpobrotus edulis/ Hottentot fig	High	Yes	Anytime 1. Pull seedlings. 2. Treat with herbicide (glyphosate)	Establishes in disturbed areas and can spread into relative undisturbed areas, including dune systems. Present east of the site.
Centaurea solstitialis/ Yellow star-thistle	High	No	Timing can be anytime after plants come up, but before seed matures (March-May) 1. Dig up or pull plant and dispose offsite. 2. Cut above-ground parts of plant and haul offsite (may require several treatments)	Establishes in disturbed areas and can spread into relative undisturbed areas.
Conium maculatum/ Poison hemlock	Moderate	No	Spring/Summer 1. Pull young plants 2. Cut flowering stalks (such as with a weed whacker) prior to formation of seed. Will require multiple treatments per season and for multiple seasons	Biennial. Cutting is effective for removal, but must be conducted for more than one year.

Table 11. Preliminary List of Invasive Exotic Species for Removal

Scientific Name/ Common name	Priority	Present on or near Site	Timing and methods for removal*	Comments
Cortaderia spp./ Pampas grass; jubata grass	Very High	No	Anytime 1. Dig up plant and dispose offsite 2. Spot spray with herbicide (glyphosate or similar)	Large, aggressive weed that establishes in small open areas and spreads. Can cover large areas and degrade otherwise undisturbed habitats.
Cynodon dactylon/ Bermuda grass	Moderate	Yes, turf grass on and adjacent to downstream planting areas	Anytime, but best in late spring 1. Pull and remove all material from site	This species will come up in the treatment area and need to be removed frequently for the life of the Project.
Delairea odorata/ Cape ivy	Very High	No	Anytime. 2. Remove above ground parts several times a year 3. Treat resprout with herbicide	Highly invasive species of riparian systems. Known from many locations in the Santa Barbara foothills. Can establish from a short (two-inch) section of plant.
Foeniculum vulgare/ Sweet fennel	High	No	Anytime 1. Pull seedlings (must get root) 2. Dig up larger plants	Highly persistent in a variety of habitats. May not respond well to herbicide. Hand removal recommended.
Hirschfeldia incana/ Mediterranean mustard	Moderate	No	Timing should be prior to seed maturation (March/April) 1. Hand pull individual plants 2. Cut plants to within three inches of the ground (may require several treatments in the spring)	Somewhat invasive species. Generally requires a disturbed area for establishment and will not invade undisturbed habitats.
Marrubium vulgare/ Horehound	High	No	Anytime 1. Dig up plant and dispose offsite. 2. Pull seedlings	Moderate invader, particularly long roadsides. Will creep into native undisturbed areas.
Myoporum laetum/ Myoporum	Very High	Yes, the upstream planting areas are currently this species	Anytime 1. Pull up seedlings 2. Dig up larger plants	Moderate invader, expected to come up in upstream planting areas due to amount of seed currently in the soil.
Nicotiana glauca/ Tree tobacco	High	No	Anytime 1. Dig up plant. 2. Spot spray with herbicide (glyphosate or similar)	Establishes well in disturbed areas and then spreads and takes hold in small disturbed areas, such as on eroding slopes.

Table 11. Preliminary List of Invasive Exotic Species for Removal

Scientific Name/ Common name	Priority	Present on or near Site	Timing and methods for removal*	Comments
Pennisetum clandestinum/ Kikuyu grass	Very High	Yes, downstream of the treatment area	Anytime 1. Dig up and/or pull any plants observed.	
Pennisetum setaceum/ Fountain grass	Very High	No	Anytime 1. Dig up plant and dispose offsite. 2. Spot spray with herbicide (glyphosate or similar)	Establishes quickly along roadsides and once established, spreads into adjacent or nearby undisturbed areas. Can prevent establishment of native species.
Piptatherum miliaceum/ Smilo grass	High	No	Springtime is preferred 1. Dig up plant and dispose offsite.Spot spray with herbicide (glyphosate or similar)	Establishes along roadsides and spreads into adjacent habitat.
Ricinus communis/ Castor bean	High	No	Anytime 1. Pull seedlings 2. Dig out larger plants	Seeds of the castor bean are highly toxic and the foliage can irritate skin and eyes.
Silybum marianum/ Milk thistle	Moderate	No	Timing should be prior to seed maturation (March/April) 1. Hand pull individual plants 2. Cut plants to within three inches of the ground (may require several treatments in the spring)	Tends to establish in disturbed sites and spreads easily into open habitats. Not likely to invade undisturbed habitat.
Tamarix spp./ Tamarisk	High	Yes, one sapling observed a short distance downstream	Anytime 1. Hand pull plant and dispose of any flowering or fruiting material offsite 2. Dig up larger plants 3. Cut plant and paint cut stem immediately with herbicide	Aggressive invasive species in riparian and wetland habitats
Xanthium strumarium/ Cocklebur	Moderate	Yes, lots of plants downstream of Project	Spring/Summer 1. Pull seedlings and small plants 2. Cut larger plants at the base 3. Cut and bag all maturing seed pods and dispose offsite	Problematic, particularly at the early stages of restoration.

Note:

* herbicide use limited to restrictions described above.

7.0 Monitoring and Maintenance

After construction and prior to planting, a survey of the treatment area will be conducted by the Restoration Biologist to inspect the integrity of the soil surface and to ensure that erosion control methods (e.g. coconut fiber blanket) and irrigation systems are in place. After planting, the objectives of monitoring will be to document establishment and growth of planted species, to identify the need for maintenance (including repair of irrigation systems), and to identify incipient weed problems. Incipient weed problems are defined as establishment in the treatment area of invasive non-native species not abundant in adjacent areas that might, by establishment in the treatment area, interfere with revegetation by native species or threaten to invade adjacent undisturbed habitats. Maintenance will be conducted as necessary to ensure that revegetation goals can met in a timely manner.

Monitoring visits will be conducted following installation of container plantings for five years or longer, if necessary to meet the performance criteria. During the year following planting, subsequent monitoring will be scheduled by the Restoration Biologist based on timing of heavy rainfall events and progression of spring annuals as it pertains to the establishment of non-native invasive species. A general schedule for monitoring visits is provided in Table 12. The need for additional visits will be determined by the Restoration Biologist as necessary to detect and correct erosion following significant rainstorms. The purpose of monitoring visits will be to document and provide recommendations for weed control and/or erosion control. Photopoints will be taken in April and September. Fall monitoring will also include documentation of establishment of native perennial vegetation and quantitative monitoring of individual plantings, if feasible.

Table 12. Approximate Schedule for Monitoring Visits

Type of Monitoring	Timing				
	Year 1 (2012/2013)*	Year 2 (2014)	Year 3 (2015)	Year 4 (2016)	Year 5 (2017)
General walk-through of planting area to determine maintenance needs	Every two weeks following completion of construction	Jan/Feb/ Apr/Jun/ Nov	Mar/May	Mar/May	Mar/May
Photopoints	Apr/Sept	Apr/Sept	Apr/Sept	Apr/Sept	Apr/Sept
Detailed quantitative sampling	Sept	Sept	Sept	Sept	Sept

* Date may be subject to one year project delay

Once weed infestations and erosion appear to be under control, monitoring may be reduced to once in the spring and once in the fall. This schedule is preliminary and may be modified by the Restoration Biologist, as necessary to meet Project objectives.

Container planting will generally be installed following completion of construction and monitoring will begin during that growing season. For this reason, 2013 is generally assumed to be the first year of the restoration monitoring effort. This schedule may be modified by the

Restoration Biologist as necessary, depending on site-specific conditions and changes in Project schedule. In addition, while minor maintenance can be accomplished during monitoring, major maintenance efforts (such as erosion and weed control, supplemental irrigation, or replanting, etc.) will be scheduled, as necessary.

Whenever the performance criteria (see below) are not met or when monitoring indicates that additional erosion control or weed control actions are necessary, the Restoration Biologist in consultation with the City of Santa Barbara will determine what measures are required and make sure that they are implemented.

8.0 Remedial Measures

Following each monitoring visit, the Restoration Biologist will inform the City of Santa Barbara in writing of important observations and any problems observed. Recommendations will be provided, including timing for implementation. Timing will be critical for some problems, such as for failure of irrigation systems and removal of some invasive exotic species. Timing will be less critical for other problems, such as a need for replacement plants.

9.0 Performance Evaluation

The performance evaluation will be based on meeting specific criteria within a specific timeframe. The purpose of the performance evaluation is to provide an objective measure of Project success. The discussion below is divided into general criteria that all areas must meet and also specific criteria for each sub area of the Project. In addition, some of the criteria have milestones for progress at different stages of the Project.

General:

- Following planting, the landscape contractor must meet the following basic survival milestones:

    1. 100 percent survival of container plantings at one month.

    2. 85 percent survival of container plantings at 90 days.

    3. No invasive non-native species present on the Project site at 90 days.

- No single species accounts for more than 50 percent of the total cover at the end of the monitoring program.

- No high priority or woody non-native invasive species are present on the Project site at the completion of the monitoring program.

- Cover of all non-native invasive species does not exceed five percent total cover.

- A given treatment area has been monitored for a minimum of five years at completion of the monitoring program and plantings have survived for a minimum of three years without supplemental irrigation, except as provided above.

