CALIFORNIA COASTAL COMMISSION
CENTRAL COAST AND NORTH CENTRAL COAST DISTRICT OFFICES
725 FRONT STREET, SUITE 300
SANTA CRUZ, CA 95060
PHONE: (831) 427-4863
FAX: (831) 427-4877
WEB: WWW.COASTAL.CA.GOV

Th11a

Filed:	12/06/2012
Staff:	M. Watson - SC
Staff Report:	09/26/2013
Hearing Date:	10/10/2013

STAFF REPORT: REGULAR CALENDAR CDP APPLICATION

Application Number:	**3-11-063**
Applicant:	**Moss Landing Harbor District**
Project Location:	Three sites within Moss Landing Harbor including two within the north harbor (Sites 1 and 2: adjacent to the boat launch and Sea Harvest restaurant), and one in the south harbor (Site 3: adjacent to the "G" dock).
Project Description:	Repair damaged revetments at two locations within North Moss Landing Harbor (150 and 200 linear feet respectively), and construct a new revetment in the South Harbor (130 linear feet). Project involves grading, slope preparation, placement of geotextile fabric, installation of storm drain facilities, key excavation, and placement of approximately 1,165 cubic yards of quarter-ton armor stone (700 cubic yards at Sites 1 & 2 and 465 cubic yards at Site 3).
Staff Recommendation:	Approval with Conditions

SUMMARY OF STAFF RECOMMENDATION

The Applicant, Moss Landing Harbor District, proposes to repair two rip-rap revetments (installed under CDP 3-01-016 in 2006) adjacent to the north harbor boat launch and public access promenade, both of which are coastal-dependent facilities that are vulnerable to shoreline erosion at this location. The revetments were damaged by the 2011 Tsunami. In addition, the Applicant proposes to install a new revetment in the south harbor adjacent to "G" dock (recreational boats) and the Moro Cojo box culvert pipe beneath Moss Landing Road, which are

likewise threatened by erosion. These facilities are essential to maintaining commercial and recreational boating (coastal-dependent and Coastal Act priority uses), and public access and recreation. In addition, the box culvert helps maintain tidal flow between the south harbor and Morro Cojo Slough, which serves to maintain its estuarine habitat and protect against flooding. The proposed revetments are all located along the shoreline frontage within Moss Landing Harbor in the small town of Moss Landing in northern Monterey County. The revetments extend approximately 150 linear feet at Site 1 (adjacent to the boat launch), roughly 200 linear feet at Site 2 (fronting the public access promenade), and approximately 130 linear feet at Site 3 (next to "G" dock and box culvert pipe).

With regard to the north harbor, the proposed project constitutes repair of previously permitted revetments. The Applicant is also proposing to restore the public pedestrian pathway along the shoreline adjacent to the revetments, and install public access signage, to finalize the project that was authorized under the previous permit for the site (3-01-016). As such, at this time, the Commission's review of the north harbor portion of the project is limited to evaluating the method of repair and any impacts the repair itself may cause. Staff is recommending several special conditions that apply to the repair portion of the project, including construction best management practices to protect water quality, and a requirement to maintain the revetments in their approved configuration for the life of the project.

With regard to the south harbor, staff believes that shoreline protection is necessary to protect the harbor facilities from danger and agrees that a rip-rap revetment is the most appropriate alternative available for this purpose at the current time. Alternative structural and non-structural protective alternatives were considered, but were dismissed mainly due to infeasibility. In the future, however, it is possible that the harbor shoreline will be redeveloped, including with respect to different shoreline protection at the water's edge (e.g., sheet pile and/or other more vertical options), at which time alternative protection of this site should be considered. Monterey County is in the process of updating the Moss Landing Community Plan (the "Plan"), a specific plan for the town of Moss Landing, including the harbor, which among other things is intended to address shoreline erosion and appropriate approaches to armoring within the harbor. Given the proximity to Elkhorn and Moro Cojo Sloughs, and tidal flow through the box culvert pipe, all three of the sites will continue to be subject to erosion. The upcoming Plan may inform how to address future armoring at these locations in a more comprehensive manner.

The impacts to sand supply from the proposed armoring would equate to roughly 578 cubic yards of sand being removed from the nearshore littoral system over a 20-year period. Staff recommends that the Commission find it is appropriate to mitigate for the project's access and sand supply impacts via in-kind public access and recreational improvements within the vicinity of the proposed development. In the south harbor, a public mini park/viewing area would be created including picnic table, bench, decomposed granite surfacing, interpretive signage, and landscaping. Staff believes that these public access enhancements represent significant recreational benefits and appropriate mitigation measures to offset the project's sand supply impacts.

Accordingly, to define the approved project, and to fully mitigate for project impacts, staff is recommending a series of conditions related to the new revetment at the south harbor, including:

(1) an approval that (a) ties the length of armoring authorization to the life of the existing development (i.e., harbor facilities) that the armoring is required to protect; (b) requires the Applicant to submit a complete permit amendment application to remove the armoring when the harbor facilities warranting armoring are no longer present, or no longer require armoring; and (c) requires the Applicant to submit a complete permit amendment application to propose mitigation for impacts attributable to the armoring beyond the 20-year period upon which initial impact mitigation is based; (2) in-kind public access and recreational improvements to mitigate for the loss of sand and materials that would otherwise contribute to the nearshore littoral system; (3) revetment maintenance and monitoring program; (4) submittal of as-built plans; (5) construction plan; (6) water quality measures; and (7) restrictions on future development, indemnification, and other related conditions to address coastal resource impacts and issues.

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

TABLE OF CONTENTS

EXHIBITS

I. MOTION AND RESOLUTION

Staff recommends that the Commission, after public hearing, **approve** a coastal development permit for the proposed development. To implement this recommendation, staff recommends a **YES** vote on the following motion. Passage of this motion will result in approval of the CDP as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Motion: *I move that the Commission approve Coastal Development Permit Number 3-11-063 pursuant to the staff recommendation, and I recommend a yes vote.*

Resolution to Approve CDP: *The Commission hereby approves Coastal Development Permit Number 3-11-063 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 Permittees 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 or interpretation of any condition will be resolved by the Executive Director or the Commission.

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

5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the Permittees 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. **Revised Final Plans.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the Permittee shall submit two copies of Revised Final Plans for Executive Director review and approval showing all development authorized by this CDP. The Revised Final Plans shall be in substantial conformance with the submitted project plans prepared by Moffat & Nichol (North Harbor sites 1 & 2) and Sea Engineering Inc. (South Harbor site 3), and dated received in the Coastal Commission's Central Coast District Office on November 6, 2012 except that they should be revised as follows:

   (a) Public Access Improvements. All public access improvements and amenities identified in Special Condition 9 below shall be identified in site plan view. Such improvements shall be constructed of materials and finishes that are sensitive to the shoreline aesthetic, including through use of natural materials (wood, decomposed granite pathways, etc.) as much as possible.

   (b) Drainage Plans. Revised drainage plan shall be submitted for Executive Director review and approval showing either that filtration units shall be placed at the outboard end of each drainage discharging to the harbor or the drainage plan has been modified to incorporate a water quality filtration system that not only removes sediments, oil and grease, but also removes pollutants of concern (heavy metals, hydrocarbons and detergents) prior to discharge into harbor waters. All drainage and related elements within the revetments shall be camouflaged (e.g., hidden within the rip-rap armor stones) so as to be hidden from view and/or inconspicuous as seen from the top of the bluffs.

   (c) Landscaping. All landscaping shall utilize native and noninvasive plant species that are tolerant of salt air and salt spray, with a preference for species capable of trailing vegetation that can colonize steeper bluff areas and also screen the top of the seawall as seen from the beach as much as possible. All invasive and non-native species in the project area, including iceplant, shall be removed and not be allowed to persist. All plants shall be kept in good growing condition and shall be replaced as necessary to maintain the approved vegetation over the life of the project, including to maintain some visual screening of the top of the seawall. Regular monitoring and provisions for remedial action (such as replanting as necessary) shall be identified to ensure landscaping success.

   All requirements of the approved Revised Final Plans shall be enforceable components of this CDP. The Permittee shall undertake all development in accordance with the approved Revised Final Plans.

2. **Construction Plan.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT the Permittee shall submit two sets of a Construction Plan to the Executive Director for review and approval. The Construction Plan shall, at a minimum, include the following:

   (a) Construction Areas. The Construction Plan shall identify the specific location of all construction areas, all staging areas, all storage areas, all construction access corridors (to

the construction site and staging areas), and all public pedestrian access corridors. All such areas within which construction activities and/or staging are to take place shall be minimized in order to minimize construction encroachment on all publicly available pathways, beach, and beach access points, to have the least impact on public access.

(b) Construction Methods and Timing. The Construction Plan shall specify the construction methods to be used, including all methods to be used to keep the construction areas separated from public recreational use areas (including using the space available on the blufftop portions of the project area for staging, storage, and construction activities to the maximum extent feasible provided it does not significantly adversely affect public access, and including using unobtrusive fencing (or equivalent measures) to delineate construction areas), and including all methods to be used to protect harbor waters. All erosion control/water quality best management practices to be implemented during construction and their location shall be noted.

(c) Construction Requirements. The Construction Plan shall include the following construction requirements specified by written notes on the Construction Plan. Minor adjustments to the following construction requirements may be allowed by the Executive Director if such adjustments: (1) are deemed reasonable and necessary; and (2) do not adversely impact coastal resources.

- All work shall take place during daylight hours, and lighting of the beach area is prohibited.
- Construction work or equipment operations shall not be conducted below the mean high tide line unless tidal waters have receded from the authorized work areas.
- Grading of intertidal areas is prohibited, except removal of existing concrete, rip-rap, and rubble is allowed in these areas.
- Only rubber-tired construction vehicles are allowed on the beach, except track vehicles may be used if the Executive Director determines that they are required to safely carry out construction. When transiting on the beach, all such vehicles shall remain as close to the bluff edge as possible and avoid contact with slough waters.
- All construction materials and equipment placed seaward of the bluffs during daylight construction hours shall be stored beyond the reach of tidal waters. All construction materials and equipment shall be removed in their entirety from these areas by sunset each day that work occurs, except for erosion and sediment controls and/or construction area boundary fencing where such controls and/or fencing are placed as close to the toe of the coastal protection/bluff as possible, and are minimized in their extent.
- Construction (including but not limited to construction activities, and materials and/or equipment storage) is prohibited outside of the defined construction, staging, and storage areas.
- No work shall occur during weekends and/or the summer peak months (i.e., from the Saturday of Memorial Day weekend through Labor Day, inclusive) unless, due to

extenuating circumstances (such as tidal issues or other environmental concerns), the Executive Director authorizes such work.

- Equipment washing, servicing, and refueling shall not take place on the beach, and shall only be allowed at a designated inland location as noted on the Plan. Appropriate best management practices shall be used to ensure that no spills of petroleum products or other chemicals take place during these activities.
- The construction site shall maintain good construction site housekeeping controls and procedures (e.g., clean up all leaks, drips, and other spills immediately; keep materials covered and out of the rain, including covering exposed piles of soil and wastes; dispose of all wastes properly, place trash receptacles on site for that purpose, and cover open trash receptacles during wet weather; remove all construction debris from the beach; etc.).
- All erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each workday. At a minimum, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction-related runoff and/or sediment from entering into Elkhorn Slough and the harbor.
- All public recreational use areas impacted by construction activities shall be restored to their pre-construction condition or better within three days of completion of construction. Any native materials impacted shall be filtered as necessary to remove all construction debris.
- The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office at least three working days in advance of commencement of construction or maintenance activities, and immediately upon completion of construction or maintenance activities.

All requirements above and all requirements of the approved Construction Plan shall be enforceable components of this coastal development permit. The Permittee shall undertake development in accordance with this condition and the approved Construction Plan.

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

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

   (b) Construction Coordinator. A construction coordinator shall be designated to be contacted during construction should questions arise regarding the construction (in case of both regular inquiries and emergencies), and the coordinator's contact information (i.e., address, phone numbers, etc.) including, at a minimum, a telephone number that will

be made available 24 hours a day for the duration of construction, shall be conspicuously posted at the job site where such contact information is readily visible from public viewing areas, along with an 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.

4. **Future Monitoring and Maintenance.** This CDP requires ongoing monitoring of the permitted revetments, and authorizes future maintenance as described in this special condition. The Permittee acknowledges and agrees on behalf of the Moss Landing Harbor District and all successors and assigns that: (a) it is Permittee's responsibility to maintain the permitted revetments in a structurally sound manner and in their approved state; (b) it is Permittee's responsibility to retrieve loose rock that is displaced from the revetments; and (c) it is Permittee's responsibility to annually, or more often, if necessary, inspect the overall permitted revetments for signs of failure and/or displaced armor rock. Any such maintenance-oriented development associated with the permitted revetment shall be subject to the following:

   (a) Maintenance. "Maintenance", as it is understood in this condition, means development that would otherwise require a CDP whose purpose is to repair and/or maintain the permitted revetments in their approved configuration, including retrieval of armor rock that may be displaced from the permitted revetments. 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 CDP amendment unless the Executive Director determines that the proposed modifications will not result in additional coastal resource impacts, in which case an amendment would not be required.

   (b) Other Agency Approvals. The Permittee acknowledges that this maintenance condition does 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 of the proposed maintenance activities. Except for necessary emergency interventions, such notice shall be given by first-class mail at least 30 days 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 CDP. 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 CDP. The notification shall clearly indicate that the maintenance event is proposed pursuant to this CDP, 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) Maintenance Coordination. Maintenance events shall, to the degree feasible, be coordinated with other maintenance events proposed in the immediate vicinity with the goal being to limit coastal resource impacts, including the length of time that construction occurs in and around the harbor and bluff area. As such, the Permittee shall make reasonable efforts to coordinate the Permittee's maintenance events with other adjacent events, including adjusting maintenance event scheduling as directed by planning staff of the Coastal Commission's Central Coast District Office.

(e) Construction Site Documents and Construction Coordinator. All requirements set forth in **Special Condition 3** above ("Construction Site Documents & Construction Coordinator") shall apply to any maintenance event.

(f) Restoration. The Permittee shall restore all bluff and rocky shore platform areas and all access points impacted by maintenance activities to their pre-construction condition or better at the conclusion of any maintenance event. Any native materials impacted shall be filtered as necessary to remove all construction debris from the area within three days of completion of construction. The Permittee shall notify planning staff of the Coastal Commission's Central Coast District Office upon completion of restoration activities to arrange for a site visit to verify that all restoration activities are complete. If planning staff identifies additional reasonable measures necessary to restore the affected area, such measures shall be implemented as quickly as reasonably possible.

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

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

(i) Duration and Scope of Covered Maintenance. Future maintenance under this CDP is allowed subject to the above terms throughout the length of the armoring approval (see **Special Condition 6**) subject to Executive Director review and approval every ten years to verify that there are not changed circumstances associated with such maintenance that necessitate re-review. It is the Permittee's responsibility to request Executive Director approval prior to the end of each ten-year maintenance period (i.e., with the first period running through October 10, 2023. Maintenance can be carried out beyond October 10, 2023 (and beyond subsequent ten-year periods) if the Permittee requests an extension prior to the end of each ten-year maintenance period and if the Executive Director extends the maintenance term in writing. The intent of this permit is to allow for 10-year extensions of the maintenance term for as long as the seawall remains authorized 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 maintenance condition. The Permittee shall maintain the permitted armoring in its approved state. No expansion or enlargement of the permitted armoring is allowed.

5. **Other Agency Review and Approval.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the Permittee shall submit to the Executive Director written evidence that all necessary permits, permissions, approvals, and/or authorizations for the approved project have been granted, including by the U.S. Army Corps of Engineers, the Monterey Bay National Marine Sanctuary and the California Department of Fish and Wildlife. Any changes to the approved project required by these agencies shall be reported to the Executive Director. No changes to the approved project shall occur without a Commission amendment to this CDP unless the Executive Director determines that no amendment is legally necessary.

6. **Length of Armoring Approval: Site 3 Only.** This coastal development permit authorizes the approved armoring at Site 3 until the time when the public improvements inland of the revetment are redeveloped, no longer present, or no longer require armoring, whichever happens first. If some portion of the public improvements is removed, while some portion is retained, the revetment shall be reduced or modified so that it is the minimum necessary to protect the public improvements that are retained. At such time (i.e., when public improvements are removed or when the public improvements no longer require armoring), the Permittee shall submit a complete coastal development permit amendment application to the Coastal Commission to remove or modify the approved armoring and to appropriately restore the affected area.

   (a) Amendment Required Proposing Mitigation for Retention of Armoring Beyond 20 Years. If the Permittee intends to keep the armoring in place after October 10, 2033, the Permittee must submit a complete CDP amendment application prior to October 10, 2033 proposing mitigation for the coastal resource impacts associated with the retention of the armoring beyond 20 years (including, in relation to any potential modifications to the approved project desired by the Permittee at that time that may be part of such CDP application).

7. **As-Built Plans.** WITHIN 90 DAYS OF COMPLETION OF CONSTRUCTION, 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 CDP in relation to development located within 100 feet of the bluff edge. The As-Built Plans shall be substantially consistent with the approved Revised Final Plans (see **Special Condition 1**). 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 the surrounding area, 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 a sufficient number of upcoast,

downcoast, inland and seaward viewpoints as to provide complete photographic coverage of the permitted project at this location.

8. **Public Access Management Plan.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the Permittee shall submit two copies of a Public Access Mitigation Plan for Executive Director review and approval. The Mitigation Plan shall provide for the installation of the following public recreational access improvements in the north harbor between the new boat launch and the Sea Harvest restaurant: (a) a 5-foot wide decomposed granite pedestrian path; (b) seamless connection with the side entrance (north side) to the public wharf fronting the Sea Harvest restaurant; (c) public access signage indicating public accessibility at several locations along the path including the side entrance to the public wharf. In the south harbor: (a) a mini park in the vicinity of the "D" dock with decomposed granite surfacing; (b) one picnic table; (c) one view bench; (d) drought tolerant landscaping; and (e) one interpretive sign that educates and informs the public of the history of Moss Landing Harbor and Elkhorn/Moro Cojo sloughs. The Permittee shall maintain all such improvements in their approved state, including replacing any improvements that are damaged or destroyed by natural or man-made causes.

   Within 180 days of Executive Director approval of the Public Access Management Plan, the Permittee shall submit evidence to the Executive Director for review and written approval that the public recreational access improvements have been installed and are available for public use. The Permittee shall provide and maintain the public recreational access improvements consistent with the approved Management Plan. Any proposed changes to the approved Management Plan shall be reported to the Executive Director. No changes to the approved Management Plan shall occur without an amendment to this CDP unless the Executive Director determines that no amendment is legally required.

9. **Assumption of Risk, Waiver of Liability and Indemnity.** By acceptance of this permit, the Permittee acknowledges and agrees, on behalf of himself and all successors and assigns: (i) that the site is subject to hazards from episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunami, tidal scour, coastal flooding, and the interaction of same; (ii) to assume the risks to the Permittee and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

IV. COASTAL DEVELOPMENT PERMIT DETERMINATION

A. Project Location

The three project sites are situated along the shoreline within Moss Landing Harbor in the small unincorporated town of Moss Landing in northern Monterey County. Moss Landing is located near the middle of Monterey Bay between the cities of Santa Cruz (approximately 26 miles north) and Monterey (approximately 18 miles south), and between two river systems, the Pajaro River (approximately 1.5 miles north) and the Salinas River (approximately 4 miles south) (see Exhibit 1 for regional location and site vicinity map, and an aerial photo of the harbor area.). The harbor lies just west of Highway 1 where Elkhorn Slough meets the Pacific Ocean. It is also immediatelyadjacent to the Monterey Bay National Marine Sanctuary, which extends some 35 miles offshore. The Monterey Bay National Marine Sanctuary is the nation's eleventh and largest marine sanctuary, protecting marine resources that include the nation's most expansive kelp forests, one of North America's largest underwater canyons (Monterey Canyon), and the closest deep ocean environment to the continental United States.

Moss Landing Harbor was created in 1947 when the United States Army Corps of Engineers first dredged the mouth of Elkhorn Slough near the northern extent of the Old Salinas River mouth for harbor purposes. The Harbor occupies a portion of the Old Salinas River channel[1] paralleling the coast and separated from the ocean by sand spits and dunes. Permanent jetties placed along the north and south sides of the entrance provide year-round access to the Pacific Ocean. Tide gates along the north and south ends of the Harbor allow for muted tidal activity within Bennett Slough to the north, as well as in the Moro Cojo Slough and the Old Salinas River channel to the south. The 4,000-acre Elkhorn Slough watershed lies east of Highway 1 and is hydrologically linked with the harbor through which daily tides flow.

