# Pismo Beach, CA Shoreline
# CAP 103 Study

# Project Management Plan

**Los Angeles District, US Army Corps of Engineers**

**September 2008**

## CONCURRENCE PAGE 1 of 2

As members of the Los Angeles District Project Review Board, we the undersigned, concur with the contents of the CAP 103 Project Management Plan dated, August 2008, for the Pismo Beach CAP 103 Study. We understand that the Project Management Plan is a living management document that will be updated throughout the course of the study.

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## CONCURRENCE PAGE 2 of 2

As the responsible functional elements of the Los Angeles District, we the undersigned, concur with the contents of the CAP 103 Project Management Plan dated, August 2008, for the Pismo Beach CAP 103 Study. We understand that the Project Management Plan is a living management document that will be updated throughout the course of the study.

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# 1 The Project Management Plan

This Project Management Plan (PMP) is an attachment to the Continuing Authorities Program (CAP) 103 Feasibility Cost Sharing Agreement (FCSA) for the Pismo Beach Shoreline CAP 103 Study. This document defines the planning approach, activities to be accomplished, schedule, and associated costs that the Federal Government and the Non-Federal Sponsors will be supporting financially. The PMP defines a contract between the Corps of Engineers and the Non-Federal Sponsor – the City of Pismo Beach, and reflects a buy-in on the part of the financial backers, as well as those who will be performing and reviewing the activities involved in the shoreline special study.

## *1.1* Basis for Change

Because planning is an iterative process without a predetermined outcome, more or less funding and time may be required to accomplish the formulation and reformulation and evaluation of the alternative plans. With clear descriptions of the scopes and assumptions outlined in the PMP, deviations are easier to identify. The impact in either time or money is easily assessed and decisions can be made on how to proceed. The PMP provides a basis for change.

## *1.2* Review and Evaluation

The PMP is a basis for the review and evaluation of the special study report. Since the PMP represents a contract among study participants, it will be used as the basis to determine if the draft special study report has been developed in accordance with established procedures and previous agreements. The PMP reflects mutual agreements between the Los Angeles District (CESPL), the South Pacific Division (CESPD), the Non-Federal Sponsor – the City of Pismo Beach, and Headquarters, U.S. Army Corps of Engineers (HQUSACE) regarding the Pismo Beach Shoreline CAP 103 Study. The PMP establishes the scope, critical assumptions, methodologies, and level of detail for the studies that are to be conducted during the CAP 103 study. Review of the draft report will be to insure that the study has been developed consistent with these agreements. The objective is to provide early assurance that the project is developed in a way that can be supported by higher headquarters.

## *1.3* Management Tool

The PMP is a study management tool that includes scopes of work to be used for funds allocation by the Project Manager. It forms the basis for identifying commitments to the Non-Federal Sponsor and serves as a basis for performance measurement.

## *1.4* Summary of PMP Requirements

This PMP is comprised of the following chapters:

Chapter 1. The Project Management Plan. This chapter includes a description of the PMP and a summary of PMP requirements.

Chapter 2. Initial Appraisal Report. Chapter 2 is the Initial Appraisal Report that includes an overview of the study findings, the plan formulation rationale and proposed streamlining initiatives.

Chapter 3. Work Breakdown Structure. A product-based Work Breakdown Structure (WBS) defines the project, subprojects, and parent tasks and other tasks that will be accomplished throughout the study. The major milestone tasks and definitions are included as Appendix B to the PMP.

Chapter 4. Scopes of Work. Detailed scope of the tasks and activities that describes in narrative form the work to be accomplished, and answers the questions -- What? How? How Much?

Chapter 5. Responsibility Assignment. The Organizational Breakdown Structure (OBS) defines who will perform work on the study. This allows the identification of the functional organization that will perform each of the tasks in a Responsibility Assignment Matrix (RAM).

Chapter 6. Special Study Schedule. The schedule defines when key decision points, CESPD milestone conferences and mandatory HQUSACE milestones will be accomplished.

Chapter 7. Special Study Cost Estimate. This is the baseline cost estimate for the CAP 103 study.

Chapter 8. Quality Management Plan. Chapter 8 supplements the District's Quality Management Plan. It highlights any deviations to the District's plan and lists the members of the study team and the a review team.

Chapter 9. Identification of Procedures and Criteria. This chapter references the regulations and other guidance that cover the planning process and reporting procedures.

Chapter 10. Public Involvement and Coordination. Public involvement and coordination activities for the Pismo Beach CAP 103 Study are described in this Chapter.

# 2 Initial Appraisal Report

## *2.1* Introduction

This report presents the results of an initial appraisal of the Pismo Beach shoreline to assess problems and opportunities related to beach erosion and storm damage reduction. Shoreline retreat has progressed at several locations within the City to the point where existing infrastructure and development is vulnerable to future damages. This report provides a preliminary review of the situation to determine if there is sufficient basis for Federal participation to implement structural and/or non-structural remedies.

### *2.1.1* Purpose and Scope

The purpose of this study is to review existing shoreline erosion problems that are currently being experienced by the City of Pismo Beach, assess feasible measures to solve the identified problems, and determine if there is a Federal interest to implement a program of intervention.

### *2.1.2* Authorization

This study was authorized by Section 103, River and Harbor Act of 1962 (PL 87-874), as amended that empowers the Corps of Engineers to participate in the cost of protecting shores of publicly owned property from storm damage. Under this authority, more commonly known as the Continuing Authorities Program (CAP), the Corps of Engineers may be authorized to plan, design, and construct projects without additional project specific Congressional authorization.

### *2.1.3* Study Participation and Coordination

The study was conducted in cooperation with the City of Pismo Beach.

### *2.1.4* Prior Studies and Reports

The following studies and reports have been previously prepared for the study area:

a. “Beach Erosion Control Report, Cooperative Research and Data Collection Program of Coast of Southern California, San Luis Obispo County”, was prepared by the Los Angeles District in 1970. The appendix discussed shoreline conditions and erosion over a three-year period of study. It was stated that no noticeable shoreline erosion was observed within the Pismo Beach coastal area during the period of study between 1967 through 1969.

b. The coast of California was surveyed in 1970 by the South Pacific Division as part of the “National Shoreline Study”. The report indicated a state of non-critical erosion existed for the Pismo Beach shoreline segment.

c. In 1976 the Los Angeles District conducted a brief study of serious bluff erosion reported by the City of Pismo Beach at three locations. The problem was believed to be primarily related to surface runoff drainage over the top of the seacliff as opposed to wave action.

d. "Assessment and Atlas of Shoreline Erosion along the California Coast" was prepared by the California Department of Navigation and Ocean Development in 1977. The inventory of conditions state-wide indicated that erosion was critical for the Pismo Beach seacliffs.

e. The District was requested by the City of Pismo Beach to review storm erosion damages that were reported during the winter of 1977-78. Preliminary designs, construction cost estimates, and associated benefits analysis were drafted in unpublished format.

f. A field reconnaissance of seacliff erosion was conducted by the Los Angeles District in 1983 to review damages following the winter storms of 1982-83. An initial appraisal of the problem along Cypress Street between Harloe and Wadsworth Avenues concluded that a plan of improvement was economically justified. A small beach erosion control project under the authority of Section 103 of the 1962 River and Harbor Act was recommended for further study.

g. A summary state of knowledge of the coastal processes of the Santa Maria littoral cell which includes the City of Pismo Beach shoreline was prepared by the District in 1986 under the auspices of the Coast of California Storm and Tidal Waves Study.

h. "Bluff Erosion Study, City of Pismo Beach, California" was prepared by Earth Systems Consultants in 1992. The report provided a broad view of the shoreline's geology, bluff erosion characteristics, and key influential factors. An overview of potential shoreline protection measures to reduce seacliff retreat was also presented. Three areas were identified as needing immediate attention for stabilization.

i. Bluff erosion at three locations (Memory Park at Seacliff Drive, Ocean Boulevard near Capistrano Drive, and Price Street between Dinosaur Caves and Shelter Cover Lodge) was studied by Earth Systems Consultants in 1999. Shoreline protection and road stabilization measures were recommended.

## *2.2* The Study Area

### *2.2.1* Location

The study area is situated within the upper reach of San Luis Bay which is a hook-shaped shoreline that extends south from Port San Luis to the County line for about 21 miles. The northern portion of this reach which includes the City of Pismo Beach shoreline consists of wide sandy beach at the southern end that transitions upcoast to high seacliffs, rocky coast, and narrow beaches. Within the City's northern segment, three areas have been identified as chronically erosional. At each area, recession has jeopardized existing street rights-of-way, infrastructure, and public improvements. A vicinity map which shows the limits of the study area vicinity is shown in **Figure 1**.

Source: Automobile Club of Southern California 2000.

**Figure 1 Vicinity Map**

### *2.2.2* Physical Setting

*Geology*

Pismo Beach is located along the southwest flank of the San Luis Range within the southern end of the Coast Range Province. This geologic unit consists of north west oriented ridges and valleys. The mountains, with an average elevation of 2,000 feet, are separated from the ocean by a narrow wave cut terrace that abruptly ends as seacliffs at the shoreline. Two major rock types predominate throughout the province: Jurassic through Pleistocene sedimentary rocks and the Franciscan Formation and associated granitic-like rocks (USACE, 1985).

The Pismo Beach shoreline segment reviewed in this study is part of the City's seven-mile long coastal frontage. A broad sandy beach extends for a short distance along the downtown area whereas rocky coast with narrow pocket beaches, prominent headlands, and offshore sea stacks typify the character of the remaining shoreline. The numerous embayments contain thin lenses of steeply sloping profiles of coarse sand and cobble which overlie a shallow bedrock nearshore platform. The seacliffs, which are in an active state of erosion, vary in height from 10 feet to over 100 feet above low crested beach berms.

*Bluff Geometry*

Assessing bluff erosion requires an understanding of the interactive relationship between the upper-bluff and seacliff. Emery and Kuhn (1982) have developed a system of classifying coastal bluff profiles. Applying that system to the Pismo Beach coastline, the bluff geometry of the various study reaches will be designated by a letter classification in accordance with **Figure 2**. The bluff geometry will tend to indicate which portion of a bluff is eroding at a greater rate, which can suggest more effective mitigation techniques.

According to the Emery and Kuhn bluff classification table, study reaches 1-4 have been classified with a designation of "Type-3, Active Seacliff". The marine derived erosion is much greater than subaerial erosion of the upper-bluff within this reach.

At Price Street, the base of the bluff consists of volcanic tuff overlain by sandstone and marine terrace deposits. Further west at Shell Beach, the foundation material consists of Monterey shale. The base rock is interbedded with soft, fractured, and highly erodable clay stone. Marine terrace sediments cap the upper portion of the section (Earth Systems Consultants, 1999).

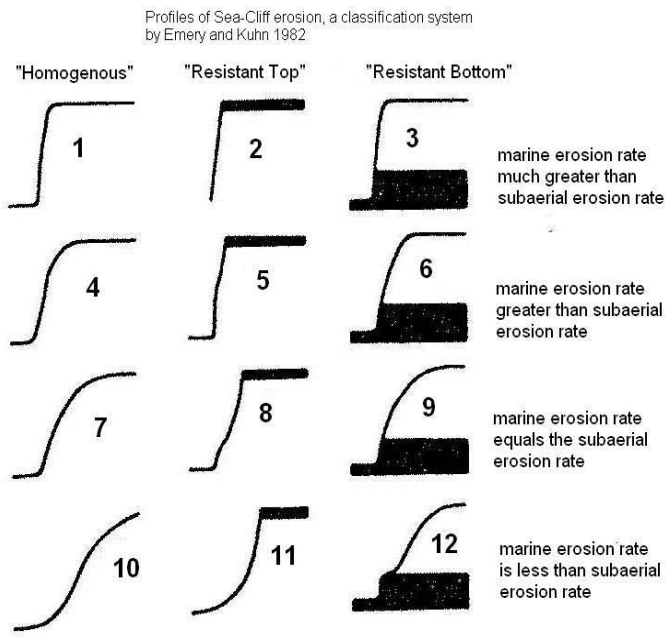


**Figure 2 Sea-Cliff Classification (Emery and Kuhn, 1982)**

### Reach 1: Seacliff (Memory Park)

Controlling drainage and erosion of the bluff terrace will continue to provide limited protection to Memory Park, however, the bluff classification in this area indicates that the more significant erosion is occurring within the bedrock seacliff portion of the total bluff. As a result, protection of the seacliff toe is more critical for stabilization.

### Reach 2: Ocean Boulevard

Maintaining control of the bluff top terrace drainage is critical to maintaining the roadway and park areas adjacent to the bluff. Although drainage control is important, the bluff classification within this study segment indicates that more of the current instability is driven by instability within the seacliff bedrock portion of the total bluff.

### Reach 3: Price Street

The more significant bluff erosion, - according to the classification of “Type-3, Active Seacliff” - is occurring within the seacliff bedrock portion of the total bluff. That means that controlling erosion created by the marine derived environment is of primary concern. The methods of controlling the seacliff erosion include placement of a rock revetment or a seawall in the reentrants, or grouting of the local sea caves and (local) weaker bedding layers.

The seacliff bluff toe may be protected by placing armor stone at reentrants and at seacave openings. Seawall construction is considered difficult due to the limited access to the bluff toe.

Upper-bluff surface treatment may reduce erosion of exposed surfaces along the upper-bluffs. Surface treatments consist of measures such as the application of a spray-on chemical grout or a soil/chemical grout mixture.

Areas along the bluff have overhanging soil blocks, old pavement, abandoned concrete structures and pipes. These items should to be removed or stabilized where possible, to enhance both upper-bluff stability and safety.

**Reach 4: Cypress Street Bluff**

Control of storm-related toe erosion will eliminate much of the continuing instability of the Cypress Street bluff. As toe erosion occurs, the instability of the marine terrace bluff deposits results in more bluff top retreat as the material seeks a flatter and more stable configuration. Toe erosion would consist of recurring beach nourishment, stone armor, or sheet pile (currently used downcoast of the Cypress Street reach).

