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STAFF REPORT: REGULAR CALENDAR CDP APPLICATION

Application No.:	**3-10-34**
Applicant:	**California Department of Transportation (Caltrans)**
Location:	Base of the bluff seaward of Highway 1 at Alder Cove and Shale Point extending from post mile (PM) 7.1 to 8.1, in the Big Sur Coast Area of Monterey County.
Project Description:	Combined after-the-fact (ATF) authorization for two rip-rap revetments (637 feet and 820 feet long) and follow-up application for augmentation of these revetments under emergency coastal development permits (CDPs) 3-10-005-G and 3-10-015-G between post mile PM 7.1 and 7.3, north and south of Shale Point, and ATF authorization for two gabion crib walls (550 feet and 426 feet long) and related development between post mile PM 7.3 and 8.1 north and south of Alder Creek.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

The existing shoreline armoring for which ATF approval is being sought is designed to protect State Highway Route 1, a structure that is vulnerable to ocean wave attack and extreme landsliding at this location. Highway 1 is a vital transportation and public access link for the Big Sur Coast Area.

The armoring is located at four locations near Shale Point and within Alder Cove. Shale Point and Alder Cove are located approximately 3 miles south of the small town Gorda on the Big Sur coast in Monterey County, and are located at the base of the Santa Lucia Mountains where the mountains interface with the Pacific Ocean. At the north end of the cove is Alder Creek winding its way to the ocean from inland U.S. Forest Service Lands. At the southern end of the cove is Shale Point, a well-known sea stack. As is the case along this stretch of Big Sur, the highway has been notched into the base of the Santa Lucia range, which slopes precipitously into the ocean.

The toe of the slope north and south of Shale Point is armored with two revetments covering a distance of about 637 linear feet and 820 linear feet respectively. In addition, two gabion crib walls, 550 linear feet and 426 linear feet respectively, have been installed on either side of Alder Creek. Although there was some armoring present prior to CDP requirements in the early 1970s, the current revetments and crib walls lack CDP authorization. The CDP application would recognize both emergency work completed in 2010, as well as authorize the overall armoring system (i.e., the two revetments, the two gabion walls, drainage elements, etc) after the fact.

Staff believes that armoring at this location is necessary to protect Highway 1 from danger and is the most appropriate alternative available for this purpose at the current time. Ultimately, Caltrans may need to pursue a longer term solution for this section of the highway system which is continually subject to wave attack, shoreline erosion, landslide, and geologic uplift in a dynamic environment. In the meantime, the armoring system in place can help to maintain slope stability and protect this important transportation, public safety, and recreational access corridor. The armoring is not, however, without impacts, including in terms of sand supply, public recreational access, and public views. The project is self-mitigating to a certain degree because it is designed to ensure continued public recreational access along Highway 1. To define the approved project, and to further mitigate for project impacts, staff is recommending conditions for as-built plans, future maintenance, construction BMPs, other agency approvals, only a 20-year CDP authorization, and a mitigation package (to open up access to a lower bench area above the armoring and below the highway, a sign showing the area is public, a bench for public use, camouflaging drain pipes, and maintaining existing public parking areas).

Accordingly, staff recommends that the Commission approve a conditioned CDP for the project. The motion to act on this recommendation is found on page 4 below.

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I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit Application No. 3-10-034 subject to the conditions set forth in the staff recommendation.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves coastal development permit 3-10-034 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.

II. STANDARD CONDITIONS

This permit is granted subject to the following 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. 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 of 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.

III. SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

1. **As-Built Plans.** WITHIN 90 DAYS OF COMMISSION ACTION ON THIS COASTAL DEVELOPMENT PERMIT APPLICATION, or within such additional time as the Executive Director may grant for good cause, the Permittee shall submit two copies of As-Built Plans for Executive Director review and approval showing all development authorized by this coastal development permit; all property lines; and all highway elements inland of the permitted armoring structures. The As-Built Plans shall be substantially consistent with the submitted project plans (dated April 5, 1971 and February 14, 1984, and dated received in the Coastal Commission's Central Coast District Office on September 26, 2011). 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 shoreline armoring system at this location (i.e., revetments, cribwalls, drainage, and associated development). 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 armoring has been constructed in conformance with the submitted project plans.

2. **Future Monitoring and Maintenance.** This coastal development permit requires ongoing monitoring of the overall permitted shoreline armoring system at this location (i.e., revetments, cribwalls, drainage, and associated development), 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 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 the 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 overall permitted shoreline armoring system shall be subject to the following:

(a) 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. Any proposed modifications to the approved as-built plans or required construction BMPs 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)

(b) 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.

(c) 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 first-class mail at least two weeks in advance of 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.

(d) 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.

(e) 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).

(f) 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.

3. **MBNMS Authorization**. WITHIN 30 DAYS OF COMMISSION ACTION ON THIS COASTAL DEVELOPMENT PERMIT APPLICATION, the Permittee 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 MBNMS 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 necessary.

4. **State Lands Commission Authorization**. WITHIN 30 DAYS OF COMMISSION ACTION ON THIS COASTAL DEVELOPMENT PERMIT APPLICATION, 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.

5. **Public Access/Sand Supply/Visual Mitigation.**

(a) Shale Point Access. General public pedestrian access shall be provided and allowed at the Shale Point overlook and along the maintenance access road extending from the overlook to the lower bench above the beach (except during active maintenance events).

(b) Bench. One bench shall be installed at the Shale Point overlook. The bench shall match the existing bench at this location, shall be installed in such a way as to limit visual impacts and integrate with the existing bench, and shall be oriented towards the south (i.e., south facing). Caltrans shall maintain the two benches in a manner designed to facilitate public use of them, including replacing said benches if they are damaged or destroyed by natural or man-made causes.

(c) Sign. A 12-inch U.S. Forest Service sign (badge) shall be installed on the gate at the entrance to the maintenance access road. Other signs shall be prohibited unless approved in advance by the Executive Director as facilitating public access.

(c) Parking. Publicly available vehicle parking areas on the seaward side of Highway 1 at Shale Point and on the inland side of Highway 1 adjacent to the Alder Creek culvert shall be maintained for such use.

(d) Access Disruption Prohibited. Development that interferes with or hinders general public use of the Shale Point overlook, the maintenance access road, and the Shale Point and Alder Creek parking areas shall be prohibited.

(e) Drainpipes. All drain pipes in the project area shall be camouflaged and/or screened from public view (by burying, landscaping, painting, etc.).

WITHIN 30 DAYS OF COMMISSION ACTION ON THIS COASTAL DEVELOPMENT PERMIT APPLICATION, or within such additional time as the Executive Director may grant for good cause, the Permittee shall submit two copies of a mitigation plan for Executive Director review and approval identifying the measures to be taken to implement the above mitigation requirements, and shall implement the mitigation plan within 30 days of Executive Director approval unless the Executive Director identifies a different deadline.

6. **Term of Permit/Armoring Removal.** This CDP authorizes the shoreline armoring system at this location (i.e., revetments, cribwalls, drainage, and associated development) for twenty years from the date of approval (i.e., until July 13, 2032) or until the time when the currently existing structure warranting armoring is no longer present and/or no longer requires armoring for such protection, whichever occurs first. If the Permittee intends to keep the armoring in place after that time, the Permittee must apply for a new CDP authorization to allow the armoring (including, as applicable, any potential modifications to it desired by the Permittee). Provided such complete application is received before the twenty-year or earlier permit expiration, the expiration date shall be automatically extended until the time the Commission acts on the application. In addition, this CDP authorizes the armoring to protect Highway 1 as it now exists. Any future realignment or significantly redesigned highway configuration on the site shall be considered independent of the

authorized armoring and shall not rely on the armoring to demonstrate Coastal Act and/or Monterey County LCP consistency.

7. Construction Plan. PRIOR TO COMMENCEMENT OF ANY FUTURE MAINTENANCE EVENTS, the Permittee shall submit two copies 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, and all construction access corridors in site plan view. All such areas within which construction activities and/or staging are to take place shall be minimized to the maximum extent feasible in order to have the least impact on public access and shoreline resources, including by using inland areas for staging and storing construction equipment and materials as feasible.

b. Construction Methods. The Construction Plan shall specify the construction methods to be used, including all methods to be used to keep the construction areas separated from bay and public recreational use areas (including using unobtrusive fencing (or equivalent measures) to delineate construction areas).

c. Construction BMPs. The Construction Plan shall also identify the type and location of all erosion control/water quality best management practices that will be implemented during construction to protect coastal water quality, including the following: (a) silt fences, straw wattles, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction-related runoff and/or sediment from discharging to the bay; (b) equipment washing, refueling, and/or servicing shall take place at least 50 feet from the bluff edge. All construction equipment shall be inspected and maintained at an off-site location to prevent leaks and spills of hazardous materials at the project site; (c) the construction site shall maintain good construction 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 site); and (d) all erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each work day.

d. Construction Site Documents. The Construction Plan shall provide that copies of the signed coastal development permit and the approved Construction Plan be maintained in a conspicuous location at the construction job site at all times, and that such copies are 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.

e. Construction Coordinator. The Construction Plan shall provide that a construction coordinator be designated to be contacted during construction should questions arise regarding the construction (in case of both regular inquiries and emergencies), and that

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, is 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.

f. Notification. The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office at least 3 working days in advance of commencement of construction, and immediately upon completion of construction.

IV. FINDINGS AND DECLARATIONS

A. PROJECT LOCATION

The project site is located at Alder Cove and Shale Point approximately 3 miles south of the town of Gorda and six miles north of the San Luis Obispo county line on the Big Sur coast in southern Monterey County. At this location, Highway 1 has been notched into the side of the Santa Lucia Mountains where they drop precipitously into the Pacific Ocean. This stretch of coastline, like much of the Big Sur coast, finds Highway 1 extending along a rather extreme coastal landform, helping to create the unique scenic drive that characterizes the touring experience along much of this area, but also leading to the types of issues associated with maintaining its somewhat precarious perch.

Sandy beach areas along this portion of the southern Big Sur coastline are rare, and that applies to the project site as well. The beach at this location is narrow and relatively steeply sloping. It is comprised of medium sized rock and boulders delivered to the shoreline by ongoing landslides, debris flows, and stream transport of both Alder and Villa Creeks. Waves and currents work this material, sorting the finer grain material from the larger cobble. The finer grained material accumulates from time to time in the southern end of Alder Cove during times of lower swells and storms, but is quickly lost to sea when wave/swell and storm activity picks up. The larger (and heavier) rock and boulders generally remain on the beach at all times, since they are much less likely to be pushed to other locations. The resultant narrow and rocky shoreline does not generally attract significant numbers of beachgoers, but rather provides a shoreline experience that is generally limited to picking ones way through larger rocks and cobble. Access to the shoreline from the Highway is difficult due to slopes, although there is evidence of public access and use through the large culvert that crosses under Highway 1 at Alder Creek. The nearest larger recreational sandy beach areas are located approximately 5 miles north at the Sand Dollar Beach Picnic Area, and 8.5 miles to the south at San Carpoforo.

There are four different sites along about a mile of shoreline below Highway 1 (between PM 7.1 and 8.1) that are associated with this application. From north to south, there are two gabion crib wall locations on either side of Alder Creek extending from PM 7.3 to PM 8.1. Further south and on either side of Shale Point there are two rip-rap revetment locations between PM 7.1 and 7.3.

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

B. PROJECT BACKGROUND AND DESCRIPTION

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 were transported by sea. In the 1930's, in an impressive feat of engineering, the Carmel-San Simeon (now Big Sur Coast) Highway was punched through this previously road-less area. In the vicinity of Alder Cove and Shale Point, the State of California obtained a highway easement from the Hearst Corporation for the purposes of establishing and constructing a State Highway. One of many major obstacles to overcome was the sheer vertical nature of the mountains and the absence of a coastal terrace or blufftop upon which to construct a road. Accordingly, the highway was notched into the steep mountainside and a redwood timber bridge installed to span Alder Creek. In 1954 the Alder Creek bridge was replaced with a large concrete culvert to allow the creek to drain beneath Highway 1 into the sea without washing out the roadway. By the 1970's, the first of several attempts to forestall wave attack and erosion of the base of the mountains was introduced at this location.

In 1971, pre-dating the coastal permitting requirements of Proposition 20 (the Coastal Initiative in 1972), a rip-rap revetment measuring roughly 820 feet in length was constructed south of Shale Point. According to Caltrans, the revetment consisted of almost 10,000 cubic yards of 4-ton rock, and was approximately 12 feet high and extended about 8 feet out from the base of the bluff. Caltrans further indicates that a maintenance access road was built from the turn out along Highway 1 to the top of the revetment, and five 36-inch down drains were installed within the project limits to convey storm water runoff from the highway to the shoreline below. In 1984, following significant storm damage, the revetment was essentially reconstructed south of Shale Point and a new revetment was installed north of Shale Point. The work south of Shale Point included placement of an additional almost 11,000 cubic yards of rip-rap, and the work north of Shale Point included almost 9,000 cubic yards of rip-rap extending 637 feet north into Alder Cove in a similar configuration as the more southerly revetment along with one 36-inch down drain to convey storm water runoff from the highway. At the same time in 1984, two gabion crib walls were constructed at the toe of the slope on either side of Alder Creek just north of the more northerly revetment. The crib walls were made up of gabion baskets filled with rock and extending 21 feet in height and 12 feet in width. The crib wall north of Alder Creek was approximately 550 feet in length with 3,012 cubic yards of rock, and the crib wall south of Alder Creek was 426 feet in length with 2,485 cubic yards of rock. There is no evidence of CDPs for the 1984 work.

In 2010, continued shoreline erosion undermined the revetment structures and the earthen slope below the roadway, and in January 2010 Caltrans was issued emergency CDP 3-10-005-G to repair the revetment and slope north of Shale Point through placement of 3,000 tons of 8 to10 ton rock over a 200-foot long section at the toe of the slope, and to add a second drainage device at the north end of the revetment. Later that same year, and due to similar issues south of Shale Point, Caltrans was issued a second emergency CDP (3-10-015-G) to place 500 tons of 8 to 10 ton rock over a 70-foot section of the more southerly revetment. This CDP application represents the required follow-up regular CDP application to recognize the temporary emergency work as permanent. Because the 1984 work created two new gabion crib walls and the northerly revetment, and reconstructed the more southerly revetment, without CDPs, this CDP application also seeks ATF approval for the four armoring structures themselves. Thus, this CDP application is for the four armoring structures and related development as it currently exists, and represents a

de novo review on the merits of constructing such armoring structures in the first place. Although the structures exist, and relevant existing information on them is brought to bear, they have not previously been authorized by a CDP. Thus, for Coastal Act analytical purposes, the evaluation of the structures is as proposed development as if it weren't yet in place.