The Harbor entrance and Elkhorn Slough channel divide the Moss Landing Harbor into two parts, referred to as the North and South Harbor areas, respectively (see Exhibits 1 and 2). The North Harbor area occupies a portion of the Old Salinas River near its confluence with Bennett Slough, and the South Harbor area occupies portions of both the Old Salinas River and the mouth of Moro Cojo Slough. Lands to the west of the Harbor are made up of sand flats and sand dunes that have built atop the sand spits of the Old Salinas River. Beach strand and dune fields located in the Moss Landing and Zmudowski State Beaches make up the coast north of the Harbor entrance, which extends to the mouth of the Pajaro River. Similarly, beach strand and developed beach dunes make up the coast shoreline south of the Harbor entrance.

East of the Harbor lie the mud flats and tidal marshes of the Elkhorn Slough and Moro Cojo Slough watersheds, which extend inland for nearly seven miles. Upland areas immediately surrounding the Harbor are made up of low rolling hills, which reach about 20 feet in elevation.

The North Harbor is currently home to approximately 155 recreational motor and sail boats, the Elkhorn Yacht Club, a commercial kayaking center, and the Sea Harvest restaurant. The South Harbor is home to approximately 455 commercial, research, and recreational boats, including

[1] The Old Salinas River channel refers to the area where the Salinas River historically entered the Pacific Ocean. Today, the Salinas River flows into the Pacific Ocean several miles to the south.

most of the commercial fishing and oceanographic research vessels. The South Harbor area also includes multiple onshore commercial fishing, marine industrial, and oceanographic research facilities built along Sandholdt Road.

As a result of the harbor's proximity to both deep-water marine environments immediately offshore and estuarine environments and tidal sloughs inland, the harbor is highly valued for the commercial fishing, research and recreational boating and educational opportunities this location provides. Moss Landing Harbor is one of only six harbors located along the Central Coast area, and is the largest fishing port between San Francisco and Los Angeles.

B. Project Background and Description

In general, because of its location at the bottom of two major watersheds, Moss Landing Harbor is a depositional sink for fine-grained sediments, especially following major storms that carry large volumes of sediment from the Salinas Valley watershed via the Old Salinas River. Similarly, fine-grained sediments eroded from the Elkhorn Slough watershed ultimately end up in the harbor as well. Sand-sized material transported by longshore currents also gets trapped in the entrance channel forming shoals, and onshore winds transport beach and dune sands into the North Harbor, forming sand bars that sometimes extend east into the North Harbor navigation channel. Excessive sediment deposition in the harbor can impede navigation in berthing areas, navigation channels, turning basins, and boat ramp areas, which in turn restricts movement of commercial fishing, recreational, and marine research vessels and the activities they support. Maintenance dredging is periodically necessary to maintain navigable depths in these areas.

At the same time, both north and south harbor project sites are also subject to tidal scour due to their proximity to the harbor mouth, Elkhorn Slough main tidal channel, and the Moro Cojo Slough tidal culvert. In recent years, tidal currents in and out of Elkhorn and Moro Cojo sloughs have increased, and active bank erosion has been observed in the tidal slough system.

In addition, accelerated currents related to the 2011 Tohoku Earthquake in Japan and the resulting tsunami that reached California's central coast resulted in rapidly changing water levels within Moss Landing Harbor. Based on observations by Harbor District representatives, there was an approximately 7-foot change in water surface elevation over several cycles of tsunami inundation. Large volumes of water surged in and out of the harbor. The rapidly changing water levels caused very high current flow speeds. Extreme turbidity within the water column indicated that currents were actively eroding and scouring sediment from within the Harbor and surrounding tributaries (e.g. Elkhorn Slough and Moro Cojo Slough). The tsunami-powered surges over-topped existing revetments, resulting in slope failure and displacement of rip-rap stones, loss of sand cover, and exposure of geotextile fabric bedding material. Evidence of the tsunami's damage can be easily seen in photographs of the previously armored shoreline at Sites 1 and 2, and in the bank undercutting at Site 3. (See Exhibit 2).

To combat tidal scour, bank erosion, and slope failure, including that associated with potential future tsunami events, the Applicant seeks CDP approval for repair of two revetments in the north harbor, and installation of a new revetment in the south harbor. See Exhibit 3 for project plans and see Exhibit 2 for photographs of the project site.

C. Standard of Review

The proposed project is located within the Commission's retained CDP jurisdiction and thus the standard of review is the Coastal Act. As relevant, the Monterey County certified LCP can provide non-binding guidance. However, the LCP and Coastal Act policies are very similar in regards to allowing shoreline armoring and eliminating or mitigating for its impacts. Thus, the LCP policies do not provide significantly different policy direction in this case.

D. Repairs at Sites 1 and 2

Permit Authority, Extraordinary Methods of Repair & Maintenance

Coastal Act Section 30610(d) generally exempts from Coastal Act permitting requirements the repair or maintenance of structures that does not result in an addition to, or enlargement or expansion of, the structure being repaired or maintained. However, the Commission retains authority to review certain extraordinary methods of repair and maintenance of existing structures that involve a risk of substantial adverse environmental impact as enumerated in Section 13252 of the Commission regulations.

Section 30610 of the Coastal Act provides, in relevant part (emphasis added):

> *Notwithstanding any other provision of this division, no coastal development permit shall be required pursuant to this chapter for the following types of development and in the following areas:*
>
> . . .
>
> *(d) Repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the object of those repair or maintenance activities; provided, however, that if the commission determines that certain extraordinary methods of repair and maintenance involve a risk of substantial adverse environmental impact, it shall, by regulation, require that a permit be obtained pursuant to this chapter.*

Section 13252 of the Commission administrative regulations (14 CCR 13000 *et seq*.) provides, in relevant part (emphasis added):

> *(a) For purposes of Public Resources Code section 30610(d), the following extraordinary methods of repair and maintenance shall require a coastal development permit because they involve a risk of substantial adverse environmental impact:*
>
> *(1) Any method of repair or maintenance of a seawall revetment, bluff retaining wall, breakwater, groin, culvert, outfall, or similar shoreline work that involves:*
>
> …
>
> *(B) The placement, whether temporary or permanent, of rip-rap, artificial berms of sand or other beach materials, or any other forms of solid materials, on a beach or in coastal waters, streams, wetlands, estuaries and lakes or on a shoreline protective work except for agricultural dikes within enclosed bays or estuaries;*
>
> …

(3) Any repair or maintenance to facilities or structures or work located in an environmentally sensitive habitat area, any sand area, within 50 feet of the edge of a coastal bluff or environmentally sensitive habitat area, or within 20 feet of coastal waters or streams that include:

(A) The placement or removal, whether temporary or permanent, of rip-rap, rocks, sand or other beach materials or any other forms of solid materials;

(B) The presence, whether temporary or permanent, of mechanized equipment or construction materials.

…

All repair and maintenance activities governed by the above provisions shall be subject to the permit regulations promulgated pursuant to the Coastal Act, including but not limited to the regulations governing administrative and emergency permits. The provisions of this section shall not be applicable to methods of repair and maintenance undertaken by the ports listed in Public Resources Code section 30700 unless so provided elsewhere in these regulations. The provisions of this section shall not be applicable to those activities specifically described in the document entitled Repair, Maintenance and Utility Hookups, adopted by the Commission on September 5, 1978 unless a proposed activity will have a risk of substantial adverse impact on public access, environmentally sensitive habitat area, wetlands, or public views to the ocean.

(b) Unless destroyed by natural disaster, the replacement of 50 percent or more of a single family residence, seawall, revetment, bluff retaining wall, breakwater, groin or any other structure is not repair and maintenance under Section 30610(d) but instead constitutes a replacement structure requiring a coastal development permit.

…

The proposed work at sites 1 & 2 in the north harbor constitutes a repair project pursuant to the Coastal Act and the Commission's regulations. First, it does not involve an addition to or enlargement to the original revetments permitted in conjunction with the Commission's action on CDP 3-01-016, as amended. The proposed repairs are designed within the original footprint of the approved revetments, which extend along nearly 1,000 linear feet of harbor shoreline. Second, Section 13252 of the Commission's regulations provides an explicit measure of when a repair and maintenance project is not a repair and maintenance project, but rather represents a replacement structure. It states in applicable part: "Unless destroyed by natural disaster, the replacement of 50 percent or more of a single family residence, seawall, revetment, bluff retaining wall, breakwater, groin or any other structure is not repair and maintenance under Section 30610(d) but instead constitutes a replacement structure requiring a coastal development permit." In this case, the originally permitted revetments were damaged by the 2011 Tsunami. In addition, the revetment repairs at Sites 1 & 2 represent only 37% of the volume of armor rock of the originally permitted revetments, and thus do not meet or exceed the 50 percent threshold in

Section 13252. Therefore, the project is specifically identified as a type of repair and maintenance per 14 CCR Section 13252(1)(B).

Although certain types of repair projects are exempt from CDP requirements, Section 13252 of the regulations requires a coastal development permit for extraordinary methods of repair and maintenance enumerated in the regulation. The proposed repair work involves the placement of riprap armoring on a beach and in coastal waters, and the presence of mechanized equipment and construction materials within 20 feet of coastal waters. The proposed repair project therefore requires a coastal development permit under 14 CCR Section 13252(a)(1).

In considering a permit application for a repair or maintenance project pursuant to the above cited authority, the Commission reviews whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. The Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity of the structure itself with the Coastal Act.[2]

Consistency Analysis for Sites 1 and 2

The harbor facilities at sites 1 and 2 include amenities such as a shoreline access path, boating and launch facilities, public wharf, parking, and south transient guest dock, all of which are popular with visitors from throughout the Monterey Bay area. Many of these improvements, as well as the shoreline armoring, were approved by the Commission in its action on Coastal Development Permit (CDP) 3-01-016. That approval authorized the armoring of approximately 1,000 linear feet of shoreline and the placement of roughly 1,900 cubic yards of rock fronting the north harbor including at the location of Sites 1 & 2 identified in this application in order to protect those facilities which were in danger from erosion. A geotechnical report prepared for the site found that direct wave attack, tidal scour, and high tidal velocities between the entrance channel and Elkhorn Slough had caused the shoreline, which is comprised mainly of sand, to retreat as much as 35-feet over a 37 year period (i.e., approximately 1-foot per year).

As noted, the project included significant mitigations to reduce the identified coastal resource impacts, including the construction of a new 4-lane boat launch ramp, auto and boat trailer parking, transient guest docks, and extensive public access improvements throughout north Moss Landing harbor. In addition, the public access improvements included dedicated pedestrian access from Highway 1 to and along the shoreline with connections to the public wharf, a Class I bicycle lane adjacent to Highway 1, and a sheet-pile wall immediately south of the original single-lane boat ramp for easy beach access and kayak launching.

Subsequent amendments to the permit modified these access requirements including by allowing the north transient dock and a portion of the pedestrian wharf north of the Sea Harvest restaurant to be eliminated from the project . Also, due to the high cost of installation, the permit was amended to allow a temporary revetment instead of the sheet pile wall / bulkhead that was required to be installed adjacent to the original boat ramp. The authorization for the temporary revetment was limited to a period of 5 years to allow the harbor district additional time to secure

[2] By contrast, the proposed project at site 3 is new development involving the placement of 465 cubic yards of quarter-ton rock along approximately 130 linear feet of shoreline. Since it is new development, the revetment at site 3 will be fully evaluated for Coastal Act consistency (see Section C: Revetment at Site 3, below).

funding for the bulkhead. The amended project retained the public access requirement including for a coastal trail from Highway 1 to and along the shoreline with a connection to the wharf fronting the Sea Harvest restaurant (see Exhibit 4).

The Harbor District is currently out of compliance with the previous permit for the site (3-01-016). First, the approved plans require public pedestrian access along the entire north harbor shoreline, from Highway 1 to the shore and south to the wharf fronting the Sea Harvest Restaurant. This path is the preferred alignment of the California Coastal Trail through Moss Landing. However, based on recent observations, there appears to be several gaps in the path, including the segment from Highway 1 to the shoreline and a critical connection between the shoreline trail and public wharf fronting the Sea Harvest restaurant. Additionally, the path along the immediate shoreline has not been well maintained and the current uneven surface may be unsuitable for persons with limited mobility. Secondly, an amendment to the base permit (3-01-016-A2) allowed the harbor district to temporarily install a rip-rap revetment in place of a vertical bulkhead adjacent to the north boat ramp. The terms of the amendment state that the revetment must be replaced with a vertical bulkhead or removed within 5 years from the date of approval. The bulkhead and tidal steps were initially required to maintain access to a small sandy beach area used primarily for launching kayaks and similar watercraft. The Harbor District has indicated that it does not currently have the funds to install a bulkhead at this location but is looking for sources of funding for the improvements or the removal of the revetment. The Commission's enforcement unit has opened a violation case to track the Harbor District's progress towards fully complying with the terms of the permit.

In 2011, the revetments and the access improvements immediately landward of them were heavily damaged by the Tohoku Earthquake in Japan and the resulting tsunami that reached California's central coast. Tsunami-powered tidal surges over-topped existing revetments and embankments resulting in slope failure and displacement of rip-rap stones, loss of sand cover, exposure of geotextile fabric bedding material, and undercutting of the shoreline access trail. As a result of the tsunami, the revetments within the north harbor are no longer effective in protecting the now exposed shoreline from the daily cycle of tides, currents, and wave action.

In this case, the proposed project involves repairs to two segments of the previously approved revetment (Sites 1 & 2). The size and design of the revetment is similar to the revetment installed there previously, and the proposed project includes maximum reuse of existing rock, thereby minimizing the amount of new rock required to serve the coastal-dependent use. However, the project raises Coastal Act issues because the boat launch facilities, vehicle and trailer parking, as well as the public access trail will be impacted for the duration of the repair and maintenance construction time frame.

To mitigate for these impacts and to restore the area to what was authorized under 3-01-016, the project includes reconstruction of the shoreline access trail which is currently undercut and riddled with gopher holes. Reconstruction of the trail would also entail providing a direct connection to the pedestrian wharf which fronts the Sea Harvest restaurant. Currently, the pathway stops about 25 feet short of the public walkway alongside the Sea Harvest restaurant that leads to the wharf. A trash dumpster and small gate further impede access out to the wharf. Restoring the pedestrian trail and re-establishing the connection between the harbor revetment path and the public wharf including removal of identified impediments (**Special Condition 8**)

along with limits on construction timing (**Special Condition 2a and 2b**), appropriate native landscaping (**Special Condition 1c**), and construction BMPs to protect coastal water quality (**Special Conditions 2 and 3**) will help to address coastal resource concerns and are made conditions of approval to ensure their implementation.

Monitoring, Maintenance, and Long-Term Stability
It has been the Commission's experience that the expected lifespan of shoreline armoring projects is often substantially less than applicants indicate at the inception of a project due to the need for major maintenance or modifications, or entire redevelopment of an armoring structure within a much shorter timeframe. If the revetment that is repaired through this project is damaged in the future (e.g., as a result of wave action, storms, landsliding, etc.) it could threaten the stability of the site, which could lead to the need for more bluff alteration and/or additional or more substantive armoring. Therefore, in order to find the proposed revetment repair consistent with the Coastal Act, the Commission finds that the revetment must be properly maintained in its approved state. Further, in order to ensure that the Permittee and the Commission know when repairs or maintenance are required, the Permittee must monitor the condition of the revetment over the long term. The monitoring will ensure that the Permittee and the Commission are aware of any damage to the revetment and can determine whether repairs or other actions are necessary to maintain the structure in its approved state before such repairs or actions are undertaken. In addition, as evidenced by the difficulties in reviewing such applications without clear as-built plans, such future monitoring and maintenance activities must be understood in relation to a clear as-built revetment profile. Finally, the upper bluff soils must be adequately stabilized with vegetation, and upper bluff drainage controlled, to ensure overall stability and to prevent future erosion, and this proposed aspect of the project can be best implemented through conditions of approval.

Therefore, special conditions are imposed to implement a revegetation and drainage plan (**Special Condition 1**); to require the submittal of as-built plans (to define the profile of the permitted structure) with surveyed reference points to assist in evaluation of future proposals at this site (**Special Condition 7**); for monitoring, the Applicant is responsible for ensuring adequate monitoring of the revetment and the Applicant is also responsible for promptly retrieving and removing any rocks, riprap or concrete blocks that migrate seaward of the existing revetment (**Special Condition 4**).

Assumption of Risk
The experience of the Commission in evaluating the consistency of proposed developments with Coastal Act policies regarding development in areas subject to problems associated with geologic instability, flood, wave, or erosion hazard, has been that development has continued to occur despite periodic episodes of heavy storm damage, landslides, or other such occurrences. Oceanfront development is susceptible to bluff retreat and erosion damage due to storm waves and storm surge conditions. Past occurrences statewide have resulted in public costs (through low interest loans, grants, subsidies, direct assistance, etc.) in the millions of dollars. As a means of allowing continued development in areas subject to these hazards while avoiding placing the economic burden on the people of the state for damages, the Commission has regularly required that Applicants acknowledge site geologic risks and agree to waive any claims of liability on the part of the Commission for allowing the development to proceed.

There are inherent risks associated with development and repair and maintenance on and around

seawalls and eroding bluffs in a dynamic coastal bluff environment. The project site, and all development on it, is likely to be affected by shoreline erosion in the future. Although the Commission has sought to minimize the risks associated with the repair and maintenance work proposed in this application, the risks cannot be eliminated entirely. Given that the Applicant has chosen to pursue the repair and maintenance work despite these risks, the Applicant must assume these risks. Accordingly, this approval is conditioned for the Applicant to assume all risks at this location (**Special Condition 9**).

Other Agency Approval
The project is proposed in an area that may be subject to Army Corps of Engineers (ACOE), Monterey Bay National Marine Sanctuary (MBNMS), California Department of Fish & Wildlife (CDFWS), and California State Lands Commission oversight among others. Thus, the project is conditioned for evidence of other approvals (**Special Condition 5**).

Coastal Act Consistency Conclusion
Although the repair project at sites 1 and 2 is in some ways a fairly straight forward revetment repair and maintenance project, it includes impacts to recreational resources that must be properly mitigated, and it must not itself require additional more substantive armoring. Thus, special conditions are included to define construction parameters, to require reuse of old riprap, to restore the shoreline pedestrian trail after construction, to make the connection between the pedestrian trail and wharf, to adequately sign the trail, to ensure the project is properly monitored and maintained over time, to provide for a native plant vegetation on the bluff and across the top of the revetment, to ensure that there will be no current or future seaward encroachment of rock or riprap, and to assume the risks of developing within a shoreline hazards area.

E. Revetment at Site 3
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, Section 30235 limits the construction of shoreline protective works to those required to serve coastal-dependent uses, or 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 that are inconsistent with the Chapter 3 policies of the Coastal Act, including adverse effects on sand supply, public access, coastal views, natural landforms, and overall shoreline beach dynamics on and off site.

Shoreline armoring has a number of direct impacts on beach area and sand supply, 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. However, when required to protect existing structures or to serve coastal-dependent uses, under Coastal Act Section 30235, shoreline protective structures may be approved if the required protection is designed to eliminate or mitigate the adverse impacts on shoreline sand supply.

Existing Structures and/or Coastal-Dependent Uses to be Protected
In the south harbor, the "G" dock provides mooring space for approximately 28 recreational pleasure boats. Access to the dock is via a gang-plank connection from the south harbor public parking facilities. In the same general location, a box culvert pipe beneath Moss Landing Road maintains tidal connection between the harbor and the Moro Cojo slough wetlands. Recreational boating facilities are a coastal dependent and priority use within Moss Landing Harbor. The box culvert pipe is essential to maintaining the functional capacity of the Moro Cojo slough which drains approximately 17 square miles of upper watershed, and to minimize flooding impacts along its banks. As such, these harbor and waterway facilities are for the purposes of Coastal Act Section 30235 existing structures and/or coastal-dependent uses.

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, wave attack, flooding, earthquakes, and other 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." The Commission evaluates the immediacy of any threat in order to make a determination 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 previously 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).

In this case, the proposed shoreline protection would be installed within Moss Landing Harbor. The south harbor site is located at the rear of the harbor immediately adjacent to the box culvert pipe that provides tidal connection to Moro Cojo slough. Like the rest of the Harbor and other facilities located along the shoreline here, the site is located within historical sand dunes. Undeveloped sites within Moss Landing Harbor still display dune properties, but long developed sites, like the public boating and parking facilities and the island they are constructed on, don't generally have the outward appearance of dunes. Still, the underlying geologic substrate is sandy. These sandy soils are easily erodible and, when subject to scour and wave action or via accelerated currents near the box culvert pipe, can lead to significant shoreline loss.