Bluff face surface treatment will reduce erosion of exposed surfaces. Surface treatments consist of measures such as the application of a spray-on chemical grout and a soil/chemical grout mixture. Logs in the area downcoast of the subject reach, and site observations indicate that there is no bedrock within a depth of 40-feet of the bluff toe which would preclude efficient pile placement.

*Tides*

Tides within the central California coastal waters are of the mixed semi-diurnal type. Typically, a lunar day (about 24 hours) consists of two high and two low tides, each of different magnitude. The lower-low normally follows the higher-high by about seven to eight hours, whereupon the next higher-high (after the lower-high and higher-low waters) follows in about 17 hours. Tidal characteristics at Pismo Beach are referenced to the Los Angeles Harbor control gage using the nearby Port San Luis Wharf subordinate station. Relevant tidal statistics from that gage are summarized in **Table 1.**

**Table 1 Tidal Characteristics at Port San Luis Wharf**

| Datum or Level | Elevation (ft,MLLW) |
|---|---|
| Highest Measured Water Level (18 Jan 1973) | 7.80 |
| Mean Higher High Water (MHHW) | 5.39 |
| Mean High Water (MHW) | 4.68 |
| Mean Tide Level (MTL) | 2.86 |
| National Geodetic Vertical Datum- 1929 (NGVD) | 2.73 |
| Mean Low Water (MLW) | 1.04 |
| Mean Lower Low Water (MLLW) | 0.00 |
| Lowest Measured Water Level (20 Dec 1949) | -2.10 |

Source: NOS, 2000

*Wave Climate*

Wind waves and swells within the southern and central California Coast are produced primarily by six basic meteorological patterns: 1) extratropical storm swells in the northern hemisphere (north or northwest swell); 2) wind swells generated by northwest winds in the outer coastal waters (wind swell); 3) westerly (west sea); 4) southeasterly (southeast sea) local seas; 5) storm swells of tropical storms or hurricanes off the Mexican coast; and 6) southerly swells originating in the southern hemisphere (USACE, 1996). Among the identified weather patterns, the extratropical storm swells (north or northwest swell) are the most influential wave pattern at the project coastal area.

The extratropical cyclone of the Northern Hemisphere (north or northwest swell) is related to low pressure centers which develop along the polar front. They are the source of the predominant wave action along the entire coast during the winter half of the year. Storm swell is generated at some distance from the Pismo Beach coastline in the North Pacific. Most commonly these storms will traverse the mid-Pacific before turning northeastward toward the Gulf of Alaska with swell decaying on the average of 1,500 miles to the coast of central California. However, under some meteorological conditions, storms can move in much closer to the coast; and on rare occasion these storms may move directly across central California, following either a northeast, east or southeast trajectory.

In general, the modal deep-water approach direction of these waves to central California is between 275° and 285°. However, these North Pacific low-pressure systems exhibit great variations from year to year such that wave approach directions and amplitudes will show a corresponding degree of variation. Years when the storm centers follow a more northerly route in the eastern Pacific will result in quiet conditions at the Pismo Beach area, whereas more southerly storm tracks through the mid and/or eastern Pacific will result in frequent periods of high wave conditions.

*Currents*

Nearshore currents are estimated to be predominantly from north to south in response to the prevailing northwesterly wave and wind approach direction. Velocities may range from 5 to 50 centimeters per second. There is little measured data regarding deeper water shelf currents. Studies conducted over the years off the California coast indicate that wind driven currents can be strong enough to transport significant amounts of sediment. However not enough data has been collected to develop a full quantitative understanding of the process (USACE, 1986).

*Littoral Processes*

The Pismo Beach shoreline is located within the Santa Maria littoral cell. This 82-mile long physiographic unit extends from Point Buchon in the north to Point Conception at the southern end. Although the central California coastline experiences some of the highest fluxes of wave energy, the general shore normal orientation of the beaches results in relatively low net littoral rates of transport. Annual net alongshore rates of 40,000 to 65,000 cubic yards per year have been estimated with the predominantly direction of transport toward the down coast (southeast) (USACE, 1986).

The beaches near the project site consist of thin lenses of sand which overlies bedrock. Sediment probes measured at several sites during the field reconnaissance survey on March 14-15, 2000, indicated that the sand and cobble thickness was only two to three feet. Given this thin layer of sediment cover, the beaches are expected to experience significant seasonal changes as sand moves inshore and offshore in response to variations in the wave climate. The more energetic winter sea and swell temporarily carries the beach sand offshore leaving the rocky nearshore platform exposed. During the summer and early fall, a reverse trend of onshore sand transport and beach re-building occurs when the swells are typically lower in height and longer in period.

Sediment sources to the littoral sub-cell are limited to fluvial delivery from nearby creeks, material deposited as a result of seacliff erosion, and a possible net onshore transport component that may exist further south within the sub-cell. It has been estimated that about 8,000 cubic yards per year is delivered from the upcoast fluvial source. A minor amount of sediment is thought to be contributed by bluff erosion due to the remnant sand content contained in the sloughed marine terrace deposits (USACE, 1986).

### *2.2.3* Environmental Baseline

Biological resources within the study area include coastal sage scrub vegetation on the bluffs, narrow coastal strand consisting of both sandy and cobble beaches, and a combination of soft-bottom and rocky intertidal marine habitat. In some areas, the rocky substrate has formed tide pools in the tidal zone and allowed the growth of extensive kelp beds offshore. These varied habitats attract a diverse assemblage of terrestrial and marine species.

The bluff vegetation includes sagebrush (*Artimesia californica*), coast goldenbush (*Socoma venetus* var. *vernonioides*), buckwheat (*Eriogonum vesciculatum*), and grasses, among other native and non-native species. Severe erosion along several reaches has resulted in almost barren cliff faces, but the small caves, niches, and uneven slope continues to provide shelter for burrowing mammals and cliff-dwelling birds. Terrestrial species observed or likely to occur in the area include birds such as blackbirds, finches, sparrows, swallows, and starlings; small mammals such as rabbits and squirrels; reptiles; and myriad invertebrates, including butterflies. Existing stabilization features (seawalls and toe protection) do not appear to have significantly diminished the overall habitat values in the area, as these structures are often separated by extensive unprotected reaches.

The narrow beaches and intertidal areas provide habitat for shorebirds that forage for invertebrates in the sand or fish in the intertidal and nearshore zones. Shorebirds observed in the area include egrets, grebes, gulls, cormorants, and terns. Other birds likely to occur include sandpiper species (including godwits, curlews, willets, and yellowlegs), dowitchers, turnstones, sanderlings, plovers, killdeer, and others.

The rocky coast provides habitat for various marine species and organisms. Marine animals commonly found in the intertidal areas include crabs, clams, sea urchins, mussels, barnacles, molluscs, worms, sponges and starfish, as well as various types of algae. The open water areas are used as habitat for fish and shore birds, while the

rocky outcroppings provide subsurface habitat for rock-dwelling fish and surface resting areas for shorebirds. Kelp and seagrasses provide important nursery, foraging, and refuge areas for fish and other organisms. The most common marine mammals found along the northern coast are the harbor seal and the southern sea otter, but the California sea lion and the Steller sea lion have also been observed.

A fish species of particular concern is the California grunion (*Leuresthes tenuis*). Grunion, a member of the silversides family (*Atherinidae*), may occasionally utilize the beaches in the area for spawning from March through mid-September, with an expected peak in activity between April and June.

Federally-listed threatened or endangered animal species may occasionally occur in or near the project area, including southern sea otters (*Enhydra lutris nereis*), California brown pelicans (*Pelecanus occidentalis californicus*), Steller sea lions (*Eumetopias jubatus*) and California least terns (*Sterna antillarum browni*). Steelhead (*Onchorhynus mykiss*) may occasionally migrate through the project area to reach up or downcoast spawning grounds. The Western snowy plover (*Charadrius alexandrinus nivosus*) is not likely to breed on the narrow beaches in the project area, but may occasionally forage or rest in the vicinity.

Recreation opportunities and aesthetics are also considered important resources within the study area. Roads, sidewalks, and bike paths extend for miles along the top of the bluffs, with frequent opportunities for beach access. The breathtaking scenery includes grassy, rolling hills that end abruptly at the high, wave-beaten cliffs, with quiet coves and beaches, breaking waves, and the ocean's expanse at the base of the bluffs. Views are disrupted by freeways, roads, and existing development, but the natural beauty is barely diminished. With some exceptions, much of the existing bluff protection consists of riprap or colored stone that seems to conform to the surrounding area.

*Development Characteristics*

Pismo Beach was incorporated in 1946. The city limits cover 3.5 square miles. **Table 2** shows the 1990 demographic information for the City of Pismo Beach.

**Table 2 Demographic Information in 1990**

| Category | |
|---|---|
| Population | 7,700 |
| Labor Force | 4,000 |
| Housing Units | 4,500 |
| Per Capita Income | $20,400 |
| Median Family Income | $37,000 |

Source: Information Publications, 2000

Pismo Beach sits astride the four-lane U.S. Highway 101 freeway corridor. In 1990 this corridor carried an Average daily traffic (ADT) of 50,000-66,000 vehicles. It was estimated in 1990 that the number of vehicles using the highway would steadily

increase at an average rate of 4.2 percent per year. This increase is primarily attributed to the regional and local community development. However, even excluding local growth, the freeway traffic will exceed the existing four-lane capacity within a 20-year (year 2010) planning period. Widening the freeway to six (6) lanes in the future has been planned by CALTRANS.

The two-lane Price Street provides regional access to the Pismo Beach area via its connection to State 227 and the City of San Luis Obispo. It was estimated in 1990 that the ADT of 5,600 was increasing at a rate of 6.8 percent per year. This estimated rate is higher than expected from local and regional growth. The long-term projection of 20,760 ADT in the year 2010 would require a four-lane facility.

## *2.3* Problem Identification

### *2.3.1* Site Descriptions

*Reach 1: Seacliff (Memory Park)*

Bluff Top Structures: Existing development consists of existing bluff top homes located on either side of a small park, as shown in **Figure 3**. The small park (Memory Park) is grass covered and lined with picnic tables and park benches. Seacliff Drive is an asphalt covered public road that parallels the cliffs along this reach. This road consists of curbing and storm water inlet drains along it edges that collect storm run-off water into a series of large diameter collector pipes. The storm water exits via the collector pipes that protrude horizontally from the edges off the top of the bluffs.

**Figure 3 Seacliff (Memory Park)**

Bluff Makeup: The terrace soil deposits are near vertical and extend down to near the shoreline throughout the reach. Shoreline erosion appears to be controlled mostly by wave erosion to the base of Seacliff Drive. Several large sea-caves have formed within the bedrock at the toe of the cliffs throughout this reach. The soil portion of the bluffs is approximately 3 times the thickness of the underlying bedrock portion of the bluff, which is thinner in this reach and is more so then the much thicker bedrock that exists at other reaches. The soil layer contact is closer to mean sea level and exposes more of the upper soil portions of the cliff to wave and ocean derived erosion. In addition, the bedrock contains exposed bedding planes, orientated parallel to the direction of the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. This is evidenced by several large 50 foot wide gullies and several 20 feet wide sea caves that have formed within the reach, as well as a larger series of connected sea caves that have formed approximately 100 feet up coast of the reach. Just below the middle of Memory Park, the ceiling of the largest sea cave has nearly eroded through the thin portions of the bedrock layer and into the overlying soil layer of the cliff.

Beach Makeup: Sand beaches are poorly developed or not present. A large flat bedrock surface exists here in most places instead of a sandy beach. Most of the beach and shoreline is a natural wave-cut platform, a classical geomorphic feature that indicates ocean wave produced erosion is still strong and ongoing along this entire reach.

Existing Bluff Protection: Bluff protection consists of stone revetment at the south end of Seacliff Drive, at the farthest down coast portion of this reach. Minor amounts of dumped stone (rip-rap) have been used to fill two erosion gullies that have occurred within both bedrock and soil. One or the gullies is located at the up coast end of Seacliff Drive, along a storm water exit pipe and the other along a non-engineered pedestrian trail in the middle of the reach.

*Reach 2: Ocean Boulevard (Eldewayen Ocean Park)*

Bluff Top Structures: Existing development consists of Ocean Boulevard, several engineered pedestrian beach walkways and Eldewayen Ocean Park as shown in **Figure 4**. Ocean Boulevard is an asphalt covered public road that parallels the cliff along this reach. This road consists of curbing, wooden guardrails and storm water inlet drains along it edges that collect storm run-off water into a series of a half dozen large diameter collector pipes. The storm water exits via the collector pipes that protrude horizontally from the edges off the top of the bluffs.

**Figure 4 Ocean Boulevard (Eldewayen Ocean Park)**

Bluff Makeup: The terrace soil deposits overlie bedrock of the Monterey shale and Obispo tuff along this entire reach. The shale is highly deformed and soft and is in contact with resistant slabs of the tuff throughout this reach. The bedrock is equally as thick as the overlying soil in the up coast portion of this reach. The bedrock is thinner (approximately 1/3 the thickness of the soil layer) at the Park and then becomes thicker (approximately 1-1/2 times the thickness of the soil layer) at the down coast end of this reach. The bedding structure within the bedrock has more influence on the ocean derived erosion process than does the thickness of the bedrock. Throughout the reach, the bedrock contains exposed vertical to steeply vertical bedding planes, orientated parallel to the direction of the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. Many smaller 5 foot high sea caves and vertical gullies have formed within the bedrock preferentially aligned with its bedding. Most of the gullies have eroded through the entire thickness of the bedrock and continued into the overlying terrace soils of the cliff along this reach. Once the gullies are formed, the rain water sheet flow tends to open them wider within the terrace soils.

