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STAFF REPORT: REGULAR PERMIT

Application No.:	**E-12-007**
Applicant:	**BEACON**
Agent:	none
Location:	Goleta Bay, Santa Barbara County.
Project Description:	Experimental installation of 212 small stone columns in sandy seafloor to evaluate the natural recruitment of kelp and establishment of a kelp bed.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

The Beach Erosion Authority for Clean Oceans and Nourishment (BEACON), a California Joint Powers Authority, proposes to carry out a pilot project to evaluate an experimental method of promoting the natural recruitment of kelp and formation of a kelp bed in an area of soft substrate. To carry out this project, BEACON proposes to install 212 small (4-inches square by 30-inches long) granite columns across three areas between approximately 800 to 3000-feet offshore of Goleta Beach. The columns would be installed vertically with only the top several inches exposed above the substrate. Divers would install the columns in water depths of between 27 and 48-feet by using hand-held water jet devices to burrow small holes in the sand into which the columns would be placed.

Typically, kelp beds form in areas of rocky reef and hard substrate that provide consistent anchoring surfaces for kelp plants. However, the proposed project site is within a sandy area that historically supported a large kelp bed. BEACON believes that the recovery of this historic kelp bed will be facilitated by installing small stone anchoring surfaces in this area. BEACON anticipates that over time, giant kelp (*Macrocystis pyrifera*) will attach to and grow on the exposed portions of the granite columns, leading to the formation of a kelp bed that could then spread to adjoining areas of soft substrate. In addition to evaluating the proposed method of restoring a kelp bed, BEACON is also interested in considering the creation or restoration of kelp beds as a possible means of reducing sand erosion rates on nearby beach areas. If this pilot project is shown to successfully promote the formation of a sand-dwelling kelp bed, BEACON may consider a similar, more substantial effort in Goleta Bay in the future. This future project would require additional Commission review and permitting as well as a lease from the California State Lands Commission.

Major Coastal Act issues associated with this project include potential adverse impacts to marine resources. The granite columns proposed to be installed in the sand are expected to remain in place and only be partially exposed. However, natural sand movement and current action may cause the columns to become exposed and carried away from the project site. Movement and deposition of the columns on the shoreline or in areas of sensitive marine habitats may disturb, displace, or damage these areas and the species they support and adversely affect their biological productivity. In addition, installation of the columns also has the potential to adversely affect biological productivity if this activity is carried out in an area that supports kelp, eelgrass or other sensitive marine habitats or species.

Commission staff recommends **Special Conditions 1-6** to reduce impacts to marine resources such that the project can be found consistent with the marine resources policies of the Coastal Act. **Special Condition 1** would ensure that the granite columns are either not maintained beyond the lease term authorized by the California State Lands Commission, or abandoned in place. In addition, to address potential impacts to marine biological productivity resulting from the movement or displacement of the columns, **Special Condition 2** would require quarterly monitoring of the columns to be carried out for three years after initial installation and would require reports with the results of this monitoring effort to be submitted to the Executive Director for his review. **Special Condition 3** would require the results of the "pull-out" tests on a subset of the columns to be submitted to the Executive Director to aid in the Commission's assessment of the possible movement of the columns away from their installation locations. **Special Condition 4** would require a coastal development permit application to be submitted for recovery and removal of the columns if, based on the results of the monitoring carried out per **Special Conditions 2 and 3**, kelp recruitment on the columns is not successful, colonization by invasive species occurs, or substantial movement or burial of the columns occurs or is likely to occur. Further, **Special Condition 5** would require immediate recovery and removal of any granite columns that become dislodged or displaced, and **Special Condition 6** would prohibit installation activities and water-jetting in all areas of sensitive marine habitat.

The staff recommends the Commission find that, as conditioned, the project would be consistent with Sections 30233 and 30230 of the Coastal Act, and, therefore recommends that the Commission **APPROVE** coastal development permit application E-12-007, as conditioned.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

I move that the Commission approve Coastal Development Permit E-12-007 subject to conditions set forth in the staff recommendation specified below.

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 Commissioners present.

Resolution:

The Commission hereby approves the Coastal Development Permit for the proposed project 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

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 applicant or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

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

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

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

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

III. SPECIAL CONDITIONS

1. **Permit Term Limit.** The term of the permit shall be limited to the current term of the California State Lands Commission Lease for Sovereign Tide and Submerged Land (Lease No. PRC 9032.9) which ends on December 4, 2017. If this lease is amended or a new lease is issued by the California State Lands Commission, an application for an amendment to this Coastal Development Permit may be submitted to extend the permit term.