See Exhibit B for project plans and see Exhibit C for photographs of the project site.

C. STANDARD OF REVIEW

The proposed project is located on federal (U.S. Forest Service) land (in a Highway 1 easement) where the Commission retains CDP jurisdiction. 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 with regards to shoreline armoring and protecting against its impacts. Thus, the LCP policies do not provide significantly different policy direction in this case, and in this review are cited only if useful as a supplement to the applicable Coastal Act policies.

D. GEOLOGIC CONDITIONS AND HAZARDS

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

> *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:

> *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, 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.

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.

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.

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.

Existing Structure to be Protected

The existing State Highway at this location was originally constructed in the 1930's, and therefore predates the coastal permitting requirements of both 1972's Proposition 20 (the Coastal Initiative) and the 1976 Coastal Act. As noted, Highway 1 provides a very important transportation, commerce, and public safety link to communities within Big Sur and along the Big Sur coast. It is also an extremely valuable and popular public access and recreation amenity. Accordingly, the highway and its related elements (e.g., drainage pipes, etc.) at this location qualify as existing structures for purposes of Coastal Act Section 30235.

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.

Caltrans submitted site photographs and a summary of two geologic assessments prepared in the aftermath of the Duck Pond and Gray Slip landslides to document its determination that Highway 1 is in danger from shoreline erosion, and that the proposed project is appropriate. The reports contain a characterization of existing conditions, a review of existing geotechnical literature applicable to the site, evaluation of alternative solutions, and recommendations for correction. These reports also document the project need and purpose, the immediacy of the threat, and the reasons that Caltrans selected the current alternative as the most appropriate for the circumstances at Shale Point and Alder Cove.[1]

The proposed project site is located at the base of the Santa Lucia Mountain Range as it rises sharply from the Pacific Ocean. The mountains are comprised of metamorphosed shale, essentially fine grained rocks consisting mainly of silt and clay (i.e., shale or mudstone). This material, known as non-differentiated Franciscan sedimentary material, is relatively soft and very vulnerable to fracturing. Mixed within the sedimentary material are medium-sized rocks and boulders comprised mainly of igneous (i.e., hard) rock. In comparison to the sedimentary material, this rock is very resistant to weathering and erosion. In general however, the mountain slope is susceptible to erosion and slope failure including because it is subjected to harsh marine conditions.

The roadway surface of Highway 1 is about 80 feet vertically above the toe of the slope. The distance from the back of the beach to the edge of pavement varies but is as little as 25 feet horizontally in the vicinity of the gabion crib walls near Alder Creek. Overall, the slope below the Highway is thus near vertical and fairly tall. Alder Cove, including Shale Point and the rocky beach north of it, has an almost north-south orientation. Long-period swells arriving from the northwest tend to refract wave action into the cove focusing its energy in the vicinity of Shale Point. Large winter swells pound the base of the steep mountain slopes. Potent winter storms hit the coast range which seemingly rise straight up from the shore and often deposit high amounts of rainfall in relatively short durations. Compounding the erosive forces of the ocean and rain, coastline fracturing and tectonic uplift create a dynamic and highly variable -- and unstable -- environment upon which the highway has been constructed.

As reported by Caltrans, in the early 1980s the mountainside became saturated from storms, and the saturated soils were rapidly eroded during periods of large swells and wave run-up. Erosion at the base of the slope continued to the point where the angle was too steep to support the material above it and ultimately the slope failed. This type of event has repeated itself several times over the past 40 years, including two such events in 2010 necessitating emergency

[1] Reconnaissance Engineering Geologic Assessment of Duck Pond Landslide Complex, Highway 1, P.M. 7.94/9.2 MON. M. Mason (CGS), February 3, 2004; and Reconnaissance Engineering Geologic Assessment of Gray Slip Landslide Complex, Highway 1, P.M. 6.7/7.07 MON. B. Foster and M. Mason (CGS), June 30, 2004.

responses to shore up the slope and preserve the highway. The base of the mountain range, already weakened by fracturing and saturation, is subjected to wave attack until the slope fails. Without protection, failure of the slope will continue, bringing with it Highway 1.

Accordingly, Highway 1 and its related elements are existing structures that are in danger from erosion and thus qualify for shoreline protection consideration under the second Section 30235 test.

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.[2] 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 applied to the bluff and on the blufftop itself; and combinations of each. In the present case, the first two alternatives were not pursued because they would result in the closure of Highway 1, which is an unacceptable outcome for necessary transportation links, commerce, and public access and recreation along the Big Sur Coast. The no-project alternative would mean that storm wave erosion would threaten the slope that supports the westerly edge of Highway 1. Left alone and unarmored, roadway collapse would shortly follow and scenic Highway 1 would have to be closed. Thus, the no-project and abandonment alternatives are rejected because they would not accomplish the prime project purpose of protecting the existing highway. Similarly, on this narrow rocky beach, sand replenishment and above-beach stabilization measures would also not effectively address the primary threat of direct wave attack to the toe of the supporting and weakly consolidated slope, and are likewise insufficient responses here.

Caltrans considered a range of additional alternatives to address the wave erosion threat at this location. Several such alternatives were rejected. For example, one option at this location would be a concrete seawall or rigid (e.g., concrete encased) revetment. However, given the exposure to direct wave attack, narrow beach profile, and limited offshore elements to diffuse wave energy, Caltrans concluded that this alternative would be quickly lost to the incessant pounding of waves, and would do little in the way of absorbing wave energy and forestalling wave run-up and slope erosion. Additionally, Caltrans was concerned that there does not appear to be competent bedrock material within which to found a seawall or rigid revetment in a manner that could withstand the forces placed on it. Construction of such structures was also deemed extremely difficult, including requiring extraordinary measures to hold back the ocean during construction.

[2] 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.

Other alternatives considered included bridging or installing viaducts that might be able to avoid the ocean driven problems. However, these kinds of options are made difficult by geologic instabilities, construction difficulties, and extremely high costs. The cut-bench roadway configuration exists continuously for miles in either direction along this section of coast. As such, construction of a bridge or viaduct would be prohibitively expensive and take many years, possibly decades, to navigate the project design, environmental review, and construction phases. In addition, in areas of deep massive landslides such as the Duck Pond complex (e.g., at the north end of Alder Cove), a bridge or viaduct would be made more difficult and complicated because the entire terrain is continually moving. These kinds of options may eventually need to be pursued at this and similar locations along the Big Sur coast, including more systematically as part of an overall coordinated program of hazard abatement, but they are not feasible at this time and at this location today.

In sum, the above armoring and redesigned Highway 1 alternatives are long-term, high-cost construction projects, requiring a separate project development and environmental review process. They involve constructing a bridge, a viaduct, a concrete seawall, or some combination thereof. These alternatives are either not immediately feasible or not cost effective for addressing the erosion taking place at Alder Cove and Shale Point. Based on the very limited options for relocating and maintaining the Highway, it becomes necessary to preserve the seaward limit of the mountain in order to preserve the roadway bench above it.

Thus, the proposed project, employing a series of rip-rap revetments and gabion crib walls, was selected by Caltrans as the least environmentally damaging feasible alternative. Revetments serve the needs at this location for a variety of reasons, including because they are most easily installed (relatively speaking), they are flexible (including in terms of differential settlement and ability to repair), and they can absorb the tremendous amount of wave energy observed at this location. Revetments can withstand large waves and can be supplemented and or locally repaired as needed with no action to adjacent undamaged segments. They can also be removed in part or entirely as necessary. Similarly, gabion crib walls in the slope above the beach allow the passage of water and small materials while maintaining the integrity of the slope they are protecting. They also have a minimal footprint at the back of beach and are barely visible from the roadway above. As such, the design of these features are expected to effectively address the current shoreline erosion problems.

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 may need to undertake a project development process that may be able to avoid or minimize shoreline armor at this location via bridge, viaduct, or similar alternative device. In time, all such structures in this area—even shoreline protection works and large bridges—will need replacement. Structural durability is compromised by landsliding and severe, high-energy wave attack. 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, and because there currently isn’t a long-term feasible alternative in the works, interim armoring will continue to be needed. Such armor is necessary for minimizing risk to the existing highway, which is indispensable for transportation, commerce, and public access along the Big Sur Coast.

The Commission concurs that the proposed 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 and at the current time. Again, future planning is required to better address Highway 1 stability more comprehensively and proactively (as opposed to a project by project response basis), but such efforts will take significant time and resources, and aren't appropriately a part of the current project. As discussed, the gabions and revetments offer the most flexible approach at this location, including in terms of allowing for modification and changes should future planning dictate.

In summary, Highway 1 is in danger from erosion, shoreline armoring is required, and Caltrans' preferred solution is the most appropriate in this case. Accordingly, the proposed project meets the first three Section 30235 tests.

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.

Within Alder Cove and at Shale Point, the shoreline area is made up of medium-sized cobble and boulders which appear to be comprised of harder rock, unlike the non-differentiated Franciscan sedimentary material which makes up the bulk of the surrounding mountainside. This material was formed deep beneath the earth's surface under extreme pressure and temperature, and is presumed to have been brought to the surface via tectonic uplift and erosion. The Franciscan material that makes up the mountain fronting the shore is mainly comprised of metamorphosed shale (i.e., densely compressed mudstone/siltstone). The mudstone is made up of fine grained particles that are easily broken down and quickly washed away. Alder Creek is one possible contributor to the rock and cobble delivered to the shore. Offshore deposits and longshore transport are not thought to be significant sources, as the larger heavier boulders are less readily transported via longshore current, and the steeply sloping sea floor immediately offshore argues against these sources as significant contributors.

Before highway construction, erosion of the scree slope at the base of the mountains was a likely contributor to beach rock and sand supply. Loose debris shed by the steep rocky hillside 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 mountain's densely compressed siltstones and mudstones. At the toe of the debris slope, wave attack would excavate loose material and thereby add to the offshore sand budget. Continued wave attack across the narrow beach area would steepen the toe of the debris slope, inducing more material to slide down towards the sea until a new, temporary equilibrium was reached. However, since the source of the debris slope is chiefly composed of shale and fine grained silt particles, only a small portion of the material reaching the shoreline could be expected to be or become beach-quality sand.

Indeed, only intermittent, quasi-sandy beaches have been observed within Alder Cove, and typically only after large-scale landslide events that deposit vast amounts of material onto the shoreline. Even then, the muddy/silty beach areas that do form are quickly lost to sea during periods of increased swell and wave activity. The raking and sifting action of the waves have left in its wake the medium-sized cobble and boulders that one sees today and that are stronger and heavier and therefore less likely to be relocated away from the beach via longshore current and/or wave action.

These natural shoreline processes affecting the formation and retention of the beach and beach material 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 slopes produce material, and to the extent that the shoreline is eroding, shoreline armoring will deprive the beach of a measurable amount of replacement material.

Some of the effects of armoring structures on the beach and shoreline (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 these areas. 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.[3]

Encroachment on the beach

Shoreline protective devices 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 total footprint of the proposed armoring occupies roughly 23,368 square feet of beach space. Typically the Commission would calculate the volume of sand covered up by a shoreline protective device, which is in this case the 23,368 square foot encroachment area, to determine what volume of sand is lost by being covered with the shoreline protective device. At this beach, however, there is very little sand. The area covered by the revetment is mostly rock and cobble, so it is inappropriate to use the Commission's typical sand conversion factor to determine what volume of sand is needed to mitigate for the encroachment area. Although there is little lost sand here, the area covered by the revetment is still beach area that could otherwise

[3] The sand supply impact refers to the way in which the project impacts creation and maintenance of beach sand. Although this ultimately typically 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.

be used for public access. As a result, Caltrans must still provide mitigation for the loss of public access from the revetment's encroachment onto the beach. As discussed below, a series of public access measures are required here to mitigate for this, and the other access impacts also discussed below.

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 and/or material 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. More recently a growing body of evidence suggests 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)[4] 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 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".

Such passive erosion impacts can be calculated over the time the proposed armoring is expected to last. In this case, Caltrans has not indicated an expected lifetime for the proposed armoring. However, it has been the Commission's experience that the actual expected lifespan of shoreline armoring projects is limited due to the need for major maintenance or modifications, or entire redevelopment of an armoring structure within several decades, as has been the case historically at this location. In this case, the proposed shoreline armoring structures can be expected to be subject to heavy wave action on a fairly regular basis. This wave action can only be expected to be exacerbated by sea level rise over time, with resultant impacts to the strength and integrity of the shoreline armoring. It has been the Commission's experience that shoreline armoring, particularly in such a significantly high-hazard area as this project, tends to be augmented, replaced, and/or substantially changed within about twenty years. Rising sea levels and attendant consequences will tend to further delimit such time period in the future, potentially dramatically, depending on how far sea level actually rises.

[4] 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).

The other factor that is appropriate to consider when identifying a particular horizon for an armoring structure in an approval is the changing and somewhat uncertain nature of the context affecting coastal development decisions regarding armoring (including not only climate change and sea level rise, but also due to legislative change, judicial determinations, etc.). A twenty-year period better responds to such potential changes and uncertainties, including to allow for an appropriate reassessment of continued armoring and its effects at that time in light of what may be differing circumstances than are present today, including with respect to its physical condition after twenty years of hard service. In addition, with respect to climatic change and sea level rise specifically, the understanding of these issues should improve in the future, given better understanding of the atmospheric and oceanic linkages and more time to observe the oceanic and glacial responses to increased temperatures, including trends in sea level rise. Such improved understanding will almost certainly affect CDP armoring decisions, including at this location. Of course it is possible that physical circumstances as well as local and/or statewide policies and priorities regarding shoreline armoring are significantly unchanged from today, but it is perhaps more likely that the baseline context for considering armoring will be different – much as the Commission's direction on armoring has changed over the past twenty years as more information and better understanding has been gained regarding such projects, including their affect on the California coastline.