Beach Makeup: There is a narrow sandy beach covering the shoreline starting up coast and extending down coast along more than half of the reach. A large flat bedrock surface exists in the down coast portion of the reach instead of the sandy beach. Most of the beach and shoreline is made up a natural wave-cut platform, a classical geomorphic feature that indicates ocean wave produced erosion is still strong and ongoing along this entire reach.

Existing Bluff Protection: Bluff protections consist of a 175 foot long concrete seawall with a retaining wall topper, along the down coast portion of the reach. A large cavity has formed in the bedrock toe, approximately 250 feet down coast from this seawall. The cliff has severely retreated into Ocean Blvd, above the cavity.

*Reach 3: Price Street (Shelter Cove Lodge to Shore Cliff Lodge)*

Bluff Top Structures: Existing development consists of the Shore Cliff and Shelter Cove Lodges and Price Street and several engineered pedestrian beach walkways, see

**Figure 5**. Price Street is an asphalt covered public road that parallels the cliff along this reach. This road consists of curbing, wooden guardrails and storm water inlet drains along it edges that collect storm run-off water into a series of a half dozen large diameter collector pipes. The storm water exits via the collector pipes that protrude horizontally from the edges off the top of the bluffs. An abandoned, buried oil pipeline exists at the up coast portion of this reach.

**Figure 5 Price Street**

Bluff Makeup: The terrace soil deposits overlie bedrock of the Obispo tuff along this entire reach. The tuff is highly weathered and decomposed at various exposures within the bedrock along the reach. The bedrock is equally as thick as the overlying soil along the reach. Both the bedding structure and the weathering effects within the bedrock have more influence on the ocean derived erosion process than does the thickness of the bedrock. Throughout the reach, the bedrock contains series of exposed vertical to steeply vertical bedding planes, orientated parallel to the direction of the incoming ocean waves, and highly weathered-decomposed rock zones, which further weakens

the toe of the cliff and makes the bedrock more susceptible to wave attack. Many large 20 foot high sea caves and undercutting has occurred within the bedrock, preferentially aligned with its bedding and decomposed zones. Most of the undercutting has occurred at the bedding planes and has caused the overlying thick bedrock to fall in slabs or layers. The remains of the slabs can be seen as piles of talus and boulders beneath the falls. The profile of the cliff in the reach varies, as the upper cliff has retreated and is inclined within the terrace soils in some portions of the reach and is vertical in other portions. The retreated cliff portions coincide with the weathered-decomposed and bedding planes of the bedrock below. The cliff retreat is more pronounced in two areas along Price Street, which have been reinforced with engineered concrete crib-walls.

Beach Makeup: There is a narrow sandy beach covering the shoreline starting up coast and extending down coast along most of the reach. Some shoreline areas of the reach contain just a rocky flat surface instead of the sandy beach. Most of the beach and shoreline is made up of a natural wave-cut platform, a classical geomorphic feature that indicates ocean wave produced erosion is still strong and ongoing along this entire reach.

Existing Bluff Protection: There is no shoreline protection features along the shoreline of the cliffs of this reach, except for the two crib walls in the terrace soils previously mentioned.

*Reach 4: Cypress Street Bluff*

Bluff Top Structures: Existing development consists of bluff top homes, Cypress Street and a sewer pump station as shown in **Figure 6.** Cypress Street is an asphalt covered public road that parallels the cliff along this reach. This road consists of curbing, wooden guardrails and storm water inlet drains along it edges that collect storm run-off water into a buried collection pipe system. The storm water does not exit through collector pipes at the cliff.

**Figure 6 Cypress Street Bluff**

Bluff Makeup: The cliff is composed entirely of terrace soils and there are no exposures of underlying bedrock. Adjacent logs obtained for pier sheetpile reconstruction (approximately 1000 feet downcoast) indicate no bedrock to a depth of -40 feet.

The base of the seacliff is bound by Pismo Beach. Bluff top erosion at the toe appears mostly dependent on episodic wave attack during severe ocean derived storms. The high tide does not always reach the base of the seacliff.

Beach Makeup: The wide beach provides general shoreline protection, although storm conditions appear cause wave access to the bluff toe.

Existing Bluff Protection: Portions of the bluff are covered with shotcrete near Harloe Avenue. Seasonal sand berms have been placed along the bluff toe.

### *2.3.2* Shoreline Erosion History

Five shoreline sections within the northern end of Pismo Beach and one section within the southern end have been identified as erosional:

a) Memory Park at Baker Ave. (St. Andrews Lift Station);
b) Ocean Boulevard at Vista del Mar Ave. (Vista del Mar Lift Station);
c) Ocean Boulevard at Capistrano Ave;
d) 2 sites along Price Street between Dinosaur Caves and Shelter Cove Lodge; and
e) Cypress St.

The locations of these sites are shown in **Figure 7**. Photographs of the existing conditions are shown in **Figures 8-12**. The first three sites are located within residential neighborhoods. Bluff top development immediately threatened by the seacliff recession is limited in the near term to the road pavement and limited public amenities.

Price Street is presently within about 10 feet of the edge of the nearly vertical 100-foot bluff face. The thoroughfare is a major city arterial surface street that connects the downtown area with Shell Beach and outlying areas. As such the road is a primary transportation corridor. Immediately landward and adjacent to the Price Street right-of-way is U.S. Highway 101. This route is a major interstate connector that provides a vital linkage between northern and southern California.

Historical photographic and survey data has been consulted to estimate the erosion that has occurred at the Price Street site. An aerial view of the area in 1979 is shown in **Figure 13**. Using topographic maps dating back to 1925 and historical aerial photography flown since 1954, indications are that the top of the seacliff has been eroding at an average rate of 6 to 8 inches per year (Earth Systems Consultants, 1992). At this pace, Price Street will be impacted with significant damages sometime within the next decade.

The inherent slope instability associated with the existing near vertical face, the episodic nature of the seacliff erosion process, and the susceptibility of the terrace deposits to sloughing implies that a singular more catastrophic slope failure may be expected at any time. The problem is being exacerbated by groundwater seepage and surface water runoff that appears to be accelerating sloughing of the marine terrace slope. These conditions imply that the erosion damages to Price Street could occur at any time. If no action is taken to remedy the problem, the erosion is expected to ultimately progress to the point where a significant threat to U.S. Highway 101 will develop.

**Figure 7 Location of Erosion Sites**

**Figure 8 Memory Park at Baker Ave (St. Andrews Lift Station)**

**Figure 9 Ocean Blvd (Vista del Mar Lift Station)**

**Figure 10 Ocean Blvd at Capistrano Ave.**

**Figure 11 Price St (northern location)**

**Figure 12 Price St (southern location)**

**Edge of Bluff**

**Figure 13 Aerial Photo of Price Street in 1979**

### *2.3.3* Economic Damages

If the erosion of the bluff continues, it will eventually erode away Price Street and threaten a portion of U.S. Highway 101. The lost of Price Street or U.S. Highway 101 will cause major detours for drivers currently using these routes. Based on information obtained from the City of Pismo Beach, drivers will spend an extra 10 minutes driving the detour that bypasses Price Street. If U.S. Highway 101 is closed due to the bluff erosion, then drivers are expected to spend an extra 35 minutes driving the detour that bypasses U.S. Highway 101. The cost of the detours for Price Street and U.S. Highway 101 is based on the Corps guidance for opportunity cost of time (IWR, 1991). Based on 1990 information, the commuters using Price Street have an opportunity cost of $32,000 per day. The commuters using U.S. Highway 101 have opportunity cost of $537,000 per day. This translates to an annual combined loss of the opportunity cost in excess of 240 million dollars, if both U.S. Highway 101 and Price Street are damaged and closed due to the bluff retreat.

### *2.3.4* Environmental Review

Under the existing without-project condition, erosion of the cliff face will continue. Episodic bluff failure during which a block of bluff falling onto the beach can occur in any particular year, depending on the meteorological and oceanographic conditions within the region. The bluff material would then become a source of beach sand. The bluff-retreat condition would also result in the occasional loss of vegetation, nests, and burrows. In a natural system, however, where retreat is not curtailed by roads or concrete, or aggravated by urban runoff, the cliffs would eventually reach a stable slope (at least temporarily) and the habitat would recover.

## *2.4* Plan Formulation

The goals and objectives guiding this study reflect the concerns expressed by officials of the City of Pismo Beach. They provide direction for the development of alternative plans for shoreline stabilization and erosion protection.

Rerouting Price Street and U.S. Highway 101 and constructing new corridors can be considered as another measure to mitigate the current bluff erosion problem at Price Street. However, the project cost will be extremely high and potential environmental impacts to the to-be-planned alternative corridors may be significant. There is strong interest and support from the City of Pismo Beach to protect the sewage lift stations located at Memory Park and along Ocean Boulevard.

### *2.4.1* Alternative Plans

Federal participation in mitigating any potential bluff erosion is only applicable to the existing problem related to the oceanographic factors (e.g. storm wave induced damage). As a result, the federal involvement presented below evaluates the measures limited to the seacliff or toe areas of the total bluff.

An array of plans may be considered to address the stated objective of protecting the erosive areas as follows:

a) Protect bluff toe from wave erosion;

b) Stabilize the upper slope face;
c) Protect the terrace deposits from groundwater and surface water erosion effects; and
d) Retrofit existing bluff top improvement threatened by the erosion with foundation support structures.

Seacliff erosion has progressed to the point where protection of the bluff toe will not address the threat posed by the over-steepened upper slope. This means that even if no further bluff toe erosion occurs, the instability of the marine terrace deposits above the basement rock will result in more bluff top retreat as the material seeks a flatter and more stable configuration. Consequently toe protection measures alone will not address the problem.

*Price Street, Ocean Blvd, and Memory Park*

Of the possible measures that have been proposed, the Federal participation is focused on stabilizing the toe of the seacliff area. The most effective means of protecting the bluff toe is the placement of angular armor stone at the base of the seacliff. A stone range of 2-ton to 5-ton is proposed for placement, based upon the initial recommendation of the Coastal Engineer.

Seacliff erosion has progressed to the point where protection of the bluff toe will not address the threat posed by the over-steepened upper-slope. This means that even if no further bluff toe erosion occurs, the instability of the marine terrace deposits above the basement rock will result in more bluff top retreat as the material seeks a flatter and more stable configuration.

The City of Pismo Beach has proposed a modified shoreline retreat concept to maintain the integrity of Price Street while allowing a measured amount of seacliff retreat to continue. Their plan consists of limited toe protection to the bluff toe to prevent further loss of base material and construction of an on-grade bridge within the effected retreat zone to provide support for Price Street at a future time when the seacliff recession impacts the existing right-of-way.

Other stabilization techniques for the upper slope may include re-grading to lay back the face to a flatter and more stable configuration, structural measures to restrain the existing slope in-place, or full retreat and abandonment. Excavation of the existing bluff top to lay back the slope will require partial bridging of Price Street over the gap that would be created. Construction of retaining walls is considered to present difficult construction problems at the high bluff face. Therefore, of the possible alternative measures that may be proposed, the City's plan of managed retreat presents a plan that is considered to be the most economical, least disruptive to existing use restrictions, and easiest to construct. Therefore, this alternative was developed further to assess the merits of its implementation. **Figure 14** shows a typical plan and section of the proposed on-grade road bridge alternative.

*Cypress Street Bluff*

Of the possible measures that have been proposed, the Federal participation is focused on stabilizing the toe of the bluff. The most effective means of protecting the bluff toe (and to provide an opportunity for local interests to stabilize the bluff face and bluff top)

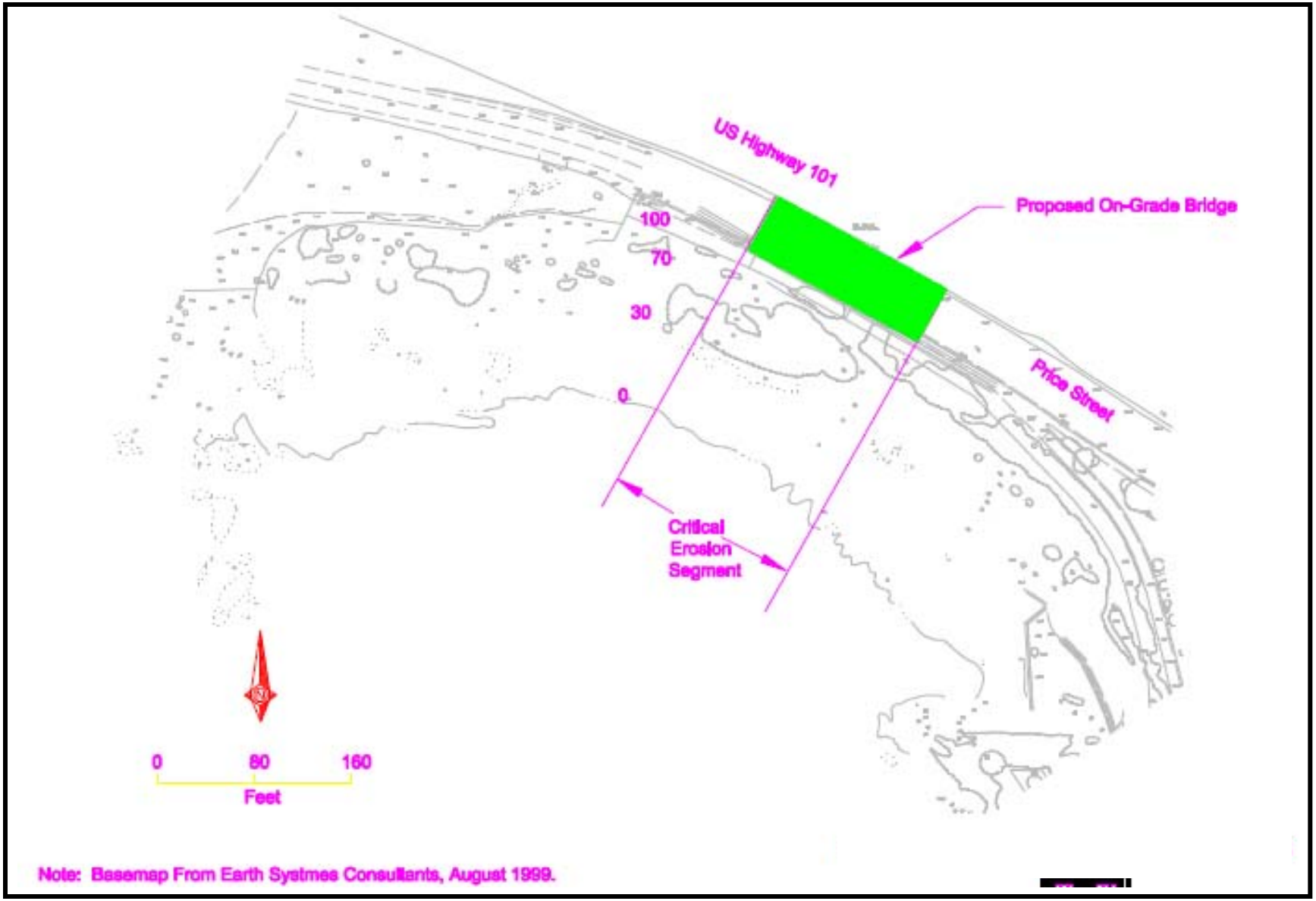


**Figure 14 Proposed Price Street Improvements**

is to place a sheetpile wall at the toe of the remnant bluff. The sheetpile would not be placed by traditional impact methods, which would aggravate any instability in the adjacent bluff slope. A press-in method of pile placement would be effective in the Cypress Street reach.