2. **Monitoring Reports.** BEACON shall monitor the status of each of the installed granite columns for the first three years after initial installation. Monitoring shall include an evaluation of (1) kelp recruitment on and around the columns; (2) the presence of eelgrass at the project sites; (3) column burial depth; (4) column movement; (4) the presence or growth of invasive species on the columns; and (5) accumulation of derelict fishing gear and/or marine debris on the exposed columns. Any such material shall be collected and removed and records of the removal activity and material collected shall be included in monitoring reports. Each column shall be accounted for at each monitoring event. Monitoring shall be carried out every four months and after significant wave and swell events and reports of monitoring findings and data shall be submitted to the Executive Director and the California Department of Fish and Wildlife within 45 days of each monitoring event. Monitoring may cease prior to three years after initial installation if the lease for the project site terminates prior to this date and is not renewed, extended, or re-issued.

3. **Pull-Out Test.** A "pull-out" test shall be carried out no more than one year after installation on five of the granite columns. Results from this test shall be compiled in a report and submitted to the Executive Director within 45 days of test completion.

4. **Site Restoration.** If, based on the Executive Director's evaluation of the results recorded in the monitoring reports or pull-out test report, (1) the buoyancy and drag forces exerted by a mature kelp plant appear likely to dislodge the columns; (2) kelp recruitment and initial formation of a sand-dwelling kelp bed has not occurred at the project site; (3) colonization of the columns by invasive species has occurred; (4) burial of the columns has occurred; and/or (5) substantial movement of the columns away from their initial installation location has occurred, BEACON shall, prior to expiration of the California State Lands Commission Lease, submit a complete Coastal Development Permit application for the recovery and removal of all of the granite columns.

5. **Fugitive Materials.** All descender devices, ropes, and lines used during installation shall be collected and removed. Any granite columns that become unburied or displaced from the site of their initial installation shall be recovered and removed by BEACON to an onshore storage, reuse, or disposal location as early as feasible after their dislocation. A report documenting the type and quantity of collected material shall be submitted to the Executive Director within 45 days of the completion of collection activities.

6. **Installation.** No water jetting, excavation, anchoring, or other installation activities may be carried out within or adjacent to any area that supports visible populations of ornate tubeworms (*Diopatra ornata*) or sea pens (*Stylatula enlongata*) or in which eelgrass (*Zostera spp*.) or kelp (*Macrocystis pyrifera*) is growing.

IV. FINDINGS AND DECLARATIONS

A. BACKGROUND AND PROJECT DESCRIPTION

Prior to the 1980s, the Santa Barbara coast supported a series of large, persistent offshore kelp beds. However, warm ocean waters associated with several years of El Nino conditions in the 1980s combined with large winter wave events and caused many of these kelp beds to be damaged, dislodged, and lost. While surveys carried out in 1967 recorded up to 18 square miles of kelp bed surface canopy in the Santa Barbara area, by 1989 only 6 square miles of this canopy remained. Several of the kelp beds that disappeared during this time were from areas of soft and sandy seafloor that had uniquely developed kelp habitat (kelp beds typically only become established above areas of hard substrate that provide robust anchoring surfaces). As reported by the California Department of Fish and Wildlife in its most recent 2003 status report on kelp resources, these sand-dwelling kelp beds around Santa Barbara still have not recovered from the losses that occurred in the 1980s. The Goleta Bay project area is included in this list of sites with sand-dwelling kelp beds that were lost in the 1980s and have not reappeared. Surveys carried out in Goleta Bay on behalf of BEACON and the County of Santa Barbara over the past several years have confirmed the continuing absence of beds of sand-dwelling kelp in Goleta Bay (Kiel 2013, County of Santa Barbara 2014).

Explanations for the continuing absence of the Goleta Bay kelp bed point to the unique set of conditions that apparently led to its initial formation in an area of soft, sandy seafloor that would not typically be expected to support a persistent kelp bed. These conditions included an abundance of sand dwelling invertebrate species (such as ornate tubeworms) whose burrows provided adequate substrate for young kelp plants to begin to anchor, combined with a prolonged period of calm sea states that allowed the kelp plants to grow, spread, and establish more substantial anchor systems capable of persisting through more energetic ocean conditions. Once the kelp bed was lost due to the particularly unfavorable circumstances of the 1980s, the unique conditions needed for its recovery have not appeared again. While dive surveys carried out in recent years continue to result in observations of small kelp plants growing in sandy areas and using invertebrate burrows throughout Goleta Bay, these plants have not persisted long enough to become established as adult, bed-forming kelp. BEACON hypothesizes that this may be because the plants become dislodged due to wave surge and current action before they can develop larger, more robust anchoring systems.