In the south harbor adjacent to the "G" dock and box culvert pipe, there is little protection against shoreline scouring and undermining of the pipe and/or gangway abutment. The daily tidal exchange between the ocean and the slough slowly erode the highly erodible unconsolidated sand material that comprises the harbor's inner edge. The rate of retreat is not as pronounced at Site 3 as it is elsewhere in the north harbor, but over time the bluff edge has slowly retreated to within a few feet of the existing harbor facilities at the "G" dock, Moss Landing Road itself, and the box culvert connection with Moro Cojo Slough –all of which are now threatened. The Applicant's engineering report indicates that without the proposed shoreline armoring, these vital recreational boating facilities and public access improvements in Moss Landing harbor, roadway infrastructure, and the functional capacity of the upper Moro Cojo slough will be impaired. The Commission's Senior Engineer, having personally observed the site, concurs.

Also, additional threats from rare events cannot be discounted. Written accounts of significant damage caused by the 2011 Tohoku Earthquake in Japan and the resulting tsunami include a significant amount of displaced rip-rap, loss of sand cover, and undercutting of the south harbor gangway abutment and box culvert pipe. Again, Commission staff has observed the damage from the tsunami and recognizes the threat that they pose.

Accordingly, the existing structures are "in danger from erosion" as that term is understood in a Coastal Act context, and thus the project meets the second test of Section 30235 of the Coastal Act.

Feasible Protection Alternatives

The third Section 30235 test that must be met is that the proposed armoring must be "required" to protect the existing threatened structures. In other words, shoreline armoring shall only be permitted if it is the only feasible alternative capable of protecting the existing endangered structures.[3] Other, less environmentally damaging alternatives typically considered include: the "no project" alternative; planned retreat, including abandonment and demolition of threatened structures; relocation of threatened structures; beach and sand replenishment programs; drainage and vegetation measures on the blufftop; and combinations of each.

First, vegetated berms and other "soft" fixes such as beach nourishment are not suitable at the subject location near the harbor entrance channel and at the culvert pipe, where wave action, scour, and tidal currents are strongest. The shoreline edge is made up of mainly sandy soils and

[3] 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.

unconsolidated earthen materials which are easily and quickly eroded, and under these circumstances any such soft alternatives would require constant maintenance to remain effective. Even then, it is not clear that they can be successfully used to protect the facilities.

Another potential alternative is a vertical seawall or bulkhead. Vertical walls can be as effective as revetments at reducing the effects of erosion and scour, and can also minimize impacts on visual, biological and public access resources. Currently, few vertical walls exist within the harbor. Within a harbor setting, vertical walls make the most sense where there is a need for vessel docking immediately adjacent to the shoreline such as along Sandholdt Road where large commercial fishing and research vessels are moored. At this location, recreational fishing and pleasure boats are moored on floating slips in the middle of the harbor, reducing the need for a vertical wall option.

In addition, a revetment at Site 3 is preferable in the short term until the wetland and slough enhancement project identified in the Moss Landing Community Plan (MLCP) update has been carried out. The MLCP envisions restoring / enhancing tidal exchange between the ocean (via the harbor) and the upper Moro Cojo watershed for a variety of reasons, including to enhance the estuarine habitat characteristics of the upper watershed and to reduce flood risks along its banks. As envisioned, the future project would involve removing the box culvert, earthen fill, and existing crossing of Moss Landing Road, and spanning the arm of Moro Slough to re-establish full tidal exchange to the ocean. A vertical wall along the banks at this location would be more difficult to remove or work-around to allow for this future project, and removal could result in more disturbance of the back harbor. Also, a vertical wall may limit the ability to plan for and re-establish the natural banks of the slough once the roadway fill is removed. Accordingly, given the use and configuration of the site, and the planned future wetland enhancements, the rip-rap revetment is the most appropriate, feasible alternative available for this purpose at the current time.

Finally, in the future, other shoreline protection alternatives may prove to be more feasible. In addition to envisioning the slough enhancement project identified above, the MLCP update is intended to identify appropriate responses to erosion along the entire harbor shoreline, and will evaluate whether rip-rap revetments or some other form of Harbor edge (i.e., vertical walls, natural vegetated berms, bulkheads, etc.) are most appropriate. After certification, the MLCP will provide a comprehensive planning framework to guide future development and re-development within the community of Moss Landing, including Moss Landing Harbor, and will be critical in determining the appropriate erosion response in the future. The issue areas relevant to Moss Landing Harbor and included within the context of the MLCP update include land use and development, biological resources, shoreline erosion, effects of sea level rise, harbor dredging, and specific area plans for shoreline fronting parcels. The current draft of the MLCP contains policies that give priority to commercial fishing, conservation of wetlands, dunes, and other natural resources, improving tidal circulation, and addressing shoreline erosion and sea level rise. With regard to these last two issues, the MLCP is taking a close look at shoreline armoring and the range of feasible alternatives available to address these issues including via rip-rap revetments, vertical walls, bulkheads, and in some locations, vegetated berms. It may be that a bulkhead could be a more feasible option for providing protection to the existing site if it is constructed as part of a comprehensive plan to address shoreline armoring, and if such a plan complements future restoration efforts at the slough.

Given that a rip-rap revetment is the least damaging feasible alternative at this time, the final question is whether the revetment is designed to minimize impacts. Fortunately, the proposed revetment design is for the minimum amount of rip-rap rock necessary to adequately define the edge of the harbor and protect existing upland facilities. The revetment is sized and designed to match rock slope protection elsewhere within Moss Landing Harbor, ensuring an appropriate level of protection and visual continuity throughout the harbor. Therefore, the project as proposed is the least environmentally damaging, feasible alternative.

Duration of Authorization

Section 30235 only authorizes shoreline protection devices when necessary to protect an existing structure in danger of erosion, and shoreline protective devices are no longer authorized by Section 30235 after the existing structures they protect are redeveloped, no longer present, or no longer require armoring.

Specifically, armoring impedes public access to and along the shoreline, adversely impacts beaches and related habitats, increases erosion on adjacent properties, and visually impairs coastal areas. A portion of the proposed project is also located within historic tidelands that are subject to the public trust. The proposed armoring is inconsistent with several Chapter 3 policies of the Coastal Act and, as detailed herein, will cause impermissible adverse impacts to coastal resources that are protected by the Coastal Act, including but not limited to substantial alteration and destruction of natural landforms inconsistent with the requirements of Sections 30251 and 30253. Additionally, although design modifications and access improvements can help mitigate sand supply and beach access impacts, including by allowing for the purchase or provision of comparable low-cost access and recreational opportunities, these impacts can never be entirely eliminated or mitigated. The proposed armoring is nevertheless being approved by the Commission, however, based on the "override" provision of Section 30235 that instructs the Commission to approve a shoreline protective device to protect an existing structure if specified criteria are satisfied.

In such a circumstance, the only applicable basis for the Commission to approve proposed armoring such as this that is otherwise inconsistent with the Coastal Act is when it is required to protect an existing structure in danger from erosion. If there was no existing structure in danger from erosion and the armoring was not required to protect it, the revetment would be denied. That the project satisfies the tests of the Section 30235 "override," and thereby must be authorized despite its other impacts that cannot be fully mitigated, therefore presumes the existence of a legally authorized existing structure that the armoring is required to protect.

Accordingly, one reason to limit the length of a shoreline protective device's development authorization is to ensure that the armoring being authorized by Section 30235 is only being authorized as long as it is required to protect a legally authorized existing structure. If an applicant must seek reauthorization of the armoring before the structure that it was constructed to protect is demolished or redeveloped, then Section 30235 instructs the Commission to approve the shoreline protective device if it is still required to protect an existing structure in danger of erosion. However, once the existing structure that the armoring is required to protect is demolished or redeveloped, the armoring is no longer authorized by the override provisions contained in Section 30235 of the Coastal Act. Accordingly, if there is no existing structure in

danger from erosion, then the Commission cannot approve an otherwise inconsistent shoreline protective device relying on the provisions of Section 30235 of the Coastal Act.

Another reason to limit the authorization of shoreline protective devices is to ensure that the Commission can properly implement Coastal Act Section 30253 together with Section 30235. If a landowner is seeking new development along the shoreline, Section 30253 requires that such development be sited and designed such that it will not require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. Sections 30235 and 30253 prohibit such armoring devices for new development and require new development to be sited and designed so that it does not require the construction of such armoring devices. These sections therefore should not be read to permit landowners to rely on such armoring devices when siting new structures on blufftops and/or along shorelines. If a shoreline protective device exists in front of a lot, but is no longer required to protect the existing structure it was authorized to protect, it is no longer consistent with the provisions of 30235, so it should not form the basis for approving new development that would not meet geologic setback requirements. Otherwise, if a new structure is able to rely on shoreline armoring which is no longer required to protect an existing structure, then the new structure could be sited without a sufficient setback, perpetuating an unending reconstruction/redevelopment loop that prevents proper siting and design of new development, as required by Section 30253. By limiting the length of development authorization of a new shoreline protective device to the existing structure it is required to protect, the Commission can more effectively apply Section 30253 when new development is proposed.

Therefore, the Commission here authorizes the proposed armoring in this case coincident with the existing structures it is authorized to protect, and requires removal of the armoring when the structures it was authorized to protect are no longer present, demolished or redeveloped. Special Condition 6 also requires the Applicant to submit a complete permit amendment application to remove the armoring when the existing structures warranting armoring are redeveloped, are no longer present, or no longer require armoring. In this manner, new development will not be able to rely on armoring that no longer meets the override provisions of Section 30235 of the Coastal Act.

Mitigation for Impacts of Revetment

In terms of impact mitigation for the approved project, and as discussed further below, the mitigation for the impacts associated with the proposed shoreline protection have used a twenty-year time period to calculate passive erosion and sand retention impacts, both of which are tied to the future rates of erosion and are time dependent. These impacts will continue to occur, though, for the full time that the approved armoring system is in place, including beyond twenty years if it continues to be necessary to protect the existing endangered structures identified. This CDP approval requires the Applicant to submit a complete permit amendment application to propose mitigation for impacts attributable to the armoring beyond the twenty-year period upon which initial impact mitigation is based. And as such, additional mitigation will be required after the initial twenty-year period.

Using a twenty-year period for initial impact mitigation is appropriate in this case. Such initial twenty-year mitigation framework uses available information on historic trends for the projection of future erosion. In siting new development, proposed setbacks attempt to anticipate future acceleration of erosion through using the highest historic erosion rate or by developing

relationships between erosion and sea level. And, on an eroding coastline, if the proposed erosion rate is higher than the actual rate, the result is only that the development will be safe from erosion for a longer time period than initially assumed. However, for shoreline armoring mitigation, the Commission has often based the calculations upon average or moderate historic erosion rates so that the mitigation is unlikely to cover unanticipated impacts over the mitigation period (e.g., associated with higher actual erosion rates and associated problems than anticipated and applied in a mitigation context). While long-term erosion rates for mitigation calculations can be expected to provide a reasonable estimate of future erosion for the coming one or two decades, projections much farther into the future are far more uncertain; and the uncertainty concerning future erosion only increases with time. Using a time period of twenty years for the mitigation calculations ensures that the mitigation will cover the likely initial impacts from the revetments, and then allows a recalculation of the impacts based on better knowledge of future erosion rates and associated impacts accruing to the armoring when the twenty years has elapsed. Efforts to mitigate for longer time periods would require the use of much higher erosion rates and would bring a higher amount of uncertainty into a situation where a single, long-term mitigation effort is not necessary to be effective.

Therefore, **Special Condition 6** ties the length of development authorization to the timeframe of the structure being protected and requires the Applicant to submit an application for a permit amendment to remove the armoring when the currently existing structures warranting armoring are redeveloped, are no longer present, or no longer require armoring. However, since the mitigation is calculated based on the first twenty years of impact (again see Mitigation of Shoreline Sand Supply Impacts Section below), **Special Condition 6a** also requires the Applicant to submit an application for a permit amendment prior to the expiration of the twenty-year period, proposing mitigation to address the impacts of the armoring beyond the twenty-year period.

Sand Supply Impacts

The final test of section 30235 is that shoreline armoring 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, typically 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 Central Coast, examples of each of these beach-forming processes can be seen.

The 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.[4]

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 typically 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 2,730 square feet of beach space resulting in a 2,730 square-foot beach encroachment area.

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. This phenomenon is often referred to as passive erosion. 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. There is also a growing body of evidence that there has been an increase in global temperature and that acceleration in the rate of sea level rise can be expected to accompany this increase in temperature (some shoreline experts have indicated that sea level could rise 4.5 to 6 feet by the year 2100).[5] Mean sea 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

---

[4] 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.

[5] The California Climate Action Team has evaluated possible sea level rise for the California coast and, based on several of the Intergovernmental Panel on Climate Change (IPCC) scenarios, projected sea level rise up to 1.4 meters (4.5 feet) by 2100. These projections are in line with 2007 projections by Stefan Rahmstorf ("A Semi-Empirical Approach to Projecting Future Sea-Level Rise", *Science*; Vol 315, 368 – 370. Research by Pfeffer et al. ("Kinematic Constraints on Glacier Contributions to 21st-Century Sea-Level Rise", *Science*, Vol, 321, 1340 – 1343) projects up to 2 meters of sea level rise by 2100.

of the intersection of the ocean with the shore. This, too, leads to loss of the beach as a direct result of the armor as the beach is squeezed between the landward migrating ocean and the fixed backshore.

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.[6] In this case, the proposed riprap revetment extends along the edge of the harbor, fixing a total of 130 linear feet of shoreline with a protective device. The armoring footprint also covers some area 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.

A long term erosion rate was not supplied with the application materials. Elsewhere in the harbor near the entrance channel where there is more direct wave action, long term erosion rates are generally about 1-foot per year. At the rear of the harbor there is much less wave action and the effects of erosion are muted. However, given the generally sandy materials and the tidal velocities in the vicinity of the Moro Cojo box culvert, as well as future sea level rise, it is estimated that an average rate of 6 inches (0.5 feet) annually for calculating passive erosion impacts is appropriate. Therefore, the impacts from fixing the back beach, as calculated using the Commission's identified methodology, will be the annual loss of 65 square feet of beach. Over a 20-year permit horizon, this would result in a loss of 1,300 square feet of beach that would have been created if the bluff had not been fixed by the revetment.

Retention of potential beach material

Finally, 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 outside the harbor. The volume of total material that would have gone into the sand supply system over the lifetime of the revetment would be the volume of material between (a) the likely future bluff-face location with the revetment; and (b) the likely future bluff-face location without the revetment. 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 that 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. In this case, the underlying material is roughly 80% sand. The Commission has established a methodology for identifying this impact[7] that equates to 28.9 cubic yards of sand per year for the proposed project. Over the

---

[6] 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.

[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

course of a 20-year horizon, this equates to a retention impact of 578 cubic yards of beach quality sand.

Mitigation of Shoreline Sand Supply Impacts

The proposed project would result in quantifiable shoreline sand supply impacts. There would be loss of beach area due to: 1) placement of a rip-rap revetment onto approximately 2,730 square feet of beach that otherwise would be available for public use (converted to a sand volume of 2,730 cubic yards); 2) fixing of the back beach location, resulting in the loss of 1,300 square feet of beach that would have been created over the 20-year horizon (65 square feet of loss annually, and a total of 1,300 cubic yards over 20 years when converted to sand volume); and; 3) retention of 578 cubic yards of beach quality sand over the 20-year horizon that would have been added to the littoral cell (roughly 28.9 cubic yards of sand material per year). Over twenty years, these impacts would equate to a total of 4,030 square feet of lost beach area and the loss of 578 cubic yards of beach quality sand.

As discussed above, the proposed revetment would be located in an area of the harbor that is dedicated primarily to recreational boating and general working harbor facilities including the "G" dock in the south harbor. The nearest public beach is located in the north harbor, north of the public boat launch. Otherwise, the nearest public beach is located across the harbor channel on the beaches fronting the western edge of the spit or at Moss Landing State Beach. There are no public recreational beach areas within the south harbor. Further, although the proposed revetment covers sand, the area in this case is not suitable for beach recreation, so the placement of the revetment would not directly displace public access and recreation due to the footprint of the revetment.

However, sand trapped within the inner harbor contributes to the sand supply system, including the Monterey Bay littoral cell and area beaches. The harbor district dredges sediment to keep navigation channels and berths open for safe passage of commercial fishermen, recreational boating, and research vessels. Uncontaminated dredged materials are disposed at two offshore unconfined discharge sites (SF-12 and SF-14) and at three beach nourishment sites located north and south of the harbor entrance (Moss Landing State Beach, North Jetty Beach, and South Jetty Beach). Finer-grained sediments (generally greater than 20% mud) are generally disposed at the offshore sites, and more sandy materials (generally 80% or more sand) are generally placed at the beach locations. Moss Landing Harbor has typically dredged approximately 50,000 cubic yards of sediment every three years or so, although a recent permit (CDP 3-01-049) has allowed upwards of 100,000 cubic yards per year to be removed. Thus, the 578 cubic yards of beach quality sand that would be withheld over the 20-year horizon can be considered a potential source of beach sand that will be lost due to the project.

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

---

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 revetment would be in place, assuming the revetment has 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).

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. There are no readily available properties of this sort in the vicinity. In similar cases, the Commission has approved other types of mitigation for public recreational impacts, such as in-lieu fees and/or beach nourishment, and in some cases compensatory beach access and other similar 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 Monterey Bay littoral cell sand system to mitigate the impact of the project. If this impact were to be mitigated through a beach nourishment effort, the impacts would be comparable to the deposition of about 29 cubic yards of beach quality sand yearly (or roughly 3 large truck loads). Absent a larger comprehensive program that provides a means to coordinate and maximize the benefits of several mitigation efforts in the area now and in the future, the success of piecemeal mitigation efforts, such as an Applicant-only project to drop equivalent amounts of sand over time at this location, is questionable.

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. Based on an estimated range of costs for beach quality sand in this vicinity ranging from $25 to $50 per cubic yard delivered (or possibly more), a mitigation payment in this case would range from about $14,450 to $28,900.[9]

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 materials. Such mitigation has been applied by the Commission to public agencies that manage public access when they have applied for armoring projects[10] as well as to private applicants.[11]

In the south harbor, public access is not well defined and there are significant gaps in through lateral access and recreational amenities. For example, there are few access and recreational improvements along the edge of the recreational boat harbor, and even more glaring is the absence of a pedestrian pathway or sidewalk along Moss Landing Road, the primary (only) access route to Sandholdt Road and the sand spit. The Moss Landing Community Plan and the

---

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).

9 Based on 578 cubic yards of such sand purchased today for $25 per cubic yard ($14,450) or $50 per cubic yard ($28,900).

10 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; December 13, 2007); and similar improvements associated with the Commission's approval of a seawall at Twin Lakes Beach in Santa Cruz County in CDP 3-12-055; August 15, 2013.

11 See, for example, CDP 3-02-107, Podesto, and CDP 3-12-018, Gravelle's Boatyard.

general policies of the North Monterey County Land Use Plan (LUP) identify installation of sidewalks along Moss Landing road as a means to enhance pedestrian access through the central community area of Moss Landing. Additionally, the LUP calls for a pedestrian and bicycle bridge over Elkhorn Slough and pathway along the eastern edge of the south harbor to Moss Landing Road, and the County's Public Works department is in the process of planning for these essential access improvements. To offset the impacts of the proposed project, the Applicant has suggested complementing these plans by installing a viewing area/park with benches, bike racks, picnic tables, decomposed granite surfacing, and landscaping, etc., together with interpretive signing that educates and informs the public of the history of Elkhorn and Moro Cojo Sloughs and Moss Landing Harbor. Such a project would be a significant addition to the access and recreational amenities in the area. Consistent with this proposal, **Special Condition 8** is attached requiring the installation of a mini park with interpretive signs, benches, tables, and decomposed granite surfacing in the vicinity of the south harbor revetment. Improvement of these public facilities in the manner described would represent a significant and proportional recreational benefit / mitigation measure to offset the project's sand supply impacts.

Accordingly, 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 revetments within Moss Landing harbor. 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. Commission staff has collaborated with the Applicant to identify appropriate in-kind recreational resource mitigation measures. The resulting agreement is memorialized and is reinforced by **Special Condition 8**.

Accordingly, as conditioned, the proposed project mitigates 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.

Long-Term Stability, Maintenance, and Risk

Coastal Act Section 30253 requires the project to assure long-term stability and structural integrity, minimize future risk, and avoid additional, more substantial protective measures in the future. Given the locations near the harbor entrance and Moro Cojo box culvert which are susceptible to waves, tidal surges, and episodic tsunami events, the main Section 30253 concern is in ensuring that the proposed project is maintained in its approved state. In order to ensure that the Applicant and the Commission know when repairs or maintenance are required, the Applicant must regularly monitor the condition of the subject armoring, particularly after major storm events. Such monitoring will ensure that the Applicant and the Commission are aware of any damage to or weathering of the armoring and can determine whether repairs or other actions are necessary to maintain the seawall structure in its approved state before such repairs or actions are undertaken.