Press-in sheetpile would be installed to a full height of the bluff, allowing local interests to backfill the wall and replace Cypress Street (as they require). Federal interest would be limited to the sheetpile wall placement as bluff toe protection, only.

### *2.4.2* Plan Evaluation

The proposed plan was evaluated for technical performance in engineering design and construction, and potential environmental impacts and economic benefits resulting from the implementation of the project.

*Engineering Aspect*

The conceptual design details of the proposed on-grade bridge structure are shown in **Figures 15-16**. The structure consists of a cast-in-place concrete box beam bridge section supported by drilled caissons. The improvements may be constructed using conventional equipment and methods. The site would be excavated to the depth of the beam section. Form-work would be greatly simplified since the bridge's foundation may be fully supported on-grade during construction. One lane access through Price Street may also be maintained throughout the project's construction by building the section in one-half increments. A preliminary project cost estimate for the on-grade bridge construction is summarized in **Table 3.**

**Table 3 Project Cost Estimate for Bluff Protection**

Pismo Beach Bluff Protection
San Luis Obispo County, California

| Item No. | Description | Qty | UOM | Unit Cost | Total | Notes |
|---|---|---|---|---|---|---|
| 1 | Mob/Demob of Equipment | 1 | LS | $10,000 | $10,000 | |
| | | | | | | |
| 2 | Ocean Blvd Rock Revetment | 1152 | Ton | $234.00 | $269,568 | 1,2 |
| | | | | | | |
| 3 | Price Street & Hwy 101 Rock Revetment | 2062 | Ton | $185.00 | $381,470 | 1,2 |
| | | | | | | |
| 4 | Seacliff Drive & Memory Park | 1383 | Ton | $204.00 | $282,132 | 1,2 |
| | | | | | | |
| 5 | Cypress Street Sheet Piling (40' H x 600' L) | 24000 | SF | $70.00 | $1,680,000 | |
| | | | | | | |
| **Grand Total** | | | | | **$2,623,170** | |

Note:

1 Unit costs include markups of the following:
(a) Field Office Overhead = 8.00%
(b) Home Office Overhead = 6.00%
(c) Profit = 12%
(d) Bond = 1.13%
(e) Escalation = 5%
(f) Contingency = 15%
(g) SIOH = 7%

2 Unit costs are different because area involves different quanities of stone placement and cavity fillings

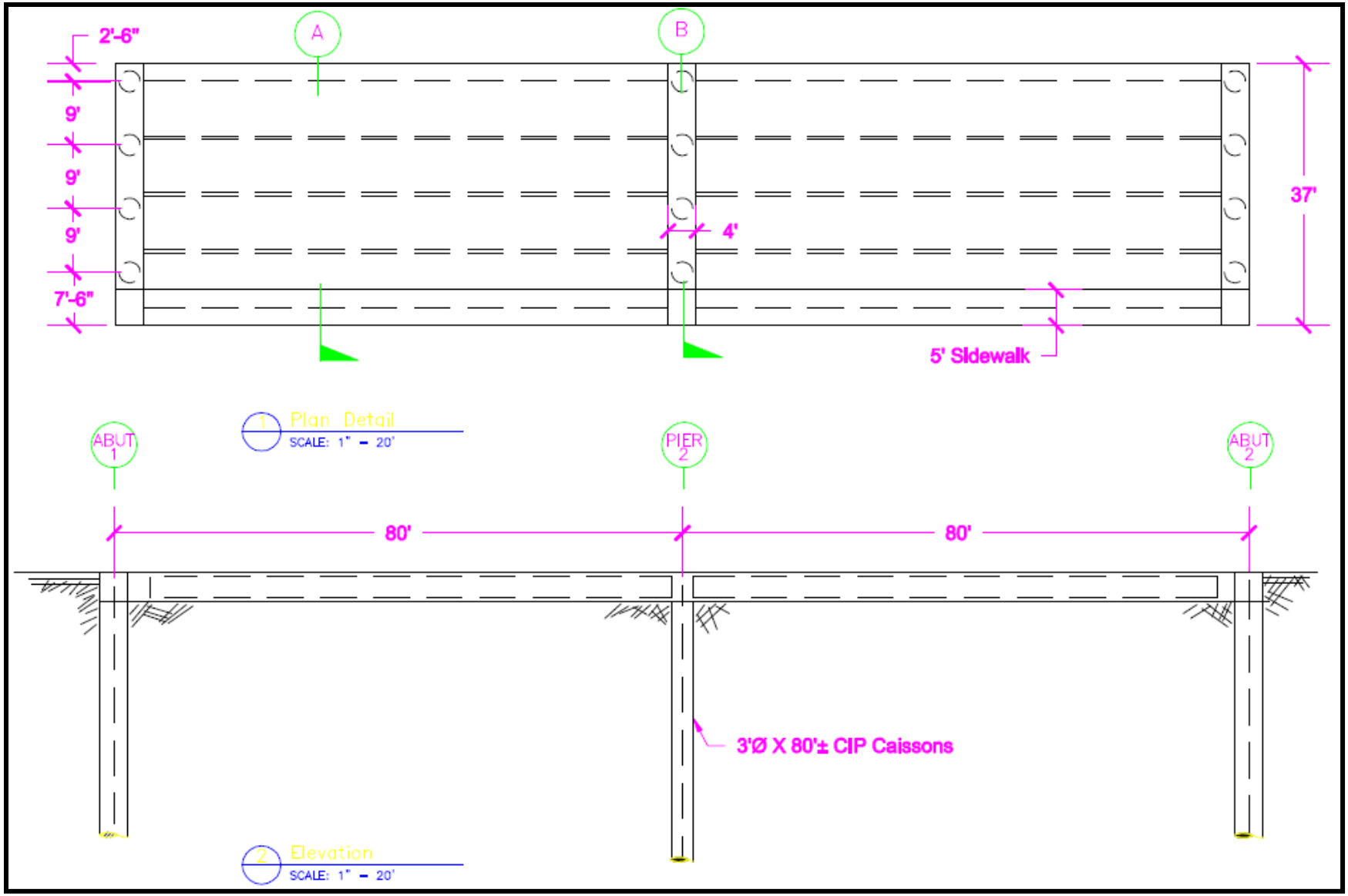


**Figure 15 Plan of Price Street On-Grade Bridge**

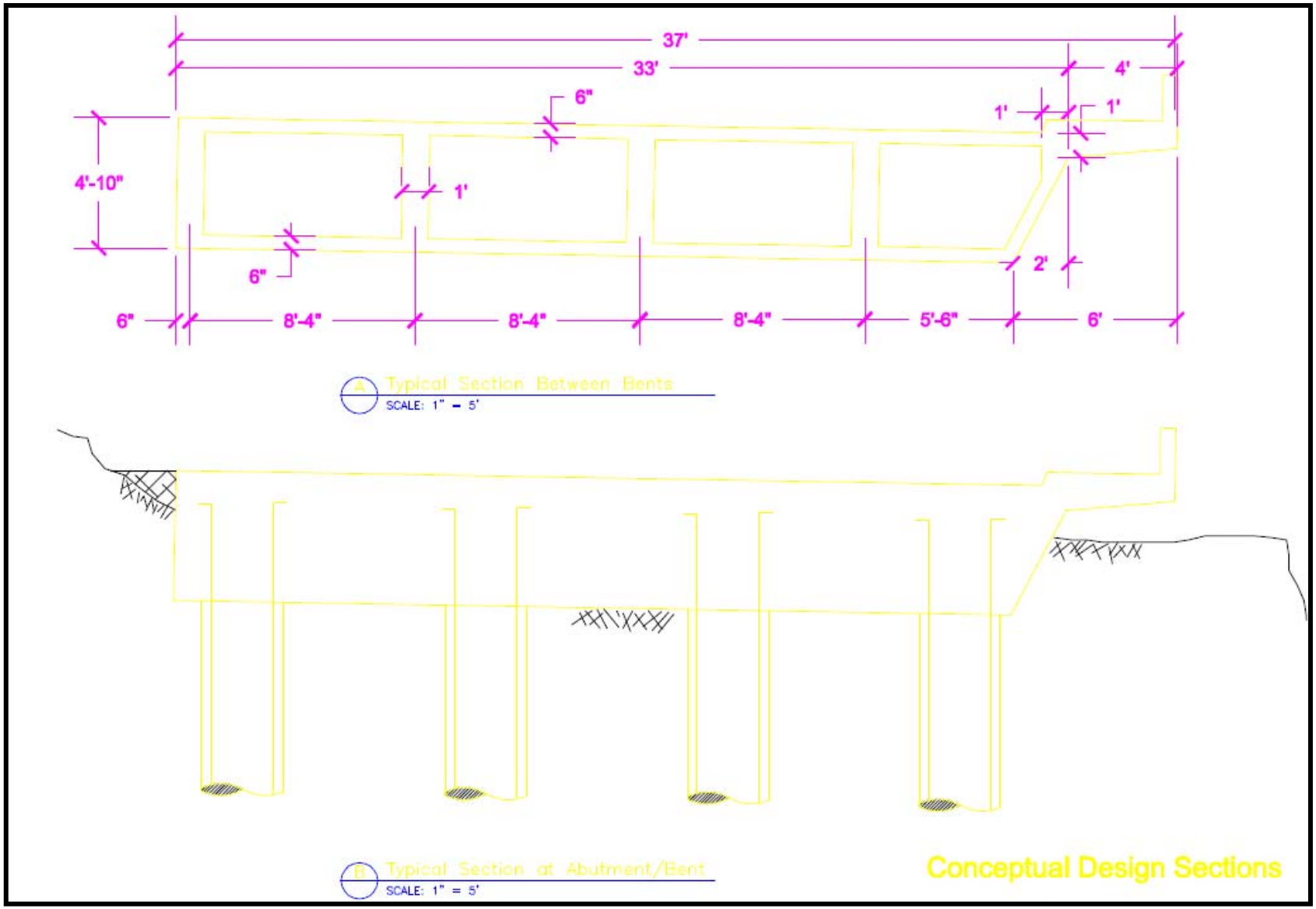


**Figure 16 Conceptual Design Sections**

*Environmental Aspect*

By itself, the currently proposed project, which would extend only 200 feet along one cliff, would probably not have a significant, adverse impact to vegetation or wildlife in the Pismo area. However, considering the probable need for future stabilization in other reaches, and the losses already engendered by previous efforts, the potential for cumulative impacts would be a concern.

The bridge structure and riprap would prevent or significantly reduce the current natural erosion, resulting in less input of material into the littoral system. Impacts of bluff stabilization would include the immediate and complete loss of native vegetation within the construction footprint. Continued erosion of the bluff, back to the bridge structure, would result in the eventual loss of vegetation on the lower slope of the protected reach. Birds, mammals, reptiles, and invertebrates that currently inhabit the area would be displaced. Until the bluff finally erodes to a vertical cliff face, some vegetation and wildlife would persist. Depending on the depth of soil in front of and behind the caissons, some species may continue to burrow or nest in the bluff, even after its final retreat. Habitat values in the immediate area, however, would be significantly diminished. Toe stabilization would have an additional impact by covering a forage base and resting area for shorebirds.

Impacts to recreation and aesthetic resources would also occur. The beach would be further narrowed by toe stabilization, and the concrete and rubble features would detract from the natural outlook.

Compared to other potential stabilization methods such as retaining walls or complete riprap slopes, the proposed plan of managed retreat would result in fewer biological and environmental impacts. From an environmental perspective, however, relocation of Price Street would be a preferred solution.

*Economic Aspect*

After the implementation of the plan measure, the potential road closures to U.S. Highway 101 and Price Street will be eliminated. Therefore, the economic benefits will be equivalent to a gain in the opportunity loss of 240 million dollars per year as compared to the closure of both U.S. Highway 101 and Price Street.

## *2.5* Conclusions and Recommendation

The Pismo Beach Initial Appraisal Study found that there is a potential for significant bluff erosion damage at Price Street located in the City of Pismo Beach. Price Street, the main corridor of the City and U.S. Highway 101, located immediately landward of it, will be threatened. The City has proposed a retreat on-grade bridge to provide support for the street in anticipation of continuous bluff retreat. A plan evaluation for the City's proposed plan was conducted. Consequently, a modified construction plan and its construction cost were presented. It was determined that the proposed bridge is a feasible measure to mitigate the on-going bluff retreat problem.

