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Staff:	T. Gedik-A
Staff Report:	3/28/14
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STAFF REPORT: REGULAR CALENDAR

Application No.:	**1-13-0603**
Applicant:	**Noyo Harbor District**
Location:	Noyo Harbor Mooring Basin, 0.6 mile upstream from the mouth of the Noyo River, at the intersection of Basin Street and South Harbor Drive, adjacent to 19101 South Harbor Drive, near the City of Fort Bragg, in Mendocino County
Project Description:	Repair docks and fingers damaged by the March, 2011 tsunami.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

Commission staff recommends **approval** of CDP application 1-13-0603, as conditioned.

The Noyo Harbor Mooring Basin ("marina"), located just outside the City of Fort Bragg, provides 265 berths for permanent tenants and transient commercial, recreational, and sport fishing vessels. The marina is the only all-year harbor available between Bodega Bay and Eureka capable of supporting larger vessels.

On March 11, 2011, a tsunami generated by the 9.0-magnitude Tohoku Earthquake off the coast of Japan struck the California coast. High winds and tsunami waves caused enough damage for a

local emergency under the California Disaster Assistance Act to be declared in Mendocino County. Tsunami damage eliminated berths and end-tie fingers previously rented to 25 commercial and recreational fishing vessels. Mendocino County did not receive federal assistance, and Noyo Harbor District has been unable to pursue final project design and authorization for marina repairs until its receipt of the final insurance settlement in late 2012 and final disaster grant funding in 2013.

The proposed dock repair project includes removal of 48, 15-inch-diameter creosote-treated wood piles that will be replaced with 25 prefabricated 14-inch-square concrete piles, thereby reducing the overall piling footprint in the basin by 25 square feet. The project also includes replacing floating docks damaged by the tsunami with new pre-fabricated concrete wrapped floating docks.

The applicant proposes a number of mitigation measures such as limiting pile driving activities to the period of July 15 through September 31, when sensitive salmonids are unlikely to be present within the project area, and using Best Management Practices to avoid discharges to the waters of the marina. Although these and other measures proposed by the applicant are appropriate, additional measures are needed to avoid or minimize potential project impacts on water quality and sensitive fish species.

Staff recommends **Special Condition No. 1** requiring the applicant to submit a debris disposal plan prior to issuance of the permit to ensure that the removed marine debris, including debris that may have been previously treated with wood preservatives, shall be taken to appropriate landfills. **Special Condition No. 3** requires adherence to various construction responsibilities to minimize water quality impacts. Among other requirements, the condition requires various measures to minimize the leaching into harbor waters of contaminants from the small amount of pressure-treated wood that is proposed to be used in some of the dock repairs. **Special Condition No. 4** sets certain limitations on the pile driving and requires implementation of acoustic monitoring measures to ensure pile driving activities do not create underwater noise levels harmful to salmonids and other fish. **Special Condition No. 5** requires pre and post construction eelgrass surveys to verify that the project will not result in significant adverse impacts on eelgrass.

Staff believes that with the recommended conditions, the proposed dock repair project will avoid significant adverse impacts on the marine environment including effects on sensitive fish and wildlife species and water quality consistent with the requirements of Sections 30230, 30231, 30232, and 30233 of the Coastal Act

The motion to conditionally approve the project is found on Page 4.

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[1] National Marine Fisheries Service

I. MOTION AND RESOLUTION

The staff recommends that the Commission adopt the following resolution:

Motion:

I move that the Commission approve coastal development permit 1-13-0603 pursuant to the staff recommendation.

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

Resolution:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

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

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

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

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

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

III. SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

1. **Debris Disposal Plan**
   A. PRIOR TO ISSUANCE OF THECOASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a plan detailing the methods by which, and locations at which excavated material and other project debris will be legally disposed. The plan shall demonstrate at a minimum that:
      1) No construction materials, debris, or waste shall be placed or stored where it may be subject to entering waters of Noyo Harbor; and
      2) All construction debris, including general wastes from the excavation of existing damaged piles and dock materials shall be removed and disposed of in an upland location outside of the coastal zone or at a disposal facility authorized to accept such debris and any contaminants contained within the debris.
   B. The permittee shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

2. **Restrictions on Timing of Construction.** In accordance with the applicant's proposal:
   A. Project-related activities, including staging and storage of materials and equipment at the project site, shall only be undertaken and completed during a single construction season during the period of June 15 through September 31, 2014, or for such additional time that the Executive Director may permit for good cause and in consultation with all relevant resource protection agencies, to minimize conflicts with commercial and recreational fisheries and to protect sensitive fish species; and
   B. No pile driving activities will occur until after July 15, when the presence of sensitive salmonids within the project area will be unlikely.

3. **Construction Responsibilities.** The permittee shall comply with the following construction-related requirements:
   A. Construction activities within tidal and upland work areas shall not commence until all sediment, turbidity, and runoff control measures as appropriate have been properly installed in and around active work areas;
   B. No construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wave, wind, or rain erosion and dispersion. Construction materials shall be stored only in approved designated staging and stockpiling areas;

C. During construction, all trash shall be properly contained. Any and all debris resulting from construction activities shall be removed on a daily basis and disposed of at an appropriate location(s);

D. At the end of the construction period, the permittee shall inspect the project area and ensure that no debris, trash, or construction materials remain on land or in the water, and that the project has not created any hazard to navigation;

E. All fueling and maintenance of construction equipment except for the barge-mounted crane shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas. Mobile fueling of construction equipment and vehicles on and around the marina construction site shall be prohibited. Mechanized heavy equipment and other vehicles used during the construction process except for the barge-mounted crane shall not be stored or re-fueled within 50 feet of drainage courses and other coastal waters;

F. Fuels, lubricants, and solvents shall not be allowed to enter the coastal waters or wetlands, and all equipment used during construction shall be free of leaks at all times.

G. Hazardous materials management equipment including oil containment booms and absorbent pads shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call;

H. An on-site spill prevention and control response program, consisting of BMPs for the storage of clean-up materials, training, designation of responsible individuals, and reporting protocols to the appropriate public and emergency services agencies in the event of a spill, shall be implemented at the project site to capture and clean-up any accidental releases of oil, grease, fuels, lubricants, or other hazardous materials;

I. If a temporary erosion control product (such as mulch control netting, erosion control blanket, or mat) is used to stabilize soils until vegetation is established, only products manufactured from 100% biodegradable (not photodegradable) materials shall be used. If temporary erosion control products that have a netting component are used, the netting shall be loose-weave natural-fiber netting. Products with plastic netting, including but not limited to polypropylene, nylon, polyethylene, and polyester shall not be used. If fiber rolls (wattles) are used for wetland protection and/or temporary sediment control, the netting component of these products shall be made of loose-weave natural-fiber (not plastic) netting;

J. Preservative-treated wood used in construction of the project must meet the American Wood Protection Association's (AWPA) wood preservative standards, specifically AWPA Standard U1, the primary specification for pressure-treated wood;

K. ACZA preservative-treated wood shall be treated to the proper preservative retention standard (i.e., amount of preservative) specified by the AWPA for the appropriate AWPA Use Category. The ACZA preservative-treated wood used for the project shall not have a preservative retention exceeding the minimum specified for the

appropriate Use Category, in order to minimize the amount of preservative present in treated wood on-site that may subsequently leach into the marine environment;

L. The ACZA preservative-treated wood shall be inspected on-site to assure it is free of visible surface residues or bleeding of preservatives. If ACZA preservative-treated wood has a noticeable ammonia odor, then it has not been properly processed or aged, and the preservative may thus not be properly fixed, therefore the lumber shall not be used;

M. The ACZA preservative-treated wood shall be stored away from the water until it is needed for installation. The wood shall be stacked above the ground, and the area shall have adequate drainage to prevent the wood from being subjected to standing water. If there is a chance of precipitation, the wood shall be stored under a covered area or tarp to minimize exposure to precipitation;

N. Whenever possible, cutting or drilling of ACZA preservative-treated wood shall be performed at a site a minimum of 100 feet away from the water, to minimize transport of sawdust by wind. The resulting sawdust, drill shavings, and wood scraps shall be contained and collected, in order to prevent the discharge of preservative-treated wood to the marine environment. If it is essential that treated wood be cut or drilled in place on the dock, all sawdust, shavings, and wood scraps generated during construction must be collected and prevented from entering the water below;

O. The procedures outlined in AWPA Standard M4, Standard for the Care of Preservative-Treated Wood Products, shall be followed when applying a topical (non-pressure treated) preservative to the cut ends of treated wood. Whenever possible, application of a topical preservative to treated wood shall be performed at a site a minimum of 100 feet away from the water, equipped with containment for potential drips and spills, in order to prevent discharge of the preservative to the environment. The topical preservative shall not be applied in the rain. Any excess topical preservative shall be wiped off, and the preservative must be allowed to fully dry before the wood is used in construction. If a small amount of touch-up preservative application must be performed over water, then tarps or containers must be used to capture any potential spills or drips.

4. Pile-Driving Limitations.

A. All pile-driving activities shall be performed in full accordance with the following pile-driving requirements:

1) Pile-driving of all piles shall occur only during the period of July 16 through September 31, pursuant to Special Condition No. 2 above;

2) The piles to be installed shall consist only of 14-inch-square concrete piles;

3) The concrete piles shall be installed using a small diesel impact hammer as proposed;

4) A bubble curtain surrounding the new piles shall be employed during all pile driving to attenuate the underwater sound pressure level (SEL) produced by the pile driving;

5) Hydroacoustic monitoring shall be performed consistent with the methods detailed in the underwater acoustic monitoring plan titled, "Noyo Harbor Mooring Basin Dock Replacement & Modification Project Underwater Acoustic Monitoring Plan," dated January 2014, and prepared by Illingworth & Rodkin, Inc.;

6) To protect fish from the acoustic impacts of pile-driving, peak sound pressure levels within Noyo Harbor Mooring Basin shall not exceed 206 dB and accumulated SEL shall not exceed 187 dB;

7) Hydroacoustic monitoring shall be conducted initially for at least five of the 25 piles to be driven with an impact hammer. The five piles to be initially monitored shall be piles that are driven into water depths that are representative of the water depths into which all 25 piles will be driven. In the event that the monitoring results from the driving any of the five piles to be initially monitored indicate that sound pressure levels equal or exceed either criterion of the dual metric exposure criteria (206 dB peak or accumulated SEL level of 187 dB μPa^2-sec), hydroacoustic monitoring of all pile driving operations shall occur;

8) Monitoring results from daily pile driving activities shall be reported to the Executive Director within 24 hours after monitoring concludes for the day. In addition, a final report that includes data collected and summarized for all monitoring locations shall be submitted to the Executive Director within 90 days of completion of the hydroacoustic monitoring;

9) In the event of an exceedance of either criterion of the dual metric exposure criteria, pile-driving operations shall be immediately stopped and shall not recommence unless the Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Wildlife and the National Marine Fisheries Service so authorizes based on the resumption of hydroacoustic monitoring of all pile driving operations and the deployment of additional sound attenuation or other measures deemed likely by qualified technical experts to return the pile-driving to conformance with the dual metric exposure criteria;

10) If the return to pile-driving after the implementation of the additional measures discussed in Subparagraph (9) above results in an exceedance of either criterion of the dual metric exposure criteria, pile-driving shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to CDP 1-13-0603 that proposes substantial changes to the proposed project that are deemed by the Executive Director to offer a high likelihood of success in preventing further exceedance of the dual metric exposure criteria.

B. Pile-driving shall be conducted at all times in accordance with these provisions. Any proposed changes to these pile-driving requirements and limitations shall be reported to the Executive Director. No changes to the requirements of the special condition shall be made without a Coastal Commission approved amendment of CDP 1-13-0603 unless the Executive Director determines that no amendment is legally required.

5. **Eelgrass Survey and Monitoring Requirements.** In accordance with the applicant's eelgrass monitoring and mitigation plan titled, "Eelgrass Monitoring Plan, Noyo Harbor Mooring Basin Tsunami Repair Project, Fort Bragg, California," dated February 2014, and prepared by Pacific Watershed Associates:

   A. A pre-construction eelgrass survey shall be conducted and completed during the active growing season for eelgrass (May-September) and prior to the beginning of construction for all intertidal and shallow subtidal areas of the mooring basin within 50 meters of the project location and shall be valid for 60 days. The survey shall be in substantial conformance with survey recommendations in Appendix B, "Recommendations Concerning Surveys for Assessing Impacts to Eelgrass," of the Draft California Eelgrass Mitigation Policy prepared by the National Marine Fisheries Service (NMFS), Southwest Region dated December 7, 2011 (published in the Federal Register March 9, 2012). Survey results shall be submitted for the review and approval of the Executive Director.

   B. Direct and indirect impacts to eelgrass plants shall be avoided to the maximum extent feasible.

   C. A post-construction eelgrass survey shall be completed within the first 30 days of completion of construction. The survey shall be in substantial conformance with survey recommendations in Appendix B, "Recommendations Concerning Surveys for Assessing Impacts to Eelgrass," of the Draft California Eelgrass Mitigation Policy prepared by NMFS, Southwest Region dated December 7, 2011. Survey results shall be submitted for the review and approval of the Executive Director.

   D. Density and extent of vegetative cover shall be estimated during pre-construction surveys and post-construction surveys at control areas described in the February 2014 PWA report. Changes in density and extent of vegetated cover of the surveyed control areas shall be used to account for natural variability of eelgrass growth in interpreting site survey results.

   E. The post-construction survey shall document any adverse impacts to eelgrass plants. Adverse impacts to eelgrass shall be measured as the difference between the pre-construction and post-construction estimates of eelgrass cover and density within and adjacent to the remediation areas.

   F. If post-construction survey results demonstrate to the satisfaction of the Executive Director that eelgrass densities have not decreased and there has been no loss of extent of vegetated cover, then no further monitoring or mitigation is required.

   G. If post-construction survey results indicate any decrease in eelgrass density or cover in eelgrass beds or patches within and adjacent to the remediation areas, then an extended eelgrass mitigation and monitoring plan shall be prepared and submitted as an application for an amendment to CDP 1-13-0603. The mitigation methods, the location of the mitigation sites, and the monitoring plan shall be in substantial conformance with the recommendations in Appendix D, "Recommended Measures for Eelgrass Impact Mitigation," of the Draft California Eelgrass Mitigation Policy prepared by NMFS, Southwest Region dated December 7, 2011 and shall provide for the following:

1) The plans shall provide for an initial transplant area to impact area ratio of 4.82:1.

2) Within three years of completion of transplanting, the eelgrass mitigation site shall have a minimum of 40% of the coverage of eelgrass and 20% of the density of the control site over an area not less than 1.2 times the area of impact.

3) The plan shall provide for mitigation site identification, planting methods, monitoring methods, and schedule. Specific success and monitoring criteria are as follows:

   a. A minimum of 40% of the coverage of eelgrass and 20% of the density of the control site over an area not less than 1.2 times the area of impact in the first year;

   b. A minimum of 85% of the coverage of eelgrass and 70% of the density of the control site over an area not less than 1.2 times the area of impact in the second year;

   c. A minimum 100% of the coverage of eelgrass and 85% of the density of the control site over an area not less than 1.2 times the area of impact in years three through five.

4) Monitoring methods shall include mapping and random sampling of the eelgrass areas using a sampling size adequate to obtain representative data for the entire mitigation area and control area determine bed size, percent cover, and shoot density.

5) A detailed monitoring schedule shall be provided that indicates when each of the required monitoring events will be completed. Monitoring reports shall be provided to the Executive Director, DFG, and NMFS by December 31 of the year in which they are conducted;

6) If the impacted eelgrass areas have not met the recovery standard in subsection (c) in five years, the permittee shall submit an application for an amendment to coastal development permit 1-13-0603 proposing additional mitigation to ensure all performance criteria are satisfied consistent with all terms and conditions of this permit.

H. Eelgrass surveying and monitoring shall be conducted at all times in accordance with these provisions. Any proposed changes to these surveying and monitoring requirements shall be reported to the Executive Director. No changes to the requirements of the special conditions shall be made without a Commission approved amendment of CDP 1-13-0603, unless the Executive Director determines that no amendment is legally required.

6. Army Corps of Engineers Approval. PRIOR TO COMMENCEMENT OF CONSTRUCTION, the permittee shall provide to the Executive Director a copy of a permit issued by U.S. Army Corps of Engineers, a letter of permission, or evidence that no permit or permission is required. The applicant shall inform the Executive Director of any changes to the project required by the U.S. Army Corps of Engineers. Such changes shall not be incorporated into the project until the applicant obtains a Commission

amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

7. **Lake or Streambed Alteration Agreement.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall provide to the Executive Director a copy of the Lake or Streambed Alteration Agreement issued by CA Department of Fish and Wildlife, or evidence that no agreement is required. The applicant shall inform the Executive Director of any changes to the project required by CA Department of Fish and Wildlife. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.
8. **Assumption of Risk, Waiver of Liability and Indemnity.** By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards from erosion, earth movement, waves, storm waves, tsunamis, and sea level rise; (ii) to assume the risks to employees and assigns of Noyo Harbor District, including contractors and subcontractors and their officers, agents, and employees, and to the public utilizing the proposed project during and after construction, and to the property that is the subject of this permit of injury and/or 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.
9. **Construction Staging and Loading Areas.** The permittee shall ensure that all construction staging and equipment and material loading and unloading activities occur within the areas depicted for such activities on the SWPCP Location Map dated January 29, 2014 included in Exhibit 3. No changes to the approved staging and loading/unloading areas shall occur without an amendment to the coastal development permit, unless the Executive Director determines that no amendment is legally required.

IV. FINDINGS AND DECLARATIONS

The Commission hereby finds and declares as follows:

A. BACKGROUND AND PROJECT DESCRIPTION

The Noyo Harbor Mooring Basin ("marina") is a publicly-owned marina located just outside the City of Fort Bragg, and provides 265 berthing accommodations to permanent tenants and to transient commercial, recreational, and sport fishing vessels. The Noyo Harbor Mooring Basin is the only all-year harbor available between Bodega Bay and Eureka capable of supporting larger vessels. The Noyo marina consists of a main pier and eight full service permanent docks alphabetically labeled "A" through "H" adjacent to Basin Street, beginning with Dock A downriver and continuing inland (upriver) to Dock H. The Noyo Harbor District ("District") proposes to repair boat docking facilities within the marina that were damaged in the March 11,

2011 tsunami event by removing all pilings, docks, and fingers (attached berthing slips), and replacing the damaged components with new pilings, docks and fingers.

On March 11, 2011, a tsunami generated by the 9.0-magnitude Tohoku Earthquake off the coast of Japan struck the California coast. High winds and tsunami waves caused enough damage for a local emergency to be declared in Mendocino County under the California Disaster Assistance Act. In its request for the declaration in Resolution No. 11-033 the Board of Supervisors of Mendocino County indicated that "When the tsunami struck the Mendocino County coastline, it drained a reported four feet of water out of the Noyo Harbor before causing the water to surge back into the Harbor with destructive force…Noyo Harbor suffered substantial damage, which includes the destruction of approximately 1,000 feet of docks, destroyed pilings, and a lost pump-out station." The District has indicated that tsunami waves entering the harbor fanned out as they moved into the harbor, impacting Docks B and C the worst **(Exhibit 4)**. The float at Dock C was ripped apart and six finger piers were lost. The end tie at Dock B was torn in two and three finger piers were lost. Several guide piles and mooring piles were also ripped from the harbor floor. Tsunami damage eliminated berths and end-tie fingers previously rented to 25 commercial and recreational fishing vessels. Video footage documenting the tsunami surges at Noyo Harbor has been provided by the local Mendocino Coast Television website at www.mendocoasttv.org/FirstTsunamiSurgehitsNoyoHarborMarch112011.html#featured.

Mendocino County did not receive federal emergency assistance for repairs of tsunami damage. However, the District negotiated a settlement with its private insurance carrier and received some disaster grant assistance from California Office of Emergency Services (CalOES) to cover the repairs. The District was unable to pursue final project design and seek permit authorization for the necessary repairs to the marina until its receipt of the final insurance settlement and disaster grant funding, which occurred in 2013.

The District proposes to remove existing treated wooden piles, treated wood decking, and exposed foam floatation damaged by the tsunami. The District will replace the damaged components with new piles and approximately 1,506 linear feet of docks and fingers covering 7,316 square feet. The proposed new construction will use pre-fabricated concrete piles, pre-fabricated concrete decking, and concrete wrapped flotation structures. The concrete docks will also be equipped with AZCA (ammoniacal copper zinc arsenate)-treated timber walers (structural beams mounted flush to the deck of the dock) as part of the load distribution system. The applicants have provided pre—and post-construction schematics depicting the location of the dock repairs (**Exhibit 3**). All new piles, docks and fingers will replace (with the exception of C-Dock) the damaged components that have undergone temporary repairs. Approximately 1/3 of the C-Dock was damaged too severely to accommodate temporary repairs following the tsunami damage and will be replaced to its pre-tsunami configuration. The reconstructed C-dock will be 6 feet wide and 311 feet long with fingers that are approximately 40, 45, and 50 feet long. The project will restore the mooring basin to its 265 vessel capacity and mix of berth sizes that existed prior to the tsunami. The expected lifespan of the new concrete dock and float system is 40-50 years depending on usage and maintenance. The concrete piles have an anticipated lifespan of at least 50-years.

The project includes removal of 48, 15-inch-diameter creosote-treated wood piles using a vibratory hammer to enable sediment to slowly slough off at or near the mud line. The treated

wood piles will be replaced with 25 prefabricated 14-inch-square concrete piles, thereby reducing the overall piling footprint in the basin by 25 square feet. Pile driving and extraction will be conducted from a barge mounted crane and diesel impact hammer. Silt curtains surrounding the old piles will be employed during extraction to minimize the extent of turbid water. New piles will be installed using a small diesel impact hammer. Hydroacoustic noise levels will be monitored during pile driving and the pile driving will be managed to ensure that pile driving noise levels do not adversely affect threatened salmonid species or other fish. A bubble curtain surrounding the new piles will be employed during all pile driving in order to attenuate the underwater sound pressure level (SPL) produced during pile driving. Pile extraction and installation is further detailed in **Finding F** below.

Extracted piles, docks and fingers will be temporarily staged prior to re-use or disposal. The staging area will occupy 18-20 boat/trailer parking spots within the existing marina asphalt parking lot. Tarps, wattles, and sand bags will be installed to contain runoff and potential sediment or leachate from pilings and floats from reaching the water. A separate truck loading/unloading area adjacent to the east side of the marina will occupy 2-3 parking spaces. The applicant also proposes a variety of best management practices to minimize impacts to water quality. The District also plans to replace the waste pump-out stanchion that was eliminated during the tsunami. The new pump-out stanchion will be included in the repair of the B-Dock L-head. The stanchion will connect to a new mechanical waste pump located on shore that connects to the City sewer system. The replacement system will not increase the current capacity and will tie into existing electrical and plumbing terminals.

The applicant proposes to conduct a pre-construction eelgrass survey and a post-construction survey for all areas within 50 meters of the project location, consistent with the methodology provided in their submitted pre-and post eelgrass monitoring plan to verify that the development does not adversely affect eelgrass habitat (**Exhibit 8**). The applicant proposes to conduct all other project activities between June 15 and September 31, 2014, commencing with on-water mobilization and removal of damaged pilings and docks from June 15 onward. Noyo Harbor District has modified their project at the request of National Marine Fisheries Service (NMFS) to propose that no pile driving activities will occur until after July 15, when the presence of sensitive salmonids within the project area will be unlikely.

