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COASTAL DEVELOPMENT PERMIT APPLICATION

Application number.....**3-09-020, Limekiln Beach Rock Slope Protection Project**

Applicant.....California Department of Transportation (Caltrans)

Project location .....Within Limekiln State Park, at the toe of slope and along the north end of Limekiln Beach, seaward side of Limekiln Creek Bridge, State Highway Route 1 (P.M. 21.1), in the Big Sur Coast Area of Monterey County.

Project description.....Modify existing rock slope protection including through installing new flexible ring-net gabion baskets adjacent to existing seawall/cribwall to protect Highway 1 and the Limekiln Creek Bridge. Project includes approximately 1,214 cubic yards of rock "fill" for the gabions and voids, including rock to be salvaged from prior armoring projects that have failed. The maximum dimensions of modified revetment affected will be 29 feet high, 41.5 feet wide, and 90 feet long.

File documents.....Coastal Commission coastal development permit (CDP) application file 3-09-020; State Parks Right of Entry Permit (executed August 31, 2009); Consolidated CDP Processing Request from Monterey County (letter dated February 2, 2009); Design Approval from Monterey County (summarized by letter of August 14, 2009); CDP file 3-87-130 (Caltrans) for cribwall and rock slope protection; Geotechnical Design Report, John D. Duffy, Caltrans Sr. Engineering Geologist (November 19, 2007); Monterey County Local Coastal Program (LCP); Big Sur Coast Highway Management Plan (2004).

Staff recommendation ...**Approval with Conditions**

A.Staff Recommendation

1. Staff Note: Consolidated CDP

This project includes work along the shoreline, above and below the mean high tide line of the sea at the north end of Limekiln Beach. Project plans show that the Mean High Water mark is (currently) at 4.77 feet above mean sea level. Construction equipment will need to straddle this contour for sand excavation to expose bedrock, to retrieve armor rock from the failed prior revetment, to place rock in and around

the new ring net gabion system, and to make related modifications. Thus, some aspects of the project fall within the Commission's original coastal permit jurisdiction, and the adjacent slope falls within the area of Limekiln State Park where the coastal permit authority has been delegated to Monterey County.

To avoid having two obtain two different coastal development permits (CDPs) for a single project, Coastal Act Section 30601.3 provides for consolidated coastal permit processing by the Commission in such cases. Consent is required from Caltrans, the County, and the Coastal Commission's Executive Director. In this case, all parties have agreed that a consolidated permit process would be appropriate, including because opportunities for public participation will not be substantially impaired.

2. Summary of Staff Recommendation

The proposed project will protect the existing Limekiln Creek Bridge, an essential State Highway structure that is vulnerable to ocean wave attack, and the Highway itself at the same location. Limekiln Creek Bridge, a vital link for the Big Sur Coast Highway (State Highway Route 1), soars high over the beach within Limekiln State Park.

The toe of the slope northward of the mouth of Limekiln Creek is already armored by an existing seawall/cribwall structure with rock slope protection (RSP), fronting the beach over a distance of about 328 feet. The northern part of the existing RSP has failed and scattered onto the beach. The function of the new proposed RSP system is to modify the existing rip-rap at the seawall/cribwall interface at the toe of the slope in order to support and protect the northern bridge abutment and Highway 1. These armoring structures are all necessary to maintain the integrity of the bridge and Highway, but are battered by continuing wave attack that has already dislocated the armoring of 8-ton rock, thrown boulders against the cribwall, and demolished conventional gabion baskets placed here under previous permits. Armoring rock from earlier protection efforts is now spread widely over the public beach area. By 2005, a portion of the beach had to be closed to public use due to the hazard of continued erosion and unstable rock.

The proposed project will correct these problems through installation of a novel ring-net basket gabion design. The proposed 40 feet by 90-foot long gabion arrangement, along with supplementary rock armor, will occupy an area approximating the previously-approved, partially-destroyed armoring efforts. This innovation will allow near-vertical stacking of armor rock, minimize the development's footprint on the beach, contain smaller armoring rock that would otherwise tend to be dislodged by high-energy waves, and allow for dismantling when no longer needed in the future. To the extent feasible, Caltrans proposes to fill the new ring nets with retrieved rock from the beach.

The proposed project is best understood as a temporary fix to ensure protection of the Highway and the bridge in the interim while Caltrans pursues a longer term solution for this section of the highway system. For the long run, Caltrans is undertaking a project development process that may be able to avoid or minimize shoreline armor through reconstruction of the northern bridge supports, highway realignment and/or replacement of the bridge. In the meanwhile, the goal is to maintain slope stability

for approximately 10 years, in order to protect the bridge until a long-term solution can be implemented. This represents an appropriate interim measure to maintain the continuity of public access on Highway 1. Therefore, staff recommends that the Commission **approve** the proposed RSP project, as conditioned.

Recommended Special Conditions include submittal of a specific construction plan and other measures that will assure protection of coastal resources. Examples of required measures include: 1) use of appropriate construction best management practices; 2) temporary fencing to separate construction activities from Limekiln Creek and the beach access corridor; 3) retrieval of armoring rock now scattered on the beach; 4) compliance with a State Parks agreement that will provide for in-kind public access and recreational improvements, to mitigate for the project's impacts to sand supply and beach recreational access; 5) aesthetic treatment of existing concrete surfaces and imported rock materials in view of the beach, to match the appearance of the surrounding bluffs; 6) monitoring and maintenance of the as-built project, 7) measures to improve the appearance of the existing slope above the armoring through drainage and vegetation enhancement; and; 8) removal of all armoring present at this location (including rock, metal and concrete) within 10 years of permit issuance (or upon implementation of a long range solution, whichever occurs first).

Accordingly, the project, as conditioned, can be found consistent with the Coastal Act. The motion to act on this recommendation is directly below.

3. Staff Recommendation on CDP Application

Staff recommends that the Commission, after public hearing, **approve** the proposed project subject to the standard and special conditions below.

> **Motion:** I move that the Commission approve coastal development permit number 3-09-020 pursuant to the staff recommendation.
>
> **Staff Recommendation of Approval:** Staff recommends a **YES** vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.
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> **Resolution to Approve the Permit:** The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

Report Contents

B. Findings and Declarations

The Commission finds and declares as follows:

1. Project Location, Background, and Description

A. Project Location

The proposed project site is located at the base of a steep slope that buttresses the northerly abutment for the existing, 578-foot long Limekiln Creek Bridge as well as Highway 1 itself. This bridge, a vital link for the Big Sur Coast Highway (State Highway Route 1), soars high over the beach within Limekiln State Park.

The shoreline northward of the mouth of Limekiln Creek is already armored by some existing failed and failing rock slope protection that fronts a seawall/cribwall and some concrete splash apron structures. This armoring system has been battered by continuing wave attack that has already demolished conventional gabion baskets placed here under previous permits. Armoring rock from earlier protection efforts is now spread widely over the public beach area.

See Exhibit A for project location maps and Exhibit C for photographs of the project site.

B. Background and CDP History

Before there was roadway of any kind along the Big Sur Coast, all land travel was by the old Coast Trail. All large and heavy items went by sea. As along the Mendocino Coast, a number of "doghole ports" were established, including Rockland Landing at the mouth of what became known as Limekiln Creek. These ports were served by the Pacific Steamship Company, headquartered at Moss Landing.

The project vicinity was the site of a brief but intense spate of industrial activity. Limestone deposits at the base of Cone Peak were quarried and processed in large steel kilns, deep in their namesake canyon approximately a half mile inland from the beach. Sidehills were stripped of tree cover to fuel the kilns. The bluff at the south edge of the beach was developed with a derrick and other improvements to ship finished cement. But, the enterprise proved to be uneconomical, and was soon abandoned.

Later, in the 1930s, in a feat of engineering that is still impressive for its shear audacity, the Carmel-San Simeon (now Big Sur Coast) Highway was punched through this previously roadless area. One of many major obstacles to be overcome was the deep canyon at the mouth of Limekiln Creek. At first the canyon was spanned by a structure of huge wooden beams milled from local redwoods. In 1957, this was replaced by the existing, modern-style bridge. By 1958, 4-ton size rock armor was present at the current project site. By the 1970's, the present-day concrete cribwall/attenuation wall structure had been added, along with additional rock armor.

By the 1980's, it became evident that continuing shoreline erosion would undermine these structures and the earthen slope above the beach. The northern abutment for the bridge is imbedded in this slope, so failure of the slope would threaten the integrity of the bridge. Loss of the bridge would mean that the highway would have to be closed. There would be no alternative for through public access along the Big Sur Coast Highway.

Accordingly, in 1987 Caltrans proposed to protect the toe of the slope with additional cribwall, rock slope protection, gabions and drainage structures, including above-ground metal culverts to preserve the adjacent slope above. These were approved and installed pursuant to CDP 3-87-130. Later, pursuant to County-issued coastal permits in 1995 and 1996, major revetment repair work and a seismic retrofit of the bridge were performed (3-MCO-95-009 and 3-MCO-96-137). This included extremely large rock armor in the 8-ton to 12-ton range. Even this rock was dislodged, and was gone by 1998.

Concurrent efforts to protect the Big Sur Coast in these two decades included certification of the Monterey County LCP, including the Big Sur Coast Land Use Plan (LUP); public acquisition of the old

commercial campground at the mouth of the canyon, now protected as Limekiln State Park; establishment of the Monterey Bay National Marine Sanctuary, including the waters adjoining the Big Sur Coast; and, designation of the Big Sur Coast Highway as a National Scenic Byway, now managed in accordance with the Coast Highway Management Plan (CHMP).

The CHMP was developed under the leadership of Caltrans during 2001-2004, with the participation of Coastal Commission, County Planning, State Parks, and Marine Sanctuary staffs (among others). It serves as an interagency coordination and strategy plan for maintaining Route 1's function as a key recreational and public access corridor, while protecting adjacent resource qualities including those found within Limekiln State Park and the National Marine Sanctuary. Any future highway projects at Limekiln must take into account this multi-layered context.

C. Project Description

The project will modify the partially failed rock revetment that is part of the armoring system that protects the north abutment of Limekiln Creek Bridge on State Highway Route 1. The revetment shields an existing concrete seawall-cribwall structure, which in turn stabilizes the slope upon which the bridge abutment rests. A concrete splash apron extends a short distance up the slope from the cribwall, to minimize water getting behind the cribwall from surface runoff and overtopping storm waves.

The goal of the proposed project is to protect the bridge supports until highway realignment or other long-term solution can be implemented.

The central feature of the proposed rock slope protection project is the installation of a stacked array of ring-net gabion baskets along the seaward face of the existing seawall-cribwall, to create a "flexible" revetment structure typically about 20 feet in height. Maximum dimensions of the revetment will be 29 feet high, 41.5 feet wide, and 90 feet long.

The gabions will be anchored in place with cable ties. Any remaining gaps between the gabions and the top of the cribwall will be filled with armor rock. Installation of the novel design will require approximately 1,214 cubic yards of rock "fill" altogether, including an estimated 200-300 cubic yards of rock to be salvaged from the beach (dislodged from earlier revetments). Temporary construction impacts will affect approximately 0.33 acres for staging area-site access, and for regrading of an existing construction access road.

The project will also include:

- establishment of a construction staging area on the inland side of the bridge, in the seaward extremity of the currently-unoccupied campground (corresponding to campsites 1-12);

- temporary security/habitat protection fencing/parallel to the construction access route under the bridge, to prevent accidental incursions into Limekiln Creek, and to separate the construction area at the north end of the beach from the retained public use area south of the stream;

- retrieval of all fugitive armoring rock lost from previously-placed rock revetments and gabions, except for that which is so deeply embedded that removal would significantly disrupt the beach;

- visual treatment of non-indigenous armor rock and exposed areas of the existing concrete cribwall and splash apron, to improve visual compatibility with natural rocks and rock surfaces facing the beach; and,

- best management practices to prevent contaminants and construction debris from entering Limekiln Creek and the marine environment adjoining the project site.

See Exhibit B for project plans and see Exhibit C for photographs of the project site. A variety of project alternatives were considered. See Exhibit F, attached, and Geologic Conditions and Hazards Finding, below, for a summary.

D. Relationship to future major project

Caltrans has commenced a process to identify and construct a long-term solution that will reduce exposure of State Route 1 from erosion at Limekiln Beach. An important goal is to avoid having to periodically re-install shoreline armor to protect Limekiln Creek Bridge. It is expected that this future major project will be listed for submittal to the California Transportation Commission in 2011, with the environmental review process to follow sometime around the time period of 2013-2017. A preliminary timeline for such a project and process has been submitted by Caltrans staff (see Exhibit G).

The proposed flexible rock slope protection project is designed to endure for approximately 10 years. This will provide the time necessary to develop an environmentally appropriate long term solution. The terms of this permit require retrieval of any dislodged armor rock during the effective period, and removal of the entire revetment, including the permitted rock slope protection, upon completion of the permanent measures (or ten years, whichever is first).

Depending on future permit approvals, funding availability, and construction timing for the long-term solution, it is possible that the interim armoring under this permit may be needed for additional years beyond 2020. Beyond the initial 10 year term, extension(s) or reconstruction will be subject to the coastal permit amendment process.

2. Coastal Development Permit Approval Determination

The proposed project straddles the boundary between the Commission's retained ("original") jurisdiction and the area where coastal permit authority has been delegated to Monterey County. Pursuant to Coastal Act Section 30601.3, and based on the concurrence of the applicant, the County, and the Commission's Executive Director, this application is being processed as a consolidated coastal development permit application. Accordingly, the standard of review is the Coastal Act. As relevant, the County's certified LCP can provide non-binding guidance. However, the LCP and Coastal Act policies are very similar as regards allowing shoreline armoring and protecting against its impacts. Thus, the

LCP policies do not provide different policy direction in this case, and in this review are cited only if useful as a supplement to applicable Coastal Act policies.

A. Geologic Conditions and Hazards

1. Applicable Policies

Coastal Act Section 30235 addresses the use of shoreline protective devices:

> ***30235.*** *Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.*

Coastal Act Section 30253 addresses the need to ensure long-term structural integrity, minimize future risk, and to avoid landform altering protective measures in the future. Section 30253 provides, in applicable part:

> ***Section 30253.*** *New development shall do all of the following:*
>
> *(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*

Coastal Act Section 30235 acknowledges that seawalls, revetments, cliff retaining walls, groins and other such structural or "hard" methods designed to forestall erosion also alter natural landforms and natural shoreline processes. Accordingly, with the exception of new coastal-dependent uses, Section 30235 limits the construction of shoreline protective works to those required to protect existing structures or public beaches in danger from erosion. The Coastal Act provides these limitations because shoreline structures can have a variety of negative impacts on coastal resources including adverse affects on sand supply, public access, coastal views, natural landforms, and overall shoreline beach dynamics on and off site, ultimately resulting in the loss of beach.

In addition, the Commission has generally interpreted Section 30235 to apply only to existing principal structures. The Commission must always consider the specifics of each individual project, but has generally found that accessory structures (such as patios, decks, gazebos, stairways, etc.) are not required to be protected under Section 30235, or can be protected from erosion by relocation or other means that do not involve shoreline armoring. The Commission has generally historically permitted at-grade structures within the geologic setback area, recognizing that they are expendable and capable of being removed rather than requiring a protective device that would alter natural landforms and processes along bluffs, cliffs, and beaches.

Under Coastal Act Section 30235, shoreline protective structures may be approved if: (1) there is an existing structure; (2) the existing structure is in danger from erosion; (3) shoreline altering construction is required to protect the existing threatened structure; and (4) the required protection is designed to eliminate or mitigate the adverse impacts on shoreline sand supply. The first three questions relate to whether the proposed armoring is necessary. The fourth question applies to mitigating some of the impacts from armoring.

2. Analysis

A. Project and Policy Context

In general, shoreline armoring has a number of impacts on the coast, including but not limited to impacts from beach encroachment, fixing the back of the beach, and preventing the natural erosion of coastal bluffs that provides sandy material to the nearby beaches. As a result, the Coastal Act is premised on both hazard avoidance and shoreline armoring avoidance.