Federal participation in mitigating any potential bluff erosion is only applicable to the existing problem related to the oceanographic factors (e.g. storm wave induced damage). The bluff along the four different areas of the appraisal report are actively

undergoing erosion derived from ocean waves and sub-aerial erosion processes of surface storm water run-off and wind. Geotechnical protection measures instituted at the base of the bluffs along each of the reaches will stabilize the cliff from long term ocean derived erosion. Therefore, at the present time, a federal involvement in a CAP 103 study to further evaluate the alternative measures to prevent continued bluff retreat is warranted.

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# 3 Work Breakdown Structure

## *3.1* Levels of the Work Breakdown Structure

The work breakdown structure is divided into the following five levels.

**Level 1**. The Project

**Level 2**. The Subprojects are established by the phase that is appropriated by Congress – in this case the feasibility phase of the study. This level includes the major products generated in the study phase: the CAP 103 Study Report, the Project Management Plan and the PED Agreement, which are identified in the first character of the work breakdown structure code.

**Level 3**. The Parent Tasks are generally identified as separate products that go into the final study phase documentation. Examples of these subprojects include such items as the real estate report, the coastal report, etc. These parent tasks are normally identified with the responsibility of a particular functional organization. This level is generally identified in the second and third characters of the work breakdown structure code.

**Level 4**. The Tasks are major separable elements of the subprojects that are keyed to separately identifiable products that are developed for the major special study milestones. These tasks are elements of work resulting in a deliverable product which have a beginning and an end, may be accomplished within one functional organization, can be described at a work order of detail and are the lowest level that will be specifically tracked with respect to cost and schedule. As an example, the cost estimates for the draft special study report would be an example of a task. Tasks can be described as the summation of activities that would be accomplished by a particular functional organizational between two of the milestone events. The milestone tasks and definitions are included in Appendix B. The following durations between milestones are generally used for the establishment of tasks.

1. Between Milestone F1 and F3
2. Between Milestone F3 and F4
3. Between Milestone F4 and F4A
4. Between Milestone F4A and F5
5. Between Milestone F5 and F8
6. Between Milestone F8 and F9

**Level 5**. The Activities are separate elements of work that are managed by the functional managers to whom the tasks are assigned and which may not necessary result in a deliverable work product to another organization. These activities are not tracked separately in terms of cost and schedule but are described in the scopes of work to the extent required to provide a clear understanding of the work required.

In accordance with the levels above, the following work breakdown structure indicates subprojects and parent tasks in bold type, followed by the subordinate tasks.

| WBS# | Description |
|---|---|
| **J0000** | **Detailed Project Report (Feas)** |
| **J0000** | **Milestones** |
| | Initiate Feasibility Phase |
| | DPR Study Pub Wkshp (F2) |
| | DPR Study Conf #1 (F3) |
| | DPR Study Conf #2 (F4) |
| | Public Review of Draft Report |
| | Final Public Meeting |
| | Feasibility Report w\NEPA |
| | Filing of Final EIS |
| | ROD Signed |
| **JA000** | **Engineering Appendix** |
| **JAB00** | **DPR - Hydrology and Hydraulics Studies/Report (Coastal)** |
| | H&H - Without Project Conditions & Preliminary Plans |
| | H&H - With Project Conditions for Final Plans |
| | H&H - Draft Report |
| | H&H - Final Report |
| **JAC00** | **DPR - Geotechnical Studies/Report** |
| | Geotech - Without Project Conditions & Preliminary Plans |
| | Geotech - With Project Conditions for Final Plans |
| | Geotech - Draft Report |
| | Geotech - Final Report |
| **JB000** | **DPR - Socioeconomic Studies** |
| | Socioecon - Without Project Conditions & Preliminary Plans |
| | Socioecon - With Project Conditions for Final Plans |
| | Socioecon - Draft Report |
| | Socioecon - Final Report |
| **JC000** | **DPR - Real Estate Analysis/Report** |
| | Real Estate - Without Project Conditions & Preliminary Plans |
| | Real Estate - With Project Conditions for Final Plans |
| | Real Estate - Draft Report |
| | Real Estate - Final Report |
| **JD000** | **Feas - Environmental Studies/Report (Except USF&WL)** |
| | Environ - Without Project Conditions & Preliminary Plans |
| | Environ - With Project Conditions for Final Plans |
| | Environ - AFB documentation |
| | Environ - Draft Report/EIS |

| | |
|---|---|
| | Environ - Final Report/EIS |
| **JE000** | **Feas - Fish and Wildlife Coordination Act Report** |
| | USFWS - Planning Aid Letter |
| | USFWS - Draft Coordination Act Report |
| | USFWS - Final Coordination Act Report |
| **JF000** | **Feas - HTRW Studies/Report** |
| | HTRW - Without Project Conditions & Preliminary Plans |
| | HTRW - With Project Conditions for Final Plans |
| | HTRW - AFB documentation |
| | HTRW - Draft Report/EIS |
| | HTRW - Final Report/EIS |
| **JG000** | **Feas - Cultural Resources Studies/Report** |
| | Cultural - Without Project Conditions & Preliminary Plans |
| | Cultural - With Project Conditions for Final Plans |
| | Cultural - AFB documentation |
| | Cultural - Draft Report |
| | Cultural - Final Report |
| **JH000** | **Feas - Cost Estimates** |
| | Cost Estimates - Without Project Conditions & Preliminary Plans |
| | Cost Estimates - With Project Conditions for Final Plans |
| | Cost Estimates - AFB documentation |
| | Cost Estimates - Draft Report |
| | Cost Estimates - Final Report |
| **JI000** | **Feas - Public Involvement Documents** |
| | Initial Public Meeting\NEPA Scoping |
| | Public Workshops in Support of Plan Selection |
| | Public Involvement Support to AFB |
| | Final Public Meeting |
| | Public Involvement Support to FRC |
| **JJ000** | **Feas - Plan Formulation and Evaluation** |
| | Plan Formulation of Preliminary Plans |
| | Plan Formulation for Final Plans |
| | Plan Formulation - AFB documentation |
| | Plan Formulation - Draft Report |
| | Plan Formulation - Final Report |
| | Plan Formulation - Support to Division Commander's Notice |
| **JL000** | **Feas - Final Report Documentation** |
| | Reproduction and Distribution of F3 Documentation |
| | Reproduction and Distribution of F4 Documentation |

| | |
|---|---|
| | Reproduction and Distribution of AFB Documentation |
| | Reproduction and Distribution of Draft Report |
| | Reproduction and Distribution of Final Report |
| **JLD00** | **Feas - Technical Review Documents** |
| | Agency Technical Review - F3 Documentation |
| | Agency Technical Review - F4 Documentation |
| | Agency Technical Review - AFB Documentation |
| | Agency Technical Review - Draft Report |
| | Agency Technical Review - Final Report |
| **JM000** | **Feas - Washington Level Report Approval (Review Support)** |
| **JP000** | **Feas - Management Documents** |
| **JPA00** | **Project Management and Budget Documents** |
| | Programs and Project Management to F3 Milestone |
| | Programs and Project Management to F4 Milestone |
| | Programs and Project Management - AFB documentation |
| | Programs and Project Management - Draft Report |
| | Programs and Project Management - Final Report |
| | Programs and Project Management - DE's Notice |
| **JPB00** | **Supervision and Administration** |
| | S&A - Planning Division |
| | S&A - Engineering Division |
| | S&A - Real Estate Division |
| | S&A - PPMD |
| | S&A - Contracting Division |
| **JPC00** | **Contingencies** |
| **L0000** | **Project Management Plan (PMP)** |
| | PMP - Draft PMP |
| **LA000** | **PMP - Final PMP** |
| **Q0000** | **PED Cost Sharing Agreement** |

# 4 Scopes of Work

## *4.1* Detailed Scopes of Work

For each task that is included in the work breakdown structure, a scope of work is developed that describes the work that is to be performed. For each task, the scope describes the work, including specific activities, to be accomplished in narrative form. The scopes of work have been developed by the study team, which includes representatives of the non-Federal sponsor. The scopes also reflect the policy exceptions and streamlining initiatives that have been approved in the Initial Appraisal Report Analysis.

## *4.2* Duration of Tasks

The durations for the tasks are used to develop the schedule that is included in Chapter 6. The durations are based on negotiations between the Project Manager and the chiefs of the responsible organization, as identified in Chapter 5.

## *4.3* Costs of Tasks

The scopes of work for the tasks are grouped by the parent tasks that they support. The total estimates for the parent tasks are then combined in the Cost Estimate, Chapter 7. The cost estimates for the tasks are also based on negotiations between the Project Manager and the chiefs of the responsible organizations.

## *4.4* Task Descriptions

The following sections provide a discussion of the work tasks.

### *4.4.1* Coastal Engineering and Design Analysis

The purpose of the coastal engineering studies is to define the coastal processes and oceanographic design conditions in the study area. This analysis is used to project the potential for economic loss; prepare preliminary designs of engineering alternatives; provide the technical evaluation of formulated plans; and account for risk and uncertainty in engineering calculations. The work will include preliminary design and cost estimates of the alternative plans and the evaluation of these alternatives. The need for field studies has not been identified, but will be recommended upon the collection and review of available data.

The work includes design and cost estimates for shoreline stabilization and protection measures, and the estimate of the physical effects caused by alternate protection features for use in the economic evaluation and environmental impact analysis. Available data will be collected on hydrographic and topographic surveys, these data will be evaluated, and if adequate, used to develop base maps and to determine the existing conditions of the coastline. Also, a detailed analysis of the wave climate and prevailing coastal processes will be performed.

An engineering analysis will be conducted to obtain the "best estimate" of the National Economic Development (NED) plan. Also, a risk and uncertainty analysis will be performed to develop a statistical description about the answers. This analysis will

consist of evaluation of coastal storm characteristics and frequency and shoreline and structure response to storm events.

The wave climate will be developed utilizing commercial wave hindcast data and modeling wave transformation to specific project sites with numerical wave propagation models available from ERDC. Water and tide levels will utilize published NOAA tidal information and future sea level rise projections published in NRC, IPCC and EPA publications.

Preliminary construction procedures, construction sequencing, operation and maintenance analysis will be developed. Construction hauling routes, access and staging areas will be identified. Preconstruction engineering and design and construction schedules will be prepared.

Work will include preparation of materials, including text and plates, for inclusion in the appendix summarizing the coastal processes and design studies, assisting in plan formulation, in-house report review, response to comments, and preparation of work and cost estimates for the Project Management Plan. Activities for the design work consist of the following:

*Task Initiation and Research*

- Site Visit
- Collection and purchase of existing data.
- Review existing data
- Coordination and study team meeting attendance

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $25,000 | $25,000 | $0 |

*Mapping*

- Collect and assess adequacy of hydrographic and topographic surveys
- Analyze survey data to prepare 3-D CADD base map compatible with GIS systems.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $17,500 | $17,500 | $0 |

*Baseline Coastal Processes*

- Review existing maps and studies
- Review of historic shoreline and bluff comparisons and document estimates of bluff retreat rates.
- Determine wave climate
    - Compile wave statistics for normal and extreme conditions from available CDIP.

- Purchase and review GROW hindcast for near shore region.
- Model local wave refraction-diffraction with STWAVE or WABED model developed by ERDC to define design wave climate at each project site.
- Perform extreme wave analysis at each project site.

❖ Perform water level studies that include tide, ENSO, wind and wave setup

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $45,000 | $45,000 | $0 |

*Preliminary Design*

❖ Site investigations
❖ Preliminary designs
- Design of alternatives
- Determine quantities
- Draft preliminary designs
- Coordinate cost estimate

❖ Evaluate preliminary design
- Effects on shoreline
- Effectiveness under storm conditions

❖ Preliminary design review changes
- Revise design of alternatives
- Determine quantities
- Draft designs
- Coordinate cost estimate

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $52,500 | $52,500 | $0 |

*Recommended Plan Detail Design*

❖ Site investigation/field check
- Draft conceptual design plates
- Determine construction quantities
- Coordinate cost estimate
- Prepare construction schedule

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $16,000 | $16,000 | $0 |

*Risk and Uncertainty Analysis*

- Coastal storm characteristics and frequency
  - return frequency of significant wave heights and periods
  - tides
  - surge (ENSO, wind and wave setup)
  - duration
  - occurrences per year
- Shoreline and structure response to storm events
  - maximum wave run-up and inundation levels
  - performance of existing protective works (reliability analysis)

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $20,000 | $20,000 | $0 |

*Constructability Analysis*

- Develop preliminary procedures and sequencing
- Identify hauling routes, access and staging areas

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $6,500 | $6,500 | $0 |

*Operations and Maintenance (O&M) Analysis*

- Identify O&M requirements
- Coordinate O&M cost estimate

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $3,000 | $3,000 | $0 |

*Report Preparation and Processing/Review*

- Prepare coastal processes appendix
- Prepare design appendix and plates
- Coordination with Project Delivery Team
- Respond to review comments
- Review feasibility report/appendix

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $43,500 | $43,500 | $0 |

*PMP Input*

- Prepare scope
- Prepare cost estimate

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $5,500 | $5,500 | $0 |

*Technical Supervision*

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $21,000 | $21,000 | $0 |

### *4.4.2* Geotechnical

The Geotechnical analysis of the study will be comprised of a geology investigation analysis and soils design and material analysis. A draft report will be written with the findings of the reviews and recommendations.