B. ENVIRONMENTAL SETTING

The Noyo Harbor District was formed in 1950 as a port district pursuant to section 6231 of the Harbors and Navigation Code. As described in a January 2014 Municipal Service Review (MSR) report prepared for the Mendocino LAFCO (Appendix A), the District "provides harbor-related services to residents and visitors of the District and owns and operates select parcels and facilities in Noyo Harbor." The Noyo Harbor Mooring Basin ("marina") is located approximately four tenths of a mile from the intersection of Highway One and Highway 20 in Mendocino County (**Exhibit 1**). The marina is within Noyo Harbor, in an off-channel area excavated and periodically dredged, and located within six tenths of a mile of the mouth of the Noyo River (**Exhibit 2**).

The Noyo Harbor Mooring Basin is a publicly-owned marina located just outside the City of Fort Bragg, and is situated on approximately 10 acres that provides berthing accommodations to permanent tenants and to transient commercial, recreational, and sport fishing vessels. The Noyo

Harbor Mooring Basin is the only all-year harbor available between Bodega Bay and Eureka capable of supporting larger vessels.

The marina is separated from the Noyo River channel by an approximately 1,160-foot-long and 12-foot-deep wooden debris wall that extends the length of the mooring basin, with an entrance and exit connection to the river channel at the downstream end. The debris wall helps prevent sediments carried by the river from settling within the marina. The District has indicated that it may evaluate repairing damaged portions of the debris wall in the reasonably foreseeable future, following completion of repairs to the marina. Future repairs to the debris wall may also include design enhancements such as a hydrostatic surge vent at the north end of the debris wall to help reduce damage created by tsunami wave surges.

The marina receives tidal influence and functions as a fully saltwater section of the Noyo River estuary during the low flow summer season**.** According to soil boring data presented in a May 2, 2013 geotechnical investigation report prepared by SHN (Appendix A), water depth at low tide ranges between 11 and 16 feet within the vicinity of the docks that will be repaired in the marina. The water depths are maintained by periodic dredging, which last occurred in 2010 and is anticipated to occur again in 2015. In a March 5, 2014 consultation determination letter (**Exhibit 5**), National Marine Fisheries Service (NMFS) characterizes the biotic environment of the marina and surrounding Noyo River estuary in part as follows:

> …*The action area is within designated critical habitat for the* [Central California Coast-CCC] *steelhead* [Distinct Population Segment], [California Coast] *Chinook Salmon* [Evolutionarily Significant Unit- ESU], *and the CCC coho salmon ESU. Different life history stages of these species are known to seasonally migrate through lower estuarine sections of their natal streams such as the Noyo River on a seasonal basis. Adult coho and Chinook salmon may be in the Noyo River estuary as early as October, awaiting fall rains to begin their upstream spawning migrations which can continue into early January. Adult steelhead can be expected to be transiting through the estuary on spawning migrations from November through April. Coho salmon juveniles can be expected to be outmigrating through lower estuarine saltwater areas from early April to early July, Chinook from early April to mid-July…and steelhead juveniles from January to early June…*

C. Other Agency Approvals

U.S. Army Corps of Engineers

The Corps has regulatory authority over the proposed project under Section 10 of the Rivers and Harbors Act (RHA) of 1899 (*33 U.S.C. 1344*) and Section 404 of the Clean Water Act (CWA). Section 10 of the RHA regulates the diking, filling, and placement of structures in navigable waterways. Section 404 of the CWA regulates fill or discharge of materials into waters and ocean waters. Under the Endangered Species Act of 1973, as amended (U.S.C. Sec 1531 et seq.), the Corps of Engineers initiated an informal Section 7 Consultation (Corps File No. 2013-00291N) and sent a letter to the National Marine Fisheries Service (NMFS) on August 8, 2013 requesting their concurrence that the proposed project is not likely to adversely affect listed species. Final action from the Corps is forthcoming, following receipt of a March 5, 2014 determination letter from NMFS concurring that the proposed project is not likely to adversely affect essential physical or biological features associated with sensitive salmonid resources and

essential fish habitat. Therefore, to ensure that the applicant has the necessary authorization from the Corps of Engineers to undertake the project, the Commission attaches Special Condition No. 6, which requires that the applicant provide a copy of all necessary permits from the Corps of Engineers for such development prior to the commencement of construction.

California State Lands Commission
The State Lands Commission (SLC) has retained authority over former sovereign lands through both exempted and reserved rights to all deposits of minerals, and its public trust responsibilities under the state Constitution. Noyo Harbor District indicates that the SLC indicated via telephone that because no sediment is being removed from the project area, no permit or lease is required. In a letter dated August 12, 2013, the State Lands Commission indicated that "The subject parcel within the Basin is located landward of the Noyo River historic bed within lands the State did not acquire or patent and are Federal lands patented by the United States as a cash entry patent, Serial No. 1274, dated November 10, 1870. Therefore, a lease is not required for the project."

California Department of Fish and Wildlife
The California Department of Fish and Wildlife (CDFW) has jurisdiction over all "waters of the state," including any lakes, streams, or rivers containing fish or wildlife resources. CDFW additionally is a Trustee agency responsible for protecting coastal biological resources and regulating aquaculture activities in coastal areas. Noyo Harbor District has submitted a "Notification of Lake or Streambed Alteration" (LSAA) to CDFW, and anticipates receipt of the necessary LSAA agreement in the near future. Therefore, to ensure that the applicant obtains the necessary agreement from CDFW, the Commission attaches Special Condition No. 7 which requires that the applicant provide a copy of the necessary agreement from CDFW for the development prior to issuance of the coastal development permit.

North Coast Regional Water Quality Control Board
On January 21, 2014, the RWQCB issued its Water Quality Certification Order (File No. WDID 1B13102WNME) pursuant to Section 401 of the federal Clean Water Act. As part of its certification, the RWQCB indicates that the discharge associated with pile removals is also regulated under State Water Board Order 2003-0017-DWQ, *General Waste Discharge Requirements for Dredge and fill Discharges that have Received State Water Quality Certification,* which requires compliance with all the conditions of the water quality certification.

D. JURISDICTION AND STANDARD OF REVIEW

The site of the proposed project is within and adjacent to the semi-confined waters of the Noyo Harbor Mooring Basin, an off-channel area excavated and periodically dredged adjacent to the Noyo River channel, and located within six tenths of a mile of the mouth of the Noyo River entrance to the Pacific Ocean. The project is located in areas subject to the public trust within the Coastal Commission's area of original or retained jurisdiction. Therefore, the standard of review that the Commission must apply to the development is the Chapter 3 policies of the Coastal Act.

E. DOCK REPAIR AND 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):

> *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:…*
>
> *(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 replacement of the damaged docks within the Noyo Harbor Mooring Basin constitutes a repair and maintenance project because the repairs do not involve an addition to or enlargement of the subject docks. A limited number of piles and associated dock floats will be replaced, but no additional piles or associated materials will be added to the docks. The 48, 15-inch-diameter treated wood piles will be replaced with 25 prefabricated 14-inch-square concrete piles, thereby reducing the overall piling footprint in the basin by 25 square feet. The replacement piles and dock floats will encroach no further into harbor waters than the piles they will replace.

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

construction materials and removal and placement of solid materials within 20 feet of coastal waters with the use of a barge, crane, pile drive, and other mechanized equipment and construction materials. The proposed repair project therefore requires a coastal development permit under 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 with the Coastal Act of the underlying existing development.

The repair and maintenance of pilings and other dock facilities in coastal waters, such as is proposed under the subject CDP application, can have adverse impacts on coastal resources, such as on sensitive fish species, eelgrass habitat, and coastal water quality. The applicant has included a number of mitigation measures as part of its proposal, as discussed above, such as limiting pile driving activities to the period of July 15 through September 31 , when the presence of sensitive salmonids within the project area will be unlikely, monitoring eelgrass to ensure that project impacts on eelgrass are avoided or fully mitigated, and using standard appropriate Best Management Practices (BMPs) to avoid discharges to the waters of the marina. Although these and other measures proposed by the applicant are appropriate, additional measures are needed to avoid or minimize potential project impacts on water quality and sensitive fish species. The conditions required to meet these standards are discussed in the following findings relevant to water quality and marine resources. Therefore, as conditioned, the Commission finds that the proposed dock repairs are consistent with all applicable Chapter 3 policies of the Coastal Act.

F. PROTECTION OF COASTAL WATERS

Section 30230 of the Coastal Act states the following:

> *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. [Emphasis added.]*

Section 30231of the Coastal Act states the following (emphasis added):

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer*

> *areas that protect riparian habitats, and minimizing alteration of natural streams. [Emphasis added.]*

Section 30232 of the Coastal Act states the following:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containments and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

Section 30233 of the Coastal Act states, in applicable part:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> *(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
>
> …
>
> *(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary…[Emphasis added.]*

The proposed replacement of piles within the Noyo Harbor Mooring Basin and the replacement of damaged docks and fingers involve the placement of pile fill within coastal waters. The above policies set forth a number of different limitations on what development projects may be allowed in coastal wetlands and waters. As discussed in **Finding E** above, the Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity with the Coastal Act of the underlying existing development. However, the Commission must review whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. For analysis purposes, the applicable parts of the above listed policies require that development involving the filling of coastal waters shall only be permitted where feasible mitigation measures have been provided to minimize adverse environmental impacts. The proposed development would be located within and around coastal waters and wetlands. Depending on the manner in which the proposed filling is conducted, the significant adverse impacts of the project may include: (1) effects on sensitive fish and wildlife species; and (2) water quality impacts from the placement of materials in and/or undertaking construction involving the use of hazardous materials in close proximity to coastal waters.

Acoustic Impacts from Pile Driving on Fish

The Noyo Harbor Mooring Basin and other portions of the Noyo River estuary support threatened and endangered anadromous salmon species as well as a large variety of other fish species. The development will require the driving with an impact hammer of 25, 46-foot-long piles approximately 20 feet into the existing mud bottom to secure the replacement docks and fingers. Pile-driving with an impact hammer generates hydroacoustic pressure impulses and particle velocities that can cause effects on fish ranging from altered behavior, hearing loss, and

tissue injuries to immediate mortality. In recent years, fish kills from pile driving have been noted on both coasts and have resulted in unforeseen impacts to sensitive fishery resources. According to a report entitled "Effects of Sound on Fish," (Hastings & Popper, Caltrans, January 28, 2005), the degree of damage to fish is not related directly to the distance of the fish from the pile, but to the received level and duration of the sound exposure.

As part of a programmatic effort to bring together top scientists in the field, review existing research on "barotrauma" and other pressure-related effects, develop noise thresholds for injury to fish, and conduct additional research to increase understanding of impacts, California Department of Transportation ("CalTrans") is working in conjunction with Washington and Oregon State Transportation agencies, the Federal Highway Administration, the U.S. Army Corps of Engineers, NOAA Fisheries, the U.S. Fish and Wildlife Service, and CDFG. This effort has included establishment of a "Fisheries Hydroacoustic Working Group." The working group has established interim standards that have been utilized by resource agencies including CA Department of Fish and Wildlife, the National Marine Fisheries Service, and the Coastal Commission to protect fish from pile driving impacts. These standards indicate the sound exposure levels at which fish are likely to receive lethal physical injury, and pile driving activities are usually prohibited from reaching or exceeding these standards. Acoustic monitoring devices can be utilized to determine whether pile driving activities are approaching these sound exposure levels. The standards include a level at which a single hammer strike would cause lethal injury as well as a standard for accumulated exposure to multiply hammer strikes over the course of one day. The standards are as follows:

DUAL METRIC EXPOSURE CRITERIA

1) Criteria: SEL-accumulated:
A fish receiving an accumulated Sound Exposure Level (SEL) at or above 187 dB re one micropascal squared-second during the driving of piles shall be deemed to have received a lethal physical injury. To estimate the sound energy to which a fish is exposed during multiple hammer strikes, the simple summation procedure is used where Total SEL = Single Strike SEL + 10log (number of strikes).

2) Criteria: Peak SPL:
A fish receiving a peak sound pressure level (SPL) at or above 206 dB re one micropascal from a single hammer strike shall be deemed to have received a lethal physical injury.

To avoid impacts to various sensitive fish and wildlife species, the applicant proposes that pile driving activities will only occur during the period of July 15 through September 31, when the presence of sensitive salmonids within the project area will be unlikely. Additionally, the applicant has submitted a Pile Driving Underwater Noise Analysis dated July 3, 2013 (**Exhibit 6**), and an Underwater Acoustic Monitoring Plan dated January 2014 (**Exhibit 7**), both prepared by Illingworth & Rodkin, Inc. The applicant proposes to implement noise level thresholds developed by NMFS as outlined in the Illingworth and Rodkin Memo dated July 3, 2013, and to incorporate certain pile driving measures to reduce the acoustic impacts from pile driving on fish. First, the piles to be utilized are concrete piles. Driving concrete piles tends to produce less acoustic impact than driving metal or other kinds of piles. Second, a bubble curtain surrounding the new piles will be employed during all pile driving activities. Third, cumulative noise

reduction protocols will be implemented if a daily sound threshold limit is reached. The contractor will curtail activity if a daily limit is reached.

The applicant proposes to utilize acoustic monitoring to determine whether the pile driving activities will exceed the recommended maximum sound exposure levels to avoid lethal injury to fish. As described in the January 2014 Illingworth and Rodkin Underwater Acoustic Monitoring Plan (**Exhibit 7**), hydroacoustic monitoring will be conducted for at least ten percent of piles (5 piles out of 25) struck with an impact hammer. Piles chosen to be monitored will be driven in water depths that are representative of typical water depths at the project location where the piles will be driven, and will be determined prior to construction once the pile driving sequence has been established. The hydroacoustic monitoring will include monitoring of: (a) underwater background noise levels for a minimum of 24 hours prior to beginning of construction; (b) airborne noise levels at one fixed location onshore; and (c) mid-water depth noise levels at two distances (at approximately 10 meters, and between 45 and 150 meters) from each pile being monitored. The January 2014 monitoring plan proposes to continuously monitor the entire duration of pile driving for each pile being monitored, and to notify the Noyo Harbor District representative and suspend pile driving if either of the dual criteria (single strike peak or accumulated SEL) are exceeded, until such time that the two sound threshold levels are reduced sufficiently that pile driving activities may recommence.

To ensure that the proposed pile-driving activity will not exceed sound exposure levels that will cause lethal injury to salmon and other fish species, the Commission attaches **Special Condition No. 4** which requires implementation of the acoustic impact mitigation and monitoring measures proposed by the applicant. Additionally, **Special Condition No. 4** requires initial hydroacoustic monitoring of at least five of the 25 piles to be driven, and requirements to monitor all pile driving if sound exposure levels are met or exceeded. In the event that sound exposure levels are exceeded, **Special Condition No. 4** further requires that: (a) all pile-driving operations shall immediately stop and not recommence unless the Executive Director, in consultation with the fisheries biologists of the California Department of Fish & Wildlife and the National Marine Fisheries Service so authorizes based on the resumption of hydroacoustic monitoring of all pile driving operations and the deployment of additional sound attenuation or other measures deemed likely by qualified technical experts to return the pile-driving to conformance with the dual metric exposure criteria, and (b) if exceedance of sound exposure levels continue after deployment of additional sound attention measures, pile-driving shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to CDP 1-13-0603 that proposes substantial changes to the proposed project that prevent further exceedance of the dual metric exposure criteria.

On March 5, 2014, the National Marine Fisheries Service ("NMFS" or "NOAA Fisheries") issued a concurrence letter (**Exhibit 5**) for the associated Corps FCWA Section 404 permit for tsunami repairs at the Noyo Harbor Mooring Basin. The concurrence letter outlined that project's potential effects on marine species listed under the federal Endangered Species Act (ESA) and "Essential Fish Habitat" (EFH) under the Magnuson-Stevens Fishery and Conservation Act, and acknowledged a previous Letter of Concurrence submitted in 2010 associated with the Noyo Harbor District Mooring Basin dredging. The 2014 consultation letter addressed the Corps analysis of potential impacts to various threatened and endangered species, including Central California Coast (CCC) coho salmon (*Oncorhynchus kisutch*), Central California Coast steelhead

(*O. mykiss*), California Coast Chinook salmon (*O. tshawytscha*), Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), and EFH for salmon and fishery species. In its March 5, 2014 Concurrence Letter, NMFS states in part that:

> *The Noyo Harbor District has proposed the project to be carried out when there is a low probability of ESA listed fish being present in or near the action area. The pile driving window of 16 July through 31 September avoids the migration timing of both upstream migrating adult and downstream migrating juvenile salmonids. Additionally, the project will use a bubble curtain to attenuate underwater sound energy transmission. NMFS currently uses a dual metric criteria of 206dB (re: 1μPa) peak SPL for any single strike, and a cumulative sound exposure level (cSEL) of 187 dB 9re: 1μPa 2-sec) as thresholds to correlate physical injury to fish greater than 2 grams in size exposed to underwater sound produced during the installation of piles with impact hammers (FHWG 2008). An analysis by Illingworth and Rodkin (2013) of the sound pressure levels likely to be generated by driving the 14 inch concrete piles with the attenuation effects of the bubble curtain, projected a peak SPL of 186 db, which is 20 db below the NMFS peak db threshold for physical injury. The analysis projected a cSEL of 186 db within a radius of less than 10 meters with the driving of 10 piles in a day, which is 1 db below the NMFS threshold for injury resulting from cumulative sound exposure level. With the low probability of ESA listed fish being in the Noyo Harbor during pile driving, it is highly unlikely an individual fish would be within the off-channel action area of the mooring basin, and within less than 10 meters of 10 different individual piles driven in a day. Moreover, installation of concrete piles similar to those proposed for this project generally generates lower sound pressure levels per individual strike than steel pipe piles. To date, NMFS has not observed fish injury as a result of impact hammering of this size of concrete piles (Jacqueline Pearson-Meyer, NMFS, personal communication, February 2014).*

Based on: (1) the informal consultation letter for the associated tsunami repairs project within the Noyo Harbor Mooring Basin and its findings that with the impact avoidance and mitigation measures cooperatively developed by the applicant and the agency, the proposed project will not likely result in significant direct or cumulative impacts to endangered or threatened species or other protected fish and wildlife; and (2) the proposed mitigation measures incorporated into the project to schedule construction when sensitive species are unlikely to be within the marina; The Commission finds that with the attachment of certain special conditions, the development involves the least environmentally damaging alternative and will include feasible mitigation measure to minimize adverse environmental effects consistent with Section 30233 of the Coastal Act. In addition, the Commission finds that the development will maintain the biological productivity and marine resources consistent with Sections 30230 and 30231.

To further ensure that the proposed dock repairs are carried out in a manner that will not cause significant adverse impacts to sensitive fish species or habitat consistent with the determinations of NOAA Fisheries, the Commission attaches **Special Condition No. 2**. This condition requires the applicant to undertake development in accordance with their proposal, including that all project-related activities shall only be undertaken and completed during a single construction

season between June 15 and September 31, 2014, and that no pile driving activities will occur until after July 15, when the presence of sensitive salmonids within the project area will be unlikely.

Special Condition No. 4 sets certain limitations on the pile driving, including requirements that: 1) the pile driving be limited to the period between July 15 and September 31 when threatened and endangered salmon are not likely to be present in significant numbers, 2) a bubble curtain surrounding the piles to be driven be employed during all pile driving, 3) only concrete piles that generate less noise than other kinds of piles when driven be used, 4) sound pressure levels from pile-driving not exceed levels that can be sustained by fish in the area as recommended by the National Marine Fisheries Service and the Department of Fish & Wildlife; and 5) hydroacoustic monitoring be performed consistent with the January 2014 hydroacoustic monitoring plan prepared by Illingworth and Rodkin. The special condition requires that in the event that after implementation of the additional measures, conformance with the dual metric exposure criteria (described in the hydroacoustic monitoring report and in Special Condition No. 4) still is not met, pile-driving shall be stopped immediately and shall not re-commence until or unless the Commission approves an amendment to the permit that incorporates substantial changes to the project that prevent further exceedance of the dual metric exposure criteria.

The Commission finds that as conditioned, the proposed pile driving operations will minimize adverse acoustic impacts on fish species.

Disturbance of Eelgrass Habitat

Eelgrass (*Zostera marina*) is considered to be an environmentally sensitive habitat area worthy of protection because it functions as important shelter and foraging habitat. For example, eelgrass provides cover for juvenile fish and in some locations, serves as a spawning ground for herring. In addition, black brant, a species of migratory geese, feed almost exclusively on eelgrass. Eelgrass is a flowering plant that extends long rhizomes (roots) an average of 1.5 – 8 inches below the substrate from which the turions (stems) sprout with long, green blades (leaves) and it thrives in protected coastal waters with sandy or muddy bottoms. Eelgrass can be adversely impacted by direct contact, or indirectly by shading from over-water structures.

A February 2014 Eelgrass Survey and Contingency Monitoring Plan (**Exhibit 8**) prepared for the Noyo Harbor District states in part that:

> *While the presence of eelgrass in the lower Noyo River is well-established, the distribution of eelgrass habitat within the river has not been thoroughly mapped (CDFW 2010). No known formal eelgrass surveys have been conducted within the Noyo Harbor Mooring Basin project area since at least 2002. Eelgrass surveys were conducted during August and November 2009 within and adjacent to the Noyo River Channel maintenance dredging footprint in support of maintenance dredging operations (Merkel 2009). Although these surveys established the presence of eelgrass both up and down river of the mooring basin, they did not include coverage of the mooring basin (project area) itself.*

In their 2014 Concurrence Letter (page 7 of **Exhibit 5**), NMFS indicates the following:

> *Both the periodic dredging and the maintained depths likely limit the ability of benthic algae, eelgrass and other macrophytes common to shallow bays and estuaries to become established within the action area…*
>
> *…Increased turbidity due to pile removal and driving can limit light availability and cause detrimental impacts to native aquatic biota, such as* Zostera marina*, common name of eelgrass, and phytoplankton…The contents of the suspended material may react with the dissolved oxygen in the water and result in short-term oxygen depletion to aquatic resources (Nightingale and Simenstad 2001). Eelgrass is present in the Noyo Harbor and outside of the mooring basin…Eelgrass is not expected to be present in the action area, but pre- and post-construction surveys of eelgrass will be conducted. Following implementation of avoidance and minimization measures, such as use of a silt curtain, no impacts to eelgrass are expected. If direct or indirect impacts to eelgrass are observed in the post-construction survey, then a mitigation plan will be agreed upon between the project proponent and NMFS staff.*

The NOAA concurrence letter and the information upon which it is based provide evidence that eelgrass is likely not present in Noyo Harbor and the development will not adversely affect eelgrass habitat. However, a level of uncertainty exists as to whether eelgrass is actually present in the harbor to a degree that the development would actually affect it given that no actual survey of the harbor bottom for the presence of eelgrass has been conducted in recent years. Therefore to verify that the development would not have significant adverse environmental impacts on eelgrass habitat, the applicant proposes to conduct a pre-construction survey to be completed during the active eelgrass growing season (May-August) and within 30 days prior to the beginning of construction. If pre-construction surveys detect eelgrass within the project area, the February 2014 Eelgrass Survey and Contingency Mitigation Plan (**Exhibit 8**) indicates that post-construction surveys would be conducted with the results compared against the results of the pre-construction surveys. If direct or indirect impacts to eelgrass are observed, then the applicant will prepare and provide a mitigation plan that will propose potential mitigation in the lower Noyo River, with an extended monitoring plan. Therefore, the Commission attaches **Special Condition No. 5,** requiring that the eelgrass surveys shall be conducted consistent with the applicant's February 2014 Eelgrass Monitoring Plan prepared by Pacific Watershed Associates. The post-construction survey must document any adverse impact of the development on eelgrass. If the post-construction survey demonstrates to the satisfaction of the Executive Director that that the eelgrass densities have not decreased and there has been no net loss of extent of vegetated area, then no further monitoring or mitigation is required. If the post-construction surveys indicate a decrease in eelgrass density or coverage has occurred, then an extended eelgrass mitigation and monitoring plan must be prepared and submitted as an application for an amendment of CDP 1-123-0603. The mitigation plan must conform with the recommendations in Appendix D. "Recommended Measures for Eelgrass Impact Mitigation" of the Draft California Eelgrass Mitigation Policy prepared by the National Marine Fisheries Service (NMFS), Southwest Region dated December 7, 2011 (published in the Federal Register March 9, 2012).

