

CALIFORNIA COASTAL COMMISSION

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REGULAR CALENDAR
STAFF REPORT AND PRELIMINARY RECOMMENDATION

Application No.: 6-99-56

Applicant: Buzz Colton, Richardson Family Trust, William & Layna Bennett

Agent: Walt Crampton

Description: Construction of a 90-foot long, 35-foot high, 2 ½ foot thick colored and textured shotcrete tied-back seawall along the base of a coastal bluff below one single-family residence and extending below portion of two other residences. The application is a follow-up to an emergency permit granted for the seawall on April 20, 1999.

Zoning	Open Space/Recreation
Plan Designation	Open Space/Recreation

Site: Public beach and bluff face below 255, 261, 265 Pacific Avenue, Solana Beach, San Diego County. APN 263-312-09, -08, -28.

STAFF NOTES:Summary of Staff's Preliminary Recommendation:

Staff is recommending approval of the proposed seawall. The project consists of one segment of a proposal for a 352-foot long, 35-foot high seawall below eight single-family residences previously brought before the Commission on January 13, 1999 (#6-98-134). The previous permit request involved several components: construction of the 352-foot long seawall, reconstruction of the upper bluff at the site of a significant bluff collapse at 261 Pacific Avenue, and placement of sand-filled geotubes on the beach to facilitate construction. At the January 1999 hearing, the Commission postponed action on the permit, and directed the applicants to provide a detailed analysis of alternatives to the proposed project. The Commission also directed staff to review the status of past permit conditions, which have been placed on several bluff-top residences regarding future construction of shoreline protective devices.

At the time of the January hearing, the applicants had received an emergency permit from the Executive Director to construct a 90-foot long segment of seawall below 261 Pacific Avenue (#6-98-157-G), where a bluff collapse occurred in September 1998. However, the applicants were unable to begin work on the seawall due to limited low-tide opportunities and pre-construction requirements placed on the emergency work by the City of Solana Beach and the Army Corps of Engineers. The emergency permit expired on March 6, 1999.

The applicants have indicated that although they have not yet completed the required alternatives analysis for the entire 352-foot long seawall/upper bluff reconstruction project, the area of the bluff collapse continues to experience erosion at a rapid rate. Therefore, the applicants applied for a new emergency permit for the 90-foot long seawall segment, which was granted by the Executive Director on April 20, 1999. The subject permit is a follow-up to the emergency permit. The upper bluff work at the site of the collapse and the sand-filled geotubes which were proposed in the previous regular permit application, are not part of the current permit application. However, the applicants have indicated that the entire 352-foot long seawall and the upper bluff reconstruction will be brought back before the Commission when the alternatives analysis is completed.

The applicant has demonstrated that the existing bluff-top residence at 261 is in danger from erosion as a result of a substantial bluff collapse. While the proposed 35-foot high seawall will have impacts on shoreline processes, public access, landform alteration and the visual quality of the area, the proposed wall is the least environmentally-damaging feasible alternative to protect the existing structure. The applicants have previously indicated that the seawall alone is not sufficient protection for the residence at 261 Pacific Avenue; however, construction of the seawall will address the immediate threat to the structure. The "partial solution" is being brought before the Commission in order for the Commission to have the opportunity to review the request through the regular permit process at the earliest date possible. The proposed seawall is independent of the upper bluff, and approval of the proposed seawall in no way commits the applicant to construction of upper bluff protection.

In addition, although the applicant has submitted evidence that all three residences on the subject site may be in danger from erosion (see section 3. Geologic Conditions and Hazards, below) the proposed seawall is intended to address only the immediate risk to the residence at 261 Pacific Avenue resulting from the bluff collapse. The applicants have indicated that they will bring the entire project, including the full length of the seawall and the proposal for upper bluff protection, back before the Commission when the alternatives analysis is completed.

Special Conditions have been placed on the project to mitigate the project's impact on scenic quality, public access and recreational opportunities, and shoreline sand supply. The conditions require a deed restriction acknowledging that should additional stabilization be proposed in the future, the applicant 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 stabilize the

principle residential structures and provide reasonable use of the property. If such alternatives are feasible, the Commission may require them instead of the 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 wall, long-term monitoring of the seawall and bluffs, and approval from other agencies.

Public opposition to the original 352-foot long seawall raised concerns regarding the impact the full-length project would have on shoreline processes, landform alteration, and visual quality.

Substantive File Documents: City of Solana Beach General Plan and Zoning Ordinance; Group Delta Consultants (GDC) "Sand Resource Quality Evaluation" 6/12/98; GDC "Shoreline Erosion Study North Solana Beach," 8/20/98; GDC "Emergency Permit Application for Coastal Bluff Stabilization 261 Pacific Avenue," 10/7/98; GDC "Coastal Development Permit Application 249-311 Pacific Avenue" 11/9/98; GDC "Response to Review Comments 249-311 Pacific Avenue" 12/3/98; GDC "Additional Clarification Supporting Request for Extension of Emergency Permit," 4/12/99, GDC "Coastal Development Permit Application CDP 255-265 Pacific Avenue" 4/12/99.

PRELIMINARY STAFF RECOMMENDATION:

The staff recommends the Commission adopt the following resolution:

I. Approval with Conditions.

The Commission hereby grants a permit for the proposed development, subject to the conditions below, on the grounds that the development will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976, 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 of the Coastal Act, and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

II. Standard Conditions.

See attached page.

III. Special Conditions.

The permit is subject to the following conditions:

1. 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 that include the following measures to mitigate the impacts of the seawall and address overall site stability. Said plans shall first be approved by the City of Solana Beach and include the following:

- a. Sufficient detail regarding the construction method and technology utilized for texturing and coloring the seawall. 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.
- b. The seawall shall conform as closely as possible to the natural contour of the bluff.
- c. Any existing permanent irrigation system located within the geologic setback area (40 feet from the bluff edge) on any of the three bluff top sites shall be removed or capped.
- d. All runoff from impervious surfaces on each of the three sites shall be collected and directed away from the bluff edge towards the street.
- e. Existing accessory structures in the geologic setback area on any of the three sites shall be detailed and drawn to scale on the final approved site plan.
- f. 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.
- g. Plans shall show only the approved seawall, not the placement of sand for a construction pad or geotubes.

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 \$25,337 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 4/22/99 prepared for coastal development permit #6-99-56. 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 and seawall which provides for the following:

- a. An annual evaluation of the condition and performance of the seawall, addressing whether any significant weathering or damage has occurred that would adversely impact the future performance of the seawall. This evaluation shall include an assessment of the color and texture of the wall comparing the appearance of the wall to the surrounding native bluffs.
- b. Annual measurements of the distance between each residence and the bluff edge (as defined by Section 13577 of the California Code of Regulations) at 6 or more locations. The locations for these measurements shall be the same as those identified on the as-built plans required in Special Condition #8 of this permit, and identified through permanent markers, benchmarks, survey position, written description, etc. so that annual measurements can be taken at the same bluff location and comparisons between years can provide information on bluff retreat.
- c. 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.
- d. 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 the life of the project. Each report shall be prepared by a licensed geologist or geotechnical engineer. The report shall contain the measurements and evaluation required in sections a, b, and c above. The report shall also summarize all measurements and provide some analysis of trends, annual retreat or rate of retreat, and the stability of the overall bluff face,

including the upper bluff area, 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.

- e. An agreement that the permittees shall apply for a coastal development permit within three months of submission of the report required in subsection d. above (i.e., by August 1) 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. State Lands Commission Approval. PRIOR TO ISSUANCE OF THE 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.

5. Timing of Construction. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director for review and written approval, a final construction schedule, which shall be incorporated into construction bid documents. The schedule shall specify that no work shall occur on the beach on weekends or holidays between Memorial Day weekend and Labor Day of any year.