In order to test this theory and evaluate the efficacy of a new technique for promoting the establishment of a kelp bed, BEACON has developed the proposed pilot project. This project involves the installation of small granite columns partially buried into the sandy seafloor of Goleta Bay to provide a persistent and secure anchoring point for kelp plants to naturally recruit to. The granite columns would be four inches square by 30 inches long and would be inserted vertically into the seafloor, with between four and six inches exposed above the sand. A total of 212 columns would be installed in three sites: 188 in two lines about 600-feet long, with a 200-foot by 200-foot square grid pattern of columns between them, and 24 in two 220-foot long rows of 12 columns each (as shown in **Exhibit 1**). The larger group of columns, including the grid pattern, would be installed several thousand feet offshore of Goleta Beach County Park and the smaller lines would be installed about a thousand feet offshore of Campus Point.

The columns would be lowered to the seafloor individually from a small boat using high-strength, propeller shaped plastic descenders to limit their descent speed, and then collected and installed by divers. The divers would use a hand-held water-jet tool to excavate individual post-holes into which the columns would be inserted. The plastic descender devices would be collected and removed after installation, and the exposed tips of the installed columns would remain in place to provide a surface to which kelp spores could attach and grow. BEACON anticipates that by having a more robust anchoring point, the kelp plants that attach to the columns would grow through the water column and begin to form a surface canopy. In addition, BEACON expects that the presence of these kelp plants will (1) increase populations of burrow-forming invertebrate species (such as ornate tubeworms (*Diopatra ornate*) and feather-duster worms (*Eudastylia polymorpha*)) in the area that may create soft-substrate anchoring features for kelp; and (2) provide some protection from currents in adjacent areas and thus allow kelp plants that successfully recruit to those soft-substrate features to persist longer. If successful, BEACON therefore anticipates that the installed columns may catalyze the recovery of the sand-dwelling kelp bed that was historically present within Goleta Bay.

As proposed by BEACON and required by the State Lands Commission, BEACON would monitor the three project sites with divers at four month intervals for at least three years post-installation in order to evaluate the performance of the columns at remaining in place and naturally recruiting kelp. In addition, at the end of the first year after installation, BEACON would perform a "pull-out" test on five of the installed columns from a range of locations and depths. This test would involve attaching a rope or cable to each of the columns and using a small vessel-mounted electric winch to pull them out of the substrate while measuring the force required to do so. The purpose of this test is to assess how well the columns are embedded in the substrate to ensure that they are unlikely to become unburied before the end of the permitting period.

In its proposal, BEACON hypothesizes that the disappearance of the kelp bed from the project area may have contributed to increased beach erosion at the adjacent Goleta Beach County Park. While the role of an offshore kelp bed on beach erosion patterns is difficult to assess, some of BEACON's interest in proposing the project is to develop an opportunity to further examine this issue as well. However, at the current time, BEACON has chosen to focus this project on an evaluation of the efficacy of using granite columns to restore a sand-dwelling kelp bed and does not propose to quantitatively evaluate the effect of a kelp bed on beach erosion. If the restoration technique being carried out in this pilot project is successful, BEACON may in the future pursue a Coastal Development Permit and lease of State subtidal lands for a larger project that includes such an evaluation.

B. OTHER AGENCY APPROVALS

California State Lands Commission
On December 5, 2012 the California State Lands Commission (SLC) approved Lease No. PRC 9032.9 for the installation of granite columns at three test sites on submerged sovereign lands within Goleta Bay. The term of this lease is for five years – until December 4, 2017 – but may be renewed prior to termination.

The lease includes a variety of general and specific provisions, including several directed at the avoidance and/or minimization of potential adverse impacts to marine resources. These provisions include requirements that (1) the lessee monitor the project site for the first three years after initial column installation using a four-month monitoring schedule and submit monitoring reports to SLC after each event; (2) no water-jetting activities or anchor installation occurs within active eelgrass beds; (3) no vehicle or equipment repair or refueling be carried out on state lands; (4) all waste and debris be removed – including dislodged columns and plastic descender devices; (5) either an application for a new lease or a plan for restoration of the lease area (i.e. removal of the columns) be submitted to SLC one year prior to the expiration of the lease term.