*Geology and Investigations Section*

The Geology and Investigations Section will be responsible for the mapping of sea cave and bluff dimensions to determine more accurate stone quantities and find sources of nearby stone. This section will also determine and prioritize soils and rock areas of erosion based on geology and existing conditions.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $19,000 | $19,000 | $0 |

*Soils Design and Materials Section*

The Soils Design and Materials Section will be responsible for the review of all available foundation condition reports. The review will include analysis of logs and laboratory results of the soils sampled from existing borings and a review of geological mapping of the bluffs. The Soils Design and Materials Section will then provide presumptive design values for each of the six erosion control alternatives which include some combination of sheetpile, seawall, and rock toe protection.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $12,000 | $12,000 | $0 |

*Preparation of Draft Geotechnical Appendix*

Completion of this geotechnical analysis for this study requires gathering any further data from the sponsor, including the sponsor's engineering contractors, team members, and experts. This will also include gathering any additional information from CalTrans, as applicable. Not included in this study will be additional alternative-specific geotechnical field investigation or laboratory testing. Any alternative specific investigation will be conducted during the preparation of plans and specifications. Products produced for this study will be the geotechnical appendix for the draft and final study reports.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $12,000 | $12,000 | $0 |

*Internal Technical Review*

This task involves coordination and response to comments provided by the Internal Technical Review team in regards to asset management questions.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $3,000 | $3,000 | $0 |

*Final Geotechnical Appendix*

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $4,000 | $4,000 | $0 |

### *4.4.3* Economics

The general approach taken by the economic analysis will be accordance with current principles and guidelines and standard economic practices, as outlined in the Planning Guidance Notebook-ER 1105-2-100, as well as in Institute for Water Resources (IWR) Report 91-R-6, *National Economic Development Procedures Manual, Coastal Storm Damage and Erosion*.

Per the findings of the 2008 Initial Appraisal Report, the economic analysis will evaluate damages and benefits at up to six locations within the city of Pismo Beach. Given the limited scale of this study, only a limited risk analysis will be included in the evaluation of economic impacts. Also, given that there will be no model developed to forecast the future erosion rate; the economic analysis will rely on historical rates as a predictor of future erosion rates.

*Initial Data Collection*

In order to estimate the potential damages from coastal storms and erosion, detailed data on the structures, property, and facilities will need to be collected. Data will be needed for all assets expected to be exposed to damage as a result of bluff erosion. If available, scalable drawings with locations/elevations, dimensions, structural details and construction costs for the existing structures and public utilities should be obtained. This task includes collecting data on the following:

- Structure and land values of properties that are exposed to coastal storm damage;
- Repair, replacement, and/or relocation cost associated with damage to public roads and utilities;
- Traffic counts for the potentially affected highway(s) and road(s);
- Potential detour routes and traffic time delays due to detours required as a result of damage to roads;
- Data on the cost of previous maintenance and emergency repair work done by the City or others; and
- A description of the likely future actions taken by non-federal entities in the absence of a federal project.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $12,000 | $12,000 | $0 |

*Estimate the Without and With-Project Damage from Erosion*

The analysis will identify the expected damages at various increments of bluff recession, which will then be used in conjunction with the assumptions regarding the future rate of erosion/recession to estimate the without and with-project damages.

- Develop site specific damage-erosion relationships for the structures, property, and facilities at the study locations that are expected to prevail in the absence of a federal project. This relationship will describe at each location the expected dollar value of damage caused by storm induced beach/bluff recessions.
- Relevant damage categories may include:
  - Transportation Delay Costs
  - Maintenance of Existing Structures and Properties
  - Loss of Land
  - Property Damage (including structures, roads, and relocation of utilities)
  - Emergency Costs
  - Recreation Loss

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $5,500 | $5,500 | $0 |

*Develop R&U Damage Model & Compute Without Project Damages*

Without project economic damages will be computed using a life-cycle simulation approach over a 50-year period of analysis, employing the prevailing federal interest rate. Such methodology is necessary when evaluating coastal projects with study areas susceptible to long and short term erosion, so future damages can be projected and discounted to present values. Given the limited scope of and resources available for the study, the evaluation will include only a limited application of risk and uncertainty analysis. Key parameters for the analysis will be represented in the model as probability distributions, rather than deterministic values. The distribution functions are likely to be based primarily on existing data and engineering and economic professional judgment (rather than detailed statistical analysis or other more rigorous approaches). Potential R&U parameters for the analysis include annual erosion rates, damage/cost values and function percentages, land, structure and content values, and recreation values.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $11,000 | $11,000 | $0 |

*Conduct Benefit/Cost Analysis for Each Alternative and Identify the NED Alternative*

The difference between the without-project and the with-project damages is the benefits assigned to each of the project alternatives. All benefits will be expressed in annualized terms based on the project life-cycle, and the prevailing federal interest rate will be applied. The R&U model described above for without-project conditions will be adjusted as necessary to derive projected benefits. These benefits (reduction in expected damages) will then be compared to the cost of each alternative to calculate both the benefit to cost ratio as well as the total net benefits of each alternative. The alternative with the greatest net benefits will be identified as the National Economic Development (NED) alternative.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $6,600 | $6,600 | $0 |

*Prepare Draft Economics Appendix, Respond to Comments, and attend Meetings*

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $9,900 | $9,900 | $0 |

*Prepare Final Economics Appendix and attend Meetings*

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $15,000 | $15,000 | $0 |

### *4.4.4* Asset Management (Real Estate)

*Coordination*

Includes, but is not limited to CESPL-RE participation in team meetings, negotiation of work requirements, and coordination with other offices on project data needed for Real Estate's major study products and monitoring of progress and findings associated with Real Estate study products.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $1,500 | $1,500 | $0 |

*Preliminary Market Study*

Identify and determine land ownerships. For each project purpose and feature, a description of all required real estate and type of estate needed for the project.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $5,500 | $5,500 | $0 |

*Estimate of Real Estate Cost*

This work includes a Real Estate Value Estimate for all real estate costs associated with the acquisition of the project's real property requirements.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $6,500 | $6,500 | $0 |

*Preparation of Draft Report*

Preparation of draft Real Estate Plan that supports Project Plan Formulation. Must be prepared in support of decision documents, and include a discussion of the significant topics as per Chapter 405-1-12.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $11,000 | $11,000 | $0 |

*Internal Technical Review (including review by legal staff)*

This task involves coordination and response to comments provided by the Internal Technical Review team in regards to asset management questions.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $3,000 | $3,000 | $0 |

*Final Draft Report and Issue Resolution*

Add corrections, additional comments and/or changes to final draft of the Real Estate Plan.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $2,500 | $2,500 | $0 |

### *4.4.5* Environmental Studies/Report

The environmental studies conducted within this parent task will include a database search, regulatory agency coordination, and limited field reconnaissance to document existing conditions and analyze potential adverse and beneficial environmental impacts for 3 alternatives covering 6 sites. The work described in this section will be performed in accordance with U.S. Army Corps of Engineers guidelines as contained in ER 1105-2-100 and requirements for compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The Environmental Resources Branch (ERB) will be responsible for production of an Environmental Assessment (EA) or Environmental Impact Statement/Environmental Impact Report (EIS/EIR), ensure that it meets all Corps, NEPA, and any other applicable requirements, and is technically sound. The ERB is also the main point of contact for coordination of the CEQA with the Sponsor's planning department. The Environmental representative will attend team and sponsor meetings, visit the project site, and provide any support to team members as needed. This task assumes that there are no significant impacts to environmental resources that cannot be mitigated to less than significant levels. Therefore, it is assumed that a draft and final EA will be prepared and not a draft and final EIS/EIR. If evaluation of alternatives results in significant impacts that cannot be mitigated to less than significant levels, a draft and final EIS/EIR will need to be prepared, and is not reflected in the estimate.

*Initial Field Visit/ Team Coordination*

The Environmental representative will attend team and sponsor meetings, visit the project site, and provide any support to team members as needed.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $7,500 | $7,500 | $0 |

*Initial Public and Agency Coordination*

An initial coordination meeting will be held early in the feasibility schedule to serve to introduce the study to interested parties. This coordination allows the Corps and the non-Federal sponsor to discuss the study process and scoping issues and to allow for input from the general public and agencies concerning problems, needs and opportunities. The following may be required:

- Public meeting facility (50+persons)
- Professional facilitator
- Audio/visual equipment
- Meeting announcement/advertising
- Presentation materials/handouts
- Record of meeting/follow-up mailing to interested parties
- Professional court recorder
- Preparation of hearing transcripts.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $9,500 | $4,500 | $5,000 |

*Development of Baseline Without Project Conditions*

This task will be conducted to determine the without-project environmental baseline conditions existing within the project area. Areas of interest include background and storm related turbidity levels, benthic and infaunal biological communities, the area locations of existing kelp beds, and biological environment at bluff sites.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $66,000 | $66,000 | $0 |

*Environmental Impact Analysis (Alternatives Analysis)*

This work will include an analysis of potential environmental impacts under with- and without- project condition alternatives including the construction, operation, and maintenance phases. These impact studies will include, but would not be limited to coastal processes, biological resources, water quality, air quality, construction related noise levels, aesthetics, recreation, and cultural resources. Although not anticipated, mitigation features for fish and wildlife and other affected resources will be formulated and a monitoring plan developed to record the success of mitigation. The results of the environmental studies parent task will be discussed with the Federal and Non-Federal team members to evaluate the findings and to provide a working dialog to streamline the results presented in the draft EA report.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $69,000 | $69,000 | $0 |

*Draft and Final Environmental Assessment (EA)*

This task will entail the first submission of the EA. As stated above, it is assumed that there are no significant impacts to environmental resources that cannot be mitigated to less than significant levels. This document will evaluate the environmental effects of the alternative plans, including the “no action” alternative.

A Section 404(b)(1) evaluation will be accomplished by the Corps and coordinated with the appropriate Federal agencies to ensure that adequate consideration has been given to wetlands and waters of the U.S. A Coastal Consistency Determination (CCD) will be prepared to evaluate project consistency with the Coastal Zone Management Act and the California Coastal Act. This document will be submitted to the California Coastal Commission for their approval during public review of the draft EA.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $40,500 | $40,500 | $0 |

*Response to Comments*

The ERB will review and prepare responses to comments received during the Agency Technical Review (ATR) and policy review periods. Revisions to the EA will be made. The draft EA will be circulated to allow the State and Federal agencies as well as interested organizations and individuals the opportunity to provide comments. Comments received on the draft EA or EIS/EIR will be addressed, and revisions will be made to the EA in accordance with Federal and State law allowing for the preparation of the final report.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $21,000 | $21,000 | $0 |

*Fish and Wildlife Coordination Act Report (CAR)*

This task includes involvement by the U.S. Fish and Wildlife Service (USFWS) in support of the environmental studies required by the Fish and Wildlife Coordination Act. The principal USFWS products are a final Planning Aid Report (PAR) and a Coordination Act Report (CAR). This report will present USFWS, in coordination with the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG), opinions on the impacts of the alternatives on fish and wildlife resources. The amount, quality, and scale of data, as well as the data analysis included in the Service's Scope of Work (SOW) will be consistent with the complexity of decisions for which the data will be used, limitations in funding, time, and the significance of the fish and wildlife resources involved. In addition, the USFWS may recommend types and amounts of measures for habitat losses and, where possible, suggest potential opportunities for ecological restorations. The Corps will coordinate with USFWS and supervise the interagency contract as part of its environmental impact studies task.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $15,000 | $15,000 | $0 |

*Resource Agency Coordination and Endangered Species*

The ERB will coordinate with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) under the Fish and Wildlife Coordination Act and/or the Endangered Species Act. The ERB will also coordinate with the California Department of Fish and Game (CDFG), California Coastal Commission (CCC), Regional Water Quality Control Board, and other pertinent state and local agencies to acquire the necessary permits/approvals for construction.

Although no state or federally-listed threatened or endangered species or associated habitats are currently known to occur in the project area, a site assessment and

coordination with the USFWS, NMFS, and CDFG will need to be conducted to determine if any state or federally-listed species have the potential to occur in the area of potential impacts. If listed species are determined to have the potential to occur in the area, a biological assessment will be prepared to evaluate potential effects to listed species. Avoidance and minimization measures will be developed as appropriate. If listed species may be affected by the project, formal consultation may be necessary. Formal consultation with the USFWS or the NMFS, development of a CESA permit application, and formal coordination with the California Department of Fish and Game related to state-listed species issues are not included in this task estimate.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $42,500 | $37,500 | $5,000 |

*Hazardous Toxic Radioactive Waste (HTRW) Studies/Report*

This parent task will be conducted if problems with HTRW or contaminated sediments are identified in the geotechnical investigations. If HTRW concerns are identified, a response analysis will be initiated to identify and evaluate the proper mitigation alternatives to implement. The first alternative will be avoidance of the problem area. Activities to address the problem could include sampling and analysis to identify contaminates, concentration levels, delineation of site contamination, and assessment of potential threats to human health and environmental habitats, and estimates of cleanup or disposal costs. The Environmental Planner will inspect the project site, conduct interviews, and review all pertinent environmental documents for HTRW. A Phase 1 evaluation will need to be conducted if geotechnical investigations are not completed. This parent task is currently not included in the estimate.

*Cultural Resources*

Cultural resources studies will be conducted in accordance with the requirements of Section 106 of the National Historic Preservation Act (36 CFR 800) and NEPA. A records and literature search will be conducted through the California Historical Information System at the Central Coast Information Center located at the University of California, Santa Barbara. The Native American Heritage Commission (NAHC) will be consulted to determine if there are known sacred sites to Native American groups. Individual letters requesting comment will also be sent to each Native American contact provided by the NAHC. A subsequent cultural resources field survey will be conducted by Corps of Engineers Archeology staff, or by the use of Corps' Contractors. These above studies will provide an inventory of potentially significant resources present within the area of potential effects for each alternative. The results will be described in a technical report.