For these reasons, the Commission uses a design life of 20 years for the proposed shoreline armoring structures in these findings, and implements the 20-year period through conditions (see Special Condition 6). In addition, Special Condition 6 also recognizes that the proposed seawall is being approved under Section 30235 to protect the existing structure in danger from erosion. Coastal Act consistency is only maintained when such existing structure is present and in danger. If, for whatever reason, the now existing structure warranting armoring is no longer present and/or no longer requires armoring for such protection before the twenty years is up, then the approval will no longer be valid. In other words, this approval is for a twenty-year period or the time when the existing structure is no longer present and/or no longer requires armoring, whichever comes first. Further, the approval is specific to the Highway as it now exists, and not for a replacement or significantly redeveloped Highway. Any such future replacement or redevelopment must be considered independent of the armoring allowed here that is specific to the current situation and current existing structure.

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 average annual erosion rate multiplied by the width of property that has been fixed by a resistant shoreline protective device.[5] In this case, the proposed riprap revetments and gabion walls extend along the base of the bluffs, fixing a total of 2,433 linear feet of bluff with shoreline protective devices. The armoring footprint also covers some areas of beach (as described above) and for purposes of determining the impacts from fixing the back beach, it is assumed that new beach area would result from landward retreat of the bluff.

[5] 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.

In this case, Caltrans did not provide an estimated long-term average annual erosion rate. Thus, estimating passive erosion impacts is made more difficult. However, recent literature has identified rates ranging from four to eight inches per year for this general area.[6] Given the generally fragmented nature of the slope materials, it is reasonable to presume an average rate of six inches (0.5 feet) per year (the middle of the range of erosion rates for this area that have been published) for calculating passive erosion impacts. Therefore, the impacts from fixing the back beach, as calculated using the Commission's identified methodology, will be the annual loss of 1,216.5 square feet of beach. Over the 20-year permit horizon, this would result in a loss of 24,330 square feet of beach that would have been created if the back beach had not been fixed by the proposed seawall. Thus, Caltrans must mitigate for the loss of this area of beach that could be used for public access were it not for the existence of the proposed revetment. Such mitigation is discussed below.

Retention of potential beach material

If natural erosion were allowed to continue at the project site, some amount of beach material would be added to the beach at this location, as well as to the larger littoral cell sand supply system fronting the bluffs. The volume of total material that would have gone into the sand supply system over the lifetime of the shoreline structure would be the volume of material between (a) the likely future bluff-face location with shoreline protection; and (b) the likely future bluff-face location without shoreline protection. Since the main concern is with the sand component of this bluff material, the total material lost must be multiplied by the percentage of bluff material which is beach sand, giving the total amount of sand that would have been supplied to the littoral system for beach deposition if the proposed device were not installed. The Commission has established a methodology for identifying this impact[7] that equates to 540.7 cubic yards of sand per year for the proposed project. Over the course of the identified 20-year horizon, this equates to a retention impact of 10,813 cubic yards of beach quality sand.

[6] Griggs estimated a rate of 8" per year for the area identified as the southern end of Big Sur in *Living with the Changing California Coast*. Hapke and Greene identified a range of 4 to 7 inches per year in the U.S. Geological Fact Sheet 2004-3099 as applicable to the Grey Slip slide area which is very near Alder Cove.

[7] The equation is Vb = (S x W x L) x [(R x hs) + (1/2hu x (R + (Rcu - Rcs)))]/27. Where: Vb is the volume of beach material that would have been supplied to the beach if natural erosion continued (this is equivalent to the long-term reduction in the supply of bluff material to the beach resulting from the structure); S is the fraction of beach quality material in the bluff material; W is the width of property to be armored; L is the design life of structure, if assumed a value of 1, an annual amount is calculated; R is the long term average annual erosion rate; hs is the height of the shoreline structure; hu is the height of the unprotected upper bluff; Rcu is the predicted rate of retreat of the crest of the bluff during the period that the shoreline structure would be in place, assuming no seawall were installed (this value can be assumed to be the same as R unless the Applicant provides site-specific geotechnical information supporting a different value); Rcs is the predicted rate of retreat of the crest of the bluff, during the period that the revetments and gabion walls would be in place, assuming the revetments and gabion walls have been installed (this value will be assumed to be zero unless the Applicant provides site-specific geotechnical information supporting a different value); and divide by 27 (since the dimensions and retreat rates are given in feet and volume of sand is usually given in cubic yards, the total volume of sand must be divided by 27 to provide this volume in cubic yards, rather than cubic feet).

Beach and Sand Supply Impacts Conclusion

The proposed project would result in quantifiable shoreline sand supply impacts. There would be loss of beach area due to: 1) placement of riprap revetments and gabion basket walls onto approximately 23,368 square feet of beach that otherwise would be available for public use; 2) fixing of the back beach location, resulting in the loss of 24,330 square feet of beach that would have been created over the 20-years for which this revetment is approved; and; 3) retention of 10,813 cubic yards of beach quality sand over the 20-years for which this revetment is approved (540.7 cubic yards of sand material per year). Over twenty years, these impacts would equate to a total of 47,698 square feet of lost beach area and 10,813 cubic yards of beach quality sand.

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, given the right circumstances 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, offshore bathymetry, shoreline orientation, and other factors and conditions would appear to conspire to inhibit beach sand accretion in Alder Cove at Shale Point, significantly reducing the likelihood that a beach nourishment program could succeed. Furthermore, a significant proportion of the impacts here are not loss of sand, per se, as much as they are loss of public recreational opportunities on a beach consisting primarily of rock and cobble. In addition, 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 or other areas in Big Sur. 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 corresponding amounts of sand and/or rock and cobble over time at this location, is questionable.

As an alternative mitigation mechanism, the Commission oftentimes uses a mitigation payment when in-kind mitigation of impacts is not available.[8] In situations where ongoing sand replenishment or other appropriate mitigation programs are not yet in place, the mitigation payment is deposited into an account until such time as an appropriate program is developed, and the funds 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.

Another alternative mitigation also often applied by the Commission is using public recreational access improvements to offset impacts from encroachment, passive erosion and loss of bluff

[8] See, for example, CDP A-3-SCO-06-006 (Willmott), CDP A-3-SLO-01-040 (Brett), CDP 3-98-102 (Panattoni) and CDP 3-97-065 (Motroni-Bardwell).

materials. Such mitigation is typically applied by the Commission to public agencies that manage public access 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 is to protect Highway 1, including to ensure its continued and significant public recreational access utility. Thus, there are opportunities for appropriate mitigation in situ, both in terms of project design as well as potential enhanced public recreational access features along this stretch of the Highway. Toward this end, Caltrans coordinated with Commission staff on potential improvements at Shale Point that could offset identified impacts. Specifically, it is clear that the maintenance access road constructed at Shale Point could provide an enhanced and more intimate shoreline access experience at the south end of Alder Cove for the general public. The maintenance access road switches back down the toe of the mountain about 70 feet below the Highway 1 elevation. The access road provides access to a roadway bench at the top of the revetment. The roadway bench extends from Shale Point south for about a distance of 600 feet. There is a broad landing that straddles the sea stack at Shale Point. Separation from Highway 1 enhances the recreational experience and provides close up views of the sea stack, the kelp beds offshore, and marine birds that feed in the waters nearshore. The vantage also provides a clear picture of the dramatic forces of nature at work in Alder Cove including with respect to the size and scale of the massive Alder Creek slide, the scouring action of the ocean's waves at the interface of land and water, and the height and steepness of the surrounding mountains. The maintenance road is unpaved and fairly steep. Navigating the steep switch back may be difficult for some and use of the road is not without hazards. There can be frequent high surf and the threat of rock and debris raining down from above is real.

Caltrans proposes to maintain a small pedestrian access path around the maintenance road entrance gate at the Highway 1 Shale Point pull-out. The path leading to the maintenance road already exists, but is not signed, and the locked gate can give the impression that the roadway is private property and/or "off-limits". Provided this path and the accessway is signed and available for general use, it can provide the basis of appropriate offsetting mitigation. Further, to increase the utility of the maintenance road access and highway pull-out overall, and to commensurately offset the impacts (past and present) of the project, a second south-facing view bench (i.e., there is one north-facing bench at Shale Point) near the entrance to the maintenance road will allow users to take in the views to the south and/or await the return of hikers who venture down the maintenance road. Accordingly, Special Condition 5 is attached requiring the installation of signage identifying the availability of public lands and a second bench for public use. Improvement of these public facilities in the manner described above would represent a significant recreational benefit and appropriate mitigation measure to offset both the temporary and permanent loss of usable beach area.

Caltrans also proposes to maintain the small parking areas on either side of the Alder Creek culvert on the inland side of Highway 1. There is room for a few cars at each dirt turnout. Those

[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).

nimble enough to scramble down a steep rocky trail will find their way down to Alder Creek and the Alder Creek culvert which goes under Highway 1 and daylights on the rocky beach below the toe of the mountain slope. During summer months when winter storm flows have subsided, it is possible to walk through the roughly 12-foot diameter culvert to reach the beach. Access is difficult and not appropriate for everyone. As elsewhere, obstacles and hazards are present. The bottom of the culvert is covered in moss and algae and can become very slippery. Derelict strands of rebar protrude out from the bottom of the culvert. These have been bent over to avoid sticking straight up out of the concrete but remain a fairly significant safety issue. Nevertheless, provided that development does not interfere with access at either end of the culvert including by retaining the parking areas, or inhibiting access to the culvert itself, these small public access benefits can provide additional mitigation for the loss of beach area and sand material from the bluffs.

Finally, Caltrans also stresses that armoring of the shoreline as proposed preserves the integrity of the highway right of way and the physical transportation facility, which in and of itself can be considered mitigation for the impacts caused by the shoreline protective devices. As discussed elsewhere, State Highway Route 1 (i.e., the Big Sur Coast Highway) is a designated National Scenic Byway. The iconic landscape is world renowned. The dramatic confluence of the mountains and the sea have drawn visitors to Big Sur for decades. Highway 1 is also an important transportation and commerce corridor, linking the small rural Big Sur communities with larger urban areas north and south. Big Sur and the smaller towns are dependent on the delivery of goods and services trucked-in via Highway 1, as well as the patrons who frequent local businesses. The highway further provides an essential public service link including for fire protections and response, emergency services, and law enforcement.

The Big Sur Coast Highway is also a very popular recreational asset and significant public access route. In the vicinity of Alder Cove, Highway 1 provides one of the closest and best views of the Pacific Ocean along its entire 110 mile stretch. Public access opportunities are otherwise uncommon in southern Big Sur, with the nearest developed public beach access approximately 4 miles north at Willow Creek. Highway 1 also provides the only north-south public access link between Carmel and Cayucos in the coastal zone. The next available through road is 40 miles inland. Thus, it is appropriate in this case to recognize that the project ensures that the public recreational and other attributes of Highway 1 are available for public use, and appropriate in this case to factor that into the development of an overall mitigation package here.

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 Alder Cove. 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. Staff has collaborated with Caltrans to identify 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 and is reinforced by Special Condition 5, below.

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

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 5). Additional safeguards are available through review and approval by the Monterey Bay National Marine Sanctuary and the State Lands Commission[11] (see Special Conditions 3 and 4).

Avoidance of future hazard and beach encroachment

Given that this application is required to satisfy the follow-up requirements from emergency coastal development permits 3-10-005-G and 3-10-015-G, which involved significant repair to previously installed revetments both north and south of Shale Point, there is a possibility that the repaired structures may fail as well. Failure might include displacement of armor 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 2). Such future monitoring and maintenance activities must be understood in relation to clear as-built plans. Therefore, Special Condition 1 of this approval requires the submittal of as-built plans to define the footprint and profile of the permitted development.

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 U.S. Forest Service beach, 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.

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

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 7).

Geologic Conditions and Hazards Conclusion

The project represents an appropriate measure to maintain the vital transportation and commerce link as well as the continuity of public access on Highway 1 along the Big Sur Coast. Accordingly, the project, as conditioned, can be found consistent with the hazard polices of the Coastal Act as cited in this finding.

E. PUBLIC ACCESS AND RECREATION

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:

Section 30210 of the Coastal Act states:

> *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.*

Section 30211 of the Coastal Act states:

> *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.*

Section 30213 of the Coastal Act states:

> *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …*

Section 30221 of the Coastal Act states:

> *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.*

Section 30223 of the Coastal Act states:

> *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:

> *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. They also protect Highway 1 for its public recreational attributes.

Analysis

The project is located at Shale Point and Alder Cove. Public access facilitates are limited in this area, and southern Big Sur more generally, as a result of the dramatic landform, as described above. Highway 1 is the primary public access facility at this location, and at this location (i.e., at the foot of Alder Peak at elevation 3,745 feet) offers dramatic views of the mountains and ocean, and the interface between the two. Highway 1 is only 80 – 90 feet above sea level, and it provides a dramatic vista that is iconically southern Big Sur. Turn-outs along the shoulder of Highway 1 provide an opportunity to view the offshore features present at this location including sea stacks, kelp beds, and the marine inhabitants. The turn-out at Shale Point is also an excellent opportunity to view the scar of the massive Alder Creek landslide and the geologic forces at work in Big Sur.

The beach at Alder Cove is narrow and fairly steep, comprised of medium sized rock and boulders. Silt and mud accumulates at the south end of the cove during periods of low swell and wave activity, but it is not ideal for beach recreation. The beach is located at the base of a very steep mountain and there are no developed trails or pathways leading down the slope. Informal access to the shoreline may be gained by clamboring down the slope, but it is very steep and dangerous. Alternative access is found by climbing down a hard-to-find rocky trail to Alder Creek and crossing beneath Highway 1 in the Caltrans culvert. The culvert is large enough for persons to walk through and it terminates at the beach in the center of Alder Cove. Access via the culvert can be hazardous, however, and thus Caltrans and the U.S. Forest Service do not publicize this route. As discussed above, the total footprint of the proposed armoring would occupy roughly 23,368 square feet of beach space. Some of that coverage, as in the case of the

revetment south of Shale Point, is at the base of the mountain slope where it interfaces with the ocean, and so there is little, if any, dry beach area.

Mitigating circumstances include the fact that the beach itself and the majority of the area occupied by the armoring structures are already unavailable due to the presence of naturally occurring rock and boulders on the beach. Also, access to this rocky cove is not pedestrian friendly and can be very difficult even for the sure-footed. Therefore, the project's net recreational access impact due to its footprint is relatively small. That said, the ongoing reduction of recreational beach area is still an impact caused and perpetuated by the proposed project.