6. Groundwater Impacts. Plans for the installation of hydraugers in the bluff, the construction of wells along the eastern property line, or other similar means to reduce the potential for groundwater to reach the bluff face, shall be submitted to the Executive Director for review and written approval, if, from examination of soil borings and site inspections during seawall construction, the project engineer should determine that groundwater and its potential to trigger block failures exists. Said groundwater system shall be installed concurrent with construction of the seawall. In addition, a maintenance program for such groundwater removal systems shall also be submitted and receive

written approval of the Executive Director. However, any changes to the approved seawall proposed as a result of the presence of groundwater, shall require the review and approval of the Commission through an amendment to this coastal development permit. Said program shall assure the system approved herein is maintained for efficient operation at all times.

7. 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 storage of equipment or materials shall occur on sandy beach or public parking areas. During the construction stage 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.
- b. Access corridors shall be located in a manner that has the least impact on public access to and along the shoreline.
- c. 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.

8. 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 device is 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 which includes measurements of the distance between each residence and 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.

9. Future Response to Erosion. If in the future the permittee seeks a coastal development permit to construct 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. Alternatives include but are not limited to: relocation of all or portions of the structures that are threatened, structural underpinning, and other remedial measures capable of protecting the structure without 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.

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the 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.

10. 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.

11. Future Maintenance/Debris Removal. Within 15 days of completion of construction of the protective device the permittees shall remove all debris deposited on the beach or in the water as a result of construction of shoreline protective device. The permittees shall also be responsible for the removal of debris resulting from failure or damage of the shoreline protective device in the future. In addition, the permittee shall

maintain the permitted seawall in its approved state except to the extent necessary to comply with the requirements set forth below. Maintenance of the seawall shall include maintaining the color, texture and integrity. Any change in the design of the project or future additions/reinforcement of the seawall beyond minor regrouting or other exempt maintenance as defined in Section 13252 of the California Code of Regulations to restore the seawall 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 wall to ensure a continued match with the surrounding native bluffs, the permittee shall contact the Commission office to determine whether permits are necessary, and shall subsequently apply for a coastal development permit for the required maintenance.

IV. Findings and Declarations.

The Commission finds and declares as follows:

1. Detailed Project Description/History. The proposed project involves the construction of a 35-foot high, approximately 90-foot long shotcrete tied-back seawall at the base of an 80-foot high coastal bluff. The wall would be located below an existing single-family residence at 261 Pacific Avenue at the site of a substantial upper bluff collapse. The seawall would cover the length of the 50-foot wide lot below 261 Pacific Avenue, plus an additional 20 feet south of the lot (below a single-family residence at 255 Pacific Avenue), and 20 feet north of the lot (below 265 Pacific Avenue).

The seawall would be located approximately 650 feet north of Fletcher Cove in the City of Solana Beach. The wall would be 2 ½ feet thick and colored and textured to match the surrounding bluffs. The upper bluff collapse at 261 Pacific Avenue first occurred in late September 1998. The collapse has continued to spread laterally since the initial collapse, and is currently approximately 70 feet in width.

The beach and bluff face at the project site are in public ownership, with the exception of the bluff face below 265 Pacific Avenue. The City of Solana Beach quitclaimed the bluff face to the property owner and subject applicant in 1995.

The project consists of one segment of a proposal for a 352-foot long seawall below eight single-family residences, reconstruction of the upper bluff below 261 Pacific Avenue, and the placement of sand-filled geotubes on the beach, previously brought before the Commission on January 13, 1999 (#6-98-134). At that meeting, the Commission postponed action on the permit, and directed the applicants to provide a detailed analysis of alternatives to the proposed seawall and upper bluff protection. The Commission also directed staff to review the status of past permit conditions that have been placed on several bluff-top residences regarding the limitations on future construction of shoreline protection.

At the time of the January hearing, the applicants had received an emergency permit from the Executive Director to construct a 90-foot long segment of seawall below 261 Pacific

Avenue, which was the site of a substantial bluff collapse in September 1998 (#6-98-157-G). However, the applicants were unable to perform any work on the site with the exception of a construction worker safety wall, by limited low-tide opportunities, the need to obtain a permit from the U.S. Army Corps of Engineers, and requirements by the City of Solana Beach that the applicants record a waiver of all liability claims and obtain additional insurance. The emergency permit expired on March 6, 1999.

Although the applicants have not completed the required alternatives analysis for the entire 352-foot long seawall and upper bluff protection, they have submitted evidence that the upper bluff collapse at 261 Pacific Avenue continues to experience erosion at a rapid rate and that the bluff-top residence is in imminent danger. Therefore, the applicants applied for and received a new emergency permit from the Executive Director on April 20, 1999, for the 90-foot long seawall (#6-99-56-G). The subject permit is a follow-up to that emergency permit.

The applicants have previously indicated that the seawall alone is not sufficient protection for the residence at 261 Pacific Avenue; however, construction of the seawall will address the immediate threat to the structure. The "partial solution" is being brought before the Commission in order for the Commission to have the opportunity to review the request through the regular permit process at the earliest date possible. In addition, although the applicant has submitted evidence that all three residences on the subject site may be in danger from erosion (see section 3. Geologic Conditions and Hazards, below) the proposed seawall is intended to address only the immediate risk to the residence at 261 Pacific Avenue resulting from the bluff collapse. The applicants have indicated that they will bring the entire project, including the full length of the seawall and the proposal for upper bluff protection, back before the Commission when the alternatives analysis is completed.

The bluffs in this location are approximately 80 feet high. There is little sand on the beach at the base of the bluff, and the bluffs receive nearly constant wave action. The applicants had previously proposed creating a temporary construction pad with geotubes in order to allow construction equipment to access and work at the base of the bluff. However, the applicants have not been able to obtain approval to place sand on the beach at this time, and therefore, for the proposed project, work is only proposed to occur during low tides. Because of the urgent nature of the request, the project plans submitted by the applicant still show a sand construction pad and geotubes. Special Condition #1 requires the applicant to submit final plans that will not show the sand construction pad or geotubes. Access to the site would be from the Fletcher Cove access ramp. The applicants are proposing to use a portion of the Fletcher Cove beach parking lot for staging and storage.

The City of Solana Beach does not yet have a certified LCP, and the project site is located in an area of the Commission's original jurisdiction. Therefore, Chapter 3 of the Coastal Act is the standard of review.

2. Permit History. The Commission has reviewed several permits on the project site. For 255 Pacific Avenue, the Commission approved the demolition of the previous single-family residence on the site, and construction of the current residence in February of 1974 (CDP #F1258). The permit was granted with no special conditions. The Commission approved a one and two story seaward addition to the existing single-family residence in February 1991, with conditions that all construction be set back a minimum of 25 feet from the bluff edge (#6-91-309). The geotechnical report submitted at that time stated that over the economic lifetime of the home, the bluff could retreat a maximum of 24.75 feet. The permit was approved with a special condition that required the applicant to record a deed restriction stating that in the event the existing erosion threatens the existing home, patio areas or other accessory structures in the future, the Coastal Commission will consider removal of these structures, including portions of the home or the entire home, as the preferred and practical alternative to proposals for bluff and shoreline protective works.

For 261 Pacific Avenue (the site of the upper bluff collapse), the Commission approved a permit in May 1984 for demolition of the existing structure and construction of a new single-family residence up to 27 feet from the bluff edge (#6-84-168). The geotechnical information submitted at that time for the site indicated that the bluff in this particular location was very stable. The permit was approved with special conditions requiring submittal of a geology report, landscape plan, and recordation of an assumption of risk deed restriction.

For 265 Pacific Avenue, past Commission action on the site includes demolition and reconstruction of the single-family residence on the bluff top in 1995 (#6-95-23). In its approval of the project, the Commission gave the applicant the option of either locating the new residence at least 40 feet back from the edge of the bluff, or, as proposed by the applicant, locating the structure up to 25 feet from the bluff edge, and recording a deed restriction providing that the landowner would not construct any upper or lower bluff stabilization devices (other than preemptive filling of a seacave located at the base of the bluff), to protect the portion of the residence located closer than 40 feet from the bluff edge. The recorded document additionally provides that if erosion proceeds to a point where the portion of the principal residence located seaward of the 40 foot blufftop setback is determined to be unsafe for occupancy, the landowner will submit an application for a coastal development permit to remove the portion of the structure in its entirety. The applicant chose the latter option and the home was constructed up to 25 feet from the bluff edge. Therefore, Commission is not required under Section 30235 of the Coastal Act to approve shoreline protection for the existing the single-family residence at 265 Pacific Avenue, even if the residence is in danger from erosion.