All inventories require an evaluation as to their eligibility for the National Register of Historic Places. If that evaluation cannot be made based on field survey alone, and if additional funding is provided, test excavations and more detailed studies would be

conducted to complete the evaluation. Initial coordination with the California State Historic Preservation Officer would occur to obtain comments on our identification efforts. If any significant resources are identified which cannot be avoided by construction of a proposed project, additional consultations with the SHPO and the Native American Tribes would occur towards a Memorandum of Agreement. As cultural resources location information is considered confidential, any technical report prepared would not be included as a technical appendix to the NEPA/CEQA document. However, a summary of the pertinent information will be provided as a summary in these documents. All effects to cultural resources will be evaluated and fully described in the NEPA/CEQA document.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $45,000 | $35,000 | $10,000 |

### *4.4.6* Regulatory Division

Regulatory Division will assist in the preparation and review of a delineation of waters of the US (including special aquatic sites), compensatory mitigation plan development, and the 404(b)(1) alternatives analysis.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $5,000 | $5,000 | $0 |

### *4.4.7* Cost Engineering

The Specifications & Cost Engineering Section will prepare cost estimates per Engineer Regulation (ER) 1110-2-1302 and Engineer Instructions (EI) 01D010 for each set of construction alternatives considered. The cost estimates will include comments on the method of construction, assumptions, and design data. The cost estimates will be prepared using the Micro-Computer Aided Cost Engineering System (MCACES) after sufficient engineering and design have been performed to refine the project. This cost estimate reflects the "base-line" cost estimate. This estimate will be escalated to the proposed "mid-point" of construction.

Requirements to Complete Task: Quantity calculations, project design(s), location of disposal sites.

Products: MCACES estimates only (final cost estimate and specifications will be prepared during Preconstruction Engineering and Design (PED)).

*Without Project Conditions and Preliminary Plans*

- Meetings, conferences and coordination

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $2,300 | $2,300 | $0 |

*Cost Estimates (With Project Conditions for Final Plans)*

- Research and gather information
- Site Visit
- Quantities Evaluation
- MCACES Estimates
- Meetings, conferences and coordination

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $34,600 | $34,600 | $0 |

*Cost Estimate for Selected Alternative*

- Refine cost estimates
- Research and gather information
- Quantities Evaluation
- Meetings, conferences and coordination
- Draft Cost Engineering Appendix
- Construction Schedule

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $17,600 | $17,600 | $0 |

*Final Draft Cost Engineering Appendix*

- Final Draft Cost Engineering Appendix/Documentation
- Address Review Comments

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $14,000 | $14,000 | $0 |

### *4.4.8* Plan Formulation

The Plan Formulation Branch, through the Lead Planner, will coordinate the activities of all of the technical sections and is responsible for producing the DPR. We will develop a list of tasks, costs, and schedule for the project. Planning objectives and constraints and plan formulation rationale and criteria will be developed. We will also coordinate and facilitate meetings within the team, with the Sponsor, and for the public. The Corps study team members will meet with the Sponsor for study progress meetings.

The Detailed Project Report (DPR) will evaluate the Locally Preferred and National Economic Development (NED) plans for implementation based on the analysis in the Engineering Appendix, EIR/S, Economics Appendix and Real Estate Appendix. The Lead Planner will identify the NED Plan and corresponding level of protection. The report will identify and evaluate the locally preferred plan, if different from the NED plan, and a higher level of protection plan if it is determine that there is an overriding reason to recommend one which offers a greater level of protection. Plan formulation also includes reviewing and refining the plans selected for study during the feasibility phase and other plans developed during the course of study, and developing required plans such as the “no action” plan and various non-structural plans. The costs and benefits associated with each plan will be determined, and tradeoffs required to select the recommended plan for implementation will be identified. Plan formulation includes application of engineering, economic, environmental, and other criteria to the specific problems, needs, and constraints of the study area to develop and analyze various methods, measures, and plans and their contributions to, and effectiveness in addressing the specific problems. It is an iterative and constant review process that requires team participation and constant review, reformulation, and public support. Critical to the process of plan formulation will be the development of the without-project conditions as a basis for comparison and evaluation of alternatives, and the recommendation of any key project features and/or related mitigation requirements.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $90,000 | $80,000 | $10,000 |

### *4.4.9* Final Report and Documentation

The Corps will compile data from the study team members and write a draft DPR, which will include an EIR/S. A final report will be prepared once the team members have addressed draft report comments. The Corps will be responsible for printing the draft and final reports.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $15,000 | $15,000 | $0 |

### *4.4.10* Agency Technical Review (ATR)

The ATR team will review all work on the project with the goal of producing quality planning, engineering, environmental and real estate products. Members of the study team and the technical review team will agree upon the appropriate points in the project where ATR is needed and what products need to be reviewed. The technical review team will then review these products and produce written commentaries addressing technical concerns and specific actions needed to resolve these concerns. The study team will provide responses to address the technical concerns of the review team. The technical review team will work closely with the study team to add value to the project and minimize rework, but at the same time must remain sufficiently uninvolved so that impartiality and perspective are not lost. This review process will be integrated throughout the project.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $30,000 | $25,000 | $5,000 |

### *4.4.11* Program and Project Management Division

The Program Management section will prepare budget documents, project justifications, and perform financial tracking and record keeping as well as coordinate on a non-technical level with the Sponsor on project activities and issues. The section will assist in preparation of the PMP and the FCSA. The project manager will attend project team meetings and Sponsor meetings as required and coordinate with the project planner in resolving issues concerning the project within the District as needed. The program analyst will assist the PM in preparing budget documents and fact sheets.

The project manager will be responsible for directing, overseeing, and ensuring that the study is on schedule and within budget by performing the following: 1) Manage overall project execution, including funds, data, commitments, schedule, cost, and quality. 2) Develop and manage all work using a PMP, scope of services, PROMIS, and CEFMS. 3) Ensure Quality Control (QC) plans are developed and incorporated into the PMP. 4) Provide project schedule, cost status, and issues to the PRB, with corrective action plans for potential slippage or cost over-runs. 5) Lead the study/project team. 6) Be responsible/accountable for assigned product(s) through coordination of the team efforts.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $60,000 | $60,000 | $0 |

### *4.4.12* Contingencies

Appropriate contingencies and contingency management are included to adequately deal with the uncertainty in the tasks of the study. Experience has shown that approximately 10 percent of the study costs should be reserved for contingencies and this amount has been added to the cost estimate.

### *4.4.13* Project Management Plan (PMP) for Plans and Specs

The purpose of the PMP is to define in a signed agreement the responsibilities of the Federal Government and the City of Pismo Beach for design, construction, operation and maintenance of the project. The Project Manager and Lead Planner are responsible for preparing, coordinating, negotiating, and executing the PMP. The draft PMP is formally developed in conjunction with the City of Pismo Beach during the feasibility phase of the project, which follows the reconnaissance phase. Planning Branch and Engineering Branch will review the PMP and assist the PM as needed during negotiations with the Sponsor.

The PMP will be developed based on the recommended plan and will include features that address the objective of shoreline protection along Pismo Beach.

The City of Pismo Beach will provide written assurance that it has the capability to follow, and will follow, the necessary procedures to comply with Sections 210 and 305 of Public Law 91-646, the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970", prior to the execution of the Project Cooperation Agreement (PCA). Adherence to the requirements of Public Law 91-646, as amended by Public Law 100-17, throughout the acquisition process is essential for a Federally funded project.

| TOTAL COST | CASH (FED AND NON-FED) | IN-KIND (NON-FED) |
|---|---|---|
| $20,000 | $15,000 | $5,000 |

# 5 Responsibility Assignments

## *5.1* Organizational Breakdown Structure

The scopes of work represent agreements between the Project Manager and first line supervisors of functional organizations. The functions of these organizations in support of the project are defined by the work that is assigned. All organizations responsible for tasks, including the City of Pismo Beach and other agencies, are included with their organization codes in the following Organizational Breakdown Structure (OBS).

| **Los Angeles District** | **Org Code** |
|---|---|
| Planning/Coastal Studies Group | CESPL-PD-WS |
| Planning/Economics & Social Analysis Group | CESPL-PD-E |
| Planning/Ecosystem Planning Section | CESPL-PD-RN |
| Engineering/Coastal Engineering Section | CESPL-ED-DC |
| Engineering/Geology & Investigations Section | CESPL-ED-GG |
| Engineering/Soils Design & Materials Section | CESPL-ED-GD |
| Engineering/Survey & Mapping Section | CESPL-ED-GS |
| Engineering/Cost Engineering Unit | CESPL-ED-CE |
| Real Estate/Acquisitions Section | CESPL-RE-A |
| Regulatory Division | CESPL-CO-R |
| PPMD/Civil Projects Branch | CESPL-PM-C |
| **Non-Federal Sponsor** | **Org Code** |
| City of Pismo Beach | CPB |
| **Other Agencies/Other Corps** | **Org Code** |
| US Fish and Wildlife Service | USFWS |

## *5.2* Responsibility Assignment Matrix

The scopes for each task are grouped by the parent task that they support and the primary responsible organization for each parent task is identified by the organization codes in the following Responsibility Assignment Matrix (RAM).

| Responsibility Assignment Matrix | | | | |
|---|---|---|---|---|
| **WBS#** | **Task Description** | **District Org** | **Non-Fed** | **Other** |
| JAB00 | DPR – Hydrology and Hydraulics (Coastal) | ED-DC | CPB | |
| JAC00 | DPR – Geotechnical Studies/Report | EGED-GG/GD | CPB | |
| JAE00 | DPR – Engineering and Design Anal/Report | ED | CPB | |
| JB000 | DPR – Socioeconomic Studies | PD-E | CPB | |
| JC000 | DPR – Real Estate Analysis/Report | RE | CPB | |
| JD000 | DPR – Environmental Studies/Report | PD-R | CPB | |
| JE000 | DPR – USFWS Coordination Act Report | --- | --- | USFWS |
| JF000 | DPR – HTRW Studies/Report | PD-R | CPB | |
| JG000 | DPR – Cultural Resources Studies/Report | PD-R | CPB | |
| JH000 | DPR – Cost Estimates | ED-CE | CPB | |
| JI000 | DPR – Public Involvement Documents | PD-WS | CPB | |
| JJ000 | DPR – Plan Formulation & Evaluation | PD-WS | CPB | |
| JL000 | DPR – Final Report Documentation | PD | CPB | |
| JLD00 | DPR – Technical Review Documents | All | CPB | |
| | DPR – Regulatory Coordination | CO-R | CPB | |
| JPA00 | Project Management & Budget Documents | PM-C | CPB | |
| JPB00 | Supervision and Administration | All | CPB | |
| JPC00 | Contingencies | All | CPB | |
| L0000 | Project Management Plan | All | CPB | |

# 6 Special Study Schedule

## *6.1* Schedule Development

The schedule was prepared based on the tasks and Work Breakdown Structure listed in Chapters 3 and 4. All tasks were coordinated with the study team members and approved by their respective supervisors.

## *6.2* Funding Constraints

Funding for the first Fiscal Year of the CAP 103 study is normally limited because of the uncertainty in the initiation of the study phase. This constraint has been reflected in the development of the study schedule. Following the first year, an optimum schedule based upon unconstrained funding has been assumed for subsequent Fiscal Years.

## *6.3* Non-Federal Sponsor Commitments

Milestones become commitments when the project manager meets with the Non-Federal Sponsor, the City of Pismo Beach, at the beginning of each Fiscal Year and identifies tasks that are important for the Los Angeles District to complete during the Fiscal Year. These commitments will be flagged in the PROMIS database and monitored and reported on accordingly.

## *6.4* Uncertainties in the Schedule

The initial appraisal study contains limited evaluation. As the study proceeds, the intended tasks and activities will be evaluated and refocused if necessary. A contingency has been included to account for small unintended, additional tasks and activities necessary to complete an acceptable Detailed Project Report. Changes to tasks and activities or adding other ones may require the schedule and cost to be readdressed.

## *6.5* Milestone Schedule

The schedule for the Pismo Beach Shoreline CAP 103 Study milestones in the CESPD Milestone System is as follows:

| Task | Start Date | End Date |
|---|---|---|
| **Draft EIS/DPR** | **9/30/08** | **3/28/09** |
| Draft Plan Formulation | 9/30/08 | 3/28/09 |
| Draft Coastal Engineering | 9/30/08 | 3/28/09 |
| Draft Real Estate | 1/8/08 | 3/28/09 |
| Draft Geotechnical Studies | 9/30/08 | 3/28/09 |
| Draft Economic Analysis | 9/30/08 | 3/28/09 |
| Draft Environmental Studies | 9/30/08 | 3/28/09 |
| Draft Cost Engineering MCACES | 11/29/08 | 3/28/09 |
| **QC of Draft DPR** | **3/29/08** | **4/7/09** |
| **SPD Review of Draft DPR/EIS** | **4/8/09** | **5/7/09** |
| **Draft DPR/EIS Public Review -** | **5/8/09** | **7/6/09** |
| **Concurrent CD review / determination** | **5/8/09** | **9/4/09** |
| **Prepare Final DPR / Final EIS/R** | **7/7/09** | **9/9/09** |
| Final Plan Formulation | 7/7/09 | 9/9/09 |
| Final Coastal Engineering | 7/7/09 | 9/9/09 |
| Final Real Estate | 7/7/09 | 9/9/09 |
| Final Geotechnical Studies | 7/7/09 | 9/9/09 |
| Final Economic Analysis | 7/7/09 | 9/9/09 |
| Final Environmental Studies | 7/7/09 | 9/9/09 |
| Final Cost Engineering (MCACES) | 7/7/09 | 9/9/09 |
| **SPD Review of Final DPR/Final EIS** | **9/10/09** | **10/9/09** |
| **State and Agency Final Review** | **10/10/09** | **11/8/09** |
| **Approved Final DPR/EIS** | **11/9/09** | **12/8/09** |
| **ROD - approved and signed for distribution** | **12/9/09** | **12/9/09** |
| **Draft Financial Assessment of Non-Fed Sponsor** | **11/9/09** | **11/24/09** |
| **Draft PCA** | **11/9/09** | **12/8/09** |

# 7 Special Study Cost Estimate

## *7.1* Basis for the Cost Estimate

The cost estimate is based on the costs that were identified for the individual tasks developed by the study team members and negotiated with the sponsor. Study cost estimates include allowances for inflation, product cost increases, and other incidental increases in cost pressure. Significant inflation or increases in product costs could require the schedule and cost to be renegotiated.