In this case, an essential State Highway structure is already vulnerable to ocean wave attack. For the time being, there are no available, feasible alternatives that will have less impact on the environment or avoid armoring. For the long run, Caltrans is undertaking a project development process that may be able to avoid or minimize shoreline armor at this location through reconstruction of the northern bridge supports, highway realignment and/or replacement of the bridge.

In time, all such structures in this area—even shoreline protection works and large bridges—will need replacement. Structural durability is compromised by severe, high energy wave attack as well as constant salt spray and salt air exposure. Compounding this exposure is the instability of the extremely steep slopes facing the beach. Climate change will only exacerbate these issues, due to rising sea levels and the corresponding potential for more intense storm events. Because of these vulnerabilities, it is likely that that the bridge will need to be replaced, or at least have its primary supports rebuilt. Caltrans has prepared a preliminary schedule to illustrate the anticipated longer-range solution at Limekiln (Exhibit G).

In the meanwhile, interim armoring will continue to be needed. Such armor is necessary for minimizing risk to the existing highway bridge, which is indispensable for public access along the Big Sur Coast.

B. Existing Structure to be Protected

The existing State Highway configuration at Limekiln Creek Bridge was constructed in 1957, and therefore predates the coastal permitting requirements of both 1972's Proposition 20 (the Coastal Initiative) and the 1976 California Coastal Act. Accordingly, the entire highway and bridge at this location, including its supporting members in the slope below, qualify as existing structures for purposes of Coastal Act Section 30235.

C. Danger from Erosion

The Coastal Act allows shoreline armoring to protect existing structures in danger from erosion, but it does not define the term "in danger." There is a certain amount of risk involved in maintaining

development along a California coastline that is actively eroding and can be directly subject to violent storms, large waves, flooding, earthquakes, and other geologic hazards. These risks can be exacerbated by such factors as sea level rise and localized geography that can focus storm energy at particular stretches of coastline. As a result, some would say that all development along the immediate California coastline is in a certain amount of "danger." It is a matter of the degree of threat that distinguishes between danger that represents an ordinary and acceptable risk, and danger that requires shoreline armoring per Section 30235.

Lacking Coastal Act definition, the Commission's long practice has been to evaluate the immediacy of any threat in order to make determinations as to whether an existing structure is "in danger." While each case is evaluated based upon its own particular set of facts, the Commission has generally interpreted "in danger" to mean that an existing structure would be unsafe to occupy within the next two or three storm season cycles (generally, the next few years) if nothing were to be done (i.e., in the no project alternative).

These interpretations are applicable to highway projects as well, although the lead time for major protective measures would generally be three to ten years, depending on the complexity of the project, level of environmental analysis required, and funding availability.

Reports Submitted
Caltrans has submitted a geotechnical report to document their determination that the existing Limekiln Creek Bridge is in danger from shoreline erosion, and that the proposed project is appropriate. The report of this investigation (*Geotechnical Design Report*, John D. Duffy, Caltrans Sr. Engineering Geologist, November 19, 2007) contains a characterization of existing conditions, an extensive review of existing geotechnical literature applicable to the site, evaluation of alternative solutions, and recommendations for correction. It documents the project need and purpose, as well as the immediacy of the threat—and the reasons that the current alternative was selected as the most appropriate for the current circumstances at Limekiln Beach.

Additional publications consulted included the *National Assessment of Shoreline Change, Part 3: Historical Shoreline Change and Associated Coastal Land Loss Along Sandy Shorelines of the California Coast*; and, *National Assessment of Shoreline Change, Part 4: Historical Coastal Cliff Retreat along the California Coast,* both by Cheryl J. Hapke, Ph.D., et al, USGS Open File Reports, 2006 and 2007. Dr. Hapke's methodologies for analyzing cliff retreat were previously developed and applied to studies performed in support of the Big Sur Coast Highway Management Plan, using sample sites to the north of the current project.

Are Highway 1 and the Limekiln Creek Bridge in danger from erosion?
The proposed project site is located at the base of a steep slope that supports the northern abutment for the existing Limekiln Creek Bridge and Highway 1. The roadway surface of this bridge is about 105 feet vertically above the toe of the slope. The edge of pavement at the north end of the bridge is set back about 50 feet from the back beach at this point. According to USGS, the average rate of measured cliff retreat for Central California is 56.7 feet over the 70-year study period.

The shoreline northward of the mouth of Limekiln Creek is already armored by existing failing rock slope protection, seawall/cribwall, and concrete splash apron structures. This armoring system has been battered by continuing wave attack that has already demolished conventional gabion baskets placed here under previous permits. Armoring rock from earlier protection efforts is now spread widely over the public beach area.

The previously-permitted north end of the protective rock revetment has failed, and the seawall supporting the cribwall is already undermined. The remaining life span for these protective devices has been estimated at less than two years, although failure could happen at any time. Immediate action is recommended by the Caltrans geotechnical report.

Without protection, the failure of the existing revetment will continue, threatening the integrity of the bridge by undermining the slope that anchors the bridge abutment. Thus, the Limekiln Creek Bridge—including its underpinnings—is an existing structure that is threatened with erosion. Accordingly, it qualifies for shoreline protection consideration under the second Section 30235 test.

D. Alternatives

The third Section 30235 test that must be met is that the proposed armoring must be "required" to protect the existing threatened structure. In other words, shoreline armoring can be permitted if it is the only feasible alternative capable of protecting the structure.[1] When read in tandem with other applicable Coastal Act policies cited in these findings, this Coastal Act 30235 evaluation is often conceptualized as a search for the least environmentally damaging feasible alternative that can serve to protect existing endangered structures.

Other alternatives typically considered include: the "no project" alternative; abandonment of threatened structures; relocation of the threatened structures; sand replenishment programs; drainage and vegetation measures on the blufftop itself; and combinations of each. In the present case, the first two alternatives were not pursued because they would result in closure of Route 1—an unacceptable outcome for public access and recreation along the Big Sur Coast.

On this steep beach, sand replenishment and above-beach stabilization measures would not effectively address the primary threat of direct wave attack to the toe of the supporting slope. Caltrans has identified a range of additional alternatives to address the wave erosion threat along the upcoast portion of Limekiln Beach. Identification and evaluation of alternatives included collaboration with NOAA-National Marine Sanctuary, State Parks, County and Coastal Commission staffs. Exhibit F summarizes these potential alternatives, each of which is briefly discussed below.

Alternatives identified but not selected

The potential alternatives considered included placing even more, even larger rock (in the 10-12 ton range), to replace that which was previously lost to wave action. However, this would cover more of the

[1] Note that Coastal Act Section 30108 defines feasibility as follows: "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

area of Limekiln Beach, leaving relatively little of the north end of the beach available for public recreation. And, it is estimated that it would only last 1-3 years, at which time it would have to be replaced or rebuilt, again.

Other alternatives included cabling every boulder in place, cementing all boulders together into a massive solid structure, or mooring a 787-foot long floating breakwater offshore of the beach. These were not selected because they would be less effective, be more subject to breakage in the severe high-energy wave environment, occupy more of the available public beach area or impact marine resources, or all of the above.

The no-project alternative would allow what remains of the existing shoreline armoring to further disintegrate, and storm wave erosion would threaten the seawall-cribwall and slope that supports the northerly abutment for Limekiln Bridge. If this erosion threat is not corrected, bridge collapse could follow and scenic Highway 1 would have to be closed. Thus, the no-project alternative is rejected because it would not accomplish the prime project purpose, i.e., maintaining the integrity of the existing bridge.

The remaining alternatives are long-term, high cost construction projects, requiring a separate project development and environmental review process. They include constructing a replacement bridge, highway realignment employing a tunnel, retrofitting the existing bridge foundation, constructing a new seawall, or some combination thereof. Considering the extremely limited life span remaining for the existing revetment/cribwall/seawall assemblage, these alternatives are either not immediately feasible or not cost effective for addressing the erosion taking place at the upcoast portion of Limekiln Beach.

Preferred Alternative
As discussed above, in order for a proposed shoreline protective device to be consistent with the Coastal Act, such device must represent the alternative with the fewest resource impacts that still protects the endangered structure(s).

The proposed project, employing a reconstructed modified revetment based on rock-filled flexible ring-net gabions, was selected by Caltrans as the least damaging feasible alternative. This innovative design is expected to effectively address the current shoreline erosion problem, pending a long range solution such as replacement of the bridge or reconstruction of the bridge supports.

The Commission concurs that this alternative is both feasible and appropriate, and that it forms the basis for the most Coastal Act-consistent approach for addressing the identified erosion risk at this location, for the time being. This approach limits shoreline armoring (and associated impacts) and encroachment onto beach recreational areas to the maximum extent feasible, while protecting the Limekiln Bridge structure and Highway 1 from the identified erosion danger.

Alternatives Conclusion
In summary, the existing Highway 1 bridge structure is in danger from erosion and *does* meet the three tests for shoreline protection works in Section 30235. Caltrans has identified and proposes a project that

limits coastal resource impacts to the maximum extent feasible.

Caltrans further acknowledges that a permanent solution, including one potentially not requiring shoreline armor, should be undertaken over the longer term. Such a project would likely comprise highway realignment and bridge replacement, or a major reconstruction of the northerly bridge support elements, and may take as much as ten years to implement. In the interim, the current proposal will provide sufficient protection, and as conditioned can be found consistent with the applicable Coastal Act policies.

E. Sand Supply Impacts

The fourth test of Section 30235 (previously cited) that must be met in order to allow Commission approval is that shoreline structures must be designed to eliminate or mitigate adverse impacts to local shoreline sand supply.

Shoreline Processes

Beach sand material comes to the shoreline from inland areas, carried by rivers and streams; from offshore deposits, carried by waves; and from coastal dunes and bluffs, becoming beach material when the bluffs or dunes lose material due to wave attack, landslides, surface erosion, gullying, and other processes (collectively termed mass wasting by geomorphologists). Along the Big Sur Coast, examples of each of these beach-forming processes can be seen.

At the subject site, the sediments delivered to the shore by Limekiln Creek are an observable principal sand source. Offshore sand deposits and longshore sand transport are additional possible sources, although the steeply sloping sea floor immediately offshore argues against these sources as significant contributors.

Before highway construction, erosion of the scree slope below the cliff at the north end of Limekiln Beach was a likely contributor to beach sand supply. The loose debris shed by the Rain Rocks promontory freely accumulated on the slope leading down to the beach. This slope represents the natural angle of repose for unconsolidated rocky debris sliding down from the promontory's densely compressed siltstones and mudstones.

At the toe of the debris slope, wave attack would excavate loose material and thereby replenish the beach. Continued wave attack across the narrow beach would steepen the toe of the debris slope, inducing more material to slide down towards the sea until a new, temporary equilibrium was reached. Since the source of the debris slope is itself composed of ancient marine sediments, at least a proportion of the material reaching the shoreline could be expected to be beach-quality sand. These processes continue today at the similarly-situated Pitkins Curve beach, on the north side of the Rain Rocks headland. At Pitkins, the debris slide is sufficient to maintain beach formation even without Limekiln's additional contribution of stream-borne sediments.

These natural shoreline processes affecting the formation and retention of sandy beaches can be significantly altered by the construction of shoreline armoring structures. When the back-beach or toe of slope is armored by a shoreline protective device, the natural contribution of loose material to the beach

will be interrupted. To the extent that the cliffs above produce material, and to the extent that the shoreline is eroding, shoreline armoring will deprive the beach of a measurable amount of replacement material.

At Limekiln, since the position of the armored back beach is not markedly different from the pre-highway shoreline, the sand supply impact of the existing revetment is not clear. It is possible that the impairment of the debris slope as a sediment source is masked by much larger quantities of material transported to the beach from the Limekiln Creek watershed.

In any case, some of the effects of armoring structures on the beach (such as scour, end effects and modification to the beach profile) are temporary or are difficult to distinguish from all the other actions that modify the shoreline. Others are more qualitative (e.g., impacts to the character of the shoreline and visual quality). Some of the effects that a shoreline structure may have on natural shoreline processes can be quantified, however, including: (1) the loss of the beach area on which the structure is located; (2) the long-term loss of beach which will result when the back beach location is fixed on an eroding shoreline; and (3) the amount of material which would have been supplied to the beach if the back beach or bluff were to erode naturally.[2]

Fixing the back beach

Experts generally agree that where the shoreline is eroding and armoring is installed, as is the case here, the armoring will eventually define the boundary between the sea and the upland. On an eroding shoreline, a beach will exist between the shoreline/waterline and the toe of the slope behind the beach--as long as sand is available to form a beach. As shoreline erosion proceeds, the profile of the beach also retreats and the beach area migrates inland with the bluff. This process stops, however, when the backshore is fronted by a hard protective structure such as a revetment or a seawall. While the shoreline on either side of the armor continues to retreat, the shoreline in front of the armor eventually stops at the armoring. The beach area will narrow, being squeezed between the moving shoreline and the fixed backshore. Eventually, there will be no available dry beach area and the shoreline will be fixed at the base of the structure. In the case of an eroding shoreline, this represents the loss of a beach as a direct result of the armor.

In addition, sea level has been rising slightly for many years. Also, there is a growing body of evidence that there has been an increase in global atmospheric and sea temperatures, and that acceleration in the rate of sea level rise can be expected to accompany this increase in temperature. Expert opinion indicates that sea levels could rise as much as 1.4 meters (55 inches)[3] by the year 2100 due to thermal expansion of the sea and melting terrestrial ice fields. Mean water level affects shoreline erosion several ways, and an increase in the average sea level will exacerbate all these conditions. On the California

[2] The sand supply impact refers to the way in which the project impacts creation and maintenance of beach sand. Although this ultimately translates into beach impacts, the discussion here is focused on the first part of the equation and the way in which the proposed project would impact sand supply processes.

[3] The Rahmstorf upper limit value for projected sea level rise, typically applied by the Commission, is 1.4 meters or 55 inches. It is derived from a 2007 report prepared by Dr. Rahmstorf of the Potsdam Institute for Climate Impact Research (Rahmstorf, S, 2007. "A Semi-Empirical Approach to Projecting Future Sea-Level Rise," Science, v315,368-370).

coast the effect of a rise in sea level will be the landward migration of the intersection of the ocean with the shore. This, too, leads to loss of the beach as a direct result of the armor. These effects are also known as "passive erosion."

The Commission has established a methodology for calculating passive erosion, or the long-term loss of beach due to fixing the back beach. This impact is equivalent to the footprint of the bluff area that would have become beach due to erosion and is equal to the long-term erosion rate multiplied by the width of property which has been fixed by a resistant shoreline protective device.[4] In the present case, the back beach is already fixed by an existing, although degraded, armoring structure. Although it could be argued that the proposed project will extend passive erosion impacts created by initial construction of the armoring system and subsequent changes to it, it could also be argued that those prior permits were premised on maintaining such armoring and its impacts in that configuration indefinitely and that the time to assess and quantify impacts and mitigation has come and gone. In this case, lacking evidence to indicate that the baseline armoring decision contemplated any type of "reopening" or re-review framework, it is presumed here that passive erosion for this site has already been accounted for. Thus, although the proposed project will prevent the complete breach and collapse of the existing revetment/cribwall/seawall structure, thereby precluding the natural movement of the shoreline and perpetuating the current passive erosion effect at this location, there is no sand supply impact due to fixing of the back beach associated with the current project.

Encroachment on the beach

Shoreline protective devices (such as the existing and proposed measures) are all physical structures that occupy space. When a shoreline protective device is placed on a beach area, the underlying beach area cannot be used as beach. This generally results in a loss of public access as well as a loss of sand and/or areas from which sand-generating materials can be derived. The area where the structure is placed will be altered from the time the protective device is constructed, and the extent or area occupied by the device will remain the same over time, until the structure is removed or moved from its initial location, or in the case of a revetment, as it spreads seaward over time. The beach area located beneath a shoreline protective device, referred to as the encroachment area, is the area of the structure's footprint.

In this case, the proposed reconstructed revetment's base would occupy roughly 3,600 square feet of beach space. To convert the 3,600 square foot encroachment area into a volume of sand necessary to restore the beach commensurately in cubic yards, coastal engineers use a conversion value representing units of cubic yards per square foot of beach.[5] In this case, the Commission has not been able to

[4] The area of beach lost due to long-term erosion (Aw) is equal to the long-term average annual erosion rate (R) times the number of years that the back-beach or bluff will be fixed (L) times the width of the property that will be protected (W). This can be expressed by the following equation: Aw = R x L x W. The annual loss of beach area can be expressed as Aw' = R x W.