Upstream Planting Area:

- Survival is at least 70 percent three years after planting and 60 percent overall at the end of the monitoring period. If survival is difficult to determine, cover of 60 percent, as determined by sampling representative line-intercept transects, may be used instead at the end of the five-year monitoring period.

- No bare patches exceeding one meter in diameter are present.

Downstream Planting Area, Coastal Dune Scrub:

- Cover by native shrubs is at least ten percent three years after planting and 20 percent at the end of the monitoring period. Cover by all native species, including native shrubs, is at least 25 percent three years after planting and 50 percent at the end of the monitoring period.

- No bare patches exceeding one meter in diameter are present.

Downstream Planting Area, Riparian Scrub and Mulefat Mattress and Transitional Wetlands:

- Cover by all native species is at least 35 percent three years after planting and 70 percent at the end of the monitoring period.

- No bare patches exceeding one meter in diameter are present.

Downstream Planting Area, Emergent Wetlands:

- Cover by all native species is at least 30 percent three years after planting and 60 percent at the end of the monitoring period.

Lagoon Planting Area, Coastal Dune Scrub:

- Cover by native shrubs is at least five percent three years after planting and ten percent at the end of the monitoring period. Cover by all native species, including native shrubs, is at least 15 percent three years after planting and 30 percent at the end of the monitoring period.

- No bare patches exceeding one meter in diameter are present.

Lagoon Planting Area, Riparian Scrub and Transitional Wetlands:

- Cover by all native species is at least 25 percent three years after planting and 50 percent at the end of the monitoring period.

- No bare patches exceeding one meter in diameter are present.

Lagoon Planting Area, Emergent Wetlands:

- Cover by all native species is at least 30 percent three years after planting and 60 percent at the end of the monitoring period.

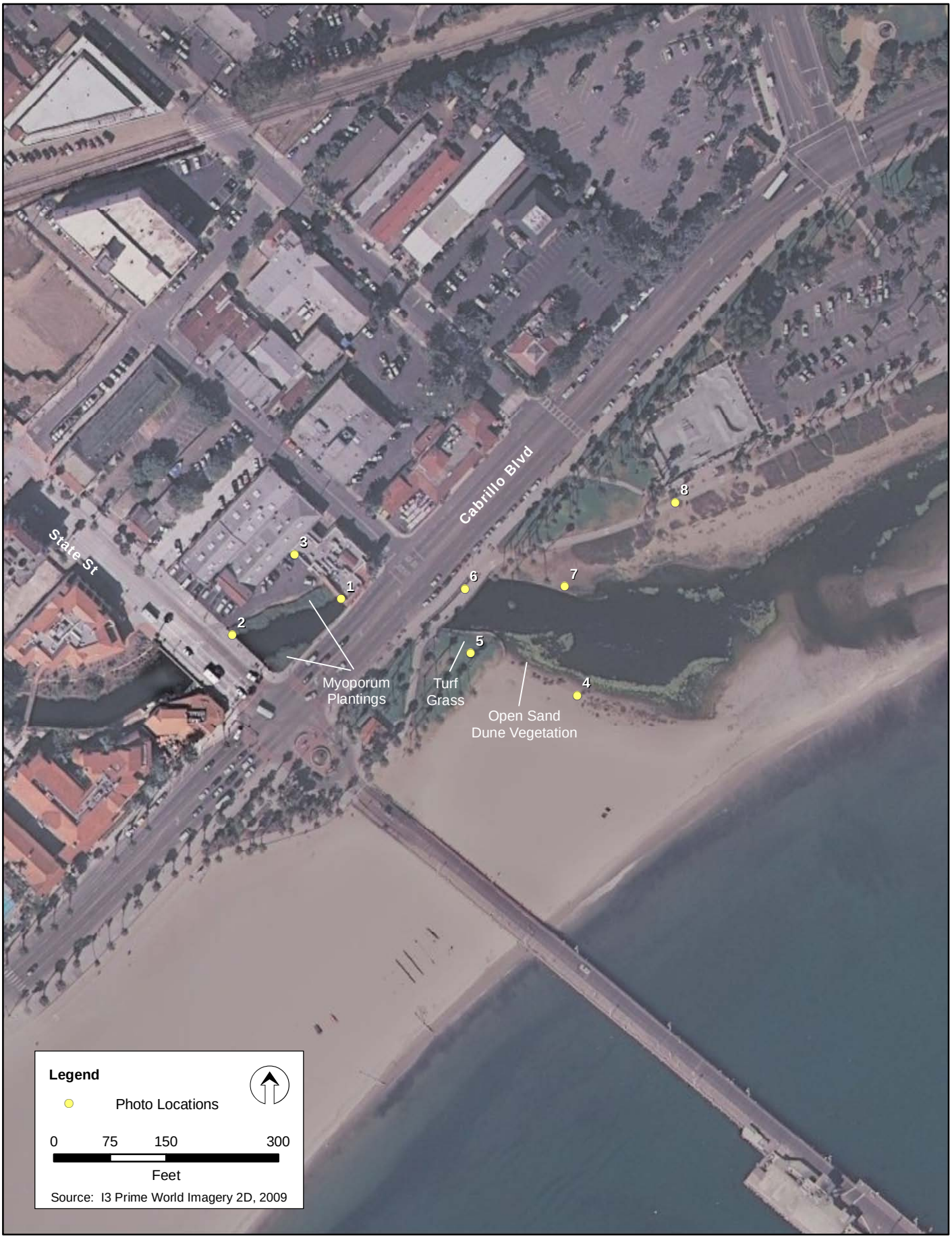
If the performance criteria are not met at the end of the five-year program, a revised or supplemental restoration program will be prepared within 90 days to compensate for those portions of the original program that did not meet the approved performance criteria. The revised program will be processed as an amendment to the coastal development permit.

10.0 Reporting

A report detailing the installation of the habitat restoration will be prepared and submitted to the City of Santa Barbara and the California Coastal Commission within 30 days of completion to document the "as built" condition. In addition, the report will include a discussion on any problems noted during implementation and resolution to those problems, a discussion on timing, any deviations from Project Plans, and at least two photographs.

For restoration monitoring, a summary annual report will be prepared to describe monitoring conducted, any weed control or other maintenance (e.g., watering) performed, problems noted and how resolved, and progress towards meeting the performance criteria. The report will include recommendations for remedial measures that may be necessary to achieve Project performance criteria and at least two photographs. Each report will be cumulative and summarize the results of previous reports. No further reporting will be necessary once the performance criteria are met and the plants have been installed for at least five years. The restoration monitoring reports will be submitted to the City of Santa Barbara, California Department of Fish and Game, and California Coastal Commission no later than January 30, covering the previous calendar year.

Appendix A



Photopoints and Pre-project Vegetation Notes

Photo Point	1	***Location***	At southwest corner of Rusty's Pizza, adjacent to Cabrillo Boulevard.

Direction: 275

Lens Size 18 mm

Direction: 275

Lens Size 18 mm

Photo Point	2	***Location***	Approximately 25 feet south of property line at northeast side of State Street bridge

Direction: 73

Lens Size 18 mm

Direction: 50

Lens Size 18 mm

Direction: 96

Lens Size 18 mm

Photo Point	3	***Location***	Immediately below circular accent on west wall of Rusty's.

Direction: 204

Lens Size 18 mm

Direction: 224

Lens Size 18 mm

Photo Point	4	***Location***	Approximately 25 feet west of bird guard on dredge pipe crossing Mission Creek

Direction: 324

Lens Size 18 mm

Direction: 306

Lens Size 55 mm

Direction: 348

Lens Size 55 mm

Direction: 10

Lens Size 18 mm

Photo Point	5	***Location***	At new palm transplant location.

Direction: 24

Lens Size 18 mm

Photo Point	6	***Location***	From center of existing bike bridge

Direction: 156

Lens Size 18 mm

Direction: 71

Lens Size 18 mm

Photo Point	7	***Location***	From existing young palm on east bank

Direction: 281 ***Lens Size*** 18 mm		***Direction:*** 230 ***Lens Size*** 18 mm	

Photo Point	8	***Location***	From 25 feet east of the bird guard on the pipe crossing the lagoon

Direction: 115 ***Lens Size 18 mm***	

Photo Point	9	***Location***	From the southwest corner of the skate park

Direction: 175 ***Lens Size 18 mm***		***Direction: 215*** ***Lens Size 18 mm***	

Appendix B

Landscape Plan

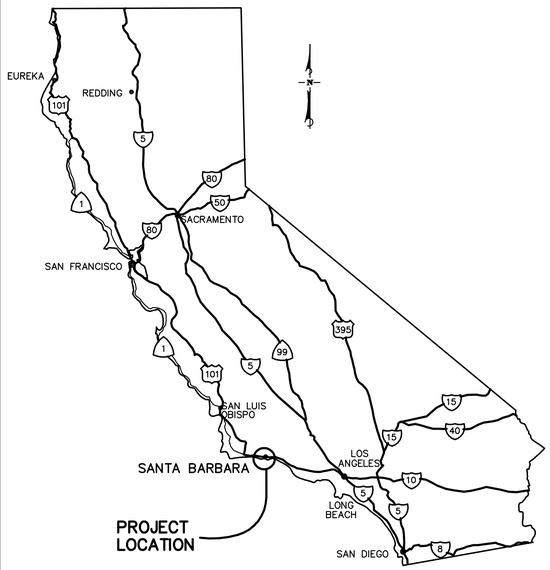
LANDSCAPE PLAN
LOWER MISSION CREEK

CITY OF SANTA BARBARA

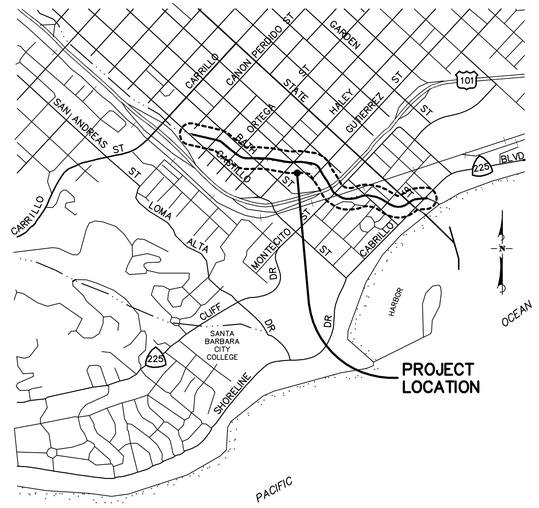
US ARMY CORPS OF ENGINEERS

SANTA BARBARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

APRIL 2006



LOCATION MAP
N.T.S.