U.S. Army Corps of Engineers
BEACON submitted an application to the U.S. Army Corps of Engineers (ACOE) on October 10, 2014, for a Section 10 permit to install and maintain 212 granite columns on the seafloor of Goleta Bay.

California Department of Fish and Wildlife
The California Department of Fish and Wildlife (DFW) issued a kelp harvest lease to The Cultured Abalone Company for use of kelp beds within the project area (designated as administrative kelp bed number 26) through 2016. Commission staff consulted with DFW regarding the proposed project and this kelp harvest lease and was informed that the proposed project activities were not inconsistent with the terms of the kelp lease but that ongoing consultation should be carried out to ensure that the proposed project did not result in adverse impacts to existing kelp resources in kelp bed number 26. BEACON will provide to DFW copies of the quarterly monitoring reports developed throughout the term of this permit.

DFW staff also provided Commission staff with input regarding potential project impacts to marine resources and the impact avoidance and minimization measures included in the Special Conditions included above. This input has been incorporated into the analysis included in the Marine Resources section of this report and the Special Conditions listed above.

C. FILL OF OPEN COASTAL WATERS

Section 30233(a) of the Coastal Act states:

> *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.*
>
> *(2) Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*

> *(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
>
> *(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
>
> *(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
>
> *(6) Restoration purposes.*
>
> *(7) Nature study, aquaculture, or similar resource dependent activities.*

The placement of the 212 granite columns on approximately 71 total square feet of sandy seafloor constitutes "fill" as defined by the Coastal Act. Section 30108.2 of the Coastal Act states:

> *"Fill" means earth or any other substance or material, including pilings placed for the purpose of erecting structures thereon, placed in a submerged area.*

Coastal Act Section 30233(a) permits fill in coastal waters if three tests are met: (1) the fill constitutes an allowable use under 30233(a); (2) there is no feasible less environmentally damaging alternative; and (3) feasible mitigation measures have been provided to minimize any adverse effects.

Allowable use

BEACON proposes to place fill in coastal waters for the purpose of evaluating a method for restoring a historic kelp bed. The proposed project is therefore a restoration project, and as such qualifies as an "allowable use" under 30233(a)(6). The project is therefore consistent with the first test of Section 30233(a).

Alternatives

The proposed project involves the experimental evaluation of a technique for promoting the restoration of a sand-dwelling kelp bed. This technique relies on the placement on the seafloor of small anchoring surfaces upon which kelp plants may establish. The installation of these anchoring surfaces is likely to result in adverse impacts to marine resources because it involves long-term displacement of soft substrate habitat and short term disturbance of additional habitat and species through water-jet excavation. Because these anchors are an essential component of the proposed project, no project alternative exists that would eliminate these impacts by eliminating the placement of fill on the seafloor. However, the Commission staff investigated several project alternatives that would reduce the need for fill – including those that included reducing the size of the proposed columns, reducing the number of columns, and/or reducing the number of test sites.

A reduction in the dimensions of each of the proposed columns would reduce the total amount of fill associated with the project. However, smaller, thinner, or shorter columns would be more likely to move, would provide less anchoring space for kelp to adhere to, and would be more susceptible to becoming dislodged or unburied. BEACON selected the four square inch by 30 inch columns because they believed these columns to be the smallest columns that would both remain in place in the sand and provide sufficient anchoring surface for kelp plants. Project alternatives that included columns of reduced dimensions would not be less damaging because they would be more likely to move and less likely to support kelp.

The Commission staff also considered project alternatives that included fewer columns and test sites. However, the proposed project – including the three test sites and configuration of 212 proposed columns – has been specifically designed by BEACON to facilitate an evaluation of its experimental sand-dwelling kelp restoration technique. The test sites were selected to include a range of depths, soft substrate densities, ocean exposures, and distances from shore, as well as replication to augment the evaluation of the performance of the columns in these different areas. While a reduction in the number of test sites or columns would reduce the amount of proposed fill - and thus the potential adverse impacts associated with it - such a reduction would also negatively affect BEACON's ability to properly evaluate the success of the pilot project. As such, reductions in the number of columns or test sites would potentially compromise the project purpose and would not be a feasible less damaging alternative.