To ensure that the proposed project is properly maintained to ensure its long-term structural stability, **Special Condition 4** requires regular monitoring of the revetment. Said monitoring shall provide for evaluation of the condition and performance of the proposed project and shoreline stability, and shall provide for necessary maintenance, repair, changes or modifications. **Special Condition 4** further allows the Applicant to maintain the project in its approved state, subject to the terms and conditions identified by the special conditions. Such

future monitoring and maintenance activities must be understood in relation to clear as-built plans. Therefore, **Special Condition 7** of this approval requires the submittal of as-built plans to define the footprint and profile of the permitted revetment in its approved state.

In terms of recognizing and assuming the hazard risks for shoreline development, the proposed project has been designed to maximize the safety and stability of the harbor facilities including the public recreational boat dock and Moro Cojo box culvert, etc. However, given that these facilities are located within and immediately adjacent to a working boat harbor, harbor entrance channel, Elkhorn and Moro Cojo Sloughs, the project still has the potential to be subject to hazards associated with episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunami, tidal scour, coastal flooding, and the interaction of same. Therefore, **Special Condition 9** has been included to require that the Applicant assume the risks of injury and damage associated with these potential hazards as they relate to the proposed project and indemnify and hold harmless the Commission against any claims, damages, or costs associated with damage caused by such hazards.

For the reasons discussed above and as conditioned herein, the Commission finds that the proposed project is consistent with Sections 30235 and 30253 of the Coastal Act.

Marine Resources
The relevant Coastal Act policies state:

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

The Moss Landing Harbor provides the vital link between the tidal waters of Monterey Bay and Elkhorn Slough. Marine mammals, fish and seabirds make use of both the aquatic and terrestrial environments provided within the harbor, the Slough and the Bay. Harbor seals and sea otters make their way through the harbor to established haul-outs in Elkhorn Slough, and they have been observed in the south harbor vicinity of the project site. Pelicans and other shorebirds have also been observed resting or foraging in the vicinity. The tidal marsh and mudflats that fringe the north harbor (across the entrance channel from the project site) area also serve as resting and foraging grounds for harbor seals, sea otters, and various shorebirds. Whereas environmentally

sensitive habitats still exist in the north harbor (including tidal flats, eelgrass beds, sandy beaches and sandy dune areas), the south harbor area near the project site has been heavily used by recreational boaters since the opening of the harbor in the mid 1940's, and has lost much of the fringing salt marsh and benthic environments that once existed. The north harbor has had relatively little development over the same time period, and so has retained at least some of the natural habitats that existed in the area prior to the opening of the harbor entrance channel, and the related introduction of increased tidal currents that now flow in and out of Elkhorn Slough.

Benthic fauna may be impacted (crushed and displaced) by rip-rap installation. However, since natural disturbance of the harbor bottom is high and benthic fauna are generally considered to be sparse and transitory in nature, these species are not expected to be significantly adversely affected by these activities at this location. Most benthic invertebrates are able to adapt to such changes due to their ability to migrate to suitable depths and bottom habitats. Additionally, based on notes from the biotic survey of the nearshore intertidal area, there appear to be very few organisms present in the sandy areas fronting the project site.

Regarding project construction and future revetment maintenance activities in their approved configuration, such construction would likely occur from the landside parking areas, avoiding the need for equipment in the water, and minimizing impacts on marine resources and water quality. However, construction activity at the water's edge always has the potential to cause adverse impacts. Therefore, **Special Condition 2** requires construction and maintenance activities to be conducted in accordance with the construction methods typically required by the Commission to protect water quality and marine resources during armoring construction, including maintaining good construction site housekeeping controls and procedures, the use of appropriate erosion and sediment controls, a prohibition on equipment washing, refueling, or servicing on the beach, etc. As conditioned, the project is consistent with Coastal Act Sections 30230 and 30231 regarding protection of marine resources and offshore habitat.

Public Access and Recreation

Coastal Act Sections 30210 through 30224 specifically protect public access and recreational opportunities, including visitor-serving resources. In particular:

> ***Section 30210:*** *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*
>
> ***Section 30211:*** *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*
>
> ***Section 30212(a):*** *Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects….*
>
> ***Section 30213.*** *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational*

opportunities are preferred.

Section 30220. *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

Section 30221. *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

Section 30223. *Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.*

Section 30224. *Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.*

As discussed in the finding above, shoreline structures can have a variety of negative impacts on coastal resources including adverse effects on beaches and sand supply, which ultimately result in the loss of the beach with associated impacts to public recreational access. In this case, covering 2,730 square feet of sand with the revetment and narrowing the beach space by approximately 1,300 square feet over the 20-year authorization period (due to passive erosion) does not impact public recreational access to such beach area because the beach at these three revetment locations are essentially inaccessible even at lower tides and are located immediately seaward of a working harbor where beach access is limited, seldom used, and not even particularly safe. Given the unique circumstances of the area, the proposed project's impact to sand supply, and ultimately to public recreational access, is due primarily to bluff retention of 578 cubic yards of sand over the 20-year authorization period. Such materials would contribute to beach formation and retention but for the revetment.

To offset these impacts mitigation is necessary. Therefore, the approved project includes in-kind public recreational access improvements (e.g., mini park, benches, bike racks, picnic table, interpretive sign, pathway connections, etc.) to offset impacts from the loss of bluff materials (see **Special Condition 8**). Improvement of these public facilities in the manner described would represent a significant recreational benefit and appropriate mitigation measure to offset public recreational access impacts.

With respect to construction impacts, this project will: require the movement of large equipment, workers, materials, and supplies in and around the shoreline area and public access points; include large equipment operations in these areas; result in the loss of public access use areas to a construction zone; and generally intrude and negatively impact the aesthetics, ambiance, serenity, and safety of the recreational experience at these locations. These public recreational use impacts are temporary and can be mitigated through construction parameters that limit the area of construction, limit the times when work can take place (to avoid both weekends and peak summer use months when recreational use is highest), clearly fence off the minimum

construction area necessary, keep equipment out of coastal waters, require off-beach equipment and material storage during non-construction times, clearly delineate and avoid to the maximum extent feasible public use areas, and restore all affected public access areas at the conclusion of construction. A construction plan is required to implement these measures (s**ee Special Condition 2**), the Applicant must maintain copies of the CDP and approved plans available for public review at the construction sites, as well as provide a construction coordinator whose contact information is posted at the sites to respond to any problems and/or inquiries that might arise (**see Special Condition 3**).

In conclusion, and because the approval includes a requirement that the applicant return for a CDP amendment to address the public access impacts of the project beyond the 20-year timeframe (see **Special Condition 6**), these mitigations can appropriately offset the public recreational access impacts associated with the proposed project for the initial twenty years of the project authorization. As conditioned, the project is consistent with the Coastal Act access and recreation policies sited above.

Other Agency Approvals

The Applicant owns the upland site, but any portion of the revetment that is seaward of the mean high tide line is located on state tidelands. As such, portions of the project may be located within the jurisdiction of the Army Corps of Engineers, Monterey Bay National Marine Sanctuary, and the California Department of Fish and Wildlife. Accordingly, this approval is conditioned to ensure that the project (as conditioned and approved by this CDP) has received all necessary authorizations (or evidence that none are necessary) from other agencies (**Special Condition 5**).

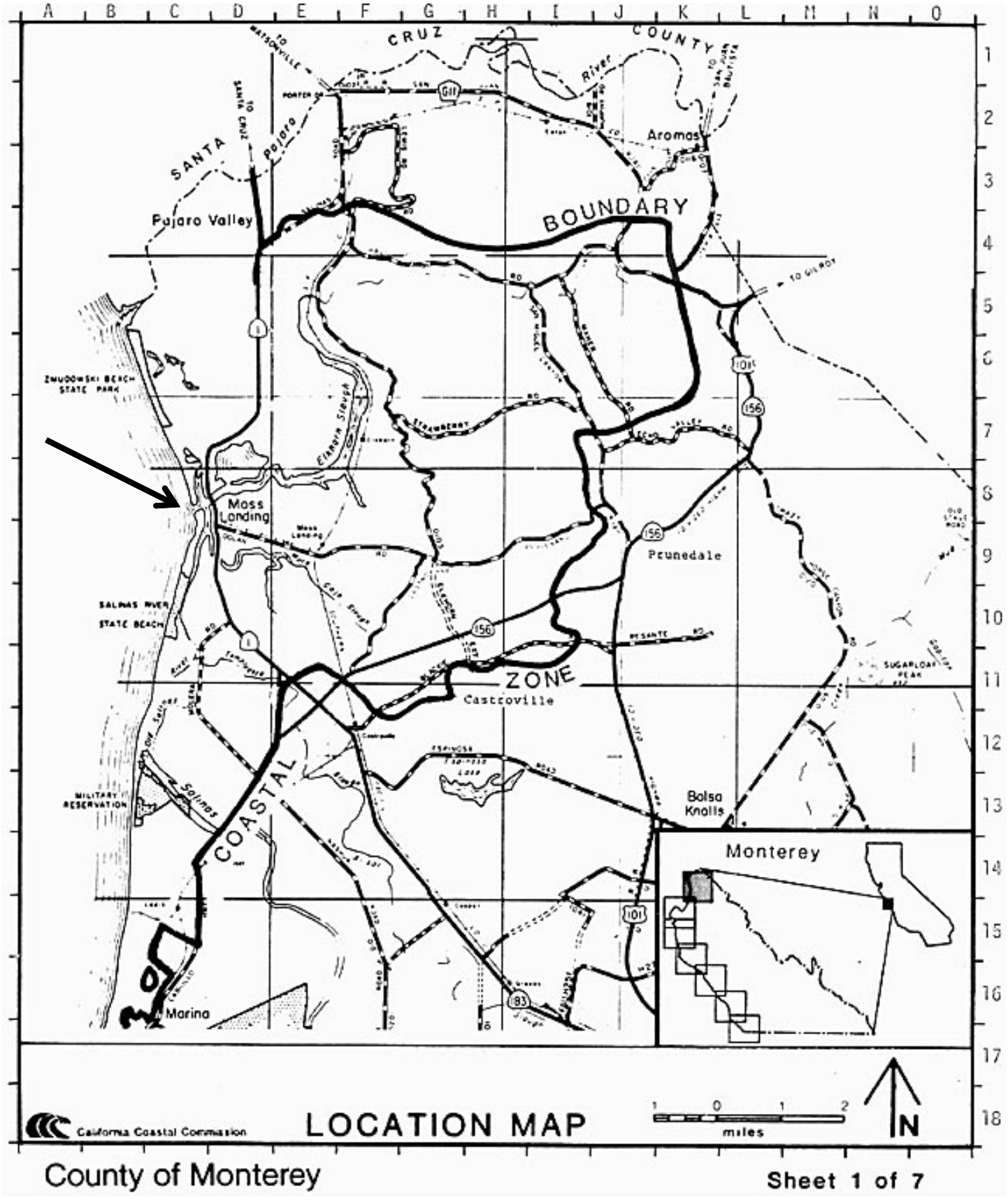
F. California Environmental Quality Act (CEQA)

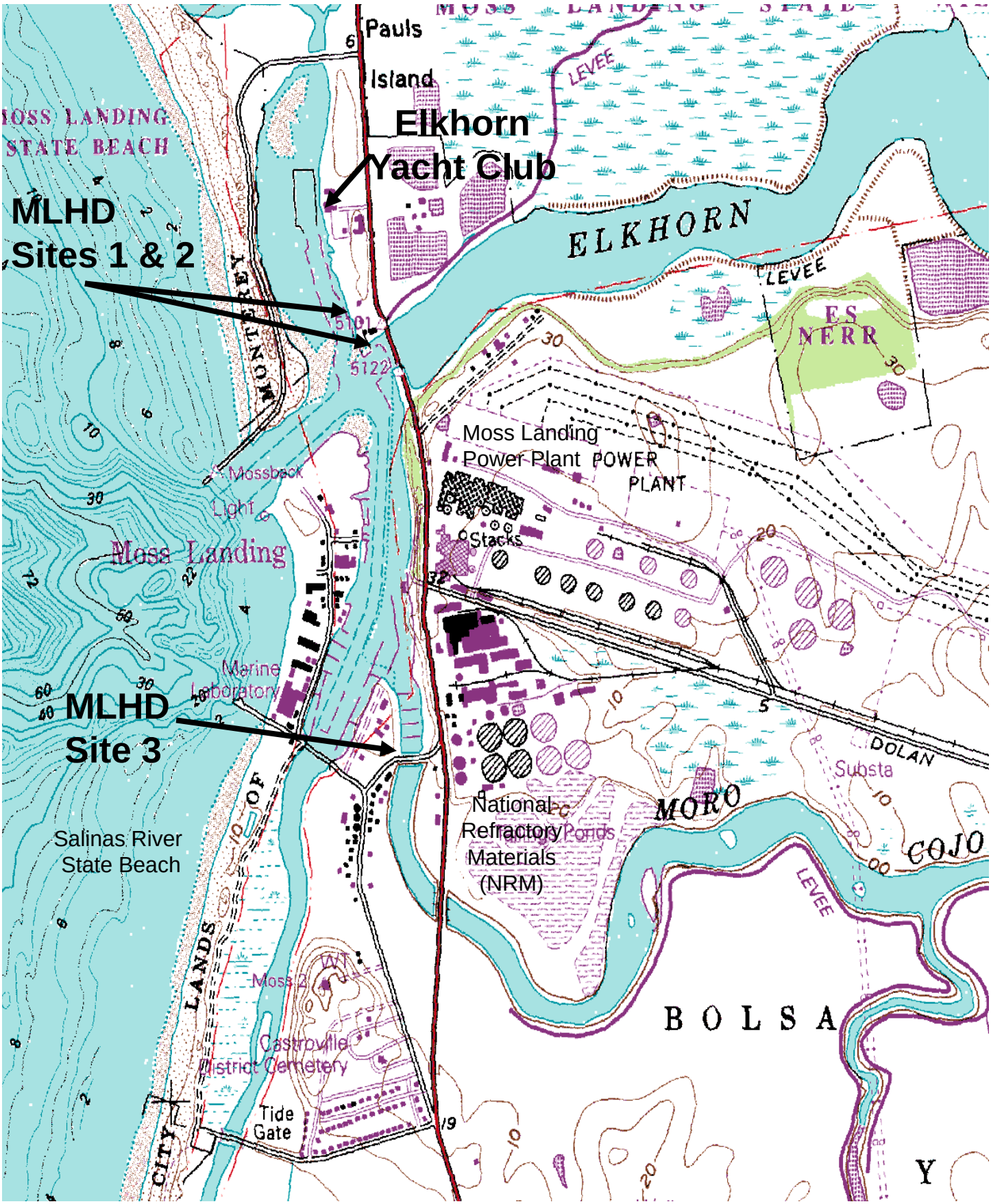
Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with CDP applications showing the application to be consistent with any applicable requirements of CEQA. Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if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

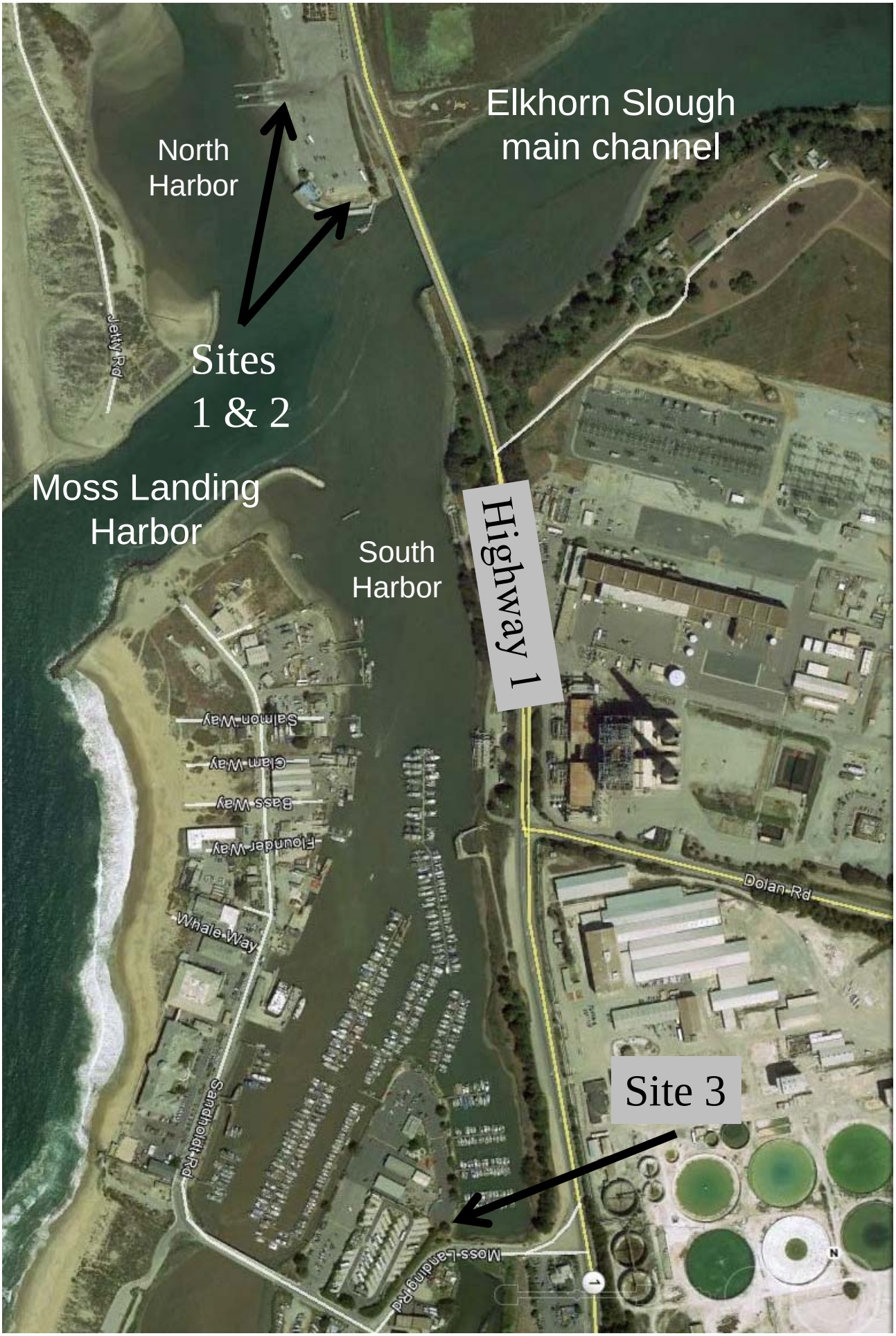
Monterey County, acting as lead agency, found that the project was categorically exempt from CEQA requirements (per CEQA Section 15302). The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. The Commission has reviewed the relevant coastal resource issues with the proposed project, and has identified appropriate and necessary modifications to address adverse impacts to such coastal resources. All public comments received to date have been addressed in the findings above. All above findings are incorporated herein in their entirety by reference.

The Commission finds that only as modified and conditioned by this permit will the proposed project avoid significant adverse effects on the environment within the meaning of CEQA. As such, there are no additional feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse environmental effects that approval of the proposed project, as modified, would have on the environment within the meaning of CEQA. If so modified, 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).