[5] This conversion value is based on the regional beach and nearshore profiles, and overall characteristics. When there is not regional data to better quantify this value, it is often assumed to be between 1 and 1.5, the idea being that to build a beach seaward one foot, there must be enough sand to provide a one-foot wedge of sand through the entire region of onshore-offshore transport. If the range of reversible sediment movement is from -30 feet msl to +10 feet msl, then a one-foot beach addition must be added for the full range from -30 to +10 feet, or 40 feet total. This 40-foot by 1 foot square parallelogram could be built with 1.5 cubic yards of sand (40 cubic feet divided by 27 cubic feet per cubic yard). If the range of reversible sediment transport is less than 40 feet, it will take less than 1.5 cubic

establish an actual conversion factor for the Limekiln Beach vicinity. However, if a 1.0 conversion factor is used (i.e., the low end of the spectrum of values typically assumed by coastal engineers), a conservative estimate of the cubic yard equivalent of the 3,600 square foot encroachment area can be calculated. Using the sand conversion factor of 1.0, the loss of sand due to encroachment translates into an impact equivalent to 3,600 cubic yards of sand.

Retention of potential beach material
If natural erosion were allowed to continue (absent the armoring at this location), some amount of beach-forming material would be added to the beach at this location, as well as to the larger littoral cell sand supply system fronting the bluffs. However, because the back beach and slope above is fixed by the previously-permitted revetment/cribwall/seawall assemblage, no shoreline retreat is evident. While it can be readily observed that a significant amount of potential sand supply material is detained behind the cribwall, the volume of total material that would have gone into the sand supply system can not be readily determined using the Commission's recommended methodology for determining proportionate mitigation.[6]

Mitigation indicated for beach and sand supply impacts
The proposed project would be expected to continue a tangible, but difficult to quantify, overall sand supply impact. Beach loss due to encroachment and passive erosion, and direct sand loss due to retention of debris slide material can be reasonably postulated, and the encroachment area impact of 3,600 cubic yards of sand can be identified. In any case, it is clear that there are sand supply impacts, and that they have not been eliminated. Thus, per Section 30235, such impacts must be mitigated.

It has proven difficult over the years to identify appropriate mitigation for such impacts. Partly this is due to the fact that creating an offsetting beach area is not an easy task, and finding appropriate properties that could be set aside to become beach area over time (through natural processes, including erosion) is difficult both due to a lack of such readily available properties and the cost of such coastal real estate more broadly. As a proxy, other types of mitigation typically required by the Commission for such direct sand supply impacts have been in-lieu fees and/or beach nourishment, and in some cases compensatory beach access improvements. With regards to beach nourishment, a formal sand replenishment strategy can introduce an equivalent amount of sandy material back into the system over time to mitigate the loss of sand that would be caused by a protective device over its lifetime. Obviously, such an introduction of sand, if properly planned, can feed into the Big Sur coast sand system to mitigate the impact of the project. However, as opposed to other areas with established programs (e.g., SANDAG in San Diego) there are not currently any existing beach nourishment programs directed at this beach area. Absent a comprehensive program that provides a means to coordinate and maximize the benefits of mitigation efforts in the area now and in the future, the success of piecemeal mitigation efforts, such as an Applicant-only project to drop equivalent amounts of sand over time at this location, is questionable.

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yards of sand to rebuild one square foot of beach; if the range of reversible sediment transport is larger than 40 feet, it will take more than 1.5 cubic yards of sand to rebuild one square foot of beach.

6 And Caltrans did not analyze this impact nor identify any specific quantity of material being retained by this structure.

As an alternative mitigation mechanism, the Commission oftentimes uses an in-lieu fee when in-kind mitigation of impacts is not available.[7] In situations where ongoing sand replenishment or other appropriate mitigation programs are not yet in place, the in-lieu mitigation fee is deposited into an account until such time as an appropriate program is developed and the fees can then be used to offset the designated impacts. When mitigation funds are pooled in this way for multiple projects in a certain area, the cumulative impacts can also be better addressed inasmuch as the pooled resources can sometimes provide for a greater mitigation impact than a series of smaller mitigations based on individual impacts and fees. The fee is based on the volume of sand equivalent to the quantified impacts and the cost to replace this volume of sand.[8] For reference, the most recent such in-lieu fee requirements in the Central Coast include CDPs 3-97-065 ($25,066), 3-98-102 ($26,783), A-3-SLO-01-040 ($53,250), and A-3-SCO-06-066 ($10,000).

Another alternative sand supply mitigation also often applied by the Commission is using beach access improvements to offset impacts. Such mitigation is typically applied by the Commission to public agencies that are in the beach management business when they have applied for armoring projects.[9] It is more difficult to put the burden for a public project on a private applicant and thus such mitigation is atypical.[10]

In this case, Caltrans' primary mission does not include beach management, and there is no overall beach management program for the Big Sur Coast that would be available for Caltrans participation. However, there are opportunities for mitigation nonetheless, both associated with the project design and related to Limekiln State Park. First, by design, the project includes retrieving boulders from the beach area here. Such removal will help to offset the sand supply impact by freeing up sand and beach area under the to-be-removed rock field. However since the rock is not present on the beach in a permitted configuration, it enjoys no CDP status, and thus the baseline here is as if those rocks were not on the beach in the first place.[11] Although such removal clearly is a resource benefit, removal would be required irrespective of the project. That said, it does help to offset physical sand supply impacts.

Second, to address such impacts, Caltrans has coordinated with State Parks on potential improvements

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[7] See, for example, CDP 3-97-065 (Motroni-Bardwell), CDP 3-98-102 (Panattoni), CDP A-3-SLO-01-040 (Brett), and A-3-SCO-06-066 (Willmott).

[8] Sand supply costs vary widely statewide, and can differ based on a variety of factors including the cost of delivery, availability of materials, as well as possible economies of scale that could be achieved from larger-scale regional sand nourishment programs. For example, supplied sand in the downcoast Cayucos area ranges from $20 per cubic yard to $44 per cubic yard (see CDP A-3-SLO-01-040, March 2009) and has been estimated to be in the $25 per cubic yard range in the Santa Cruz area. Similarly, the City of Encinitas gets about 5,000 cubic yards of sand each year for a public volleyball beach area and they pay roughly $30 per cubic yard for sorted and washed sand. The general fee for sand for larger beach nourishment projects is closer to $12 per cubic yard.

[9] For example, as recently required with respect to recreational access improvements along the Pleasure Point shoreline area of Santa Cruz County as part of the Commission's approval of a seawall fronting East Cliff Drive (CDPs A-3-SCO-07-015 and 3-07-019, approved December 13, 2007).

[10] Although the Commission has applied such a requirement for this type of impact before (see, for example, CDP 3-02-107, Podesto).

[11] In other words, removing these materials simply puts the condition back to the permitted baseline condition, as would be required regardless of the current application. Physically, removing the rock will reduce beach area impacts, but this reduction is already and otherwise required independent of this proposed project.

to Limekiln State Park that could offset beach recreational impacts.[12] Specifically, Commission and State Parks staff have observed that the campground entrance road, parking areas, and beach trailhead restroom are currently in a degraded condition. The wooden bridge for access to the lower campsites and beach access trailhead, disassembled in advance of the 2008 forest fire, has not yet been put back in place. Rehabilitation and improvement of these public access facilities would represent a potential recreational benefit, and a potential mitigation measure to offset both the temporary and permanent loss of usable beach area.

In this case, the Commission finds that in-kind recreational mitigation measures appear feasible, and are the preferable approach to mitigation of recreational resource impacts of the proposed project at Limekiln State Beach. Therefore, this permit is conditioned for in-kind recreational offsets, rather than beach replenishment or an in-lieu fee, as the most appropriate and reasonable mitigation method, given the above-described factors. The Applicant has collaborated with State Parks to identify and fund appropriate in-kind recreational resource mitigation measures. These measures are described in greater detail in the section on public access and recreation, below. The resulting agreement is memorialized in an executed State Park Right to Enter Permit, and is reinforced by Special Condition 8, below.

Accordingly, as conditioned the proposed project offsets impacts on beach sand supply through in-kind recreational resource benefits. Therefore, the project satisfies the Coastal Act Section 30235 requirements regarding mitigation for sand supply impacts.

F. Geologic Conditions and Hazards Conclusion

The proposed project, as conditioned, will meet the Section 30235 tests for shoreline revetments to protect existing structures in danger from erosion. The project is designed to minimize impacts on coastal resources. But, certain impacts, particularly the loss of beach area available for recreational use, and impairment of beach access by construction activity, are unavoidable.

Available mitigation measures to offset the project's sand supply and recreational resource impacts appear feasible, as detailed above. These measures are required as conditions of this permit (see Special Condition 8). Additional safeguards are available through review and approval by the Monterey Bay National Marine Sanctuary and the State Lands Commission[13] (see Special Conditions 6 and 7).

Avoidance of future hazard and beach encroachment

Given that the project comprises a redesigned gabion-based revetment to replace an earlier, more conventional revetment, there is a possibility that the new design may fail as well. Rupture of the ring net baskets would release rock onto the beach, with consequent additional impairment of recreational opportunities. Accordingly, this approval is also conditioned to require monitoring of the new installation to ensure that it remains stable. And, that if there is substantial encroachment of the beach by fugitive armoring rock, that it be retrieved in a timely manner (Special Condition 5). Such future monitoring and maintenance activities must be understood in relation to clear as-built plans. Therefore,

[12] Again, although the impacts in question are sand impacts, they translate directly to beach recreational access impacts in this case.

[13] Part of the proposed revetment appears to be located on State Lands' property.

Special Condition 4 of this approval requires the submittal of as-built plans to define the footprint and profile of the permitted development.

Term of permit/future removal of permitted revetment
The purpose of this project is to protect the northern abutment of Limekiln Creek Bridge until long range measures to address erosion can be implemented. Caltrans has commenced a process that will lead to this outcome. Because the long range solution is likely to entail a major construction project (e.g., reconstruction of the northern bridge supports, replacement of the entire bridge and/or realignment of the highway, etc.) this long range project cycle is projected to take approximately ten years, possibly more—see attached Exhibit G for timeline submitted by Caltrans. Accordingly, this permit is conditioned for a corresponding time period. Extension of this time period may be requested through the procedures for amendments to coastal development permits.

All permitted revetment materials must be removed, and the site reclaimed for public beach recreational use upon termination of the effective term of the permit. The removal work will be subject to a reclamation plan to be submitted for review and approval by the Executive Director. The required reclamation plan is required to include the same kinds of resource protection measures as for the Construction Plan to be submitted in accordance with Special Condition 1. These measures include, but are not limited to, environmentally sensitive area protective fencing and water quality best management practices. Upon completion, Caltrans will be required to provide written evidence from State Parks that the reclamation work has satisfactorily restored the beach to a condition suitable and appropriate for public recreational use. See Special Condition 9 below.

Risk and liability considerations
In terms of recognizing and assuming the hazard risks for shoreline development, the Commission's experience in evaluating proposed developments in areas subject to hazards has been that development has continued to occur despite periodic episodes of heavy storm damage and other such occurrences. Development in such dynamic environments is susceptible to damage due to such long-term and episodic processes. Past occurrences statewide have resulted in public costs (through low interest loans, grants, subsidies, direct assistance, etc.) in the millions of dollars.

In this instance, the State of California through its agency Caltrans assumes the economic burdens of the preventative revetment work and any necessary mitigation requirements, as well as the responsibility for seeking a long-term solution. Further, the potentially impacted properties—the Caltrans right of way, the State Park, and tidal waters under State Lands Commission jurisdiction—are all in public ownership. Nonetheless, given the uncertainties and risks involved, unforeseen costs and impacts may arise as a consequence of project approval. As a means of allowing continued development in areas subject to these hazards, applicants are regularly required to acknowledge site hazards and agree to waive any claims of liability on the part of the Commission for allowing the development to proceed.

There are inherent risks associated with development on and around rock revetments and eroding slopes in a dynamic coastal bluff environment; this applies to the project proposed as well as for the highway development above. The approved project, and all development inland of it, is likely to be affected by

shoreline erosion in the future. Although the Commission has sought to minimize the risks associated with the development proposed in this application (and in past actions with other development at this location), the risks cannot be eliminated entirely. Accordingly, this approval is conditioned for the Applicant to assume all risks for developing at this location (see Special Condition 10).

Conclusion for geologic hazards, overall
The project represents an appropriate interim measure to maintain the continuity of public access on Highway 1 along the Big Sur Coast. It is expected that the Applicant, Caltrans, will continue to diligently pursue bridge improvements or realignment that will allow the removal of artificial shoreline armor structures at this location. Accordingly, the project, as conditioned, can be found consistent with the hazard polices of the Coastal Act as cited in this Finding.

B. Public Access and Recreation

1. Applicable Policies

Coastal Act Section 30604(c) requires that every coastal development permit issued for any development between the nearest public road and the sea "shall include a specific finding that the development is in conformity with the public access and public recreation policies of [Coastal Act] Chapter 3." The proposed project is located seaward of the first through public road (State Highway Route 1). Coastal Act Sections 30210 through 30214 and 30220 through 30224 specifically protect public access and recreation. In particular:

> ***30210.*** *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*
>
> ***30211.*** *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*
>
> ***30213.*** *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …*
>
> ***30221.*** *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*
>
> ***30223.*** *Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.*

Coastal Act Section 30240(b) also protects parks and recreation areas, such as the adjacent beach area within Limekiln State Park. Section 30240(b) states:

> ***30240(b).*** *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

These overlapping policies clearly protect the beach (and access to and along it) and offshore waters for public access and recreation purposes, particularly free and low cost access.

2. Analysis

The project is located within the boundaries of Limekiln State Park, a popular recreational destination on the Big Sur Coast. The park, at the foot of Cone Peak (elevation 5,155 feet), offers spectacular mountain views, redwood forest, waterfalls, hiking trails, campground, historic limekilns, and beach access. Due to the large scale forest fire that burned the Limekiln Creek watershed in 2008, and subsequent hazardous conditions from rockfall and other conditions, the park is presently closed to regular public use. The Department of Parks and Recreation (State Parks) is currently working to reopen the park, but due to constrained funding it is uncertain when this will occur. The following analysis is based on the presumption that the park, or at least beach access, will be reopened prior to or concurrently with this permitted development.

The proposed revetment will be located in approximately the same footprint as previously-permitted shoreline protection works at the north end of Limekiln Beach. According to information supplied by the Applicant, the proposed reconstructed revetment will occupy about 3,600 square feet of beach space. Extending southwards from this reconstructed revetment, the majority of previously-permitted revetment work will remain and is not part of the current project

Mitigating circumstances include the fact that the majority of area to be occupied by the new armoring structure is already unavailable due to the presence of the existing failing structure. Also, the proposed project includes the retrieval of loose armoring boulders from the beach, which are now in such abundance as to impair recreational use. Because the north end of the beach here is relatively narrow, with the lower part only accessible at low tides on rare, calm days, it is not as heavily used as the south end. Therefore, the project's net recreational access impact due to its footprint would be relatively small. That said, the ongoing reduction of recreational beach area is still an impact caused by, or perpetuated by, the proposed project.

Beach narrowing impacts

As noted above in the discussion of sand supply impacts, in addition to the direct loss of useable recreational beach area, shoreline armoring produces a number of effects on the dynamic shoreline system and the public's beach use interests. First, the proposed revetment would be part of a structural assemblage that denies sand-bearing sediments to the beach, because the retained debris slide material behind the revetment/seawall-cribwall structure will not be available to nourish the sand supply system. Second, and particularly in combination with the denial of sand generating materials, the proposed revetment work will continue to fix the back beach location. The effect on public use will continue to be a narrowing of useable beach space. Third, changes in the shoreline profile, particularly changes in the

slope of the profile that result from a reduced beach width, alter the useable beach area available for public access. A beach that rests either temporarily or permanently at a steeper angle than under normal conditions will have less horizontal distance available for the public to use. This reduces the actual area in which the public can pass along the beach. Fourth, the proposed revetment would cumulatively affect public access by contributing to accelerated or increased erosion on the adjacent portions of Limekiln Beach. Ultimately, the proposed project could result in the loss of the northern end of Limekiln Beach altogether at this location, unless offset with fresh influxes of replenishing sediments from Limekiln Creek, the north-south littoral cell bringing sediments from the nearby Pitkins Curve landslide, or other source.