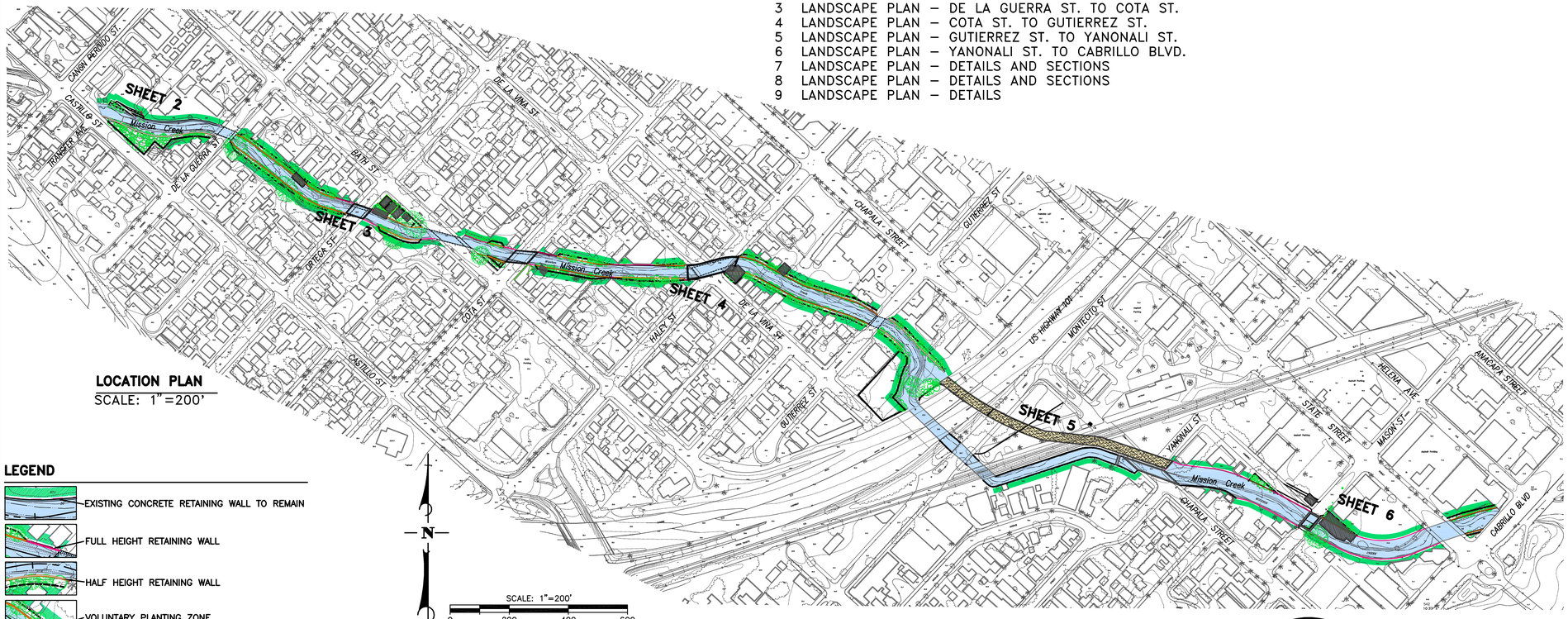
VICINITY MAP
N.T.S.

INDEX TO SHEETS

GENERAL NOTES:

ALL CHANNEL LANDSCAPING TO BE COMPLETED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS:

1. MITIGATION REQUIREMENTS CONTAINED IN THE LOWER MISSION CREEK FLOOD CONTROL FEASIBILITY STUDY, FINAL EIS/EIR, SEPTEMBER 2000 INCLUDING:
   A. U.S FISH AND WILDLIFE SERVICE FINAL BIOLOGICAL OPINION AND VARIOUS LETTERS RELATED TO ENDANGERED AND THREATENED SPECIES
   B. MITIGATION MONITORING PLAN
2. CHANNEL DESIGN RECOMMENDATIONS, LOWER MISSION CREEK FLOOD CONTROL PROJECT, JUNE 2005, PREPARED BY URS CORPORATION
3. LOWER MISSION CREEK FLOOD CONTROL PROJECT ADAPTIVE CHANNEL MAINTENANCE PLAN, SANTA BARBARA COUNTY FLOOD CONTROL DISTRICT, JUNE 2005



LOCATION PLAN
SCALE: 1"=200'

LEGEND

- EXISTING CONCRETE RETAINING WALL TO REMAIN
- FULL HEIGHT RETAINING WALL
- HALF HEIGHT RETAINING WALL
- VOLUNTARY PLANTING ZONE

N

SCALE: 1"=200'
0 200 400 600

SURVEYOR'S NOTES:

TOPOGRAPHY PERFORMED BY PENFIELD & SMITH AND TOWILL AERIAL SURVEYS FOR THE CITY OF SANTA BARBARA PUBLIC WORKS DEPARTMENT AND REVISED OCTOBER 1998.

THE DATE OF PHOTOGRAPHY IS APRIL 10, 1995.

DATUM: HORIZONTAL DATUM: CCS ZONE V, NAD 1983,
VERTICAL DATUM: NAVD 1988

US Army Corps of Engineers®

DAVID R. BLACK & ASSOCIATES
LANDSCAPE ARCHITECTURE URBAN DESIGN
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NO.	DATE	REVISIONS	APPD.

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BRUCE BURNWORTH DATE:
PROJECT ENGINEER
R.C.E. 34,394 (EXP. 9-30-07)

REGISTERED PROFESSIONAL ENGINEER
BRUCE BURNWORTH
NO 34394
EXPIRES
CIVIL
STATE OF CALIFORNIA

CITY OF SANTA BARBARA, CALIFORNIA
REVIEWED BY:
SIGNATURE DATE

LANDSCAPE PLAN
LOWER MISSION CREEK
CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05
SHEET 1 OF 9
PLAN DATE 10 MAY 2006

PLOT SCALE:1:1 PLOT DATE:5/11/2006 11:05:28 AM PLOT BY:Tobias Knowles 36-ENG SAVE DATE: 5/10/2006 5:45:22 PM

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PLANTING NOTES:

1. ALL TREES AND SHRUBS PLANTED AS PART OF THE REVEGETATION PLAN SHALL BE GROWN FROM CUTTINGS AND SEED STOCK NATIVE TO THE SOUTH COAST OF SANTA BARBARA COUNTY, AND WHEN POSSIBLE, FROM THE MISSION CREEK WATERSHED. ALL PLANT MATERIALS SHALL BE SUPPLIED BY THE OWNER AND PROPAGATED BY CITY-APPROVED NURSERIES. ALL TREES SHALL BE A MIX OF 15, 5 AND 1 GALLON SPECIMENS. ALL SHRUBS AND GRASSES SHALL BE 1 GALLON SIZE.

2. PLANTS FOR THE VOLUNTARY PLANTING ZONE WILL BE PROVIDED BY THE CITY TO PRIVATE PROPERTY OWNERS FOR PLANTING AND CARE. THE PLANTS WILL BE ACCOMPANIED BY APPROPRIATE INSTRUCTIONS FOR PLANTING AND CARE OF NATIVE PLANTS. PLANTS MADE AVAILABLE OF THE VOLUNTARY PLANTING ZONE WILL BE A SUBSET OF THE SPECIES TO BE PLANTED WITHIN THE PROJECT AREA.

3. ALL TREE AND SHRUBS PLANTINGS SHALL IN PLANTED IN ACCORDANCE WITH ALL LANDSCAPE INDUSTRY STANDARDS AND PRACTICES FOR THE PLANTING OF NATIVE PLANT MATERIALS.

4. ALL TREE PLANTINGS SHALL BE INSTALLED IN CONCRETE PIPES OF APPROPRIATE SIZE AND DIAMETER WHICH HAVE BEEN INTEGRATED AND FLUSH-MOUNTED IN THE UNGROUTED ROCK RIPRAP ON ALL SLOPE AREAS. BACKFILL FOR ALL PLANTING HOLES SHALL BE NATIVE SOIL AMENDED WITH 'GRO-POWER' FERTILIZER PER MANUFACTURER'S RECOMMENDATIONS, OR APPROVED EQUAL.