Contingency is included to adequately respond to uncertainty in the study tasks and activities. A relatively small amount of contingency has been planned as part of this study. Significant increases in cost will require cost and schedule renegotiations.

Cost for Agency Technical Review (ATR) is separated by its own Work Breakdown Structure (WBS) Number. Seamless review and informal reviews for each task is included in the respective WBS estimate.

Supervision and administration costs are included in each WBS estimate.

Inflation and cost changes are assumed to be incidental. If either is significant this PMP will be revised and the associated costs negotiated.

## *7.2* Costs for Federal and Non-Federal Activities

The Sponsor and the Government will each contribute 50 percent of the study cost. The Sponsor's share can be in-kind work and/or cash. The cost estimate shows the Federal and Sponsor Cash and In-Kind credit by major Work Breakdown Structure Number described in Chapter 3. The costs are shown in the table below.

| WBS# | Description | In-Kind Services | Fed and Sponsor Cash | Total Cost |
|---|---|---|---|---|
| JAB00 | Feas – Hydrology and Hydraulics Studies/Report (Coastal) | $0 | $234,500 | $234,500 |
| JAC00 | Feas – Geotechnical Studies/Report | $0 | $50,000 | $50,000 |
| JB000 | Feas – Socioeconomic Studies | $0 | $60,000 | $60,000 |
| JC000 | Feas – Real Estate Analysis/Report | $0 | $30,000 | $30,000 |
| JD000 | Feas – Environmental Studies/Report (except USFWS) | $10,000 | $246,000 | $256,000 |
| JE000 | Feas – Fish and Wildlife Coordination Act Report/ Planning Aid Report | $0 | $15,000 | $15,000 |
| JF000 | Feas – HTRW Studies/Report | $0 | $0 | $0 |
| JG000 | Feas – Cultural Resources Studies/Report | $10,000 | $35,000 | $45,000 |
| JH000 | Feas – Cost Estimates | $0 | $68,500 | $68,500 |
| JI000 | Feas – Public Involvement Documents | $10,000 | $4,500 | $14,500 |
| JJ000 | Feas – Plan Formulation and Evaluation | $10,000 | $80,000 | $90,000 |
| JL000 | Feas – Final Report Documentation | $0 | $15,000 | $15,000 |
| JLD00 | Feas – Technical Review Documents | $5,000 | $25,000 | $30,000 |
| | Feas – Regulatory Coor. | $0 | $5,000 | $5,000 |
| JPA00 | Project Management and Budget Documents | $0 | $60,000 | $60,000 |
| JPB00 | Supervision and Administration | $0 | $25,000 | $25,000 |
| JPC00 | Contingencies | $4,500 | $95,350 | $99,850 |
| L0000 | Project Management Plan (PMP) [Plans and Specs] | $5,000 | $15,000 | $20,000 |
| **Total** | | **$54,500** | **$1,063,850** | **$1,118,350** |

# 8 Quality Management Plan

## *8.1* Quality Control Plan Objective

The quality control objective is to achieve feasibility phase documents and services that meet or exceed customer requirements, and are consistent with Corps policies and regulations. This Quality Control Plan (QCP) provides an overall plan for producing quality planning, engineering, and real estate products for the Shoreline Protection of Pismo Beach, CA CAP 103 Study. The QCP has been specifically streamlined to meet the goals of the project and the CESPD Quality Management Plan (QMP) while minimizing the time and cost of the technical review process. The objective of this review process is the successful completion and delivery of quality products within budget and on time. The QCP is intended to provide a mechanism to appropriately evaluate technical products and processes to ensure that they comply with the associated laws, regulations, and sound technical practices of each technical discipline.

## *8.2* Guidelines Followed for Technical Review

The guidelines for independent technical review are set forth in the CESPD Quality Management Plan, CESPD R 1110-1-8.

## *8.3* Roster of the Project Study Team

| Function | Name | Org Code |
|---|---|---|
| City Manager, Pismo Beach | Kevin Rice | |
| Project Management | Susie Ming | PM |
| Plan Formulation | Heather Schlosser | PD-WS |
| | Marriah Abellera | PD-WS |
| Environmental | Tiffany Kayama | PD-RN |
| | Stephen Dibble | PD-RN |
| Economics | Mike Hallisy | PD-E |
| | Mark Bierman | San Francisco District |
| Geology | Jeff Devine | ED-GG |
| Soils | Chris Sands | ED-GD |

| Function | Name | Org Code |
|---|---|---|
| Coastal Engineering | Art Shak | ED-DC |
| Real Estate | Lisa Sandoval | RE-A |
| Regulatory | Matthew Vandersande | CO-R |
| Cost Engineering | Phil Eng | ED-CE |

## *8.4* Roster of the Technical Review Team

| Organization/Function | Name/Title | Experience | Phone |
|---|---|---|---|
| Plan Formulation | TBD | TBD | TBD |
| Environmental | TBD | TBD | TBD |
| Economics | TBD | TBD | TBD |
| Geotechnical | TBD | TBD | TBD |
| Coastal Engineering | TBD | TBD | TBD |
| Real Estate | TBD | TBD | TBD |
| Cost Engineering | TBD | TBD | TBD |

## *8.5* Documents to be Reviewed

All of the products of the tasks listed in the detailed scopes of work in Chapter 4 will be subject to agency technical review (ATR). Seamless, single discipline review will be accomplished prior to the release of materials to other members of the study team, and will be integrated into the overall study. Section chiefs shall be responsible for accuracy of the computations through design checks and other internal procedures, prior to the ATR.

ATR of products will occur prior to major decision points in the planning process so that the technical results can be relied upon in setting the course for future studies. These products will include as a minimum the draft and final reports. These products shall be essentially complete before review is undertaken. For products developed under

contract, the contractor will be responsible for QC via an independent technical review. QA of the contractor's work will be the responsibility of the District.

## *8.6* Deviations from the Approved Quality Management Plan

No deviations from the QCP are proposed.

## *8.7* Cost Estimate for Quality Management

The cost for conducting ATR is shown in Chapter 7. Supervision and Administration costs as well as seamless review costs related to Quality Management is included in each individual estimate grouped by Work Breakdown Structure described in Chapter 3 and also shown in Chapter 7. These costs are assumed to be about 1% of the main product task cost. The cost for independent technical review is approximately $30,000, which is less than 1% of the study cost estimate.

## *8.8* PMP Quality Certification

The Chief, Planning Division has certified that 1) the independent technical review process for this PMP has been completed, 2) all issues have been addressed, 3) the shoreline protection initiatives proposed in this PMP will result in a technically adequate product and 4) appropriate quality control plan requirements have been adequately incorporated into this PMP. The signed certificate is included as Appendix C.

## *8.9* DPR (Detailed Project Report) Certification

The documentation of the ATR shall be included with the submission of the reports to the South Pacific Division. Documentation of the ATR shall be accompanied by a certification, indicating that the ATR process has been completed and that all technical issues have been resolved. The certification requirement applies to all documentation that will be forwarded to the Division for review or approval. The Chief, Planning Division will certify conference documentation and the draft DPR. The District Commander will certify the final DPR, which includes the signed recommendations of the District.

# 9 Identification of Procedures and Criteria

## *9.1* Evolution of the PMP

The PMP describes all activities from the initial tasks of the feasibility phase through the preparation of the final DPR, the project management plan for project implementation and design agreement. It concludes with the District's support during the review process. As the PMP is based primarily on existing information, it will be subject to scope changes as the technical picture unfolds.

## *9.2* The Planning Process

The Water Resource Council's Principles and Guidelines (P&G) is the basic planning guidance, which establishes a six-step planning process. This process is a conceptual planning sequence for developing solutions to water resource problems and opportunities. The Planning Manual and Planning Primer, both published by IWR provide excellent coverage of the planning process. The South Pacific Division also provides training in the six- step process. This six-step process will be followed during this study.

## *9.3* Policy

The policies that govern the development of projects are contained in the DIGEST OF WATER REOURCES POLICIES AND AUTHORITIES, EP 1165-2-1.

## *9.4* CORPS Regulations

All of the Corps' current regulations are included on the HQUSACE homepage. The most important of these regulations is ER 1105-2-100, PLANNING GUIDANCE NOTEBOOK. Policy compliance review is addressed in EC 1165-2-203, TECHNICAL AND POLICY COMPLIANCE REVIEW. And, quality control is covered in the CESPD Quality Management Plan, CESPD R 1110-1-8. The review of the products will be accomplished with the review checklist that is provided in EC 1165-2-203 as Appendix B, POLICY COMPLIANCE REIVEW CONSIDERATIONS.

# 10 Public Involvement and Coordination

## *10.1* CESPD Milestones

Two of the milestones in the CESPD milestone system have been established specifically for the purpose of providing a public forum to receive public input. The first of these is the initial public workshop. This workshop is an opportunity to present the study to the public, obtain input and public opinions, and fulfill the NEPA scoping meeting requirements. The second milestone in the system is the final public meeting. This meeting is after the release of the draft report for public review and is an opportunity to present the findings of the draft report to the public and receive public comment. See Appendix B.

## *10.2* Study Specific Public Involvement Activities

The Corps will conduct public meetings at appropriate points in the schedule to ascertain public opinion on the project. A meeting will occur in the beginning stage of the project to inform the public about the project. Another meeting will occur after the draft EIS has been distributed. These meetings may be used to meet the CESPD milestone requirements. Other public meetings will be scheduled as necessary based upon public reaction to the project. The Sponsor will invite the public and provide a meeting location. The Corps will prepare meeting materials and coordinate agency attendance.

# APPENDIX A – LIST OF ACRONYMS

| | |
|---|---|
| AE | Architect – Engineer firm |
| ATR | Agency Technical Review |
| CAP | Continuing Authorities Program |
| CCC | California Coastal Commission |
| CDFG | California Department of Fish and Game |
| CEFMS | Corps of Engineers Financial Management System |
| CEQA | California Environmental Quality Act |
| CESPD | US Army Corps of Engineers, South Pacific Division |
| DPR | Detailed Project Report |
| EC | Engineer Circular |
| EIR/S | Environmental Impact Report/Statement |
| EP | Engineer Pamphlet |
| ER | Engineer Regulation |
| FCSA | Feasibility Cost Sharing Agreement |
| HQUSACE | Headquarters, U.S. Army Corps of Engineers |
| H.R. | House Resolution |
| HTRW | Hazardous, Toxic and Radioactive Waste |
| IWR | US Army Corps of Engineers, Institute for Water Resources |
| MCACES | Micro-Computer Aided Cost Engineering System |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| P&G | Water Resources Council's Principles and Guidelines |
| PCA | Project Cooperation Agreement |
| PED | Preconstruction Engineering and Design |
| PMP | Project Management Plan |
| PRB | Project Review Board |
| PROMIS | PROject Management Information System |
| QA | Quality Assurance |
| QC | Quality Control, also synonymous with the agency technical review team |
| QCP | Quality Control Plan |
| QMP | Quality Management Plan |
| TBD | To Be Determined |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| WBS | Work Breakdown Structure |
| WRDA | Water Resources Development Act |

# APPENDIX B – CESPD MILESTONE SYSTEM

for DPR (Detailed Project Report)

| MIL[1] | MILESTONE NAME | DESCRIPTION |
|---|---|---|
| 100 | Initiate Feasibility Phase | SPD Milestone F1[2] - This is the date the district receives Federal DPR study funds. |
| 101 | DPR Study Pub Wkshp (F2) | SPD Milestone F2 – This is a Public Meeting/Workshop to inform the public and obtain input, public opinions and fulfill scoping requirements for NEPA purposes. |
| 102 | DPR Study Conf #1 (F3) | SPD Milestone F3 – The Feasibility Scoping Meeting is with HQUSACE to address potential changes in the PMP. It will establish without project conditions and screen preliminary plans. |
| 103 | DPR Study Conf #2 (F4) | SPD Milestone F4 – The Alternative Review Conference will evaluate the final plans, reach a consensus that the evaluations are adequate to select a plan and prepare AFB issues. |
| 145 | Public Review of Draft DPR | SPD Milestone F5 - Initiation of field level coordination of the draft report with concurrent submittal to HQUSACE through SPD for policy compliance review. |
| 162 | Final Public Meeting | SPD Milestone F6 - Date of the final public meeting. |
| 165 | Final DPR w\NEPA | SPD Milestone F8 - Date of submittal of final report package to CESPD, including technical and legal certifications, compliance memorandum and other required documentation. |
| 310 | Filing of Final EIR/S | Date that the notice appears in the Federal Register. Letters for filing would be furnished by HQUSACE. |
| 320 | ROD Signed or FONSI Signed | Date that the ROD is signed by the ASA(CW) when forwarded for authorization. |

[1] MIL – Milestone number used in the PROMIS database.
[2] F1 through F9 are the historical designations for the SPD Milestones.

# APPENDIX C – QUALITY CONTROL CERITIFICATION

## COMPLETION OF QUALITY CONTROL ACTIVITIES

The District has completed the Project management plan for the Pismo Beach Shoreline Protection, Section 103 CAP Study. All quality control activities defined in the District's quality control plan for reconnaissance phase products have been completed. Compliance with clearly established policy principles and procedures, utilizing justified and valid assumptions, has been verified, including whether the PMP meets the Sponsor's needs and is consistent with law and existing Corps policy. All issues and concerns resulting from the independent technical review of the PMP have been resolved.

## CERTIFICATION

Certification is hereby given that 1) the independent technical review process for this PMP has been completed, 2) all issues have been addressed, 3) the streamlining initiatives proposed in this PMP will result in a technically adequate product, and 4) appropriate quality control plan requirements have been adequately incorporated into this PMP. In summary, the study may proceed into the feasibility phase in accordance with this PMP.

9/2/08

Date

Josephine R. Axt, Ph.D.
Chief, Planning Division