The Commission therefore finds that the proposed project minimizes the amount of fill to the maximum extent feasible and is therefore consistent with the second test of Section 30233(a).

Mitigation Measures

The final test of Coastal Act Section 30233(a) requires that feasible mitigation measures have been provided to minimize any adverse effects of the fill. As discussed in the Marine Resources section below, the placement of granite columns in 71 total square feet of sandy seafloor is expected to result in loss of benthic habitat and mortality and disturbance to associated organisms. However, also as discussed in more detail below, given the small size of the project footprint and associated disturbance areas relative to the abundance of similar benthic habitat in Goleta Bay and the implementation of **Special Conditions 1-6**, adverse impacts associated with the installation and presence of the proposed anchoring system would be temporary and minimal. The Commission therefore finds that the mitigation measures in **Special Conditions 1-6** would minimize the adverse environmental impacts associated with the project's use of fill and enable the Commission to find that the third and final test of Coastal Act Section 30233(a) has been met.

Conclusion

Based on the above discussion, the Commission concludes that the project meets the three tests of, and is therefore consistent with Section 30233(a) of the Coastal Act.

D. MARINE RESOURCES

Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states:

> *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.*

The proposed installation and presence of 212 granite columns in the seafloor of Goleta Bay has the potential to adversely affect marine resources and the biological productivity of coastal waters by potentially causing adverse impacts to benthic species and habitats.

Benthic Habitat

The proposed array of granite columns would be spread across three sites in Goleta Bay at depths of between 27 and 48 feet below the water surface. Two sites would be approximately 1,000 feet offshore of Campus Point and would be comprised of 12 columns each, spread in lines approximately 200 feet long. The remaining columns would be spread in a line approximately 1300 feet long perpendicular to shore in the center of Goleta Bay, with most of the columns installed in a square grid at the center of the line (as shown in **Exhibit 1**). In total, this proposed 212 unit system would displace roughly 71 square feet of sandy substrate within an approximately 50,000 square foot area.

Benthic habitat at the proposed project site is comprised primarily of sands and silts that support a variety of invertebrate species including ornate tubeworms, sea pens, sea stars, and crustaceans (Kiel 2013, County of Santa Barbara 2014). Sand dwelling fish species such as speckled sanddab are also common. Downcoast/east of the project site are a rock armored ocean outfall line used by the Goleta Sanitary District and the Goleta Pier. The hard surfaces of the outfall line and its rock armoring support a variety of reef species, including feather boa kelp, giant kelp, bryozoans, sea lettuce, urchins, and lobster. The sandy substrate areas upcoast/west of this outfall line and the pier support patches and beds of eelgrass from depths of approximately 15 feet to over 40 feet (Chambers Group 2002, Kiel 2013, County of Santa Barbara 2014).

Potential adverse impacts to benthic habitat from the proposed project include: (1) smothering of organisms and loss of habitat due to the presence of the granite columns in the seafloor; (2) disturbance to substrate from initial installation activities; (3) disturbance and/or damage to benthic habitats from the movement of dislodged columns; (4) shading of eelgrass by kelp growing from the columns; and (5) injury and/or loss of marine wildlife due to interactions with abandoned fishing gear or debris that becomes entangled in columns.

Smothering and Disturbance
Placement of the proposed network of columns would result in the long-term loss of 71 square feet of benthic habitat (spread across 212 sites of four square inches each) and the short-term disturbance of a slightly greater adjacent area due to the installation and presence of the columns. Mobile organisms such as fish and crabs would be able to relocate to undisturbed adjacent habitat areas when the columns are installed, while other types of benthic invertebrates such as ornate tubeworms, sea pens, polychaete worms, and molluscs may be smothered and killed by the columns or sediments released by the water-jet tool during installation activities. Additionally, the loss of this habitat area would reduce the amount of habitat available for soft substrate species and reduce forage opportunities for fish, rays, seabirds, and marine mammals that prey on such benthic species.

However, in the context of the larger project area and Goleta Bay as a whole, as long as sensitive habitats and high density assemblages and invertebrate communities are avoided (such as beds of sea pens and aggregations of tubeworms) the loss of 71 square feet of benthic habitat and disturbance or mortality of a small number of fast growing benthic organisms due to column placement and sediment disturbance would not adversely affect the overall biological productivity of coastal waters or substantially reduce populations of marine organisms. Benthic mapping of coastal Santa Barbara has shown that benthic habitat comprised of sand and silt sediment similar to the habitat present at the project site is dominant (covering hundreds of square miles), and research on benthic communities has shown that many of these areas support similar communities of benthic invertebrates (Johnson et al. 2013). Therefore, given the small size of the project footprint and associated disturbance areas relative to the abundance of similar benthic habitat the area, adverse impacts associated with the installation and presence of the proposed columns would be minimal.

