

CALIFORNIA COASTAL COMMISSION

SAN DIEGO AREA

7575 METROPOLITAN DRIVE, SUITE 103

SAN DIEGO, CA 92108-4402

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REGULAR CALENDAR
STAFF REPORT AND PRELIMINARY RECOMMENDATION

Application No.: 6-00-138

Applicant: Renita Greenberg
Dick and Catherine Kinzel

Agent: Bob Trettin

Description: Construction of an approximately 15 foot-high, 100 foot-long, 2 foot-wide tiedback concrete seawall at the toe of the bluff; a below-grade upper bluff retention system consisting of 16 piers placed eight-foot on center in the rear yards of the residential structures extending for approximately 100 feet in length; one row of tiebacks at elevation +19 (MSL) and; chemical grouting of an area of exposed clean sands approximately 100 feet-long and 8 feet in depth located at approximate elevation +25 to +30 ft (MSL) on the face of the bluff. The face of the proposed seawall has been designed for coloring, texturing and sculpting to allow for a more natural appearance. The chemical grouting and tiebacks are currently being installed, pursuant to an emergency permit.

Site: On the bluff and beach below 325 and 327 Pacific Avenue, Solana Beach, San Diego County. APN #263-312-01 and 263-301-11

STAFF NOTES:

Summary of Staff's Preliminary Recommendation: Staff is recommending approval of the subject development as the applicants have demonstrated that the existing blufftop residences are in danger from erosion. The subject site has recently sustained a bluff collapse that has exposed a layer of clean sands approximately midway up the bluff. Due to the collapse and exposure of the clean sands layer, the applicant's geotechnical representative has concluded that the existing blufftop residences are now in danger. The Commission's staff engineer and geologist have reviewed the applicants' geotechnical assessment and concur with its conclusions.

The subject development has been conditioned to mitigate its impact on coastal resources such as scenic quality, public access and recreation opportunities, and shoreline sand supply. A special condition has been attached which requires the applicants to record a

deed restriction acknowledging that should additional stabilization be proposed in the future, the applicants will be required to identify and address the feasibility of all alternative measures which would avoid additional alteration of the natural landform of the public beach or coastal bluffs, but would reduce the risk to the principle residential structures and provide reasonable use of the property. If such alternatives are feasible, the Commission will require them instead of additional shoreline protective devices. The recommended conditions also require the applicant to pay a beach sand mitigation fee to mitigate the direct and long-term impacts on shoreline sand supply. Other conditions involve the timing of construction, the appearance of the seawall and upper bluff wall, long-term monitoring of the seawall, grouting and below-grade upper bluff retention system, and approval from other agencies.

Substantive File Documents: City of Solana Beach General Plan and Zoning Ordinance San Diego County LCP; Conditional Use Permit #17-00-20; "Preliminary Geotechnical Evaluation of Coastal Bluff 325 and 327 Pacific Avenue, Solana Beach" by Soil Engineering Construction dated June 26, 2000; "Alternative Analysis 325 and 327 Pacific Avenue" by Soil Engineering Construction (not dated); CDP #6-84-579/Valenta, 6-00-91-G/Kinzel, Greenberg; 6-00-155-G/Kinzel, Greenberg.

I. PRELIMINARY STAFF RECOMMENDATION:

The staff recommends the Commission adopt the following resolution:

MOTION: *I move that the Commission approve Coastal Development Permit No. 6-00-138 pursuant to the staff recommendation.*

STAFF RECOMMENDATION OF APPROVAL:

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

RESOLUTION TO APPROVE THE PERMIT:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. 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.

See attached page.

III. Special Conditions.

The permit is subject to the following conditions:

1. Revised Final Plans. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit for review and written approval of the Executive Director, final seawall, site, landscape, irrigation and drainage plans in substantial conformance with the submitted plans dated 6/23/00 by Soil Engineering Construction, that include the following measures to mitigate the impacts of the shoreline protection devices and address overall site stability. Said plans shall first be approved by the City of Solana Beach and revised to include the following:

- a. Sufficient detail regarding the construction method and technology utilized for connecting the subject seawall to adjacent seawall structure(s) or, where a seawall does not exist, constructing a return wall on either side so as to gradually blend into the adjacent natural bluff.
- b. Sufficient detail regarding the construction method and technology utilized for texturing and coloring the seawall, below-grade upper bluff retention system and tiebacks. Said plans shall confirm, and be of sufficient detail to verify, that the seawall color and texture closely matches the adjacent natural bluffs, including provision of a color board indicating the color of the fill material.
- c. The seawall shall conform as closely as possible to the natural contour of the bluff.
- d. The alignment of the below-grade upper bluff retention system shall be revised landward such that it will be approximately 12 feet west of the residence at 327 Pacific Avenue.
- e. Any existing permanent irrigation system located on the two blufftop sites shall be removed or capped.
- f. All runoff from impervious surfaces on the top of the bluff shall be collected and directed away from the bluff edge towards the street.
- g. Existing accessory improvements (i.e., decks, patios, walls, etc.) located in the geologic setback area on the two sites shall be detailed and drawn to scale on the final approved site plan and shall include measurements of the distance between

the accessory improvements and the bluff edge (as defined by Section 13577 of the California Code of Regulations) taken at 6 or more locations. The locations for these measurements shall be identified through permanent markers, benchmarks, survey position, written description, etc. (the same as utilized for as-built plans required pursuant to Special Condition #5 below). The plan shall also document all accessory improvements which will be removed and/or replaced as a result of constructing the below-grade retention system.

- h. During construction of the approved development, disturbance to sand and intertidal areas shall be minimized to the maximum extent feasible. All excavated beach sand shall be redeposited on the beach. Local sand, cobbles or shoreline rocks shall not be used for backfill or for any other purpose as construction material.

The permittee shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

2. Mitigation for Impacts to Sand Supply. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall provide evidence, in a form and content acceptable to the Executive Director, that a fee of \$15,268.50 has been deposited in an interest bearing account designated by the Executive Director, in-lieu of providing the total amount of sand to replace the sand and beach area that would be lost due to the impacts of the proposed protective structure. The methodology used to determine the appropriate mitigation fee for the subject site(s) is that described in the staff report dated 2/27/01 prepared for Coastal Development Permit #6-00-138. All interest earned shall be payable to the account for the purposes stated below.

The purpose of the account shall be to establish a beach sand replenishment fund to aid SANDAG, or a Commission-approved alternate entity, in the restoration of the beaches within San Diego County. The funds shall solely be used to implement projects which provide sand to the region's beaches, not to fund operations, maintenance or planning studies. The funds shall be released only upon approval of an appropriate project by the Executive Director of the Coastal Commission. The funds shall be released as provided for in a MOA between SANDAG, or a Commission-approved alternate entity and the Commission, setting forth terms and conditions to assure that the in-lieu fee will be expended in the manner intended by the Commission. If the MOA is terminated, the Commission can appoint an alternative entity to administer the fund.

3. Monitoring Program. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and written approval, a monitoring program prepared by a licensed geologist or geotechnical engineer for the site, upper bluff retention system, seawall, tiebacks and areas of chemical grouting, which provides for the following:

- a. An annual evaluation of the condition and performance of the upper bluff retention system, lower seawall, tiebacks and the chemically grouted clean sands lens addressing whether any significant weathering or damage has occurred that would adversely impact the future performance of the structures. This evaluation shall include an assessment of the color and texture of the seawall and any exposed areas of the upper bluff retention system and tiebacks comparing the appearance of the structures to the surrounding native bluffs.
- b. Annual measurements of any differential retreat between the natural bluff face and the seawall face, at both ends of the seawall and at 20-foot intervals (maximum) along the top of the seawall face/bluff face intersection. The program shall describe the method by which such measurements shall be taken.
- c. Provisions for submittal of a report to the Executive Director of the Coastal Commission on May 1 of each year (beginning the first year after construction of the project is completed) for a period of three years and then, each third year following the last the annual report, for the life of the approved seawall, tiebacks and upper bluff retention system. Each report shall be prepared by a licensed geologist or geotechnical engineer. The report shall contain the measurements and evaluation required in sections a, and b above. The report shall also summarize all measurements and provide some analysis of trends and the stability of the overall bluff face, including the upper bluff area, the effectiveness of the chemical grouting of the clean sands lens and the impact of the seawall on the bluffs to either side of the wall, which do not include the construction of structures on the face of the bluff. In addition, each report shall contain recommendations, if any, for necessary maintenance, repair, changes or modifications to the project.
- d. An agreement that the permittees shall apply for a coastal development permit within three months of submission of the report required in subsection c. above (i.e., by August 1st) for any necessary maintenance, repair, changes or modifications to the project recommended by the report that require a coastal development permit.

The permittee shall undertake monitoring in accordance with the approved plan. Any proposed changes to the approved plan shall be reported to the Executive Director. No changes to the plan shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

4. Storage and Staging Areas/Access Corridors. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director for review and written approval, final plans indicating the location of access corridors to the construction site and staging areas. The final plans shall indicate that:

- a. No overnight storage of equipment or materials shall occur on sandy beach or within Fletcher Cove public parking spaces. During the construction stages of the project, the permittee shall not store any construction materials or waste where it will be or could potentially be subject to wave erosion and dispersion. In addition, no machinery shall be placed, stored or otherwise located in the intertidal zone at any time, except for the minimum necessary to construct the seawall. Construction equipment shall not be washed on the beach or in the Fletcher Cove parking lot.
- b. Access corridors shall be located in a manner that has the least impact on public access to and along the shoreline.
- c. No work shall occur on the beach on weekends or holidays between Memorial Day weekend and Labor Day of any year.
- d. The applicant shall submit evidence that the approved plans/notes have been incorporated into construction bid documents. The staging site shall be removed and/or restored immediately following completion of the development.

The permittee shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

5. Storm Design/As-Built Plans. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit certification by a registered civil engineer that the proposed shoreline protective devices are designed to withstand storms comparable to the winter storms of 1982-83.

Within 60 days following completion of the project, the permittee shall submit as-built plans of the approved seawall, chemical grouting, tiebacks and upper bluff retention device which include measurements of the distance between each residence (and remaining accessory improvements) and the bluff edge (as defined by Section 13577 of the California Code of Regulations) taken at 6 or more locations. The locations for these measurements shall be identified through permanent markers, benchmarks, survey position, written description, etc. to allow annual measurements to be taken at the same bluff location and comparisons between years to provide information on bluff retreat.

In addition, within 60 days following completion of the project, the permittee shall submit certification by a registered civil engineer, acceptable to the Executive Director, verifying the seawall has been constructed in conformance with the approved plans for the project.