In November 1998, the Executive Director approved an emergency permit to remove a deck at 261 Pacific Avenue which had been undermined by the failure, and to spray a liquid polymer substance on the bluffs beneath all three sites to temporarily reduce erosion from wind and rain (#6-98-134-G). On January 5, 1999, the Executive Director approved construction of the proposed project as an emergency permit (#6-98-157-G), which expired in March. The follow-up regular permit, which also proposed construction

of a 352-foot long seawall and upper buff protection, was postponed by the Commission in January 1999 (#6-98-134). The Executive Director approved issuance of a new emergency permit for the proposed project on April 20, 1999 (#6-99-56).

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 30253 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 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 90-foot long, 35-foot high seawall on public beach below one existing single-family residence at the site of an upper bluff collapse, and partially below the two other residences on either side of the house above the collapse. However, the project is proposed to address only the threat to the existing residence at 261 Pacific Avenue. The applicant's engineer has indicated that the length of the proposed wall is based on the minimum size necessary to halt the vertical and lateral expansion of the 70-foot wide bluff collapse threatening the residence at 261 Pacific, and has not been designed to protect, and is not capable of protecting the residences on either side. As previously discussed, the proposed seawall is one segment of a request previously submitted to the Commission for a 352-foot long seawall below eight residences. The applicants are not prepared to proceed with the application for the 352-foot long seawall at this time; however, because of the immediate threat the existing residence at 261 Pacific Avenue from the bluff collapse below the structure, the applicants have submitted the proposed seawall project to address the immediate threat to this existing structure only.

The applicants have submitted a geotechnical study documenting the geologic structure and recent history of the bluffs in the project area. The geologic study submitted by the applicant's engineer states the lower sea cliff collapses during last winter's El Niño storm season have resulted in an curved-shaped failure along this stretch of coastline. The study indicates that as much as 15 feet of lower sea cliff retreat has occurred at 261 Pacific since prior to last winter. This loss of the underlying seacliff material in turn undermined the upper sloping terrace deposits, creating instability of the upper bluffs.

The bluffs in the location of the proposed project are approximately 80 feet in height and consist of an underlying layer of Torrey Sandstone and an upper layer of marine terrace deposits (Bay Point Formation), which is typical of the bluff formations found in northern Solana Beach. However, along a 352-foot long stretch of bluffs at the project area, including the three subject lots, the geotechnical report has identified an 8 to 10-foot high geologic segment located between the Torrey Sandstone and Marine Terrace Deposits classified as "a clean sands lens" which has not been previously described in past geotechnical analyses reviewed by the Commission in Solana Beach.

The report indicates that clean sand lenses "occasionally" exist within the Bay Point Formation. The clean sand layer is described as a very loose sandy material with a limited amount of capillary tension and a very minor amount of cohesion, both of which dissipate easily, making this clean sand layer 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 applicants have submitted evidence that the presence of the clean sands creates a distinctly different, more rapid process of bluff erosion than typically seen on coastal bluffs. Exhibit 4 illustrates the usual process of incremental erosion where the upper bluff

gradually erodes and slowly "lays-back" to a stable angle of repose. Exhibit 5 illustrates that the presence of the clean sands creates a process where 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.

When asked why this clean sand lens has not been identified in the past, the applicants' engineer submitted photographs demonstrating that the clean sand layer was not exposed prior to the erosion of last winter's El Niño storms. As the bluffs were undermined and significant chunks of the bluffs collapse, this previously hidden sand lens was exposed starting the cycle of rapid collapsing and causing the upper bluff failure below 261 Pacific Avenue. The geotechnical reports submitted indicate that clean sands have been exposed within the vertical escarpment beneath all three of the residences at the subject site, as well as at five lots adjacent to the subject site. The report concludes that without stabilization of the clean sands, not only will the existing upper bluff failure continue to grow rapidly, but significant upper bluff failures will occur on all eight of the properties, creating a need for both lower and upper bluff stabilization along the entire stretch.

The setbacks for the three bluff top residences are approximately as follows: 255 Pacific Avenue--21 feet; 261 Pacific Avenue (the location of the recent bluff collapse)--12 feet; 265 Pacific Avenue--27 feet. These setbacks are relatively large for Solana Beach; there are many existing structures as close or closer to the bluff edge than these residences. However, the applicants have submitted a slope stability analysis for the three residences above the proposed seawall, to demonstrate that the existing primary residences are in danger from erosion. The report indicates that traditional engineering stability analyses have only limited usefulness for this type of bluff formation, because, as discussed above, the upper bluff terrace sands are continually sloughing and attempting to achieve a stable angle repose, then sloughing again. Nevertheless, the slope stability analysis determined that the computed factor of safety was less than 1.25 (the point at which the slope is considered susceptible to upper bluff failures) for 261 and 265 Pacific Avenue, both of which were deemed to be susceptible to upper-bluff failures within the near future (the next several years). The study specifically identifies the clean sands layer as requiring structural restraint, without which significant bluff failures will occur during this winter's storm season, assuming any reasonable level of storm activity. The report concludes that the coastal bluffs beneath all eight of the lots studied, if not stabilized in the near future, will experience upper bluff failures similar to the one which has occurred beneath 261 Pacific Avenue, putting all eight bluff-top residences studied at risk, and requiring significant upper-bluff fortification to protect the residences.

Interim measures have been taken at the site to attempt and reduce the threat to the bluff-top residences. In November of 1998, the Executive Director granted an emergency permits to the applicants to apply a liquid polymer spray to the bluff face beneath the eight residences being studied in this location, include the three subject sites, in an attempt to slow down the erosion of the clean sands. The geotechnical report indicates that the product has provided some limited benefit. However, erosion has continued on

the site and the material has not been effective in stopping the growth of the upper bluff collapse at 261 Pacific Avenue.

The applicants' engineer has indicated that significant amounts of erosion have continued to occur on the site over the last several months, with typical collapse volumes on the order of one cubic yard, or approximately 3,000 pounds, daily. Occasional collapses have approached volumes of 20 to 50 cubic yards. The only work which was constructed under the previously issued emergency permit, a mid-slope worker safety/debris barrier constructed in early March, has been impacted by the continuing erosion. By March 22, the debris barrier had been completely filled with sand from ongoing sloughage, and on April 4, a larger upper bluff collapse overran and destroyed a portion of the safety barrier. A second relatively large collapse on April 9 destroyed additional sections of the barrier.

Thus, given the amount of documented erosion on the site over the last year, the significant bluff collapse in September and the continue growth of the collapsed area, 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 structure at 261 Pacific Avenue is 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.

The applicants have submitted an alternatives analysis by a geotechnical engineer which reviews several alternatives to the proposed seawall including: Removal of bluff-top accessory structures; groundwater controls; injection of chemicals or other materials into the bluff; underpinning the residence; and removal and/or relocation of portions of or the entire primary structure. 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. With regard to removal of accessory structures, the residence at 261 Pacific Avenue has an on-grade concrete patio that could likely be removed without causing additional instability to the bluff. However, removal of the patio would not slow the cycle of erosion and bluff retreat resulting from the clean sands. The existing residence is approximately 12 feet from the bluff edge. Given the rapid erosion of the bluff face, and the slope stability analysis for the site showing that the existing primary structure is in danger, it is unlikely that removal of the patio would delay the need for a seawall to protect for more than a few weeks or months.