5. ALL SHRUB PLANTINGS SHALL BE PLANTED IN THE OVERLAY OF PREPARED TOPSOIL AND IN THE INTERSTICES OF THE RIPRAP AT AN AVERAGE SPACING OF FOUR (4) FEET). ALL SHRUB PLANTING HOLES SHALL BE BACKFILLED WITH NATIVE SOIL AMENDED WITH 'GRO-POWER', OR APPROVED EQUAL.

6. ALL WILLOW CUTTINGS SHALL BE PLANTED WITHIN 24 HOURS AND COLLECTED LOCALLY (I.E. SOUTH COAST WATERSHEDS). CONTRACTOR SHALL CONTACT THE SANTA BARBARA COUNTY FLOOD CONTROL DEPARTMENT REGARDING ACCESS TO A CURRENT RESTORATION PROJECT ALONG ATASCADERO CREEK (SPENCER PERS. COMM.. 1999) AS A POSSIBLE SOURCE FOR SUCH CUTTINGS.

7. ALL WILLOW CUTTINGS SHALL BE PLANTED WITHIN 24 HOURS OF HARVESTING. IF THIS IS NOT POSSIBLE, WILLOWS SHALL BE KEPT COVERED AND WET AND THEN PLANTED AS SOON AS POSSIBLE. TO SPROUT VEGETATIVELY, ALL WILLOW CUTTINGS SHALL BE IRRIGATED ON A REGULAR BASIS UNTIL FULLY ROOTED AND ESTABLISHED.

8. IN ORDER TO HELP PROTECT REVEGETATED AREAS AND TO DISCOURAGE THE USE OF LOWER MISSION CREEK BANK AREAS BY PEOPLE, THE FOLLOWING NATIVE SPECIES SHALL PREDOMINATE IN THE UPPER PORTIONS OF THE BANKS: RIBES SPECIOSUM, RUBUS URSINUS, AND ROSA CALIFORNICA.

9. ALL TREE AND SHRUB PLANTINGS SHALL BE ARRANGED AND PLANTED IN AS NATURAL AND RANDOM A MANNER AS POSSIBLE. THE FINAL PLACEMENT OF ALL PLANTINGS SHALL BE REVIEWED AND APPROVED BY THE PROJECT ENGINEER.

10. THE GROWTH RATE AND PHYSICAL CONDITION OF ALL TREES AND SHRUBS SHALL BE DOCUMENTED FOR A PERIOD OF FIVE (5) YEARS. ALL MONITORING CONDITIONS AND REQUIREMENTS SHALL BE CONSISTENT WITH THOSE OUTLINED IN THE PROJECT MITIGATION MONITORING PLAN AND THE ENVIRONMENTAL COMMITMENTS OF THE PROJECT EIS/EIR.

IRRIGATION NOTES:

1. ALL PLANTING AREAS SHALL BE IRRIGATED BY AN AUTOMATIC DRIP IRRIGATION SYSTEM.

2. THE IRRIGATION SYSTEM SHALL CONSIST OF MULTIPLE 2 INCH DIAMETER WATER METERS (APPROX. 4 TOTAL), REMOTE CONTROL VALVES WITH BATTERY OPERATED ACTUATORS, PRESSURE MAINLINE, LATERAL LINES AND DRIP EMITTERS. ALL DRIP EMITTERS SHALL BE PRESSURE COMPENSATING.

3. ALL IRRIGATION LINES SHALL BE SURFACE-MOUNTED AND STAKED. ALL MAINLINE AND LATERAL LINE PIPE SHALL BE UV-RESISTANT TYPE (BROWNLINE).

4. ALL PLANT MATERIALS SHALL BE IRRIGATED ON A REGULAR BASIS THROUGHOUT THE PLANT ESTABLISHMENT PERIOD. UPON COMPLETION OF THE ESTABLISHMENT PERIOD, ALL IRRIGATION EQUIPMENT SHALL BE REMOVED.

LEGEND

- EXISTING CONCRETE RETAINING WALL TO REMAIN
- FULL HEIGHT RETAINING WALL
- HALF HEIGHT RETAINING WALL
- VOLUNTARY PLANTING ZONE

PLANT LEGEND

TREES

SYMBOL	BOTANICAL NAME (COMMON NAME)
	PLATANUS RACEMOSA (WESTERN SYCAMORE)
	POPULUS FREMONTII (COTTONWOOD)
	QUERCUS AGRIFOLIA (COAST LIVE OAK)
	UMBELLULARIA CALIFORNICA (CALIFORNIA BAY)
	SHRUBS AND GRASSES (SEE SHEETS 7 & 8)

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NO.	DATE	REVISIONS	APPD.

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BRUCE BURNWORTH DATE:
PROJECT ENGINEER
R.C.E. 34,394 (EXP. 9-30-07)

REGISTERED PROFESSIONAL ENGINEER BRUCE BURNWORTH NO 34394 EXPIRES CIVIL STATE OF CALIFORNIA

CITY OF SANTA BARBARA, CALIFORNIA
REVIEWED BY:
SIGNATURE DATE

LANDSCAPE PLAN
LOWER MISSION CREEK
CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05
SHEET 2 OF 9
PLAN DATE 10 MAY 2006

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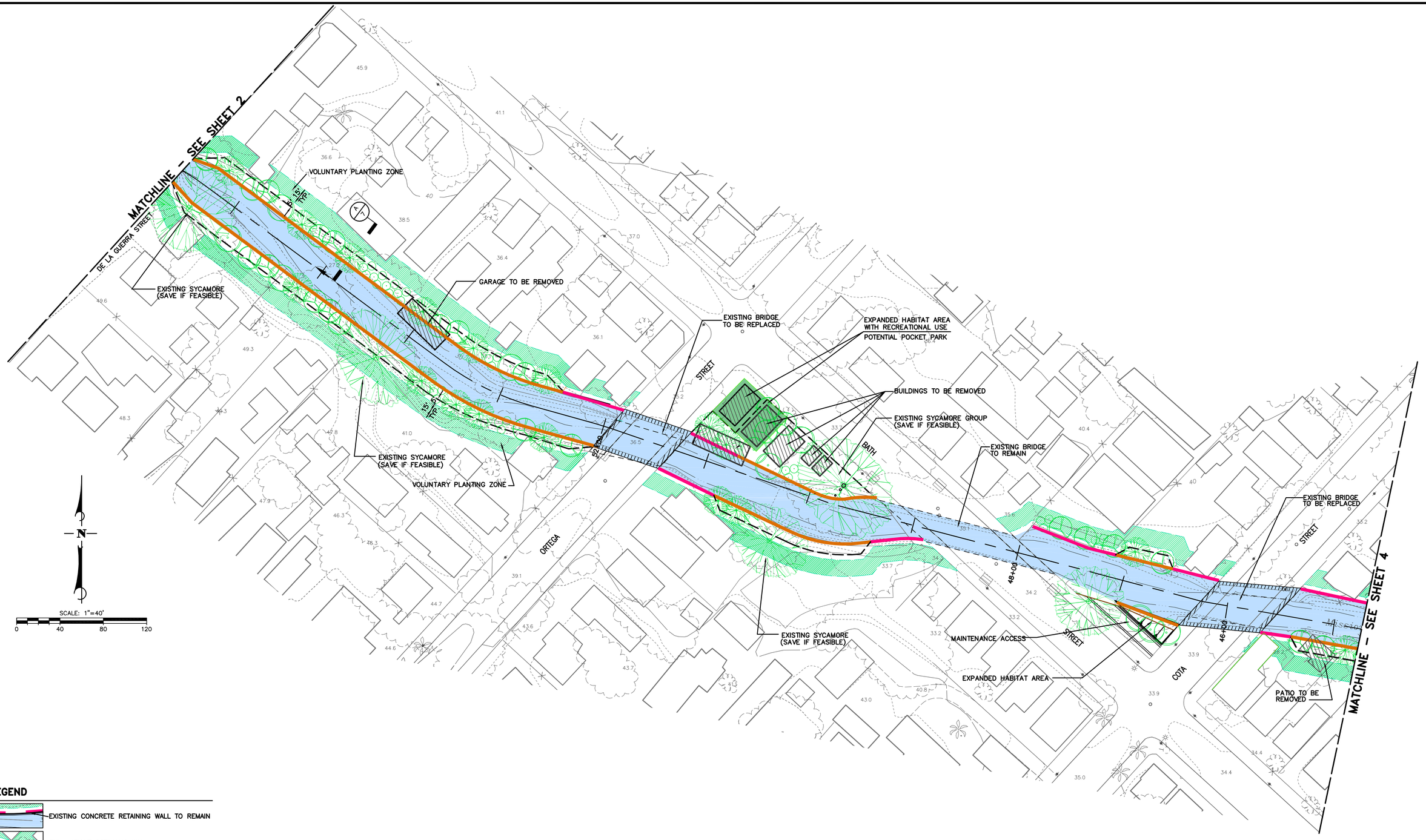