CRUZ COUNTY
SANTA
Pajaro Valley
BOUNDARY
Aromas
Moss Landing
Pajaro River
Elkhorn Slough
Strawberry Canyon
Pennedale
Castroville
ZONE
COASTAL
Salinas River
Old Salinas River
Bolsa Knolls
Marina
Monterey
ZMUDOWSKI BEACH STATE PARK
SALINAS RIVER STATE BEACH
MILITARY RESERVATION
LOCATION MAP
California Coastal Commission
miles
N
County of Monterey
Sheet 1 of 7


Pauls
Island
Elkhorn
Yacht Club
MLHD
Sites 1 & 2
MLHD
Site 3
ELKHORN
LEVEE
ES
NERR
Moss Landing
Power Plant
POWER
PLANT
Stacks
Mossback
Light
Moss Landing
Marine
Laboratory
Salinas River
State Beach
National
Refractory
Materials
(NRM)
MORO
COJO
BOLSA
DOLAN
Substa
Moss 2
Castroville
District Cemetery
Tide
Gate
LANDS
CITY
MONTEREY


Elkhorn Slough
main channel
North
Harbor
Jetty Rd
Sites
1 & 2
Moss Landing
Harbor
South
Harbor
Highway 1
Salmon Way
Clam Way
Bass Way
Flounder Way
Whale Way
Sandholdt Rd
Dolan Rd
Moss Landing Rd
Site 3
N

Moss Landing Harbor Shoreline: Site 1

Moss Landing Harbor Shoreline: Site 1

Moss Landing Harbor Shoreline: Site 2

Moss Landing Harbor Shoreline: Site 3

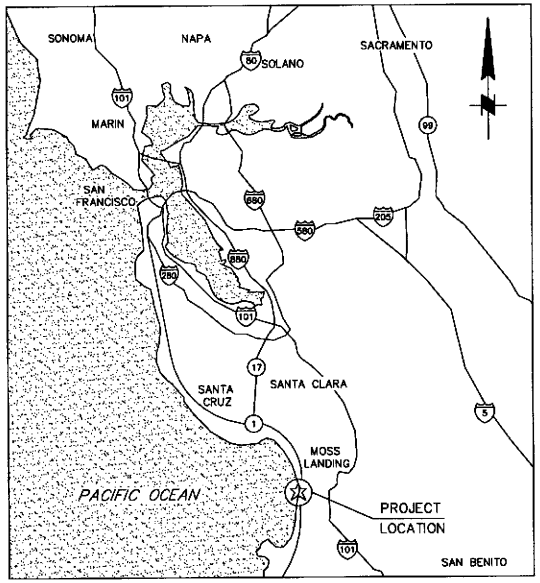
Moss Landing Harbor Shoreline: Site 3

NORTH HARBOR SHORE PROTECTION REPAIR

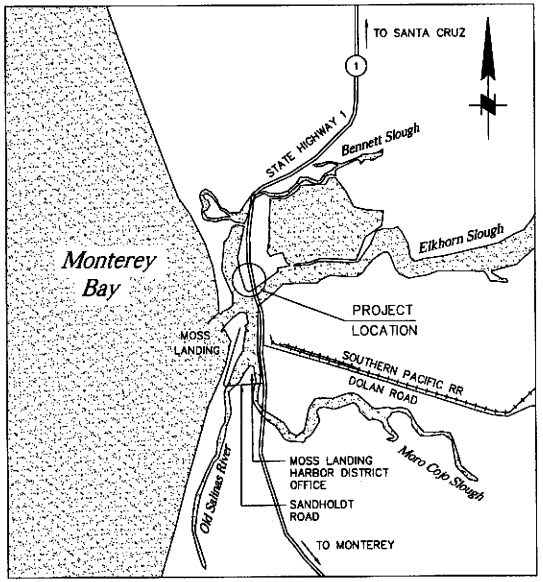
MOSS LANDING HARBOR DISTRICT

MOSS LANDING, CALIFORNIA

INDEX OF DRAWINGS		
SHEET NUMBER	DRAWING NUMBER	TITLE
1	G1	TITLE SHEET, VICINITY MAP, LOCATION MAP & INDEX OF DRAWINGS
2	G2	GENERAL NOTES, ABBREVIATIONS, LEGEND AND SYMBOLS
3	G3	SITE MAP
4	C1	GENERAL DEVELOPMENT PLAN
5	C2	PARKING AREA, DRAINAGE AND UTILITY PLAN
6	C3	PARKING AREA, DRAINAGE DETAILS
7	C4	BOAT LAUNCH RAMP, PLAN AND PROFILE
8	C5	BOAT LAUNCH RAMP, SECTION AND DETAILS
9	C6	BOAT LAUNCH RAMP, PROJECT SIGN
10	C7	SHORE PROTECTION, PLAN
11	C8	SHORE PROTECTION, TYPICAL SECTION AND DETAILS
12	C9	SHORE PROTECTION, SECTIONS
13	C10	SHORE PROTECTION, PLAN AND SECTION
14	C11	OUTFALL DETAILS
15	C12	WHARF, PILE PLAN, SHEET 1
16	C13	WHARF, PILE PLAN, SHEET 2
17	C14	WHARF, ELEVATION AND SECTIONS



VICINITY MAP
NTS



LOCATION MAP
NTS

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

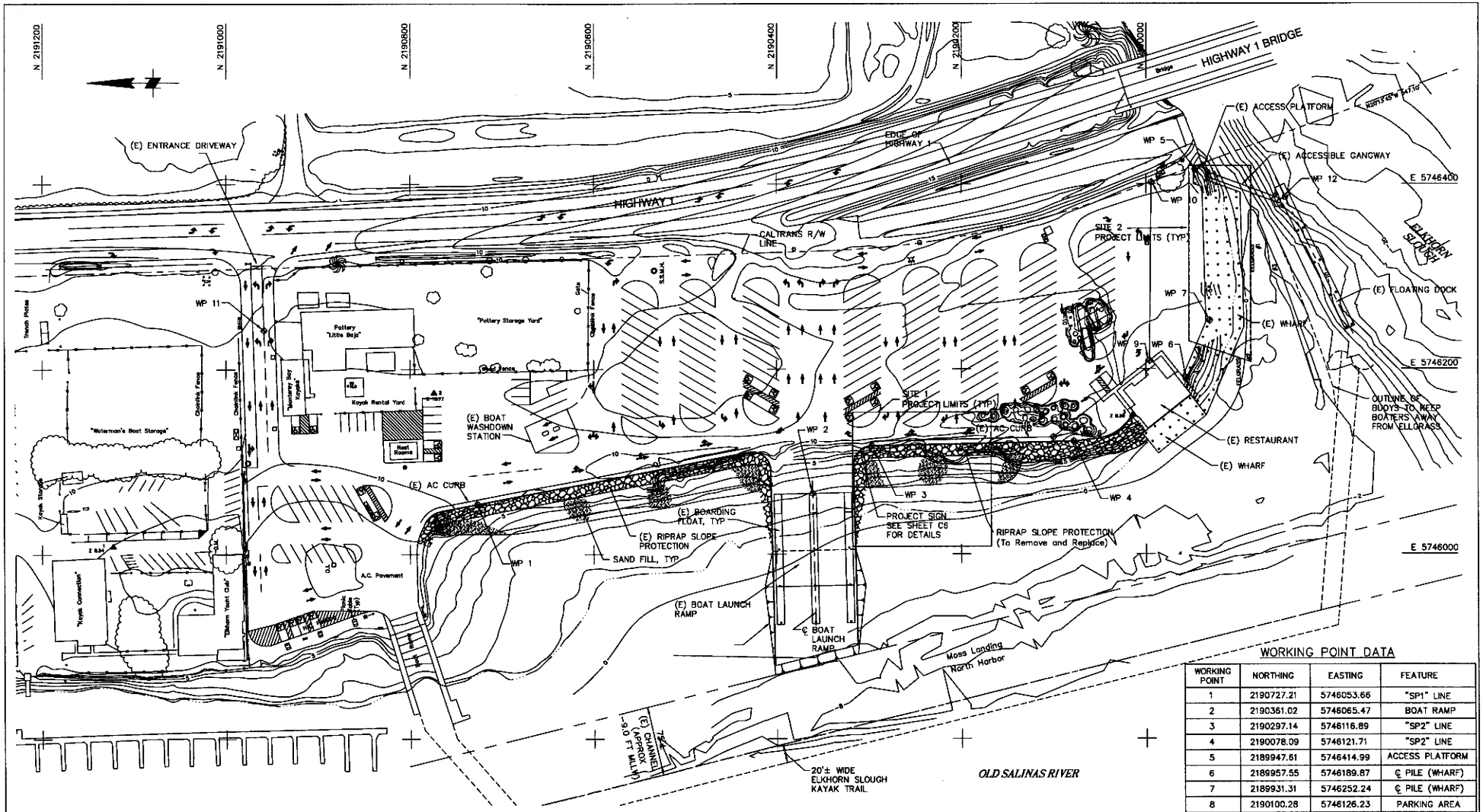
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
EP/JTC	EP	JFJ
JOB NO. 4278	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
TITLE SHEET, VICINITY MAP, LOCATION MAP AND INDEX OF DRAWINGS

DATE 03/01/12
SHEET 1 OF 17
G1



GENERAL DEVELOPMENT PLAN
1" = 50'

WORKING POINT DATA

WORKING POINT	NORTHING	EASTING	FEATURE
1	2190727.21	5746053.66	"SP1" LINE
2	2190361.02	5746065.47	BOAT RAMP
3	2190297.14	5746116.89	"SP2" LINE
4	2190078.09	5746121.71	"SP2" LINE
5	2189947.61	5746414.99	ACCESS PLATFORM
6	2189957.55	5746189.87	℄ PILE (WHARF)
7	2189931.31	5746252.24	℄ PILE (WHARF)
8	2190100.28	5746126.23	PARKING AREA
9	2189996.23	5746208.84	PARKING AREA
10	2189994.47	5746401.79	PARKING AREA
11	2190958.29	5746242.15	ENTRANCE DRIVEWAY
12	2189849.62	5746385.55	℄ FLOAT

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

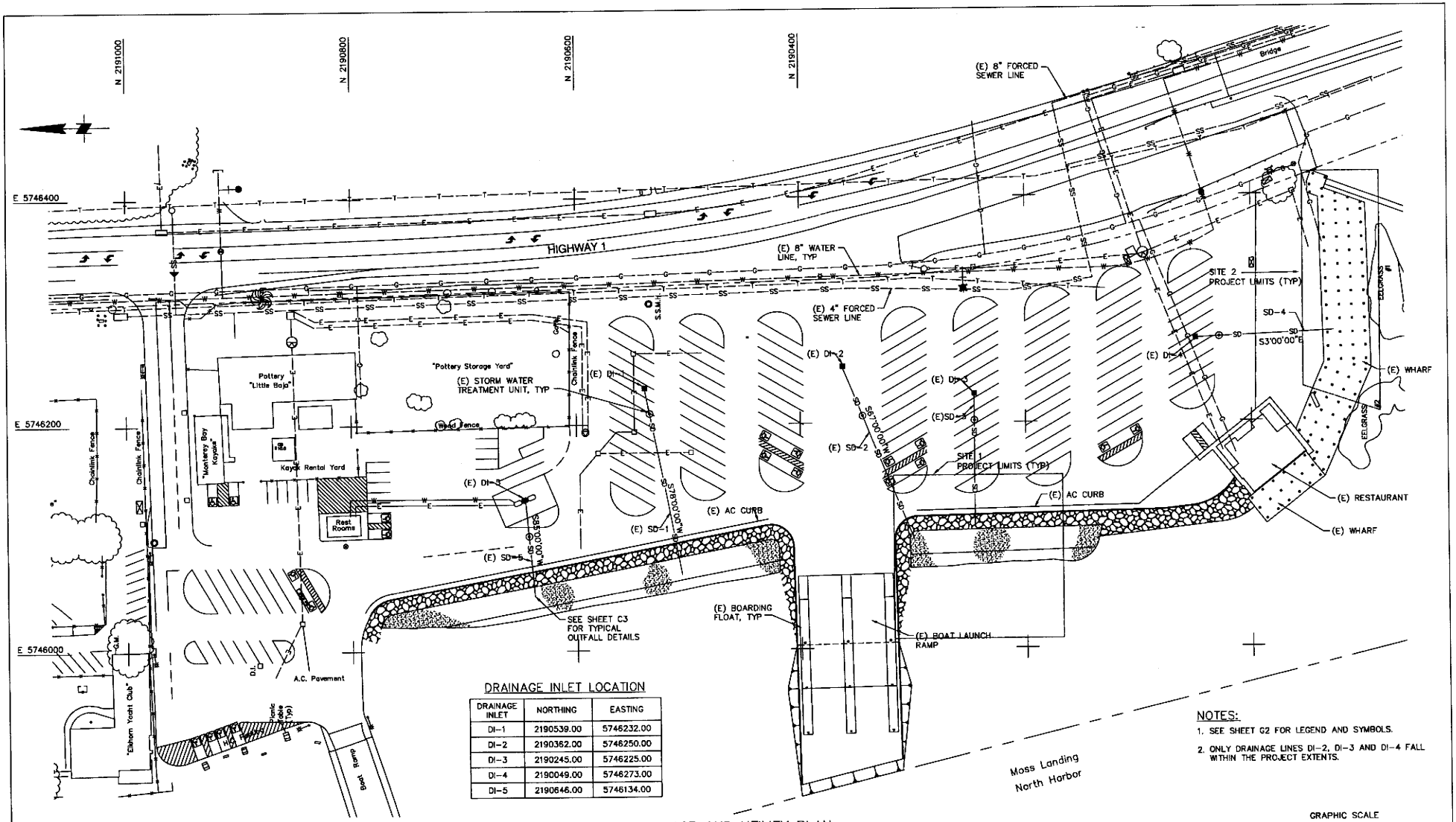
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	TEH/JFJ	DR	EP	CHK	JFJ
JOB NO.	4279	SUBMITTED BY	BMJ	TITLE	VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
GENERAL DEVELOPMENT PLAN

DATE 03/01/12
SHEET 4 OF 17
C1



DRAINAGE INLET LOCATION

DRAINAGE INLET	NORTHING	EASTING
DI-1	2190539.00	5746232.00
DI-2	2190362.00	5746250.00
DI-3	2190245.00	5746225.00
DI-4	2190049.00	5746273.00
DI-5	2190646.00	5746134.00

NOTES:

1. SEE SHEET G2 FOR LEGEND AND SYMBOLS.
2. ONLY DRAINAGE LINES DI-2, DI-3 AND DI-4 FALL WITHIN THE PROJECT EXTENTS.

DRAINAGE AND UTILITY PLAN

1" = 40'

GRAPHIC SCALE

40 0 40 80 120

1" = 40'

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
SKH/JTG	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE

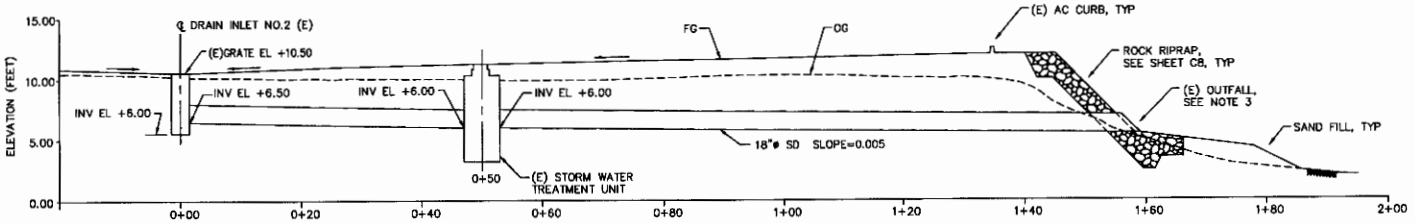
DATE 03/01/12
SHEET 5 OF 17

PARKING AREA
DRAINAGE AND UTILITY PLAN

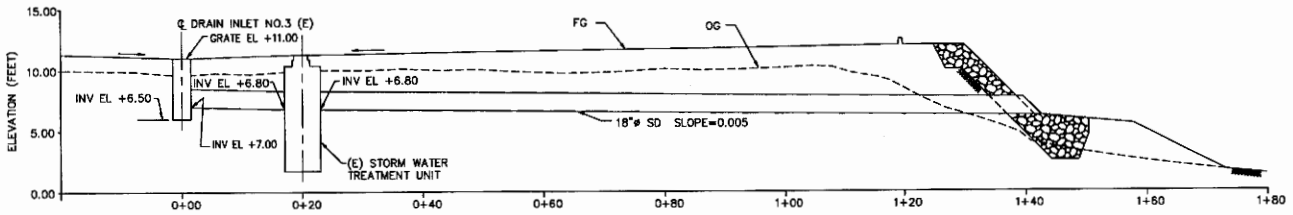
C2

NOTES:

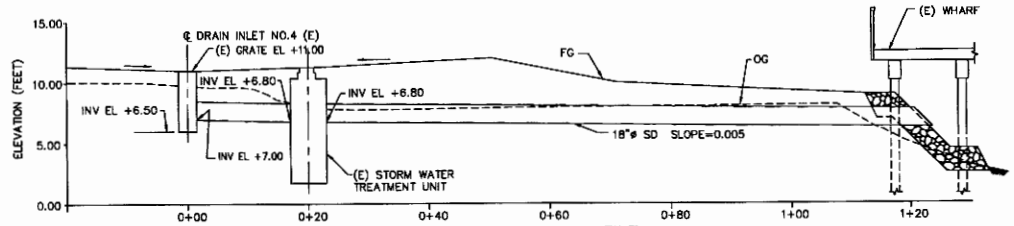
1. ONLY OUTFALLS SD-2, SD-3 AND SD-4 FALL WITHIN PROJECT EXTENTS.
2. OUTFALLS WITHIN PROJECT EXTENTS SHALL BE REPAIRED TO ORIGINAL DESIGN.
3. SD PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE). SEE SPECIFICATIONS.
4. SEE SHEET C11 FOR OUTFALL DETAILS.



SD-2 PROFILE
1" = 10' HORIZ
1" = 5' VERTICAL



SD-3 PROFILE
1" = 10' HORIZ
1" = 5' VERTICAL



SD-4 PROFILE
1" = 10' HORIZ
1" = 5' VERTICAL

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JTG/SKH	AB	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE

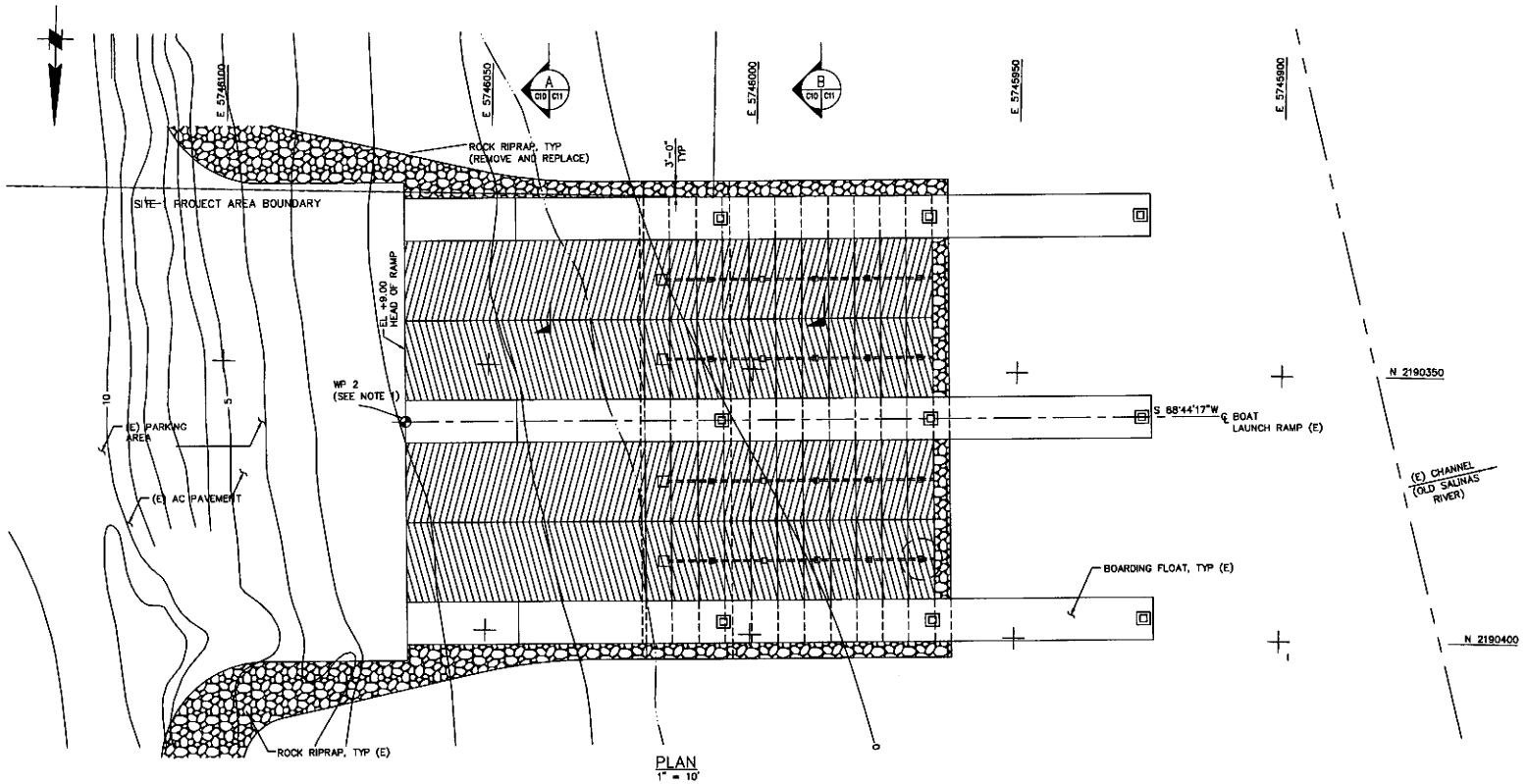
DATE 03/01/12
SHEET 6 OF 17

PARKING AREA DRAINAGE DETAILS

C3

NOTES:

1. SEE SHEET C1 FOR WP2 COORDINATES.



PLAN
1" = 10'

GRAPHIC SCALE
10 0 10 20 30
1" = 10'

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

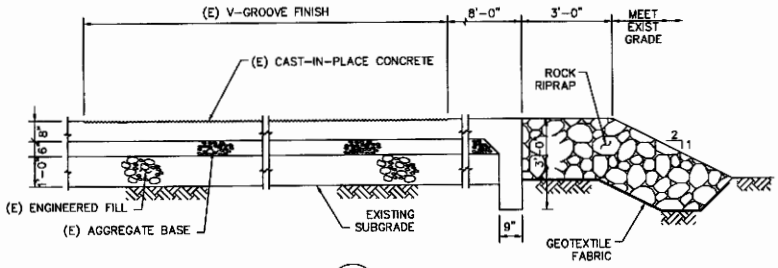
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JTG	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

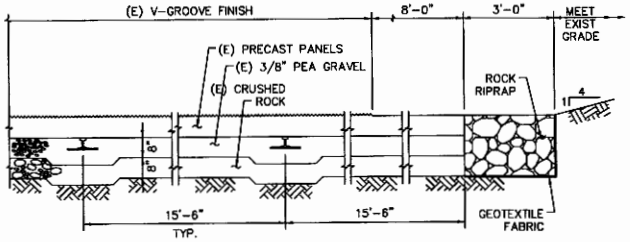
NORTH HARBOR SHORE PROTECTION REPAIR
DATE 03/01/12
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
SHEET 7 OF 17

BOAT LAUNCH RAMP
PLAN AND PROFILE

C4



A C4 C5 SECTION 1/2" = 1'-0"



B C4 C5 SECTION 1/2" = 1'-0"

NOTES:

1. SEE SHEET G2 FOR LEGEND AND SYMBOLS.
2. SECTIONS A AND B APPLY TO THE RIPRAP REVETMENT TO BE BUILT WITHIN THE PROJECT EXTENTS, TO THE SOUTH OF THE DETAILED BOAT LAUNCH RAMP.