The Commission finds that as conditioned, the development will provide feasible mitigation measures to minimize significant adverse impacts to eelgrass consistent with Section 30233 of the Coastal Act.

Impairment of Water Quality

The proposed dock repairs could potentially have adverse effects on water quality. The use of construction equipment and materials in and around sensitive marine habitats could lead to habitat contamination and impacts through the discharge of debris, trash, and contaminants such as leaky gas and other fluids and other pollutant-laden runoff. In addition, the proposed dock design includes the use of preservative-treated wood in some of the dock elements to be replaced. The use of treated wood in docks creates the potential for toxic chemicals to leach into coastal waters. Allowing such debris or pollutants to enter the waters of the harbor could adversely affect water quality and marine organisms inconsistent with Coastal Act Sections 30230, 30231, and 30232.

Coastal Act Section 30231 protects the quality of coastal waters, streams, and wetlands through, among other means, controlling runoff. Runoff from a project work site, upon entering coastal waters, increases turbidity and adversely affects fish and other sensitive aquatic species. In addition, Coastal Act Section 30232 requires protection against the spillage of crude oil, gas, petroleum products and hazardous substances and requires that effective containments and cleanup procedures be provided for accidental spills that do occur.

The proposed extraction of piles using a vibratory hammer could cause localized increases in turbidity as sediment sloughs off of piles removed from the mud floor of the marina. The applicant proposes to encircle all piles to be extracted within 45 meters of eel grass beds with silt curtains that extend from the surface of the water to the substrate. In the March 2014 Concurrence Letter, NMFS states the following (page 6 of **Exhibit 5**):

> *Extracting 48 existing piles and driving 25 new piles is likely to generate temporary increased levels of turbidity locally within the off-channel action area of the mooring basin. The mooring basin only has an opening on the downstream end, and as such is a depositional environment back flooding with the tides that likely have bottom sediments of fine silts, clays and sand. Extraction and driving of piles is likely to suspend some of these sediments, generating increased levels of turbidity and potential contaminants locally around the piles. Because the piles to be extracted are creosote treated wood, it is possible some of the sediments disturbed and suspended may be contaminated with poly-aromatic hydrocarbons (PAHs) previously leached from the piles. However, the turbidity will be contained within a silt curtain during the extractions of old piles and driving of new piles. Thus, the increased levels of turbidity or potential contaminant levels are unlikely to affect ESA listed fish because of the low probability of being in the action area during project implementation, because the action area is not accessible to downstream migrant juveniles at the upstream end, and with a large dilution factor of the much larger tidal flows of the Noyo River channel, levels of turbidity that could affect feeding or migrating behaviors of juvenile salmonid migrants and green sturgeon will be limited to a localized area around each pile within the action area, in which presence of listed salmonids and green sturgeon is unlikely. Replacement of the creosote treated wood piles with concrete piles will benefit the aquatic environment by eliminating the potential for*

> *the treated wood piles to leach PAHs into the aquatic environment in the future. Therefore NMFS considers the potential for adverse effects to listed species and designated critical habitat due to temporary elevated turbidity and contaminant levels in the water column that may be generated by the project to be discountable.*

Potential adverse impacts to the water quality of the marina could also occur during the construction process if hazardous materials, construction debris, or other pollutants were to enter coastal waters. To ensure that adverse water quality impacts associated with project debris and construction equipment are minimized, **Special Condition No. 1** requires that the applicant submit for the review and approval of the Executive Director a debris disposal plan prior to issuance of the permit to ensure that the removed marine debris, including debris that may have been previously treated with wood preservatives, shall be taken to appropriate landfills. The application does not specify where the damaged piles and other debris to be removed from the site will be disposed of. The special condition will help ensure that the creosote-treated piles and the other debris to be removed are taken to landfills appropriate to the kind of debris to be disposed and the contaminants that may be contained within the debris. Additionally, **Special Condition No. 2** imposes certain construction-related responsibilities. Most notably, these responsibilities require that (1) all construction materials and debris originating from the project shall be stored and/or contained in a manner to preclude their uncontrolled entry and dispersion to the waters of the marina; (2) any fueling of construction equipment shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas; (3) hazardous materials management equipment including oil containment booms and absorbent pads shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call; (4) stockpiles shall be covered and contained at all times to prevent polluted water runoff; and (5) at the end of the construction period, the permittee shall inspect the project area and ensure that no debris, trash, or construction material remain in or near the marina or in the water.

The special condition also requires certain measures designed to minimize water quality impacts from the treatment, storage, construction, and use of wood materials in the project treated with ACZA (ammoniacal copper zinc arsenate). The proposed prefabricated concrete dock design includes the use of wood pressure-treated with ACZA for the walers (structural beams mounted flush to the sides of the deck of the floating docks) as part of the dock load distribution system. The piles and docks themselves will not be constructed of wood and thus will not require treatment with ACZA. ACZA is commonly used to preserve wood that is used in construction in or over the water. In their March 2014 Concurrence Letter (page 6 of **Exhibit 5**), NMFS indicates in part that:

> *Despite the known impacts of dissolved copper in freshwater to functioning of the olfactory nerve of salmonids, recent research funded by the San Francisco Estuary Institute indicate that dissolved copper in saltwater has far less of an impact on olfactory nerve function of the sea water life history stage of salmon species. Specifically, the research found that while concentrations of 5μg/L of copper in freshwater had a significant impact on olfactory nerve function, 100μg/L of copper in seawater showed no significant impact (Baldwin, 2012). Research by manufacturers for EPA registration of copper based wood preservatives has shown the leaching of copper from preserved wood occurs primarily in the first few days the wood is exposed to water, and leaching of*

> *additional copper from the wood is nearly eliminated within a matter of months…Also, the AZCA treated whalers of the floating docks will be floating above the water line, thus the leaching of copper from the structure will be limited to the infrequent periods when the docks are inundated during sustained rainfall events…[T]he minor and localized areas of copper in the water column and substrate associated with this project are not expected to impair or harm listed fish species, and are not expected to result in short-term or long-term impacts to aquatic habitat…*

If Best Management Practices (BMPs) are followed, the small amount of preservative-treated wood that will be used in this project, the large volume of marine waters, and the tidal flushing, make it unlikely that potentially problematic water column concentrations of copper will occur in this location**.** **Special Condition 3** minimizes the impacts of using ACZA preservative-treated wood on the marine environment by requiring in part that use of ACZA-preservative-treated wood in the project shall: (a) adhere to the American Wood Protection Association's (AWPA) wood preservative standards; (b) be treated to the proper preservative retention standard (i.e., amount of preservative) specified by the AWPA for the appropriate AWPA Use Category; (c) be inspected on-site to assure it is free of visible surface residues or bleeding of preservatives and shall not be used if ACZA preservative-treated wood has a noticeable ammonia odor; (d) be stored away from the water and protected from precipitation until it is needed for installation; and (e) be cut or drilled at a site a minimum of 100 feet away from the water whenever possible, to minimize transport of sawdust by wind and contain, collect and properly dispose of all resulting AZCA sawdust, drill shavings, and wood scraps. Additionally, Special Condition No. 3 requires that any application of a topical preservative: (a) adhere to the procedures outlined in AWPA Standard M4, Standard for the Care of Preservative-Treated Wood Products, when applying a topical (non-pressure treated) preservative to the cut ends of treated wood; (b) shall be performed, whenever possible, at a site a minimum of 100 feet away from the water, equipped with containment for potential drips and spills, in order to prevent discharge of the preservative to the environment; (c) shall not occur in the rain; and (d) any excess topical preservative shall be wiped off, and the preservative must be allowed to fully dry before the wood is used in construction.

In conclusion, the special conditions discussed above minimize adverse impacts to water quality and do not conflict with any determination by the State Water Resources Control Board or any California Regional Water Quality Control Board determination in matters relating to water quality as required by Section 30412 of the Coastal Act. The Commission finds that as conditioned, the proposed development will minimize significant adverse impacts on the marine environment including effects on sensitive fish and wildlife species and water quality consistent with the requirements of Section 30233 of the Coastal Act that feasible mitigation measures be provided to minimize adverse environmental effects of fill in coastal waters and wetlands. The Commission further finds that as conditioned, the development will protect the quality of coastal water and wetlands appropriate to maintain optimum populations of marine organisms consistent with Sections 30230 and 30231 of the Coastal Act. Moreover, the Commission finds that as conditioned, the development will protect against the spillage of gas, petroleum products, or hazardous substances and provide effective containments and cleanup facilities and procedures for accidental spills consistent with Section 30232 of the Coastal Act.

G. PROTECTION OF COMMERCIAL FISHING & RECREATIONAL FACILITIES

Section 30234 of the Coastal Act states, in applicable part:

> *Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded…*

The Noyo Harbor is the most active and important harbor on the California coast between Bodega Bay in Sonoma County and Eureka in Humboldt County, serving as a year-round, all-weather harbor of refuge for larger fishing vessels. According to a January 2014 report prepared for Mendocino LAFCO (Appendix A), approximately 43 percent of the boats moored in the Noyo Harbor Mooring Basin are commercial craft, and "the lower harbor also contains parking and ship building areas, boat launching and repair facilities, fish processing plants, and marine supply stores. Commercial outlets, including visitor-oriented restaurants, are clustered on the north bank of the harbor." The 2014 LAFCO report also documents that approximately 45 percent of marina users are from outside the District boundary. The report further indicates that:

> *Industrial vessels, commercial fishing vessels, and sport and pleasure fishing boats come from all over northern California because the [Noyo Harbor District] marina can accommodate large boats. In addition, the District accommodates a significant number of world wide cruisers.*

The marina's capability to moor and shelter watercraft from wave attack has been reduced due to the 2011 tsunami event. Damages to the docks and berthing slips have eliminated 25 berths and the associated accommodations for vessels, resulting in lost revenue for the marina and reduced recreational and commercial opportunities for larger vessels to fish nearby and seek refuge in the marina. Therefore, the repair project is necessary to protect dock facilities that serve the commercial fishing industry and recreational boating.

To minimize conflicts with biological resources, the proposed construction activities would occur between June 15 and September 31, 2014, and pile driving activities will not occur until after July 15 when the presence of sensitive salmonids within the project area will be unlikely. Commercial and sports fishing is most common during late spring, beginning with the sport ground fish opener on May 15, sport salmon fishing continuing through summer, and commercial salmon fishing likely occurring in late summer. The project will be conducted during part of this time period. However, the Commission finds that this impact is short-term and temporary, and the rehabilitation of the Noyo Harbor Mooring Basin berthing facilities will maintain and restore boat mooring capacity and improve vessel access and safety over the long-term.

Therefore, the Commission finds that the project as conditioned will protect and improve the Noyo Harbor Mooring Basin and vessel docks and berths that serve commercial fisheries and recreational boating, consistent with Coastal Act Sections 30224 and 30234.

H. PUBLIC RECREATION AND ACCESS

Coastal Act Sections 30210 through 30211, 30214, and 30224 specifically protect public access and recreation. In particular:

> *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.* [PRC §30210]
>
> *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.* [PRC §30211]
>
> *The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case…*[PRC §30214 (a)]
>
> *Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, [...] 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*. [PRC §30224]

Noyo Harbor Mooring Basin provides public access and recreational opportunities of regional and statewide significance. These opportunities include boat launching, berthing for commercial vessels and recreational boats, and as described above, nearby boat building and repair areas, marine-related retail/commercial businesses, fish processing plants, and visitor-oriented restaurants. The private marina known as Dolphin Cove (aka Dolphin Isle Marina) is located upstream of the Noyo Harbor Mooring Basin and provides RV facilities and kayak lessons and tours.

The District has prepared a Harbor Access and Notification Plan outlining the temporary closure of certain dock areas during the repair work, the temporary use of marina parking areas for construction staging and loading and unloading equipment and materials, and the measures to be taken to notify tenants and recreational users of the marina of this temporary disruption of the use of marina facilities. The plan indicates that "The marina will remain at a minimum of 90% of its current capacity during all phases of the project and every option will be examined to minimize dislocation and keep our boats in the Noyo Harbor." The parking lot staging area will be occupying 18-20 boat/trailer parking spots during the project, and K-Dock will also lose 2-3 parking spots in addition to the loading area for trucks carrying pilings and docks to be unloaded. The gangway will remain accessible to the public except when the crane is actively unloading cargo. Additionally, three parking spaces and a loading zone area will be unavailable for approximately four weeks once repairs to the C-Dock commence. The loss of parking capacity is 3-4% of the marina's total parking capacity, and all launch ramps, docks and slips not part of the construction project will be accessible 95% of the time during the week and 100% of weekends.

Thus, temporary impacts to public access facilities as a result of construction activities will occur, but will be of limited duration and are not significant. Thus, the Commission concludes

that the project as conditioned will protect boating and recreational opportunities consistent with Coastal Act Sections 30210, 30211, 30214, and 30224. Therefore, the Commission finds that, as conditioned, the proposed project will preserve public access and recreational opportunities and is consistent with the above-cited public access and recreational policies of the Coastal Act.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The applicant served as the lead agency for the project for purposes of CEQA. The applicant determined the project to qualify for exemption from CEQA review under Section 15269(a) (Declared Emergency), because "the harbor facilities were damaged and/or destroyed as a result of a disaster in a disaster-stricken area in which a state of emergency was proclaimed by the Governor (state disaster number 2011-02)."

Section 13906 of the Commission's administrative regulations requires Coastal Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits approval of a proposed development if there are any feasible alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the proposed project has been conditioned to be consistent with the policies of the Coastal Act. No public comments regarding potential significant adverse environmental effects of the project were received by the applicant as the lead agency during CEQA review of the project, nor were any public comments received by the Coastal Commission prior to preparation of the staff report. As specifically discussed in these above findings, which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

Application file for Coastal Development Permit (CDP) Application No. 1-113-0603

Bellingham Marine Industries. January 2014. "Stormwater Pollution Control Plan (SWPCP) for Soil Disturbances of Less Than One Acre or No Soil Disturbance." Prepared by Elias Travis, PE, for Noyo Harbor District. Dixon, CA.

California Coastal Act

California State Lands Commission. August 2013. "Noyo Harbor Mooring Basin Repair Project, within Assessor's Parcel Number 018-240-22, Adjacent to the Noyo River, near the city of Fort Bragg, Mendocino County." Letter sent by Mary Hays, Public Land Manager to Kevin Michel, Noyo Harbor District.

Illingworth and Rodkin, Inc. July 2013. "Noyo Harbor Mooring Basin, Proposed Dock Replacement & Modification Pile Driving Underwater Noise Analysis." Memo prepared for SHN Consulting Engineers by Keith Pommerenck. Petaluma, CA.

-----. January 2014. "Noyo Harbor Mooring Basin Dock Replacement and Modification Project: Underwater Acoustic Monitoring Plan." Prepared for SHN Consulting Engineers.

NMFS (National Marine Fisheries Service). December 7, 2011. "Draft California Eelgrass Mitigation Policy prepared." Southwest Region (published in the Federal Register March 9, 2012).

-----. March 2014. *Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens fishery Conservation and Management Act Essential Fish Habitat Response for the Noyo Harbor Mooring Basin Tsunami Repair Project (Corps File # 2013-00291N).* Letter of Concurrence File No. WCR-2014-379. 777 Sonoma Avenue Room 325, Santa Rosa, CA.

North Coast Regional Water Quality Control Board. January 2014. "Water Quality Certification for Noyo Harbor Mooring Basin Tsunami Repair Project," File No. WDID 1B13102WNME. 5550 Skyline Blvd., Suite A, Santa Rosa, CA.

Pacific Watershed Associates. February 2014. "Eelgrass Monitoring Plan: Noyo Harbor Mooring Basin Tsunami Repair Project." Prepared for Noyo Harbor District by Whelan Gilkerson. Arcata, CA.

State Water Resources Control Board. "Order No. 2003-0017-DWQ, General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification." Available online at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf

Wildlife Inventory Systems. January 2008. "Noyo Harbor District Mooring Basin Marina Dredging Project: Wildlife and Fisheries Biological Investigation for FEMA Disaster #1628, PW #3242." Prepared for Recovery Operations Specialty Services.

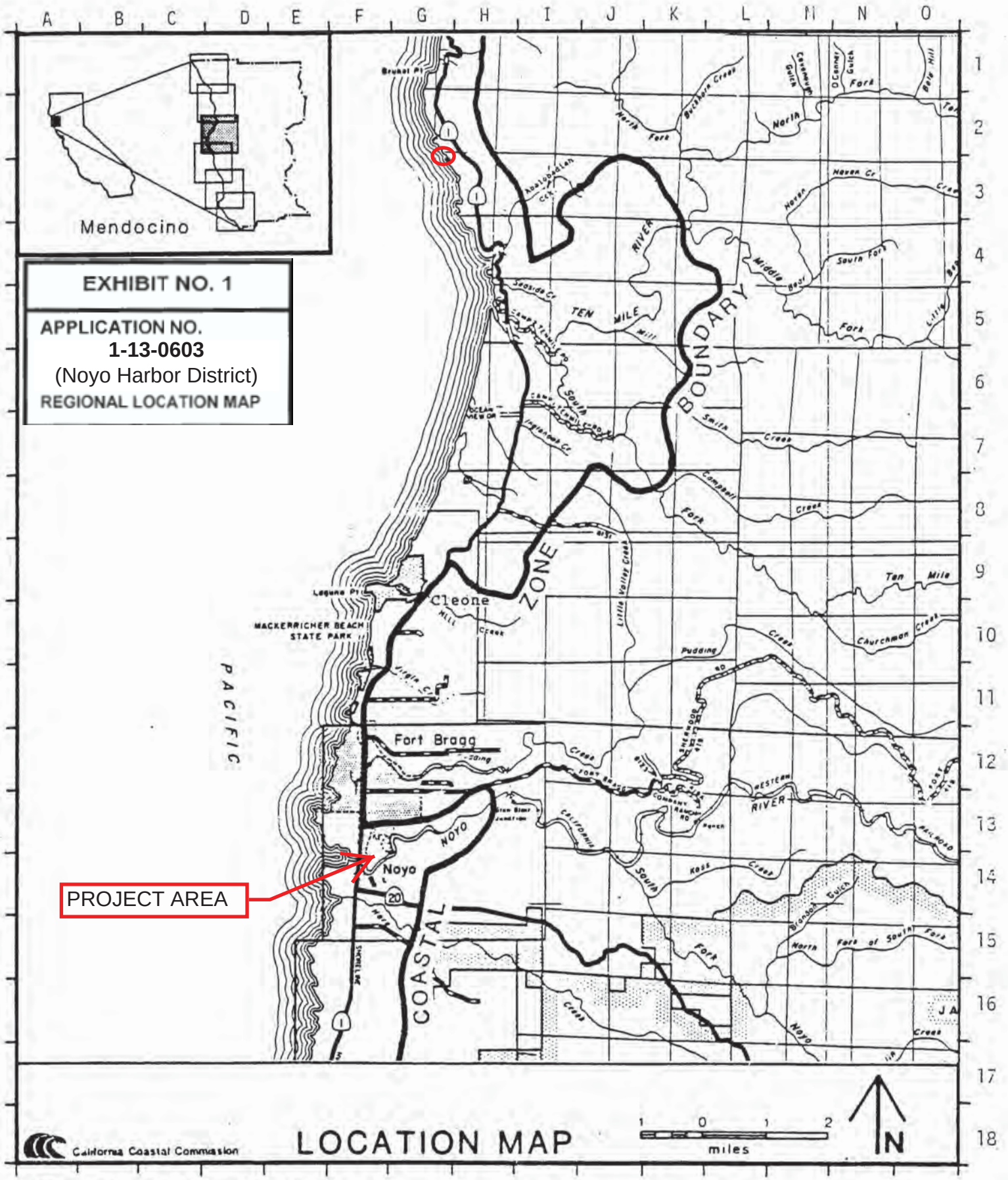

Mendocino
EXHIBIT NO. 1
APPLICATION NO.
1-13-0603
(Noyo Harbor District)
REGIONAL LOCATION MAP
PROJECT AREA
Cleone
Fort Bragg
Noyo
MACKERRICHER BEACH STATE PARK
COASTAL ZONE BOUNDARY
PACIFIC
Ten Mile
Pudding Creek
Churchman Creek
Western River
Noyo River
California Coastal Commission
LOCATION MAP
1 0 1 2
miles
N
County of Mendocino


EXHIBIT NO. 2
APPLICATION NO.
1-13-0603
(Noyo Harbor District)
PROJECT VICINITY/
AERIAL IMAGE
(1 of 2)
Shoreline Hwy
South St
S Main St
NOYO
Dolphin Cove
Noyo Bay
Noyo River
Harbor RV Park
Noyo Anchorage
Noyo Basin
Todd Point
Project Area
S Main St
Fort Bragg-Willits Rd
Fort Bragg-Willits Rd
Fort Bragg-Willits Rd
Hare Creek
Hidden Pines Campground
Shoreline Hwy
1000 ft
200 m
Imagery ©2014 DigitalGlobe, USDA Farm Service Agency, Map data ©2014 Google
Edit in Google Map Maker
Report a problem


Noyo Anchorage
Noyo Basin
Repair Areas
Noyo Harbor District
Harbor RV Park
Shoreline Hwy
S Main St
Boatyard Dr
N Harbor Dr
Casa Del Noyo
Basin St
S Harbor Dr
Coast Rd
Basin View Dr
Old Willits Rd
Fort Bragg-Willits Rd
Map
Traffic
(2 of 2)
Imagery ©2014 DigitalGlobe, USDA Farm Service Agency, Map data ©2014 Google
Edit in Google Map Maker
Report a problem

EXHIBIT NO. 3

APPLICATION NO.
1-13-0603
(Noyo Harbor District)

SITE PLANS

SWPCP NOTES:

1. BARGE AND SMALL BOAT(S) NEEDED FOR DOCK CONSTRUCTION WILL BE LAUNCHED AT THE NOYO RIVER LAUNCH RAMP APPX. 1/4 MILE NORTH OF PROJECT SITE.
2. MATERIALS TO BE STORED IN STAGING AREA ARE SMALL TOOLS AND EQUIPMENT NEEDED FOR DOCK CONSTRUCTION ONLY. EXISTING WOOD PILES AND DOCKS THAT HAVE BEEN REMOVED ARE NOT TO BE STORED HERE. THESE ITEMS ARE TO BE LOADED FROM BARGE DIRECTLY ONTO TRUCKS AND OFF-HAULED TO APPROPRIATE FACILITY.
3. THIS AREA TO BE USED DURING DEMOLITION DAYS AND NEW DOCK LAUNCH DAYS ONLY. ONE LANE VEHICLE TRAFFIC WILL BE MAINTAINED AT ALL TIMES ON BASIN STREET. PROPER SIGNAGE AND TRAFFIC CONTROL WILL BE PROVIDED.