A tempering consideration is that this proposed project does not represent the imposition of a new revetment, but a revision and reconstruction of a previously permitted project. Thus, while the original installation may have produced beach narrowing effects such as those listed above for the typical project, the current application will not so much increase impacts compared to what was previously permitted as extend the time over which such impacts will continue to accrue.

Project public access benefits and other recreational impacts
In the larger context, the project will protect Limekiln Creek Bridge, which is essential to maintaining the continuity of State Highway Route 1—the primary public access corridor along the Big Sur Coast. As stated above, Caltrans has selected a design that minimizes the permanent structural footprint on the beach. Scattered armoring rock will be retrieved from the beach, restoring the area of sandy beach available for recreational use. The north end of the beach will no longer be subject to safety closures due to unstable revetment structures. The opportunity for beach access (at low tide) all the way to the cliff that bounds the north end of the beach will be retained over the longer term.

However, during construction, which is expected to last about 8-10 weeks, beach access would effectively be precluded on the north end of the beach, due to construction activity and safety needs at the site. Also, during this same time period, the anticipated construction staging area would occupy at least a portion of the campground/beach trailhead area located on the inland side of the bridge (campsites 1-12). And, the experience of beach-goers could potentially be impacted by construction equipment transiting along the access route from the staging area to the beach, beneath the highway bridge.

Construction management measures
To provide maximum information to the beach-going public during all construction, it is the Commission's practice to require the Applicant to maintain copies of the CDP and approved plans available for public review at the construction site, as well as provide a construction coordinator whose contact information is posted at the site to respond to any problems and/or inquiries that might arise (see Special Condition 2).

Additionally, the required construction management conditions in Special Condition 1 can help to minimize the impacts of this project on beach goers, through consolidation of construction activities and support functions. However, the conditions cannot completely compensate for the unavoidable

degradation of the normal beach recreational experience available at this location, including the overall diminution of aesthetics and ambiance, due to the proposed project. To offset these impacts to the recreational beach, additional mitigation is necessary.

Additional public access mitigation measures
Anticipating the above concerns regarding loss of public recreational opportunities, and acting on the suggestions offered by various agencies at an in-field site inspection, Caltrans has modified project plans to provide for continued public access to the southerly part of the beach (when the park is open). The beach accessway for pedestrians will be protected by a temporary security/habitat protection fence, parallel to and set back from Limekiln Creek. The temporary fencing will separate transiting construction equipment from the pedestrian beach access route. This will assure that a safe beach access path approximately 4 feet in width will be available during the construction period.

Further offsets for the loss of recreational access opportunity appear feasible through in-kind repairs and improvements. An immediately obvious candidate to mitigate the project's recreational resource impacts would be rehabilitation and improvement of Limekiln State Park campsites 1-12 and the adjoining beach access trailhead. State Parks indicates that such in-kind services and/or funding could be usefully applied to restoration of the campground, main entry road and/or beach access road. The paved main entry road, for example, needs removal of loose rock from the steep hillside above the roadway and entry kiosk.

Campground improvements would potentially include reassembly of the wooden vehicle and pedestrian bridge over Limekiln Creek (which was dismantled in advance of the 2008 forest fire), and resurfacing the base rock entry road and beach parking areas. State Parks indicates that other needed, related public access improvements include updating of the trailhead restroom consistent with ADA standards, as well as rehabilitation of one of the campsites to provide an ADA-compliant parking stall.

To offset the impacts of the project and fund the public access and recreation improvements listed above, applicant Caltrans has agreed to pay a fee of $18,900 directly to State Parks. This funding will help to reopen the park, closed since the 2008 forest fire. The level of funding commitment was reportedly established by considering the cost of needed public access improvements and revenue that would have accrued to the State if the park campsites were open during the construction period. Caltrans is additionally obligated to restore damaged park road surfaces, as well as to restore, rehabilitate and revegetate any areas impacted by construction activity, to the satisfaction of the State Park Resource Ecologist. This agreement is memorialized by a State Park Right of Entry Permit, executed August 31, 2009 (see Special Conditions 1(c) and 8(e) below).

Caltrans' proposed project is designed to allow continued public access to the southern part of Limekiln Beach during construction, and has no bearing on the present closure.

3. Public Access and Recreation Conclusion
This approval is subject to conditions that: affirm the above-identified project design measures to retrieve armor rock that currently impairs use of the sandy beach area; maintain a pedestrian beach

access corridor, separated from transiting construction equipment; provide visitor information concerning construction management; and, provide or fund in-kind recreational access improvements, in a form and location acceptable to State Parks. Accordingly, the project will protect the continuity of public access on the Big Sur Coast Highway; and, through substantive public access facility improvement, offset the temporary, partial denial of beach and campground use as well as any ongoing narrowing of the beach that may result from the project. Therefore, as conditioned, the project will be consistent with the Coastal Act public access and recreation policies cited above.

C. Visual Resources

1. Applicable Policies

Coastal Act Section 30251 states:

> ***Section 30251.*** *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.*

Coastal Act Section 30240(b), previously cited, also protects the aesthetics of beach recreation areas such as those seaward of the bluffs here. Section 30240(b) states:

> ***Section 30240(b):*** *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

2. Analysis

The Big Sur Coast represents one of the State's most acclaimed scenic resources. The Big Sur Coast Highway, a designated National Scenic Byway, provides the means by which millions of visitors per year enjoy this great scenic attraction. Some of the most spectacular scenic highlights are protected by a series of state park units, all linked by the Scenic Byway. This "string of jewels" includes Limekiln State Park, a highly scenic area within the meaning of Coastal Act Section 30251.

Caltrans conducted a Visual Assessment and Scenic Resource Evaluation in November 2007. While visible, the proposed revetment project will not significantly impact views from the traveled surface of the highway due to its elevation well above the beach. This view impact is additionally tempered by the intervening distance. At beach level, however, protection of the scenic resource is a much more critical concern. The existing partially-failed revetment, exposed rusted metal gabion remnants, imported armor rock, concrete splash apron, and exposed metal culvert on the slope above contribute nothing to the

otherwise scenic ambiance of Limekiln Beach.

The project as proposed includes rebuilding of the north end of the revetment. Compared with the previous traditional gabion baskets, the new installation will feature a more flexible, curvilinear, large-diameter ring net design. This new technique will better blend the dark metal net with the enclosed rocks and natural background materials. Nonetheless, the proposed revetment will unavoidably impact the public viewshed and aesthetic as seen from the beach, due to the continued presence of an obviously artificial structure along the lower bluff directly adjacent to the back beach area.

Caltrans proposes retrieval of scattered armoring rock from the beach, and staining of the exposed surfaces of the existing concrete cribwall, shotcrete apron and imported rock to better match the dark natural rock colors found near the beach. The proposed staining will also mimic the coloration of natural rocky cliff and bluff landforms in the vicinity. This measure will help to camouflage the project, thereby minimizing visual impacts and offsetting the overall effect of the existing and new shoreline protection works. The Commission has had experience with both successful camouflaging and unsuccessful camouflaging in this respect, and much of the outcome is predicated on the skill of the contractors performing the work. Caltrans proposes precise specifications and procedures to obtain the desired aesthetic effects. These procedures include close collaboration with State Parks management. These measures are implemented through this permit by Special Condition 3.

In addition, this approval is conditioned for a scenic resource mitigation plan designed to improve the appearance of the approved armoring system, including the drainage and landscaping elements found in the slope above. The overall mitigation objective of this plan is to evoke natural colors, textures and surface undulations appropriate to this beach area and State Park context, to the maximum extent feasible. Proposed measures for this purpose shall be of a nature that can be left in place, or can be readily removed if need be upon future removal of the permitted rock slope protection structure(s). At minimum, the visual impact of the existing concrete splash apron, above-surface downdrain culvert pipes, and other incongruous lineal elements associated with the permitted rock slope protection structure, shall be reduced to the maximum extent feasible. Examples of appropriate measures for consideration include trenching to bury pipes, covering with earthen materials, installation of native plantings, contouring, and texturing to increase visual roughness. In determining feasibility, the limited duration of the improvements authorized by this permit shall be considered. Again, see Special Condition 3.

As conditioned, the project will minimize visual impacts along this public beach area, will reduce the visual impacts of damaged revetments and fugitive armor rock, will not significantly alter scenic public views, and will result in an aesthetic improvement compared to the existing condition. Thus, the project, as proposed, is consistent with Sections 30251 and 30240(b) of the Coastal Act.

D. Marine Resources

1. Applicable Policies

The Coastal Act protects the marine resources and habitat offshore of this site. Coastal Act Sections

30230 and 30231 provide:

> ***Section 30230.*** *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*
>
> ***Section 30231.*** *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

2. Analysis

The offshore waters and intertidal zone are within the Monterey Bay National Marine Sanctuary and the State Sea Otter Refuge. The adjoining beach is protected under the regulations for Limekiln State Park. These reserves protect a multiplicity of environmentally sensitive marine habitat features, notably including the beach itself, the rocky intertidal, offshore kelp forests, marine mammal haul-outs and seabird nesting and foraging areas. Each of these is represented at Limekiln Beach, and is discussed in more detail below.

Sandy beach

Beaches represent potential habitat for a variety of species, including marine mammals, seabirds, and invertebrates such as burrowing mollusks and the globose dune beetle. Certain wide, sandy or cobble beaches along the Big Sur Coast are favored by northern elephant seals and California sea lions as haul-out areas. Harbor seals favor water-accessible rock shelves and wash rocks as resting areas. But, at Limekiln Beach these mammals are only transient visitors.

Snowy plovers nest on a number of Central Coast beaches, but have not been seen to nest at Limekiln Beach. Wildlife inventories have not revealed the presence of any other sensitive species resident in the sandy beach area. See additional discussions below about subsurface beach fauna, and about other seabirds.

Beach boulders and rocky intertidal

Under the sponsorship of Caltrans, the Tenera biologic consultants have conducted detailed, multi-year habitat monitoring of a very similar beach intertidal environment immediately to the north, at Pitkins Curve. Both beaches feature free-standing boulders that are washed by waves at the seaward edge of the beach. The Tenera reports confirmed earlier studies by California State University Moss Landing Marine Laboratory to determine the relative abundance and sensitivity of marine life in intertidal zones

exposed to substantial wave-suspended sand. These studies demonstrated that rock surfaces within the surf zone that are subject to the scouring effects of suspended sand are nearly barren of observable marine life. Even fairly large boulders are rolled about, and lack sufficient stability to develop attached life forms.

The very largest rocks *on* the beach have relatively more stable surfaces, but are still severely impacted by scour effects. Above the beach surface, only a scattering of hardy, low-profile, tightly-clinging limpets appear to have successfully adapted to the "swash of liquid sandpaper." But, burrowing to escape sand scour represents the alternate beach survival strategy. Clams, sand fleas and other creatures demonstrate that even those beaches that appear barren on the surface are likely to support a hidden faunal assemblage.

Offshore marine habitat
In contrast to the beach margin, the area immediately *seaward* of the stream of suspended littoral sand is rich in observable life forms. At low tide, the zonation of marine algaes that characterize the rocky intertidal is evident on the larger, more stable rocks. Further offshore, kelp fronds mark submerged boulders resting on the bottom. Kelp beds provide shelter for sea otters and support an entire food web for marine life associated with kelp forest habitats. Clearly, the submerged and partially-submerged rocks, and ocean waters *adjacent* to the beach constitute a resource protected by Coastal Act policies, particularly those that pertain to marine habitats and environmentally sensitive habitat areas.

Seabird and shorebird habitats
Another marine resource is represented by the resident seabirds and shorebirds in the area. Black oystercatchers can be seen working the rocky intertidal between Limekiln Beach and the comparable Pitkins Curve Beach, around the corner to the north. In both cases, the beaches themselves are quite narrow, and are periodically substantially inundated by storm waves. No snowy plovers or other beach-nesting birds have been observed in residence at either site, although it is possible that transient birds would utilize the beach for foraging and resting. Similarly, the steep, sliding slope immediately above the proposed revetment work and beneath the highway bridge is unfavorable for the various seabird species seen in substantial numbers off the beach.

Potential for project impacts on marine environment
As proposed by the Applicant, Caltrans, the project would include work at the upper edge of the beach, within the approximate area of previously-constructed, degraded shoreline revetments. The new ring net gabion installation will be, at least in part, filled with fugitive armoring rock. The proposal includes retrieval of previously-imported rock now scattered over the north end of Limekiln Beach.

To accomplish this, the project will require: the movement of large equipment, workers, and supplies during periods of low tides to gain access to the site; include large equipment operations on the beach area fronting the site; include substantial sand excavation for keyway construction, and rock retrieval and placement work on the beach; and potentially encroach on Sanctuary and State Lands waters (depending on tides and the daily ambulatory position of the shoreline).

3. Marine Resources Conclusion

To protect marine resources and offshore habitat, Special Condition 1 requires that these impacts be contained and minimized through: construction parameters that limit the area of construction, clearly fence off the minimum construction area necessary, keep equipment out of Sanctuary and State Lands waters to maximum extent feasible, require off-beach equipment and material storage during non-construction times, require adherence to construction and water quality best management practices (BMPs), require construction documents to be kept at the site for inspection, require a construction coordinator to be available to respond to inquires, and clearly delineate and avoid to the maximum extent feasible beach recreational use areas. To minimize excavation impacts on the sandy beach, Caltrans has agreed that fugitive rock retrieval efforts will be limited to those rocks that are not so deeply embedded that recovery efforts would cause significant disruption.

As conditioned, the project is consistent with Coastal Act Sections 30230 and 30231 regarding protection of marine resources and offshore habitat.

E. Other environmentally sensitive habitats

1. Applicable Policy

In addition to the sensitive marine habitats identified above, there is one other environmentally sensitive habitat area (ESHA) in the immediate vicinity of the project: a perennial steelhead stream. For such area, the applicable Coastal Act policy provides:

> ***Section 30240(b):*** *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

2. Analysis

Caltrans biologists completed a Natural Environment Study (NES) for the project in August, 2007[14]. Field assessment revealed no sensitive species habitat, except for the steelhead stream. This short segment of the overall stream habitat is found roughly beneath the existing highway bridge.

The central physiographic feature of Limekiln State Park is the deep canyon of Limekiln Creek. This stream drains the seaward face of Cone Peak. At nearly a mile high, this is the highest point in the California Coastal Zone. The various branches of the creek are fed by clear-flowing cold springs on the flanks of the peak, emerging well-filtered by its limestone foundations. These tributaries drop precipitously to the sea, tumbling over one cascade after another until merging in the lower canyon.

The result is the kind of clean, clear, cool, highly oxygenated, rapidly flowing water favored by

[14] The NES included investigation for the presence of all sensitive species, including the endangered Smith's blue butterfly. Concentrations of two different native buckwheat species serve as host plants for the butterfly's larval stage. These plants are known from similar unstable roadside locations along the Big Sur Coast. But, none were found here.

salmonids. This describes Limekiln Creek as it threads its way through redwood forest, before reaching the campground area on the inland side of the highway. Near the mouth of the canyon, the riparian forest finally gives way to a few sparse willows as the creek completes its run under the highway bridge, across the beach to the sea.

Both CDFG and NOAA—Marine Fisheries list this as a steelhead stream, as does the Monterey County Local Coastal Program (Big Sur Coast Land Use Plan, policy 3.4.3.B.3). Under the Endangered Species Act, it is listed as South-Central California Coast Steelhead CSU critical habitat. Upstream, waterfalls block fish passage. But, the lower portion clearly functions as anadromous fish habitat, and therefore is subject to the Coastal Act's policies that protect ESHAs.