6. Future Response to Erosion. If in the future the permittee seeks a coastal development permit to construct additional bluff or shoreline protective devices, the

permittee will be required to include in the permit application information concerning alternatives to the proposed bluff or shoreline protection that will eliminate impacts to scenic visual resources, recreation and shoreline processes. Alternatives shall include but not be limited to: relocation of all or portions of the principle structures that are threatened, structural underpinning, and other remedial measures capable of protecting the principal structures and providing reasonable use of the property, without constructing bluff or shoreline stabilization devices. The information concerning these alternatives must be sufficiently detailed to enable the Coastal Commission to evaluate the feasibility of each alternative, and whether each alternative is capable of protecting existing structures that are in danger from erosion. No additional bluff or shoreline protective devices shall be constructed on the adjacent public bluff face above the approved seawall or on the beach in front of the proposed seawall unless the alternatives required above are demonstrated to be infeasible. No shoreline protective devices shall be constructed in order to protect ancillary improvements (patios, decks, fences, landscaping, etc.) located between the principal residential structures and the ocean.

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, each applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director incorporating all of the above terms of this condition. The deed restriction shall include a legal description of the applicant's entire parcel. The deed restriction shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction. This deed restriction shall not be removed or changed without a material amendment to this coastal development permit approved by the Commission or an immaterial amendment approved by the Executive Director.

7. Assumption of Risk. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, each applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director, which shall provide: (a) that each applicant understands that the site may be subject to extraordinary hazard from bluff collapse and erosion and the applicant assumes the liability from such hazards; and (b) each applicant unconditionally waives any claim of liability on the part of the Commission or its successors in interest for damage from such hazards and agrees to indemnify and hold harmless the Commission, its officers, agents, and employees relative to the Commission's approval of the project for any damage due to natural hazards. The deed restriction shall run with the land, binding all successors and assigns, and shall be recorded free of prior liens that the Executive Director determines may affect the enforceability of the restriction.

This deed restriction shall not be removed or changed without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

8. Future Maintenance/Debris Removal. Within 15 days of completion of construction of the protective devices the permittees shall remove all debris deposited on the bluff, beach or in the water as a result of construction of shoreline protective devices.

The permittees shall also be responsible for the removal of debris resulting from failure or damage of the shoreline protective devices in the future. In addition, the permittee shall maintain the permitted seawall, tiebacks, chemical grouting of clean sands and upper bluff below-grade retention system in its approved state. Maintenance of the seawall shall include maintaining the color, texture and integrity. Maintenance of the below-grade upper bluff retention device shall include maintaining the color, texture and integrity of any portions of the device that become exposed in the future. Any change in the design of the project or future additions/reinforcement of the seawall, tiebacks, chemical treatment of clean sands and upper bluff retention system beyond exempt maintenance as defined in Section 13252 of the California Code of Regulations to restore the structure to its original condition as approved herein, will require a coastal development permit. **However, in all cases, if after inspection, it is apparent that repair and maintenance is necessary, including maintenance of the color of the structures to ensure a continued match with the surrounding native bluffs, the permittee shall contact the Commission office to determine whether permits are necessary, and, if necessary, shall subsequently apply for a coastal development permit for the required maintenance.**

9. U.S. Army Corps of Engineers Permit. PRIOR TO COMMENCEMENT OF CONSTRUCTION, the permittee shall provide to the Executive Director a copy of a U.S. Army Corps of Engineers permit, or letter of permission, or evidence that no Corps permit is necessary. Any mitigation measures or other changes to the project required through said permit shall be reported to the Executive Director. Such changes shall not be incorporated into the project until the applicant obtains a Commission approved amendment to this coastal development permit, unless the Executive Director determines that no amendment is required.

10. State Lands Commission Approval. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and written approval, a written determination from the State Lands Commission that:

- a) No state lands are involved in the development; or
- b) State lands are involved in the development, and all permits required by the State Lands Commission have been obtained; or
- c) State lands may be involved in the development, but pending a final determination of state lands involvement, an agreement has been made by the applicant with the State Lands Commission for the project to proceed without prejudice to the determination.

11. Public Rights. The Coastal Commission's approval of this permit shall not constitute a waiver of any public rights that exist or may exist on the property. The permittee shall not use this permit as evidence of a waiver of any public rights that exist or may exist on the property.

IV. Findings and Declarations.

The Commission finds and declares as follows:

1. Detailed Project Description. The proposed project involves the construction of an approximately 15 foot-high, 100 foot-long, 2 foot-wide tiedback concrete seawall at the toe of the bluff; a below-grade upper bluff retention system consisting of 16 piers placed eight-foot on center in the rear yards of the residential structures extending for approximately 100 feet in length; one row of tiebacks at elevation +19 (MSL) and; chemical grouting of an area of exposed clean sands approximately 100 feet-long and 8 feet in depth located at approximate elevation +25 to +30 ft (MSL) on the face of the bluff. The chemical grouting and row of tiebacks at elevation +19 (MSL) are currently under construction pursuant an Executive Directors issuance of an emergency permit. The face of the proposed seawall has been designed for coloring, texturing and sculpting to allow for a more natural appearance.

The subject development is located at the base of an approximately 80 ft.-high coastal bluff below two single-family residences. The home at 325 Pacific was constructed in approximately 1956 and the residence at 327 Pacific Avenue was constructed in approximately 1985. The residence at 327 Pacific Avenue received Coastal Commission approval for its construction in 1985 (CDP #6-84-159R/Valenta and 6-84-159R-A/Valenta; see permit history discussion below).

The City of Solana Beach does not yet have a certified LCP. Therefore, Chapter 3 policies of the Coastal Act is the standard of review.

2. Site/Permit History. In 1984 the Commission approved development of a second story addition to an existing approximately 2,000 sq. ft. single-family residence at 327 Pacific Avenue (CDP No. 6-84-159/Valenta). The addition and its footings were designed to be placed at least 25 feet landward of the existing bluff edge. The applicant subsequently requested a reconsideration of the Commission action objecting to a special condition that required the recordation of a deed restriction which would notify potential property owners that the removal of an existing blufftop concrete slab and patio wall would be a preferred and practical alternative to shoreline protection if the structure were threatened in the future. Because the requirement of a deed restriction was not included as part of a pending County of San Diego LCP regulation, the Commission agreed to the reconsideration request and subsequently approved the development request eliminating the need for a deed restriction (CDP No. 6-84-159-R). However, the Commission did approve a special condition that essentially served the same function:

In the event that erosion threatens the existing patio slab and patio wall in the future, the Coastal Commission will consider removal of these structures as preferred and practical alternatives to proposals for bluff and shoreline protective works, pursuant to Board of Supervisors Policy 1-82 on Shoreline erosion.

Additional special conditions for the residential addition included final plans, a requirement that any additional bluff face development would require Commission review and an assumption of risk by the property owner.

The applicant subsequently demolished the existing residence inconsistent with the approved coastal development permit for the residential addition, and commenced construction of a new residence located 25 feet landward of the then existing edge of the bluff. In 1985, the applicant subsequently submitted (and the Commission approved) an amendment to the original coastal development to authorize the after-the-fact demolition and the construction of a new residence (CDP No. 6-84-159-A/Valenta). No additional special conditions were required.

The single-family residence at 325 Pacific Avenue was constructed in approximately 1956 and, until the recent request for emergency permits (as described below), has no prior history involving Coastal Commission action.

In July of 2000, (and again in October 2000) the Executive Director granted an emergency permit to the subject applicants to apply a chemical grout throughout the exposed layer of clean sands for a depth of 8 feet in an attempt to slow down the erosion potential of the clean sands. In addition, because the applicant identified fractures within the lower bluff that could immediately create an additional failure of the bluff below the clean sands lens, the emergency permit also authorized the installation of two rows of 10 tiebacks for the length of the property at elevation 13+ feet and 19+ feet (MSL) to shore up the bluff face (Emergency Permit #6-00-91-G/Kinzel,Greenberg). Because the applicant was unable to perform the work within the prescribed time limits of the emergency permit, the first emergency permit expired. The applicant received a second emergency permit in October 2000 (Emergency Permit #6-00-155-G/Kinzel,Greenberg). The Executive Director has subsequently extended this emergency permit until April 6, 2001 because the applicant demonstrated that work was delayed because of high tides and hourly limitations imposed by the City as to when the work can occur on the beach. The subject application represents the required follow-up to the previously issued emergency permit(s).

3. Geologic Conditions and Hazards. Section 30235 of the Coastal Act states, in part:

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply.

In addition, Section 30253 of the Coastal Act states, in part:

New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs...

Coastal Act Section 30235 acknowledges that seawalls, revetments, cliff retaining walls, groins and other such structural or "hard" solutions alter natural shoreline processes. Thus, such devices are required to be approved only when necessary to protect existing structures. The Coastal Act does not require the Commission to approve shoreline altering devices to protect vacant land or in connection with construction of new development. A shoreline protective device proposed in those situations is likely to be inconsistent with various other Coastal Act policies. For example, Section 30252 addresses new development and requires that it be sited and designed to avoid the need for protective devices that would substantially alter natural landforms along the bluffs and cliffs.

In addition, the Commission has generally interpreted Section 30235 to require the Commission to approve shoreline protection only for existing principal structures. The Commission must always consider the specifics of each individual project, but has found in many instances that accessory structures such as patios, decks and stairways are not required to be protected under Section 30235 or can be protected from erosion by relocation or other means that does not involve shoreline protection. The Commission has historically permitted at grade structures within the geologic setback area recognizing they are expendable and capable of being removed rather than requiring a protective device that alters natural landforms along bluffs and cliffs.

The proposed project involves the construction of a 100-foot long, 15-foot high tiedback concrete seawall on the public beach below two existing single-family residences, and construction of an approximately 100-foot long, 16-piered, below-grade upper bluff retention device seaward of the residences. In addition, the request includes the insertion of one row of 10 tiebacks approximately 35 feet long to be placed within the bluff across the length of the subject two properties at elevation +19 ft. (MSL) and the chemical grouting of up to 8 ft. in depth of a clean sands lens that has become exposed from approximate elevation +25 to +30 ft. (MSL). The insertion of the tiebacks and the chemical grouting of the clean sands have previously been permitted under a separate emergency permit (ref. Emergency Permit #6-00-155-G) and, although the work has commenced, it has not been completed.