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

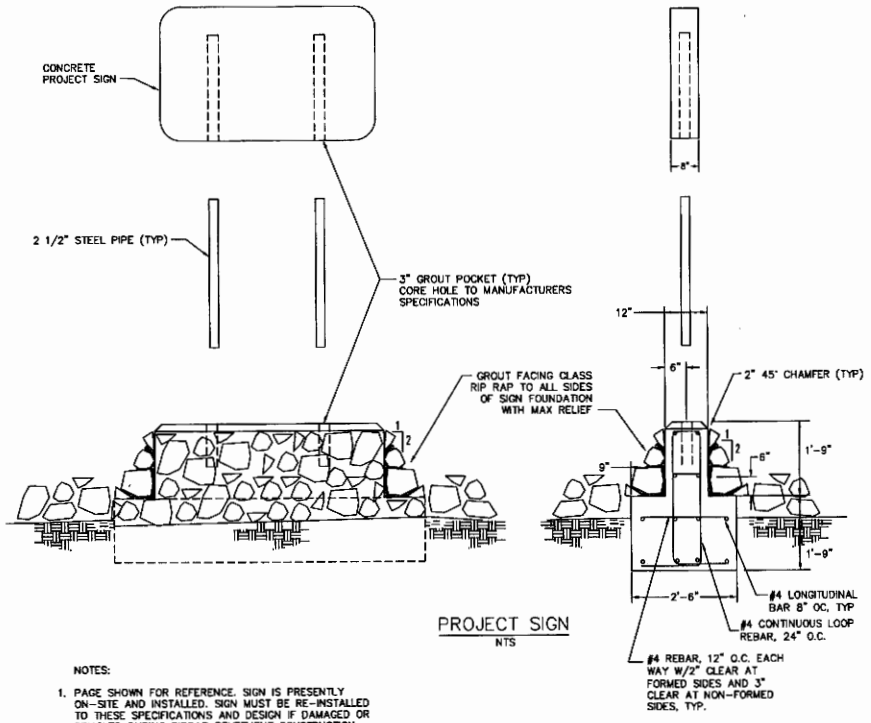
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JTG	JTG/EP	JFJ
JOB NO. 4278	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE

BOAT LAUNCH RAMP SECTION AND DETAILS

DATE 03/01/12
SHEET 8 OF 17
C5



PROJECT SIGN
NTS

NOTES:

1. PAGE SHOWN FOR REFERENCE. SIGN IS PRESENTLY ON-SITE AND INSTALLED. SIGN MUST BE RE-INSTALLED TO THESE SPECIFICATIONS AND DESIGN IF DAMAGED OR REMOVED DURING RIPRAP REVETMENT CONSTRUCTION.

FRONT OF SIGN
NTS

NOTE:
THIS SHEET IS BASED ON DBW STANDARD BOARDING FLOAT DESIGN DRAWING

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

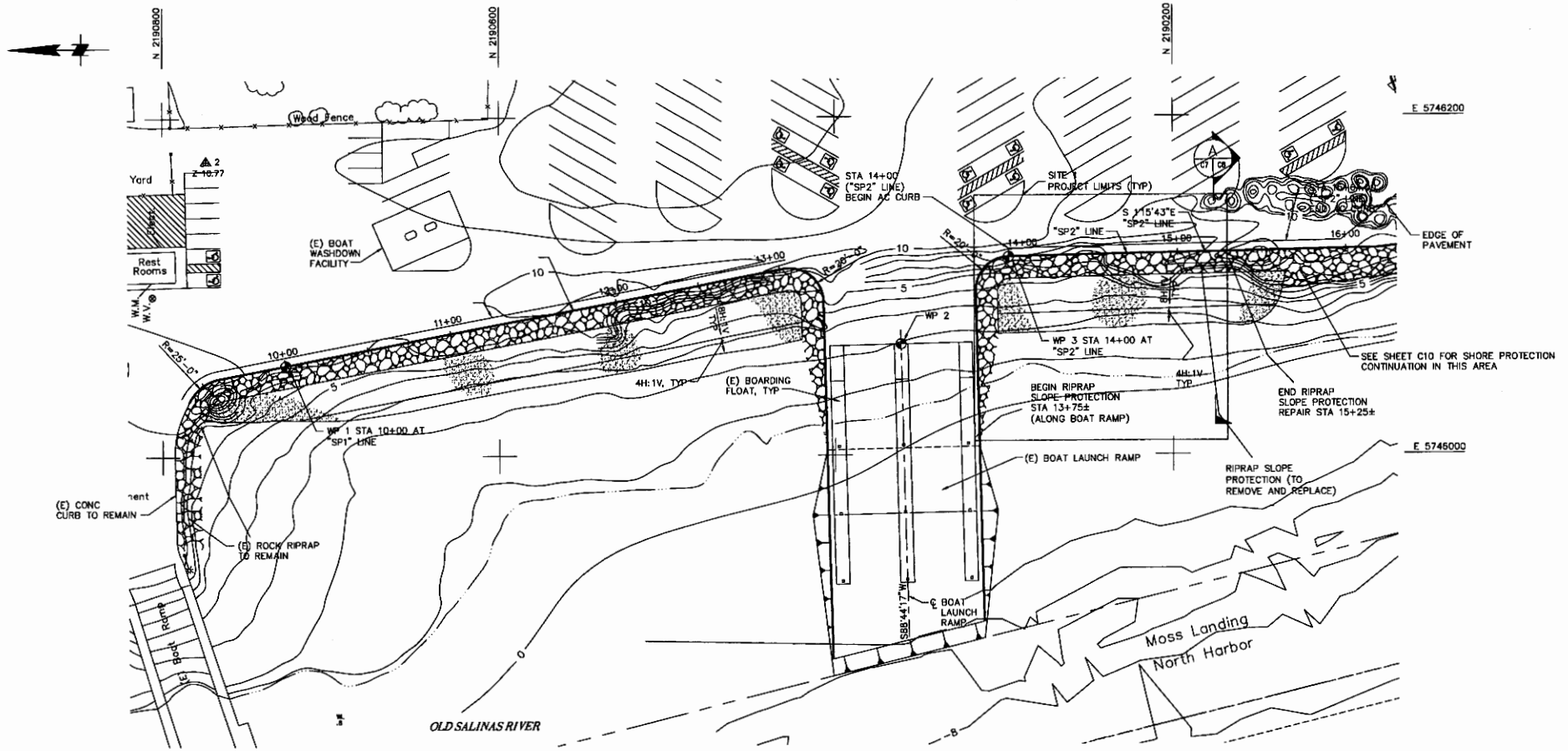
Original Design and Engineering Approval Provided by:

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
DBW	DBW	DBW
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
BOAT LAUNCH RAMP PROJECT SIGN

DATE 03/01/12
SHEET 9 OF 17
C6



SHORE PROTECTION PLAN
1" = 30'

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. SEE SHEETS C12 THROUGH C14 FOR RIPRAP SLOPE PROTECTION IN THE WHARF AREA.

GRAPHIC SCALE
30 0 30 60 90
1" = 30'

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

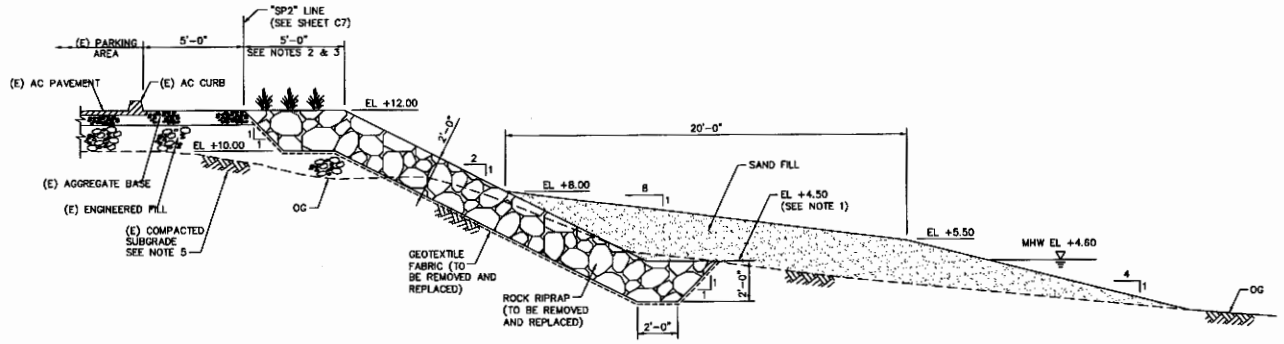
MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

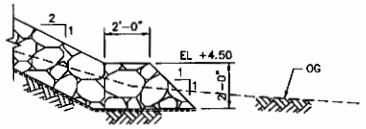
DSGN	JTG/DT	DR	EP	CHK	JFJ
JOB NO.	4279	SUBMITTED BY	BMJ	TITLE	VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
SHORE PROTECTION PLAN

DATE 03/01/12
SHEET 10 OF 17
C7



TYPICAL SECTION (A) C7 | C8
3/8" = 1'-0"



DETAIL (1) - | -
3/8" = 1'-0"

NOTES:

1. WHERE EXISTING GRADE AT TOE IS LOWER THAN EL +4.50 FEET, USE "DETAIL 1" THIS SHEET.
2. THE TOP 5 FEET WIDE (FLAT SURFACE) OF THE ROCK RIPRAP MAY BE UTILIZED FOR FUTURE LANDSCAPE PLANTINGS.
3. LANDSCAPE PLANTINGS SHOWN IS BY OTHERS AND NOT PART OF THIS CONTRACT.
4. REMOVE ALL EXISTING CONCRETE RUBBLE AND DEBRIS ALONG THE SHORELINE WHERE NEW ROCK RIPRAP SHALL BE PLACED.
5. COMPACT EXISTING SUBGRADE ONLY AT ALL LOCATIONS WHERE ENGINEERED FILL IS PLACED.

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

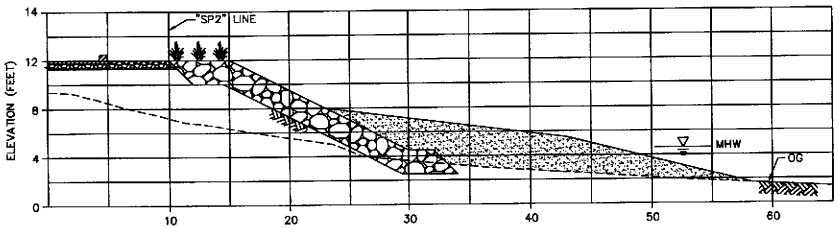
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

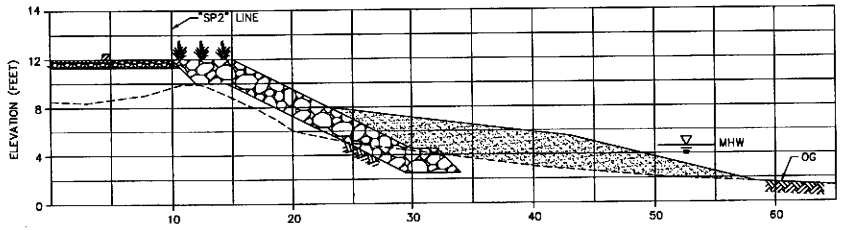
DSGN	JTG/DT	DR	EP	CHK	JFJ
JOB NO.	4278	SUBMITTED BY	BMJ	TITLE	VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
SHORE PROTECTION TYPICAL SECTION AND DETAILS

DATE 03/01/12
SHEET 11 OF 17
C8



STA 14+50



STA 15+50

NOTES:

1. SEE SHEET C14 FOR TYPICAL SECTION OF SLOPE PROTECTION IN THE WHARF AREA.

SECTIONS
1" = 5'

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

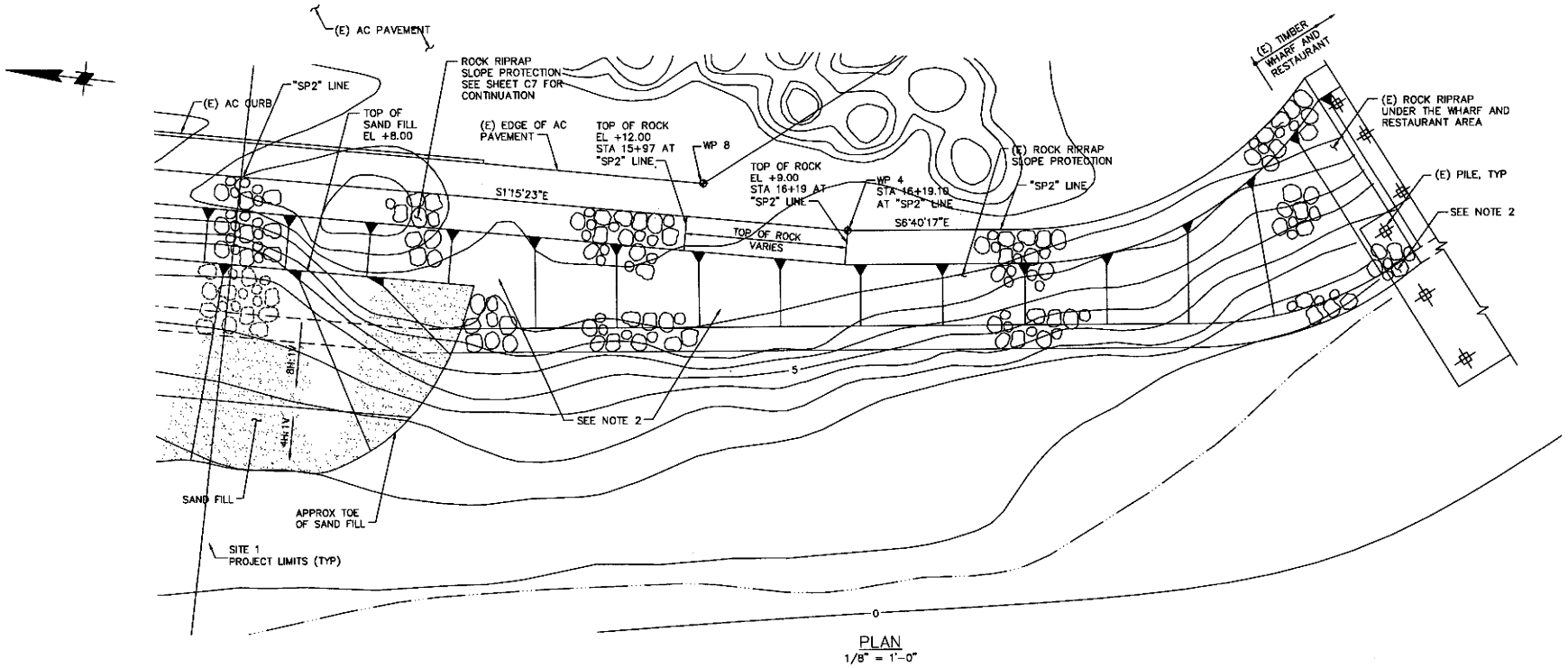
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JTG	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
SHORE PROTECTION SECTIONS

DATE 03/01/12
SHEET 12 OF 17
C9



PLAN
1/8" = 1'-0"

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. MATCH THE TOP AND BOTTOM OF (E) ROCK RIPRAP AT THE (E) RIPRAP REVETMENT. PROVIDE A UNIFORM AND SMOOTH TRANSITION OF THE NEW ROCK RIPRAP WITH THE EXISTING ROCK RIPRAP.

GRAPHIC SCALE
4 0 4 8 12 16
1/8" = 1'-0"

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

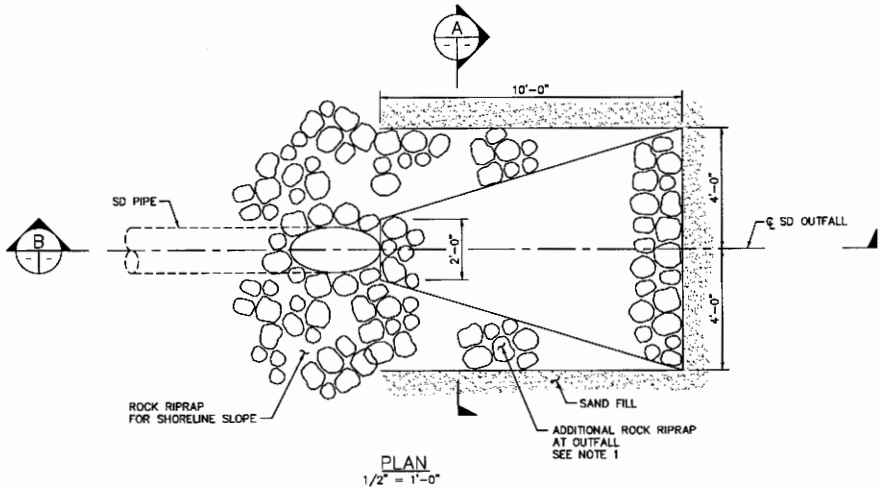
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JFJ	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

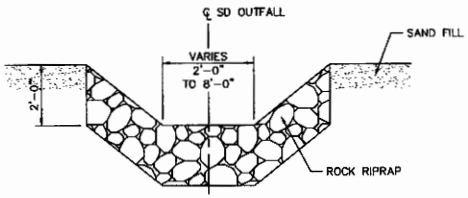
NORTH HARBOR SHORE PROTECTION REPAIR
DATE 03/01/12
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
SHEET 13 OF 17

SHORE PROTECTION PLAN AND SECTION

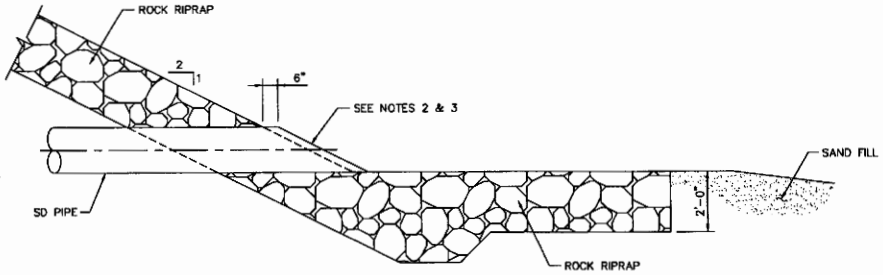
C10



PLAN
1/2" = 1'-0"



SECTION A
1/2" = 1'-0"



SECTION B
1/2" = 1'-0"

NOTES:

1. THE DETAILS SHOWN ON THIS SHEET APPLY TO SD-1, SD-2, SD-3 AND SD-5 OUTFALLS. FOR SD-4 OUTFALL, THERE WILL BE NO ADDITIONAL ROCK RIPRAP AROUND THE PIPE OUTFALL, AND NO SAND FILL.
2. CUT SD PIPE AT THE SAME SLOPE AS THE ROCK RIPRAP. SD PIPE SHALL PROTRUDE 6 INCHES FROM THE ROCK RIPRAP SURFACE AS SHOWN (ALL AROUND THE PIPE).
3. THESE DETAILS SHOWN FOR REFERENCE. OUTFALLS SHALL BE REPAIRED BACK TO ORIGINAL DESIGN SHOWN HERE.