Beach 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 armoring would be part of a structural assemblage that denies sand and rock bearing material to the beach, because the retained debris slide material behind the revetment and cribwall structures will not be available to nourish the beach. Second, and particularly in combination with the denial of beach materials, the proposed revetment work will continue to fix the back beach location. Given projected sea level rise estimates, the effect on public use will continue to be a narrowing of useable beach space. Together these impacts conspire to reduce the actual area in which the public can pass along the beach.

Project public access benefits

In the larger context, the project will protect the Highway, which is essential to maintaining the continuity of the primary public access corridor along the Big Sur Coast. Highway 1 in Monterey County along the Big Sur Coast is a designated State Scenic Highway, the first California highway to be so distinguished. In 1996, it became one of the nation's first "All American Roads", the highest designation offered by the Federal Highway Administration under the National Scenic Byways Program.

Preserving the integrity of the Highway itself provides some mitigation for recreational impacts. As discussed elsewhere, State Highway Route 1 is a very popular recreational asset and significant public access route. In the vicinity of Alder Cove, Highway 1 provides one of the closest and best views of the Pacific Ocean along its entire 110 mile stretch. The nearest public beach access is approximately 4 miles north at Willow Creek. The next available public access is more than 8 miles away. Highway 1 provides the only north-south public access link between Carmel and Cayucos in the coastal zone. The next available through road is 40 miles inland.

As stated above, Caltrans has selected a design that addresses shoreline erosion and preserves the mountain slope beneath the highway without significantly interfering with recreational use of the beach. The proposed rip-rap revetments are more integral to the rocky/boulder beach than any other type of shoreline armoring. The stones are a bit larger but are similar to the rock and boulders seen on the beach. The gabion crib walls are constructed into the side of the mountain slope and largely avoid interfering with public use of the beach in the vicinity of Alder Creek. The gabion walls also make use of smaller rock material which mimics the size and color of existing native rock. In addition, the mountain slopes above the beach are stabilized making use of the beach safer for those that are able to access it.

Additional public access mitigation measures

In addition to the public access benefits of the project, and anticipating the above concerns regarding public recreational impacts, and acting on the suggestions offered by staff at an in-field site inspection, Caltrans has offered to allow the use of the maintenance access road constructed at Shale Point for public recreational purposes and to retain a small trail around the maintenance road gate for the public to enter. The maintenance access road switches back down the toe of the mountain about 50-70 feet below the Highway 1 elevation and would provide a more intimate shoreline experience at the south end of Alder Cove. The roadway bench extends from Shale Point south for about a distance of 600 feet and allows close up views of the sea stack, the kelp beds offshore, and marine birds that feed in the waters nearshore. Special condition 5 is attached, requiring Caltrans to install a U.S. Forest Service sign on the maintenance road gate to inform the public of the underlying public lands and to expand public use of the access road. The special condition further requires installation of a second public view bench near the maintenance road gate for users to take in views to the south and await the return of hikers from the maintenance road access.

Further offsets for the recreational impact appear feasible. An immediately obvious candidate to mitigate the project's recreational resource impacts would be to preserve the public parking turnouts on the inland side of Highway 1 adjacent to Alder Creek. Even though there is no formal public access at this location, there is evidence of public use and measures taken to preserve these access features, albeit limited, can help appropriately offset project impacts.

Public Access and Recreation Conclusion

This approval is subject to conditions that provide for a new pedestrian access and viewpoint opportunity at Shale Point, and that provide for recreational access and safety improvements adjacent to Alder Creek. Accordingly, the project will protect the continuity of public access on the Big Sur Coast Highway; and, through substantive public access improvements, offset recreational access impacts of the project. Therefore, as conditioned, the project can be found consistent with the Coastal Act public access and recreation policies cited above.

F. VISUAL RESOURCES

Coastal Act Section 30251 states:

> *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:

> *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.

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 the offshore rock formations and sea stacks present along the shore near Cape San Martin and in Alder Cove. The highway in the vicinity of Shale Point and Alder Cove dips in elevation and provides some the best and closest views of the shoreline. The project area is a highly scenic area within the meaning of Coastal Act Section 30251.

The armored areas associated with the project at Shale Point and Alder Creek, while visible from the highway, do not significantly adversely impact views from the traveled surface of the highway due to its elevation well above the beach. This view impact is additionally tempered somewhat by the intervening distance. Still, they are unnatural looking elements in the shore area that impact public views. At beach level, the armoring is more obvious in the public view, and its impact is greater in that respect. However, due to the difficulty in accessing the beach at this location, this view is less critical than the primary Highway 1 view. In addition, the rock at least mimics the form of the medium sized rock and smaller boulders naturally strewn along the shoreline here. Given the harsh environment, it appears that there is little that can be done to further limit such visual impacts.[12] It is possible, however, to take measures to confine armor elements and to screen them as much as possible as part of typical maintenance parameters. Specifically, Special Condition 2 requires the Applicant to monitor and maintain the approved revetments including via retrieval and reuse of fugitive armoring rock, and to place and compact excess talus material over the top of the revetments to aid in matching the natural slope colors found near the beach.

Another opportunity for mitigation is available in the project area in terms of the Highway drain pipes. These drop down the slopes and themselves detract from the view experience. By camouflaging these downdrains (via burying, landscaping, painting, etc.), the viewshed can be incrementally improved, and can help offset visual impacts associated with the project. This is similar to the mitigation that was applied to Caltrans in the Limekiln revetment case in Big Sur (CDP 3-09-020, approved December 11, 2009), and it can help offset impacts here. See special condition 3.

These measures will help to camouflage the project, thereby minimizing visual impacts and offsetting the overall effect of the new shoreline protection works.

As conditioned, the project can be found consistent with Sections 30251 and 30240(b) of the Coastal Act.

[12] For example, a vegetative "cap" designed to screen the armoring would appear infeasible.

G. MARINE RESOURCES

Applicable Policies

The Coastal Act protects the marine resources and habitat offshore of this site. Coastal Act Sections 30230 and 30231 provide:

> *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.*
>
> *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.*

Analysis

The offshore waters and intertidal zone are within the Monterey Bay National Marine Sanctuary (MBNMS) and the State Sea Otter Refuge. The adjoining beach is protected under the regulations for U.S. Forest Service. These reserves protect a variety of marine habitat features, notably including the beach itself, the rocky intertidal, offshore kelp forests, marine mammal haul-outs and seabird nesting and foraging areas. Most of these are represented at Alder Cove, and is discussed in more detail below.

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 Alder Cove these mammals are only transient visitors.

Snowy plovers nest on a number of Central Coast beaches, but have not been observed nesting at Alder Cove. Wildlife inventories have not revealed the presence of any other sensitive species resident in the rocky beach area. See additional discussions below about subsurface beach fauna, and about other seabirds.

MBNMS scientists conducted a detailed survey of the Alder Cove beach and intertidal environment in the aftermath of the Alder Creek landslide that occurred just upcoast of the project area in April 2011. Both the beach and intertidal feature free-standing rock, boulders, and cobble that are washed by waves at the seaward edge of the beach. The survey was intended to determine the relative abundance and sensitivity of marine life in intertidal zones exposed to substantial wave-suspended sand and gravel. A secondary goal of the survey was to confirm the presence/absence of black abalone. Results varied depending upon the location of the survey (i.e., north of the Alder Creek slide, south of the slide, south of Shale Point). In general, though,

in the northern section of Alder Cove the biological community was comprised of species common to Big Sur (e.g., mussel beds, barnacle clusters, and limpets) and at normal densities though low abundance. At the center of Alder Cove near the foot of the recent slide, a wide section (about 100 meters) of the intertidal had been buried. There was little evidence of any marine life. The southern section of the cove was surprisingly lacking in density and abundance of species. The biological community around Shale Point was found to be the most fully developed and diverse consisting of multiple species of microalgae and large invertebrates. No black abalone were found.

The findings of the survey are consistent with a rock beach in a high-energy environment. The rock and cobble make it difficult even for those animals adapted to high-energy environments to escape damage caused by rolling rock. In addition to physical damage, there is a high degree of scour through the movement of coarse gravel. Even the large, relatively stable boulders displayed signs of intense scour near their bases.

Another marine resource is represented by the resident seabirds and shorebirds in the area. Black oystercatchers can be seen working the rocky intertidal at Shale Point. In addition, pelagic cormorant and Brand't cormorant have been observed roosting on the sea stack and western grebes are commonly observed rafting offshore. The beach itself is quite narrow and periodically substantially inundated by storm waves. No snowy plovers or other beach-nesting birds have been observed in residence at the site, although it is possible that transient birds would utilize the beach for foraging and resting.

Marine Resources Conclusion

There appear to be limited marine resources in the direct area of the revetments and gabions, and they do not appear to result in significant marine resource impacts. Provided ongoing repair and maintenance methods protect marine resources during such episodes (see special condition 7), then the project can be found consistent with Coastal Act Sections 30230 and 30231 regarding protection of marine resources and offshore habitat.

H. UNPERMITTED DEVELOPMENT

In 1971 pre-dating coastal permitting requirements, a revetment measuring roughly 820-feet in length was constructed south of Shale Point. The revetment was approximately 12-feet in height and 8-feet in depth (i.e., front to back) and consisted of 4-ton rock. Caltrans estimates approximately 9,562 cubic yards of rock boulders and material were placed south of Shale Point. A maintenance access road was built from the turn out along Highway 1 to the top of the revetment, and five 36-inch down drains were installed within the project limits to convey storm water runoff from the highway to the shoreline below. In 1984 following significant storm damage, the revetment south of Shale Point was augmented and restacked, and a new revetment was constructed north of Shale Point. The work south of Shale Point included placement of an additional 10,808 cubic yards of rock armoring, essentially doubling the amount of material placed there in 1971. North of Shale Point, 8,860 cubic yards of rock was placed extending roughly 637-feet north into Alder Cove. The dimensions were otherwise similar to the rock slope protection south of Shale Point (i.e., 12-feet in height and 8-feet front to back) and the project included one 36-inch down drain to convey storm water runoff from the highway. At the same time, two gabion crib wall installations were constructed within the toe of the slope on either side of Alder Creek. The crib walls measured approximately 21-feet in height and 12-feet front to

back. The gabion wall north of Alder Creek is roughly 550-feet in length and includes roughly 3,012 cubic yards of rock. The gabion wall south of Alder Creek is 426-feet in length and includes roughly 2,485 cubic yards of rock. Commission staff could not locate any records of coastal permits for either the revetments or gabion wall installations/repairs, and any records that may have existed with Caltrans for the installation of these features were destroyed in a 1995 flood of the District 5 office. Therefore, because this is an after-the-fact permit approval, Special Condition 1 requires submittal of final as-built plans within 90-days of the Commission's action.

Although development has taken place prior to submission of this permit application and approval of the CDP, consideration of the application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Action by the Commission on the permit does not constitute a waiver of any legal action with regard to the alleged violation nor does it constitute an admission as to the legality of any development undertaken on the subject site without a coastal development permit.

V. 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, determined on November 29, 2007 that the project is categorically exempt under CEQA. Nevertheless it prepared 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.

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).

Appendix A

SUBSTANTIVE FILE DOCUMENTS

1. Coastal Development Permit Application File Number 3-10-034.

2. Reconnaissance Engineering Geologic Assessment of Duck Pond Landslide Complex, Highway 1, P.M. 7.94/9.2 MON. M. Mason (CGS), February 3, 2004; and Reconnaissance Engineering Geologic Assessment of Gray Slip Landslide Complex, Highway 1, P.M. 6.7/7.07 MON. B. Foster and M. Mason (CGS), June 30, 2004.