The applicants have submitted a geotechnical study documenting the geologic structure and recent history of the bluffs in the project area. The geotechnical evaluation identifies the bluffs in the location of the proposed project are approximately 80 feet in height and consist of an underlying layer of Torrey Sandstone, an approximate 5 foot-high layer of "clean sands" and an upper layer of Marine Terrace Deposits ("Preliminary Geotechnical

Evaluation of Coastal Bluff 325 and 327 Pacific Avenue, Solana Beach" by Soil Engineering Construction dated June 26, 2000). The slope below the subject residences is described as "oversteepened" exceeding 45 degrees from the base of the bluff to edge of the upper bluff. In February of 2000 the subject site experienced a significant bluff sloughage and fracturing affecting the lower bluff involving an area approximately 20 feet high, 5 feet deep and 60 feet long. The geotechnical report identifies that today the base of the bluff consist of a near vertical and undercut 20 to 25+ ft. high sea cliff which contains several "adverse oriented planes, joints and fractures with potential for future failures along these weak zones". The bluff sloughage of February 2000 also resulted in the exposure of the approximate 5-foot high geologic segment located between the Torrey Sandstone and Marine Terrace Deposits (at approximately elevation 25-30 ft.) described as "a clean sands lens". The presence of this clean sands lens within the bluffs along the Solana Beach shoreline has previously been identified in geotechnical reports submitted in conjunction with seawall, seacave and notch infill projects south of the subject site (ref. CDP #6-99-100/Presnell, et. al, #6-99-103/ Coastal Preservation Association, 6-00-66/Pierce, Monroe). These reports document that the layer of clean sands extends south to Fletcher Cove. In addition, an exposed clean sands layer has been observed in the sections of the bluff adjacent to Tide Beach Park, approximately 1,500 feet north of the subject site, suggesting the layer extends as least as far north as Tide Beach.

According to the applicant's geotechnical report, the clean sand layer is a very loose sandy material with a limited amount of capillary tension and a very minor amount of cohesion, both of which cause the sandy material to dissipate easily, making this clean sand layer, once exposed, susceptible to wind blown erosion and continued sloughing as the sands dries out and loses the capillary tension that initially held the materials together. Gentle sea breezes and any other perturbations, such as landing birds or low-flying helicopters, can be sufficient triggers of small or large volume bluff collapses, since the loss of the clean sands eliminates the support for the overlying, slightly more cemented, terrace deposits.

The geotechnical report also states that the typical mechanism of sea cliff retreat along the Solana Beach shoreline involves the slow abrasion and undercutting of the lower Torrey Sandstone from wave action which becomes more pronounced in periods of storms, high surf and high tides. Other contributing factors to sea cliff retreat include fracturing, jointing, sea cave and overhang collapse and the lack of sand along the shoreline. As the cliff retreats, the natural angle of repose of the upper bluff is heightened which eventually leads to gradual bluff sloughage in order that the bluff regain its stable equilibrium. The subject geotechnical report identifies that the sea cliff erosion rate for Solana Beach from 1968 to 1983 was approximately 3 inches per year. However, episodic events such as sea cave or notch overhang collapses, severe winter can accelerate that process. In the case of the subject site, the geotechnical report estimates that the sea cliff retreat during the El Nino Storms of October 1997 to March 1998 was approximately 3 to 7 feet and resulted in the nearly complete removal of beach deposits. The applicant contends that on February 25, 2000 the lower bluff eroded an additional 5 feet.

Although the sea cliff below the existing residence has recently experienced erosion at a faster rate than has occurred in past decades, the geotechnical report identifies that the imminent threat to the residences is due to the recently exposed clean sands within the bluff face. Without taking into account the presence of the clean sands, the geotechnical report identifies that the factor of safety of the bluff below the residences is 1.32. A factor of safety of 1.25 is considered by the applicant's engineer to be a point at which the upper bluff is susceptible to failure, which implies the homes are not currently threatened. However, when the clean sands lens is included in the analysis, the factor of safety for the residences is reduced to 1.04, a level that the applicant's engineer contends represents an immediate threat the homes. The residence at 325 Pacific is located as close as 10 feet from the edge of the bluff and the residence at 327 Pacific is located as close as 25 feet from the edge of the bluff. The slope analysis performed by the applicant's engineer indicates that the collapse of the upper bluff resulting from loss of the clean sands would undermine the foundations for both residences.

According to the applicant's consultant, the mechanism of bluff collapse that occurs in conjunction with the exposure of the clean sands lens is significantly more catastrophic than typical bluff collapses. The presence of the clean sands creates a process whereby the clean sands rapidly undermine the upper sloping terrace deposits causing the upper bluff to collapse thereby exposing more clean sands to wind erosion which then results in more upper bluff collapses. This cycle occurs so quickly (over months or days, rather than years) that the upper bluff never achieves a stable angle of repose. In 1998, following the exposure of the clean sands lens below 261 Pacific Avenue (eight lots south of the subject site), a section of the bluff collapsed suddenly and without warning, leaving a vertical headscarp upwards of 25 feet in height at the top of the bluff. To address the concern of the clean sands at the subject site, the applicant is proposing to inject chemical grout into the layer of clean sands to a depth of approximately 8 feet, across the length of the property. However, unless the base of the bluff is afforded shoreline protection, additional sea cliff sloughage can further expose the layer of clean sands and result in a potential upper bluff failure and an immediate threat to the residences at the top of the bluff.

Although the geotechnical report contends that a lower seawall, one row of tiebacks at elevations 19+ MSL and chemical grouting of the clean sands lens are required to protect the homes, it also identifies that following the installation of these measures the homes will still be in danger from erosion. The applicants' engineer indicates that the slope of the middle and upper bluff are steep (approximately 1:1 or 45 degrees from horizontal) and even if the clean sands layer is stabilized, the bluff above the clean sands layer will continue to retreat. This retreat will soon reach the blufftop homes, undermining their foundation and subjecting to them threat which would necessitate upper bluff protection. While the upper bluff protection may not be needed immediately, it will be needed in the foreseeable future. Therefore, the applicants are also proposing a below-grade upper bluff retention system that consists of 16 drilled piers, approximately 40 feet deep, to be placed between the residences and the edge of the bluff for the length of the property.

The proposed 16 drilled pier below-grade retention system represents the first such request for the protection of blufftop residential homes along the Solana Beach shoreline. Its alignment in proximity to the bluff edge may, therefore, serve as a precedent for future devices along this section of the coast. In addition, the Commission has found in other permit actions involving below-grade retention systems that the alignment in proximity to the residence and bluff edge is important to reduce potential visual impacts. As the bluff retreats to its natural angle of repose, portions of the below grade retention device will be exposed. The degree of that exposure depends upon how close the pier structures are to the edge of the bluff. As such, the Commission has traditionally required that such structures be placed as far landward as possible.

The applicants propose to install the below-grade retaining wall up to 17 feet seaward of the residence at 327 Pacific Avenue and approximately 2 to 9 feet seaward of the residence at 325 Pacific Avenue. Since the Commission is not required to protect the rear yard or accessory structures, the alignment of the below-grade device at 17 feet seaward of the residence at 327 Pacific Avenue raises concerns that more than the residence itself will be afforded protection. The applicants' representative has identified that the rear yard at 327 Pacific Avenue extends approximately 25 feet from the western edge of the residence and consists of paver stones, stamped concrete with concrete columns approximately 3 feet high supporting Plexiglas panels. The representative has stated that the installation of the below-grade retention device will result in the need to remove the concrete columns, all the stamped concrete and part of the paver stones. However, the applicants' engineer has stated that the pierced caissons could be placed as close as 10 feet from the residential structures in order to protect the subject residences. The engineer has also asserted that the proposed northern terminus of retention system must be located as far seaward as possible in order to protect the neighbor's property to the north from future lateral failure. However, in recent conversations with the Commission's staff engineer, the applicant's engineer has agreed that the alignment can be moved landward approximately 5 feet and still provide protection to the neighboring property to the north. In addition, the Commission's staff engineer has reviewed the revised proposal and determined that installation of the upper bluff system at its most landward location will not preclude or necessitate other upper bluff stabilization in the future on adjacent properties. Therefore, Special Condition #1 has been attached which, among other things, requires the realignment of the below-grade retention system to extend no more than 12 feet west of the existing subject residences. In this way, the Commission can be assured that only the residential structures themselves are afforded protection and the visual impact of the wall's future exposure will be minimized as required by the Coastal Act.

Thus, given the amount of documented erosion on the site following the El Nino storms of 1997 and 1998, the significant bluff collapse that occurred in February 2000, the presence of the clean sands and the extreme erodibility of these sands once exposed, and the low factor of safety on the subject bluffs, substantial evidence has been provided to document that the existing primary blufftop structures are in danger from erosion. However, there are a variety of ways in which the threat from erosion could be addressed.

Under the policies of the Coastal Act, the project must be the least-environmentally damaging alternative.

Alternatives

The applicants have submitted an analysis by a geotechnical engineer which reviews several alternatives to the proposed development including: a higher seawall to contain the exposed clean sands layer; drainage controls; underpinning the residence; and removal and/or relocation of portions of or the entire primary structures. As discussed above, any effective alternative to the proposed seawall would have to address the source of the bluff instability at the project site, namely, the presence of the clean sands layer.

The applicants' analysis indicates that underpinning of the existing homes alone could potentially be considered as an alternative to the proposed project; however, this would not stop the upper bluff collapses from continuing to undermine the home, unless the piers were 80 feet deep. The applicant's engineer has argued this significant amount of construction would be infeasible. Even if 80-foot deep piers were installed, the collapse on the site triggered by the erosion of the clean sands would continue to grow laterally, undermining the upper bluffs and eventually destabilizing adjacent bluff areas thereby threatening additional bluff-top structures.

The analysis also examined the feasibility of removal or relocation of some or all of the existing bluff-top residence. The applicants assert that moving the homes or removing the western portions of the homes would be infeasible, since the only remaining space on the lots to build would be the 10 foot-wide area to the east between the residences and the street. However, the applicants assert that even if the residences could be moved somewhat further away from the bluff, or, if seaward portions of the residences were removed, it would not eliminate or delay the need for the project. As described above, once exposed, the clean sand lens erodes rapidly, undermining the upper terrace deposits, which then collapse, exposing more clean sands, and continuing the cycle. Therefore, moving the residences or removing seaward portions of the house would not significantly delay the need for the proposed seawall.

The alternatives analysis supports the control of planting and irrigation on bluff top lots to prevent excess moisture from triggering collapses of bluff-top sediments. However, the analysis again emphasizes that the bluff collapse at the project site was due to wave action and bluff fractures, not from excess water resulting from bluff-top activities. Thus, instituting stricter landscaping and irrigation controls would not stabilize the bluff, and would not reduce or eliminate the need for the proposed project, but should still be instituted to reduce the potential for water-related collapses in the future.

In summary, the exposure of the clean sands lens presents a threat of rapid erosion and bluff collapses that must be addressed by a solution that effectively contains the clean sands and affords protection to the residences at the top of the bluff. Given the substantial amount of documented erosion on the site over the last year, the presence of the clean sands and the extreme erodibility of these sands, and the low factor of safety on

the subject bluffs, substantial evidence has been provided to document that the existing primary blufftop structures are in danger from erosion. In addition, an alternatives analysis has been presented by the applicants. Therefore, the Commission is required to approve a shoreline altering device to protect the two residences, pursuant to Section 30235 of the Coastal Act.