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LANDSCAPE PLAN
LOWER MISSION CREEK
CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05
SHEET 3 OF 9
PLAN DATE 6 APRIL 2006

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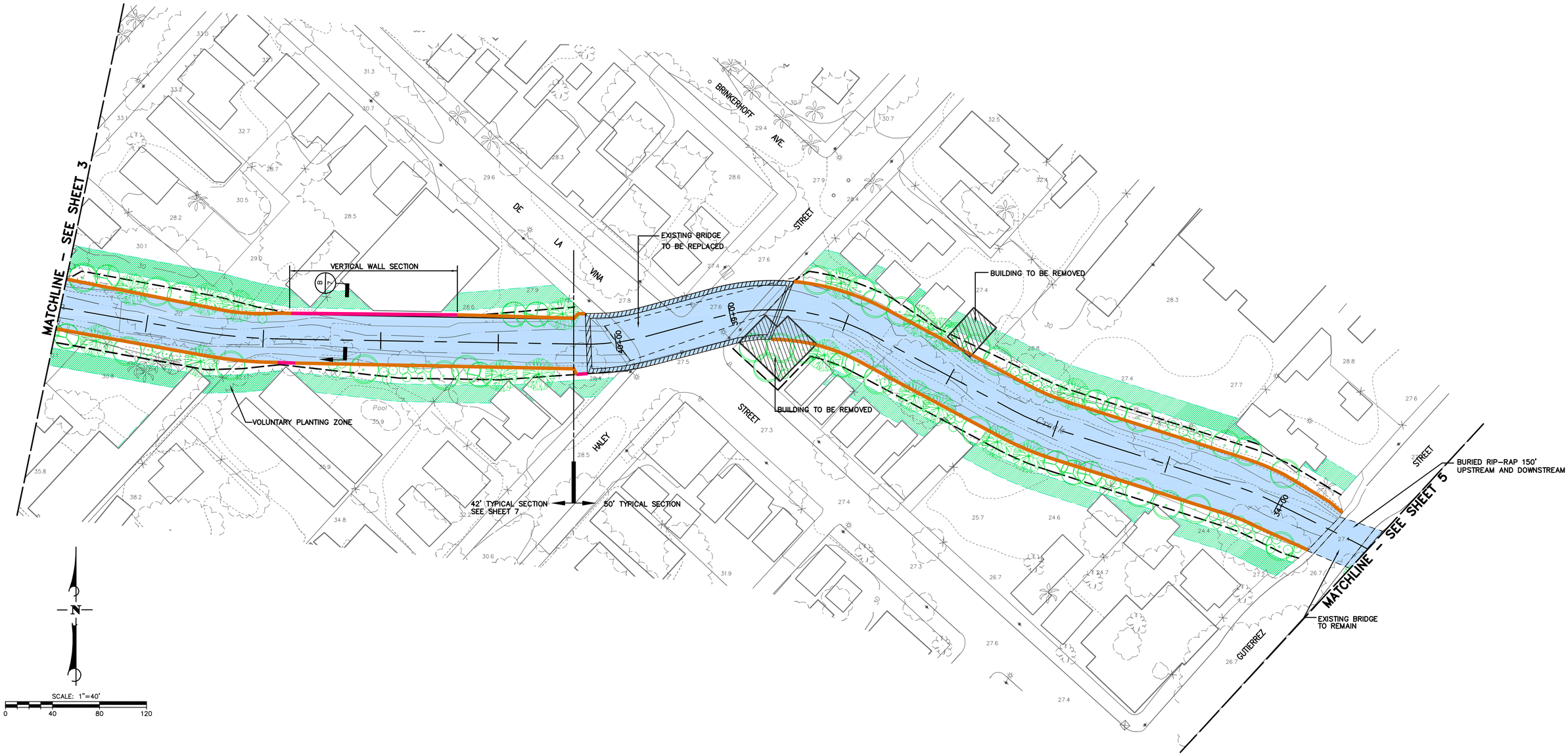

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PLOT BY:Chuck White
SAVE DATE: 4/26/2006 4:16:20 PM
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LANDSCAPE PLAN LOWER MISSION CREEK

CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05
SHEET 4 OF 9
PLAN DATE 6 APRIL 2006

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MATCHLINE - SEE SHEET 4

50' TYPICAL SECTION SEE SHEET 7

35' TYP.

15' TYP.

VOLUNTARY PLANTING ZONE

LOW FLOW DIVERSION BERM

MAINTENANCE ACCESS

30" WIDE BURIED OVERFLOW BOX CULVERT FOR STORM FLOWS ONLY

OVERFLOW BOX CULVERT

EXISTING BRIDGES TO REMAIN

EXISTING CREEK WITH HISTORIC SANDSTONE WALLS TO REMAIN

POTTER FOOTBRIDGE TO REMAIN

REHABILITATE HISTORIC BRIDGE

MORTON BAY FIG TREE

101 FREEWAY NORTH

101 FREEWAY SOUTH

MONTECITO

CHAPALA

STREET

RAILROAD

AMTK. RAILR.

YANONALI

AVENUE

Median Wall

Sign

MATCHLINE - SEE SHEET 6

N

SCALE: 1"=40'

0 40 80 120

LEGEND

- EXISTING CONCRETE RETAINING WALL TO REMAIN
- FULL HEIGHT RETAINING WALL
- HALF HEIGHT RETAINING WALL
- VOLUNTARY PLANTING ZONE

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CITY OF SANTA BARBARA, CALIFORNIA
REVIEWED BY:
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LANDSCAPE PLAN
LOWER MISSION CREEK
CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05
SHEET 5 OF 9
PLAN DATE 6 APRIL 2006

PLOT SCALE:1:1 PLOT DATE:4/26/2006 4:18:35 PM PLOT BY:Chuck White SAVE DATE: 4/26/2006 4:16:20 PM 36-ENG

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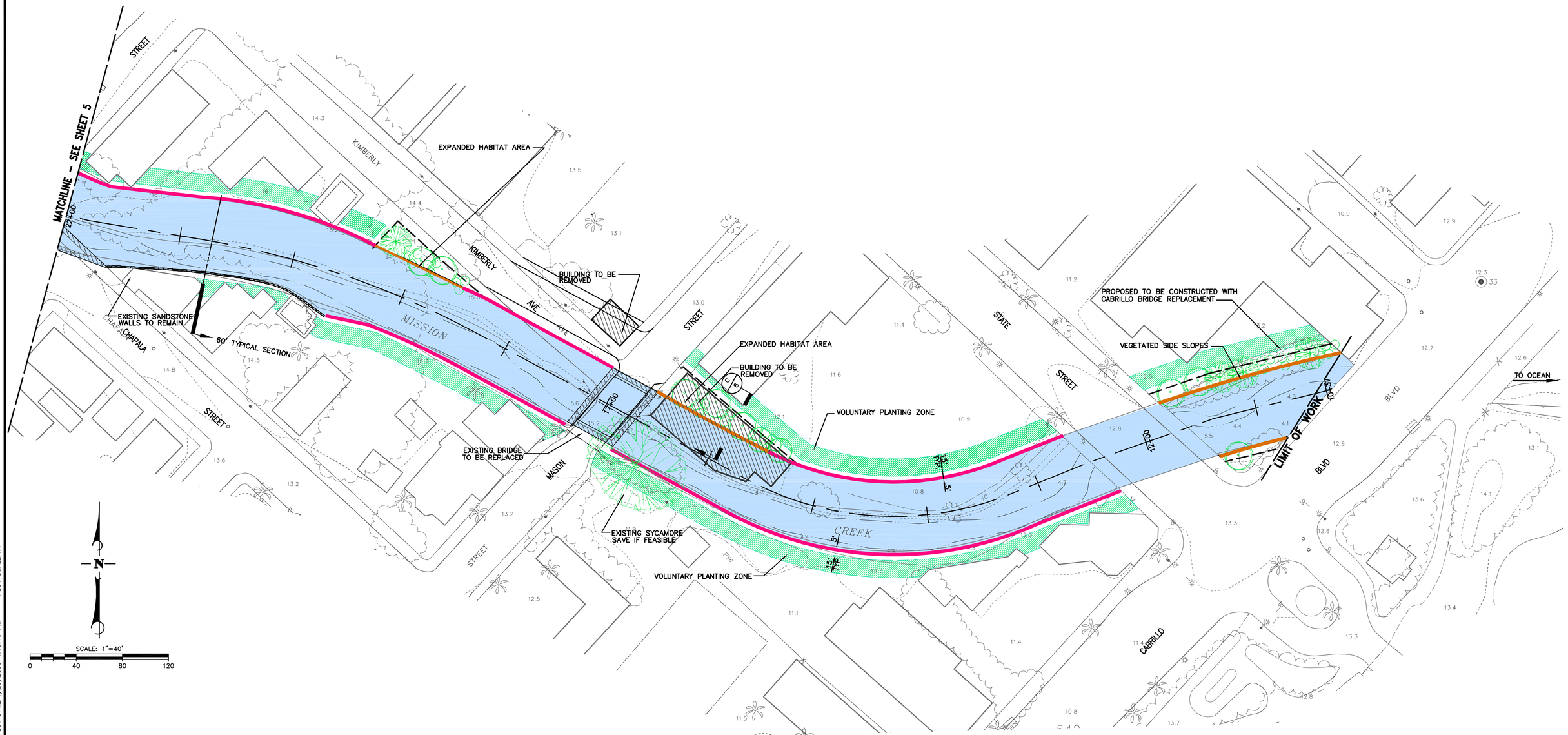