3. Big Sur Coast Highway Management Plan, Guidelines for Corridor Aesthetics, March 2004

Project Location Map

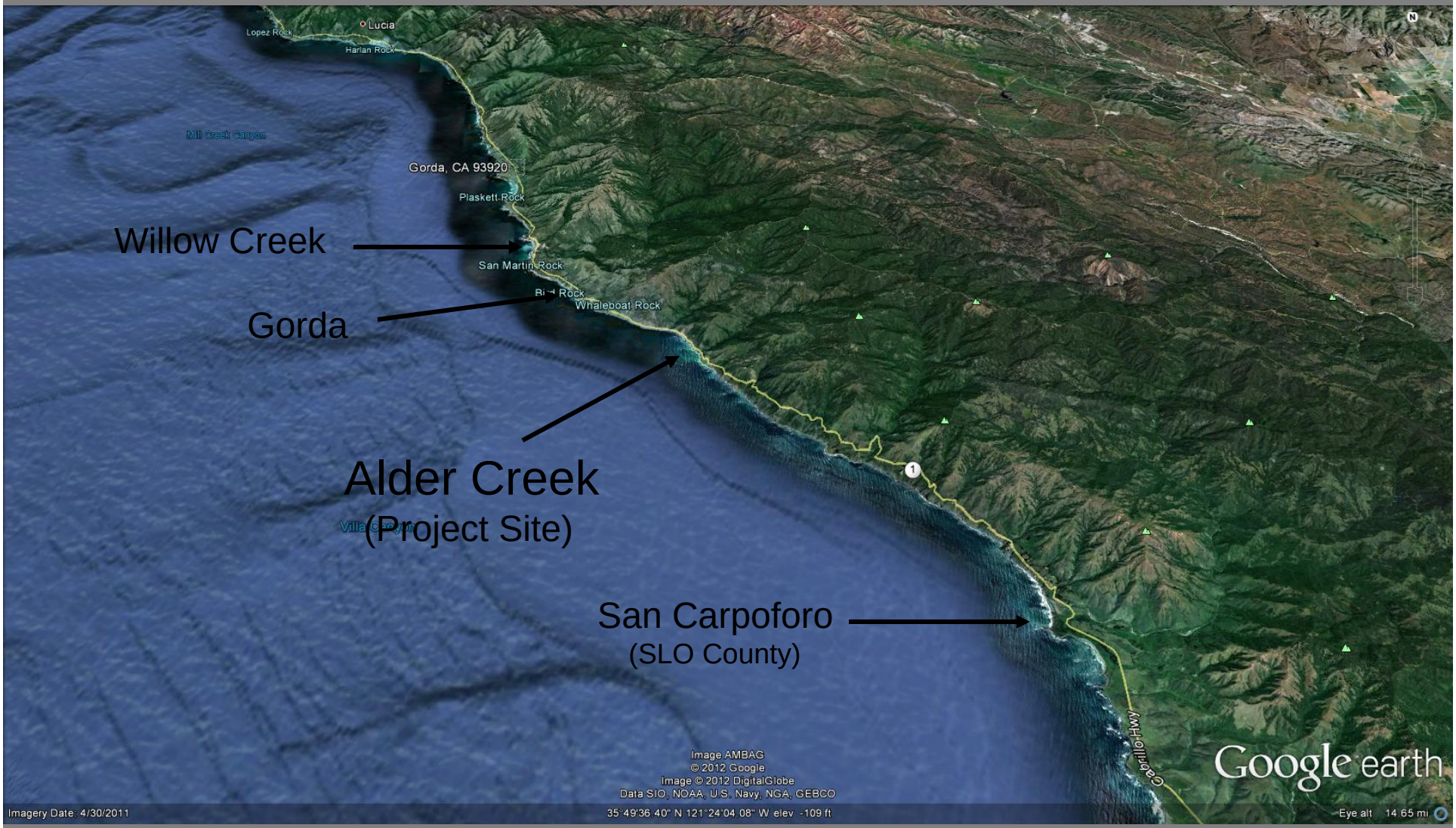
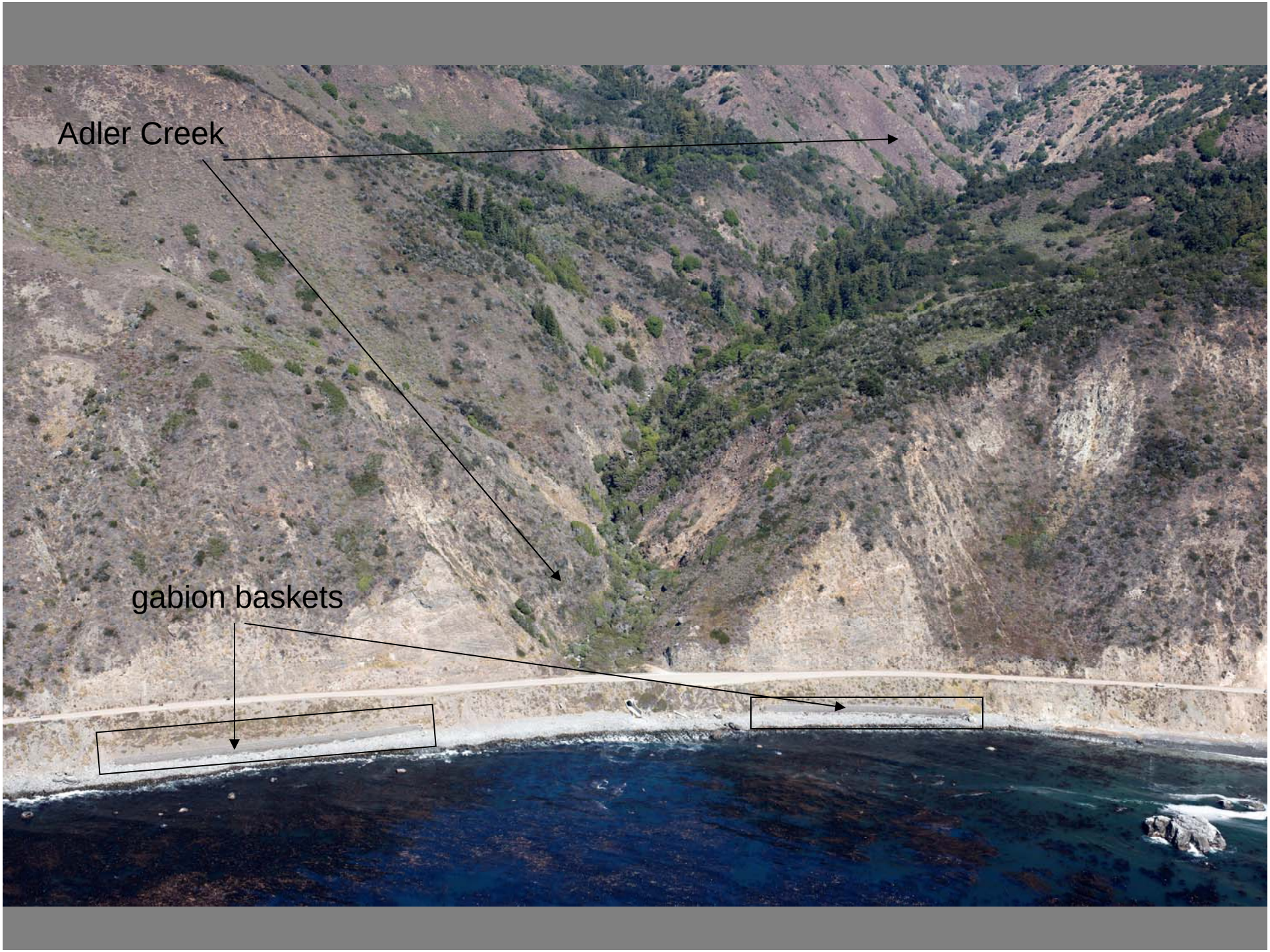


Exhibit 1: Project Location Map
F25a; 3-10-034 (California DOT)


Adler Creek
gabion baskets


Shale Point
revetments

INDEX OF SHEETS

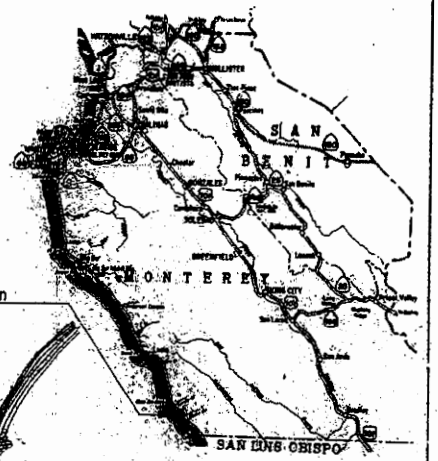
Sheet No.		
1		Title Sheet
"	2	Typical Cross Sections & Quantities
"	3	Plan and Profile
"	4-5	Drainage Cross Sections
"	1-12	General Cross Sections

APPLICABLE STANDARD PLANS

A62-A.2	A77-C.4	D77-11
A62-C.4	A79-A.4	D87-A.3
A73-7	D73-7	D98
A76-A.5	D75-7	D97-3

05	Mon	1	72/75	1	5

E. Fluegge
DISTRICT ENGINEER
REVISED CHG. ORDERS NO. 9237
DATE APPROVED April 5, 1971



AS BUILT PLANS
Contract No. 05-090504
Resident Engineer [illegible]
Date [illegible]

STATE OF CALIFORNIA
BUSINESS AND TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY
IN MONTEREY COUNTY
FROM 0.1 MILE NORTH TO 0.4 MILE NORTH OF VILLA CREEK, ABOUT 16 MILES SOUTH OF LUCIA

to be supplemented by Standard Plans dated January, 1971

Contract No. 05-090504

05 Mon 090501

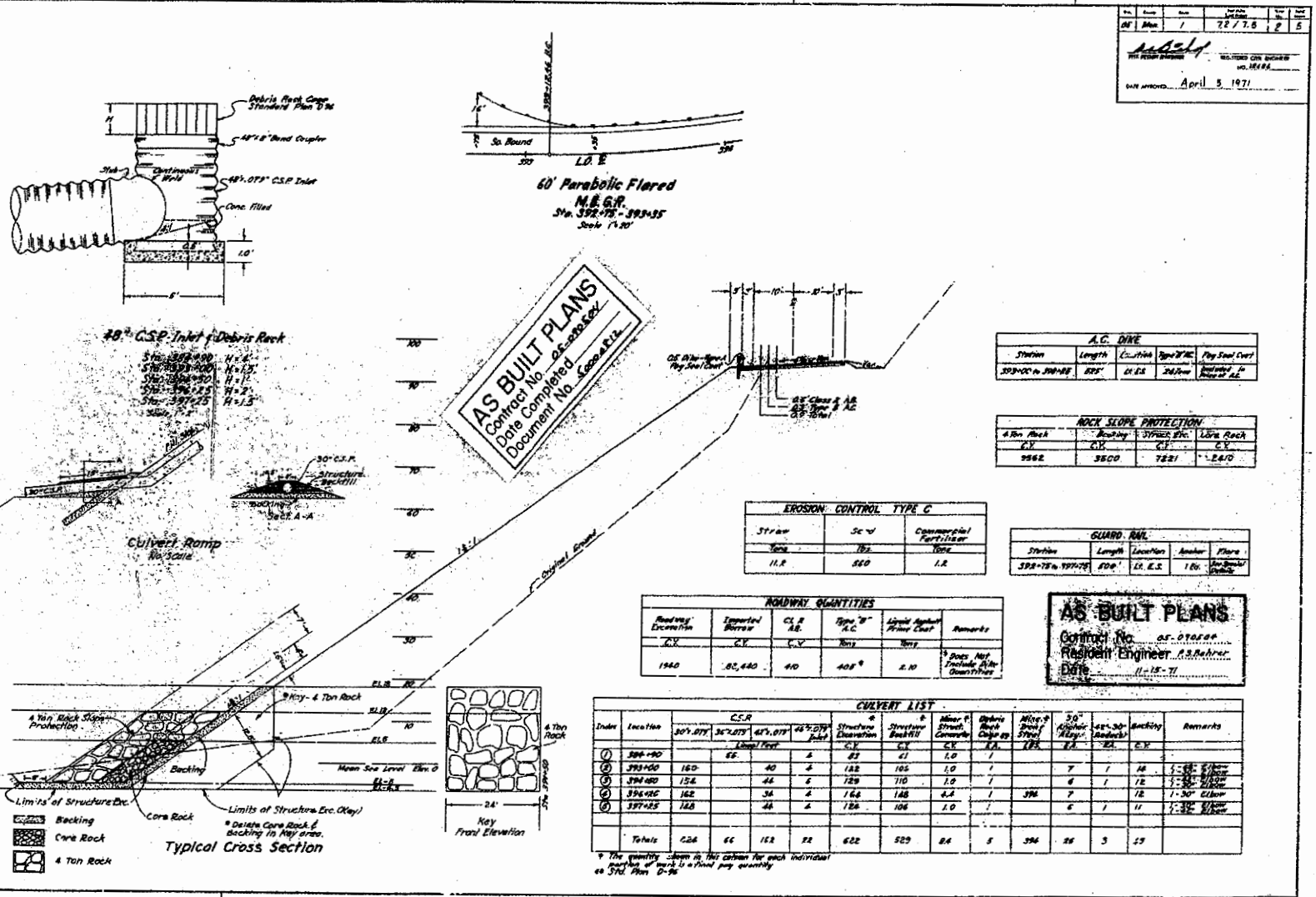
R.S. Somers | D.A. Bishop | R.A. Lafontaine

1

AS BUILT PLANS
Contract No. 05-090504
Date Completed
Document No. 5000812

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT DRAWN UNDER MY DIRECTION AND CONTROL OR WAS FILED IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 12-30-71 SIGNATURE [illegible]



A.C. DIKE				
Station	Length	Location	Type "B" A.C.	Pay Seal Coat
393+00 to 393+55	55'	Lt. E.S.	24 Tons	Included in Price of A.C.

ROCK SLOPE PROTECTION			
4 Ton Rock	Backing	Struct. Exc.	Core Rock
C.Y.	C.Y.	C.Y.	C.Y.
9562	3500	7221	2410

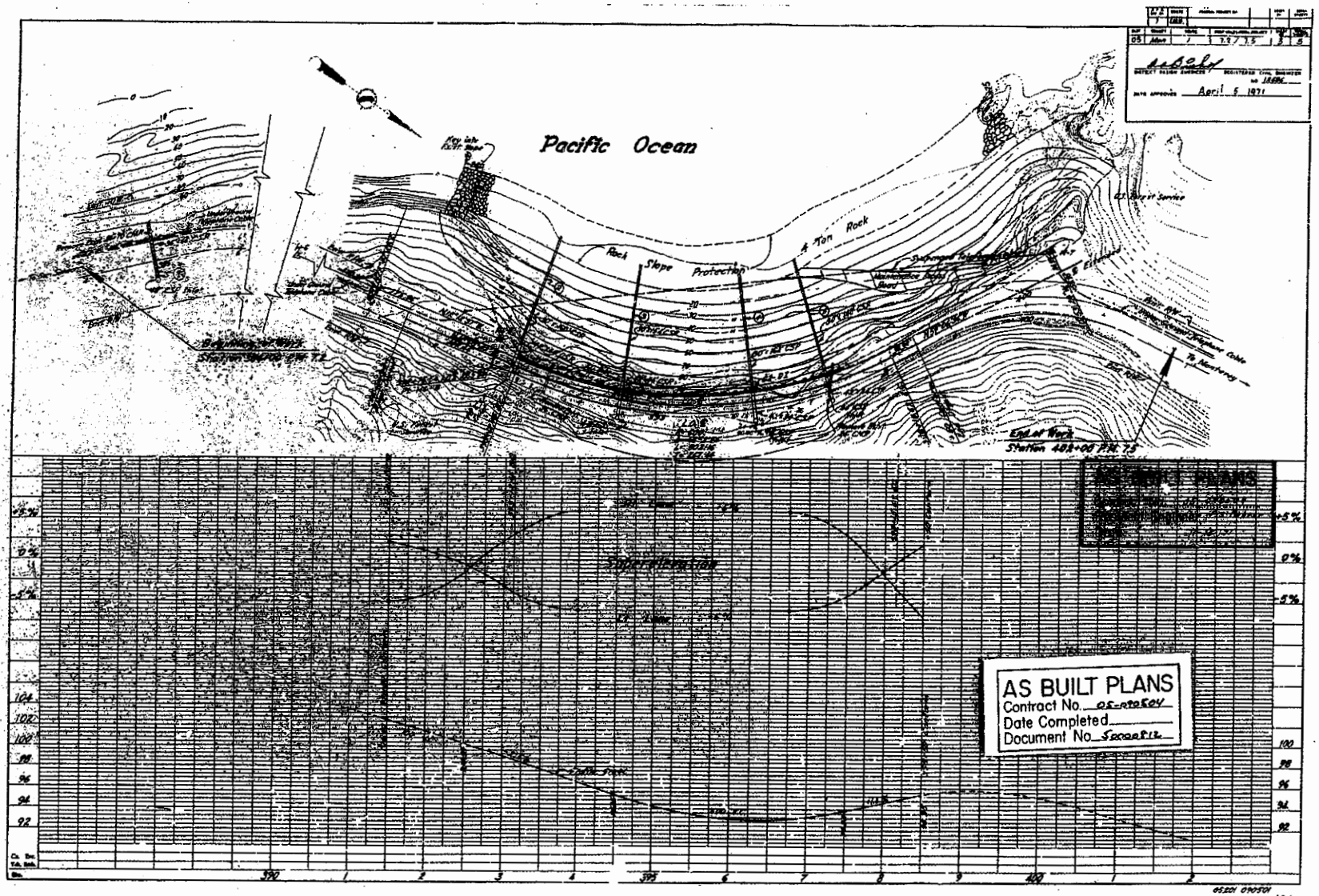
EROSION CONTROL TYPE C		
Straw	Seed	Commercial Fertilizer
Tons	lbs.	Tons
11.2	560	1.2