GRAPHIC SCALE
0 40' 80' 120'

NO.	DATE	DESCRIPTION	BY

REVISIONS

Bellingham MARINE
The World's Most Comprehensive Marina Builder
Southwest Division
1205 Business Park Drive
Dixon, CA 95620
TEL: (707) 678-2385
FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

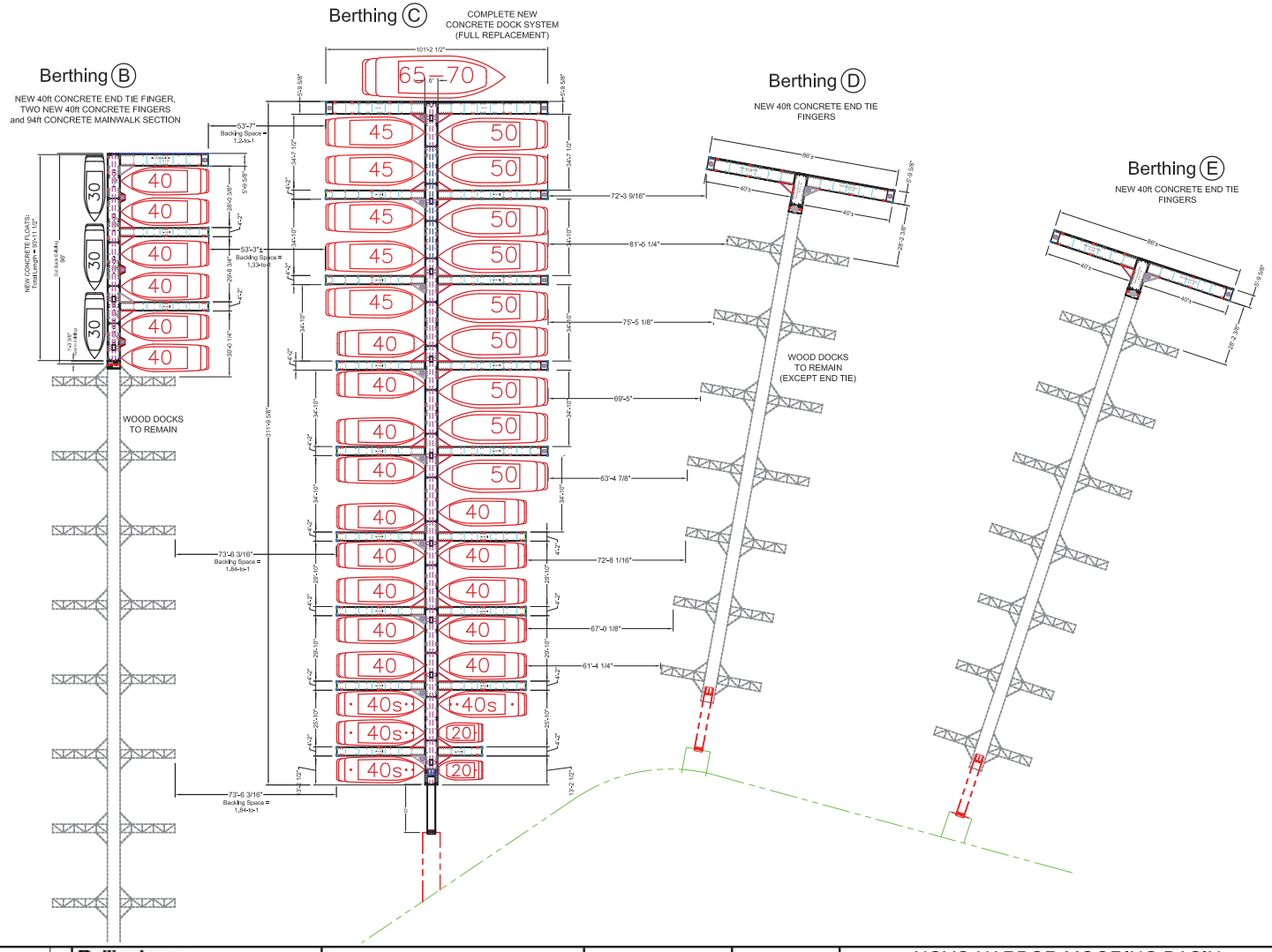
ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER:	13-3-770
ENGINEER / DESIGNER:	ELIAS TRAVIS, QSD
PROJECT MANAGER:	JON WRATTEN
CHECKED BY:	_
SCALE:	
DRAWN BY:	ET
DATE:	1-29-14
SHEET NO.:	2
DRAWING:	_

NOYO HARBOR
TSUNAMI RENOVATION PROJECT
FORT BRAGG, CA

SWPCP SITE MAP



NO.	DATE	DESCRIPTION	BY

REVISIONS

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The World's Most Comprehensive Marine Builder
Southwest Division
1205 Business Park Drive
Dixon, CA 95620
TEL: (707) 678-2385
FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	_
CHECKED BY:	S. Canaday
SCALE:	1" = 50'
DRAWN BY:	DD
DATE:	5-24-13
SHEET NO.:	1
DRAWING:	3-1

NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

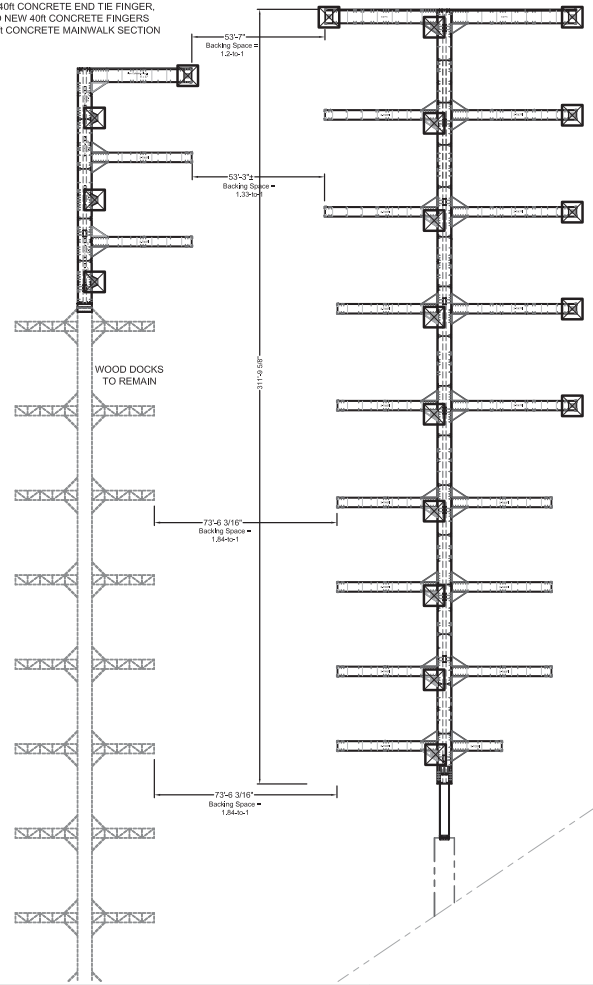
OVERALL LAYOUT #3 (Configuration 3)- C Dock Replacement (Concrete)
B Dock End Tie, Two 40' Fingers, 94' Mainwalk (Concrete)
D & E End Ties (Concrete Floats)

Berthing Ⓒ

COMPLETE NEW
CONCRETE DOCK SYSTEM
(FULL REPLACEMENT)

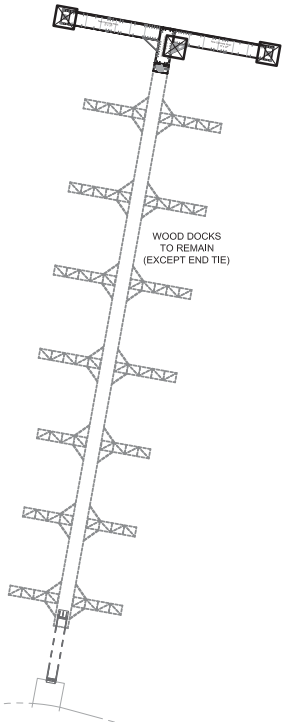
Berthing Ⓑ

NEW 40ft CONCRETE END TIE FINGER,
TWO NEW 40ft CONCRETE FINGERS
and 94ft CONCRETE MAINWALK SECTION



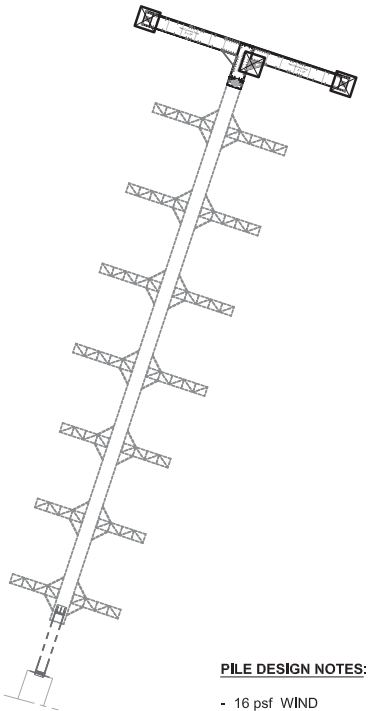
Berthing Ⓓ

NEW 40ft CONCRETE END TIE
FINGERS



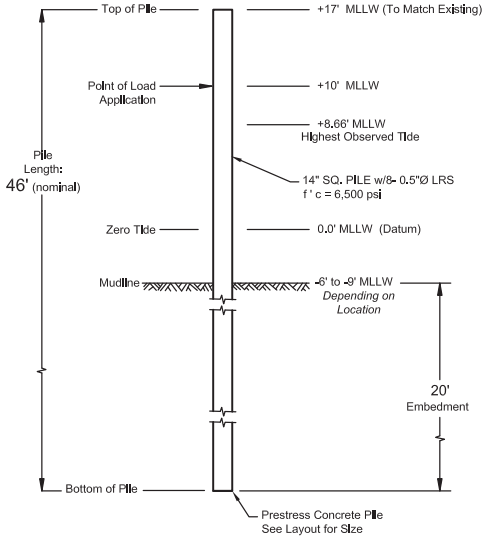
Berthing Ⓔ

NEW 40ft CONCRETE END TIE
FINGERS



NOTE:

ALL GEOTECH AND BATHYMETRIC
DATA MUST BE CONFIRMED.
PILE EMBEDMENT AND LATERAL
LOAD CAPACITY IS PER GEOTECH
REPORT BY SHN CONSULTING ENGINEERS.



☒ = NEW 14" Square Pile (8 - 0.5"Ø LRS)
f 'c = 6,500 psi
** Size Based on Results of Geotechnical
Soils Investigation Conducted and Report Provided
by SHN Consulting Engineers & Geologists, Inc.

PILE DESIGN NOTES:

- 16 psf WIND
- 1' MAX. WAVE HT.
- VESSEL LENGTH = SLIP LENGTH
- LOAD ELEV. = +10.0 MLLW

NO.	DATE	DESCRIPTION	BY

REVISIONS

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Southwest Division
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Dixon, CA 95620
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FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

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CITY ENGINEER R.C.E. EXP. DATE

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CITY ENGINEER R.C.E. EXP. DATE

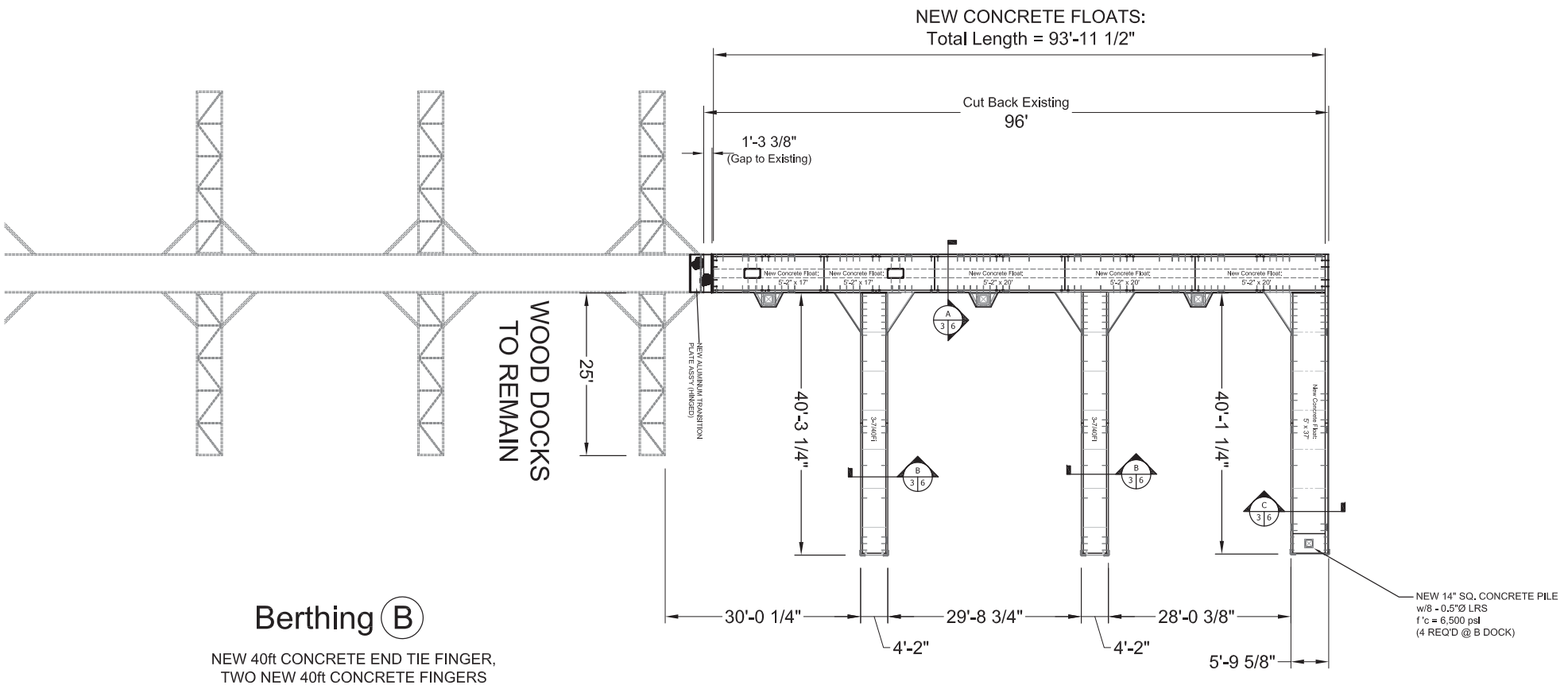
PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	_
CHECKED BY:	S. Canaday
SCALE:	1" = 50'
DRAWN BY:	DD
DATE:	5-24-13
SHEET NO.:	2
DRAWING:	3-2

NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

OVERALL LAYOUT #3 (Configuration 3)-
NEW PILE LAYOUT AND DESIGN ELEVATION

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. FUNSTON
S 4878
EXPIRES 6-30-13
STRUCTURAL
STATE OF CALIFORNIA

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Redpoint Structures under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and the like have been included in this review. Redpoint Structures can not be responsible for the accuracy of information provided by others.



Berthing (B)

NEW 40ft CONCRETE END TIE FINGER,
TWO NEW 40ft CONCRETE FINGERS
and 94ft CONCRETE MAINWALK SECTION

NO.	DATE	DESCRIPTION	BY

REVISIONS

Bellingham MARINE
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Southwest Division
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Dixon, CA 95620
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SITE IMPROVEMENT PLAN

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ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	_
CHECKED BY:	S. Canaday
SCALE:	N.T.S.
DRAWN BY:	DD
DATE:	5-15-13
SHEET NO.:	3
DRAWING:	3-3

NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

DIMENSIONAL LAYOUT #3
B Dock Partial Replacement (Concrete)

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. FUNSTON
S 4878
EXPIRES 6-30-13
STRUCTURAL
STATE OF CALIFORNIA

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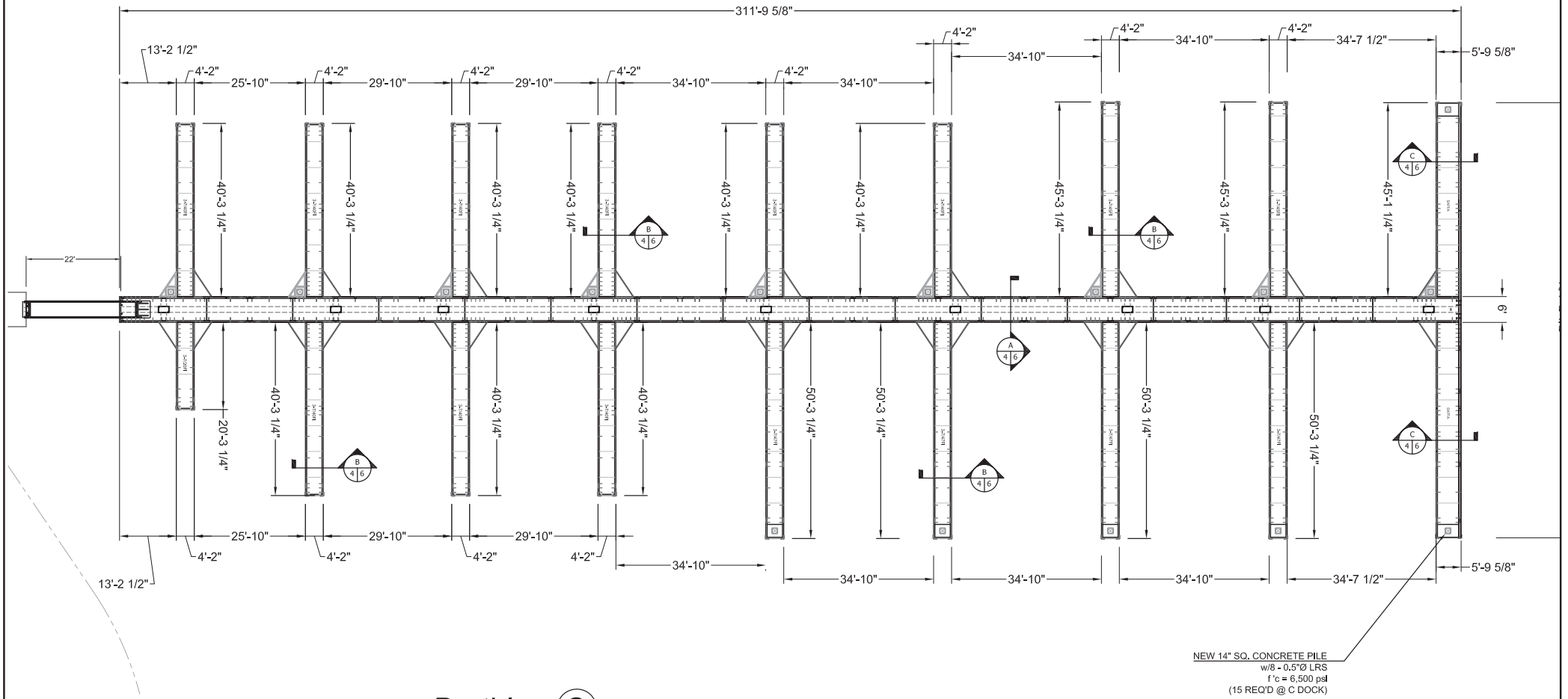

NEW 14" SQ. CONCRETE PILE
w/8 - 0.5"Ø LRS
f 'c = 6,500 psi
(15 REQ'D @ C DOCK)

Berthing C

COMPLETE NEW
CONCRETE DOCK SYSTEM
(FULL REPLACEMENT)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

Bellingham MARINE
The World's Most Comprehensive Marina Builder
Southwest Division
1205 Business Park Drive
Dixon, CA 95620
TEL: (707) 678-2385
FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	
CHECKED BY:	S. Canaday
SCALE:	N.T.S.
DRAWN BY:	DD
DATE:	5-24-13
SHEET NO.:	4
DRAWING:	3-4

NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

DIMENSIONAL LAYOUT #3
C Dock Replacement (Concrete)

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. FUNSTON
S 4878
EXPIRES 6-30-13
STRUCTURAL
STATE OF CALIFORNIA

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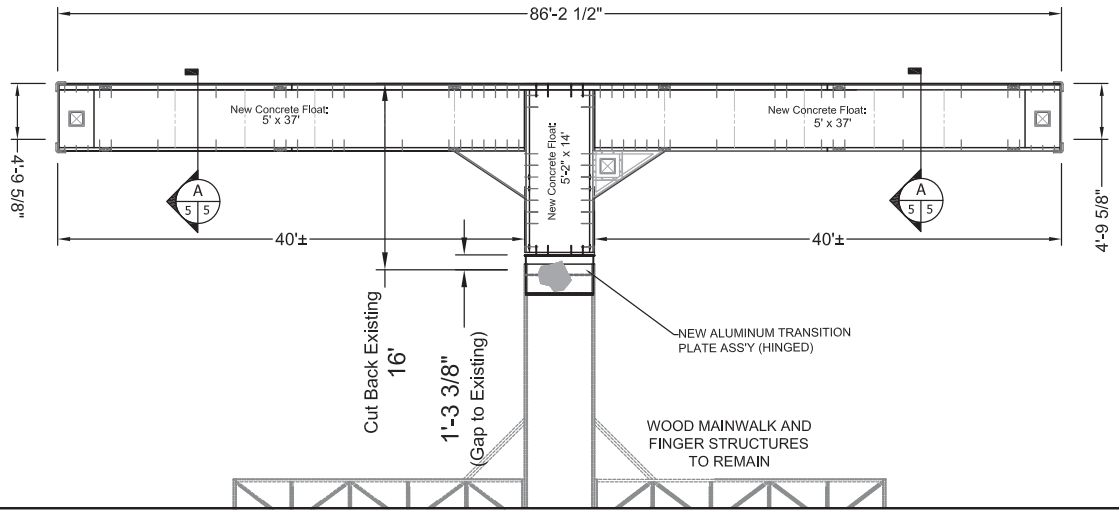
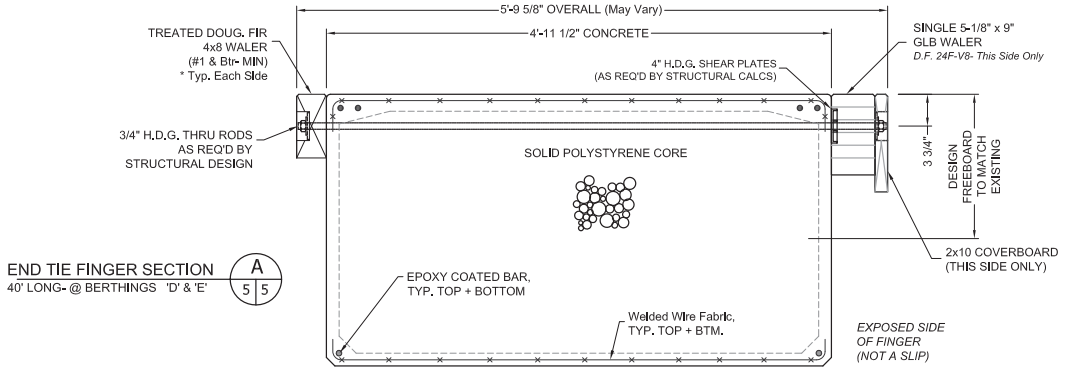
Berthing (D) Berthing (E)