LEGEND

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CITY OF SANTA BARBARA, CALIFORNIA

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SHEET 6 OF 9
PLAN DATE 6 APRIL 2006

36-ENG SAVE DATE: 4/26/2006 4:16:20 PM PLOT BY:Chuck White PLOT DATE:4/26/2006 4:19:16 PM PLOT SCALE:1:1

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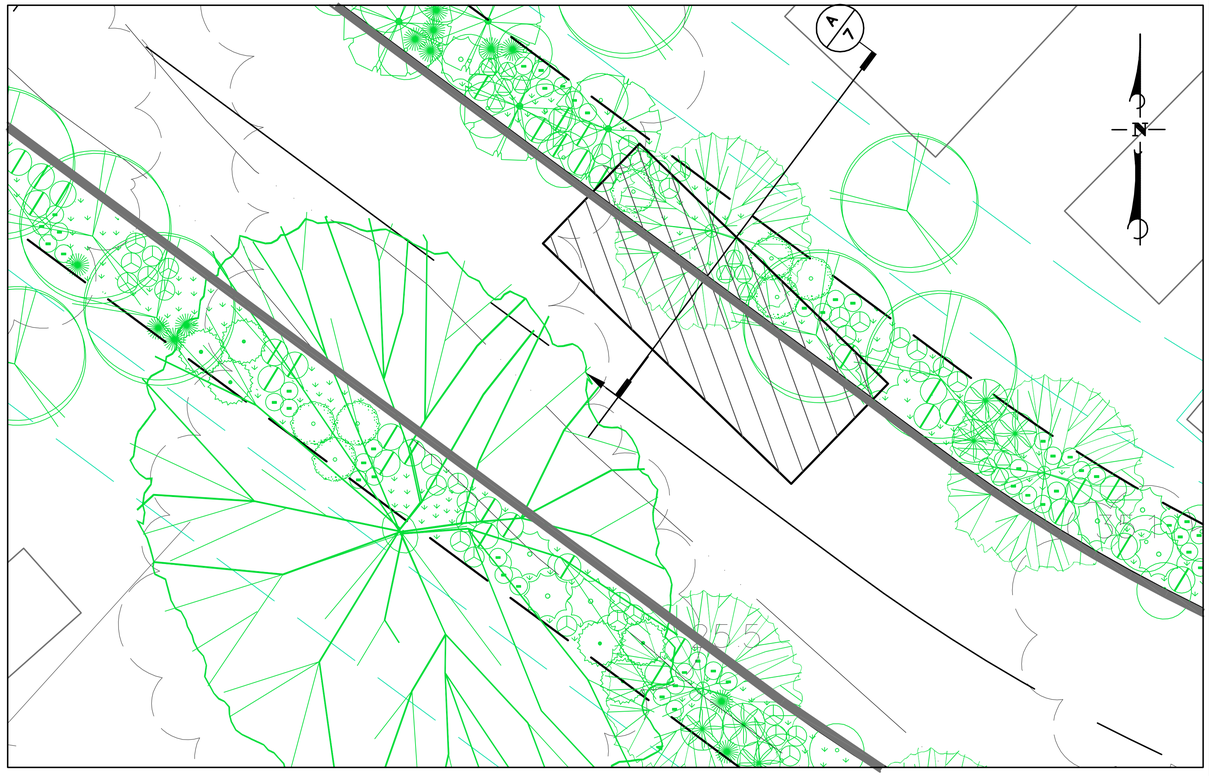
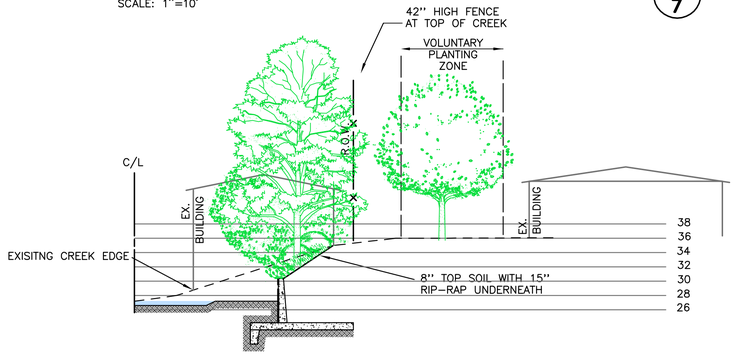


VEGETATED SIDE SLOPE – PLAN

SCALE: 1"=10'

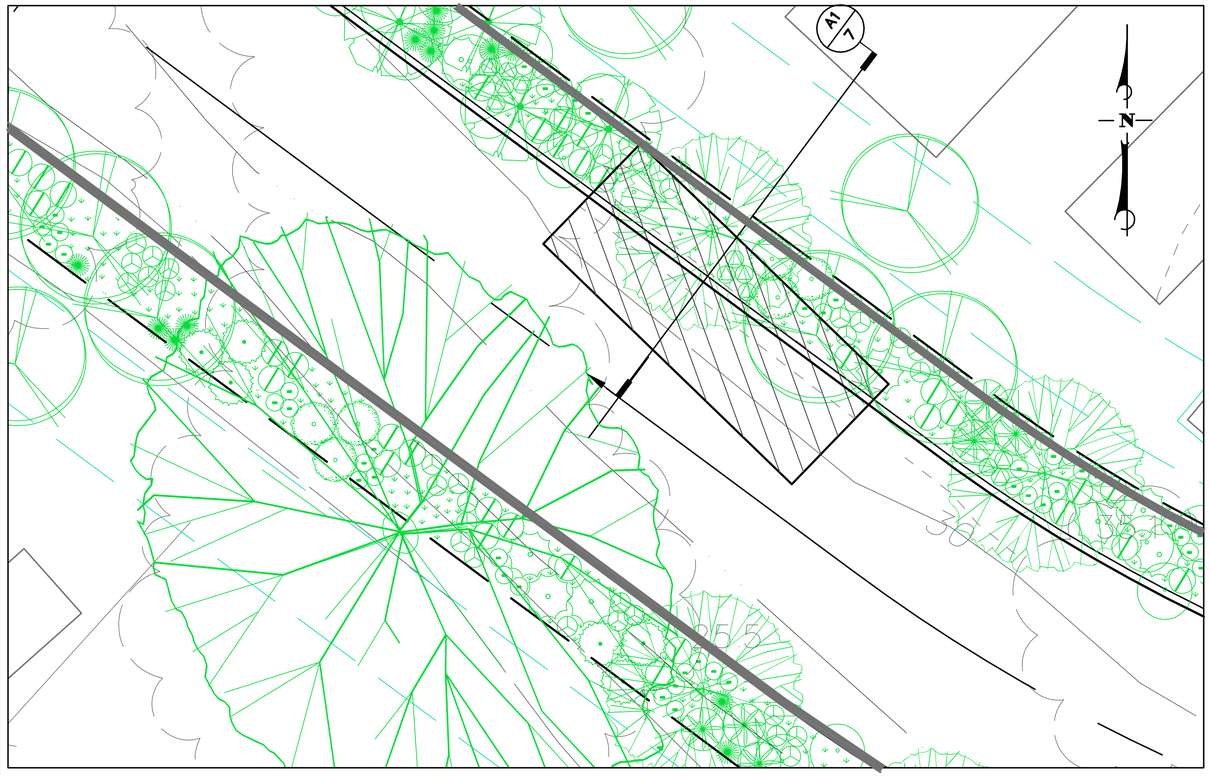
A/7



VEGETATED SIDE SLOPE – TYPICAL SECTION "A"

SCALE: HORIZ.: 1"=10'
VERT.: 1"=10'

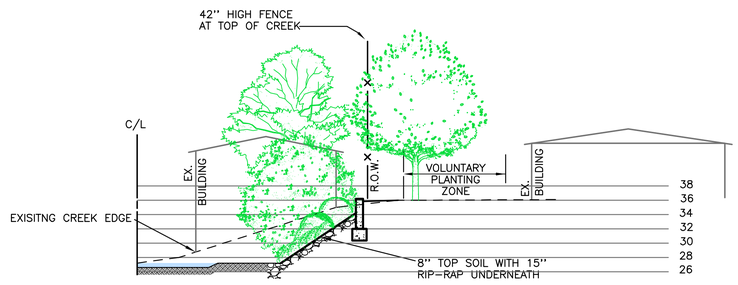
A/7



VEGETATED SIDE SLOPE ALTERNATIVE – PLAN

SCALE: 1"=10'

A1/7



VEGETATED SIDE SLOPE ALTERNATIVE– TYPICAL SECTION "A1"

SCALE: HORIZ.: 1"=10'
VERT.: 1"=10'

A1/7

PLANT LEGEND

TREES

SYMBOL	BOTANICAL NAME (COMMON NAME)
	PLATANUS RACEMOSA (WESTERN SYCAMORE)
	POPULUS FREMONTII (COTTONWOOD)
	QUERCUS AGRIFOLIA (COAST LIVE OAK)
	UMBELLULARIA CALIFORNICA (CALIFORNIA BAY)