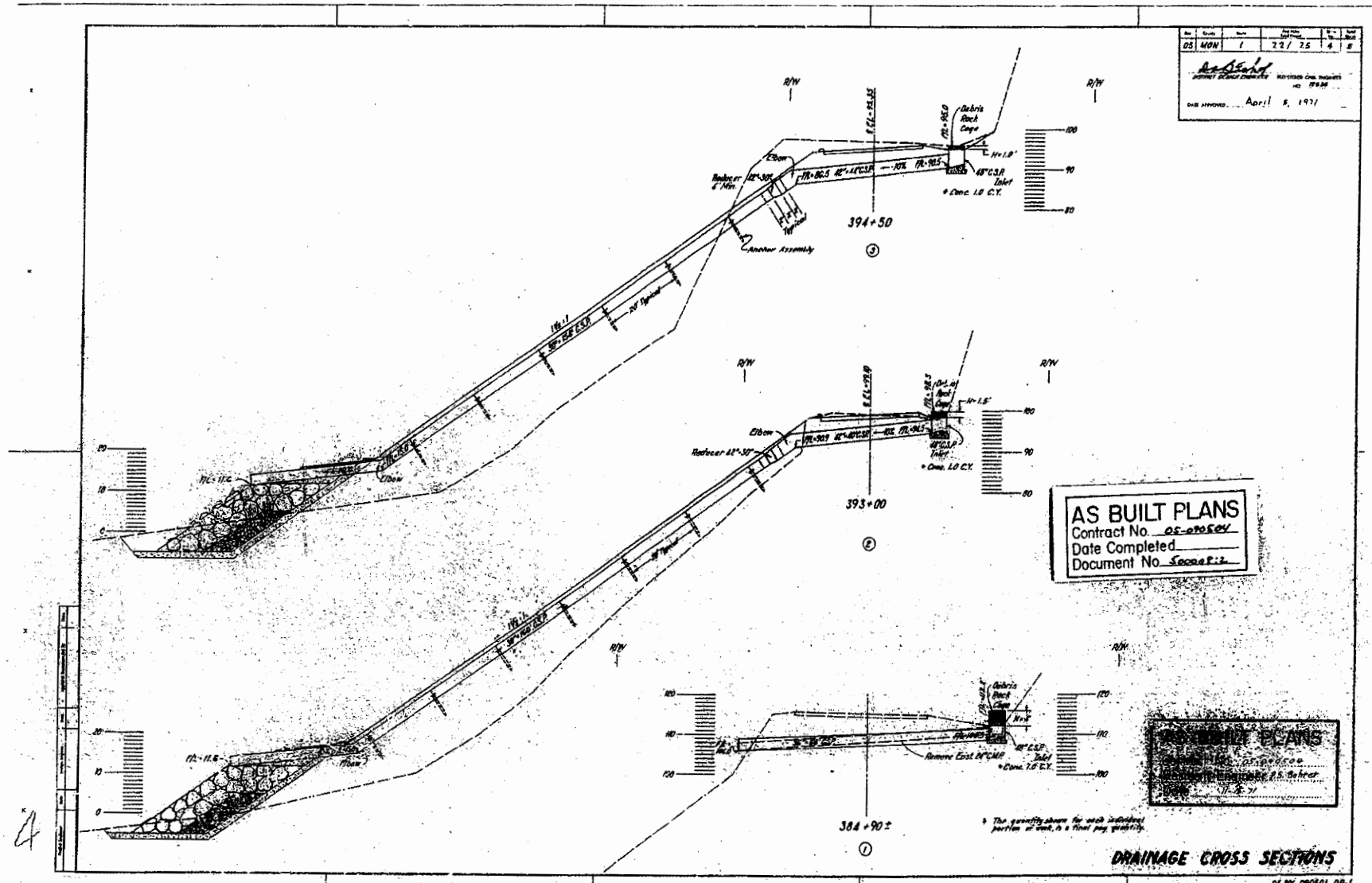
GUARD RAIL				
Station	Length	Location	Anchor	Flare
392+75 to 397+75	500'	Lt. E.S.	1 Ea.	See Special Details

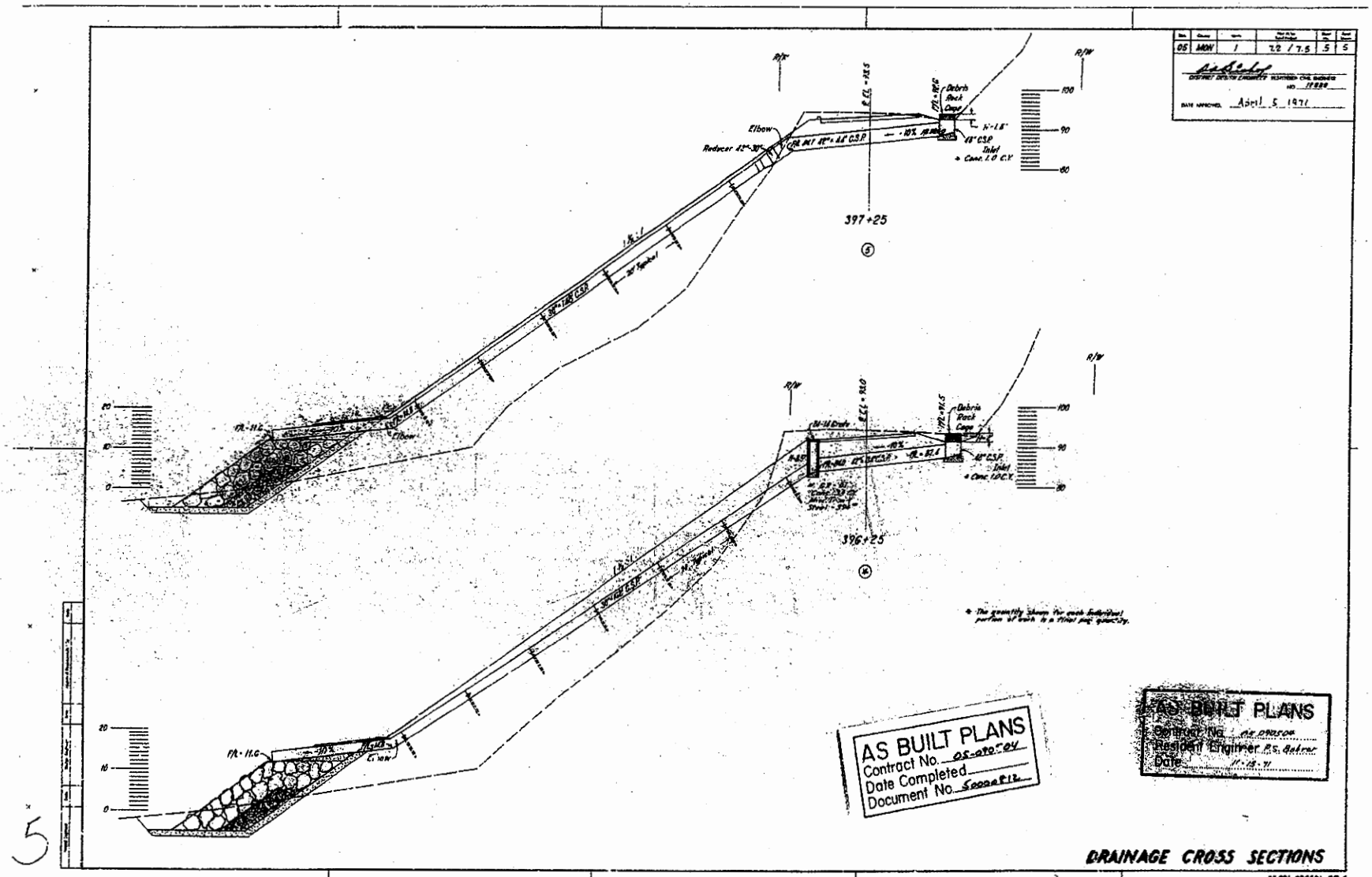
ROADWAY QUANTITIES					
Roadway Excavation	Imported Borrow	CL 2 A.B.	Type "B" A.C.	Liquid Asphalt Prime Coat	Remarks
C.Y.	C.Y.	C.Y.	Tons	Tons	
1960	80,440	410	408*	2.10	* Does Not Include Adv. Quantities

CULVERT LIST															
Index	Location	C.S.P. 30"x.077"	C.S.P. 36"x.079"	C.S.P. 42"x.079"	C.S.P. 48"x.079" Inlet	* Structure Excavation	* Structure Backfill	Miscr. * Struct. Concrete	Debris Rack Cage #9	Misc. * Bend & Steel	30° Kirchner Alloy	42"x30° Reducer	Backing	Remarks
		Lineal Feet				C.Y.	C.Y.	C.Y.	EA.	LBS.	EA.	EA.	C.Y.	
①	394+90		66		1	83	61	1.0	1					
②	393+00	160		40	1	182	105	1.0	1		7	1	18	1-45° Elbow
③	394+60	154		46	1	129	110	1.0	1		6	1	12	1-30° Elbow
④	396+25	162		36	1	166	148	0.5	1	396	7		12	1-30° Elbow
⑤	397+25	128		46	1	126	106	1.0	1		6	1	11	1-30° Elbow
	Totals	624	66	182	22	622	529	8.4	5	396	26	3	53	

* The quantity shown in this column for each individual portion of work is a final pay quantity as Std. Plan D-96


Pacific Ocean
Rock Slope Protection
4 Ton Rock
End of Work
Station 402+00 P.M. 7.5
AS BUILT PLANS
Contract No. 05-470604
Date Completed
Document No. 5000812
3


394+50
393+00
384+90±
AS BUILT PLANS
Contract No. 05-090504
Date Completed
Document No. Sheet 2 of 2
DRAINAGE CROSS SECTIONS
05 MON 1 72/75 4 8
April 8, 1971
Debris Rock Cage
Elbow
Reducer
Anchor Assembly
Remove East 84"CMP
* Conc. 1.0 C.Y.
* Conc. 1.6 C.Y.
* The quantity shown for each individual portion of cost, is a final pay quantity.
05 MON 090501 DR-1



I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

DATE 11-14-97 SIGNATURE _____ TITLE _____

INDEX OF SHEETS

APPLICABLE STANDARD PLANS

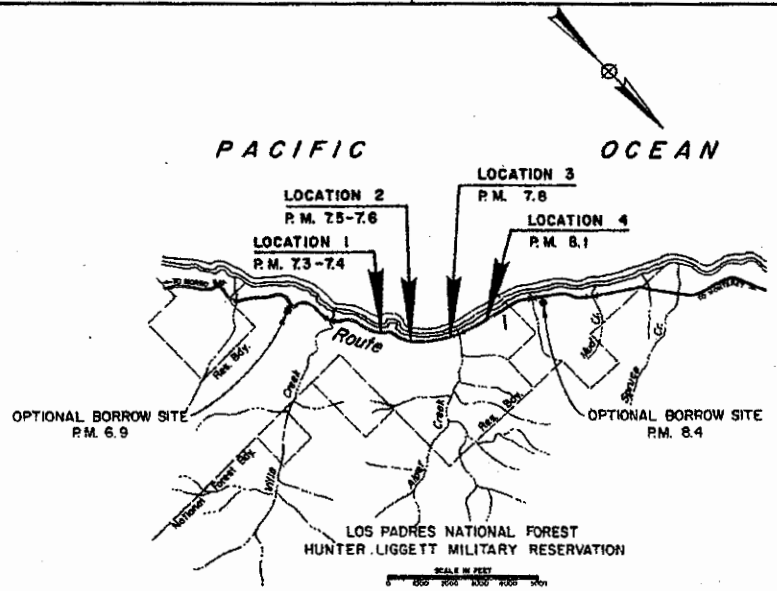
A62-A	094	B13-2	096-B
A62-B	097-B	D87-A	S42-15

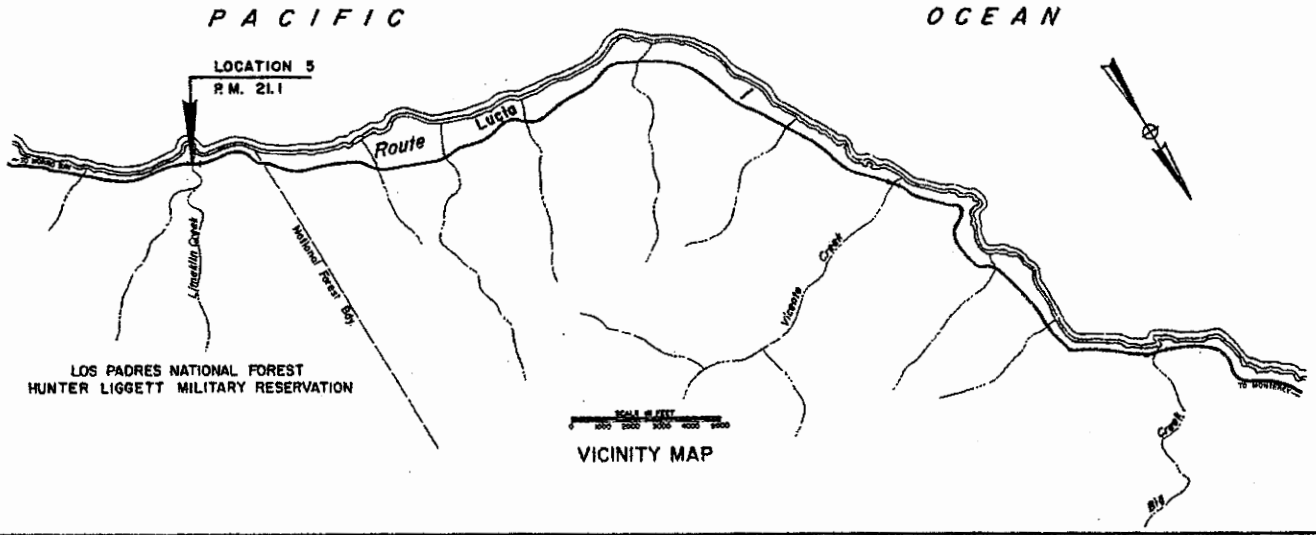
Dist.	County	Route	Post Miles	Sheet No.
05	Mon	1	7.3/21.1	1