The analysis strongly supports the strict 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 the exposure of the clean sands lens, not from excess water resulting from bluff-top activities. The report concludes that nothing about the drainage configuration on any of the three subject lots contributed to the bluff collapse that occurred. Thus, instituting stricter landscaping and irrigation controls would not re-stabilize the current vertical scarp at the failure surface, and would not reduce or eliminate the need for the proposed

seawall, but should still be instituted to reduce the potential for water-related collapses in the future.

The use of chemicals for densification of loose, compressible soils has become more common in recent years. However, the analysis states that in order to for chemical grouting to effectively "glue" the bluff sands in a stable formation, the outer 5 to 10 feet of the bluff face would have to be permeated. Chemical grouts are injected under pressure, and the engineer has stated that it would be essentially impossible to effectively contain a bluff face during pressure injection, and even controlled grouting could blow out portions of the slope face if any excess pressure buildup occurred. In addition, the process of injecting a chemical into sand under pressure 25 feet above the base of the bluff, presents a significant construction challenge and safety issue, particularly with the threat of additional collapses triggered by the process. Finally, if the chemical grouting were not effective in solidifying the *entire* clean sand layer, the undermining/collapse cycle would continue. Thus, it does not appear that the technology exists at this time to stabilize a coastal bluff with chemicals in place of a seawall.

The analysis indicates that a below-grade retention system or underpinning of the existing homes 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 high and sufficiently stable to entirely support each residence. The applicant's engineer has argued this significant amount of construction would be infeasible. Even if 80-foot high 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 which might not currently have a clean sands lens exposed, thereby threatening additional bluff-top structures. The rapid bluff retreat would also soon leave either piers or a below-grade retention system exposed to view, arguably a less-desirable visual condition than the proposed seawall.

The analysis also examined the feasibility of removal or relocation or some or all of the existing bluff-top residence. The Colton residence is currently located approximately 10 feet west of the Pacific Avenue right-of-way. The house is a two-story, wood-frame and stucco building. The rear of the house is comprised of the main living room, kitchen, and small sitting alcove on the first floor, and master bedroom and bathroom suite with cantilevered deck on the second floor. The 40-foot bluff-top setback line currently cuts across the plane of the front door. The great majority of the useable floor area of the house is seaward of 40-feet from the bluff edge. Removing the western portion of the residence would result in little of the existing residence remaining beyond the garage. Because there is about a 2-foot differential between the elevation of the garage and living portion of the house, moving the existing residence would not be possible without extensive grading of the lot and cutting the structure into pieces. Furthermore, given the rapid erosion/collapse cycle of the clean sands, moving the structure back 10 feet would not significantly delay the need for the proposed seawall.

In summary, the presence of the clean sands lens presents a threat of rapid erosion and bluff collapses that must be addressed by a structural solution that effectively contains the clean sands. The applicants have demonstrated that the existing primary structure at 261 Pacific Avenue is in danger from erosion. An alternatives analysis presented by the applicant and reviewed by staff demonstrates that there are no less environmentally-damaging feasible alternatives to the proposed project. Therefore, the Commission finds that a shoreline altering device must be approved to protect the residence pursuant to Section 30235.

As previously noted, in 1995 the landowner at 265 Pacific Avenue chose to waive his right to shoreline protection under Section 30235 in order to construct a new residence up to 25 feet from the bluff edge, rather than the 40 feet which was determined by the Commission to be the distance whereby the home would not be threatened by erosion for the lifespan of the residence. Therefore, the Commission is not required to approve shoreline protection to protect this structure. However, in the case of the proposed project, the bluff collapse that began below 261 Pacific Avenue, has spread laterally, such that in order to protect the residence at 261 Pacific Avenue, a portion of the wall must be constructed below the home at 265 Pacific Avenue. The proposed wall is the minimum length necessary to protect the existing structure at 261 Pacific Avenue, and therefore, in this particular case, a portion of the wall must be approved under 265 Pacific Avenue.

The residence at 255 Pacific Avenue also had a condition placed on a previous permit that stated the Commission would consider relocation of the residence as the preferred and practical alternative to shoreline protection. Again, in the case of the proposed project, the seawall is required to protect the residence at 261 Pacific Avenue, regardless of whether the residence at 255 Pacific could be or was removed. Although the seawall will provide some benefit to the residences north and south of 261 Pacific Avenue by reducing the threat to these structures from the collapse, the wall is still required to protect the structure at 261 Pacific Avenue. The proposed seawall will not, and is not proposed to, provide protection for the existing structures at 265 or 255 Pacific Avenue from the ongoing threat from erosion of the clean sands lens.

The proposed project, and thus, the alternatives analysis submitted for the project, involves only construction of a seawall, not upper bluff protection. However, the applicants have previously indicated that in addition to the proposed seawall, substantial upper bluff reconstruction at the location of the bluff collapse is necessary to protect the existing residence at 261 Pacific Avenue in the long term. At this time, the applicants have not submitted the alternatives analysis which would be required to determine if upper bluff reconstruction is required to protect the residence, and if so, what the minimum level of reconstruction would be required. At a minimum, this alternatives analysis would have to demonstrate that upper bluff reconstruction is required to protect the existing primary structure on the site at this time, even if existing accessory structures such as patios and decks were removed. The alternative analysis must also ascertain what would be involved in constructing piers and/or underpinning the residence, and the effect this alternative would have on the need for upper bluff protection.

Special Condition #8 requires a deed restriction acknowledging that should additional stabilization be proposed in the future, the applicant will have to identify and address the feasibility of alternatives which would avoid additional alteration of the natural landform of the public beach or coastal bluffs, but would stabilize the principle residential structures and provide reasonable use of the property. If such alternatives are feasible, they may be required by the Commission instead of shoreline protective devices. Typically, alternatives which do not involve the construction of structures on the public beach result in less environmental damage to sand supply, public access and recreation, and the visual quality of the natural environment. Recordation of a deed restriction ensures that all future owners of the property are aware of the alternatives requirement. Although the least-environmentally damaging feasible alternative cannot be finally determined at this time, approval of the proposed seawall in no way requires the Commission to approve construction of some form of upper bluff protection, nor does construction of this seawall dictate from an engineering standpoint, the presence, type, or amount of upper bluff construction that may be proposed in the future.

Although construction of a seawall is required to protect the existing principle structure 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.

Many of the effects of a structure on the beach are temporary or difficult to distinguish from all the other actions which modify the shoreline. Nevertheless, 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.

Based on review of the proposed seawall application, the Commission finds that the following impacts on beach sand supply would result from construction of the proposed seawall. The proposed seawall, which is approximately 90 ft. long by 2.5 feet thick, will encroach onto and permanently displace an estimated 225 sq. ft. of public beach area that is currently available for public use. Based on a rough approximation of current and future bluff profiles, it is estimated that approximately 1,949 cubic yards of beach quality sand will be deprived the beach over the life of the seawall due to the seawall's effect on the natural processes of the bluff.

Special Condition #2 requires the applicant to deposit an in-lieu fee to fund beach sand replenishment projects as mitigation for impacts of the proposed shoreline protective device on beach sand supply and shoreline processes. The following is the methodology used by Commission staff to develop 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 8 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.

In past shoreline protection projects approved by the Commission, applicants have been required to pay a fee in-lieu of directly depositing the sand on the beach, because the benefit/cost ratio the direct deposit would be too low. Most 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, underwater 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 that 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 the fee is roughly proportional to the impacts to sand supply attributable to the proposed seawall on the subject properties. 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 approximately 4.3 miles 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 located in Encinitas (ref. CDP Nos. 6-93-36-G/Clayton, 6-93-131/Richards, et al, 6-93-136/Favero, 6-95-66/Hann and 6-98-39/Denver/Canter).

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.

In response to these concerns, the applicants' engineer has noted that the proposed seawall has incorporated a feathered design onto either end of the proposed wall 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. However, although the proposed seawall design includes the design 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."

Therefore, the Special Condition #3 requires the applicant to submit a monitoring report which evaluates the condition and performance of the seawall and overall site stability, and submit an annual report with recommendations, if any, for necessary maintenance, repair, changes or modifications to the project.