SHRUBS

SYMBOL	BOTANICAL NAME (COMMON NAME)
	HETEROMELES ARBUTIFOLIA (TOYON)
	MALSOMA LAURINA (LAUREL SUMAC)
	BACCHARIS PILULARIS (COYOTE BUSH) or ROSA CALIFORNICA (ROSE)
	PRUNUS ILICFOLIA (HOLLY-LEAFED CHERRY) or RHUS INTEGRIFOLIA (LEMONADEBERRY)

UNDERSTORY PLANTS

SYMBOL	BOTANICAL NAME (COMMON NAME)
	SALIX LASIOLEPIS (ARROYO WILLOW)
	SAMBUCUS MEXICANA (MEXICAN ELDERBERRY) or BACCHARIS SALICIFOLIA (MULEFAT)
	RHUS TRILOBATA (SQUAW BUSH)
	RHUS URSINUS (BLACKBERRY) or RIBES SPECIOSUM (GOOSEBERRY)

GRASSES

SYMBOL	BOTANICAL NAME (COMMON NAME)
	LEYMUS CONDENSATUS (GIANT WILD RYE)
	MELIC GRASS (MELICA CALIFORNICUS)
	NASELLA PULCHRA (PURPLE NEEDLEGRASS)
	LEYMUS CONDENSATUS (GIANT WILD RYE)

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SANTA BARBARA COUNTY FLOOD CONTROL & WATER RESOURCES

CITY OF SANTA BARBARA CALIFORNIA

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LANDSCAPE PLAN
LOWER MISSION CREEK

CITY OF SANTA BARBARA, CALIFORNIA

P&S PROJECT NO. 13216.05

SHEET 7 OF 9

PLAN DATE 10 MAY 2006

36-ENG SAVE DATE: 5/10/2006 5:45:22 PM PLOT BY:Tobias Knowles PLOT DATE:5/11/2006 11:09:35 AM PLOT SCALE:1:1

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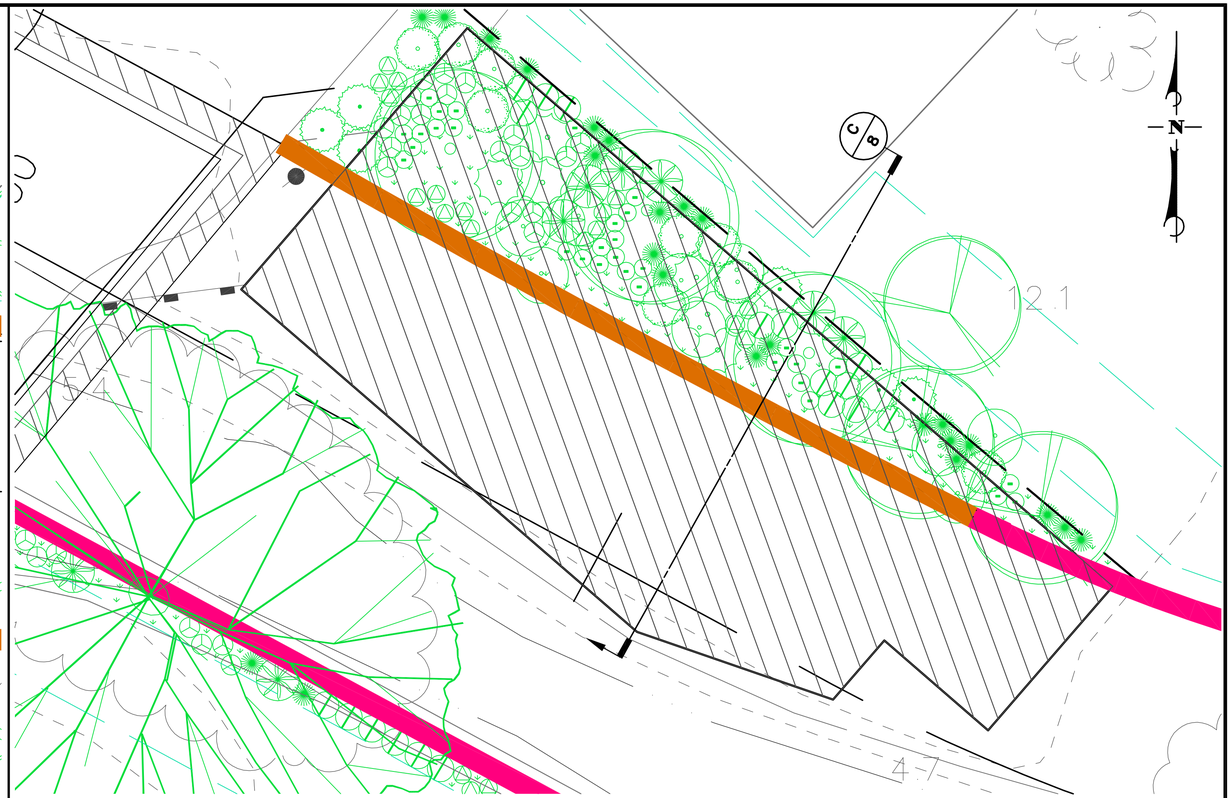
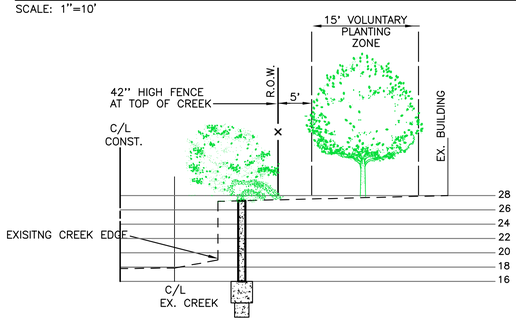


VERTICAL WALL ON PIER FOOTING – PLAN

B/8

SCALE: 1"=10'



VERTICAL WALL ON PIER FOOTING – TYPICAL SECTION

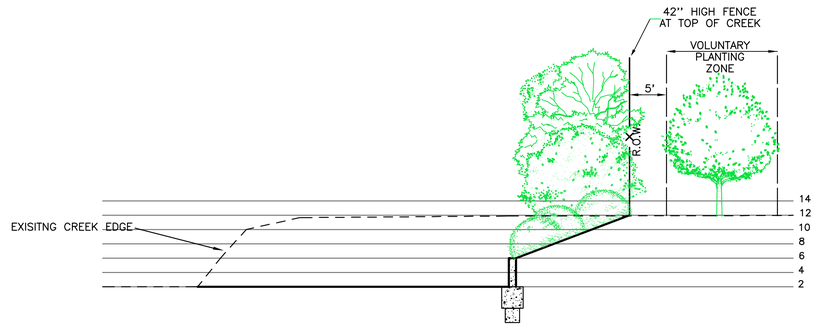
B/8

SCALE: HORIZ.: 1"=10'
VERT.: 1"=10'

EXPANDED HABITAT AREA – PLAN

C/8

SCALE: 1"=10'



EXPANDED HABITAT AREA – TYPICAL SECTION

C/8

SCALE: HORIZ.: 1"=10'
VERT.: 1"=10'

PLANT LEGEND

TREES

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CITY OF SANTA BARBARA, CALIFORNIA

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SHEET 8 OF 9
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Figure 3a. Thalweg Alignment and Pools along Lower Mission Creek

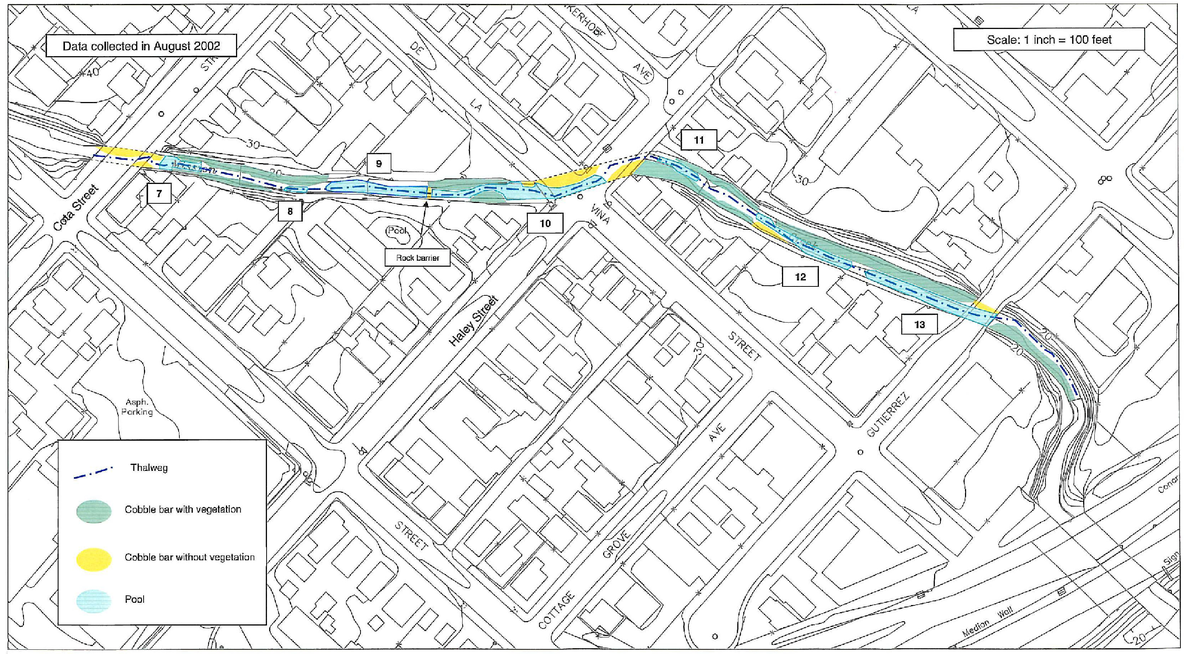

Figure 3b. Thalweg Alignment and Pools along Lower Mission Creek

Figure 4. Channel Cross Section for the Lower Mission Creek Project - Recommended Project