ACTING DISTRICT DIRECTOR OF TRANSPORTATION
REGISTERED CIVIL ENGINEER No. 10934

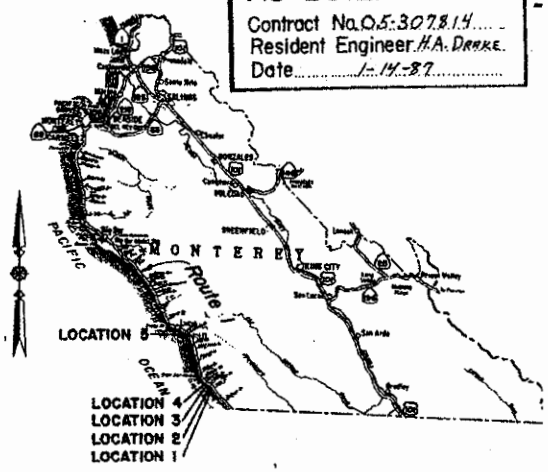
CHIEF, OFFICE OF OFFICE ENGINEER
REGISTERED CIVIL ENGINEER No. 8854

DATE APPROVED February 14, 1984





AS BUILT PLANS
Contract No. 05-307814
Resident Engineer H.A. Drake
Date 1-14-87



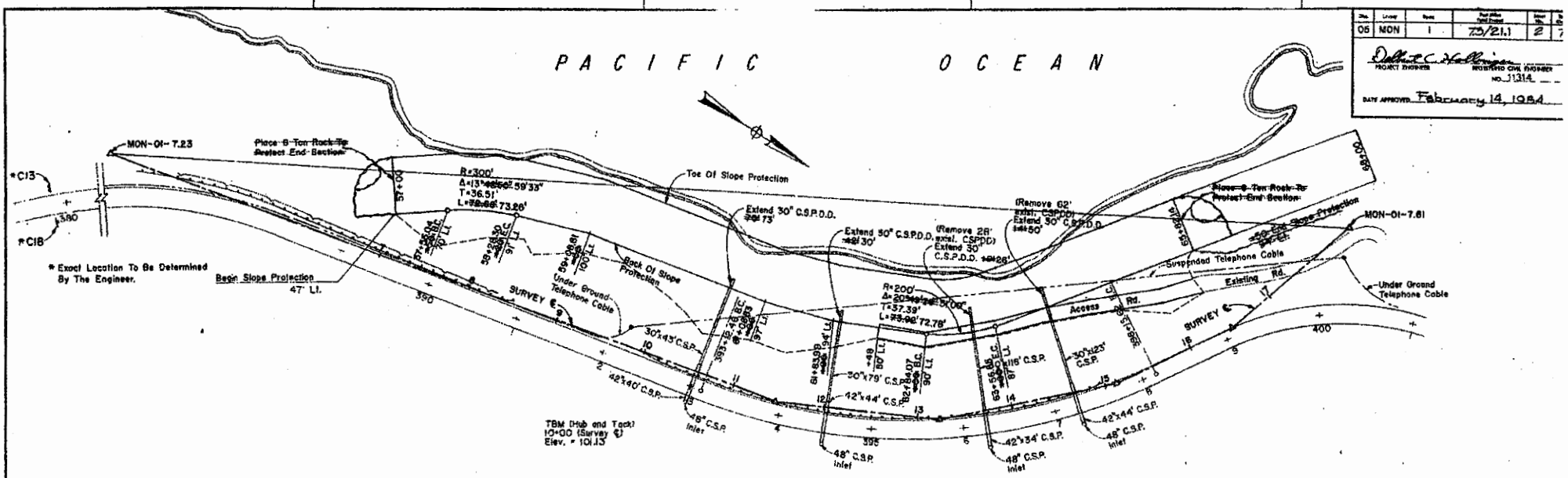
LOCATION MAP
No Scale

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN MONTEREY COUNTY
AT VARIOUS LOCATIONS
FROM 0.2 MILE NORTH OF VILLA CREEK BRIDGE
TO 0.1 MILE NORTH
OF LIMEKILN CREEK BRIDGE NEAR LUCIA

to be supplemented by Standard Plans dated January, 1981

Contract No. 05-30781
05 201 30781

Designed	Date	Project Engineer	Date	Project Supervisor	Date	Assistant Supervisor	Date
B.E. Pasterino	4/1981	D.C. Hollinger	4/1983	P. Horn		M.W. Beckstead	



LOCATION 1
P.M. 7.3/7.4

LOCATION 2
P.M. 7.5/7.6

AS BUILT PLANS
Contract No. 05-307814
Resident Engineer H.A. Drake
Date 1-14-87

LAYOUT
LOCATION 1 AND 2

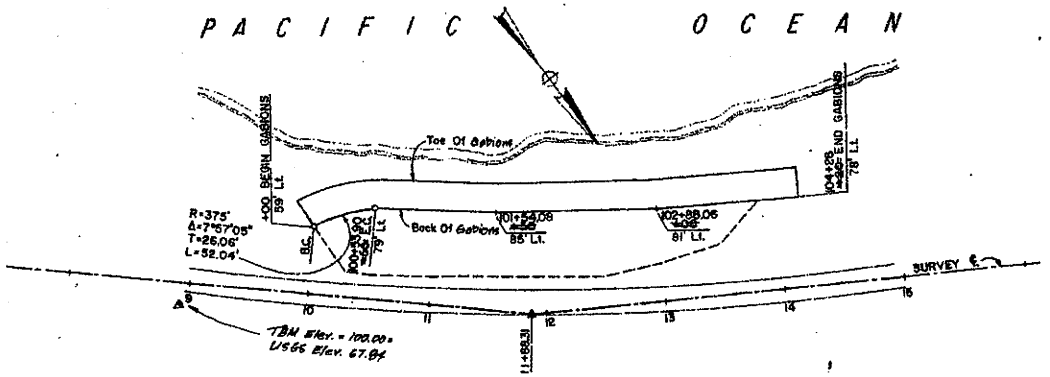
05201 307811

Dist.	County	Route	Total Sheets / Sheet No.	Sheet No.
05	Mon	1	23/21.1	5

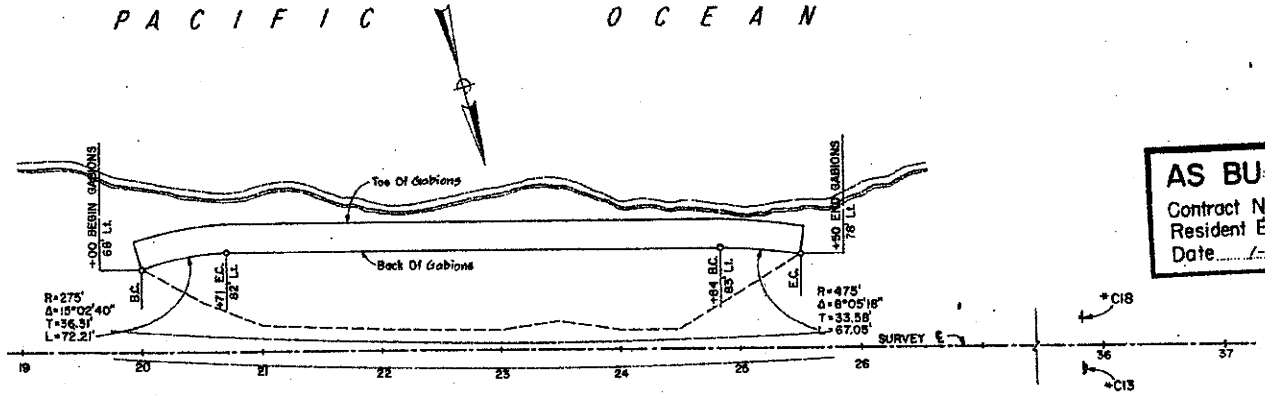
PROJECT ENGINEER

REGISTERED CIVIL ENGINEER NO. 11314

DATE APPROVED February 14, 1984



LOCATION 3
P.M. 7.8



LOCATION 4
P.M. 8.1

AS BUILT PLANS
Contract No. 05-307814
Resident Engineer H. A. DEARE
Date 1-14-87

* Exact Location To Be Determined By The Engineer.

Elevations based on TBM shown at Location 3.

LAYOUT
LOCATION 3 AND 4

05201 307811

FOR REVISED PLANS 0 1 2 3

Dist.	County	Route	Post Mile / Total Project	Sheet No.	Total Sheets
05	Mon	1	7.3/21.1	4	7

PROJECT ENGINEER — REGISTERED CIVIL ENGINEER NO. 11514

DATE APPROVED February 14, 1984

EARTHWORK SUMMARY

Station	Roadway Excavation	Roadway Embankment
	Cubic Yards	
LOCATION 1		
7+00 To 16+50	10,015	17,504
LOCATION 2		
20+50 To 26+8729	5836	15,162
LOCATION 3		
10+00 To 14+20	1903	9428
LOCATION 4		
20+00 To 25+50	2430	12,993
Totals	20,193	55,087

GABION SLOPE PROTECTION SUMMARY

Gabions		Location					
Type	Size	1	2	3	4	Totals	+C.Y.
A	6' x 3' x 3'	660	462			1122	2244
C	12' x 3' x 3'			660	736	1296	5184
D	6' x 3' x 1.5'	300	210			510	510
E	9' x 3' x 1.5'	1350	945			2295	3443
F	12' x 3' x 1.5'	377	210	105	138	830	1660
					Total Cubic Yards		13,041

* Gabions Paid By Cubic Yards.

CONSTRUCTION AREA SIGNS

STATIONARY MOUNTED

Sign	No. Of Signs	Size Of Posts	Total No. Of Posts
C18 - 48" x 48"	2	4" x 6"	2
C13 - 60" x 24"	2	4" x 4"	4

AIR BLOWN MORTAR

Location	Sq. Yds.
3	921
4	1199
Total	2120

CONCRETE SUMMARY

Location 6	Misc. Concrete (Rock slope) C. Y.
Mon-1-21.1	366

ROCK SLOPE PROTECTION SUMMARY

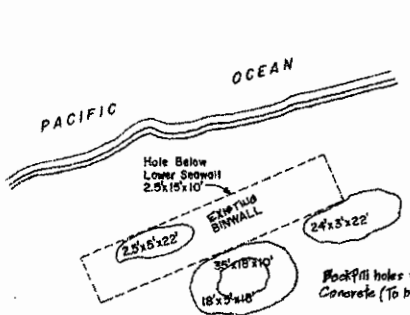
Station	6 Ton Rock Slope Protection	+Gabion Rock	Filter Fabric
	C.Y.		S.Y.
LOCATION 1	10,808.4	3,088.5	5,462.9
7+00 To 16+50	~~10,800~~	~~4800~~	~~6480~~
LOCATION 2	8,859.7	2,331.5	3,399.4
20+50 To 26+8729	~~8548~~	~~2800~~	~~5106~~
LOCATION 3	2,485	934	
10+00 To 14+20	354	~~2440~~	~~900~~
LOCATION 4	3,012	1,205	
20+00 To 25+50	414	~~3280~~	~~4585~~
Totals	~~25,948~~ 25,836.1	~~8750~~ 10,918.0	~~18,035~~ 17,060.3

+Included In Price For Gabions.

DRAINAGE SUMMARY

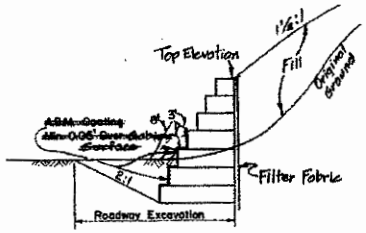
Station	30" Bit. Coated CSP Downdrain (.109" Thick)	30" Bit. Coated CSP (.109" Thick)	30" CSP	Remove Existing (Partial)	Flr. s. Bit. Coated	Anchor Assembly (Alternative B)	Abandon Culvert
	L.F.					EA	
Location 1							
10+59	~~73~~					~~2~~	
12+09	~~30~~					~~4~~	
13+72	~~26~~		28			~~2~~	
14+68	~~50~~		62			~~2~~	
Location 2							
25+12	~~80~~	~~80~~ 85			1	~~4~~	1
Totals	~~240~~ 259	~~80~~ 85	90		1	~~14~~ 6	1

* Not A Separate Pay Item

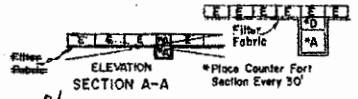


Backfill holes with Concrete (To be paid for as extra work).