Special Condition #1 requires the applicants to submit final plans for the project indicating that the seawall conforms to the bluff contours and to demonstrate that existing irrigation systems within the geologic setback area on the blufftop have been removed, as these would impact the ability of the seawall to adequately stabilize the site. The final plans and Special Conditions #6, which requires an analysis of ground water conditions, are designed to ensure that overall site conditions which could adversely impact the stability of the bluff have been addressed.

Special Condition #11 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 seawall is required in the future, including maintenance of the color and texture of the wall, 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 #8 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.

Also, due to the inherent risk of shoreline development and the Commission's mandate to minimize risk, Special Condition #10 requires the applicant to waive liability and indemnify the Commission against damages that might result from the seawall or its construction. The risks of the proposed development include that the seawall will not protect against damage to the residences from bluff failure and erosion. In addition, the structure itself may cause damage either to the applicants' residences or to neighboring properties by increasing erosion at the sides of the structure. 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 seawall despite these risks, the applicants must assume the risks. Accordingly, Special Condition #10 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 bluff top residence at 261 Pacific Avenue is in danger from erosion and subsequent bluff failure. Thus, the Commission is required to approve the proposed protection for this residence. There are no other less damaging alternatives available to reduce the risk from bluff erosion. 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 30210, 30211, 30212, 30235, 30240, 30250, 30251 and 30253 of the Coastal Act.

4. Visual Resources/Alteration of Natural Landforms. 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 at the base of a coastal bluff fronting a City public beach park. The bluffs along this section of the Solana Beach coastline currently remain in a natural state, with virtually no existing bluff or shore protection other than seacave fills from just north of Fletcher Cove to Tide Park, an approximately one-quarter mile stretch of beach. 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 35-foot high tied-back seawall, which is the minimum height necessary to cover the clean sand lens. A lower wall would reduce undermining at the base of the bluff, but would not prevent the clean sands from eroding and undermining the upper bluff, and thus would not address the main threat to stability at the site. No upper bluff work above the seawall is proposed at this time.

As discussed above, the applicants have demonstrated that there are no feasible alternatives to construction of a shoreline protective device at this location. However, different types of shoreline protection would have varying degrees of impact on the visual quality of the area. The applicants examined several alternatives to the proposed shoreline protection. Exhibit 6 shows an upper-bluff, carved and colored tied-back wall that could be located 30 feet above the base of the bluff, which would cover the clean sands lens and could negate the need for any lower sea-cliff stabilization until an additional 30 feet of marine erosion eventually undermined the upper wall. However, the report indicates that construction of this type of wall on fragile, unstable upper bluffs is problematic at best, and would also be more visually intrusive than the proposed construction of a vertical wall against lower and mid-bluff cliffs which are currently essentially vertical.

A second alternative to the 35-foot high seawall is presented in Exhibit 7, which involves construction of two separate 15-foot high walls, one at the base of the bluff and the other at the mid-bluff to cover the clean sands. However, this alternative would also require construction on the unstable mid-bluff area and offers little in the form of improved aesthetics.

The vertical portion of the existing coastal bluffs in this location currently stand almost completely vertical up to a height of 35 feet. Thus, constructing a 35 foot high vertical seawall at the base of the bluff at least presents the opportunity to minimize the visual impact through sculpting and coloring the wall to match the bluff landform. The proposed seawall will have a colored and textured surface replicating the natural bluff. The upper 10 feet of the wall will be colored specifically to match the terrace deposits. As a requirement of the City of Solana Beach, the contractor for the project will be

required to construct a scale prototype wall section at an off-site location for City approval. 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. The condition requires that should the appearance of the wall change or deteriorate in the future, the applicants must apply for a coastal development permit to maintain the wall in its approved condition, including coloring and texturing. In this way, the Commission can be assured that the proposed seawall will blend with the natural bluffs in the area to the maximum extent feasible. Therefore, as conditioned, the Commission finds that potential visual impacts associated with the proposed development have been reduced to the maximum extent feasible, consistent with Section 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 1,000 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 2.5 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 ½ feet for a length of 90 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 and thus alter public access and recreational opportunities.

The precise impact of shoreline structures on the beach is a persistent subject of controversy within the discipline of coastal engineering. However, the Commission is led to the conclusion that if a seawall works effectively on a retreating shoreline, it results in impacts on the beach. As discussed previously, the construction of a shore/bluff protective structure has a number of quantifiable and not so quantifiable impacts on the local sand supply on the adjacent sandy beach. Briefly stated, the seawall will halt natural bluff retreat, preventing bluff material from becoming part of the sand supply; will physically occupy beach area, displacing recreational use of a public beach, thereby creating a burden on the public; will halt the landward migration of the beach; and, the vertical seawall can cause increased turbulence, accelerating the pace of sand scour, steepening the beach profile and causing the beach to become narrower and eventually disappear. Additionally, seawalls can lead to accelerated erosion of the adjacent unprotected bluff due to wave reflection.

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. The line where that datum intersects the shoreline will vary seasonally. 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 that 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, riprap, 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. In this location, the majority of the beach and bluffs are in public ownership (the bluff face below 265 Pacific is owned by the bluff-top property owner. 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 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.

As debris dislodged from the seawall either during construction or after completion also has the potential to affect public access, Special Condition #11 has also been proposed. This condition notifies the applicant that they are responsible for maintenance and repair of the seawall 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. The applicants are proposing to use a portion of the 95-space parking lot at Fletcher Cove for construction staging and storing. Fletcher Cove is the main recreational beach for all of Solana Beach, and the parking area at Fletcher Cove is the only public beach parking lot directly adjacent to the beach in Solana Beach.

Construction vehicles traveling along the access ramp at Fletcher Cove as proposed will have an adverse impact on the ability of the public to access Fletcher Cove and to walk along the beach to the north during low tides. However, this ramp is the only way heavy equipment can reach the project site. To further impact public access by usurping even a small amount of parking in the lot would significantly adversely impact public access. As such, Special Condition #7 has been proposed to require that a staging area plan be submitted that indicates that no portion of the beach will be used for storage of materials and equipment, and requires that no public parking lots will be used for staging. Special

Condition #5 prohibits construction on the sandy beach during weekends and holidays in the summer months of 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 an 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.

In preparation of an 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 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.

The bluffs in this section of the Solana Beach coastline are mostly in public ownership; for the most part pristine, devoid of shore and bluff protection structures or private access stairways. Evidence of a clean sand lens, which has been documented on the project site, has not been reported elsewhere in the area. As such, it is premature to commit this entire stretch of bluffs to armoring without a thorough analysis of alternatives.

In the case of the proposed project, site specific geotechnical evidence has been submitted indicating that the existing structure on the project site is 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, the project 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

8. 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.

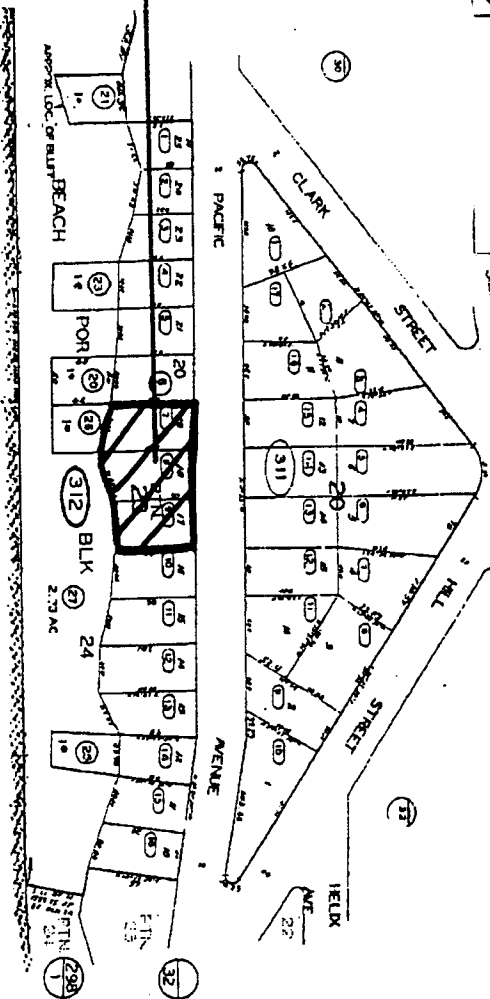
The proposed project has been conditioned in order to be found consistent with the geologic stability, visual quality, and public access policies of the Coastal Act. Mitigation measures, including conditions addressing construction techniques consistent with the geotechnical report and color of construction 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. Compliance. All development must occur in strict compliance with the proposal as set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. 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.
7. 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.