To ensure that the proposed columns are not installed in rarer and more sensitive areas of benthic habitat, such as high density invertebrate communities or sites that support eelgrass or kelp, the Commission is requiring **Special Condition 6**. **Special Condition 6** prohibits the installation of granite columns in any area that supports visible benthic invertebrates such as sea pens and ornate tubeworms or in which kelp or eelgrass is growing.

Dislodged Columns
Although BEACON does not anticipate that typical ocean conditions such as sand scour, swell surge, and currents would be capable of unburying or dislodging the columns once installed, BEACON cannot assure that unusual ocean conditions (such as large storms events) could not displace the columns. If the columns did indeed become unburied over time or as a result of an unusually powerful event, they would remain loose on the seafloor and capable of further movement throughout the project area as long as the forces that dislodged them remained

present. They could then skid and roll along the seafloor, disturbing and damaging benthic species and moving into areas of sensitive habitats such as kelp and eelgrass beds where they could damage or dislodge adult plants and further displace habitat.

To address this potential impact, the Commission is requiring **Special Conditions 2-5**. **Special Condition 2** would require quarterly monitoring of the columns to be carried out for three years after initial installation and would require reports with the results of this monitoring effort to be submitted to the Executive Director for review. **Special Condition 3** would require the results of the "pull-out" tests on a subset of the columns to be submitted to the Executive Director to aid in the Commission's assessment of the possible movement of the columns away from their installation locations. **Special Condition 4** would require a coastal development permit application to be submitted for recovery and removal of the columns if, based on the results of the monitoring carried out under **Special Conditions 2 and 3**, kelp recruitment on the columns is not successful or substantial movement or burial of the columns occurs or is likely to occur. Further, **Special Condition 5** would require immediate recovery and removal of any granite columns that become dislodged or displaced.

Shading
The presence of a kelp canopy on the ocean surface would reduce sunlight penetration to the seafloor and through the water column and negatively affect marine plant species such as eelgrass (*Zostera spp*.) that grow on the seafloor and require sunlight. Based on surveys of the project area carried out on behalf of BEACON and the County of Santa Barbara over the past several years, eelgrass is present at the depth range that would be used for column installation (Chambers Group 2002, Kiel 2013, County of Santa Barbara 2014). However, the three proposed test sites were located in areas in which eelgrass was not present during the most recent surveys carried out by BEACON. Nevertheless, given the substantial annual and seasonal variability known to occur in eelgrass growth and abundance and the location of the test sites within the depth range of eelgrass, it may be present within the test sites at the time of column installation.

To prevent installation activities from disturbing or damaging this eelgrass and to reduce possible shading impacts associated with the establishment of a surface canopy forming kelp bed above eelgrass, the Commission is requiring **Special Condition 6**, which would prohibit installation activities and water-jetting in and adjacent to all areas in which eelgrass is growing.

Entangled Fishing Gear/Debris
Fishermen have been known to snag gear or nets on structures and elevated features on the seafloor. When this occurs, fishermen may abandon their gear or nets (creating "ghost nets"), thereby creating a risk to marine mammals and other types of marine wildlife that may become entangled in this abandoned gear. While only low levels of fishing typically occur at the project sites, the presence of the proposed columns and the kelp that may recruit to them has the potential to attract additional fishing activities, thus increasing the amount of fishing gear that may become entangled. In addition, the nearby Goleta Pier is a popular fishing location and may serve as a source of abandoned gear that could drift into and collect on the proposed columns.

To address this concern **Special Conditions 1 and 2** require that all project materials are removed at the end of the permit and lease period and that quarterly surveys of the project sites include the collection and removal of all abandoned fishing gear that may have become snagged or otherwise collected on the project structures.