In this case, the project will not directly impact the stream or streamside vegetation comprising an ESHA. Nonetheless, precautions are warranted because of the project's proximity to the mouth of the stream. The only reasonable staging area for construction is at the seaward edge of the campground, which is also where the beach access trailhead is located. The access route for construction equipment will be under the bridge, parallel to the stream, as for existing pedestrian access. Thus, the main potential for impact on steelhead habitat would be from contaminants leaking from construction equipment, either parked in the staging area or enroute to the beach, or from any construction equipment that might stray into the stream.

Available avoidance measures
Fortunately, avoidance and risk-minimization measures are available, and will be part of the project as proposed by Caltrans. These measures will prevent significant disruption of the riparian resource, and will assure compatibility with the continuance of healthy stream habitat. Specifically, these avoidance measures include temporary fencing to separate the beach access route for construction equipment from the stream, and adherence to construction and water quality best management practices (BMPs). Caltrans will treat the stream corridor as an environmentally sensitive area (ESA), and the temporary barrier is shown on project plans as "ESA Fencing." The BMPs are designed to avoid accidental spills of fuel, lubricating fluids, and hydraulic fluids that might otherwise enter the stream or nearshore marine environment utilized by the steelhead.

Although already intended by Caltrans, these measures are reinforced through the requirements attached to this permit. These measures include submittal of a detailed construction plan specifying the BMPs, and including further specificity such as use of biodegradable hydraulic fluids in equipment operating in or near the beach and stream area (see Special Condition 1).

3. Other ESHA conclusion
The project will involve the operation of construction equipment near the stream channel of Limekiln Creek, at its mouth beneath the existing Highway 1 bridge and on Limekiln Beach. This channel is essential for steelhead migration. As designed and conditioned, the project will avoid adverse impacts on steelhead migratory habitat. Accordingly, the adjoining ESHA represented by Limekiln Creek as it flows across the beach, and the nearshore marine environment associated with the creek, will be protected from any potential "spillover" impacts from the permitted project. Thus, as conditioned, the

project will therefore be consistent with the requirements of Coastal Act sections 30231 and 30240(b).

3. Conditions of Approval

A. Standard Conditions

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Otherwise, pursuant to special condition 9, the permit shall expire ten years from the date of its issuance. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

B. Special Conditions

1. **Construction Plan.** PRIOR TO COMMENCEMENT OF CONSTRUCTION, the Permittee shall submit two sets of a Construction Plan to the Executive Director for review and approval. The Construction Plan shall, at a minimum, include the following:

   (a) Construction Areas. The Construction Plan shall identify the specific location of all construction areas, all staging areas, all storage areas, all construction access corridors (to the construction site and staging areas), and all public pedestrian access corridors. All such areas within which construction activities and/or staging are to take place shall be consolidated to the maximum extent feasible in order to limit construction encroachment on the beach, to maintain a clear beach access corridor, to minimize disruption of the campground, to avoid Limekiln Creek, and to have the least impact on public access (assuming the park is otherwise open during the construction period) and habitat overall.

   (b) Construction Methods and Timing. The Construction Plan shall specify the construction methods to be used, including all methods to be used to keep the construction areas separated

from public recreational use and habitat areas (including the use of security fencing including or equivalent measures to delineate construction exclusion areas). All erosion control/water quality best management practices to be implemented during construction and their location shall be noted.

(c) Property Owner (State Parks) Consent. The Construction Plan shall be undertaken in accordance with the submitted State Park Right of Entry Permit, executed August 31, 2009. Any proposed changes or amendments to this State Park Right of Entry Permit shall be submitted for Executive Director review, along with written evidence indicating that State Parks has consented to such changes. This requirement applies to use of any State Park properties on which construction activities are to take place, including properties to be crossed in accessing the site. No changes to the approved project shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally necessary.

(d) Construction Requirements. The Construction Plan applies to initial installation of the modified revetment, as well as maintenance of the overall permitted shoreline armoring system at this location (i.e., revetment, seawall/cribwall, splash apron, drainage, and associated landscaping). The Construction Plan shall include the following construction requirements specified by written notes on the Construction Plan. Minor adjustments to the following construction requirements may be allowed by the Executive Director if such adjustments: (1) are deemed reasonable and necessary; and (2) do not adversely impact coastal resources.

- All work shall take place during daylight hours and floodlighting of the beach area is prohibited.
- Construction work or equipment operations shall not be conducted below the mean high tide line unless tidal waters have receded from the authorized work areas.
- Grading and excavation of intertidal areas is prohibited, except for the minimum necessary to establish the keyway for the permitted armoring project. Retrieval of fugitive armor rock is limited to that which can be accomplished without substantial excavation.
- Only rubber-tired construction vehicles are allowed on the beach, except track vehicles may be used if the Executive Director agrees that they are required to safely carry out construction or rock retrieval. When transiting on the beach, all such vehicles shall remain as high on the upper beach as possible and avoid contact with ocean waters and intertidal areas when feasible.
- In order to minimize contamination risk to the marine environment, hydraulic fluids in such vehicles shall be specified as biodegradable (to the extent feasible and consistent with appropriate equipment maintenance practices).
- All construction materials and equipment placed on the beach during daylight construction

hours shall be stored beyond the reach of tidal waters. Except for armoring rock, all loose construction materials and equipment shall be removed in their entirety from the beach area by sunset each day that work occurs. The only other exceptions shall be for erosion and sediment controls and/or construction area temporary boundary fencing where such controls and/or fencing have been previously approved by State Parks.

- Construction (including but not limited to construction activities, and materials and/or equipment storage) is prohibited outside of the defined construction, staging, and storage areas.

- When the State Park is open, no work that would potentially interfere with public use of the beach area southwards of Limekiln Creek shall be allowed. Similarly, no work that would reduce the available beach parking or camping opportunities shall occur during weekends and/or the summer peak months (i.e., from the Saturday of Memorial Day weekend through Labor Day, inclusive), other than the approved staging area. In event of extenuating circumstances (such as tidal issues or other environmental concerns), exceptions may be allowed if both State Parks and the Executive Director authorize such work.

- Equipment washing, servicing, and refueling shall not take place on the beach, and shall only be allowed at a designated inland location as noted on the Plan. Appropriate best management practices shall be used to ensure that no spills of petroleum products or other chemicals take place during these activities.

- The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain, including covering exposed piles of soil and wastes; dispose of all wastes properly, place trash receptacles on site for that purpose, and cover open trash receptacles during wet weather; remove all construction debris from the beach; etc.).

- For any portion of the project where the existing soil surface is disturbed, all erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each workday. At a minimum, with respect to such disturbed areas, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction-related runoff and/or unwanted sediment from entering into Limekiln Creek or the Pacific Ocean.

- All beach areas and all beach access points impacted by construction activities shall be restored to their pre-construction condition or better within three days of completion of construction. Any beach sand impacted shall be filtered or screened as necessary to remove all construction debris from the beach.

- The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office at least three working days in advance of commencement of construction or maintenance activities, and immediately upon completion of construction or maintenance

activities.

All requirements above and all requirements of the approved Construction Plan shall be enforceable components of this coastal development permit. The Permittee shall undertake development in accordance with the approved Construction Plan. Any proposed changes to the Construction Plan shall be reported to the Executive Director. No changes to the approved Construction Plan shall occur without a Commission amendment to this permit unless the Executive Director determines that no amendment is legally necessary.

2. **Construction Site Documents & Construction Coordinator.** DURING ALL CONSTRUCTION:

   (a) Construction Site Documents. Copies of the signed coastal development permit and the approved Construction Plan shall be maintained in a conspicuous location at the construction job site or at the beach access trailhead (at all times the park is open to the public), and such copies shall be available for public review on request. All persons involved with the construction shall be briefed on the content and meaning of the coastal development permit and the approved Construction Plan, and the public review requirements applicable to them, prior to commencement of construction.

   (b) Construction Coordinator. A construction coordinator shall be designated to be contacted during construction should questions arise regarding the construction (in case of both regular inquiries and emergencies), and their contact information (i.e., address, phone numbers, etc.) including, at a minimum, a telephone number that will be made available 24 hours a day for the duration of construction, shall be conspicuously posted at the job site where such contact information is readily visible from public viewing areas, along with indication that the construction coordinator should be contacted in the case of questions regarding the construction (in case of both regular inquiries and emergencies). The construction coordinator shall record the name, phone number, and nature of all complaints received regarding the construction, and shall investigate complaints and take remedial action, if necessary, within 24 hours of receipt of the complaint or inquiry.

3. **Aesthetic Treatment Measures**. WITHIN TWO (2) MONTHS OF ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the Permittee shall submit, for review and approval by the Executive Director, an aesthetic treatment plan to mitigate the visual impact of man-made shoreline protection structures in this highly scenic area. The overall mitigation objective is to evoke natural colors, textures and surface undulations appropriate to this beach area and State Park context, to the maximum extent feasible. Proposed measures for this purpose shall be of a nature that can be left in place, or can be readily removed if need be upon future removal of the permitted rock slope protection structure(s).

   At minimum, all exposed concrete surfaces and incongruously-colored imported rock, whether within or immediately adjoining the permitted rock slope protection structure, shall be colored or stained to mimic the naturally-occurring rock seen in surrounding natural bluff faces.

Similarly, the visual impact of the existing concrete splash apron, above-surface downdrain culvert pipes, and other incongruous lineal elements associated with the permitted rock slope protection structure, shall be reduced, to the extent feasible. Examples of appropriate measures for consideration include trenching to bury pipes, covering with earthen materials, installation of native plantings, contouring, and texturing to increase visual roughness. In determining feasibility, the limited duration of the improvements authorized by this permit shall be considered.

All approved measures shall be in place WITHIN THREE MONTHS OF PLACEMENT OF THE PERMITTED ROCK SLOPE PROTECTION or PRIOR TO SCHEDULED RE-OPENING OF THE PARK, whichever is later.

4. **As-Built Plans.** WITHIN THREE (3) MONTHS OF COMPLETION OF CONSTRUCTION, the Permittee shall submit two copies of As-Built Plans showing all development completed pursuant to this coastal development permit; all property lines; and all highway structures inland of the existing and permitted revetment structures. The As-Built Plans shall be substantially consistent with the submitted project plans . The As-Built Plans shall include a graphic scale and all elevation(s) shall be described in relation to National Geodetic Vertical Datum (NGVD). The As-Built Plans shall include color photographs (in hard copy and jpg format) that clearly show the as-built project, and that are accompanied by a site plan that notes the location of each photographic viewpoint and the date and time of each photograph. At a minimum, the photographs shall be from upcoast, seaward, and downcoast viewpoints, seen from the edge of the highway; and from a sufficient number of beach viewpoints as to provide complete photographic coverage of the permitted and existing revetments. Such photographs shall be at a scale that allows comparisons to be made with the naked eye between photographs taken in different years and from the same vantage points; recordation of GPS coordinates would be desirable for this purpose. The As-Built Plans shall be submitted with certification by a licensed civil engineer with experience in coastal structures and processes, acceptable to the Executive Director, verifying that the revetment has been constructed in conformance with the submitted project plans.

5. **Future Monitoring and Maintenance.** This coastal development permit requires ongoing monitoring of the overall permitted shoreline armoring system at this location (i.e., revetment, seawall/cribwall, splash apron, drainage, and associated landscaping), and authorizes future maintenance as described in this special condition. The Permittee acknowledges and agrees on behalf of Caltrans and all successors and assigns that: (a) it is Caltrans' responsibility to maintain the overall permitted shoreline armoring system in a structurally sound manner and in its approved state; (b) it is Caltrans' responsibility to retrieve loose armor rock that might otherwise substantially impair the recreational qualities of Limekiln Beach; and (c) it is Caltrans' responsibility to annually or more often inspect the overall permitted shoreline armoring system for signs of failure and/or displaced armor rock. Any such maintenance-oriented development associated with the approved as-built overall permitted shoreline armoring system shall be subject to the following:

   (a) Construction Site Documents. Copies of the signed coastal development permit and the approved Construction Plan shall be maintained in a conspicuous location at the construction job

site or at the beach access trailhead (at all times the park is open to the public), and such copies shall be available for public review on request. All persons involved with the construction shall be briefed on the content and meaning of the coastal development permit and the approved Construction Plan, and the public review requirements applicable to them, prior to commencement of construction.

(b) Maintenance. "Maintenance," as it is understood in this condition, means development that would otherwise require a coastal development permit whose purpose is to repair and/or maintain the overall permitted shoreline armoring system in its approved configuration, including retrieval of armor rock that may be displaced from the approved structure.

(c) Maintenance Parameters. Maintenance shall only be allowed subject to the parameters of the approved Construction Plan required by Special Condition 1, above. Any proposed modifications to the approved construction plan and/or beach restoration requirements associated with any maintenance event shall be reported to planning staff of the Coastal Commission's Central Coast District Office with the maintenance notification (described below), and such changes shall require a coastal development permit amendment unless the Executive Director deems the proposed modifications to be minor in nature (i.e., the modifications would not result in additional coastal resource impacts).

(d) Other Agency Approvals. The Permittee acknowledges that these maintenance stipulations do not obviate the need to obtain permits from other agencies for any future maintenance and/or repair episodes.

(e) Maintenance Notification. Prior to commencing any maintenance event, the Permittee shall notify, in writing, planning staff of the Coastal Commission's Central Coast District Office. Except for necessary emergency interventions, such notice shall be given by regular mail or e-mail at least two weeks in advance of the actual commencement of work. The notification shall include a detailed description of the maintenance event proposed, and shall include any plans, engineering and/or geology reports, proposed changes to the maintenance parameters, other agency authorizations, and other supporting documentation describing the maintenance event. The maintenance event shall not commence until the Permittee has been informed by planning staff of the Coastal Commission's Central Coast District Office that the maintenance event complies with this coastal development permit. If the Permittee has not received a response within 30 days of receipt of the notification by the Coastal Commission's Central Coast District Office, the maintenance event shall be authorized as if planning staff affirmatively indicated that the event complies with this coastal development permit. The notification shall clearly indicate that the maintenance event is proposed pursuant to this coastal development permit, and that the lack of a response to the notification within 30 days of its receipt constitutes approval of it as specified in the permit.

(f) Maintenance Coordination. Maintenance events shall, to the degree feasible, be coordinated with State Parks, with the goal being to limit coastal resource impacts, including the length of

time that construction occurs in and around the beach area and beach access points at Limekiln Beach.

(g) Non-compliance Proviso. If the Permittee is not in compliance with the conditions of this permit at the time that a maintenance event is proposed, then the maintenance event that might otherwise be allowed by the terms of this future maintenance condition may not be allowed by this condition, subject to determination by the Executive Director.

(h) Emergency. Nothing in this condition shall serve to waive any Permittee rights that may exist in cases of emergency pursuant to Coastal Act Section 30611, Coastal Act Section 30624, and Subchapter 4 of Chapter 5 of Title 14, Division 5.5, of the California Code of Regulations (Permits for Approval of Emergency Work).

(i) Duration of Covered Maintenance. Future maintenance under this coastal development permit is allowed subject to the above terms for TEN (10) YEARS FROM THE DATE OF PERMIT ISSUANCE. Maintenance can be carried out beyond the 10-year period if the Executive Director extends the maintenance term in writing. The intent of this permit is to regularly allow for 10-year extensions of the maintenance term unless there are changed circumstances that may affect the consistency of this maintenance authorization with the policies of Chapter 3 of the Coastal Act and thus warrant a re-review of this permit.

6. MBNMS Review and authorization. PRIOR TO COMMENCEMENT OF CONSTRUCTION, the Permittees shall submit to the Executive Director for review a copy of the Monterey Bay National Marine Sanctuary (MBNMS) permit, letter of permission, or evidence that no MBNMS permit is necessary for the approved project. Any changes to the approved project required by the Sanctuary shall be reported to the Executive Director. No changes to the approved project shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally necessary.

7. State Lands Commission Authorization. PRIOR TO COMMENCEMENT OF CONSTRUCTION, the Permittee shall submit to the Executive Director for review a copy of the State Lands Commission authorization to allow the approved project, or evidence that no State Lands Commission authorization is necessary. Any changes to the approved project required by the State Lands Commission shall be reported to the Executive Director. No changes to the approved project shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally necessary.