SITE



PACIFIC OCEAN

1"=OPEN SPACE ESMT

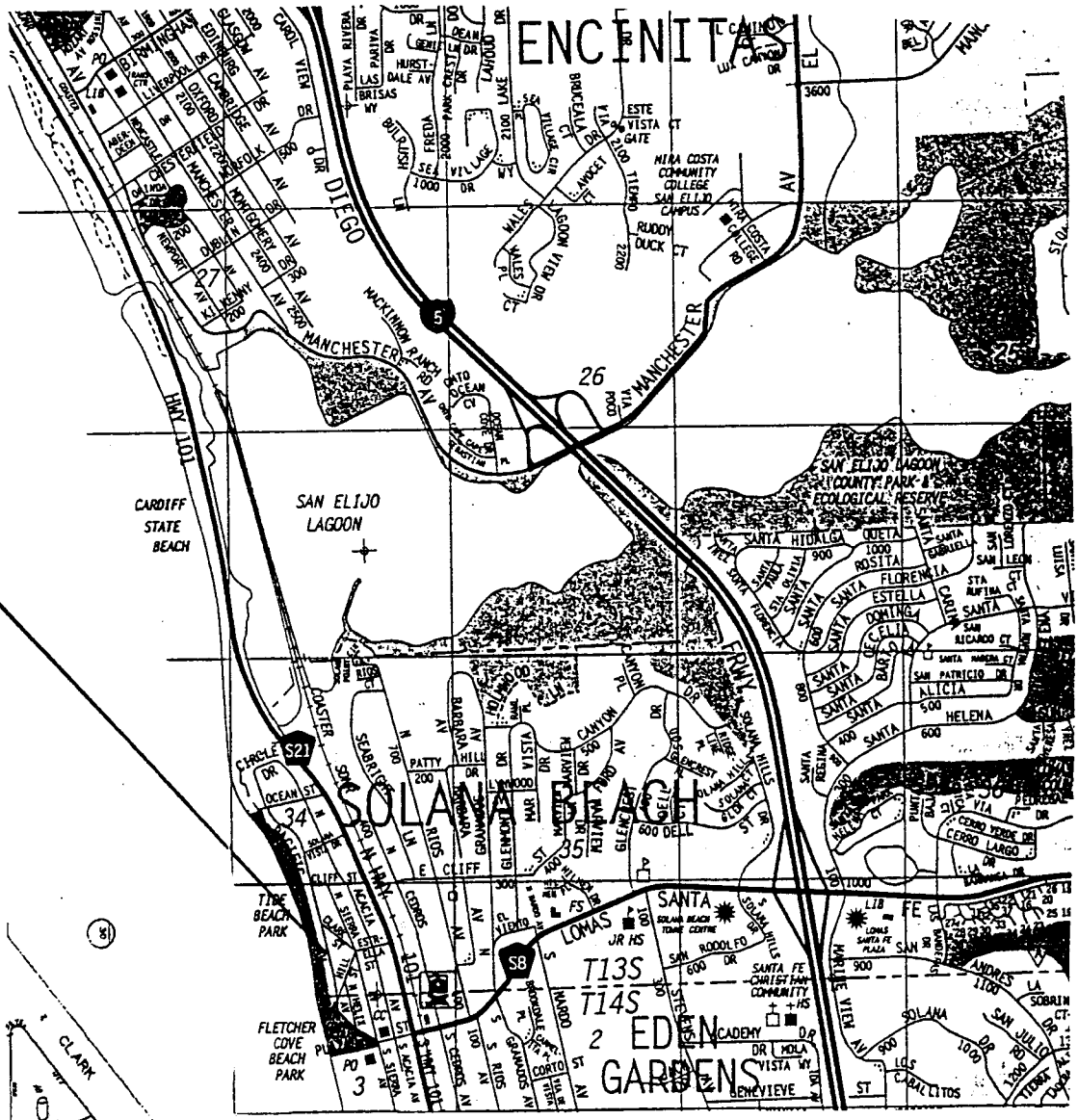
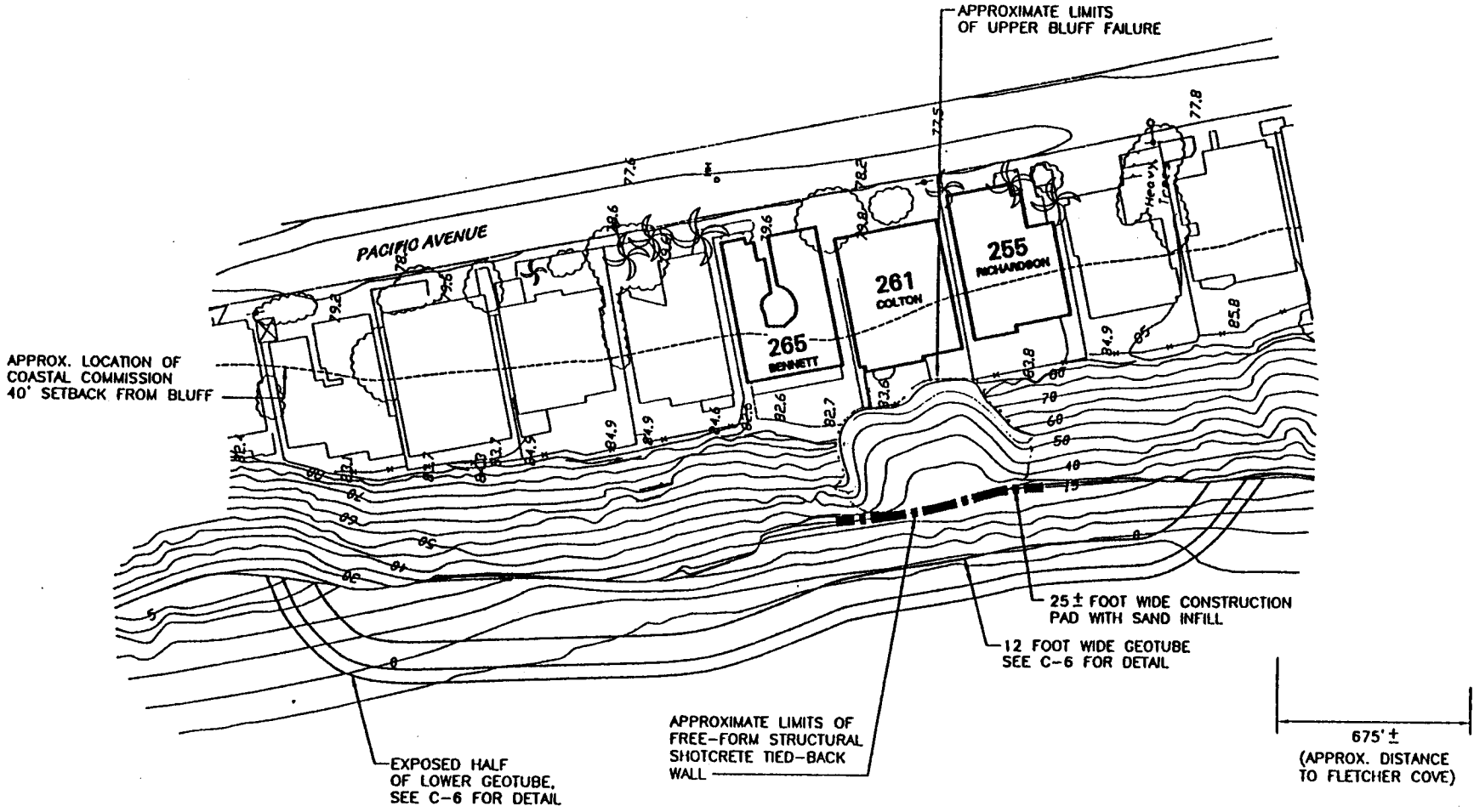
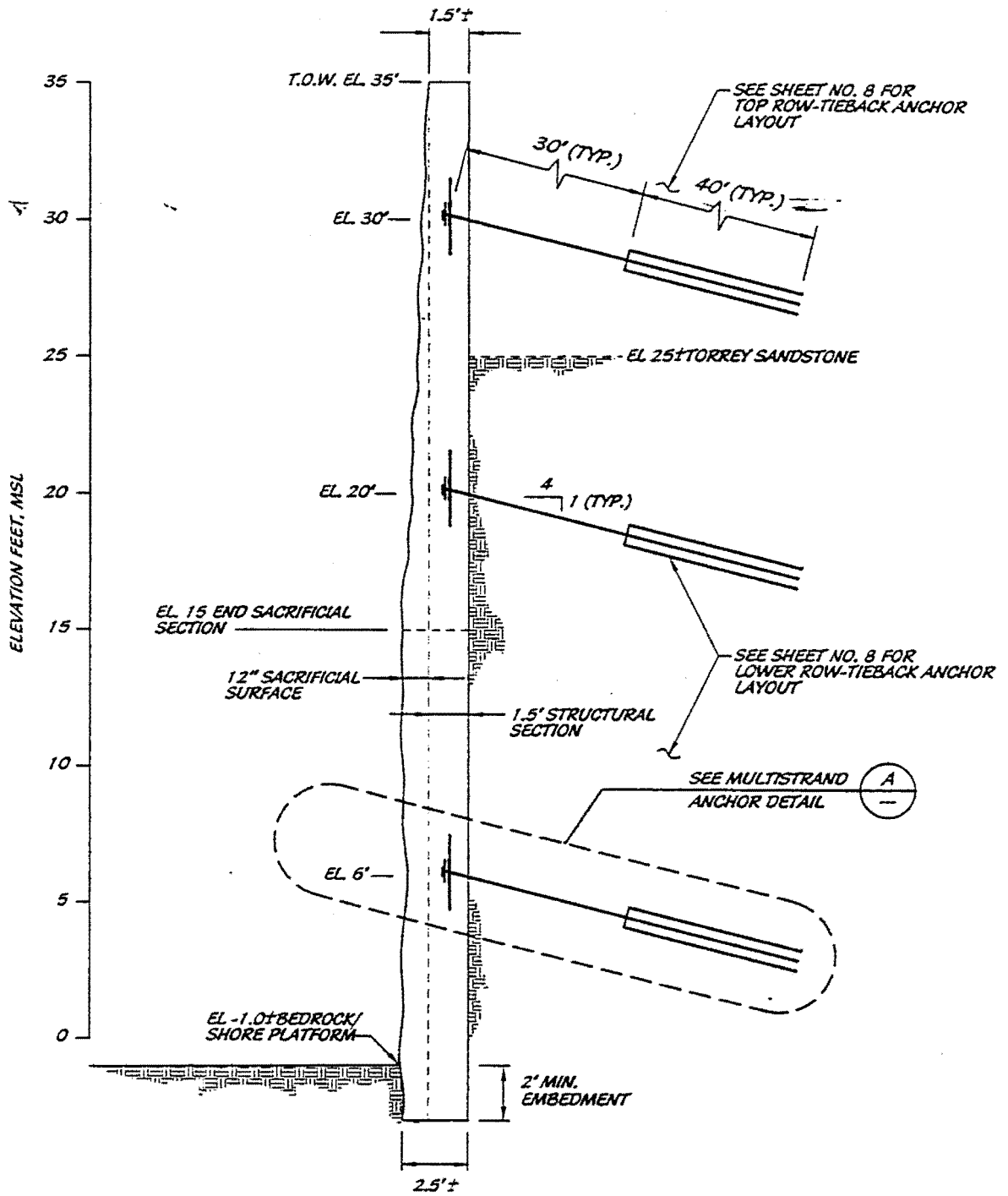