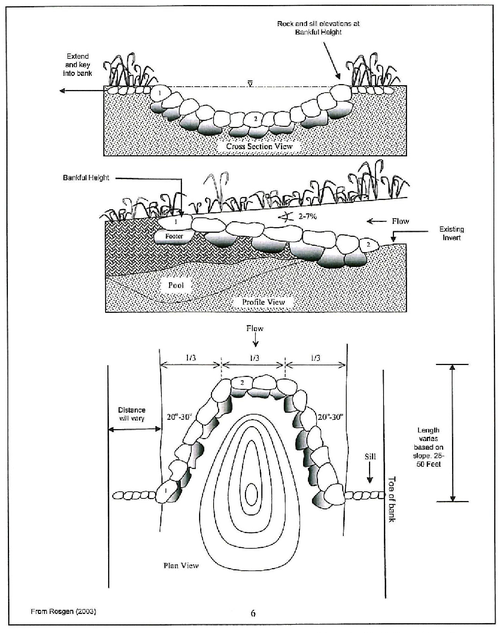

Figure 5. Rock Cross-Vane Weirs

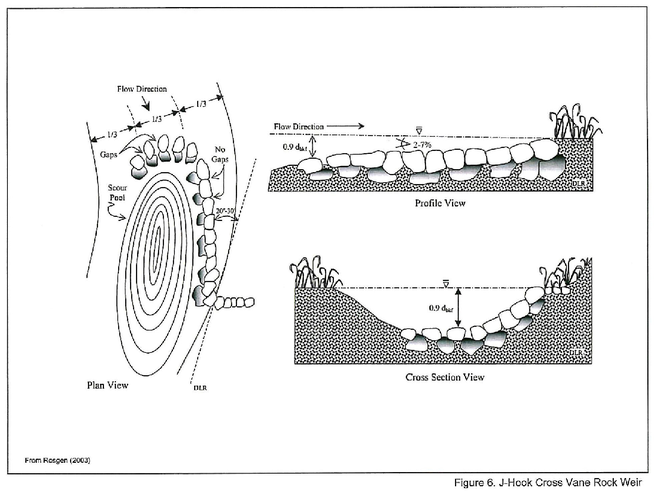

Figure 6. J-Hook Cross Vane Rock Weir

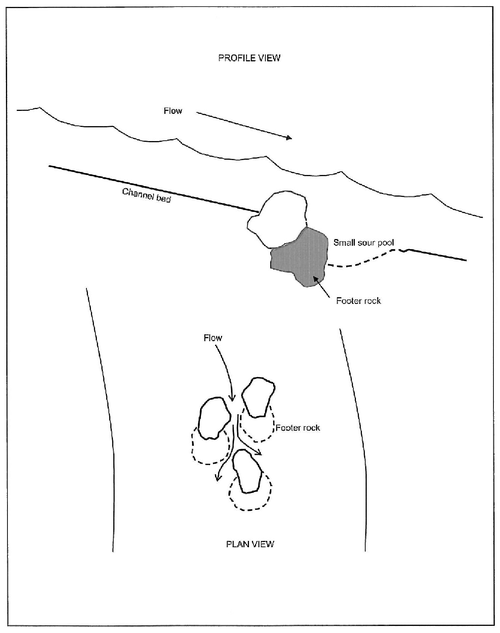

Figure 7. Recommended Rock Clusters

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Lower Mission Creek Flood Control Project

Landscape Plan for Private Property

The following terms and conditions apply to the City/County of Santa Barbara voluntary landscape plan designed to provide assistance to private property owners with property on Lower Mission Creek:

1. Participation in this program is voluntary.

2. The program is available for properties within the City of Santa Barbara and along Lower Mission Creek only.

3. Participation in the program; including site suitability, eligibility, and project scope, is at the sole discretion of the Creeks Division Manager and will depend on site characteristics. In order to be eligible for the program the site must have the potential to improve riparian habitat through participation in the program.

4. The program will include planting of native riparian shrubs and trees only which must be consistent with the LMC Landscape Plan planting palette. No non-native plants will be planted as part of the program.

5. Participation in the program may be conditioned upon the removal of non-native trees and understory plants where deemed appropriate and necessary for the survival of the new native shrubs and trees. Any trees or plants that will be required to be removed will be identified prior to participation in the program.

6. The program will include installation of a five year temporary drip irrigation that will be in place until the new plants have been established.

7. The property owner must be willing to sign an agreement with the City/County including a promise to maintain the plantings (including irrigating and weeding) for a minimum of 5 years with annual City inspections.

8. The City/County will perform annual inspections to monitor plant health and survival rates.

9. For approved projects up to $1,000, the City will provide all project funds (no cost to the property owner).

10. For approved projects over $1,000 and up to $5,000, the Creeks Division will provide the first $1,000, and 75% of the project cost between $1,000 and $5,000. The property owner will provide 25% of the project cost between $1,000 and $5,000. For example, if the total project cost is

$3,000, the City will provide $2,500 and the property owner will provide $500. The maximum project cost for any project in the Program is $5,000.

11. City staff will coordinate with the property owner and their landscape contractor (if applicable) regarding design, native tree and shrub installation, non-native plant removal, irrigation and maintenance. City staff or the land owner's landscape contractor would design the planting and irrigation layout. The City or the landowner contactor would hire a licensed contractor to perform the tree installation, tree removal, and irrigation work. A recommended plant list is attached.

12. If more than 30% of the project trees are intentionally removed or perish due to a lack of proper maintenance within one year of installation, the property owner will be responsible for reimbursing the City for all project costs paid by the City.

13. The contractor would provide the City and Flood Control their landscape plan as-builts to document success of private plantings.

The plant list below is approved for use:

Plant Species List For Lower Mission Creek Flood Control Project

SPECIES	COMMON NAME
CREEK BANKS	
Artemisia californica	Old man sage
Artemisia douglasiana	Mugwort
Baccharis douglasii	Marsh baccharis
Baccharis Pilularis	Coyote Bush
Baccharis salicifolia	Mulefat
Clematis ligusticifolia	Creek clematis
Encelia californica	Coastal encelia
Euthamia occidentalis	Western goldenrod
Heteromeles arbutiflia	Toyan
Isocoma menziensii	Coast goldenbush
Keckiella cordifolia	Climbing penstemon
Leymus condensatus	Giant ryegrass
Leymus triticoides	Creeping ryegrass
Lonicera subspicata subspicata	Chaparral honeysuckle
Malacothamnus fasciculatus	Chaparral mallow
Malasma laurina	Laurel sumac
Melica californica	California melic
Mimulus aurantiacus	Sticky monkey flower
Muhlenberga rigens	Deer grass
Nassella pulchra	Purple needlegrass
Eriogonum parvifolium	Seacliff buckwheat
Prunus ilicifolia	Hollyleaf cherry
Rhamnus californica	Coffeeberry
Rhus integrifolia	Lemonadeberry
Rhus trilobata	Squaw bush
Ribes amarum hoffmannii	Bitter gooseberry
Ribes speciosum	Fuchsia-flowered gooseberry
Rosa californica	California rose
Rubus ursinus	Blackberry
Salvia mellifera	Black sage
Salvia leucophylla	Purple sage
Salivia apiana	White sage
Salvia spathacea	Hummingbird sage
Sambucus Mexicana	Mexican elderberry
Sisyrinchium bellum	Blue eyed grass
Solanum xanti	Purple nightshade
Solidago californica	California goldenrod
Stachys bullata	Wood mint
Symphorcarpus mollis	Snowberry
Venegasia carpesioides	Canyon sunflower
Verbena lasiostachys	Verbena

CREEK BOTTOM & WETLANDS	
Anemopsis californica	Yerba mansa
Carex barbarae	Santa Barbara sedge
Carex praegracilis	CA field sedge
Distichlis spicata	Saltgrass
Eleocharis macrostachya	Common spikerush
Juncus effusus	Bog rush
Juncus patens	Common rush
Salix exigua	Sandbar willow
Salix Lasiolepis	Arroyo willow
Scirpus maritimus	Praire bulrush
Scirpus microcarpus	Small-fruited bulrush
Scirpus robustus	California bulrush
TREES	
Alnus rhombifolia	White alder
Cornus seicea	Dogwood
Juglans californica	Black walnut
Plantanus racemosa	Western sycamore
Populus balsamifer trichocarpa	Black cottonwood
Populus Fremonti	Freemont cottonwood
Quercus agrifolia	Coast live oak
Salix lasiolepis/ Salix laevigata	Willow
Sambucus mexicanus	Mexican elderberry
Umbellularia californica	CA bay laurel