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

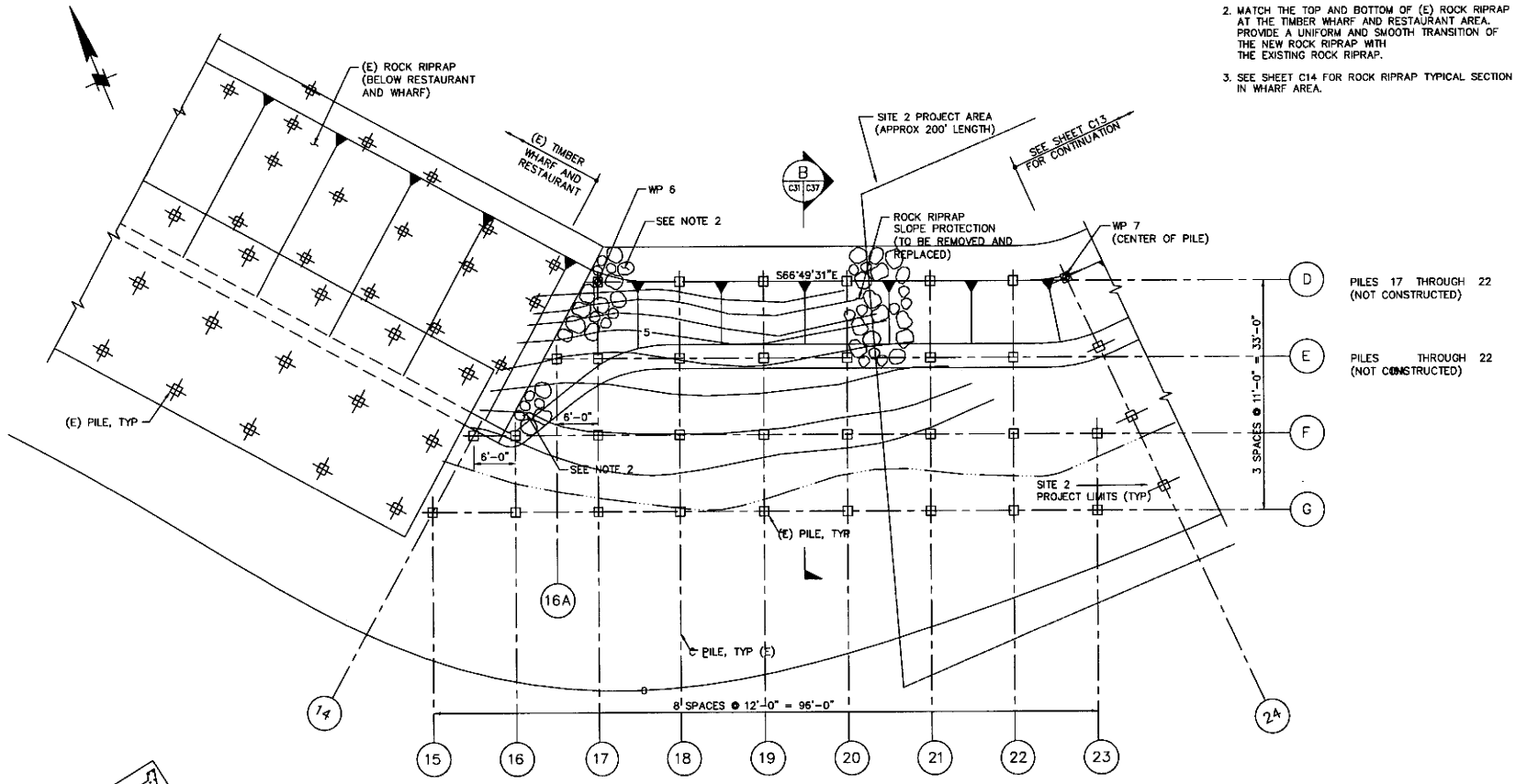
DSGN	DR	CHK
JFJ/JTG	EP	JFJ
JOB NO.	SUBMITTED BY	TITLE
4279	BMJ	VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
OUTFALL DETAILS

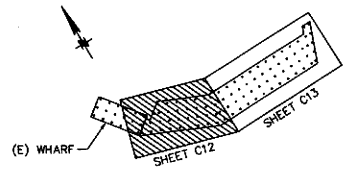
DATE 03/01/12
SHEET 14 OF 17
C11

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. MATCH THE TOP AND BOTTOM OF (E) ROCK RIPRAP AT THE TIMBER WHARF AND RESTAURANT AREA. PROVIDE A UNIFORM AND SMOOTH TRANSITION OF THE NEW ROCK RIPRAP WITH THE EXISTING ROCK RIPRAP.
3. SEE SHEET C14 FOR ROCK RIPRAP TYPICAL SECTION IN WHARF AREA.



PILE PLAN
1/8" = 1'-0"



KEY MAP

GRAPHIC SCALE
4 0 4 8 12 16
1/8" = 1'-0"

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

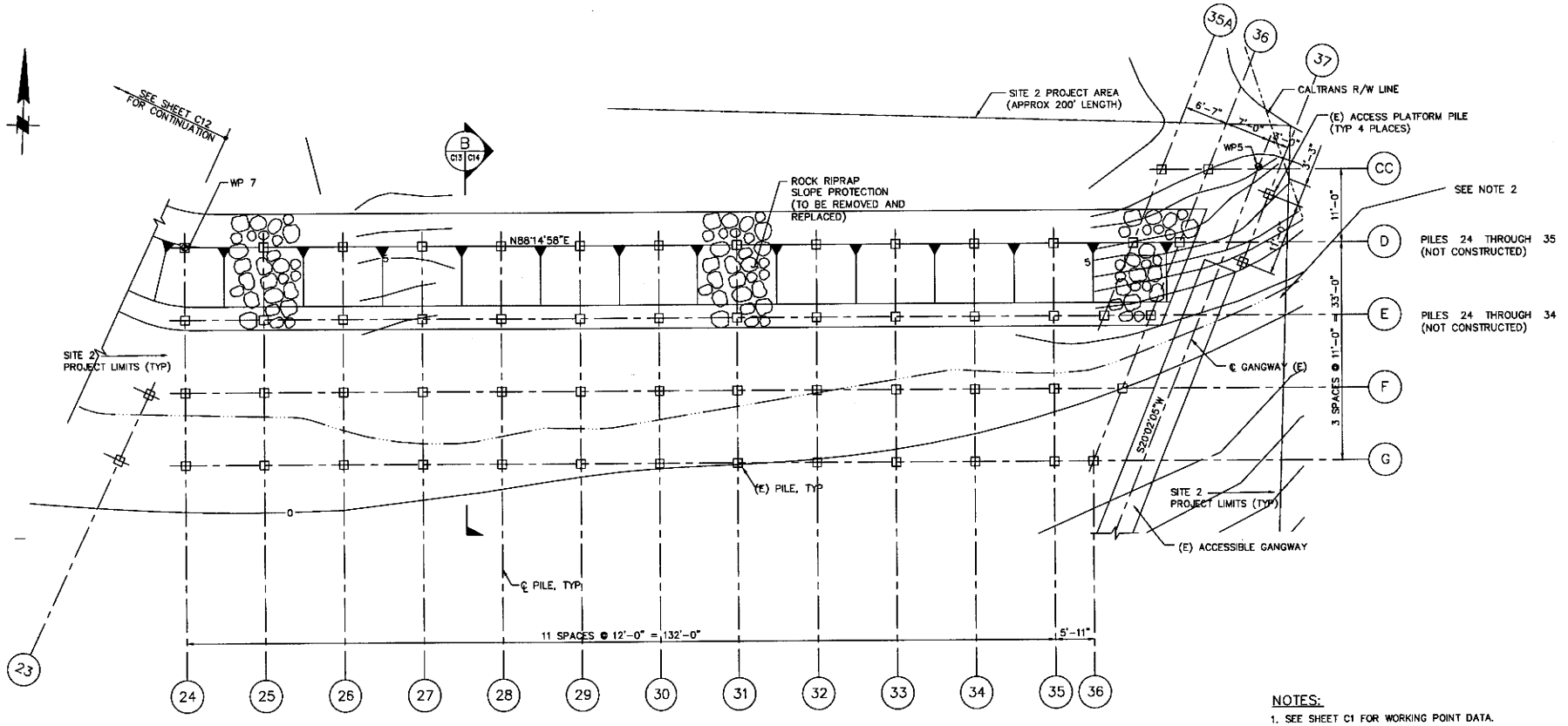
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
PJ/EP	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
WHARF PILE PLAN SHEET 1

DATE 03/01/12
SHEET 15 OF 17
C12

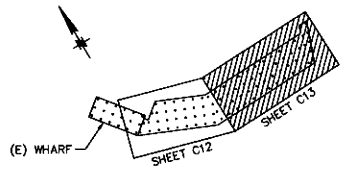
DWG INFO: P:\4279 MOSS LANDING\DWG\M_SUBMITTALS\-PARKING & SHORE PROTECTION\4279000C03I-32.DWG, OCT 25 2005 - 11:24 AM



PILE PLAN
1/8" = 1'-0"

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. REMOVE ANY EXISTING TIMBER PILES IN THIS AREA. CUT PILES AT LEAST 2 FEET BELOW MUDLINE.
3. SEE SHEET C14 FOR ROCK RIPRAP TYPICAL SECTION IN WHARF AREA.



KEY MAP

GRAPHIC SCALE
4 0 4 8 12 16
1/8" = 1'-0"

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

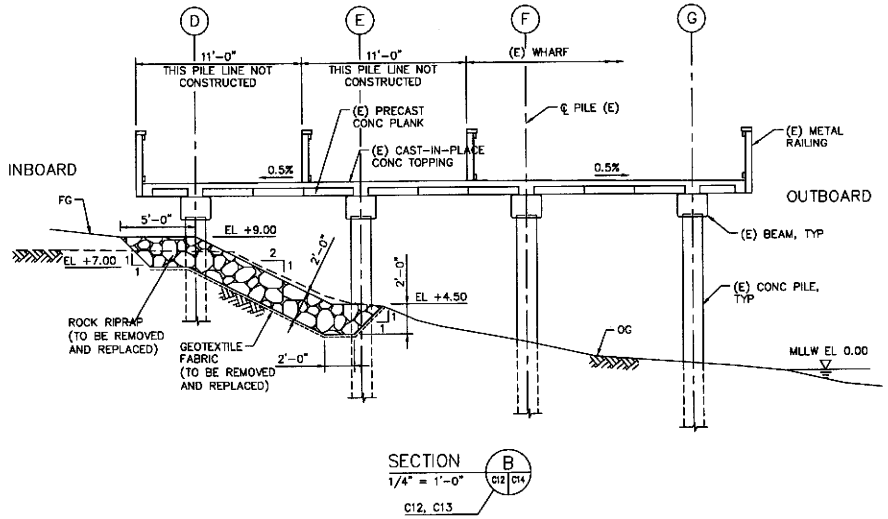
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
PJ/EP	EP	JFJ
JOB NO.	SUBMITTED BY	TITLE
4279	BMJ	VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE
WHARF PILE PLAN SHEET 2

DATE 03/01/12
SHEET 16 OF 17
C13



GRAPHIC SCALE
2 0 2 4 8
1/4" = 1'-0"

Original Design and Engineering Approval Provided by:

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JFJ/PJ	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR SHORE PROTECTION REPAIR
SHORE PROTECTION ALONG NORTH HARBOR SHORELINE

DATE 03/01/12
SHEET 17 OF 17

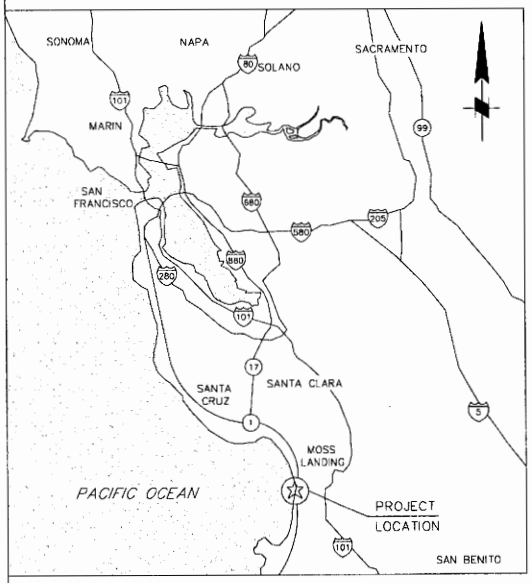
WHARF
ELEVATION AND SECTIONS

C14

SOUTH HARBOR SHORELINE REPAIR PROJECT

MOSS LANDING HARBOR DISTRICT

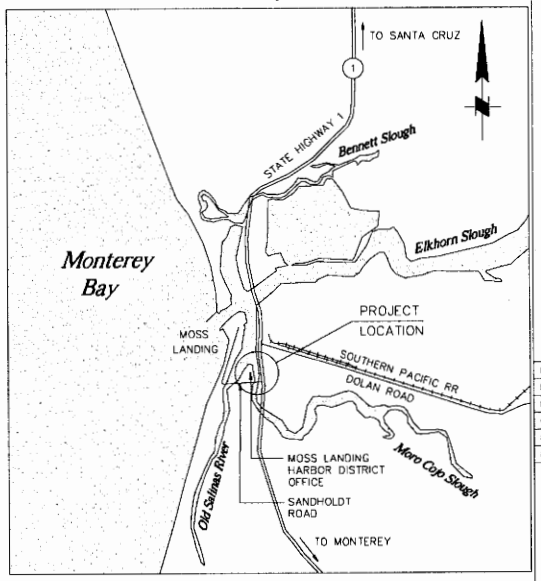
MOSS LANDING, CALIFORNIA



VICINITY MAP
NTS

LIST OF DRAWINGS

SHEET NUMBER	DRAWING NUMBER	TITLE
1	G1	TITLE SHEET, LIST OF DRAWINGS, VICINITY MAP, AND LOCATION MAP
2	G2	GENERAL NOTES, ABBREVIATIONS, LEGENDS & SYMBOLS
3	S1	GENERAL SITE PLAN
4	S2	SHORELINE EXISTING PLAN
5	S3	SHORELINE EXISTING SECTION
6	S4	SHORELINE REPAIR PLAN
7	S5	SHORELINE REPAIR SECTION



LOCATION MAP
NTS

Sea Engineering, Inc.
Santa Cruz, CA 95060
PHONE 831.421.0871
FAX 831.421.0875

NOTES:

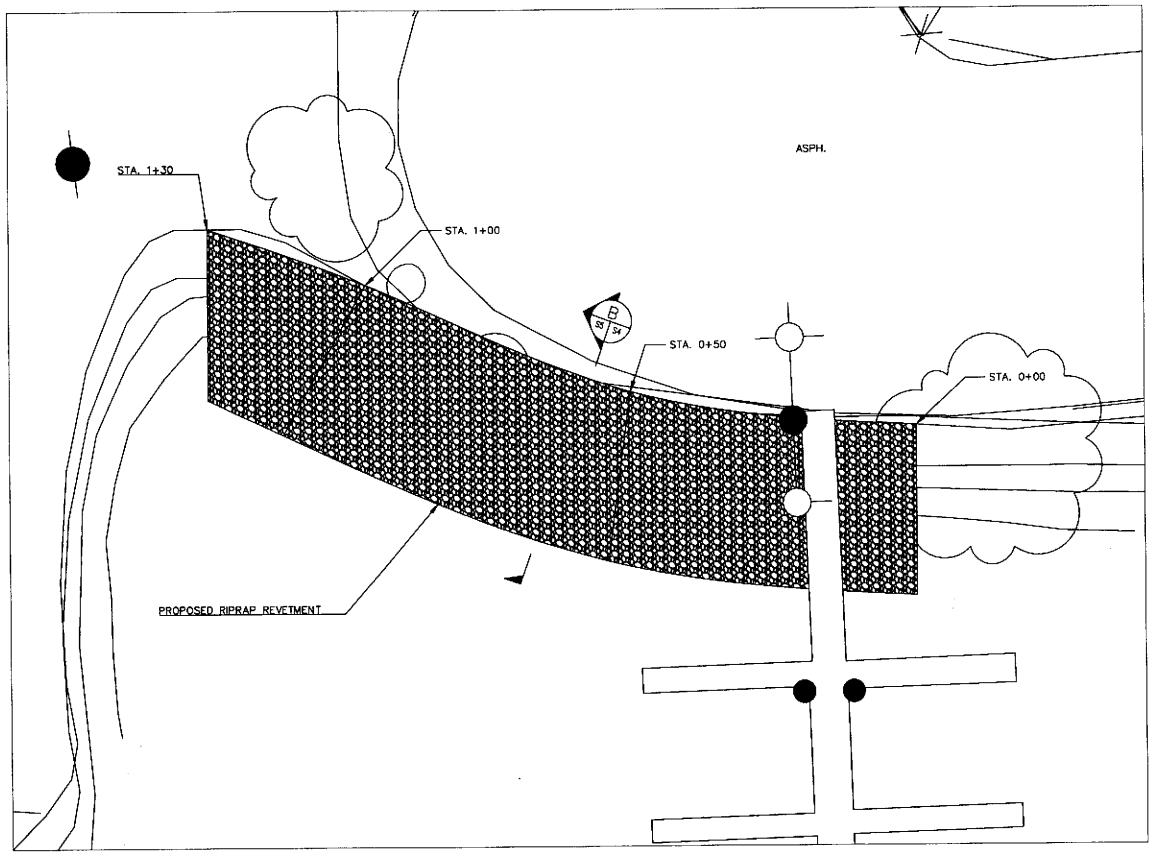
MOSS LANDING HARBOR DISTRICT
MOSS LANDING, CALIFORNIA

PROJECT NUMBER: 35015
PROJECT ENGINEER: PR
DRAWN BY: PR
CHECKED BY: KI
SCALE: VARIES
DATE: APRIL 7, 2012

SOUTH HARBOR SHORELINE REPAIR PROJECT

TITLE SHEET, LIST OF DRAWINGS, VICINITY MAP, AND LOCATION MAP

SHEET: G1
RENO: 1/7



10' 0' 5' 10'
SCALE: 1"=10'
NORTH

Sea Engineering, Inc.
Santa Cruz, CA 95060
PHONE 831.421.0871
FAX 831.421.0875

NOTES:

MOSS LANDING HARBOR DISTRICT

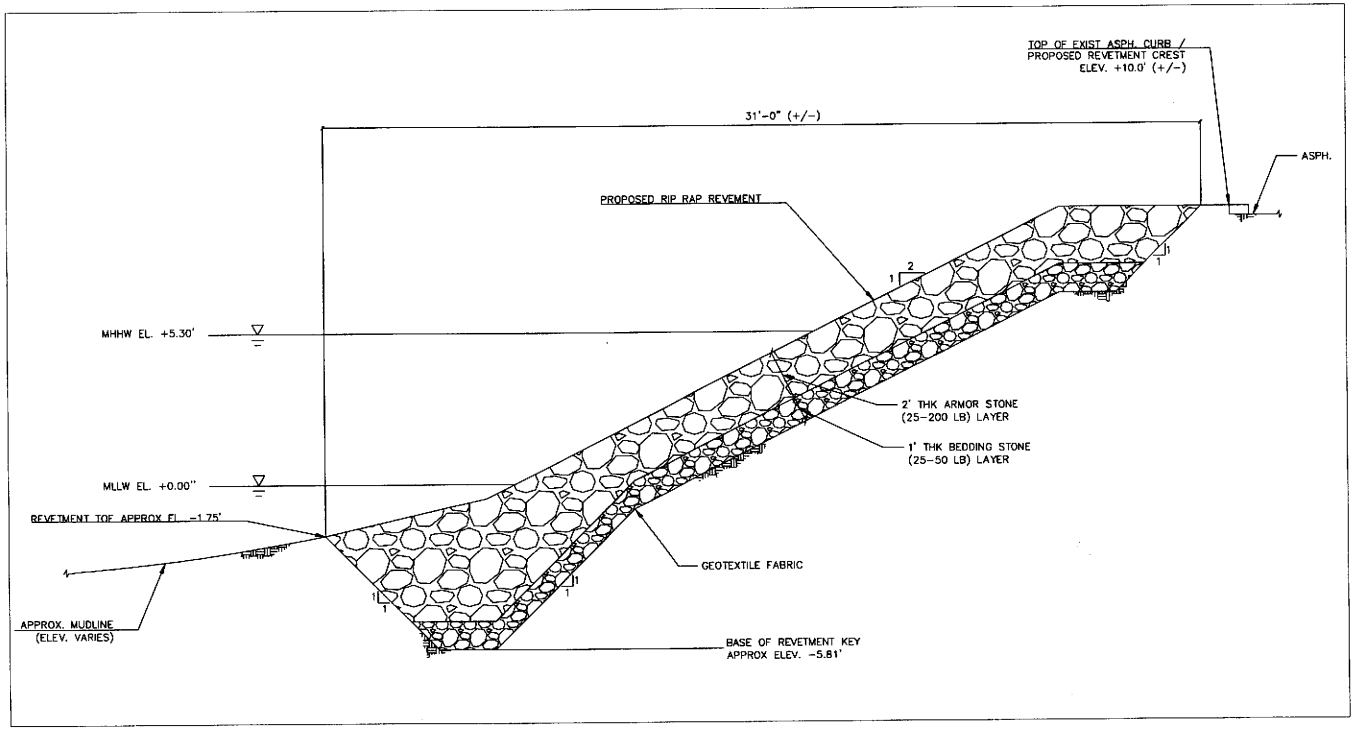
MOSS LANDING, CALIFORNIA

PROJECT NUMBER: 35015
PROJECT ENGINEER: PR
DRAWN BY: PR
CHECKED BY: KI
SCALE: VARIES
DATE: APRIL 7, 2012

SOUTH HARBOR SHORELINE REPAIR PROJECT

SHORELINE REPAIR PLAN

SHEET: S4
RING: 4/7



SECTION B (S4 | S5)