NEW 40ft CONCRETE END TIE FINGERS





END TIE FINGER SECTION A 5 5
40' LONG- @ BERTHINGS 'D' & 'E'

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

Bellingham MARINE The World's Most Comprehensive Marine Builder
Southwest Division
1205 Business Park Drive
Dixon, CA 95620
TEL: (707) 678-2385
FAX: (707) 678-1760

SITE IMPROVEMENT PLAN

ACCEPTED BY: _____ CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: _____ CITY ENGINEER R.C.E. EXP. DATE

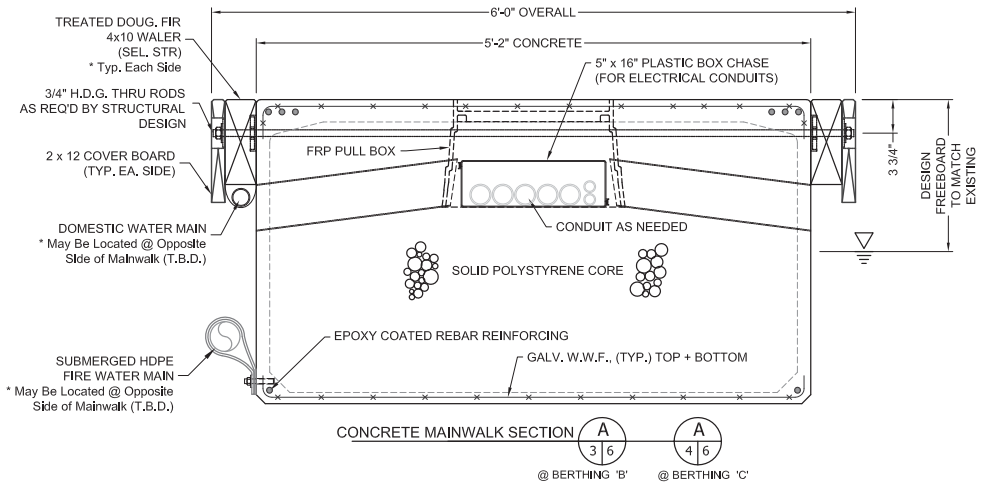
PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	_
CHECKED BY:	S. Canaday
SCALE:	as shown
DRAWN BY:	DD
DATE:	5-15-13
SHEET NO.:	5
DRAWING:	3-5

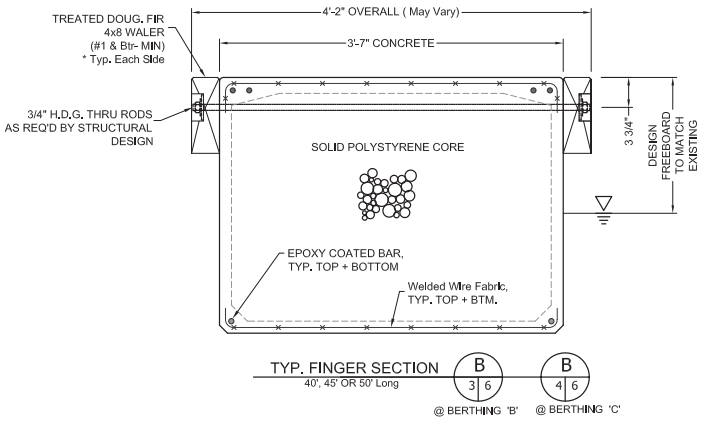
NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

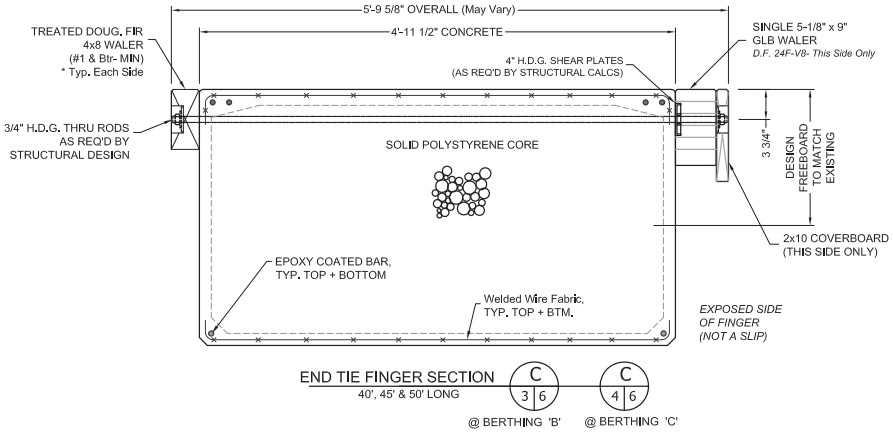
DIMENSIONAL LAYOUTS-
D & E Dock End Ties (Concrete Float Option)

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. FUNSTON
S 4878
EXPIRES 6-30-13
STRUCTURAL
STATE OF CALIFORNIA

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Redpoint Structures under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and the like have been included in this review. Redpoint Structures can not be responsible for the accuracy of information provided by others.







NO.	DATE	DESCRIPTION	BY

REVISIONS

Bellingham MARINE
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SITE IMPROVEMENT PLAN

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

ACCEPTED BY: _____
CITY ENGINEER R.C.E. EXP. DATE

PROJECT NUMBER:	13-3-719
ENGINEER / DESIGNER:	Redpoint Structures
PROJECT MANAGER:	
CHECKED BY:	S. Canaday
SCALE:	as shown
DRAWN BY:	DD
DATE:	5-15-13
SHEET NO.:	6
DRAWING:	CS1

NOYO HARBOR MOORING BASIN
Proposed Dock Replacement & Modification
FORT BRAGG, CA

TYPICAL DOCK SYSTEM CROSS-SECTIONS

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. FUNSTON
S 4878
EXPIRES 6-30-13
STRUCTURAL
STATE OF CALIFORNIA

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Redpoint Structures under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and the like have been included in this review. Redpoint Structures can not be responsible for the accuracy of information provided by others.

B and C Dock

C Dock

EXHIBIT NO. 4

APPLICATION NO.
1-13-0603
(Noyo Harbor District)

PHOTOS OF NOYO HARBOR TSUNAMI DAMAGE

B Dock

B Dock Remnants

EXHIBIT NO. 5
APPLICATION NO.
1-13-0603
(Noyo Harbor District)

NMFS CONSULTATION DETERMINATION LETTER

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

March 5, 2014 **Refer to NMFS No: WCR-2014-379**

Lieutenant Colonel John K. Baker
U.S. Department of the Army
San Francisco District, Corps of Engineers
1455 Market Street
San Francisco, California 94103-1398

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Noyo Harbor Mooring Basin Tsunami Repair Project (Corps File # 2013-00291N)

Dear Colonel Baker:

On August 12, 2013, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that the U.S. Army Corps of Engineers' (Corps) proposed authorization of the Noyo Harbor Mooring Basin Tsunami Repair Project under the Rivers and Harbors Act of 1899 (33 USC §403) is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation Tracking System (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts).[1] A complete record of this consultation is on file at NMFS Santa Rosa office located at 777 Sonoma Avenue Room 325, Santa Rosa California, 95404.

[1] Once on the PCTS homepage, use the following PCTS tracking number within the Quick Search column: WCR-2014-379, or search for the project by name: Noyo Harbor Tsunami Repair.

Proposed Action and Action Area

The proposed action by the Corps is permitting the Noyo Harbor District (NHD) to repair damage to docks within the Noyo Harbor Mooring Basin. The damage was caused by the March 11, 2011 tsunami generated by the Fukushima earthquake off the coast of Japan. The project involves: 1) extracting 48 treated wood piles and replacing with 25 fourteen-inch square concrete piles; and 2) removing and replacing the damaged attached docks and fingers (attached berthing slips). The docks to be removed are built of treated wood and exposed foam flotation. The replacement docks will be built of pre-formed concrete and wrapped foam flotation. The concrete docks will be equipped with wooden whalers treated with AZCA wood preservative. A total dock space of 7,316 square feet will be replaced at a 1:1 ratio. Pile driving and extraction will be conducted from a barge mounted crane. Silt curtains surrounding the old piles will be employed during extraction to minimize extent of turbid water. New piles are proposed to be driven with a small diesel impact hammer. A bubble curtain surrounding the new piles will be employed during all pile driving in order to attenuate the underwater sound pressure level (SPL) produced during pile driving. Hydroacoustic monitoring and agency reporting will be employed during the pile driving according to the Fisheries Hydroacoustic Working Group's published guidelines (2014). The project is proposed to be carried out between June 15 and September 31, 2014. Pre- and post-construction eelgrass surveys will be conducted. The NHD modified the project at NMFS' request so that driving of the new piles will not occur until after July 15, when the presence of ESA listed salmonids within the action area will be unlikely. No interrelated or interdependent activities affecting ESA listed salmonids are anticipated.

The action area is the Noyo Harbor mooring basin located within Noyo Harbor in the City of Fort Bragg, Mendocino County California. The mooring basin is an off channel area excavated and periodically dredged adjacent to the Noyo River channel and separated from the channel by a wooden sea wall extending the length of the mooring basin, with an entrance and exit connection to the river channel at the downstream end. The mooring basin is located within six tenths of a mile of the mouth of the Noyo River entrance to the Pacific Ocean, and is adjacent to Basin Street and the intersection with South Harbor Drive. The action area is fully tidally influenced, thus is a fully saltwater section of the Noyo River estuary during the low flow summer season.

Consultation History

The initial consultation request package from the Corps, which NMFS has reviewed in developing the conclusions of this concurrence letter included a complete set of project plans, specifications and description of the project, including proposed work windows, and the following documents:

> *Noyo Harbor Mooring Basin, Proposed Dock Replacement & Modification Pile Driving Underwater Noise Analysis* (Illingsworth and Rodkins Inc., 2013);
>
> *Noyo Harbor District Mooring Basin Marina Dredging Project, Wildlife and Fisheries Investigation* (Wildlife Inventory Systems, 2008);

Geotechnical Investigation, Proposed Noyo Harbor Mooring Basin Dock Replacement and Modification, Fort Bragg, California (SHN Consulting Engineers and Geologists Inc., 2013); and

Letter of Concurrence, Noyo Harbor District Mooring Basin Dredging (NMFS 2010).

Additional information regarding the project was provided by Kevin Michel of NHD via telephone conversations and electronic mail messages between August 27, 2013 and February 11, 2014. In a telephone conversation with Kevin Michel on August 27, 2013, NMFS recommended the project description be modified to limit pile driving until after July 15, when presence of ESA listed salmonids would be unlikely, and also requested a completed hydroacoustic monitoring plan. NHD confirmed by email on August 28, 2013 the project description would be modified to limit pile driving till after July 15. A completed hydroacoustic monitoring plan was provided to NMFS via email on February 11, 2014. On September 6, 2013 NMFS requested via email from NHD additional information on eelgrass within the action area, and an eelgrass pre- and post-project monitoring plan. An eelgrass pre- and post-construction survey plan was provided to NMFS via email on January 24, 2014. An eelgrass draft monitoring and mitigation plan was received by NMFS via email on February 3, 2014.

Also, additional sources of information upon which NMFS based the conclusions of this concurrence letter are cited in the text below, and are listed in a *Literature Cited* section at the end of the letter.

Action Agency's Effects Determination

The Corps has determined that the proposed project is not likely to adversely affect the following ESA listed species and designated critical habitat known to seasonally use, or exist in the action area:

Central California Coast (CCC) coho salmon ESU (*Oncorhynchus kisutch*)
Endangered listing determination (June 28, 2005; 70 FR 37160)
Critical habitat designated (May 5, 1999; 64 FR 24049);

Central California Coast steelhead DPS (*O. mykiss*)
Threatened listing determination (January 5, 2006; 71 FR 834)
Critical habitat designated (September 2, 2005; 70 FR 52488);

California Coast Chinook salmon ESU (*O. tshawytscha*)
Threatened listing determination (June 28, 2005; 70 FR 37160)
Critical habitat designated (September 2, 2005; 70 FR 52488); and

Southern DPS of North American green sturgeon (*Acipenser medirostris*)
Threatened listing (April 7, 2006; 71 FR 17757).

The Corps NLAA determination for the above listed species and designated critical habitats is based on avoidance and minimization measures proposed by the applicant including use of a

bubble curtain while pile driving, hydroacoustic monitoring during pile driving to insure staying below threshold sound levels of adverse effects on ESA listed species, and operating during the summer work window of 2014.

Regarding EFH, the Corps evaluated the potential effects of this project and determined that the proposed action would not have a significant adverse impact on EFH or the following below federally managed fisheries in California waters:

Pacific Groundfish FMP – starry flounder, English sole and brown rockfish;
Coastal Pelagic FMP - northern anchovy; and
Pacific Coast Salmon FMP - Chinook salmon, coho salmon.

The project area is also in an area designated as Habitat Areas of Particular Concern (HAPC) for various federally-managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, Fort Bragg, including the project area, is identified as canopy kelp and seagrass HAPC.

The Corps determination that the action would have no significant adverse impact on EFH is based on the fact that no new habitat will be impacted, as the docks and pilings are being replaced in the same location and the same acreage as the damaged structures.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

NMFS analyzed the project's potential to adversely affect ESA listed species and critical habitats through the following impacts of the project which are likely to occur:

1. Hydroacoustic impacts resulting from driving 25 new piles;

2. Increased water column turbidity and potential contaminant levels resulting from extraction of 48 existing piles and driving 25 new piles;

3. Release of copper into the aquatic environment from AZCA treated wood whalers of the new floating docks proposed to be installed; and

4. Shading impacts of non-light transmitting docks within the mooring basin action area.

As described above, the action area is within designated critical habitat for the CCC steelhead DPS, CC Chinook salmon ESU, and the CCC coho salmon ESU. Different life history stages of these species are known to seasonally migrate through lower estuarine sections of their natal streams such as the Noyo River on a seasonal basis. Adult coho and Chinook salmon may be in the Noyo River estuary as early as October, awaiting fall rains to begin their upstream spawning migrations which can continue into early January. Adult steelhead can be expected to be transiting through the estuary on spawning migrations from November through April. Coho salmon juveniles can be expected to be outmigrating through lower estuarine saltwater areas from early April to early July, Chinook from early April to mid-July ((Moser *et. al.* 1991, Wallace 2003), and steelhead juveniles from January to early June (Groot and Margolis 1991, Maahs and Cannata 1998). Monitoring by the California Department of Fish and Wildlife in the lower saltwater sections of the Noyo estuary has found very few salmonids during the summer season. Monitoring for the Noyo Harbor Bridge construction in 2002 found no salmonids or green sturgeon during the summer season (NMFS 2010).

The southern DPS of North American green sturgeon spawn in the upper reaches of the Sacramento River. Adult green sturgeon exhibit an extensive marine existence, traveling as far north along the Pacific west coast as far as Alaska. These fish return from the ocean every few years in the late winter to spawn, and generally show fidelity to their upper Sacramento River spawning sites. Along their migration pathway up and down the west coast, sturgeon are known to enter larger bays and estuaries such as Humboldt Bay and the Columbia River Estuary for feeding and thermal refuge from colder ocean conditions. One occurrence of a green sturgeon was documented in the Noyo Harbor prior to 1995 (NMFS 2010).

The Noyo Harbor District has proposed the project to be carried out when there is a low probability of ESA listed fish being present in or near the action area. The pile driving window of 16 July through 31 September avoids the migration timing of both upstream migrating adult and downstream migrating juvenile salmonids. Additionally, the project will use a bubble curtain to attenuate underwater sound energy transmission. NMFS currently uses a dual metric criteria of 206 dB (re: 1 μPa) peak SPL for any single strike, and a cumulative sound exposure level (cSEL) of 187 dB (re: 1 μPa ^{2}-sec) as thresholds to correlate physical injury to fish greater than 2 grams in size exposed to underwater sound produced during the installation of piles with impact hammers (FHWG 2008). An analysis by Illingworth and Rodkin (2013) of the sound pressure levels likely to be generated by driving the 14 inch concrete piles with the attenuation effects of the bubble curtain, projected a peak SPL of 186 db, which is 20 db below the NMFS peak db threshold for physical injury. The analysis projected a cSEL of 186 db within a radius of less than 10 meters with the driving of 10 piles in a day, which is 1 db below the NMFS threshold for injury resulting from cumulative sound exposure level. With the low probability of ESA listed fish being in the Noyo Harbor during pile driving, it is highly unlikely an individual fish would be within the off-channel action area of the mooring basin, and within less than 10 meters of 10 different individual piles driven in a day. Moreover, installation of concrete piles similar to those proposed for this

project generally generates lower sound pressure levels per individual strike than steel pipe piles. To date, NMFS has not observed fish injury as a result of impact hammering of this size of concrete piles (Jacqueline Pearson-Meyer, NMFS, personal communication, February 2014).

NMFS' threshold for behavioral effects on fish resulting from pile driving uses a root mean square (RMS) db level of 150 RMS db. The Illingworth and Rodkin analysis projected an 185-meter radius that a RMS 151 db would occur. With the projected RMS sound level just one db above the behavioral impact threshold, any behavioral response by fish is not expected to interfere with their foraging, migration or resting behaviors (Jacqueline Pearson-Meyer, NMFS, personal communication, February 2014). Thus, based on the analysis of projected sound impact levels of the project, NMFS considers it discountable that listed salmonids or green sturgeon will be adversely affected by the hydroacoustic impacts of pile driving during project implementation.

Extracting 48 existing piles and driving 25 new piles is likely to generate temporary increased levels of turbidity locally within the off-channel action area of the mooring basin. The mooring basin only has an opening on the downstream end, and as such is a depositional environment back flooding with the tides that likely have bottom sediments of fine silts, clays and sand. Extraction and driving of piles is likely to suspend some of these sediments, generating increased levels of turbidity and potential contaminants locally around the piles. Because the piles to be extracted are creosote treated wood, it is possible some of the sediments disturbed and suspended may be contaminated with poly-aromatic hydrocarbons (PAHs) previously leached from the piles. However, the turbidity will be contained within a silt curtain during the extractions of old piles and driving of new piles. Thus, the increased levels of turbidity or potential contaminant levels are unlikely to affect ESA listed fish because of the low probability of being in the action area during project implementation, because the action area is not accessible to downstream migrant juveniles at the upstream end, and with a large dilution factor of the much larger tidal flows of the Noyo River channel, levels of turbidity that could affect feeding or migrating behaviors of juvenile salmonid migrants and green sturgeon will be limited to a localized area around each pile within the action area, in which presence of listed salmonids and green sturgeon is unlikely. Replacement of the creosote treated wood piles with concrete piles will benefit the aquatic environment by eliminating the potential for the treated wood piles to leach PAHs into the aquatic environment in the future. Therefore NMFS considers the potential for adverse effects to listed species and designated critical habitat due to temporary elevated turbidity and contaminant levels in the water column that may be generated by the project to be discountable.

The proposed project may also affect listed salmonids through the leaching of copper from the preservative AZCA used to treat the whalers of the new concrete floating docks. Copper in freshwater has been shown to affect the olfactory nerve function of salmonids at very low concentration in freshwater (NMFS 2007). Copper is near ubiquitous in freshwater environments from road runoff and other anthropogenic sources, and any increase above background levels can significantly affect salmonids' ability to detect and avoid predators, find prey, and has been shown to affect homing ability to natal streams. Despite the known impacts of dissolved copper in freshwater to functioning of the olfactory nerve of salmonids, recent research funded by the San Francisco Estuary Institute indicate that dissolved copper in saltwater has far less of an impact on olfactory nerve function of the sea water life history stage of salmon species. Specifically, the research found that while concentrations of 5 µg/L of copper in freshwater had a significant impact

on olfactory nerve function, 100 µg/L of copper in seawater showed no significant impact (Baldwin, 2012). Research by manufacturers for EPA registration of copper based wood preservatives has shown the leaching of copper from preserved wood occurs primarily in the first few days the wood is exposed to water, and leaching of additional copper from the wood is nearly eliminated within a matter of months. Additionally, leached copper is quickly bound up with dissolved solids and suspended particles in the water column, soil particles in the underlying substrate, and significantly diluted by tidal currents. Also, the AZCA treated whalers of the floating docks will be floating above the water line, thus the leaching of copper from the structure will be limited to the infrequent periods when the docks are inundated during sustained rainfall events. Any localized elevated levels of copper leachate will quickly disperse from the project area with tidal circulation. Listed anadromous salmonids and green sturgeon in the San Francisco Bay estuary commonly encounter areas of increased copper due to storm flow runoff events, wind and wave action leaching wood preservatives from existing structures, and benthic foraging activities of other aquatic organisms. Therefore, the minor and localized areas of copper in the water column and substrate associated with this project are not expected to impair or harm listed fish species, and are not expected to result in short-term or long-term impacts to aquatic habitat. Once project construction is completed, impacts to salmonids and their designated critical habitat, or to green sturgeon are anticipated to be insignificant.

Primary constituent elements (PCEs) of designated critical habitat for salmonids in the Noyo River estuary include water quality and quantity, foraging habitat, natural cover including large substrate and aquatic vegetation, and migratory corridors free of obstructions. As listed above, the primary potential of the project to affect designated critical habitat of listed fish is due to over-water shading by the docks to be replaced. The shadow cast by an overwater structure affects both the plant and animal community below the structure by limiting light for photosynthesizers such as diatoms, benthic algae, eelgrass, and other macrophytes (Haas *et. al.* 2002), and by providing cover and perching platforms for piscivores (Helfman 1981).

The minimum depth of the mooring basin at low tide is approximately 16 feet (SHN 2013). This depth is maintained with periodic dredging. Both the periodic dredging and the maintained depths likely limit the ability of benthic algae, eelgrass and other macropphytes common to shallow bays and estuaries to become established within the action area. The action area is also isolated from the main channel of the Noyo River by a wooden seawall except for the exit/entrance for boats at the downstream end. The isolation from the natural tidal and river currents likely limits both recruitment of macrophytes to the action area and its suitability as habitat for submerged aquatic vegetation. The seawall which abuts the shoreline at the upstream end also likely limits the action area's use by downstream migrating salmonids, the life history stage which would be most susceptible to predation by piscivores using the floating docks for cover or perching platforms. Additionally, given the small footprint of the action area in relation to the Noyo River estuary, potential effects to available forage areas is expected to be negligible. The overall effects of the project are not expected to result in either a net change to existing habitat values or result in adverse impacts to designated critical habitat for salmonids. For these reasons NMFS believes the shading impacts on critical habitat of the non-light transmitting docks within the mooring basin action area will be insignificant.