EXHIBIT NO. 1
APPLICATION NO.
6-99-56
Location Map
California Coastal Commission



EXHIBIT NO. 2
APPLICATION NO. 6-99-56
Site Plan
California Coastal Commission





TIED-BACK WALL REINFORCING SECTION (3)
SCALE: 1"=3"

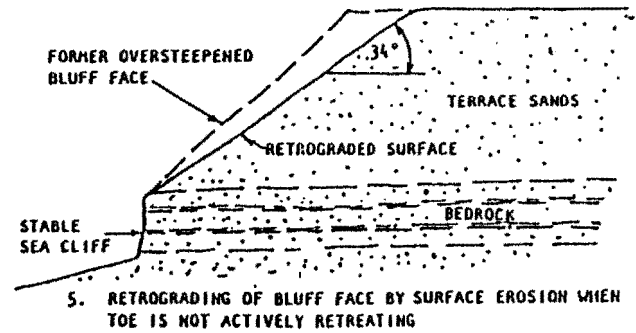
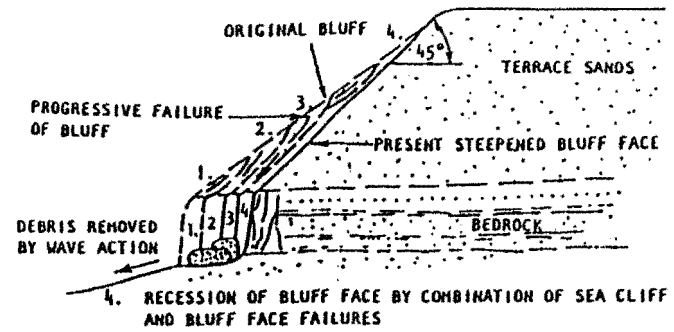
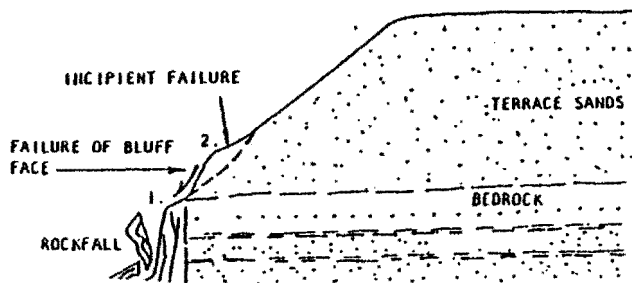
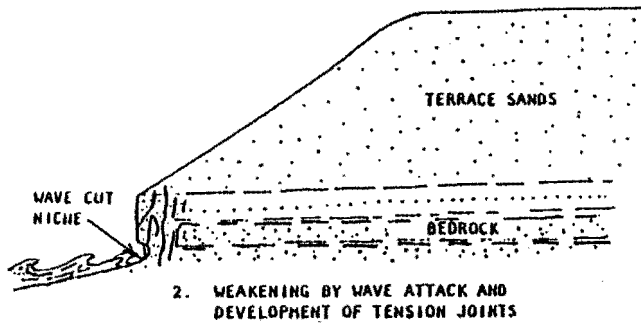
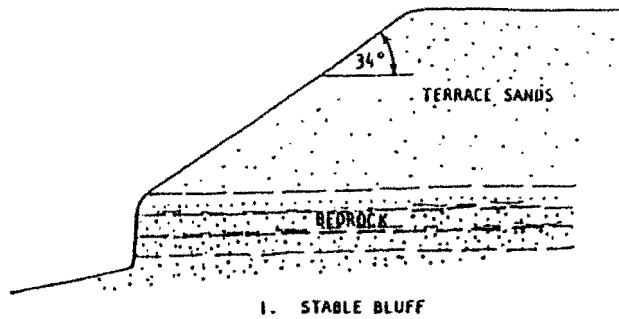
EXHIBIT NO. 3
APPLICATION NO. 6-99-56
Seawall
Cross-Section
California Coastal Commission