2' 0' 1' 2'

SCALE: 1/2"=1'-0"

Sea Engineering, Inc.
Santa Cruz, CA 95060
PHONE 831.421.0871
FAX 831.421.0875

NOTES:

MOSS LANDING HARBOR DISTRICT

MOSS LANDING, CALIFORNIA

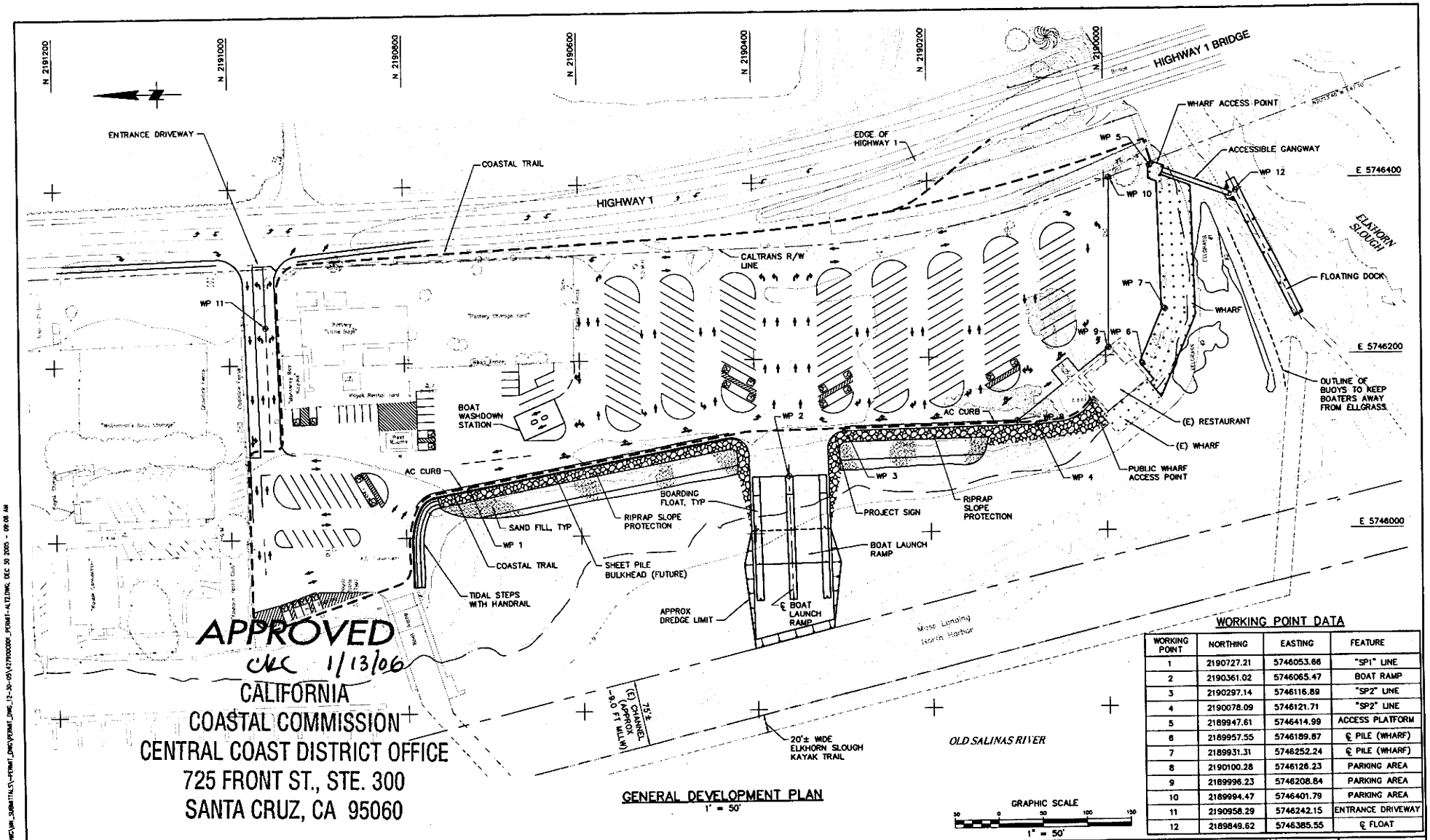
PROJECT NUMBER: 35015
PROJECT ENGINEER: PR
DRAWN BY: PR
CHECKED BY: KI
SCALE: VARIES
DATE: APRIL 7, 2012

SOUTH HARBOR SHORELINE REPAIR PROJECT

SHORELINE REPAIR SECTION

SHEET: S5

RING: 7/7



APPROVED
CKC 1/13/06
CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT ST., STE. 300
SANTA CRUZ, CA 95060

GENERAL DEVELOPMENT PLAN
1" = 50'

GRAPHIC SCALE
50 0 50 100 150
1" = 50'

WORKING POINT DATA

WORKING POINT	NORTHING	EASTING	FEATURE
1	2190727.21	5746053.66	"SP1" LINE
2	2190361.02	5746065.47	BOAT RAMP
3	2190297.14	5746116.89	"SP2" LINE
4	2190078.09	5746121.71	"SP2" LINE
5	2189947.61	5746414.99	ACCESS PLATFORM
6	2189957.55	5746189.87	℄ PILE (WHARF)
7	2189931.31	5746252.24	℄ PILE (WHARF)
8	2190100.28	5746126.23	PARKING AREA
9	2189996.23	5746208.84	PARKING AREA
10	2189994.47	5746401.79	PARKING AREA
11	2190958.29	5746242.15	ENTRANCE DRIVEWAY
12	2189849.62	5746385.55	℄ FLOAT

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

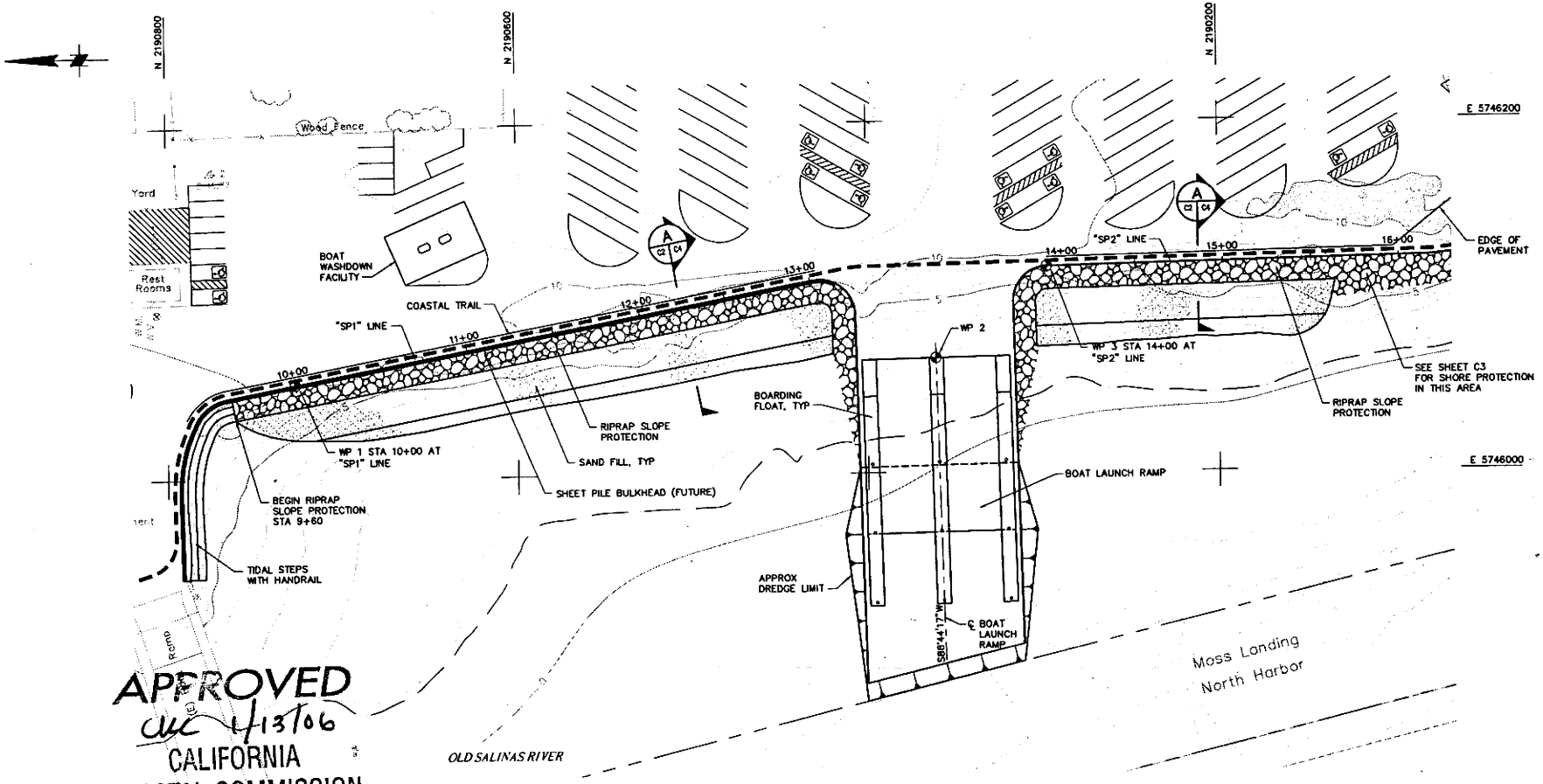
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
TEH/JFJ	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR IMPROVEMENT PROJECT
PARKING AREA, BOAT LAUNCH RAMP, SHORE PROTECTION, WHARF, AND DOCK
GENERAL DEVELOPMENT PLAN

DATE 12/30/05
SHEET OF
C1

DWG #FIG: P:\4279 MOSS LANDING\DWG\MM_SUBMITTALS\-PERMIT_DWG\PERMIT_DWG_12-30-05\4279000001_PERMIT-ALT2.DWG, DEC 30 2005 - 09:08 AM



SHORE PROTECTION PLAN
1" = 30'

APPROVED
CCC 4/13/06
CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT ST., STE. 300
SANTA CRUZ, CA 95060

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. REMOVE EXISTING CONCRETE RUBBLE, DEBRIS AND EXISTING RIPRAP ALONG THE SHORELINE. REPLACE WITH NEW RIPRAP SLOPE PROTECTION AS SHOWN.

GRAPHIC SCALE
30 0 30 60 90
1" = 30'

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

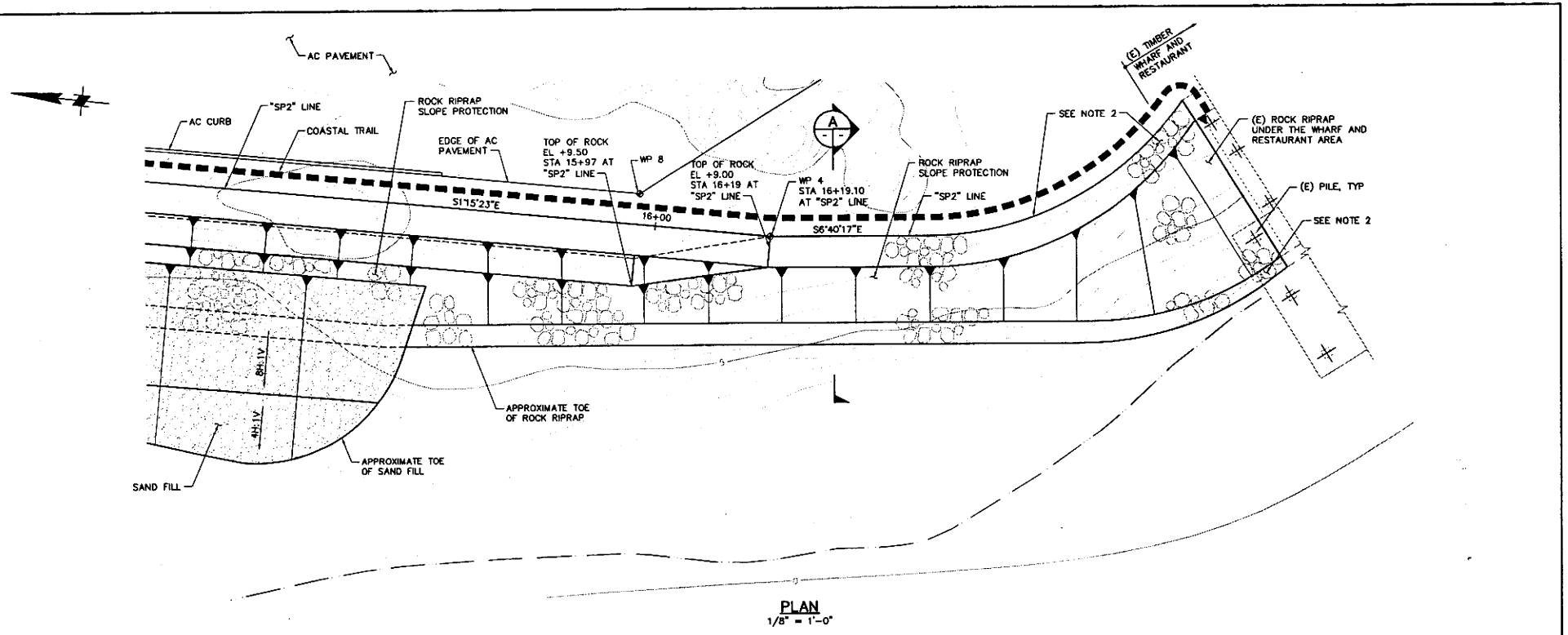
APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

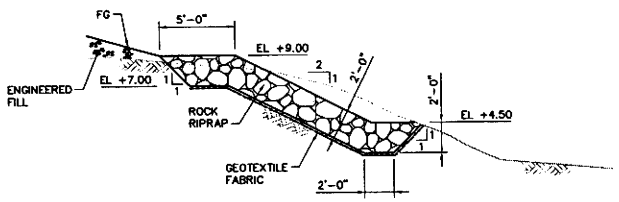
DSGN	DR	CHK
JTG/DT	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR IMPROVEMENT PROJECT
PARKING AREA, BOAT LAUNCH RAMP, SHORE PROTECTION, WHARF, AND DOCK
SHORE PROTECTION PLAN

DATE 12/30/05
SHEET OF
C2



PLAN
1/8" = 1'-0"



SECTION A
1/4" = 1'-0"

APPROVED
CLL 1/13/06
CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT ST., STE. 300
SANTA CRUZ, CA 95060

NOTES:

1. SEE SHEET C1 FOR WORKING POINT DATA.
2. MATCH THE TOP AND BOTTOM OF (E) ROCK RIPRAP AT THE (E) TIMBER WHARF AND RESTAURANT AREA. PROVIDE A UNIFORM AND SMOOTH TRANSITION OF THE NEW ROCK RIPRAP WITH THE EXISTING ROCK RIPRAP.

GRAPHIC SCALE
4 0 4 8 12 16
1/8" = 1'-0"

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

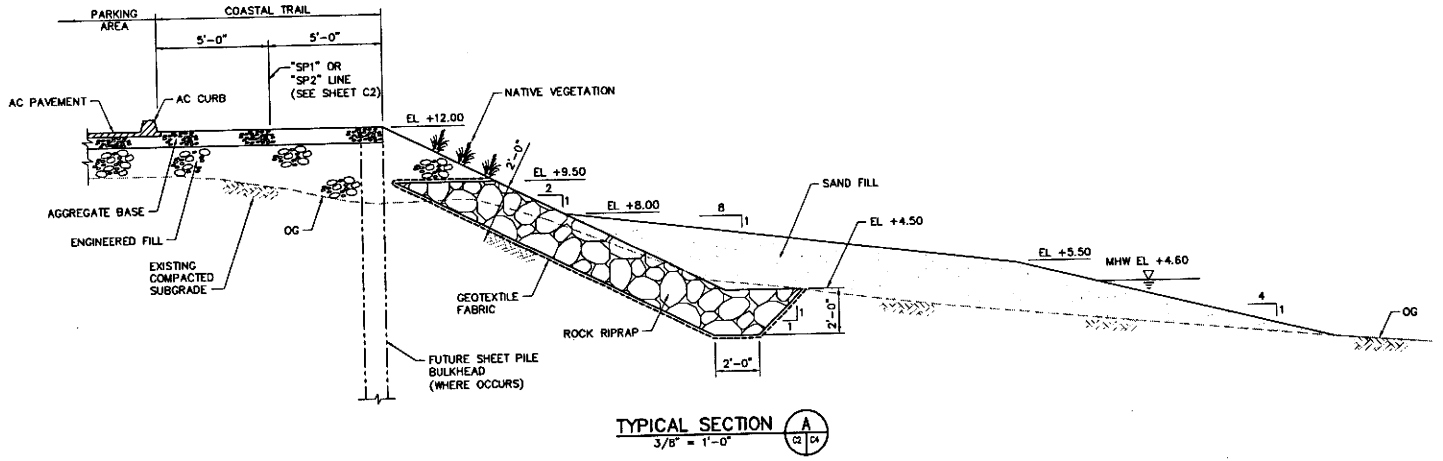
Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
JFJ	EP	JFJ
JOB NO. 4278	SUBMITTED BY BMJ	TITLE VICE PRES.

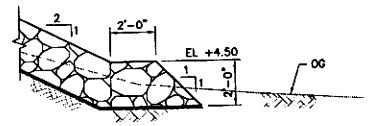
NORTH HARBOR IMPROVEMENT PROJECT
PARKING AREA, BOAT LAUNCH RAMP, SHORE PROTECTION, WHARF, AND DOCK
SHORE PROTECTION NORTH OF RESTAURANT PLAN AND SECTION

DATE 12/30/05
SHEET OF
C3

DWG INFO: P:\4278 MOSS LANDING\Civil\Working\SUBMITTALS\PERMIT_DWG\PERMIT_DWG_12-30-05\4278000003_PERMIT-ALT2.DWG, DEC 30 2005 - 02:38 PM



TYPICAL SECTION (A) C2 | C4
3/8" = 1'-0"



TOE OF RIPRAP WHERE EXISTING GRADE IS LOWER THAN EL +4.50

DETAIL (1) -|-
3/8" = 1'-0"

NOTE:

REMOVE ALL EXISTING CONCRETE RUBBLE AND DEBRIS ALONG THE SHORELINE WHERE NEW ROCK RIPRAP SHALL BE PLACED.

APPROVED
CLC 1/13/06
CALIFORNIA
COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT ST., STE. 300
SANTA CRUZ, CA 95060

REVISION	DESCRIPTION	BY	DATE

MOSS LANDING HARBOR DISTRICT
7881 Sandholdt Road
Moss Landing, CA 95039

APPROVED _____

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DESIGN	DR	CHK
JTC/DT	EP	JFJ
JOB NO. 4279	SUBMITTED BY BMJ	TITLE VICE PRES.

NORTH HARBOR IMPROVEMENT PROJECT
PARKING AREA, BOAT LAUNCH RAMP, SHORE PROTECTION, WHARF, AND DOCK

DATE 12/30/05
SHEET OF

SHORE PROTECTION
TYPICAL SECTION AND DETAILS

C4

DWG INFO: P:\4279 MOSS LANDING\DWG\AM_SUBMITTALS\~PERMIT_DWG\PERMIT_DWG_12-30-05\4279000304_PERMIT-ALT1.DWG, DEC 30 2005 - 02:48 PM