NMFS has evaluated the proposed project for potential adverse effects to ESA-listed anadromous salmonids, their designated critical habitats and on ESA-listed green sturgeon. Based on the best available scientific information, NMFS concurs with the Corp's determination that the proposed project is not likely to adversely affect NC steelhead, CCC coho salmon, CC Chinook salmon or the southern DPS of North American green sturgeon. Regarding critical habitat, NMFS has determined the proposed project is not likely to adversely affect essential physical or biological features associated with designated critical habitat for NC steelhead, CCC coho salmon, and CC Chinook salmon This concludes consultation in accordance with 50 CFR §402.13(a) for the proposed project design and scheduling to rebuild and repair the existing floating docks within the existing footprint of the current dock structure in the Noyo Harbor mooring basin in Fort Bragg, California. However, further consultation may be required if: (1) new information becomes available indicating that listed species or critical habitat may be affected by the project in a manner or to an extent not previously considered; (2) current project plans change in a manner that causes an effect to listed species or critical habitat in a manner not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

Magnuson-Stevens Fishery Conservation and Management Act

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

NMFS determined the proposed action would adversely affect EFH as follows:

1. Localized increases in turbidity and
2. Suspension of sediment-borne contaminants.

The project proposes to remove 48 creosote-treated wood piles and replace with 25 concrete piles and to replace damaged wood docks and fingers with concrete structures at a 1:1 ratio. Increased turbidity due to pile removal and driving can limit light availability and cause detrimental impacts to native aquatic biota, such as *Zostera marina*, common name of eelgrass, and phytoplankton (Dennison and Alberte 1986, Zimmerman *et al.* 1991). The contents of the suspended material may react with the dissolved oxygen in the water and result in short-term oxygen depletion to aquatic resources (Nightingale and Simenstad 2001). Eelgrass is present in the Noyo Harbor and outside of the mooring basin. Eelgrass beds are highly functional habitat providing productivity, prey, refuge, and physical structure in nearshore marine systems (Plummer *et al.* 2013; Subtidal Habitat Goals 2010). Eelgrass provides a high level of primary production, forming the base of detrital-based food webs and providing a food source for organisms that feed directly on eelgrass (Deegan *et al.* 2002). Secondary production of eelgrass includes support of epiphytic plants, animals, and microbial organisms that are grazed upon by invertebrates, larval and juvenile fish, and birds. Eelgrass is not expected to be present in the action area, but pre- and post-construction surveys of eelgrass will be conducted. Following implementation of avoidance and minimization

measures, such as use of a silt curtain, no impacts to eelgrass are expected. If direct or indirect impacts to eelgrass are observed in the post-construction survey, then a mitigation plan will be agreed upon between the project proponent and NMFS staff.

Pile excavation and driving may release sediment-borne contaminants in the aquatic habitat. Creosote, a distillate of coal tar, is a complex chemical mixture, up to 80% of which is comprised of polycyclic aromatic hydrocarbons (PAHs). Polycyclic aromatic hydrocarbons are acutely toxic to aquatic life. Removal of existing creosote pilings will improve water quality in the project area by removing this on-going source of contaminant leaching. With regard to water quality, the avoidance and minimization measure of using a silt curtain will abate the suspension of sediment-borne contaminants in the water column. Furthermore, benefits to EFH are expected with the removal of approximately 48 creosote-treated timber piles.

The proposed floating dock replacements will continue to shade 7,316 square feet of the substrate of the Noyo Harbor Mooring Basin. However, depths of water under the floating docks likely preclude growth of eel grass under the docks in all areas except for where the docks meet the shoreline. Furthermore, the project will replace damaged creosote-treated wood piles, docks and fingers with concrete structures. There will be a net decrease of 25 sq. ft. of fill. Beneficial effects to EFH are expected from the removal of creosote-treated wood and a net decrease in fill. Furthermore, the project proponents have implemented avoidance and minimization measures for potential impacts to eelgrass.

As discussed above, NMFS has determined the proposed project would adversely affect EFH for species managed under the Pacific Salmon, Coastal Pelagic and Pacific Groundfish FMPs. However, the project contains adequate avoidance and minimization measures. Pursuant to 50 CFR 600.920(l) of the EFH regulations, the Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH. This concludes EFH consultation for the proposed replacement of structures damaged by the 2011 tsunami in the Noyo Harbor, Fort Bragg, California.

If you have any questions about these comments, please contact John McKeon at 707-575-6069 / john.mckeon@noaa.gov, or Autumn Cleave at (707) 575-6056 / autumn.cleave@noaa.gov.

Sincerely,

Signature on File

for William W. Stelle, Jr.
Regional Administrator

cc: Kevin Michel, Noyo Harbor District, Fort Brag
Tom Herman, SHN Engineering, Willits
Dominick McCormack, Corps, San Francisco District
copy to file: 151422WCR2014SR00033

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A. Personal Communications

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M E M O

EXHIBIT NO. 6
APPLICATION NO.
1-13-0603
(Noyo Harbor District)
PILE DRIVING UNDERWATER NOISE ANALYSIS

Date: July 3, 2013

To: Thomas M. Herman. PLS
Regional Manager
SHN Consulting Engineers & Geologists, Inc.
335 South Main Street
Willits, CA 95490

From: Keith Pommerenck

SUBJECT: **Noyo Harbor Mooring Basin, Proposed Dock Replacement & Modification Pile Driving Underwater Noise Analysis**

The following memorandum was prepared by Illingworth & Rodkin, Inc. and includes a summary of the hydro-acoustic analysis completed for the driving of 14-inch square concrete piles in connection with Noyo Harbor Mooring Basin Dock replacement and Modification Project.

The primary source of underwater noise will be from the driving of the 46 foot long 14-inch square concrete piles. There is currently one option under consideration; Option 3 which requires the driving of four piles at Berthing B; 15 piles for the replacement of Berthing C; and three piles at the end of Berthing's D and E, for a total of 25 piles. Based on previous projects where concrete pile are driven we assumed that a smaller diesel impact hammer would be used to drive the piles. A hammer similar to a DelMag D30-32 or D36-32 which has an energy rating of 35,400 to 90,720 ft.-lbs. could be used. The piles will be driven into the existing mud bottom approximately 20 feet which we assumed would require approximately 300 blows to reach the final tip elevation. This was calculated by assuming 10 blows per foot at the beginning of the drive and 25 blows per foot at the end of the drive. The primary sources of underwater noise would be from direct radiation from the pile being driven and the ground borne vibration released from the bottom of the harbor. Underwater sounds from the pile driving activities are described below. Predictions for distances to the National Marine Fisheries (NMFS) Criteria[1] are made using levels based on actual measurements taken by Illingworth & Rodkin, Inc. from similar pile driving experiences on other projects in Northern California.

[1] Memorandum of Understanding from the Fisheries Hydroacoustic Working Group Dated June 12, 2008 and signed by NOAA's Fisheries, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Federal Highway Administration, and the California/Washington/Oregon Departments of Transportation.

Fundamentals of Underwater Noise

When a pile driving hammer strikes a pile a pulse is created that propagates through the pile and radiates sound into the water, the ground substrate, and the air. Sound pressure pulse as a function of time is referred to as the waveform. In terms of acoustics, these sounds are described by the peak pressure, the root-mean-square pressure (RMS), and the sound exposure level (SEL). The peak pressure is the highest absolute value of the measured waveform, and can be a negative or positive pressure peak. For pile driving pulses, RMS level is determined by analyzing the waveform and computing the average of the squared pressures over the time that comprise that portion of the waveform containing 90% of the sound energy.[2] The pulses RMS level has been approximated in the field for pile driving sounds by measuring the signal with a precision sound level meter set to the "impulse" RMS setting and is typically used to assess impacts to marine mammals. Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The total sound energy in the pulse is referred to in many ways, such as the "total energy flux"[3]. The "total energy flux" is equivalent to the un-weighted sound exposure level (SEL) for a plane wave propagating in a free field, a common unit of sound energy used in airborne acoustics to describe short-duration events. The unit is dB re $1\mu Pa^2$-sec. In this report, peak pressures and RMS sound pressure levels are expressed in decibels re 1 μPa; however, in other literature they can take other forms such as a Pascal or pounds per square inch. The total sound energy in an impulse accumulates over the duration of that pulse. How rapidly the energy accumulates may be significant in assessing the potential effects of impulses on fish. The attached figure illustrates the units used to describe the acoustical characteristics of an underwater pile driving pulse. Table 1 includes the definitions of terms commonly used to describe underwater sounds.

The variation of instantaneous pressure over the duration of a sound event is referred to as the waveform. Studying the waveforms can provide an indication of rise time; however, rise time differences are not clearly apparent for pile driving sounds due to the numerous rapid fluctuations that are characteristic to this type of impulse. A plot showing the cumulation of sound energy over the duration of the pulse (or at least the portion where much of the energy accumulates) illustrates the differences in source strength and rise time. An example of the characteristics of a typical pile driving pulse is shown in Figure 1.

SEL is an acoustic metric that provides an indication of the amount of acoustical energy contained in a sound event. For pile driving, the typical event can be one pile driving pulse or many pulses such as pile driving for one pile or for one day of pile driving. Typically, SEL is measured for a single strike and a cumulative condition. The cumulative SEL associated with the driving of a pile can be estimated using the average single strike SEL value and the number of pile strikes through the following equation:

$$SEL_{CUMULATIVE} = SEL_{SINGLE\ STRIKE} + 10 \log (\#\ of\ pile\ strikes)$$

For example, if the average single strike SEL for a pile is 165 dB and it takes 1000 strikes to drive the pile, the cumulative SEL is 195 dBA (165 dB + 30 dB = 195 dB), where $10 * Log_{10}(1000) = 30$.

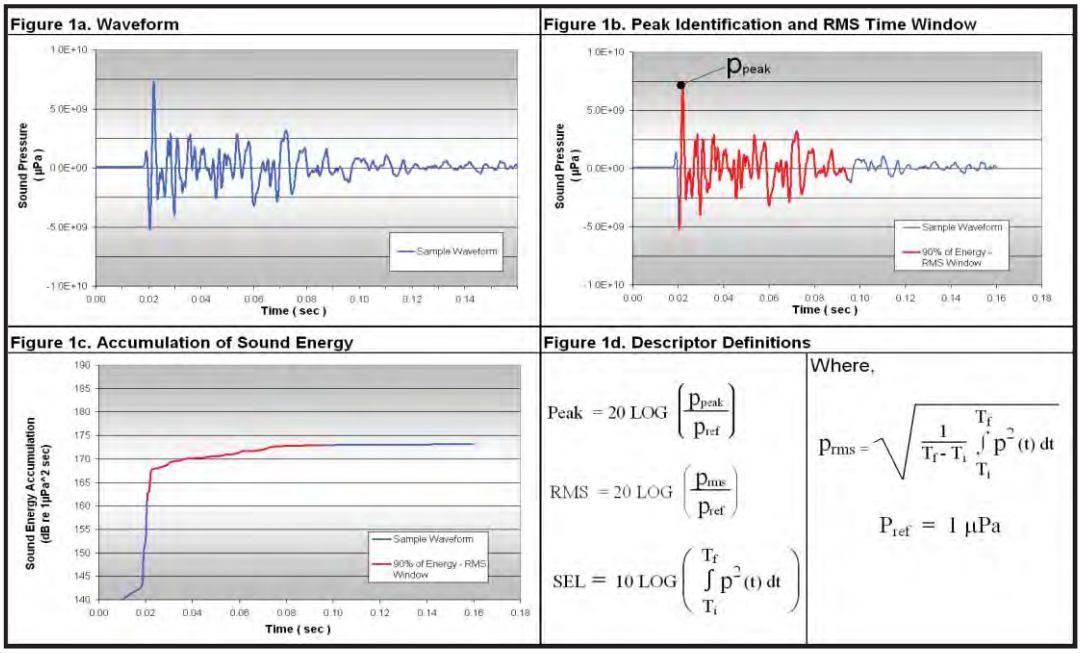
[2] Richardson, Greene, Malone & Thomson, *Marine Mammals and Noise*, Academic Press, 1995 and Greene, personal communication.

[3] Finerran, et. al., *Temporary Shift in Masked Hearing Thresholds in Odontocetes after Exposure to Single Underwater Impulses from a Seismic Watergun*, Journal of the Acoustical Society of America, June 2002.

Table 1 - Definitions of Underwater Acoustical Terms

TERM	DEFINITIONS
Peak Sound Pressure, unweighted (dB)	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1 µPa) but can also be expressed in units of pressure, such as µPa or PSI.
RMS Sound Pressure Level, (NMFS Criterion) dB re 1 µPa	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse[4].
Sound Exposure Level (SEL), dB re 1 μPa^2 sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of dB re 1 μPa^2 sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Cumulative SEL	Measure of the total energy received through a pile-driving event (here defined as pile driving that occurs with a day).
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds)
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in rms pressure and defined frequency bandwidth

Figure 1 - Characteristics of a Pile Driving Pulse



Underwater Sound Thresholds

A Fisheries Hydroacoustic Workgroup (FHWG) that consisted of transportation officials, resources agencies, the marine construction industry (including Ports), and experts was formed in 2003 to address the underwater sound issues associated with marine construction. The first order of business was to document all that was clearly known about the effects of sound on fish. The result of this effort was a report prepared by Dr. Mardi Hastings and Dr. Arthur

[4] The underwater sound measurement results obtained during the Pile Installation Demonstration Project indicated that most pile driving impulses occurred over a 50 to 100 millisecond (msec) period. Most of the energy was contained in the first 30 to 50 msec. Analysis of that underwater acoustic data for various pile strikes at various distances demonstrated that the acoustic signal measured using the standard "impulse exponential-time-weighting" (35-msec rise time) correlated to the RMS (impulse) level measured over the duration of the impulse.

Popper, titled Effects of Sound on Fish[5]. This report provided recommended preliminary guidance to protect fish. A graph showing the relationship between the SEL from a single pile strike and injurious effects to fish based on size (i.e., mass) was presented. Fish with a mass of about 0.03 grams were expected to have no injury for a received SEL of a pile strike below 194 dB and suffer 50% mortality at about 197 dB. The report also described possible effects to the auditory system (i.e., auditory tissue damage and hearing loss), based on a received dose of sound. The recommendations were frequency dependent, based on the hearing thresholds of fish or most sensitive auditory bandwidths. Presentations to the FHWG found that, for salmonids, hearing effects would be expected at or near the thresholds for injury based on the single strike SEL. Research to further investigate the effects of pile driving sounds on fish was also recommended in this report. Some of these were taken up in an ongoing National Cooperative Highway Research Program (NCHRP 25-28). This NCHRP study is intended to develop guidelines for the prediction and mitigation of the impacts on fish from underwater sound pressure and particle motion caused by pile driving.

To provide additional explanation of the injury criteria recommended in the "The Effects of Sound on Fish" and to provide a practical means to apply the criteria, Caltrans commissioned Dr. Popper and other leading experts to prepare a subsequent report. This report is entitled "Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper", (*White Paper*).[6] The *White Paper* recommends a dual criterion for evaluating the potential for injury to fish from pile driving operations. The dual approach considered that a single pile strike with high enough amplitude, as measured by zero to peak (either negative or positive pressure) could cause injury. A peak pressure threshold for a single strike was recommended at 208 dB. The White Paper suggested a value between 205 and 215 dB and found through other studies, the 208 dB level was adequate.

To account for the energy in a single strike, the SEL metric proposed by Hastings and Popper was included as the second part of the duel criteria. The proposed threshold is 187 dB SEL that would be applied to only the highest pile strike. Thus, the dual criteria of 208 dB Peak or 187 dB SEL for any pile strike were recommended for the interim until further research has been conducted.

On June 12, 2008, NOAA's National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service, California, Oregon, and Washington Departments of Transportation, California Department of Fish and Game and the U.S. Federal Highway Administration agreed in principal to interim criteria to protect fish from pile driving activities. These agreed upon interim criteria are as follows:

Table 2 Adopted Fish Criteria

Interim Criteria for Injury	Agreement in Principle
Peak	206 dB re: 1μPa (for all size of fish)
Cumulative SEL	187 dB re: 1μPa^2-sec – for fish size of two grams or greater. 183 dB re: 1μPa^2-sec – for fish size of less than two grams.

[5] Hastings, M and A. Popper. 2005. Effects of Sound on Fish. Prepared for the California Department of Transportation. January 28 (revised August 23).

[6] Popper, A., Carlson, T. , Hawkins, A., Southall, B., and Gentry, R. 2006. Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper. May 15.

The primary difference between the adopted criteria and previous recommendations is that the single strike SEL was replaced with a cumulative SEL over a day of pile driving. NMFS does not consider events that produce a SEL per strike of less than 150 dB to accumulate and cause injury.

The adopted criteria listed in Table 2 are for pulse-type sounds (e.g., impact pile driving) and does not address sound from vibratory driving. The SEL criteria are not applied to vibratory driving sounds.

NMFS is currently developing comprehensive guidance on sound levels likely to cause injury and behavioral disruption in the context of the MMPA. Until formal guidance is available, NMFS uses conservative thresholds of sound pressure levels from broadband sounds that cause behavioral disturbance. Table 3 outlines the various thresholds currently used by NMFS.

Table 3 Marine Mammal Disturbance Thresholds for Marine Construction Activities

	Underwater Noise threshold (dB re: 1µPa)		
Species	**Vibratory Pile Driving Disturbance Threshold**	**Impact Pile Driving Disturbance Threshold**	**Injury Threshold**
Harbor Seals	120 dB RMS	160 dB RMS	190 dB RMS
Sea Lions and Sea Otters	120 dB RMS	160 dB RMS	190 dB RMS
Cetaceans	120 dB RMS	160 dB RMS	180 dB RMS

Source: (70 FR 1871), Southal et al. 2007: 71FR 3260 January 20, 2006; and WADOT.wa.gov/nr/rdonlyres/216F21DA./BA_Marine/Noisethreshold.pdf

Concrete Piles

The Noyo Harbor Project would involve pile driving in the water. Many projects monitored by Illingworth & Rodkin, Inc. have involved the driving of concrete piles of a larger or similar size in the water. A review of four different projects was conducted to develop representative source levels. These projects include the Pier 2 at the Concord Naval Weapons Station[7], Berkeley Marina measured in 2007[8], Caged Fish Study for Berth 32, Port of Oakland[9], and the Berkeley Marina measured in 2009[10]. A review of these studies indicate that similar piles driven the water produce average underwater sound levels of about 184 dB peak, 169 dB RMS and 158 dB SEL at a distance of 10 meters from the pile driving (see Table 4 for summary of levels).

[7] Illingworth & Rodkin, Inc. 2003. *Structural Repairs to Pier 2 Naval Weapons Station, Concord, California – Report of Underwater Sound Level Measurements Resulting from Pile Driving*. Report to Miller Thompson Constructors dated January 17, 2003.

[8] Illingworth & Rodkin, Inc. 2007. *Underwater Sound Levels Associated with Pile Driving Activities Associated with* Berkeley Marina Concrete Pile Installation. Report to Vortex Caltrans dated April 23, 2007

[9] Strategic Environmental Consulting (SEC). *2005. Monitoring the Effects of Conventional Pile Driving on Three Species of Fish. April 8, 2005.*

[10] Illingworth & Rodkin, Inc. 2009. Underwater Sound Levels Associated with Pile Driving at the Berkeley Marina, Dutra Construction, November 2009.

Table 4 - Sound Pressure Levels used in Analysis Measured dB re: 1uPa

Project	Peak	RMS	SEL (1-Sec)	Distance
Concord Naval Station, 16-inch concrete piles	183	169	--[1]	10 meters
Berkeley Marina, (2007) 18-inch Concrete piles	181	167	155	10 meters
Bert 32 Port of Oakland – 24-inch concrete piles	185	173	162	10 meters
Berkeley Marina, (2009) 18-inch Concrete piles	186	169	158	10 meters

[1] – SEL not measured

The data used in this analysis is based primarily on the data measured for the piles driven at the Berkeley Marina measured in 2007 and 2009. The conditions at the Berkeley Marina project site are similar in terms of the depth of water and in terms that the piles were driven primarily to contain docks. To be conservative in our analysis the maximum levels from the Berkeley Marina measurements were used as the baseline data for the analysis. Tables 5 and 6 show the levels and distance to the various marine mammal and fish thresholds calculated for both attenuated and unattenuated scenarios. Attachment 1 shows the National Marine Fisheries Worksheet used to calculate the data shown in Table 5 and 6. Table 7 summarizes the data showing the distances to the various marine mammal disturbance thresholds and fish injury thresholds.

Table 5 - Unattenuated Pile Strikes - 14" concrete piles

						Accumulated SEL for Number of Piles Driven in 12 hr Period									
	Blows	Hammer type	Peak Sound Pressue	RMS Level	Single Strike SEL	1	2	3	4	5	6	7	8	9	10
	300	D46	186	169	158	183	186	188	189	190	191	191	192	192	193
						Distance to Cumulative SELfor number of piles driven - Meters									
	Blows	Hammer type	Peak Sound Pressue	RMS Level	Single Strike SEL	1	2	3	4	5	6	7	8	9	10
187 dB	300	D46	186	169	158	<10	<10	11	13	15	17	19	21	23	24
183 dB	300	D46	186	169	158	10	15	20	24	28	32	35	39	42	45
			Distace to the 160 dB Marine Mammal Harrasment zone			40									

table 6 - Attenuated Pile Strikes - 14" Concrete Piles

						Accumulated SEL for Number of Piles Driven in 12 hr Period									
	Blows	Hammer type	Peak Sound Pressue	RMS Level	Single Strike SEL	1	2	3	4	5	6	7	8	9	10
	300	D46	179	162	151	176	179	181	182	183	184	184	185	185	186
						Distance to Cumulative SELfor number of piles driven - Meters									
	Blows	Hammer type	Peak Sound Pressue	RMS Level	Single Strike SEL	1	2	3	4	5	6	7	8	9	10
187 dB	300	D46	179	162	151	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
183 dB	300	D46	179	162	151	<10	<10	<10	<10	10	11	12	13	14	15
			Distace to the 160 dB Marine Mammal Harrasment zone			14									

Table 7 - 14-inch Concrete Piles Distance to Harassment and Injury Thresholds

	Marine Mammals (RMS)				Fish[4]		
	Pinnipeds		Cetaceans				
Threshold	**A[1]**	**B[2]**	**A[1]**	**B[2]**	**Peak**	**Large SEL**	**Small SEL**
dB re:1µPa	**190 dB**	**160 dB**	**180 dB**	**160 dB**	**206 dB**	**187 dB**	**183 dB**
Unattenuated	0	40	<10	40	<10	<10[3]	10[3]
Attenuated	0	14	<10	14	0	<10[3]	<10[3]

1 Level A harassment, as defined by the 1994 Marine Mammal Protection Act, has the potential to injure a marine mammal or marine mammal stock in the wild.

2 Level B harassment, as defined by the 1994 Marine Mammal Protection Act, has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild

3 Based on one pile with a total number of pile strikes equal to 300 blows.

4 Memorandum of Understanding from the Fisheries Hydroacoustic Working Group Dated June 12, 2008 and signed by NOAA's Fisheries, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Federal Highway Administration, and the California/Washington/Oregon Departments of Transportation

Conclusion

Based on the maximum levels measured at the Berkeley Marina Project, which was at 10 meters from the pile driving, and assuming that the concrete piles would be installed in a similar manner, the unattenuatted underwater noise levels for Option 3 should not reach the marine mammal injury thresholds or the interim threshold for fish for one pile driven during a day. If more than one pile is driven in a day the distance to the injury threshold would be 10 meters. If ten piles were driven in a day the distance could be as great as 24 meters for large fish and 45 meters for smaller fish. With unattenuatted pile driving the distance to the marine mammal harassment zone would be 40 meters. If a bubble curtain were to be used the distance to the marine mammal harassment zone would be reduced to less than 15 meters, assuming a conservative 7 dB reduction with a bubble curtain. The fish injury zone would also be reduced with the use of a bubble curtain to less than 10 meters for large fish and approximately 15 meters for smaller fish.