8. Public Access/Sand Supply Mitigation.

(a) Beach Access. A continuously available pedestrian beach access route that is safely separated from construction equipment movements by temporary fencing parallel to and set back from Limekiln Creek shall be provided during the construction period.

(b) Rock Retrieval. All rock located on the beach that is not located within the existing permitted configuration of the revetment shall be removed as part of project construction (except for deeply embedded rock, the removal of which would substantially disrupt the beach).

(c) Construction Restoration. All beach areas, equipment access routes, and campground areas impacted by permitted construction activities shall be restored to their pre-construction condition or better immediately following revetment completion.

(d) State Parks Improvements. Prior to commencement of construction, the Permittee shall pay $18,900 to State Parks to fund in-kind recreational improvements including but not limited to rehabilitation and improvement of the State Park entrance road, campsites, beach trailhead parking area and associated restroom facilities, picnic tables, trails, interpretive signage, and the useable sandy beach itself.

(e) Right of Entry Permit. The permitted development shall be completed in accordance with the submitted State Park Right of Entry Permit, executed August 31, 2009. Any proposed changes or amendments to this State Park Right of Entry Permit shall be submitted for Executive Director review, along with written evidence indicating that State Parks has consented to such changes. This requirement applies to use of any State Park properties on which construction activities are to take place, including properties to be crossed in accessing the site. No changes to the approved project shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally necessary.

9. Term of Permit/Armoring Removal. This coastal development permit SHALL EXPIRE TEN YEARS FOLLOWING ISSUANCE.

Further, in order to assure orderly progress towards a long range solution to shoreline erosion at Limekiln Beach, Permittee shall submit to the Executive Director a progress report that confirms that the project development process is proceeding in the manner outlined by the Timeline attached as Exhibit G. Such report shall be submitted to the Executive Director for confirmation FIVE YEARS AFTER PERMIT ISSUANCE. Extension of this report submittal date or permit expiration date may be requested prior to the expiration date through the procedures for amendments to coastal development permits.

All shoreline armoring at this location (i.e., revetment, seawall/cribwall, splash apron, and drainage), including all imported rock, metal and concrete shall be removed and the affected area restored to natural bluff and beach conditions by the expiration date of this permit, or upon completion of the identified long term highway protection measures, whichever occurs first. The Permittee shall submit, for Executive Director review and approval, a reclamation plan for such purposes PRIOR TO EXPIRATION OF THIS PERMIT. The required reclamation plan shall include environmentally sensitive area protective fencing, water quality best management practices, and all other applicable resource protection measures as were approved for the Construction Plan (to be submitted in

accordance with Special Condition 1 above). Upon completion, Permittee shall provide written evidence from State Parks that the reclamation work has satisfactorily restored the bluff and beach to a natural condition, including restoring the beach area so that it is suitable and appropriate for public recreational use.

10. **Assumption of Risk, Waiver of Liability, and Indemnity Agreement.** By acceptance of this permit, the Permittee acknowledges and agrees on behalf of themselves and all successors and assigns:

    (a) That the site is subject to extreme coastal hazards including but not limited to episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunami, coastal flooding, landslides, bluff and geologic instability, and the interaction of same;

    (b) To assume the risks to the Permittee and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development;

    (c) To unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards;

    (d) To indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards; and,

    (e) That any adverse effects to property caused by the permitted project shall be fully the responsibility of the Permittee.

4. California Environmental Quality Act (CEQA)

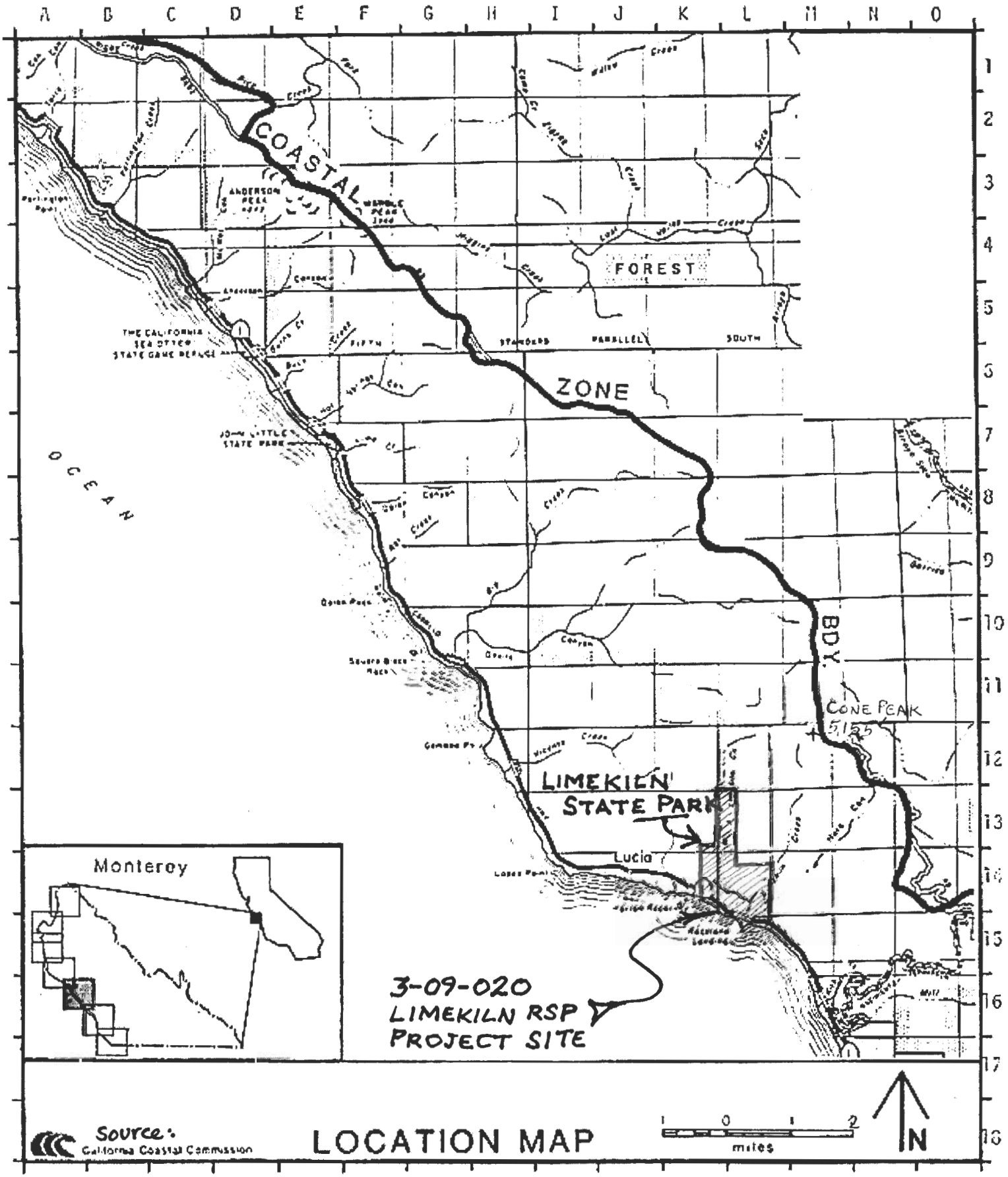
Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with coastal development permit applications showing the application to be consistent with any applicable requirements of CEQA. Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect that the activity may have on the environment.

Caltrans, acting as the lead CEQA agency, completed a Natural Environment Study (NES) and other studies for the project. Caltrans concluded that, with the incorporation of various avoidance and minimization measures, the project would not have significant environmental impacts. Caltrans has incorporated such measures into its project proposal, and determined that the project is Categorically Exempt under CEQA (November, 29, 2007).

The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary

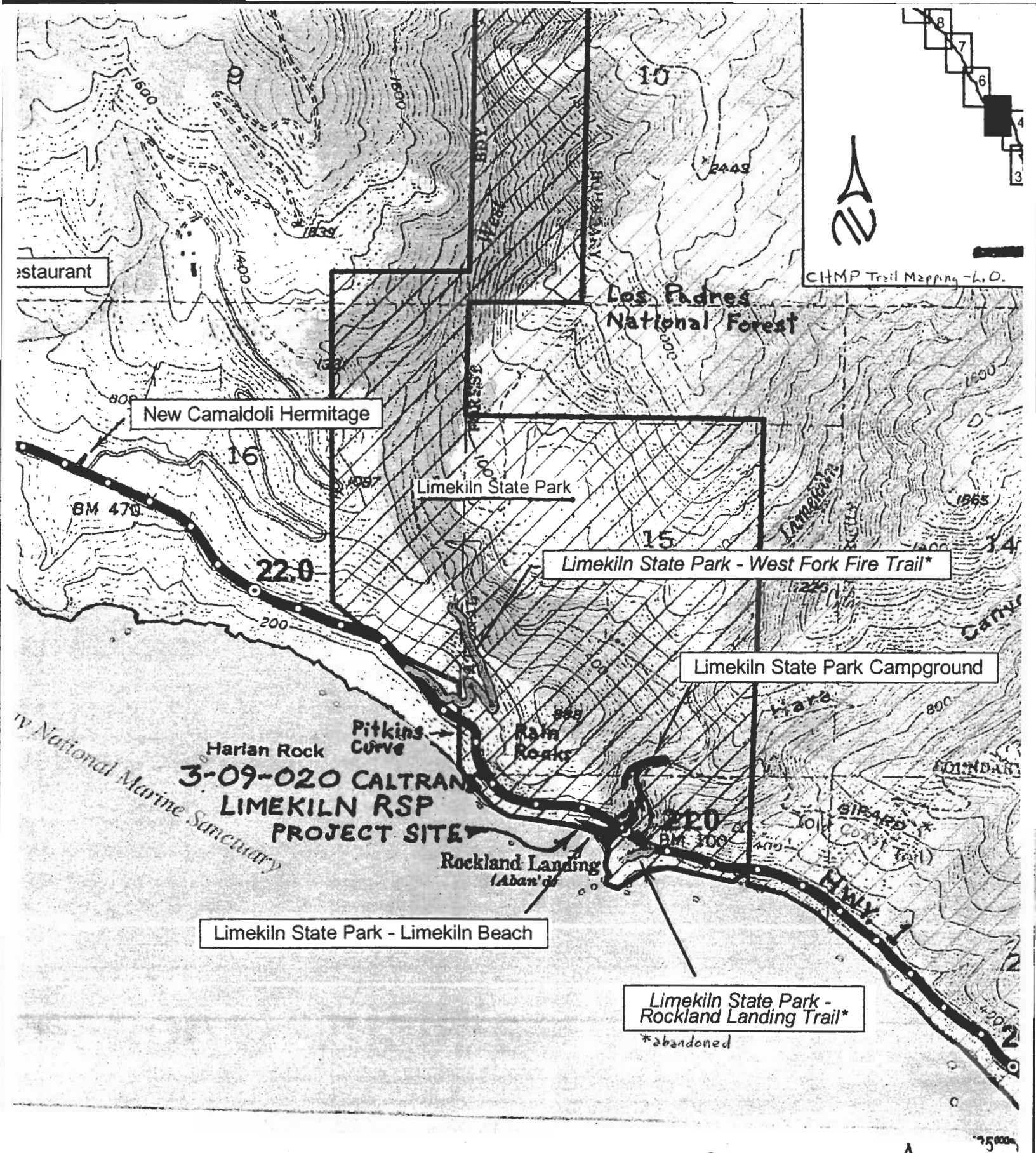
of Resources as being the functional equivalent of environmental review under CEQA. The preceding coastal development permit findings discuss the relevant coastal resource issues with the proposal, and the permit conditions identify appropriate modifications to avoid and/or lessen any potential for adverse impacts to said resources. All public comments received to date have been addressed in the findings above, which are incorporated herein in their entirety by reference.

As such, there are no additional feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse environmental effects which approval of the proposed project, as conditioned, would have on the environment within the meaning of CEQA. Thus, if so conditioned, the proposed project will not result in any significant environmental effects for which feasible mitigation measures have not been employed consistent with CEQA Section 21080.5(d)(2)(A).



County of Monterey

CCC Exhibit A
(page 1 of 2 pages)



CCC Exhibit A
(page 2 **of** 2 **pages)**

BIG SUR —
Lucia Coast

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	MON	1	21.2	3	

REGISTERED CIVIL ENGINEER DATE — MARK BALLENTINE No. 64101 Exp. 9-30-10 CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

NOTE:
1. FINAL PLACEMENT OF TEMPORARY CONSTRUCTION ENTRANCE TO BE DETERMINED BY ENGINEER.
2. FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

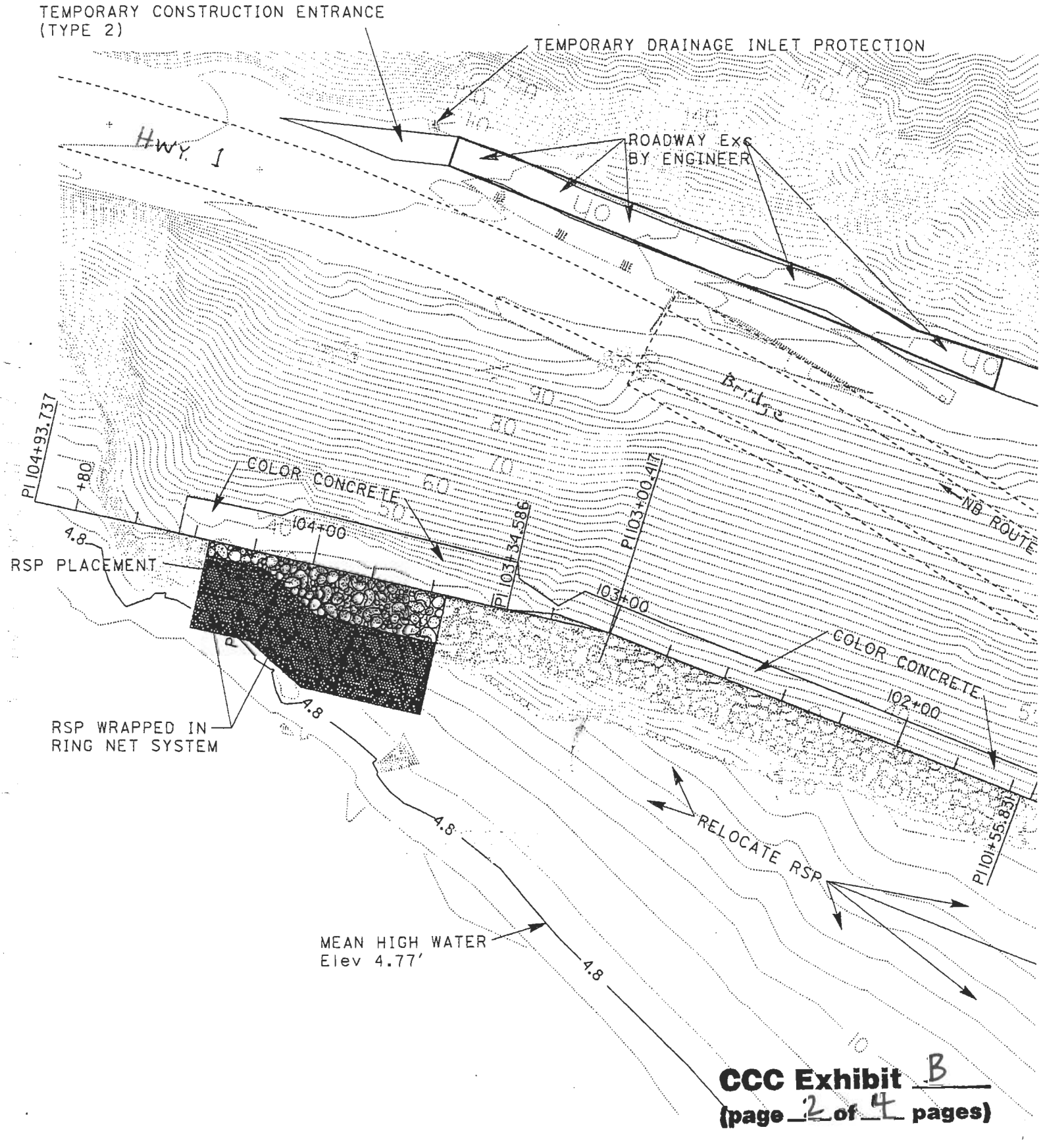
TEMPORARY CONSTRUCTION ENTRANCE (TYPE 2)
TEMPORARY DRAINAGE INLET PROTECTION
Hwy. 1
ROADWAY Exc BY ENGINEER
HAUL ROAD (temp.)
PRUNE EXISTING PLANTS
HAUL ROAD (e)
ESA FENCING
COLOR CONCRETE
RSP PLACEMENT
RSP WRAPPED IN RING NET SYSTEM
NB ROUTE 1
LIMEKILN CREEK BRIDGE
STAGING AREA
BEACH ACCESS
ESA FENCING
RELOCATE RSP
"A" LOL
LIMEKILN CREEK
MEAN HIGH WATER Elev 4.77'
PROJECT SITE
BEACH
ESA FENCING