Invasive Marine Species

The proposed project would result in the placement of 212 individual columns on the seafloor. BEACON anticipates that the hard substrate provided by these columns would facilitate recruitment and growth of native giant kelp (*Macrocystis pyrifera*) but it may also inadvertently provide an opportunity for colonization by other non-native and invasive species of algae that also prefer hard substrate habitat. These species may include those such as *Undaria pinnatifida* or *Sargassum horneri* that are the target of active control and eradication efforts throughout Southern California's marine waters. If the hard substrate provided by the proposed project provides habitat for these invasive species, their spread into nearby areas and native habitats could be facilitated and control and eradication efforts could be hampered. In areas of California where these species have become established, they have spread rapidly and abundantly into surrounding marine areas and negatively affected native species and habitats through competition, physical displacement, and by altering the composition and function of native ecological communities. To address this potential impact, the Commission is requiring in **Special Condition 2** that quarterly monitoring efforts include recording and reporting the presence of non-native species growing on or colonizing the granite columns. In addition, **Special Condition 4** requires BEACON to submit a complete Coastal Development Permit application for the recovery and removal of all of the granite columns, which will ensure that they cannot be used to support invasive species after the pilot project has been completed.

Marine Protected Areas

All three of the proposed project sites are located a within one mile or less of the Campus Point and Goleta Slough State Marine Conservation Areas. Although no project activities are proposed to occur within these areas of special biological significance, the project nevertheless has the potential to result in adverse impacts to these areas if dislodged columns move into them and are not recovered. To address this potential impact, **Special Conditions 2-5** require that a pull-out test and quarterly surveys be carried out to ensure that the columns are not becoming dislodged and that any columns that do move away from their installation sites are collected and removed as early as is feasible.

In addition, regarding potential conflicts between the proposed project and the regulatory protections DFW maintains for these areas, DFW staff indicated that with the provisions in place through the SLC lease and proposed in the Special Conditions included above, no adverse impacts to the MPAs would be expected.

Conclusion

Although the proposed project has the potential to adversely impact marine resources and the biological productivity of coastal waters, with implementation of **Special Condition Nos. 1** through **6**, the Commission finds that the project would be carried out in a manner in which marine resources are maintained, species of special biological significance are given special protection, the biological productivity of coastal waters is sustained, and healthy populations of all species of marine organisms will be maintained. The Commission further finds that, as

conditioned, the project would maintain the biological productivity of coastal waters appropriate to maintain optimum populations of marine organisms. The Commission therefore concludes that the proposed project, as conditioned, would be consistent with the marine resource sections (Sections 30230 and 30231) of the Coastal Act.

In addition, as a restoration project that may catalyze the return of a historic and long-absent sand-dwelling kelp bed to Goleta Bay, the proposed project has the potential to provide a benefit to the marine resources of the project area. While some very limited and temporary adverse impacts may occur as a result of column installation, the restoration of a kelp bed to Goleta Bay would enhance the biological resources and productivity of the area. Further, the proposed project would also allow a novel method of promoting the restoration of a kelp bed to be evaluated and would improve our understanding of possible kelp restoration techniques.

E. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the Commission's administrative regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, to be 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 feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment. The project as conditioned herein incorporates measures necessary to avoid any significant environmental effects under the Coastal Act, and there are no less environmentally damaging feasible alternatives or mitigation measures. Therefore, the proposed project is consistent with CEQA.

Appendix A – Substantive File Documents

Kiel, R. 2013. Sand-Dwelling Macrocystis Kelp Restoration Project Proposal.

Johnson, S.Y., Dartnell, P., Cochrane, G.R., Golden, N.E., Phillips, E.L., Ritchie, A.C., Greene, H.G., Krigsman, L.M., Kvitek, R.G., Dieter, B.E., Endris, C.A., Seitz, G.G., Sliter, R.W., Erdey, M.E., Gutierrez, C.I., Wong, F.L., Yoklavich, M.M., Draut, A.E., Hart, P.E., and Conrad, J.E. (S.Y. Johnson and S.A. Cochran, eds.). 2013. California State Waters Map Series—Offshore of Santa Barbara, California: U.S. Geological Survey Scientific Investigations Map 3281, 45 p., 11 sheets, scale 1:24,000, http://dx.doi.org/10.3133/sim3281.

County of Santa Barbara. 2008. Environmental Analysis and Public Response Goleta Beach Park Coastal Access and Recreation Enhancement - Beach Sand Stabilization.

Chambers Group. 2002. Underwater Survey of Biological Resources Offshore Goleta Beach.

County of Santa Barbara. 2014. Goleta Beach County Park Managed Retreat Project 2.0 Final Environmental Impact Report.

Exhibit 1 – Project Location and Design