Attachment 1

Noyo Boat Harbor Repair Project Pile driving Calculations for Unattenuated 14-inch Concrete Piles

	Acoustic Metric			Effective Quiet
	Peak	RMS	SEL	
Measured single strike level (dB)	186	169	158	150
Distance (m)	10	10	10	34
Estimated number of strikes	300			
Cumulative SEL at measured distance				
183				

Transmission loss constant (15 if unknown)	Distance (m) to threshold					
	Peak	Cumulative SEL**	RMS	RMS	RMS	RMS
15	**206**	**187**	**183**	**190**	**180**	**160**	**150**
Use This Number in Meters	**0**	**5**	**10**	**0**	**2**	**40**	**185**
Use This Number in Feet	2	17	32	1	6	131	606
Use this number in Miles	0.0	0.0	0.0	0.0	0.0	0.0	0.1

** This calculation assumes that single strike SELs < 150 dB do not accumulate to cause injury (Effective Quiet).

Noyo Boat Harbor Repair Project Pile driving Calculations for Attenuated 14-inch Concrete Piles

	Acoustic Metric			Effective Quiet
	Peak	RMS	SEL	
Measured single strike level (dB)	179	162	151	150
Distance (m)	10	10	10	12
Estimated number of strikes	300			
Cumulative SEL at measured distance				
176				

Transmission loss constant (15 if unknown)	Distance (m) to threshold					
	Peak	Cumulative SEL**	RMS	RMS	RMS	RMS
15	**206**	**187**	**183**	**190**	**180**	**160**	**150**
Use This Number in Meters	**0**	**2**	**3**	**0**	**1**	**14**	**63**
Use This Number in Feet	1	6	11	0	2	45	207
Use this number in Miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0

** This calculation assumes that single strike SELs < 150 dB do not accumulate to cause injury (Effective Quiet).

NOYO HARBOR MOORING BASIN
DOCK REPLACEMENT & MODIFICATION
PROJECT
UNDERWATER ACOUSTIC MONITORING PLAN

Prepared for:
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January 2014

EXHIBIT NO. 7

APPLICATION NO.
1-13-0603
(Noyo Harbor District)

UNDERWATER ACOUSTIC MONITORING PLAN

INTRODUCTION

The Noyo Harbor District proposes to repair damage to the marina caused by the 2011 Tsunami event and restore the marina to the original configuration. The project consists of removing all pilings, docks, and fingers that were damaged in the tsunami and replacing them with new pilings, docks, and fingers. The new construction will consist of installing 25 14-inch square concrete mooring piles, decking and wrapped flotation structures. The new installation will have the same footprint as existed prior to the tsunami. See vicinity map (Figure 1).

Figure 1. ***Vicinity map of Noyo Harbor Mooring Basin Dock Replacement and Modification Project***

PROJECT AREA

The project is located on the Noyo River (United States Geological Survey (USGS) Hydrologic unit 180101). The water depth in the project area is between 8-10 feet deep and is behind a sea wall that protects the berths from strong tidal and river currents.

PERMIT/ESA CONDITIONS

On July 15, 2013 the Noyo Harbor District filed a request for a Permit authorization letter with the United States Army Corps of Engineers (Corps). The Corps initiated an Endangered Species

Act (ESA) "Section 7" consultation on August 8, 2013 with the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS).

Consistent with federal species protection guidelines Illingworth and Rodkin has prepared this Plan based on the following criteria:

- Be based on the dual metric criteria (Popper et al. 2006) and the accumulated Sound Exposure Level (SEL;
- Establish the distance to the 206 dB peak sound pressure criteria;
- Establish field locations that will be used to document the extent of the area experiencing 187 dB $_{\text{SEL accumulated}}$ and 183 dB $_{\text{SEL cumulative}}$;
- Establish the marine mammal injury zone for impact pile driving (190 dB Root Mean Square (RMS) for pinnipeds,180 dB RMS for cetaceans); and
- Establish the underwater behavioral zone for impact pile driving (160 dB RMS for marine mammals and 150 dB RMS for fish).

PILE INSTALLATION LOCATION

Figure 2 indicates the location of Berth B, Berth C, Berth D and Berth E of the Noyo Harbor Mooring Basin where the pile driving will occur. There will be a total of 25 piles driven as part of the Noyo Harbor Mooring Basin Project. Figure 3 shows the exact location of the piles. A pile driving schedule has not yet been developed for the project so it is not possible to show which piles will be monitored. The exact piles to be monitored will be completed at a later date prior to construction.

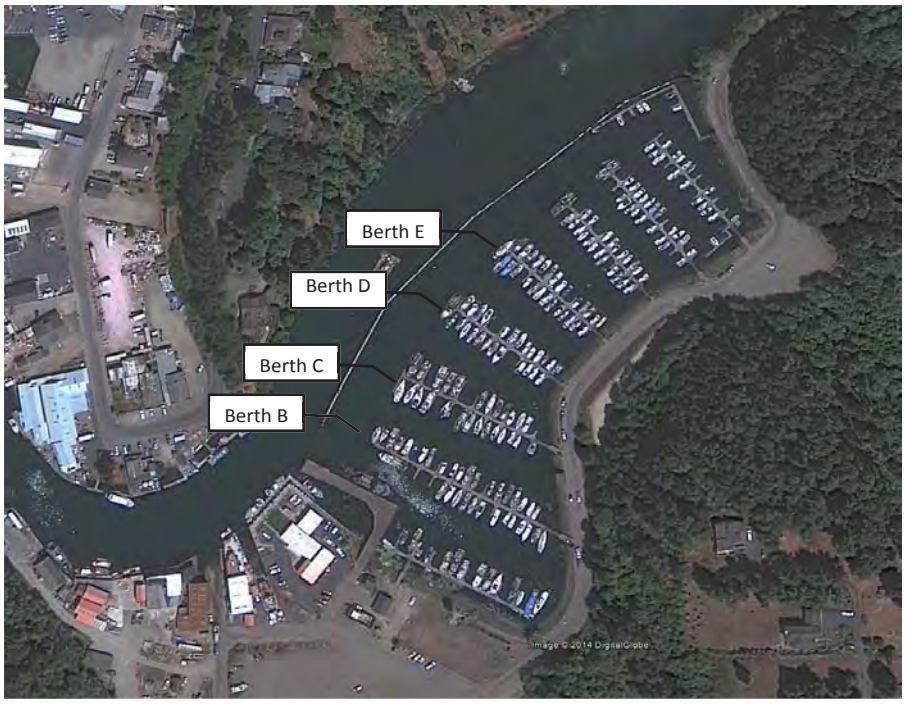

Figure 2 - Work Area.

PILE INSTALLATION

Impact Pile Driving for Fish Consultations

Hydroacoustic monitoring will be conducted for at least ten percent of piles struck with an impact hammer. Piles chosen to be monitored will be driven in water depths that are representative of typical water depths at the project location where piles will be driven.

Hydroacoustic monitoring of 14-inch square concrete piles with impact driving will include:

- Monitoring 5 piles, out of a total of 25 piles driven for the project.
- Measuring underwater background levels for a minimum of 24-Hours prior to beginning of construction;
- Airborne noise monitoring will be conducted at one fixed location on shore, at a location to be determined in the field.

Figure 3 indicates the location of the piles to be installed, the exact piles to be monitored will be determined prior to construction once the pile driving sequence has been established.
All hydrophones will be placed at least 1m (3.3 feet) below the surface. Two hydrophones will be used to assist in calculating the transmission loss over distance. Water depth at the project location is approximately 3m (10 feet). The first hydrophone will be placed 10 meters (33 feet) from the pile being driven and the second hydrophone will be placed approximately 45m (148 feet) to 150 meters (492 feet) from the pile being driven. This distance would be

approximately three times the depth of the water at the pile. Hydrophones will be located with a clear acoustic line-of-sight between the pile and the hydrophone.

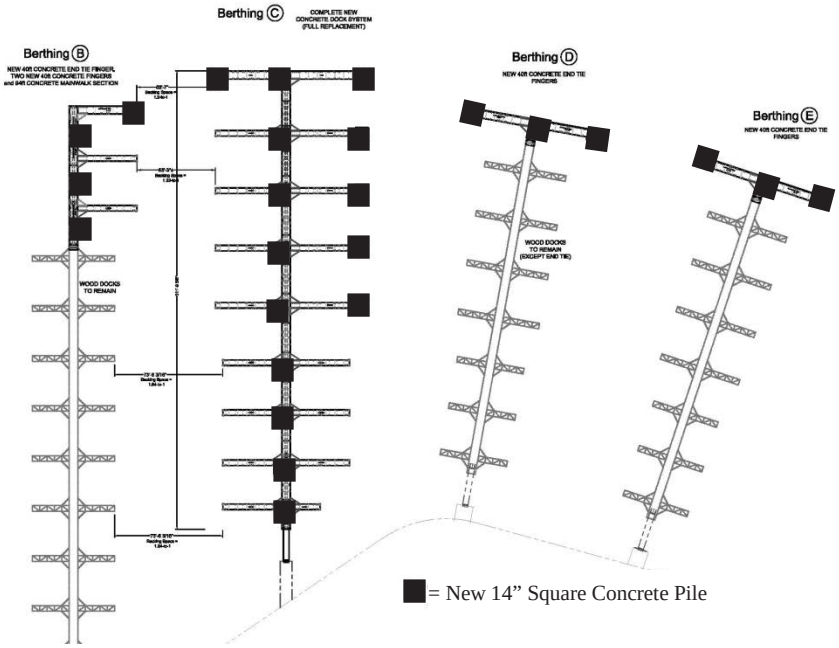

Figure 3 - Location of the piles on Berths B through E

Table 1 lists where piles are to be installed, the water depth, and the number and size of piles that will be installed.

Table 1 - Depth, Number Piles to be Monitored

Structure	Water Depth	Structural Components Installed
Berth B	*8 feet to 10 feet*	*4– 14-inch square concrete piles*
Berth C	*8 feet to 10 feet*	*15 – 14-inch square concrete piles*
Berth D	*8 feet to 10 feet*	*3– 14-inch square concrete piles*
Berth E	*8 feet to 10 feet*	*3 – 14-inch square concrete piles*

ACOUSTIC MONITOR REQUIREMENTS

The acoustic monitoring contractor will submit a detailed description of their qualifications, which must include a minimum of a bachelor's degree in a related field[1], 3 years' experience in noise monitoring and analysis, and a monitoring plan based on this template for approval by NOAA Fisheries. A list of the contractors' proposed sound level monitoring equipment shall be included, along with specifications and a description of the purpose. The measurement range in terms of amplitude (in dB referenced to one micropascal (re: 1 uPa)), sensitivity, and frequency shall be stated. A minimum frequency range of 20 Hz to 20 kHz and a minimum sampling rate of 48,000 Hz will be used when monitoring. Sampling rates higher than 48 kHz are preferred. Table 2 describes the minimum requirements of the equipment to be used. In addition to the equipment selection, quality control/quality assurance procedures should be described (e.g., how will system responses be verified and how will data be managed).

Table 2 – Sample Equipment for underwater sound monitoring

Item	Specifications	Quantity	Usage
Hydrophone	Receiving Sensitivity- 211dB ±3dB re 1V/µPa	2	Capture underwater sound pressures and convert to voltages that can be recorded/analyzed by other equipment.
Signal Conditioning Amplifier	Amplifier Gain- 0.1 mV/pC to 10 V/pC Transducer Sensitivity Range- 10^{-12} to 10^{3} C/MU	2	If necessary, used to adjust signals from hydrophone to levels compatible with recording equipment.
Calibrator (pistonphone-type)	Accuracy- IEC 942 (1988) Class 1	1	Calibration check of hydrophone in the field.
Sound Level Meter and Digital Recorder	Sampling Rate- 48K Hz or greater	4 SLMs 2 DR	SLMs measure and DR records data.
Laptop computer	Compatible with digital analyzer	1	Store digital data on hard drive.
Post-analysis	Real time Analyzer-	1	Monitor real-time signal and post-analysis of sound signals.

To facilitate further analysis of data full bandwidth, time-series underwater signal shall be recorded as a text file (.txt) or wave file (.wav) or similar format. Recorded data shall not use data compression algorithms or technologies (e.g. MP3, compressed .wav, etc.).

[1] This can include Institute of Noise Control Engineering of the USA (INCE/USA) certification or related fields such as acoustics, physics, oceanography, geology or other physical sciences that have required coursework in physics.

METHODOLOGY

Background underwater noise levels will be measured for a minimum of one full 24-hour cycle (i.e., 6 am to 6 am) in the absence of construction activities to determine background sound levels (Stockham et al., 2010). Following NMFS guidance (NMFS, 2012), see Attachment 1, the analysis will be conducted using both data from the full range of frequencies recorded from 7 Hz to 20 kHz. Data will be used to calculate 30-second Root Mean Square (RMS) values for each 30 second period of the 24-hour cycle measured. These data will be used to calculate and plot a Cumulative Distribution Function (CDF) (NMFS, 2009). Overall average background sound levels will be reported as the 50% CDF and include a spectral analysis of the frequencies (NMFS, 2009) for a minimum of an hourly cycle.

One hydrophone will be placed at mid water depth at the nearest distance, approximately 10 meters, from each pile being monitored. An additional hydrophone will be placed at mid water depth at a distance of 45 meters (148 feet) to 150 meters (492 feet) from the pile to provide two sound level readings during ambient and pile driving recording. A weighted tape measure will be used to determine the depth of the water. The hydrophones will be attached to a nylon cord or a steel chain if the current is swift enough to cause strumming of the line. One end of the nylon cord or chain will be attached to an anchor that will keep the hydrophone at the specified distance from the pile. The opposite end of the nylon cord or chain will be attached to a float or tied to a static line at the surface at the specified recording distance from the pile. The distance will be measured by a tape measure, where possible, or a range finder. To the extent practicable, there will be a direct line of sight between the pile and the hydrophones.

Ambient underwater sound levels will be measured for at least 1 minute prior to initiation of pile driving, as well as in the absence of construction activities. It will be necessary to have the inspector/contractor inform the hydroacoustic specialist when pile driving is about to start.

Underwater sound levels will be continuously monitored during the entire duration of each pile being driven. The Peak, RMS, and SEL level of each strike will be monitored in real time. The $SEL_{cumulative}$ will also be monitored live, assuming no contamination from other noise sources. Sound levels will be measured in decibels.

Prior to and during the pile driving activity, environmental data will be gathered, including but not limited to wind speed and direction, air temperature, water depth, wave height, weather conditions, and other factors (e.g. aircraft, boats, etc.) that could contribute to influencing the underwater sound levels. Start and stop time of each pile driving event will be recorded.

Ambient underwater sound levels will be measured for a minimum of one minute in the absence of construction activities to determine background levels. Ambient levels will be reported as RMS and include a spectral analysis of the frequencies.

If when collecting sound measurements there are tidally influenced currents, appropriate measures will be taken to ensure that the flow-induced noise at the hydrophone will not interfere with the recording and analysis of the relevant sounds (NMFS, 2012a). As a general rule, current speeds of 1.5 meters/second (2.9 knots) or greater are expected to generate significant flow-induced noise, which may interfere with the detection and analysis of low-level sounds, such as the sounds from a distant pile driver or background sounds. If it becomes necessary to reduce the flow-induced noise at the hydrophone, a flow shield will be described and installed around the hydrophone to provide a barrier between the irregular, turbulent flow and the hydrophone. A flow shield will be used when the tidal flow is expected to approach 1.5 meters/sec (2.9 knots).

The hydrophone calibrations will be checked at the beginning of each day of monitoring activity. Calibration of measurement systems shall be established prior to use in the field each day. An acoustical piston phone and hydrophone coupler would be used along with manufacturer calibration certificates. Calibration of measurement systems would be established using an acoustically certified piston phone and hydrophone coupler that fits the hydrophone and that directly calibrates the measurement system. The volume correction of the hydrophone coupler using the hydrophone is known so that the piston phone produces a known signal that can be compared against the measurement system response. The response of the measurement system is noted in the field book and applied to all measurements.

The SLMs are calibrated to the calibration tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audio recordings that will be used. The system calibration status would be checked by measuring the calibration tone and recording the tones. The recorded calibration tones are used for subsequent detailed analyses of recorded pile strike sounds.

National Institute of Standards and Technology traceable calibration forms shall be provided for all relevant monitoring equipment. Prior to the initiation of pile driving, the hydrophone will be placed at the appropriate distance and depth as described above.

The onsite inspector/contractor will inform the acoustics specialist when pile driving is about to start to ensure that the monitoring equipment is operational. Underwater sound levels will be continuously monitored during the entire duration of each pile being driven with a minimum one-third octave band frequency resolution. The wideband instantaneous absolute peak pressure and SEL values of each strike, and daily cumulative SEL should be monitored in real time during construction to ensure that the project does not exceed its authorized take level. Peak and RMS pressures will be reported in dB (re: 1 µPa). SEL will be reported in dB (re: 1 $\mu Pa^2 \cdot sec$). Wideband time series recording is strongly recommended during all impact pile driving.

Prior to and during the pile driving activity, environmental data will be gathered, such as water depth and tidal level, wave height, and other factors that could contribute to influencing the underwater sound levels (e.g. aircraft, boats, etc.). Start and stop time of each pile driving event and the time at which the bubble curtain or functional equivalent[2] is turned on and off will be logged.

If the levels at the 10-meter location indicate that either of the dual criteria (single strike peak or accumulated SEL) may be exceeded, the Noyo Harbor District representative (construction manager) will be notified. The construction manager will then suspend pile driving while the raw data from the sound level meter (SLM) is down loaded and analyzed. All non-pile driving noise and SEL levels below 150 dB re: 1µPa will then be removed from the cumulative SEL calculation and an estimate of the number of strikes that would allow the accumulated SEL to remain below the criteria level would be calculated and reported to the construction manager. At this time the construction manager could authorize the pile driving to continue for the calculated number of strikes. If either the dual criteria, 206 dB peak or the cumulative SEL level of 187 dB 1 μPa^2-sec are exceeded the appropriate regulatory agency would be notified and the construction manager will immediately suspend all pile driving activities until such time as the two sound threshold levels are reduced sufficiently that pile driving activities may recommence. Regulatory agency will be notified of any modified construction methodologies required to meet the peak and cumulative noise thresholds.

The contractor or agency will provide the following information, in writing, to the contractor conducting the hydroacoustic monitoring for inclusion in the final monitoring report: a description of the substrate composition, approximate depth of significant substrate layers, hammer model and size, pile cap or cushion type, hammer energy settings, and any changes to those settings during the piles being monitored, depth pile driven, blows per foot for the piles monitored, and total number of strikes to drive each pile that is monitored.

Sound Attenuation Monitoring

An approved noise attenuation system will be in use during all monitoring. Testing of this system, in terms of turning the system off during pile driving, is not anticipated.

[2] A functional equivalent must function as well as or better than the attenuation device that was proposed during consultation or required by the ESA consultation or applicable permits. It must achieve the same or better sound level reductions that were used in the calculations during ESA consultation or the permitting process.

SIGNAL PROCESSING

Impact Pile Driving for Fish Consultations

Post-analysis of the underwater pile driving sounds will include:

- Number of pile strikes per pile and per day.
- For each recorded strike (or each strike from a subset), determine the following:
    - The peak pressure, defined as the maximum absolute value of the instantaneous pressure (overpressure or underpressure).
    - The root mean squared sound pressure across 90% of the pile strikes acoustic energy ($RMS_{90\%}$) or $RMS_{impulse}$[3].
    - Sound exposure level, measured across the accumulated sound energy during pile strikes.
- Maximum, mean, and range of the peak pressure, with, and if applicable, without attenuation.
- Maximum, mean, range, and Cumulative Distribution Function (CDF) of the $RMS_{90\%}$, both with, and if applicable, without attenuation where the CDF is used to report the percentage of $RMS_{90\%}$ or $RMS_{impulse}$ values above the thresholds.
- Maximum, mean, and range of the SEL, both with, and if applicable, without attenuation.
- The accumulated SEL across all of the pile strikes for each pile measured. If SEL is to be calculated based on the number of strikes, Accumulated SEL is estimated as follows: $cSEL = SEL_{mean} + 10*\log$ (total # strikes).
- Where surrogate piles are monitored to represent a larger project, an estimate of the accumulated SEL during a typical day of construction driving would be reported by summing the SEL over the expected number of pile strikes in a typical day for the larger project: Accumulated $SEL = SEL_{mean} + 10*\log(\#strikes)$. The SEL_{mean} used in this calculation must correspond with the actual sound attenuation measures that will be used during construction of the larger project.
- A frequency spectrum both with and without attenuation, between a minimum of 20 and 20 kHz for up to eight successive strikes with similar sound levels.

[3] Analysis of the data from the San Francisco-Oakland Bay Bridge Pile Installation Demonstration project indicated that 90 percent of the acoustic energy for most pile driving impulses occurred over a 50 to 100 millisecond period with most of the energy concentrated in the first 30 to 50 milliseconds (Illingworth and Rodkin, 2001).

REPORTING

Preliminary results for the daily monitoring activities, if required, will be reported to the primary point of contact for the Harbor District within 24 hours after monitoring concludes for the day. In addition a draft report, including data collected and summarized from all monitoring locations, will be submitted to the Harbor District and NOAA Fisheries within 90 days of the completion of hydroacoustic monitoring. The results will be summarized in graphical form and include summary statistics and time histories of impact sound values for each pile. A final report will be prepared and submitted to the Services within 30 days following receipt of comments on the draft report from the Services. The report shall include:

1. Size and type of piles.
2. A detailed description of the noise attenuation device, including design specifications.
3. The impact hammer energy rating used to drive the piles, and make and model of the hammer.
4. A description of the sound monitoring equipment.
5. The distance between hydrophones and pile.
6. The depth of the hydrophones and depth of water at hydrophone locations.
7. The distance from the pile to the water's edge.
8. The depth of water in which the pile was driven.
9. The depth into the substrate that the pile was driven.
10. The physical characteristics of the bottom substrate into which the piles were driven.
11. The total number of strikes to drive each pile and for all piles driven during a 24-hour period.
12. The results of the hydroacoustic monitoring, as described under Signal Processing. An example table is provided in Appendix A for reporting the results of the monitoring.
13. The distance at which peak, cumulative SEL, and RMS values exceed the respective threshold values.
14. A description of any observable fish, marine mammal, or bird behavior in the immediate area and, if possible, correlation to underwater sound levels occurring at that time.

REFERENCES

Illingworth and Rodkin, Inc. 2001. Noise and Vibration Measurements Associated with the Pile Installation Demonstration Project for the San Francisco-Oakland Bay Bridge East Span, Final Data Report, Task Order 2, Contract No. 43A0063.

NMFS, 2012a. Guidance Document: Data Collection Methods to Characterize Underwater Background Sound Relevant to Marine Mammals in Coastal Near shore Waters and Rivers of Washington and Oregon. Memorandum: NMFS Northwest Fisheries Science Center – Conservation Biology Division and Northwest Regional Office – Protected Resources Division, January 31, 2012.

NMFS, 2012b. Guidance Document: Data Collection Methods to Characterize Impact and Vibratory Pile Driving Source Levels Relevant to Marine Mammals. Memorandum: NMFS Northwest Fisheries Science Center – Conservation Biology Division and Northwest Regional Office – Protected Resources Division, January 31, 2012.

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APPENDIX A

Table 1. Example table for required information for reporting the results of hydroacoustic monitoring of pile driving.