LOCATION 5'
P.M. 21.1



LOCATIONS 3&4



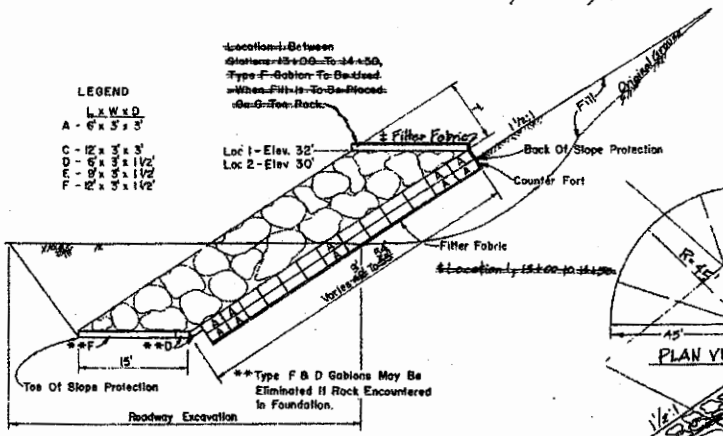
AS BUILT PLANS
Contract No. 05-307814
Resident Engineer H.A. Drake
Date 1-14-87

LEGEND

L x W x D

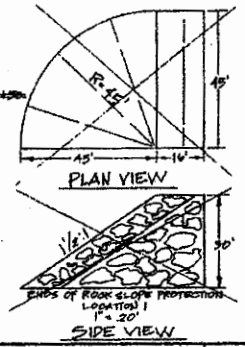
A - 6' x 3' x 3'
C - 12' x 3' x 3'
D - 6' x 3' x 1½'
E - 9' x 3' x 1½'
F - 12' x 3' x 1½'

~~Location 1: Between Stations 13+00 To 14+50, Type F Gabion To Be Used When Fill Is To Be Placed On 6 Ton Rock.~~

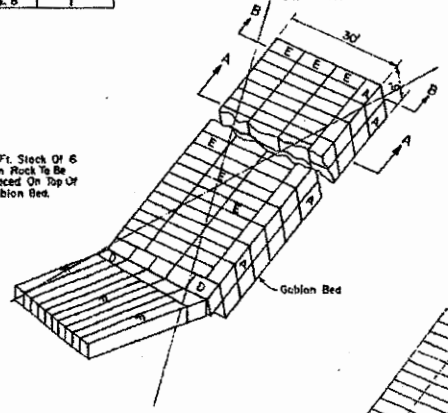


**Type F & D Gabions May Be Eliminated If Rock Encountered In Foundation.

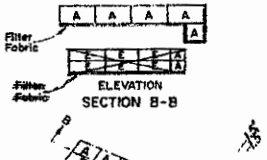
LOCATIONS 1&2
No Scale

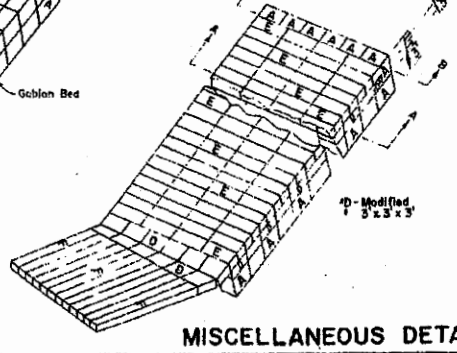


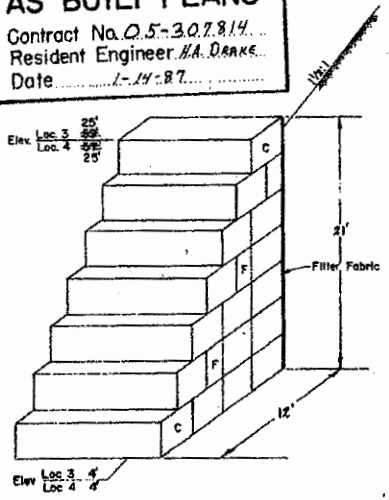
7 Ft. Stock Of 6 Ton Rock To Be Placed On Top Of Gabion Bed.



GABIONS
LOCATIONS 1&2
No Scale



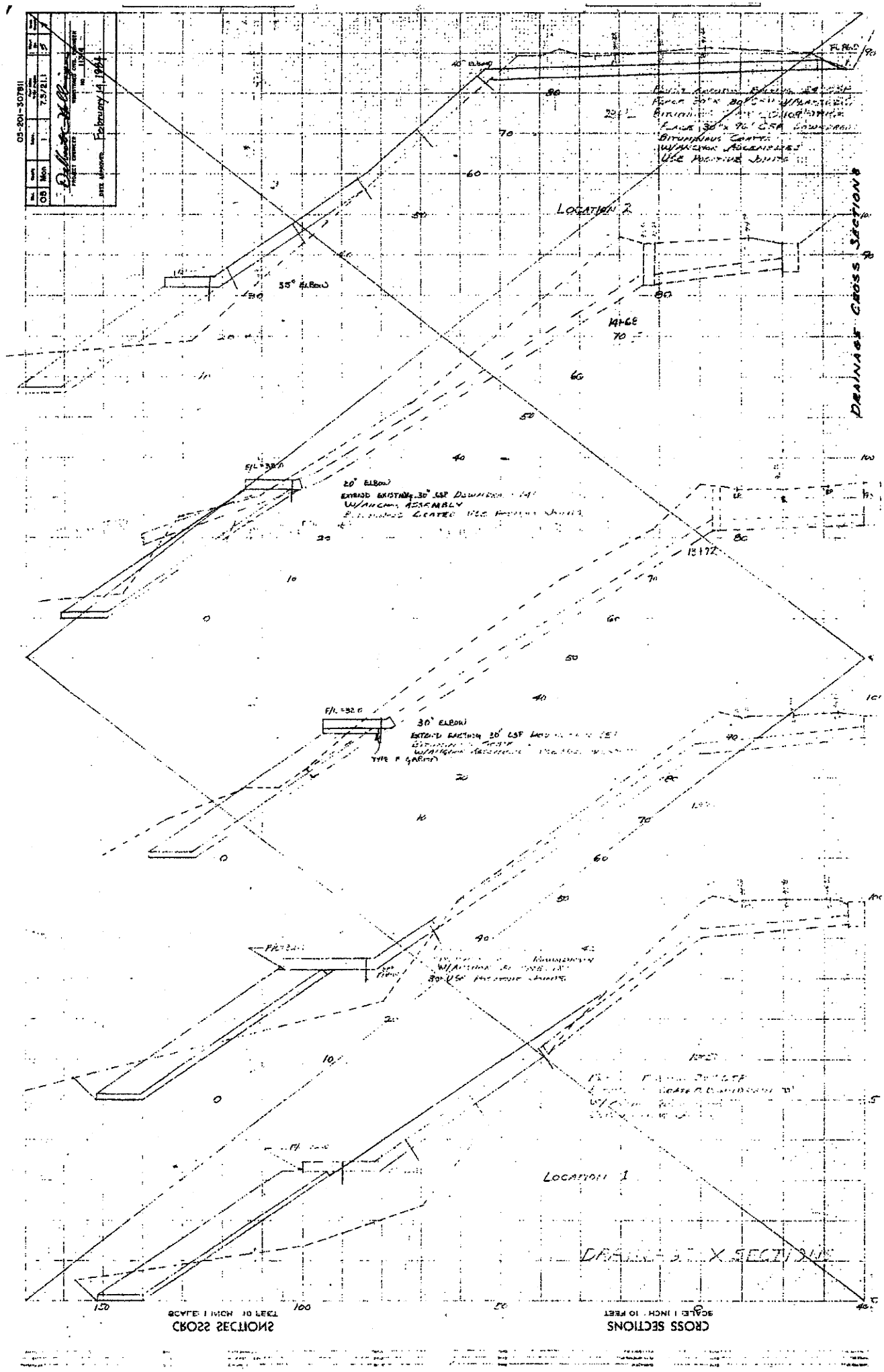




GABION CRIBWALL
LOCATIONS 3&4
No Scale

MISCELLANEOUS DETAILS & SUMMARY OF QUANTITIES

05 201 307811

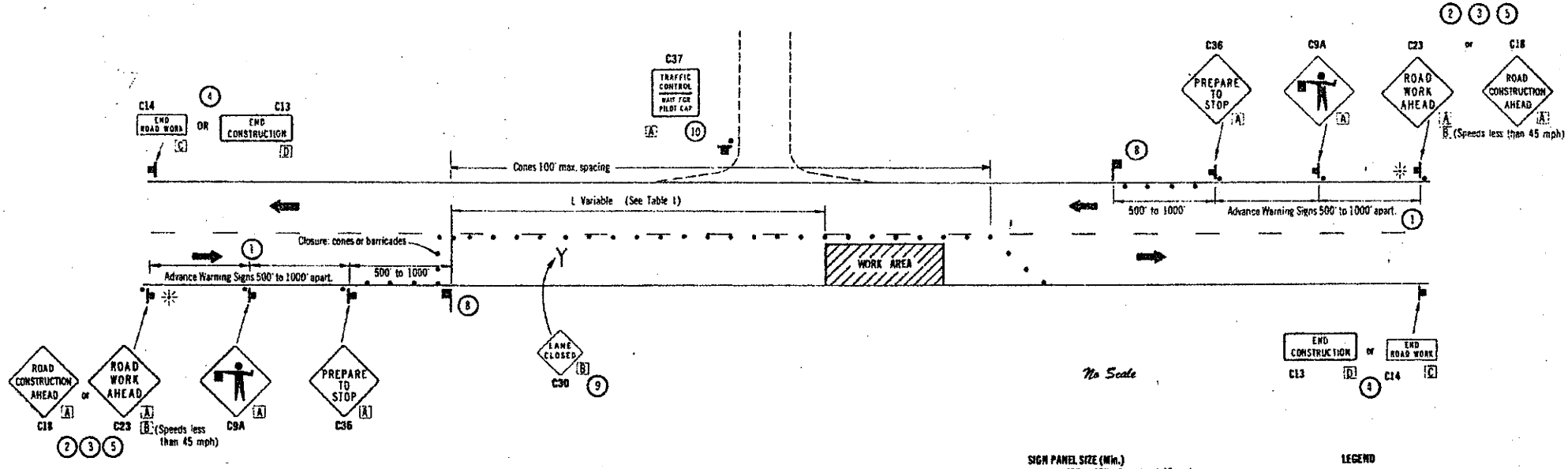

05-201-30781
February 14, 1984
LOCATION 2
55° ELBOW
20° ELBOW
30° ELBOW
LOCATION 1
DRAINAGE CROSS SECTIONS
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET

To accompany plans dated February 14, 1984

DIST	COUNTY	ROUTE	POST MILE	TOTAL PROJECT	SHEET	TOTAL SHEETS
05	Mon	1	7.5/21.1		6	7

CHIEF, DIVISION OF TRAFFIC ENGINEERING — 9-8-82

TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL



SIGN PANEL SIZE (Min.)

- [A] 48" x 48" - Speeds of 45 mph or more; 36" x 36" - Speeds less than 45 mph (except C23)
- [B] 30" x 30"
- [C] 36" x 18"
- [D] 48" x 18"

LEGEND

- Traffic Cone
- Flag Tree
- Portable Sign
- Flagger
- Direction of Travel
- Portable Flashing Beacon

NOTES:

1. Where approach speeds are low, signs may be placed at 300 foot spacing, and in urban areas, closer.
2. All advance warning signs for night closures shall be illuminated. Other signs shall be either illuminated or reflectorized.
3. All advance warning sign installations shall be equipped with flags for daytime closures. Flashing beacons shall be placed at the locations indicated during night lane closures.
4. A C13 "END CONSTRUCTION" or C14 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project limits.
5. If the C18 (or C23) sign would follow within 2,000 feet of a stationary C18, C23, or C11 "STATE HIGHWAY CONSTRUCTION NEXT _____ MILES", use a C9A sign for the first advance warning sign.
6. All cones used for night lane closure shall be illuminated traffic cones.
7. Portable delineators, placed at one half the spacing indicated for traffic cones, may be used in lieu of cones for daytime closures only.
8. An additional advance flagger shall be considered on high volume highways where traffic queues may develop. Flaggers stations for work at night shall be illuminated as noted in Section 5.06 of the "Manual of Traffic Controls."
9. Place C30 "LANE CLOSED" sign on flag tree at 500'-1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.
10. When a pilot car is used, place C37 "TRAFFIC CONTROL ——— WAIT FOR PILOT CAR" sign.

TABLE I

Approach Speed Miles Per Hour	*L (Feet)±
0-30	200
30-45	310
over 45	500

(*) Increase by 20% on sustained downgrades steeper than 3% and longer than 1 mile.

AS BUILT PLANS
Contract No. 05-307814
Resident Engineer H.A. Drake
Date 1-14-87

TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON TWO LANE CONVENTIONAL HIGHWAYS

MISCELLANEOUS DETAILS

REVISED 5/26/83

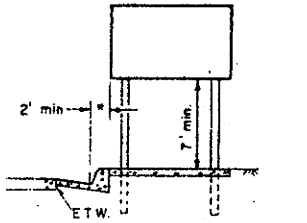
T-1

To accompany plans dated February 14, 1984

DIST	COUNTY	ROUTE	POST MILE	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	Mon	1	33/R31.1		7	7

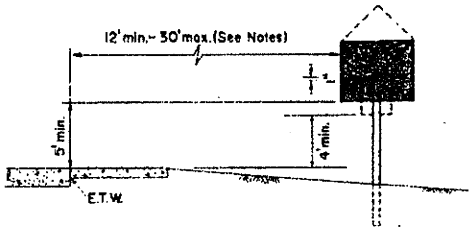
CHIEF, OFFICE OF TRAFFIC ENGINEERING
REGISTERED CIVIL ENGINEER NO. 9210

DATE APPROVED 24 May 1984



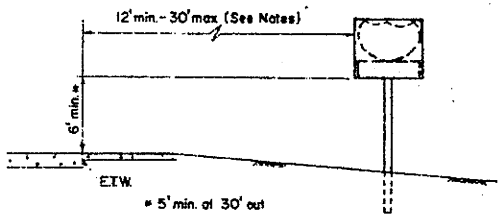
* 1' min. where lateral clearance limited

URBAN LOCATIONS

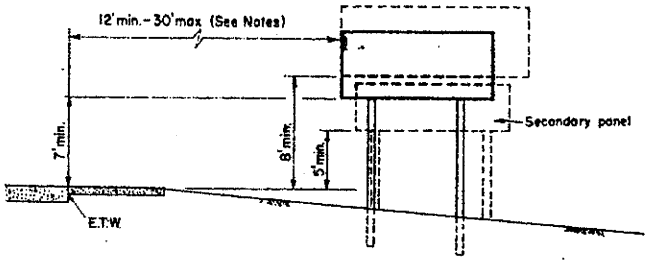


RURAL LOCATIONS

CONVENTIONAL HIGHWAYS AND INTERCHANGE AREAS



REGULATORY AND WARNING SIGNS
AND ROUTE SHIELDS



GUIDE SIGNS

FREEWAY AND EXPRESSWAY LOCATIONS

NOTES.

When clear roadside recovery areas are provided, signs shall be placed as far from the edge of traveled way as possible, up to a maximum of 30 feet. When possible they shall be placed in protected locations.

Signs in medians shall be placed at midpoint of median up to a maximum distance of 30' from edge of traveled way. When appropriate, signs for opposing directions shall be placed back to back.

E.T.W. = Edge of Traveled Way

AS BUILT PLANS
Contract No. 05-303814
Resident Engineer H.A. DRAKE
Date 1-14-87

REVISED STANDARD PLAN

Supersedes Plan Sheet S4I-3
Page 183 of the Standard Plans Book
Dated January, 1981

ROADSIDE SIGNS
TYPICAL INSTALLATION DETAILS NO. 1

RSP-S4I-3