LAYOUT SHEET
SCALE: 1" = 50' L1

STATE	CALIFORNIA	DESIGN	SUPERVISING ENGINEER	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
Caltrans			RON KRAEMER	MARK BALLENTINE	RON KRAEMER		

LAST REVISION 01-27-09 | DATE PLOTTED = 03-FEB-2009 | TIME PLOTTED = 15:02

EXHIBIT 2
(page 1 of 4 pages)



CCC Exhibit B
(page 2 of 4 pages)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	MON	1	21.2	2	

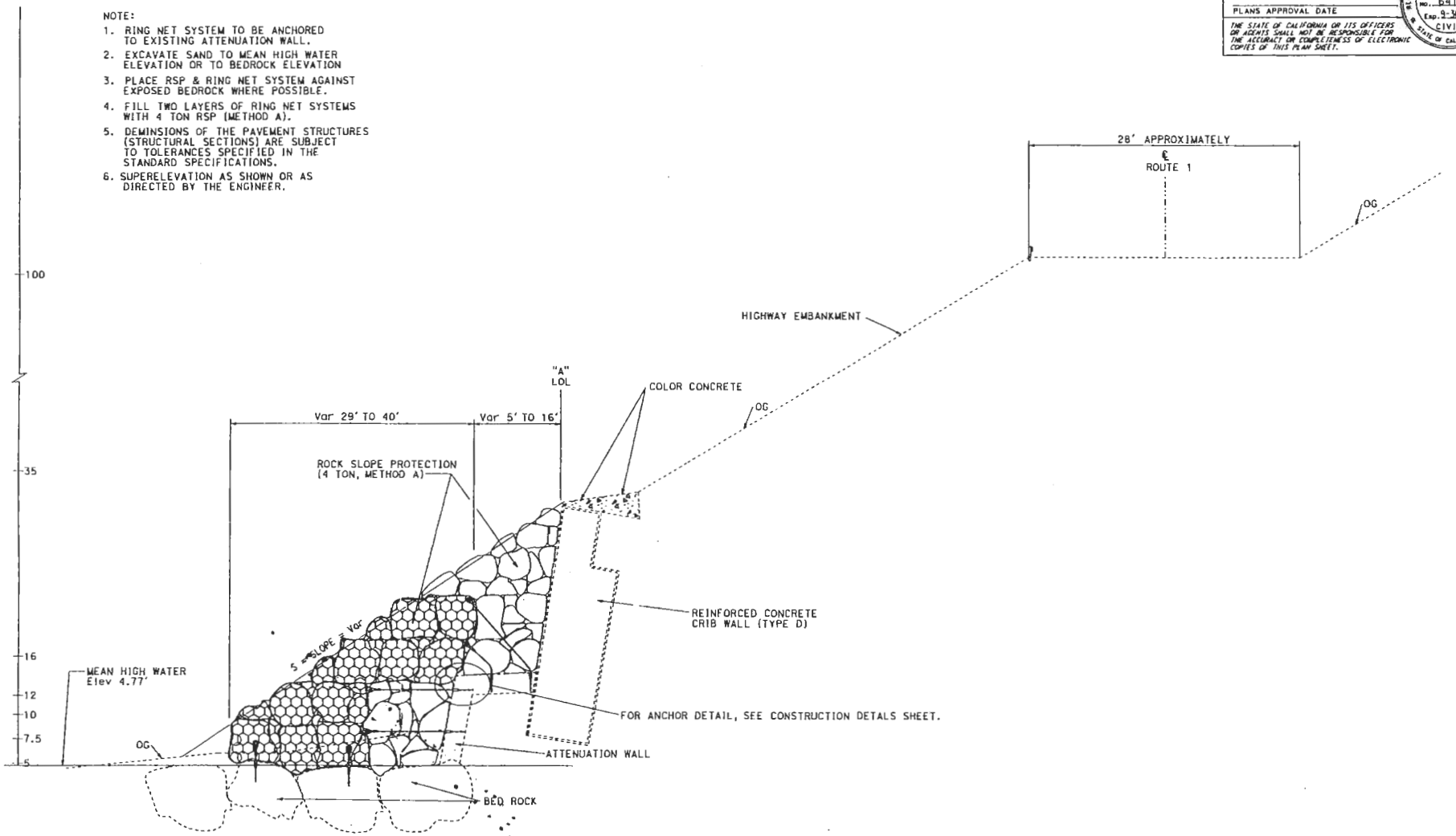
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER MARK BALLENTINE No. 64101 Exp. 9-30-10 CIVIL STATE OF CALIFORNIA

NOTE:
1. RING NET SYSTEM TO BE ANCHORED TO EXISTING ATTENUATION WALL.
2. EXCAVATE SAND TO MEAN HIGH WATER ELEVATION OR TO BEDROCK ELEVATION
3. PLACE RSP & RING NET SYSTEM AGAINST EXPOSED BEDROCK WHERE POSSIBLE.
4. FILL TWO LAYERS OF RING NET SYSTEMS WITH 4 TON RSP (METHOD A).
5. DEMINSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
6. SUPERELEVATION AS SHOWN OR AS DIRECTED BY THE ENGINEER.



ROCK SLOPE PROTECTION & RING NET SYSTEM
S = 1:1.5 STA 103+55 TO 103+95
S = 1:1 STA 104+15 TO 104+35

ELEVATIONS SHOWN ARE APPROXIMATE, VERTICAL SCALE EXAGGERATED.

TYPICAL CROSS SECTION
NO SCALE

X-1

STATE OF CALIFORNIA	SUPERVISING ENGINEER	CALCULATED-DESIGNED BY	AARON WOLFRAM	REVISED BY	
DEPARTMENT OF TRANSPORTATION	RON KRAEMER	CHECKED BY	MARK BALLENTINE	DATE REVISED	
DESIGN					

LAST REVISED: DATE PLOTTED = 30-JAN-2009
01-27-09 TIME PLOTTED = 14:14

Exhibit 12
(page 3 of 4 pages)

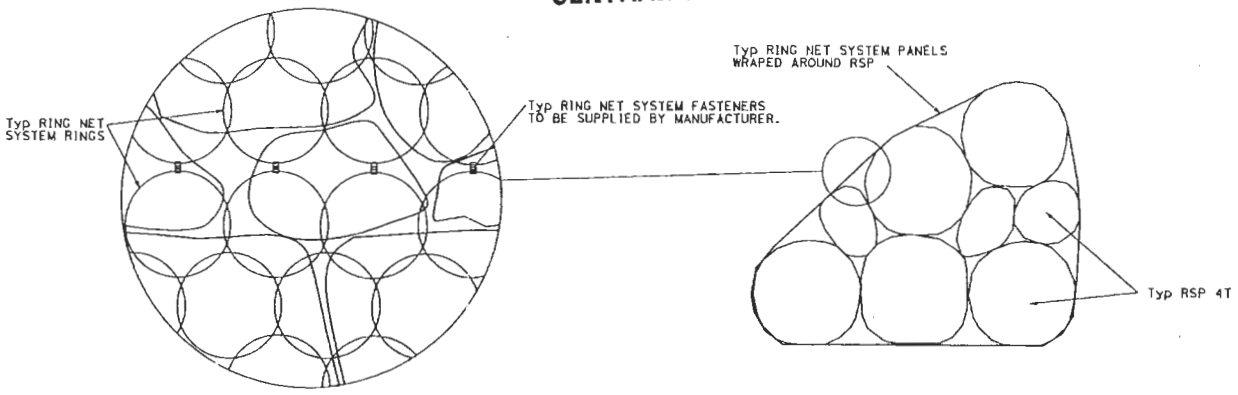
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	MON	1	21.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

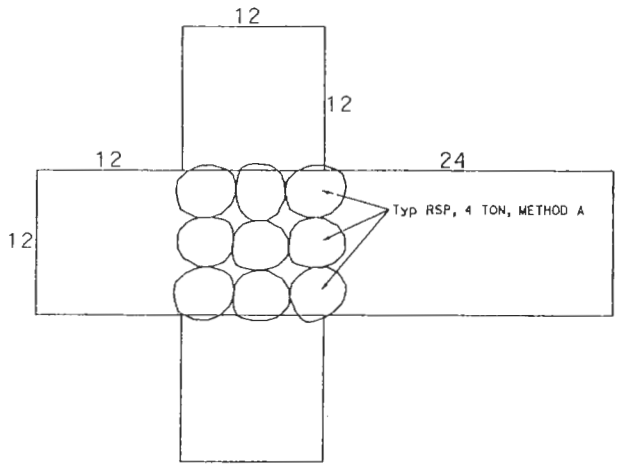
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — MARK BALLENTINE — No. 64101 — EXP. 9-30-10 — CIVIL — STATE OF CALIFORNIA

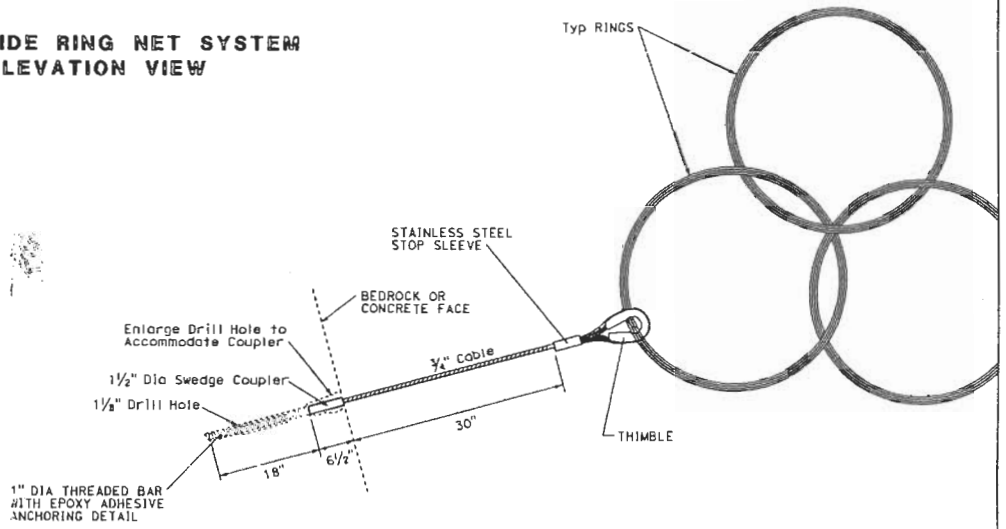


RSP INSIDE RING NET SYSTEM FRONT VIEW

RSP INSIDE RING NET SYSTEM ELEVATION VIEW



TYPICAL RING NET SYSTEM LAYOUT PLAN VIEW



TYPICAL CABLE ANCHOR DETAILS

STATE OF CALIFORNIA — DEPARTMENT OF TRANSPORTATION — DESIGN
CALCULATED-DESIGNED BY: MARK BALLENTINE
CHECKED BY: RON KRAEMER
FUNCTIONAL SUPERVISOR: RON KRAEMER
REVISED BY
DATE REVISED

CONSTRUCTION DETAILS

NO SCALE

C-1

LAST REVISION — DATE PLOTTED = 30-JAN-2009 — TIME PLOTTED = 16:54
01-30-09

CCC Exhibit 8 (page 4 of 4 pages)

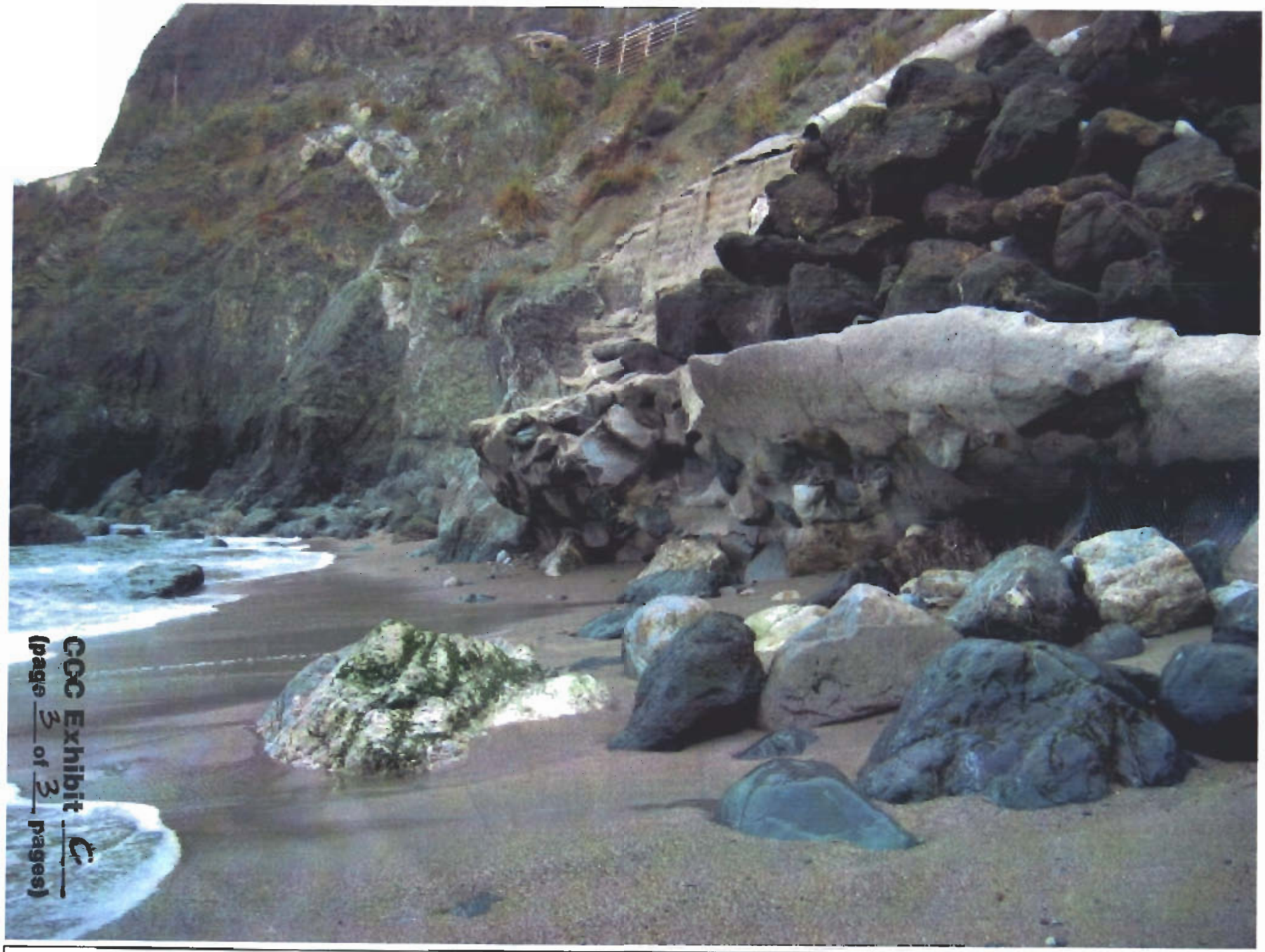
Source: California Coastal Records Project

Limekiln Creek Bridge # 44-58 Mon-1-20.95 / 21.07

Exhibit C
(3 pages)

Source: Caltrans

CCC Exhibit C
(page 2 **of** 3 **pages)**



CCC Exhibit 6c
(page 3 of 3 pages)

North end of Limekiln RSP in August, 2005

Source: Caltrans

MONTEREY COUNTY
RESOURCE MANAGEMENT AGENCY

PLANNING DEPARTMENT, Mike Novo, Director

168 W. Alisal St., 2nd Floor
Salinas, CA 93901

(831) 755-5025
FAX (831) 757-9516

February 2, 2009

California Coastal Commission
Central Coast District Office; Attn: Dan Carl, District Manager
725 Front Street, Suite 300
Santa Cruz, CA 95060-4508

SUBJECT: Rock Slope Protection (RSP) Project at Limekiln State Beach in Big Sur

Dear Mr. Carl,

On behalf of the California Department of Transportation (Caltrans)-District 5, the County of Monterey requests that the Rock Slope Protection (RSP) Project at Limekiln State Beach in Big Sur be considered for combined processing by the Coastal Commission. Per § 30601.3 of the California Coastal Act, the Coastal Commission may process and act upon a consolidated coastal development permit application if the proposed project requires a coastal development permit from both a local government with a certified local coastal program and the commission, the applicant, the local government and the commission (Executive Director), consent to consolidate the permit action, and public participation is not substantially impaired by that review consolidation.