Date and Time	Pile ID	Hammer Impact or Vibratory	# Strikes or Vibratory Seconds	Distance to Pile from Hydrophone (m)	Water Depth (m)		Peak (dB)			$SEL_{90\%}$ (dB)				$RMS_{90\%}$ (dB)		
					At Pile	At H-phone	Max	Min	Mean	Max	Min	Mean	$cSEL_{90\%}$	Max	Min	Mean

Eelgrass Monitoring Plan

Noyo Harbor Mooring Basin Tsunami Repair Project
Fort Bragg, California

PWA Report No. 141007001

February 2014

Prepared for:

Noyo Harbor District
19101 S Harbor Dr
Fort Bragg, CA 95437

Attn: Kevin Michel

EXHIBIT NO. 8

APPLICATION NO.
1-13-0603
(Noyo Harbor District)

EELGRASS SURVEY & MONITORING PLAN

Prepared by:

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INTRODUCTION/OVERVIEW

This eelgrass monitoring plan has been developed in support of the Noyo Harbor Mooring Basin Tsunami Repair Project in Fort Bragg, California. The purpose of the project is to repair damage to the harbor resulting from the March 2011 tsunami generated by the Tohoku earthquake off the eastern coast of Japan. The overall project goal is to restore the marina to the configuration that existed prior to the tsunami. To satisfy the permit conditions stipulated by the National Marine Fisheries Service (NMFS), North Coast Regional Water Quality Control Board (NCRWQCB), and the California Coastal Commission (CCC), this plan will to the maximum extent feasible, be consistent with both the Southern California Eelgrass Mitigation Policy (SCEMP) and the draft California Eelgrass Mitigation Policy (CEMP) documents.

Project Description

The project is located in the Noyo Harbor mooring basin in Fort Bragg, California (Figure 1). [*The Noyo Harbor District has received disaster grant funding in addition to insurance proceeds to repair and replace the pilings, docks and fingers damaged in the tsunami event. The proposed project consists of removing all pilings, docks and fingers that were damaged in the tsunami event and replace the damaged components with new pilings, docks and fingers. The existing dock system uses treated wooden piles, treated wood decking and exposed foam floatation. The proposed new construction uses pre-fabricated concrete pilings, pre-fabricated concrete decking and concrete wrapped flotation structures. A detailed pre-construction plan created by Bellingham Marine (Attachment – C) along with a mooring basin schematic drawing describes the details of the new system (Attachment – D). The schematic diagram illustrates where the repair work will be installed in the mooring basin. With the exception of C-Dock, all new pilings, docks and fingers will replace the existing configuration and footprint in the mooring basin, swapping out the damaged components that have undergone temporary repairs with new pilings, docks and fingers. Approximately 1/3 of C-Dock was damaged too severely to be repaired, so the new footprint will extend out approximately 100 feet from the current configuration to replace the docks and fingers that were in place prior to the tsunami. The construction agreement will require that all unusable damaged components removed from the marina will be disposed of in a licensed landfill and provide receipts confirming delivery.*

The project will restore the mooring basin to a 265 vessel capacity from the current 240 vessel capacity. There will be no increase in the number or size of vessels in the new configuration compared to the pre-disaster configuration. The materials in the proposed project are a substantial improvement over existing and previously in place materials with respect to potential water quality degradation. The expected lifespan of the concrete dock and float system is 40-50 years depending on usage and maintenance. The concrete pilings have a 50 year plus anticipated lifespan. All concrete components have a standard 5 year warranty.

The District also plans to replace the existing waste pump out station pump on the shore at the head of B-Dock. The current pump is nearing or post its useful life, the new pump will connect to the new pump-out stanchion which is included in the repair of the B-Dock L-head. A description of the pump and schematics are attached (Attachment – E). The District has reviewed the pump replacement with the Public Works Director for the City of Fort Bragg and the Planning Department for the County of Mendocino. Both agencies have determined that no permit is required to replace a land based mechanical waste pump on District property that connects to

the City sewer system which does not increase the current capacity and ties in to existing electrical and plumbing terminals.][1]

[1] Text excerpted from Noyo Harbor District-Coastal Development Permit Application: Attachment-A

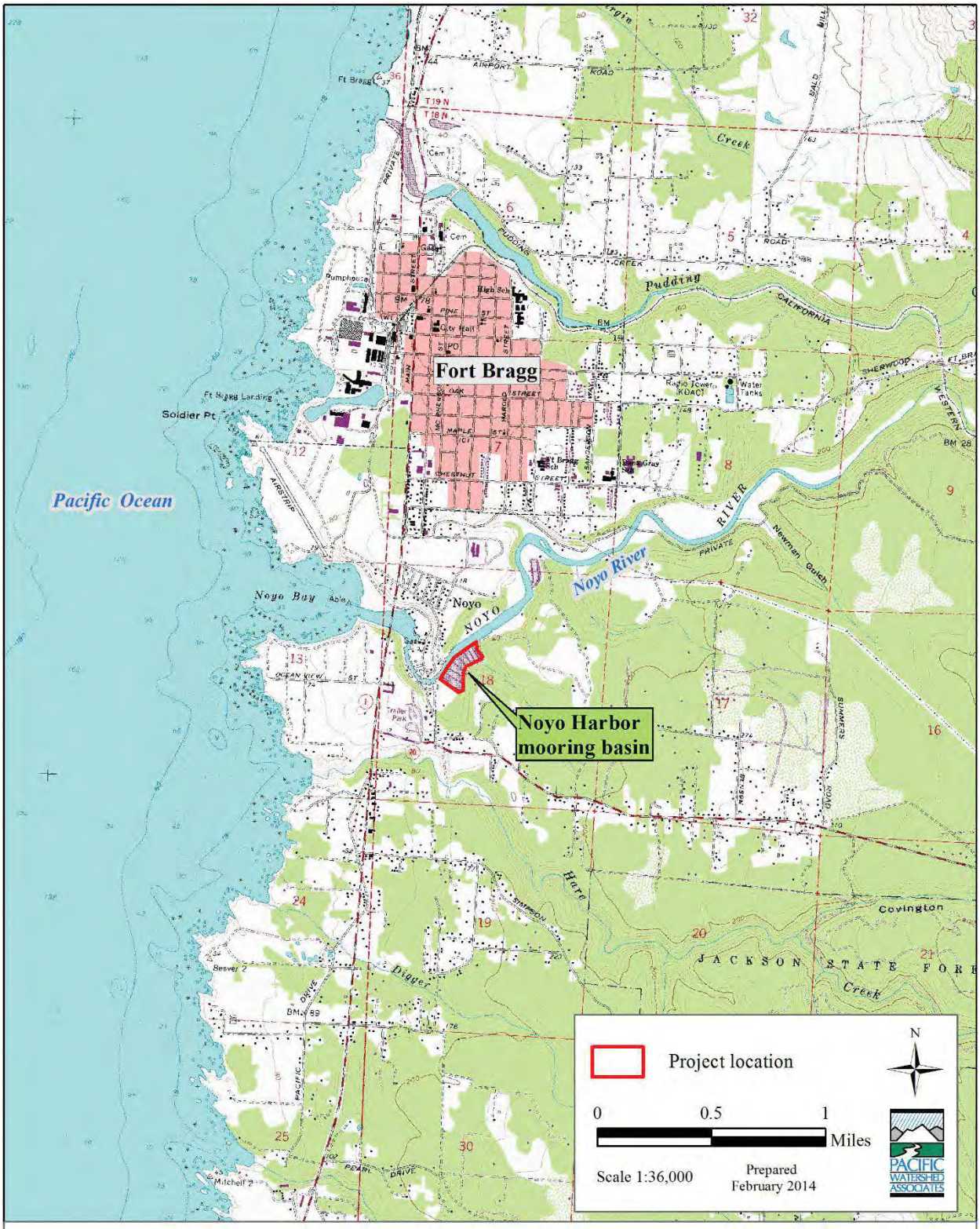

Figure 1. Location of the Noyo Harbor Mooring Basin Tsunami Repair Project, Mendocino County, California, (Fort Bragg 7.5' quadrangle; USGS 1991).

EELGRASS ECOLOGY

Eelgrass (Zostera marina) is a seagrass that is widely distributed throughout temperate estuaries and coastal embayments in both the northern Pacific and Atlantic oceans. Eelgrass plants are comprised of narrow, green, strap-like leaves that range in length from approximately 40-130 cm (Keiser, 2004). Leaves are buoyant and grow from shoots called turions that emerge from branching root-like rhizomes. Eelgrass reproduces both sexually and asexually through flowering and rhizome branching respectively. Dependence on sexual reproduction is greatest in areas prone to physical disturbance (Phillips et al., 1983). Flowering occurs primarily in the spring and early summer with seed production and dispersal occurring from midsummer into fall (Phillips, 1984).

Eelgrass is capable of growing in a wide range of unconsolidated sediments with particle sizes ranging from sand to clay (Phillips, 1984). Little is known about the depth range capable of supporting eelgrass in Noyo River; however, in Humboldt Bay, the depth range suitable to the growth of eelgrass is approximately -2.1 to 1.4 m relative to Mean Lower Low Water (MLLW) (Gilkerson, 2008). The upper limit of eelgrass growth is primarily controlled by desiccation stress and wave exposure (Koch, 2001; Boese et al., 2003), while the maximum depths are limited by light attenuation resulting from the cumulative effects of turbidity (Dennison, 1987). In river mouth estuaries such as the Noyo River (Gleason et al. 2011), eelgrass tends to grow in narrow bands and small discontinuous patches along channel margins where euryhaline conditions predominate.

Eelgrass performs a multitude of ecosystem services. It provides a critical food source for spring staging Black Brant (Branta bernicla nigricans) (Moore and Black, 2006) and supports a rich detrital food web. Eelgrass meadows also provide structure and nursery habitat for a diverse range of fish and invertebrates including juvenile Dungeness crab (Cancer magister) and Pacific herring (Clupea pallasi) (Phillips, 1984). Where eelgrass forms more extensive beds, turbulence and current velocity are reduced, facilitating the deposition of fine sediment (Fonseca and Fisher, 1986).

EELGRASS REGULATORY POLICY

Eelgrass is widely considered one of the most ecologically valuable and productive habitats in the coastal environment. The National Marine Fisheries Service (NMFS) recognizes eelgrass beds as providing Essential Fish Habitat (EFH) as well as habitat for a host of other aquatic organisms. The California Coastal Commission (CCC) also considers eelgrass habitat an Environmentally Sensitive Habitat Area (ESHA) protected under section 30240 of the California Coastal Act (1976). California Department of Fish and Wildlife (CDFW), one of the responsible agencies under the California Environmental Quality Act (CEQA) recommends avoidance of eelgrass habitat where possible and comments on proposed projects that may impact eelgrass habitat. CDFW may also approve measures to mitigate impacts associated with project implementation. The United States Army Corps of Engineers (USACE) is required to consult with NMFS and the U.S. Fish and Wildlife Service (USFWS) on proposed projects that may impact EFH or result in the potential to impact any species protected by the Endangered Species Act (ESA). Preliminary consultation with CCC staff led to the determination that the proposed

project could result in impacts to eelgrass habitat. As a result, an eelgrass monitoring and mitigation plan was required.

MINIMIZATION AND AVOIDANCE OF IMPACTS TO EELGRASS

Minimization and avoidance measures will be implemented during project construction and as a component of the overall design of the Noyo Harbor Mooring Basin Tsunami Repair Project. Appendix A of the draft CEMP provides guidance for avoiding and minimizing impacts to eelgrass caused by turbidity, shading, nutrient loading, and alteration of circulation patterns. To minimize the effects of turbidity (light attenuation) on eelgrass during project construction, a turbidity curtain will be used to contain and localize sediment that may become disturbed and suspended during pile extraction and driving activities. In terms of shading and alteration of circulation patterns, no impacts are anticipated as a result of project construction, primarily because all new construction will take place within the footprint of harbor infrastructure (docks, fingers, and pilings) that existed prior to the March 2011 tsunami. Nutrient loading is not anticipated to be a concern with this project.

Although a pre-project eelgrass survey has not yet been conducted in the Noyo Harbor mooring basin, CDFW and NMFS staff have reviewed the project description and conducted a site review in the project area of the marina. Based on their observations, CDFW and NMFS staff are both of the opinion that given the minimization protocols and their observations, it is unlikely that the project will result in a loss of vegetated areas nor will it create a loss of un-vegetated habitat capable of supporting eelgrass. These observations and opinions, however, are not a substitute for formal eelgrass surveys which will be conducted both prior to and following construction activities to ensure that any impacts to eelgrass habitat are quantified and mitigated.

EELGRASS DISTRIBUTION IN THE NOYO RIVER

While the presence of eelgrass in the lower Noyo River is well-established, the distribution of eelgrass habitat within the river has not been thoroughly mapped (CDFW 2010). No known formal eelgrass surveys have been conducted within the Noyo Harbor Mooring Basin project area since at least 2002. Eelgrass surveys were conducted during August and November 2009 within and adjacent to the Noyo River Channel maintenance dredging footprint in support of maintenance dredging operations (Merkel 2009). Although these surveys established the presence of eelgrass both up and down river of the mooring basin, they did not include coverage of the mooring basin (project area) itself. Since the presence of eelgrass within and adjacent to the project action area is unknown at this time, the results of the pre-construction eelgrass survey will provide valuable information by which to assess the likelihood that project construction may impact eelgrass habitat, and therefore; determine whether additional surveying and mitigation actions will be necessary beyond the initial post-construction survey.

EELGRASS MONITORING AND IMPACT ASSESSMENT

Eelgrass Surveying Methods

Eelgrass surveying methodology will be consistent with the guidance provided in Appendix B of the draft CEMP which is generally consistent with the guidance provided by the SCEMP with the exception of eelgrass bed definitions. The differences between the two guidance documents do not affect the manner in which the surveys are conducted; therefore, we propose to use the bed definitions as described in the draft CEMP.

Spatial Distribution of Eelgrass Beds- A combination of shoreline low-tide and subtidal SCUBA survey techniques will be used to assess eelgrass habitat conditions in the project area and reference site. Eelgrass beds, patches, and isolated individual plants will be mapped using differential GPS and/or an electronic total station referenced to a local survey control network. North American Datum 1983 (NAD 83) meters, Universal Transverse Mercator (UTM) Zone 10 North, and local mean lower low water (MLLW) meters, will be used to establish horizontal and vertical reference frames respectively for survey control purposes. Depending upon the depth distribution of eelgrass in the harbor, divers may deploy marker buoys to delineate the subtidal extent of eelgrass habitat, with surface support staff on small boats retrieving and marking the locations of the buoys.

Following mapping of all eelgrass vegetated areas identified during the survey, factors such as depth, substrate, and presence of infrastructure will be evaluated and documented to estimate the amount of additional, unvegetated eelgrass habitat that may be present in the project and reference areas. Should any of these factors limit the continuity of eelgrass habitat, eelgrass bed boundaries will be defined by the factor(s) that preclude eelgrass habitat suitability. For example, the elevation range defined by the location of the lowest and highest rooted eelgrass plants observed during the surveys will be used to define the upper and lower vertical extent of potential (unvegetated) eelgrass habitat in the absence of other limiting factors. Eelgrass beds will then be defined by extending a contiguous boundary around all mapped plants in each aggregation up to a distance of 10 meters or until a barrier to habitat suitability is reached. Gaps greater than 20 meters between adjacent vegetated areas will serve to define the boundary between adjacent eelgrass beds.

Areal extent of Eelgrass Beds- The areal extent of eelgrass beds will be determined by calculating the two-dimensional area bounded by the polygons that define the spatial distribution of beds in both the project and reference areas, using Geographic Information Systems (GIS) software.

Percent Bottom Cover within Eelgrass Beds- To determine the proportional bottom coverage of eelgrass within a defined bed, the aggregate vegetated eelgrass area present within the bed will be divided by the total area of the bed. Eelgrass cover is defined as the presence of one or more turions per square meter. If percent bottom cover is stratified by depth or other physical gradients, the bed may be subdivided with individual cover values reported separately.

Turion Density within Eelgrass Beds- In order to assess turion density, $0.25m^2$ quadrats will be used to sample vegetated areas within mapped eelgrass beds. A minimum of 30 locations will be

randomly selected within the project and reference areas. Quadrats will be placed within vegetated areas of eelgrass beds and a count of all turions falling within the quadrat frame will be made. The number of replicate samples taken will be sufficient to provide 90 percent power to detect differences where alpha and beta both equal 0.10. The actual number of replicate measures, mean turion density (turions per square meter), and standard deviation will serve to characterize the growth form of eelgrass plants within the beds. If stratification of turion density is observed in relation to depth or other physical gradients in a manner similar to percent bottom cover, turion density sampling will be stratified accordingly to ensure that sampling occurs across the observed gradient.

Pre-construction Surveys

A Pre-construction eelgrass survey will be conducted within 60 days of the beginning of project construction during the active growing season for eelgrass (May-September; NMFS 2011) in the vicinity of the project area and at a nearby reference site. The pre-construction survey is scheduled to be completed during May 2014, with project construction slated to begin in June. A pre-construction survey report will be provided to all federal and state regulatory agency staff involved in the project within 30 days of completing the survey. The pre-construction survey will be conducted for all intertidal and shallow subtidal areas of the mooring basin within 50 meters of the project location to satisfy the NCRWCB 401 permit conditions. A buffer distance of 20 meters will be used to define the extent of the active project area with respect to mapping (NMFS 2011).

Upon concurrence with NMFS and CDFW staff, the northeastern portion of the mooring basin will serve as the reference area for the project. The justification for selecting this area as the reference site includes the following rationale: The mooring basin is a unique feature in the lower Noyo River with respect to being mostly separated from the main river channel by a large debris wall. It is likely that circulation patterns within the mooring basin are not consistent with areas more influenced by direct river discharge. Additionally, the only other marina in the harbor with a similar configuration is located approximately 0.5 miles upstream, is much smaller in size, and is likely subject to different salinity and temperature regimes as a result of being more influenced by watershed conditions further upstream. Figure 2 depicts the extent and location of the proposed project and reference areas that will be surveyed prior to and following project construction.

If either direct or indirect impacts to eelgrass appear likely as a result of project construction based on the results of the pre-construction survey, this monitoring plan may be amended prior to the post-construction survey to include provisions for extended monitoring and potentially mitigation planning.

Post-construction Surveys

A post-construction eelgrass survey will be conducted within 30 days of the completion of construction activities. The post-construction survey will be conducted in the same manner as the pre-construction survey at both the project area and reference site. A post-construction survey report will be provided to all federal and state regulatory agency staff involved in the project within 30 days of completing the survey.

Assessing Potential Impacts of Construction on Eelgrass Habitat

To assess the potential impacts of project construction on eelgrass habitat, the results of the pre and post-construction surveys will be used to compare the pre and post-action conditions of eelgrass beds in the project area and reference site in accordance with Appendix C of the draft CEMP. The project team will coordinate with NMFS, CDFW, and CCC staff to consider such factors as reference area eelgrass condition, evidence of physical disturbance, turbidity and construction activities observations in order to determine whether impacts to eelgrass habitat have occurred as a result of project construction. Impact assessment will include a determination as to whether any identified impacts are anticipated to be temporary and complete following active construction, or whether there is a likelihood of chronic, intermittent, or delayed impacts to eelgrass that may require further monitoring beyond the post-construction survey.

If direct effects on eelgrass are determined to have occurred as a result of project construction, or if delayed indirect impacts are anticipated based on results of the impact analysis, then an extended post-construction monitoring program will be initiated and this monitoring plan will be amended accordingly.

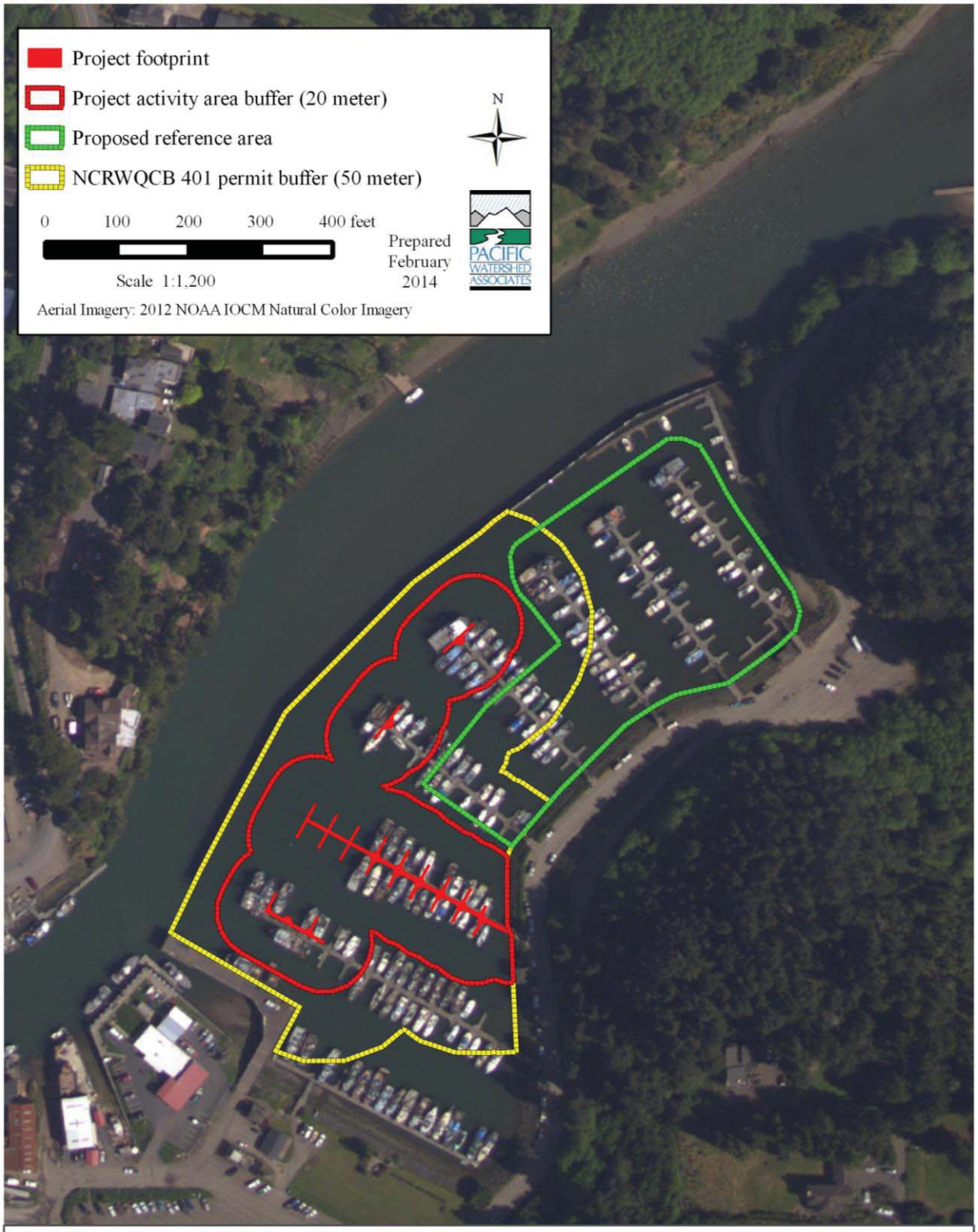

Figure 2. Proposed extent of project site and reference area eelgrass surveys, Noyo Harbor Mooring Basin, Mendocino County, California.

CONTINGENCY MITIGATION

In the event that eelgrass mitigation is required, guidance provided in Appendix D [Recommended Measures for Eelgrass Impact Mitigation: Section II A. 4 Northern California]. of the draft CEMP will be used to develop a detailed mitigation plan and this document will be amended to include all mitigation provisions required by NMFS, CDFW, and CCC staff. Since the Noyo Harbor mooring basin is anticipated to be dredged during 2015, any contingency eelgrass mitigation efforts that may be required, will likely need to be conducted in another area of the lower Noyo River. The Noyo Harbor District is committed to following through with any required extended monitoring and mitigation that may be necessary following completion of the construction phase of the project.

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