Sand Supply/In Lieu Mitigation Fee

Although construction of a seawall is required to protect the existing principle structures on the site, Section 30235 of the Coastal Act requires that the shoreline protection be designed to eliminate or mitigate adverse impacts on local shoreline sand supply. There are a number of adverse impacts to public resources associated with the construction of shoreline protection. The natural shoreline processes referenced in Section 30235, such as the formation and retention of sandy beaches, can be significantly altered by construction of a seawall, since bluff retreat is one of several ways that beach area and beach quality sand is added to the shoreline. This retreat is a natural process resulting from many different factors such as erosion by wave action causing cave formation, enlargement and eventual collapse, saturation of the bluff soil from ground water causing the bluff to slough off and natural bluff deterioration. When a seawall is constructed on the beach at the toe of the bluff, it directly impedes these natural processes.

Some of the effects of a shoreline protective structure on the beach such as scour, end effects and modification to the beach profile are temporary or difficult to distinguish from all the other actions which modify the shoreline. Seawalls also have non-quantifiable effects to the character of the shoreline and visual quality. However, some of the effects which a structure may have on natural shoreline processes can be quantified. Three of the effects from a shoreline protective device which can be quantified are: 1) loss of the beach area on which the structure is located; 2) the long-term loss of beach which will result when the back beach location is fixed on an eroding shoreline; and 3) the amount of material which would have been supplied to the beach if the back beach or bluff were to erode naturally.

Loss of beach material and loss of beach area are two separate concerns. A beach is the result of both sandy material and a physical area between the water and the back beach. Thus, beach area is not simply a factor of the quantity of sandy beach material. In Solana Beach, the shoreline is a shallow bedrock layer covered by a thin veneer of sand. The bedrock layer provides an area for collection of sandy material. The sand material is important to the overall beach experience, but even without the sand, the bedrock layer provides an area for coastal access between the coastal bluff and the ocean. The loss of beach material that will be a direct result of this project can be balanced or mitigated by obtaining similar quality and quantity of sediment from outside the littoral cell and adding this sediment to the littoral cell. There are sources of beach quality sediment that can be drawn upon to obtain new sediment for the littoral cell. Unfortunately there is not a source of extra beach land that can be used to add new land area to the littoral cell. Beach nourishment is a method that allows us to shift the shore profile seaward and create a new area of dry beach. This will not create new coastal land, but will provide

many of the same benefits that will be lost when the beach area is covered by a seawall or "lost" through passive erosion when the back bluff location is fixed.

It is possible to estimate the volume of sand needed to create a given area of dry beach through beach nourishment. The proposed project will result in a loss of 200 sq. ft. of beach due to the long-term physical encroachment of the seawall (based on a 100-foot length and 2 foot width). In addition, there will be 440 sq.ft. of beach area that will no longer be formed because the back of the beach will be fixed. This 640 sq.ft. of beach area [200 + 440] cannot be directly replaced by land, but a comparable area can be built through the one-time placement of 576 cubic yards of sand on the beach seaward of the seawall as beach nourishment. Thus, the impact of the seawall on beach area can be quantified as 576 cubic yards of sand. This estimate is only a "rough approximation" of the impact of the seawall on beach area because a one-time placement of this *volume* of sand cannot result in creation of beach *area* over the long term.

In addition to the impact on beach area, there is the amount of beach material that would have been added to the beach if natural erosion had been allowed to continue at the site, which can be calculated at a volume of 990 cubic yards. This 990 cubic yards of sand that would have been added to the littoral cell, plus the 576 cubic yards of sand associated with the impact to beach area, totals 1,566 cubic yards of sand that are needed to balance the quantifiable impacts from the entire project. Special Condition #2 requires the applicant to deposit an in-lieu fee to fund beach sand replenishment of 1,566 cubic yards of sand, as mitigation for impacts of the proposed shoreline protective device on beach sand supply and shoreline processes.

In the case of the proposed project, the fee calculates to be \$15,268.50, based on 1,566 cubic yards of sand multiplied by the cost of obtaining a cubic yard of sand, as proposed by the applicants' engineer at \$9.75.

The following is the methodology used by Commission staff in developing the in-lieu fee amount. The methodology uses site-specific information provided by the applicant as well as estimates, derived from region-specific criteria, of both the loss of beach material and beach area which could occur over the life the structure, and of the cost to purchase an equivalent amount of beach quality material and to deliver this material to beaches in the project vicinity.

The following is a description of the methodology. The actual calculations which utilize values that are applicable to the subject sites, and were used as the basis for calculating the estimated range of the mitigation fee, are attached as Exhibit XX to this report.

Fee = (Volume of sand for mitigation) x (unit cost to buy and deliver sand)

$$M = V_t \times C$$

where

M = Mitigation Fee

V_t = Total volume of sand required to replace losses due to the structure, through reduction in material from the bluff, reduction in nearshore area and loss of available beach area (cubic yards).
Derived from calculations provided below.

C = Cost, per cubic yard of sand, of purchasing and transporting beach quality material to the project vicinity (\$ per cubic yard). Derived from the average of three written estimates from sand supply companies within the project vicinity that would be capable of transporting beach quality material to the subject beach, and placing it on the beach or in the near shore area.

$$V_t = V_b + V_w + V_e$$

where

V_b = Volume of beach material that would have been supplied to the beach if natural erosion continued, based on the long-term regional bluff retreat rate, design life of the structure, percent of beach quality material in the bluff, and bluff geometry (cubic yards). This is equivalent to the long-term reduction in the supply of bluff material to the beach resulting from the structure.

V_w = Volume of sand necessary to replace the beach area that would have been created by the natural landward migration of the beach profile without the seawall, based on the long-term regional bluff retreat rate, and beach and nearshore profiles (cubic yards)

V_e = Volume of sand necessary to replace the area of beach lost due to encroachment by the seawall; based on the seawall design and beach and nearshore profiles (cubic yards)

$$V_b = (S \times W \times L/27) \times [(R \ h_s) + (h_u/2 \times (R + (R_{cu} - R_{cs})))]$$

where

R = Long-term regional bluff retreat rate (ft./yr.), based on historic erosion, erosion trends, aerial photographs, land surveys, or other accepted techniques. For the Solana Beach area, this regional retreat has been estimated to be 0.2 ft./year. This

value may be used without further documentation. Alternative retreat rates must be documented by the applicant and should be the same as the predicted retreat rate used to estimate the need for shoreline armoring.

L = Design life of armoring without maintenance (yr.) If maintenance is proposed and extends the life of the seawall beyond the initial estimated design life, a revised fee shall be determined through the coastal development permit process.

W = Width of property to be armored (ft.)

h = Total height of armored bluff (ft.)

S = Fraction of beach quality material in the bluff material, based on analysis of bluff material to be provided by the applicant

h_s = Height of the seawall from the base to the top (ft)

h_u = Height of the unprotected upper bluff, from the top of the seawall to the crest of the bluff (ft)

R_{cu} = Predicted rate of retreat of the crest of the bluff, during the period that the seawall would be in place, assuming no seawall were installed (ft/yr). This value can be assumed to be the same as R unless the applicant provides site-specific geotechnical information supporting a different value.

R_{cs} = Predicted rate of retreat of the crest of the bluff, during the period that the seawall would be in place, assuming the seawall has been installed (ft/yr). This value will be assumed to be zero unless the applicant provides site-specific geotechnical information supporting a different value.

NOTE: For conditions where the upper bluff retreat will closely follow the lower bluff, this volume will approach a volume of material equal to the height of the total bluff, the width of the property and a thickness equal to the total bluff retreat that would have occurred if the seawall had not been constructed. For conditions where the upper bluff

has retreated significantly and would not be expected to retreat further during the time that the seawall is in place, this volume would approach the volume of material immediately behind the seawall, with a thickness equal to the total bluff retreat that would have occurred if the seawall had not been constructed.

$$V_w = R \times L \times v \times W$$

where

R = Long-term regional bluff retreat rate (ft./yr.), based on historic erosion, erosion trends, aerial photographs, land surveys, or other accepted techniques. For the Encinitas area, this regional retreat has been estimated to be 0.2 ft./year. This value may be used without further documentation. Alternative retreat rates must be documented by the applicant and should be the same as the predicted retreat rate used to estimate the need for shoreline armoring.

L = Design life of armoring without maintenance (yr.) If maintenance is proposed and extends the life of the seawall beyond the initial estimated design life, a revised fee shall be determined through the coastal development permit process.

v = Volume of material required, per unit width of beach, to replace or reestablish one foot of beach seaward of the seawall; based on the vertical distance from the top of the beach berm to the seaward limit of reversible sediment movement (cubic yards/ft of width and ft. of retreat). The value of v is often taken to be 1 cubic yard per square foot of beach. In the report, "Oceanside Littoral Cell Preliminary Sediment Budget Report" (December 1987, part of the Coast of California Storm and Tide Wave Study, Document #87-4), a value for v of 0.9 cubic yards/square foot was suggested. If a vertical distance of 40 feet is used for the range of reversible sediment movement, v would have a value of 1.5 cubic yards/square foot (40 feet x 1 foot x 1 foot / 27 cubic feet per cubic yard). These different approaches yield a range of values for v from 0.9 to 1.5 cubic yards per square foot. The value for v would be valid for a region, and would not vary from one property to the adjoining one. Until further technical information is available for a more exact

value of v , any value within the range of 0.9 to 1.5 cubic yards per square foot could be used by the applicant without additional documentation. Values below or above this range would require additional technical support.

$W =$ Width of property to be armored (ft.)

$$V_e = E \times W \times v$$

where

$E =$ Encroachment by seawall, measured from the toe of the bluff or back beach (ft.)

$W =$ Width of property to be armored (ft.)

$v =$ Volume of material required, per unit width of beach, to replace or reestablish one foot of beach seaward of the seawall, as described above;

The San Diego Association of Governments (SANDAG) has adopted the Shoreline Preservation Strategy for the San Diego region and is currently working on techniques toward its implementation. The Strategy considers a full range of shoreline management tactics, but emphasizes beach replenishment to preserve and enhance the environmental quality, recreational capacity, and property protection benefits of the region's shoreline. Funding from a variety of sources will be required to implement the beach replenishment and maintenance programs identified in the SANDAG Strategy. In this particular case, SANDAG has agreed to administer a program which would identify projects which may be appropriate for support from the beach sand replenishment fund, through input from the Shoreline Erosion Committee which is made up of representatives from all the coastal jurisdictions in San Diego County. The Shoreline Erosion Committee is currently monitoring several large scale projects, both in and out of the coastal zone, they term "opportunistic sand projects", that will generate large quantities of beach quality material suitable for replenishing the region's beaches. The purpose of the account is to aid in the restoration of the beaches within San Diego County. One means to do this would be to provide funds necessary to get such "opportunistic" sources of sand to the shoreline.