Caltrans is proposing a project to repair the existing rock slope protection (RSP) located along the north end of Limekiln State Beach. The purpose of this project is to protect the north abutment of Limekiln Creek Bridge. The north bridge abutment is built into a bench on the ocean facing side of the slope. The slope is situated close to the ocean, exposing it to high-energy waves and continual erosion. The goal of the proposed project is to maintain slope stabilization for approximately 10 years. Past placement of RSP, with elements weighing as much as 10 to 12-tons have been unsuccessful.

The project, as proposed by Caltrans, involves excavating a trench down to bedrock in front of the current slope protection in order to establish a firm base and toe for the placement of RSP. Large diameter (12 to 18 inch) ring netting will be placed in the excavated area and lined with existing 2-6 ton boulders, which are scattered along the beach from past RSP projects. Larger 8-10 ton boulders will be placed on top of the ring nets in layers to form an approximately 11-foot high, 17-foot wide and 14-feet long structure. The ring nets will be anchored to the existing sea wall and to each other by cables and cable anchors.

The County agrees that consolidated processing would be appropriate in this case since a portion of the site area lies within coastal original jurisdiction. Thank you for your consideration of this request. Please confirm that the Coastal Commission will process and act upon a consolidated coastal development permit application for the project described above. If you would like to discuss further, please contact me at (831) 755-5103.

Sincerely,

Carl Holm
Assistant Director

CCC Exhibit D
(page 1 of 1 pages)

STABILIZATION

ROCK SLOPE AND SHORELINE PROTECTION

Description

Large rock used to alleviate stream bank erosion or bluff retreat is known as rock slope protection (RSP). RSP armors slopes that support features of the highway against scour in a stream or the erosive action of tidal and wave action along the shoreline. Sizing the rock will depend on the magnitude of the erosive forces and it may be either grouted or ungrouted. Other methods of shoreline protection include seawalls and wire mesh gabions (wire baskets filled with rock and interwoven).

Application Criteria

Shoreline protection is considered where it is not practicable, either from an engineering standpoint or the allowable time, to implement a long-term solution such as relocating the highway away from the erosive forces or onto competent rock. Choice of type and design will depend on site-specific coastal processes and conditions including wave run-up, elevation of mean high water; shoreline morphology, erosion rates, coastal access, aesthetics and costs. The guiding principle for engineering design is to stabilize the shoreline; issues of sediment supply and potential effects to the nearshore habitats must be considered for suitability to an individual site.

Considerations

- *Prevents undermining or erosion of the roadway embankment from tidal and wave action*
- *Cost effective*
- *Flexible, allowing some shifting of rock without compromising overall stability*
- *Effects to nearshore environment*
- *Susceptible to ongoing damage and erosion*
- *Design choices must consider visual compatibility with the natural shoreline.*
- *Artificial structures can upset natural balances of sediment flux, including seasonal variations of beach sand*

Sample Locations

- Arroyo Del Oso, north of Piedra Blancas in San Luis Obispo County (SLO-1-65.3)
- Alder Creek (MON-1-7.9)
- → Limekiln Creek (MON-1-20)
- Rocky Creek (MON-1-60.0)

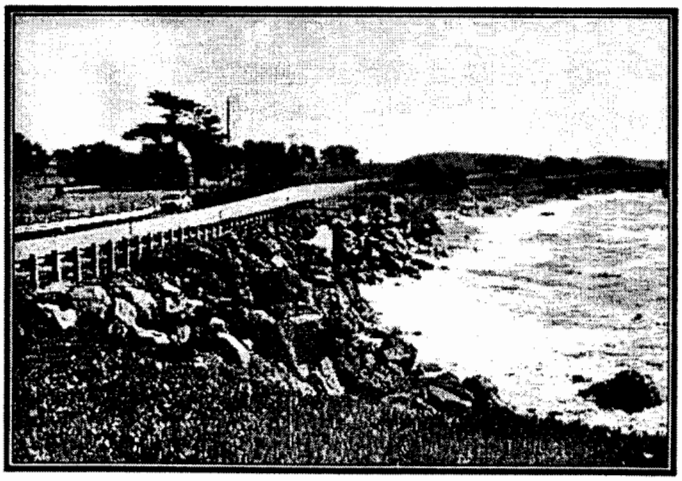


Figure 15: Rock slope protection has been used as a temporary measure at Arroyo Del Oso until a long-term solution to realign the highway can be implemented.

ATTACHMENT A

Alternatives Analysis for the Limekiln Creek Bridge

Alternative 1: Relocate and Separate

Description	Pros	Cons
• Construct a new bridge (complex arch configuration) with an optimized alignment over Limekiln Creek set approximately 98-feet east of the existing bridge. Would required 2 large tieback walls for the cut slopes on the North and South ends of bridge and along East side of the road. • New bridge would be 35-feet wide, 492-feet in length, have a 2-lane (12-foot wide) roadway, and 4-foot shoulders • Cost estimated at $16,880,000	• Eliminates needs to protect/maintain eroding north embankment from high energy waves • Improves access to Limekiln State Park by providing dedicated turn pockets for northbound and southbound traffic	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal. • Requires considerable earthwork, cut slopes, and right-of-way/construction easements within Limekiln State Park • Requires a minimum 54 month duration to complete the EIR/EIS • Current condition of embankment requires immediate action

Alternative 2: Relocate and Separate

Description	Pros	Cons
• Construct a 2-lane 1,837-foot (0.35 mile) long tunnel into the existing hillside and a complex arch configuration bridge • Route 1 would be realigned to the east, with the North portal located near Pitkins Curve and the South portal located at Limekiln Creek – 230-feet east of the existing bridge • Includes retaining walls and both portals along with required ventilation and electrical system required for the tunnel • Roadway includes 2-lanes (12-foot wide) and 4-foot shoulders • Cost estimated at $104,152,500	• Improves access to Limekiln State Park by providing dedicated turn pockets for northbound and southbound traffic • Eliminates needs to protect/maintain eroding north embankment from high energy waves	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal. • Requires further study beyond the Project Initiation Document phase • Needs additional geotechnical analysis for the exact location of the North and South portals • Requires considerable earthwork, cut slopes, and right-of-way/construction easement acquisitions within Limekiln State Park • Nearest commercial power source is located more than 9.3 miles north of the site. • Construction impacts Route 1 traffic • Requires a 54 minimum month duration to complete the EIR/EIS • Current condition of embankment requires immediate action

Alternative 3: Stabilize

Description	Pros	Cons
• Retrofit the existing bridge foundation; includes strengthening, lengthening, and maintenance of the existing bridge • Involves strengthening externally existing Bents 6,7,8,9, and Abutment 10, and lengthening existing bridge with a new slab structure • Traffic will remain open on a 1-lane road with the use of a signal light • Recommended for further study • Cost estimated at $10,080,000	• Construction duration is 1 to 2 years • IS/EA leading to an ND/CE is the anticipated environmental document • Schedule anticipated to be 18 months • No work conducted within the ocean or inter-tidal zone • Meets purpose and need with less environmental impact than other structural alternatives	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal. • Results in significant traffic delays during construction • Current condition of embankment requires immediate action

Alternative 4: Manage and Protect

Description	Pros	Cons
• Wrap several 4-ton rocks within interlocking steel ring-net systems and place at toe of slope along the north end of beach to protect slope from wave attack. • 4 to8-ton RSP placed along the northern end of beach in 1995 is completely gone. • Existing shoreline revetments along the north end of beach has a remaining life span of less than 2 years. • Cost estimated at $1,000,000 • **Current Proposal**	• Project programmed with funding currently available • RSP dissipates high-energy wave action to eliminate soil erosion on the embankment supporting existing bridge foundations • Create large collective rock masses designed to flex with wave energy but not be displaced. • Engineered foundation and use of ring net system will increases lifespan and performance of RSP	• RSP is considered a long-term, interim measure to protect bridge footings and protect the roadway

Alternative 5: Manage and Protect

Description	Pros	Cons
• Construct seawall at the beach elevation that would deflect the wave energy • Location of proposed seawall is at the location of existing crib walls • Cost estimated at $12,343,750	• Eliminates erosion at the north end embankment that supports the northern portion of the bridge • Initially provides additional beach access • A ND/FONSI is the anticipated environmental document	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal. • May eventually cause or contribute to beach erosion resulting in an eventual loss of beach access • Environmental study duration of minimum 40 months • Current condition of embankment requires immediate action

Alternative 6: Manage and Protect

Description	Pros	Cons
• Construct a floating breakwater to dissipate wave energy prior to waves reaching the beach • Places approximately 787-foot long floating breakwater where the ocean depth is 15-feet deep at mean low tide (approx. 394-feet from shore) • Plastic modules designed to dissipate the wave energy comprises the breakwater, which is anchored via chains connected to large concrete blocks resting on the ocean floor • A 49-foot overlap in the breakwater sections will keep the full energy of waves from reaching the beach. • Cost estimated at $3,678,750	• Eliminates beach erosion and potentially promotes beach nourishment • 2 openings in the floating breakwater system allows for the passage of small watercraft (kayaks and small boats) • A ND/FONSI is the anticipated environmental document	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal • Actual design may very from what is proposed • Environmental study duration of 40 months • Potential impacts to the sea floor caused by breakwater anchors • Cost of marine environmental study requirements cannot be anticipated or estimated with any level of confidence due to novelty of the design • Current condition of embankment requires immediate action

Alternative 7: Manage and Protect

Description	Pros	Cons
• Supplement the natural protective shoreline features with rock along the promontories • 10-ton to 12-ton rock will be placed from low tide elevation in the surf, extend seaward, and connect with the promontory along the south facing beach • The area will be filled with rock (from Cambria and placed from a floating barge) and incline with a 3:1 slope to the ocean bottom • Consultant with ocean engineering experience will assist in developing the alternative • Cost estimated at $5,402,500	• Appears that only supplementing the north promontory is necessary, but would have to be confirmed during the initial studies • A ND/FONSI is the anticipated environmental document	• Not a viable alternative at this time due to lack of funding, highly expensive in comparison to current proposal • Significant sea floor and visual impacts • Environmental study duration of minimum 40 months • Current condition of embankment requires immediate action

Alternative 8: No build alternative

Description	Pros	Cons
• Continue monitoring embankment and take action only during an emergency situation • Cost estimate depends upon seriousness of emergency	• Extensive environmental study is unnecessary	• Emergency situation would likely cause road failure requiring a closure with extensive traffic detours resulting in potential compromise of public safety.

Caltrans Timeline for Long-Term Project at Highway 1 and Limekiln Creek

	Activity/Document	Milestone(Meeting/Deliverable)	Anticipated Date
1	Begin Project Initiation Document (PID) for long-term solution	CCC staff may request to attend PDT meetings during development of PID	9/1/2010
2	Complete PID for long-term solution/alternative	PID	9/1/2011
3	Submit Project for inclusion in the 2012 SHOPP funding	Does not mean it will be approved	9/1/2011
4	*SHOPP Funds Awarded	If awarded	7/1/2012
5	Notice of Preparation (NOP)	NOP	8/1/2012
6	Begin Project Approval and Environmental Document (PAED)	PDT meetings	8/1/2012
7	Public Scoping meeting	BSMAAC and LUAC	8/1/2012
8	Agency Scoping Meeting to determine the preliminary Environmental Technical Studies, Impacts to be evaluated, methodology and analysis, range of alternatives, areas of concern	Meetings held with resource agencies with jurisdiction or who have an interest in the project.	9/1/2012
9	Begin siting surveys to identify routes		9/8/2012
10	End siting surveys		2/1/2013
11	Begin detailed env. tech. Studies (Cultrual, Paleo, Bio, Air/Noise/Water, Haz.Waste, Visual)		3/1/2013
12	End detailed env. tech. Studies	Technical Document may be available upon request	3/1/2015
13	Prepare Draft EIR	DEIR	3/1/2015
14	Circulate Draft EIR - Notice of Availability (NOA) and Notice of Completion (NOC)		9/1/2016
15	45 Day Public review period - public hearings sometime within this 45 day period.		10/15/2016
16	Incoprorate Public Comment		2/1/2017
17	Prepare Final EIR	FEIR	8/1/2017
18	FEIR agency review-provide written proposed response to public agencies that commented on the Draft EIR 10 days prior to FEIR cert.		8/1/2017
19	FEIR Certification - must be done before approving project	PAED complete	8/12/2017
20	Prepare Findings		8/12/2017
21	Statement of Overriding Considerations (SOC)	SOC	8/12/2017
22	Notice of Determination (NOD) must be filed within 5 days of project approval (PAED)	NOD	8/16/2017
23	Begin PSE		9/16/2017
24	End PSE		4/16/2018
25	RTL		7/16/2018
26	Approve Contract		1/16/2019
27	Complete Construction		7/16/2021

Source: Caltrans District 5

CCC Exhibit 6
(page 1 of 1 pages)

MONTEREY COUNTY

RESOURCE MANAGEMENT AGENCY

PLANNING DEPARTMENT, Mike Novo, Director
168 W. Alisal St., 2nd Floor
Salinas, CA 93901

(831) 755-5025
FAX (831) 757-9516

August 14, 2009

California Coastal Commission
Attn: Katie Morange
725 Front Street, Suite 300
Santa Cruz, CA 95060

RE: California Department of Transportation – Slope protection/Seawall repair at Limekiln State Park, Big Sur (DA090139)

Dear Ms. Morange,

The County of Monterey has reviewed the scope of the proposed CalTrans project at Limekiln State Park. The project consists of repairing an existing rock slope protection wall located along the north end of Limekiln State Beach for the purpose of protecting the north abutment of Limekiln Creek Bridge. The repair would consist of importing large boulders and anchoring them to the existing seawall with steel cables and rings. We understand the seawall is subject to wave erosion and is therefore within the Commissions jurisdiction. Attached is a completed Design Approval form from Monterey County

From a design standpoint, the project appears to be an improvement from the existing visual conditions. Currently, the concrete seawall is largely exposed as many of the boulders previously placed in front of the wall have washed away. There are also some areas where rebar can be seen protruding from the seawall. We support efforts to improve the visual appearance of the slope protection while maintaining the most natural appearance feasible. Recommended aesthetic treatments include covering as much of the seawall as possible with large, dark boulders anchored by similar colored steel rings and cables to blend with the boulders. Any remaining, exposed concrete will be stained to blend with the boulders and the hillside above. It appears that among other things, visual appearance is being considered and appropriate design elements are being included.

Monterey County is confident that the involved State agencies will take all necessary measures to protect the visual integrity of the site as well as mitigate any construction related impacts to the sensitive environment including the sanctuary, the creek, and the public uses and access.

If the staff at Monterey County can be of any assistance, we would be happy to help.

Thank you,

Craig Spencer, Assistant Planner
County of Monterey – Resource Management Agency
Planning Department
Phone: (831) 755-5233
Email: spencerc@co.monterey.ca.us

Cc: Cecilia Boudreau - CalTrans