The applicant is being required to pay a fee in-lieu of directly depositing the sand on the beach, because the benefit/cost ratio of such an approach would be too low. Many of the adverse effects of the seawall on sand supply will occur gradually. In addition, the adverse effects impact the entire littoral cell but to different degrees in different locations throughout the cell (based upon wave action, submarine canyons, etc.) Therefore, mitigation of the adverse effects on sand supply is most effective if it is part of a larger project that can take advantage of the economies of scale and result in quantities of sand at appropriate locations in the affected littoral cell in which it is located. The funds will be used only to implement projects which benefit the area where the fee was derived, and provide sand to the region's beaches, not to fund operations, maintenance or planning

studies. Such a fund will aid in the long-term goal of increasing the sand supply and thereby reduce the need for additional armoring of the shoreline in the future. The fund also will insure available sandy beach for recreational uses. The methodology, as proposed, ensures that the fee is roughly proportional to the impacts to sand supply attributable to the proposed seawall. The methodology provides a means to quantify the sand and beach area that would be available for public use, were it not for the presence of the seawall.

The above-described impacts on the beach and sand supply have previously been found to result from seawalls in other areas of North County. In March of 1993, the Commission approved CDP #6-93-85/Auerbach, et al for the construction of a seawall fronting six non-continuous properties located in the City of Encinitas north of the subject site. In its finding for approval, the Commission found the proposed shoreline protection would have specific adverse impacts on the beach and sand supply and required mitigation for such impacts as a condition of approval. The Commission made a similar finding for several other seawall developments within San Diego County including an August 12, 1999 approval (ref CDP No. 6-99-100/Presnell, et. al) for the approximately 352-foot-long seawall project located two lots south of the subject development. (ref. CDP Nos. 6-93-36-G/Clayton, 6-93-131/Richards, et al, 6-93-136/Favero, 6-95-66/Hann, 6-98-39/Denver/Canter and 6-99-41/Bradley).

In addition to the adverse impacts the seawall will have on the beach as detailed above, the Commission finds that the proposed seawall could also have adverse impacts on adjacent unprotected properties caused by wave reflection, which leads to accelerated erosion. Numerous studies have indicated that when continuous protection is not provided, unprotected adjacent properties experience a greater retreat rate than would occur if the protective device were not present. This is due primarily to wave reflection off the protective structure and from increased turbulence at the terminus of the seawall. According to James F. Tait and Gary B. Griggs in Beach Response to the Presence of a Seawall (A Comparison of Field Observations) "[t]he most prominent example of lasting impacts of seawalls on the shore is the creation of end scour via updrift sand impoundment and downdrift wave reflection. Such end scour exposes the back beach, bluff, or dune areas to higher swash energies and wave erosion." As such, as the base of the bluff continues to erode on the unprotected adjacent properties, failure of the bluff is likely. Thus, future failures could "spill over" onto other adjacent unprotected properties, prompting requests for much more substantial and environmentally damaging seawalls to protect the residences. This then starts a "domino" effect of individual requests for protection.

The applicant is proposing that the subject seawall be designed to abut a proposed seawall on its south side which is currently under review by the Commission (CDP #6-00-36/Corn, Scism). At this time, it is not known if this adjacent seawall will be permitted or constructed and, therefore, plans for its connection to the subject seawall have not been reviewed. In addition, the plans submitted by the applicant do not address the design of the proposed return wall on its northern end which will connect to a natural unarmored section of shoreline. Therefore, Special Condition #1 has been attached

which requires the submission of revised final plans that reflect the design of the proposed end return walls. The condition requires that the returns incorporate a feathered design to gradually blend into the adjacent natural bluffs which will help to reduce the turbulence at the end of the wall that can lead to accelerated erosion of adjacent unprotected bluffs. The condition also requires the submission of detailed plans for its connection to the neighboring proposed seawall if that structure is constructed in the future. However, although the proposed seawall must be designed to reduce impacts of the wall on adjacent properties, at best, the impacts can be reduced, but not eliminated. Regardless of whether accelerated erosion will occur on the adjacent unprotected properties, the adjacent bluffs will continue to erode due to the same forces that are causing them to erode currently. As this occurs, more surface area of the feathered edges will be exposed to wave attack leading to increased turbulence and accelerated erosion of the adjacent unprotected bluff. These impacts are particularly problematic in the case of the proposed project, as the seawall will be an isolated structure in a stretch of currently unprotected shoreline.

According to information contained in the Planners Handbook (dated March 1993), which is included as Technical Appendix III of the Shoreline Preservation Strategy adopted by the San Diego Association of Governments (SANDAG) on October 10, 1993, "[a] longer return wall will increase the magnitude of the reflected wave energy. On a coast where the shoreline is retreating, there will be strong incentives to extend the length of the return wall landward as adjacent property is eroded, thereby increasing the return wall, and its effects on neighboring property, with time."

If the proposed wall were damaged in the future (e.g. as a result of wave action, storms, etc.) it could threaten the stability of the site, which could lead to need for more bluff alteration. In addition, damage to the seawall could adversely affect the beach by resulting in debris on the beach and/or creating a hazard to the public using the beach. In addition, excessive wear of the seawall could result in the loss of or damage to the color or texture of the seawall resulting in adverse visual impacts (discussed in more detail in a subsequent section of this report). Therefore, in order to find the proposed seawall consistent with the Coastal Act, the Commission finds that the condition of the seawall in its approved state must be maintained for the estimated life of the seawall. Further, in order to ensure that the permittee and the Commission know when repairs or maintenance are required, the permittee must monitor the condition of the seawall annually, for three years and at three year intervals after that, unless a major storm event occurs. The monitoring will ensure that the permittee and the Commission are aware of any damage to or weathering of the seawall wall and can determine whether repairs or other actions are necessary to maintain the seawall in its approved state.

Therefore, Special Condition #3 requires the applicant to submit a monitoring report which evaluates the condition and performance of the seawall, tiebacks, chemical grouting of the clean sands layer and below-grade upper retention system and overall site stability, and submit an annual report with recommendations, if any, for necessary maintenance, repair, changes or modifications to the project. In addition, the condition requires the applicant to perform the necessary repairs through a coastal permit process.

Special Condition #6 requires a deed restriction acknowledging that alternative measures must be implemented on the applicants blufftop properties in the future, should additional stabilization be required, which would avoid additional alteration of the natural landform of the public beach or coastal bluffs, but would reduce risk to the principle residential structures and provide reasonable use of the property. The condition will ensure that future property owners will be aware that any future proposals for additional shoreline protection, such as upper bluff stabilization, will require an alternative analysis similar to one required for the subject project. If there are feasible alternatives to shoreline protection that would have less impact on visual quality, sand supply, or public access, the Commission will require implementation of those alternatives. The condition also states that no shore or bluff protection shall be permitted for ancillary improvements located within the blufftop setback area. Through this condition, the property owner is required to acknowledge the risks inherent in the subject property and that there are limits to the structural protective measures that may be permitted on the adjacent public property in order to protect the existing development in its current location.

Special Condition #1 requires the applicants to submit final plans for the project indicating that the seawall conforms to the bluff contours, details the design of the return walls or its connection to any adjacent seawall structures, revises the location of the below-grade retention device to be located no further seaward than 12 feet west of the existing residences and that demonstrate that existing irrigation systems on the blufftop have been removed, as these would impact the ability of the seawall and other shoreline protection devices to adequately stabilize the site. Submission of final plans will ensure that overall site conditions which could adversely impact the stability of the bluff have been addressed.

Special Condition #8 notifies the applicants that they are responsible for maintenance of the herein approved shore and bluff protection to include removal of debris deposited on the beach during and after construction of the structures. The condition also indicates that, should it be determined that maintenance of the proposed structures are required in the future, including maintenance of the color and texture, the applicant shall contact the Commission office to determine if permits are required.

To assure the proposed shore/bluff protection has been constructed properly, Special Condition #5 has been proposed. This condition requires that, within 60 days of completion of the project, as built-plans and certification by a registered civil engineer be submitted that verifies the proposed seawall has been constructed in accordance with the approved plans.

Special Conditions #9 requires the applicant to submit a copy of any required permits from the Army Corps of Engineers, to ensure that no additional requirements are placed on the applicant that could require an amendment to this permit.

Also, due to the inherent risk of shoreline development, Special Condition #7 requires the applicant to waive liability and indemnify the Commission against damages that might

result from the proposed shoreline devices or their construction. The risks of the proposed development include that the proposed shoreline devices (including the chemical grouting of the clean sands layer) will not protect against damage to the residences from bluff failure and erosion. In addition, the structures and chemical application themselves may cause damage either to the applicants' residences or to neighboring properties by increasing erosion of the bluffs. Such damage may also result from wave action that damages the seawall. Although the Commission has sought to minimize these risks, the risks cannot be eliminated entirely. Given that the applicants have chosen to construct the proposed shoreline devices despite these risks, the applicants must assume the risks. Accordingly, Special Condition #7 requires that the applicants record a deed restriction that evidences their acknowledgment of the risks and that indemnifies the Commission against claims for damages that may be brought by third parties against the Commission as a result of its approval of this permit. Only as conditioned can the proposed project be found consistent with Sections 30235 and 30253 of the Coastal Act.

In summary, the applicants have documented that the existing blufftop primary structures are in danger from erosion and subsequent bluff collapse. In addition, even with the construction of the seawall, tiebacks and chemical grouting of the clean sands, the upper bluff will continue to erode and soon will threaten the blufftop homes. Thus, the upper bluff retention system is also necessary to assure full protection for the existing blufftop residences. As conditioned, there are no other less damaging alternatives available to reduce the risk from bluff erosion. Thus, the Commission is required to approve the proposed protection for the two residences. Since the proposed seawall will contribute to erosion and geologic instability over time on adjacent unprotected properties and also deplete sand supply, occupy public beach and fix the back of the beach, Special Conditions require the applicant to require pay an in-lieu mitigation fee to offset this impact. Therefore, as conditioned, the Commission finds that the proposed seawall is consistent with Sections 30235 and 30253 of the Coastal Act.

4. Visual Resources/Alteration of Natural Landforms. Section 30240 (b) of the Coastal Act is applicable and states:

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

In addition, Section 30251 of the Coastal Act states, in part:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas . . .

As stated above, the proposed development will occur on the public beach at the base of an approximately 80 ft. high coastal bluff. An approximately 352 foot-long, 35 foot-high seawall is located two lots south of the subject site (6-99-100/Presnell, et.al). The two adjacent lots to the south have recently been granted an emergency permit for infill of a portion of the existing notch overhang (Emergency Permit #6-01-01-G/Corn, Scism) and a request to construct a 15 foot-high seawall similar to the subject development is pending before the Commission (CDP #6-00-36/Corn, Scism). The subject application and the neighboring proposed seawall request when combined and connected to the existing 352 foot-long, 35-foot-high wall would represent approximately 522 feet of shoreline armoring. Although there are already existing shoreline armoring devices to the south of the subject site, the bluffs north of the subject site currently remain in a natural state, with virtually no existing bluff or shore protection. As such, the potential for adverse impacts on visual resources associated with the proposed development could be significant.

The applicants are proposing to construct an approximately 15-foot high tied-back concrete seawall, install one row of tiebacks into bluff above the seawall, chemically grout a layer of exposed clean sands midway up the bluff and install a below-grade retention device at the top of the bluff. To mitigate the visual impacts of the proposed development, the applicant proposes to color and texture the seawall and any future exposed sections of the below-grade retention device to match the adjacent natural bluff. In addition, the proposed tiebacks located above the seawall at elevation +19 (MSL) will be recessed into the bluff and covered with a sculpted and colored shotcrete to match the surrounding bluff. The chemical grout application of the clean sands layer will be not be visible.

In terms of the color and texturing of the proposed seawall, a similar design was incorporated into the nearby 352-foot-long seawall to the south which today very closely mimics the natural toe of the bluff. Although the below-grade retention system at the top of the bluff will not be immediately visible, eventually, as the upper bluff recedes, portions of the device will become visible. As previously stated, the applicant proposes to grout or otherwise treat the exposed sections of below-grade device following exposure. Special Condition #1 requires the submittal of detailed plans, color samples, and information on construction methods and technology for the surface treatment of the wall, below-grade retention system and tiebacks. This condition also requires that the below-grade retention device be located as far landward as possible to reduce the amount of the device which eventually will be exposed and still provide appropriate protection to the residences. This location has been identified by the applicants' engineer to be no further seaward than 12 feet west of the existing residences. In this way, the Commission can be assured that the proposed seawall, below-grade retention system and tiebacks will blend with the natural bluffs in the area to the maximum extent feasible.

Special Condition # 3 requires the applicant to monitor the protective devices. The condition requires that should the appearance of the seawall change or deteriorate in the future, or the below-grade retention system or tiebacks become visible, the applicants

must apply for a coastal development permit to maintain the visible appearance of seawall in its approved condition and/or colorize and texture (or remove) the exposed structures..

Therefore, as conditioned, the Commission finds that potential visual impacts associated with the proposed development have been reduced to the maximum extent feasible and the proposed development will include measures to prevent impacts that would significantly degrade the adjacent park and recreation area (beach area). Thus, the project can be found consistent with Sections 30240 and 30251 of the Coastal Act.

5. Public Access/Recreation. Pursuant to Section 30604 (c), the Coastal Act emphasizes the need to protect public recreational opportunities and to provide public access to and along the coast. Section 30210 of the Coastal Act is applicable to the proposed development and states:

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

In addition, Section 30212 of the Act is applicable and states, in part:

- (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:
 - (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,
 - (2) adequate access exists nearby....

Additionally, Section 30220 of the Coastal Act provides:

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

The project site is located on a public beach utilized by local residents and visitors for a variety of recreational activities. The site is located approximately 1,500 feet north of Fletcher Cove Beach. The proposed seawall will be constructed on sandy beach area that is currently available to the public. The project will have several adverse impacts on public access.

Although the proposed seawall has been designed to be as narrow as feasible, it will project approximately 2 feet seaward of the toe of the bluff. Although the seaward encroachment of the wall appears at first glance to be minimal, the beach along this area of the coast is narrow and at high tides and winter beach profiles, the public may be

forced to walk virtually at the toe of the bluff or the area would be impassable. As such, an encroachment of any amount, including 2 feet for a length of 100 feet onto the sandy beach, reduces the beach area available for public use and is therefore a significant adverse impact. This is particularly true given the existing beach profiles and relatively narrow beach.

In addition to the above-described direct interference with public access by the proposed seawall, there are a number of indirect effects as well. Shoreline processes, and supply and beach erosion rates are affected by shoreline structures as described in Section 3 of this report, and thus alter public access and recreational opportunities.

It is generally accepted that the dividing line between public tidelands and private upland to tidal boundary in California is the mean high water datum (MHW). From an engineering point of view, a water boundary determined by tidal definition is not a fixed mark on the ground, such as a roadway or a fence; rather, it represents a condition at the water's edge during a particular instant of tidal cycle. Reference points such as Mean Sea Level and Mean High Water Datum, are calculated and reflect the average height of the tide levels over a period of time.

Development along the shoreline which may burden public access in several respects has been approved by the Commission. However, mitigation for any adverse impacts of the development on access and public resources is always required. The Commission's permit history reflects the experience that development can physically impede public access directly, through construction adjacent to the mean high tide line in areas of narrow beaches, or through the placement or construction of protective devices seawalls, rip-rap, and revetments. Since physical impediments adversely impact public access and create private benefit for the property owners, the Commission has found in such cases (in permit findings of #4-87-161 [Pierce Family Trust and Morgan], #6-87-371 [Van Buskirk], #5-87-576 [Miser and Cooper]) that a public benefit must arise through mitigation conditions in order that the development will be consistent with the access policies of the Coastal Act, as stated in Sections 30210, 30211, and 30212.

The development proposed in this application is the construction of a vertical seawall and upper bluff protection devices. The majority of the beach and bluffs along the Solana Beach shoreline are in public ownership. The subject applicant at 327 Pacific Avenue is one of the few who own the bluff seaward of their residence. Although the proposed seawall adheres closely to the contour of the natural bluff, the seawall will reduce lateral beach access by encroaching onto the beach and will have adverse impacts on the natural shoreline processes.

As stated elsewhere in these findings, Section 30235 of the Act allows for the use of such a device where it is required to protect existing development and where it has been designed to mitigate adverse impacts upon shoreline sand supply. In order to mitigate the known adverse impacts, the Commission typically requires an offer of dedication of lateral public access in order to balance the burden placed on the public with a public benefit. In this particular case, the beach (and half the bluff) are in public ownership and

will remain as such. Therefore, a dedication of lateral public access is not an available mitigation option. However, Special Condition #2, discussed in a previous section of the staff report, requires the applicant to provide mitigation for adverse impacts on beach and sand area resulting from placement of the proposed seawall, which will also serve to mitigate the impact of the loss of beach access. The mitigation will be an in-lieu fee which will be utilized for beach replenishment projects within the same littoral cell.

The development proposed in this application involves the construction of a vertical seawall, as well as significant mid and upper bluff devices. The majority of the beach and bluffs along the Solana Beach shoreline are in public ownership. Although the proposed seawall adheres closely to the contour of the natural bluff, the seawall will reduce lateral beach access by encroaching onto the beach and will have adverse impacts on the natural shoreline processes. Much of the beach is accessible in this area only at lower tides, and thus, the protection of a few feet of beach along the toe of the bluff is still important. This stretch of beach has historically been used by the public for access and recreation purposes. Special Condition #11 acknowledges that the issuance of this permit does not waive the public rights that exist on the property. The seawall may be located on State Lands Property, and as such, Special Condition #10 requires the applicant to obtain any necessary permits or permission from the State Lands Commission to perform the work.

As debris dislodged from the seawall and the upper bluff devices either during construction or after completion also has the potential to affect public access, Special Condition #8 has also been proposed. This condition notifies the applicant that they are responsible for maintenance and repair of the seawall and upper bluff devices and that should any work be necessary, they should contact the Commission office to determine permit requirements. In addition, the condition requires the applicants to be responsible for removal of debris deposited on the beach during and after construction of the project.

In addition, the use of the beach or public parking areas for staging of construction materials and equipment can also impact the public's ability to gain access to the beach. While the applicant has not submitted a construction staging and material storage plan for the subject development, it is likely that beach access to the site will occur via Fletcher Cove which is located approximately 1500 feet south of the subject site. In other developments for shoreline protection along this stretch of Solana Beach shoreline, the Commission has authorized the temporary placement of steel-tracked construction equipment (which cannot traverse asphalt streets) upland of the Fletcher Cove access ramp, in an area which is not currently used for parking. In addition, the Commission has previously authorized the use of parking spaces in an existing City-owned parking lot across the street from Fletcher Cove known as the "Distillery Lot" (for its previous use) for staging and storage of equipment during construction. This free, City-owned parking area is within easy walking distance of Fletcher Cove and is currently available to any beach users or patrons of the several small commercial facilities surrounding the lot. However, it is also the only off-street, open area in the vicinity of Fletcher Cove which can accommodate the type of equipment and vehicles required to construct the proposed project, other than Fletcher Cove itself. In addition, the City of Solana Beach has in the

past indicated that the lot is used only minimally, and thus has an excess capacity which can be allocated to staging and storage for the project, with only a minimal impact to beach uses.

Special Condition #4 prohibits the applicants from storing vehicles on the beach overnight, using any public parking spaces within Fletcher Cove for staging and storage of equipment, and prohibits washing or cleaning construction equipment on the beach or in the parking lot. The condition also prohibits construction on the sandy beach during weekends and holidays between Memorial Day to Labor Day of any year. Therefore, impacts to the public will be minimized to the greatest extent feasible. Thus, as conditioned, the Commission finds the project consistent with the public access and recreation policies of the Coastal Act.

6. Local Coastal Planning. Section 30604(a) also requires that a coastal development permit shall be issued only if the Commission finds that the permitted development will not prejudice the ability of the local government to prepare a Local Coastal Program (LCP) in conformity with the provisions of Chapter 3 of the Coastal Act. In this case, such a finding can be made.

The subject site was previously in the County of San Diego Local Coastal Program (LCP) jurisdiction, but is now within the boundaries of the City of Solana Beach. The City will, in all likelihood, prepare and submit a new LCP for the area to the Commission for review. Because of the incorporation of the City, the certified County of San Diego Local Coastal Program no longer applies to the area. However, the issues regarding protection of coastal resources in the area have been addressed by the Commission in its review of the San Diego County LUP and Implementing Ordinances. As such, the Commission will continue to utilize the San Diego County LCP documents for guidance in its review of development proposals in the City of Solana Beach until such time as the Commission certifies an LCP for the City.

The City of Solana Beach has prepared a draft LCP. In preparation of its LCP, the City of Solana Beach is faced with many of the same issues as the City of Encinitas, located immediately north of Solana Beach, whose LCP was certified by the Commission in March 1995. The City of Encinitas' LCP includes the intent to prepare a comprehensive plan to address the coastal bluff recession and shoreline erosion problems in the City. The plan will include at a minimum, bluff top setback requirements for new development and redevelopment; alternatives to shore/bluff protection such as beach sand replenishment, removal of threatened portions of a residence or the entire residence or underpinning existing structures; addressing bluff stability and the need for protective measures over the entire bluff (lower, mid and upper); impacts of shoreline structures on beach and sand area as well as mitigation for such impacts; impacts for groundwater and irrigation on bluff stability and visual impacts of necessary/required protective structures.

The City of Solana Beach LCP should also address these items in the context of a comprehensive approach to management of shoreline resources. As shoreline erosion along the coast rarely affects just one individual property, it is imperative that a regional

wide solution to the shoreline erosion problem be addressed and solutions developed to protect the beaches. Combined with the decrease of sandy supply from coastal rivers and creeks and armoring of the coast, beaches will continue to erode without being replenished. This will, in turn, decrease the public's ability to access and recreate on the shoreline.

In the case of the proposed project, site specific geotechnical evidence has been submitted indicating that the existing structures on the project sites are in danger. The Commission feels strongly that approval of the proposed project should not send a signal that there is no need to address a range of alternatives to armoring for existing development. Planning for comprehensive protective measures should include a combination of approaches including limits on future bluff development, ground and surface water controls, beach replenishment, and even continual lower bluff protection constructed in substantial segments, as with the proposed project. Although the erosion potential on the subject site is such that action must be taken promptly, decisions regarding future shoreline protection should be done through a comprehensive planning effort that analyzes the impact of such a decision on the entire City shoreline.

The project site is designated for Open Space Recreation in the City of Solana Beach Zoning Ordinance and General Plan, and was also designated for open space uses under the County LCP. As conditioned, the subject development is consistent with these requirements. Based on the above findings, the proposed seawall development has been found to be consistent with the Chapter 3 policies of the Coastal Act in that the need for the seawall has been documented and its adverse impacts on beach sand supply and on adjacent unprotected properties will be mitigated.

Therefore, the Commission finds the proposed development, as conditioned, can be found consistent with the Chapter 3 policies of the Coastal Act, and will not prejudice the ability of the City of Solana Beach to complete a certifiable local coastal program. However, these issues of shoreline planning will need to be addressed in a comprehensive manner in the future through the City's LCP certification process

7. Consistency with the California Environmental Quality Act (CEQA).

Section 13096 of the Commission's Code of Regulations requires Commission approval of Coastal Development Permits to be supported by a finding showing the permit, as conditioned, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The proposed project has been conditioned in order to be found consistent with the geologic stability, visual quality, and public access policies of the Coastal Act. Mitigation measures, including conditions addressing payment of an in-lieu fee for impacts to sand supply, construction techniques consistent with the geotechnical report and the color of construction materials, will minimize all adverse environmental impacts.

As conditioned, there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment. Therefore, the Commission finds that the proposed project is the least environmentally-damaging feasible alternative and can be found consistent with the requirements of the Coastal Act to conform to CEQA.

STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

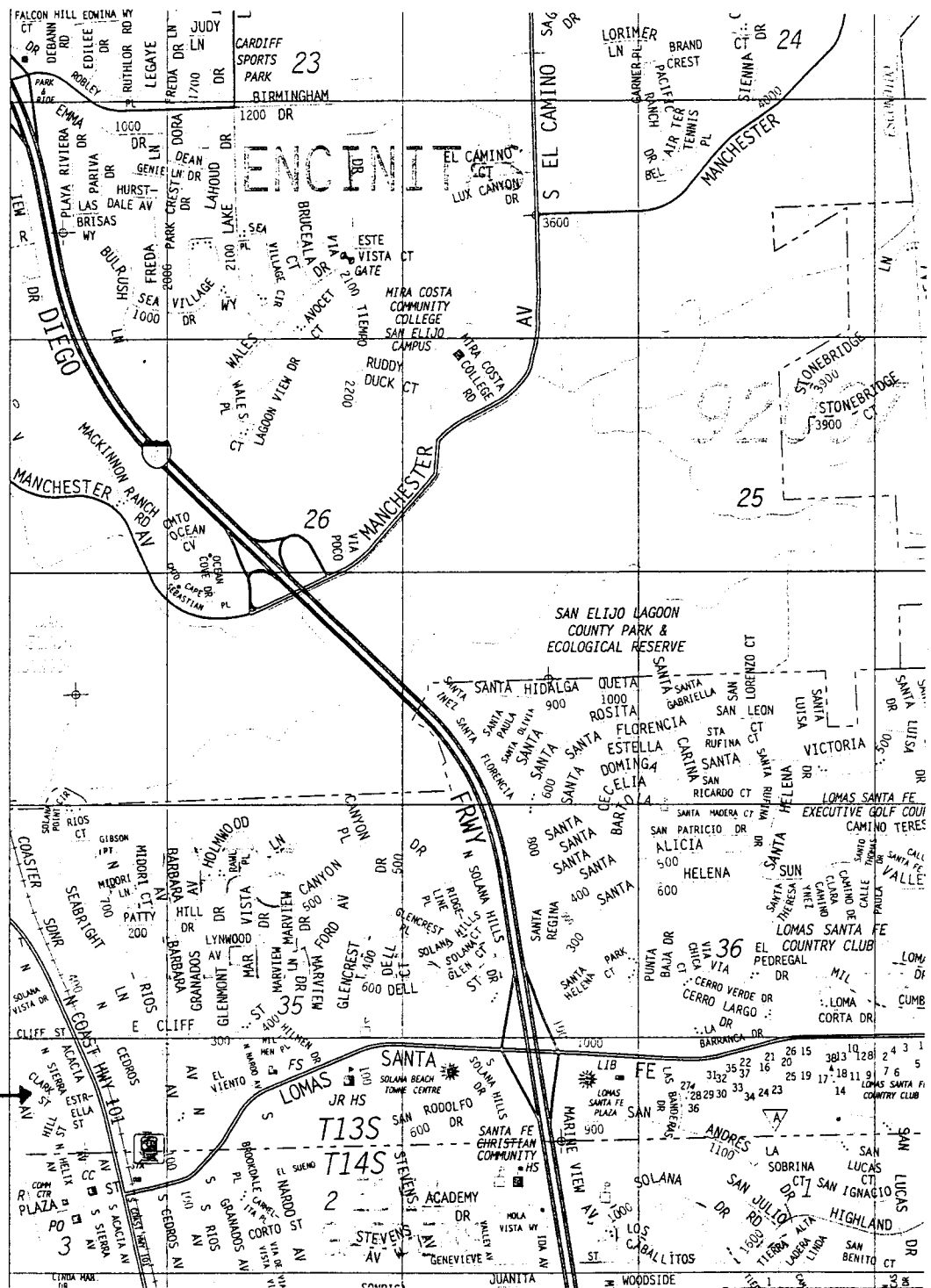

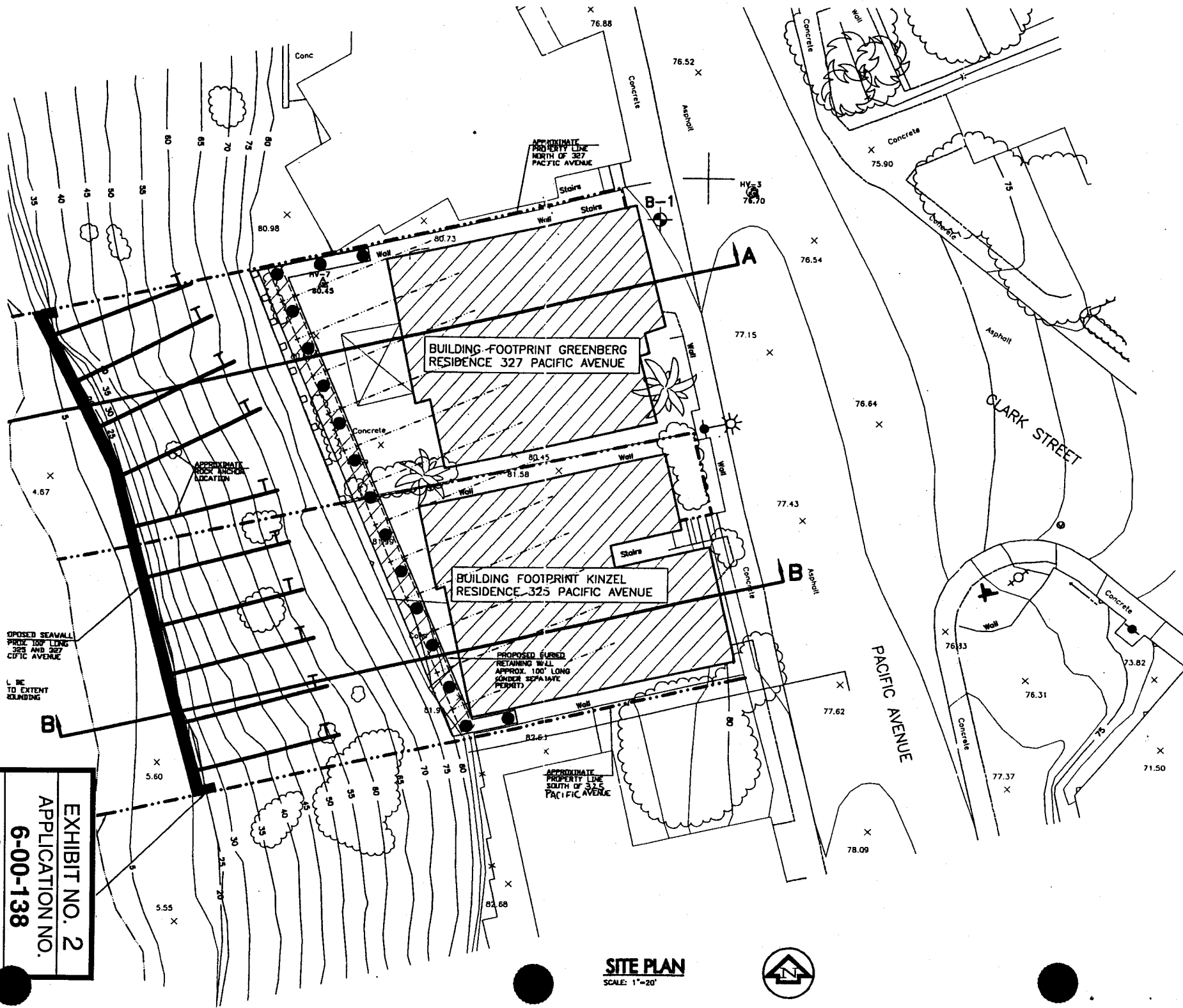


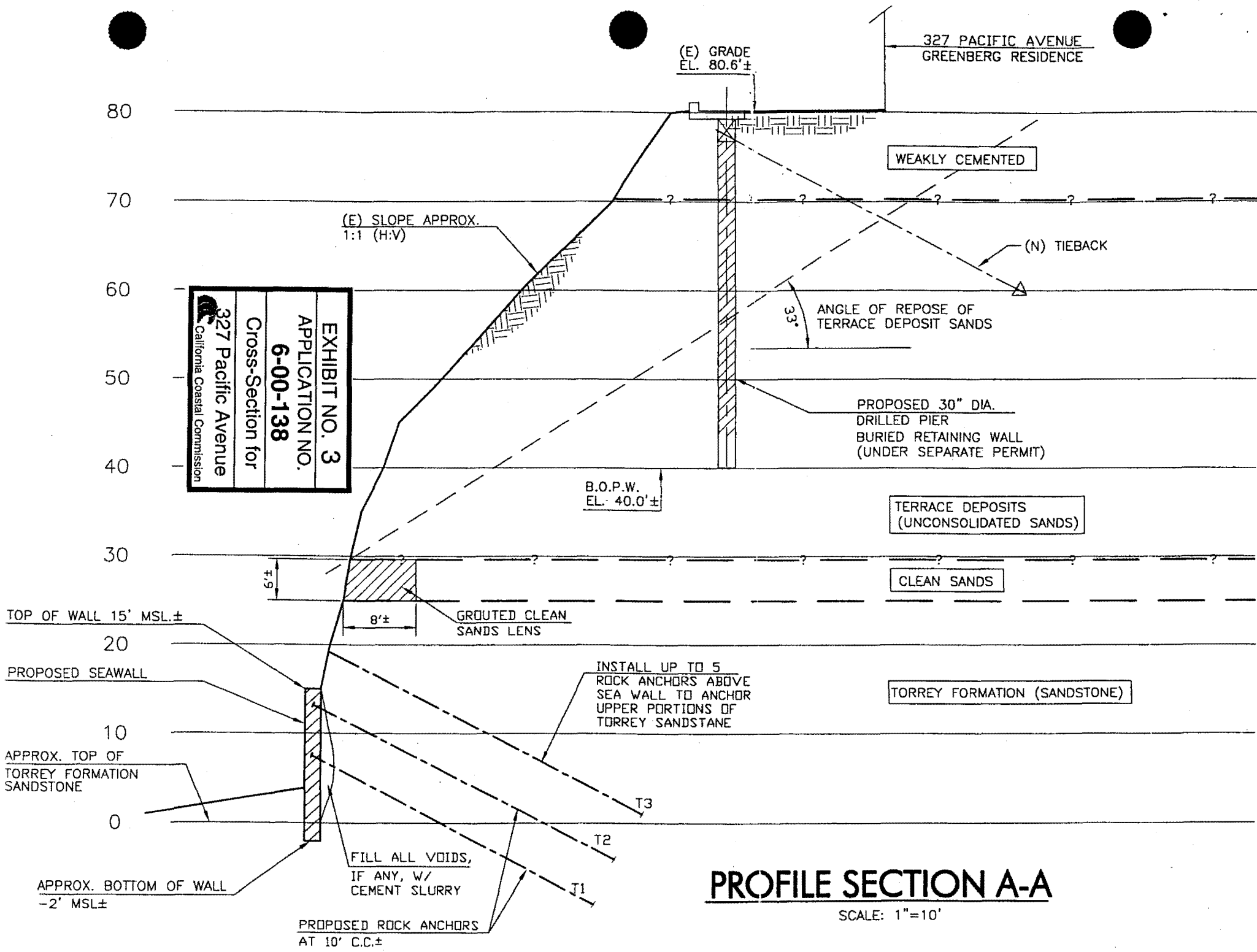
EXHIBIT NO. 1
APPLICATION NO.
6-00-138
Location Map

 California Coastal Commission	EXHIBIT NO. 2 APPLICATION NO. 6-00-138
	Site Plan



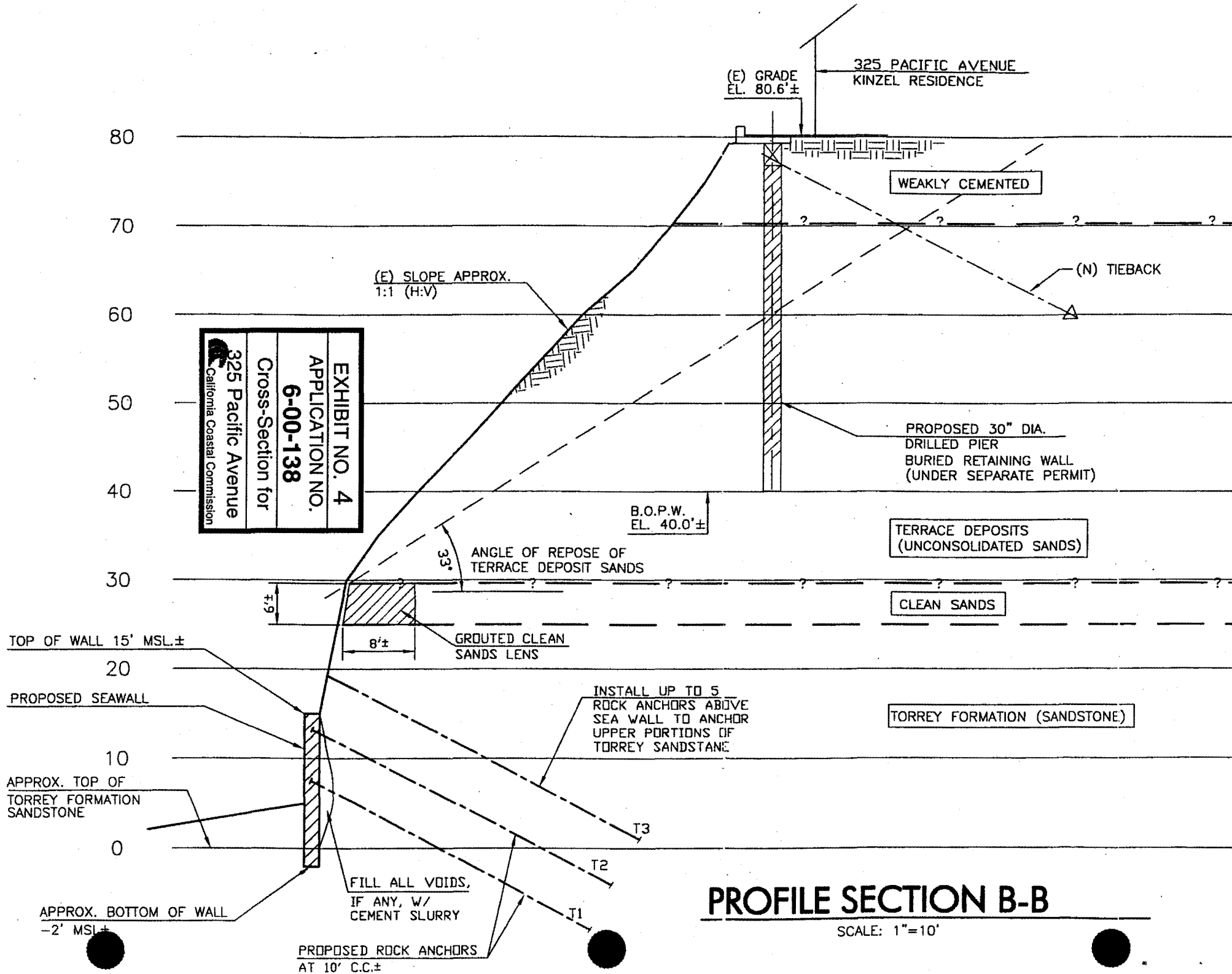
SITE PLAN
 SCALE: 1"=20'





PROFILE SECTION A-A

SCALE: 1"=10'



SAND MITIGATION FEE WORKSHEET

325 & 327 Pacific Avenue
Solana Beach

W = 100
E = 2
v = .9
R = 0.2 ft.
L = 22 yr.

RECEIVED

DEC 13 2000

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

Ae = W x E Ae = 100 x 2 Ae = 200
Ve = Ae x v Ve = 200 x .9 Ve = 180

Aw = R x L x W Aw = 0.2 x 22 x 100 Aw = 440
Vw = Aw x v Vw = 440 x .9 Vw = 396

S = .75
Hs = 15
Hu = 66
Rcu = 0.2 ft.
Rcs = 0

Vb = (S x W x L) x {(R x hs) + (1/2hu x (R + (Rcu - Rcs)))}/27
(S x W x L) = (.75 x 100 x 22) = 1650

{(Rx hs) + (1/2hu x (R + (Rcu - Rcs)))}
3 + (33 x (.2 + .2)) / 27
3 + (13.2) / 27

Vb = 1650 x 16.2 / 27 Vb = 990

Vt = Vb + Vw + Ve Vt = 990 + 396 + 180 Vt = 1566

M = Vt x C

M = 1566 x \$9.75 M = \$ 15,268.50

There are two (2) 50' wide properties in this permit application. Each property will be responsible for 1/2 of M, or a Sand Mitigation Fee of \$ 7,634.25

EXHIBIT NO. 5
APPLICATION NO.
6-00-138
Sand Replenishment In-Lieu Fee Calculations
 California Coastal Commission



December 10, 2000

TO: Bob Trettin, Agent
Kinzcl & Greenberg

FROM: John Niven, P.E.
Soils Engineering Construction

RE: Variables for Sand Mitigation Fee Worksheet;
325 and 327 Pacific Avenue, Solana Beach

In response to your requests, SEC is providing the following information:

- "W" (the width of the properties encompassed by the proposed seawall) is 100 lineal feet.
- "E" (the encroachment by the seawall, measured from the toe of the bluff) is approximately 2 feet.
- "S" (the percentage of beach quality material in the bluff material) is .75. This number was derived in testing by Group Delta at properties immediately south of the subject site. There is no differentiation in the composition of the bluff, so we saw no reason to reevaluate.
- "L" (the design life of the seawall without significant maintenance) is projected at 22 years. This is generally consistent with other seawalls designed and constructed by SEC in southern California.
- hs (the height of the seawall from the base of the bluff (0 MSL) is 15 feet.
- hu (the height of the unprotected upper bluff, from the top of the seawall to the crest of the bluff) is 66 feet.

The remaining variables in the formula are consistent with those used in all of our past Submittals. The Coastal Commission has documentation on record for each variable as it applies to this littoral cell:

$V = .9$ $R = 0.2$ $R_{cu} = 0.2$ $R_{cs} = 0$

Please contact me at (760) 633-3470 if you require additional information.