26 PACIFIC AVENUE SHORELINE STABILIZATION PROJECT

CITY OF SOLANA BEACH

STRUCTURAL DETAILS

RECOMMENDED FOR APPROVAL	APPROVE
BY: _____	BY: _____
R.C.E.: _____ EXP.: _____	CITY ENGINEER
DATE: _____	EXP.: _____



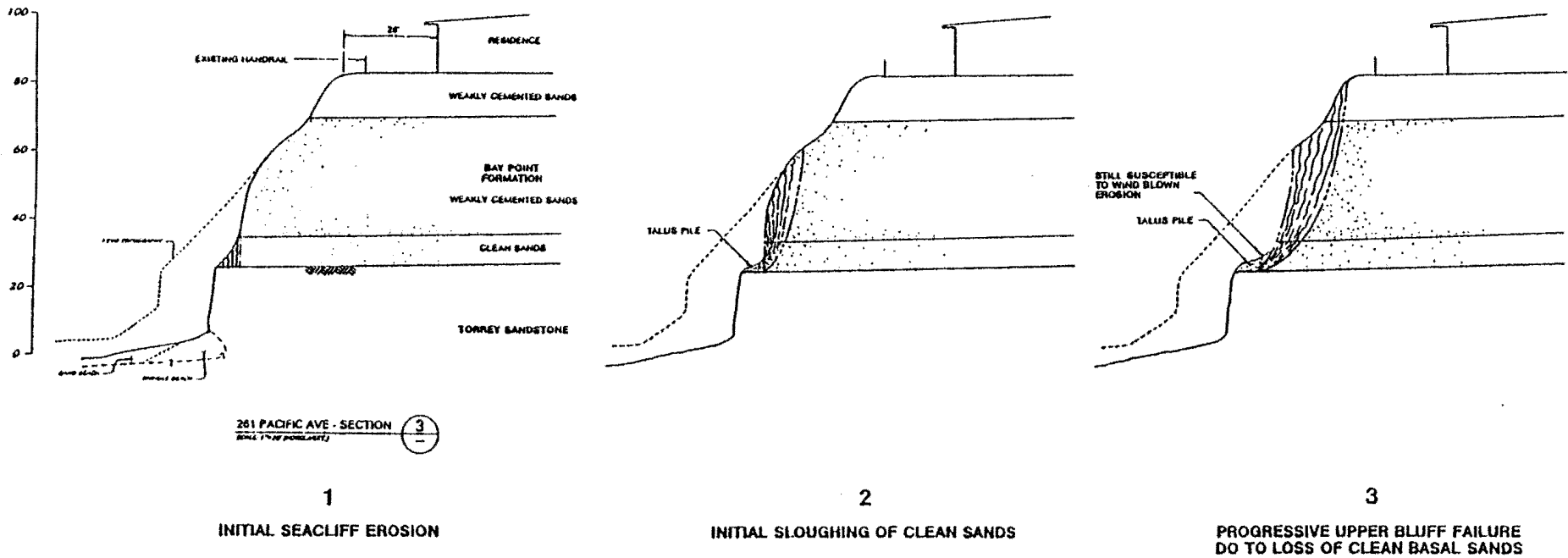
PROCESS OF SLOPE DECLINE


[Reproduced from Leighton & Associates, 1979]

Project Name: 249/311 Pacific Avenue Seawall - Project Number: 1831-



<p>California Coastal Commission</p>	<p>EXHIBIT NO. 4</p>
	<p>APPLICATION NO.</p>
	<p>6-99-56</p>
	<p>Typical Bluff Erosion Process</p>

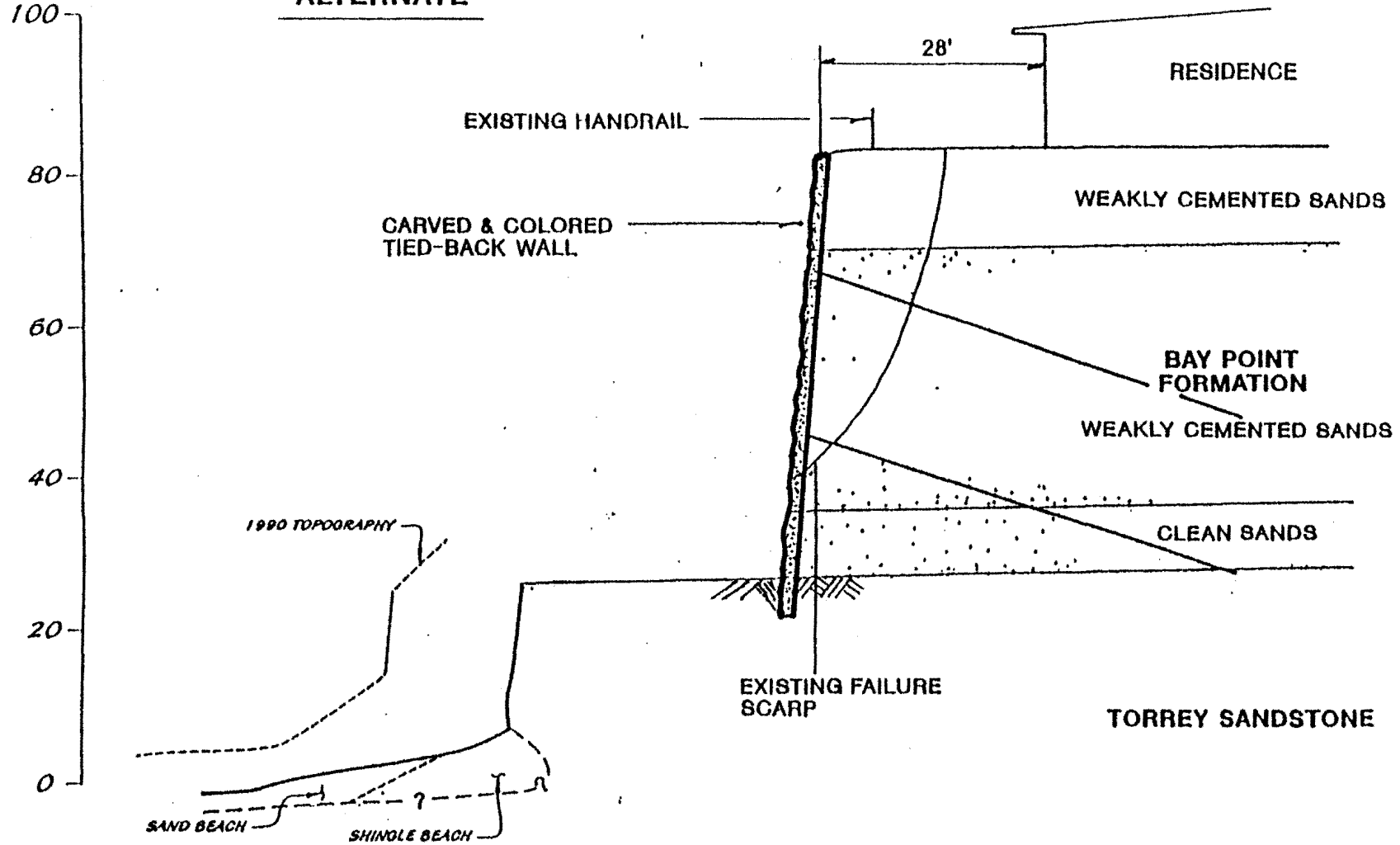



 California Coastal Commission
 Process
 Clean Sands Erosion
 APPLICATION NO.
 6-99-56
 EXHIBIT NO. 5


E SEAWALL	FAILURE MECHANISM OF CLEAN SANDS	Project No. 1831-3	Figure 21
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VTS, INC.

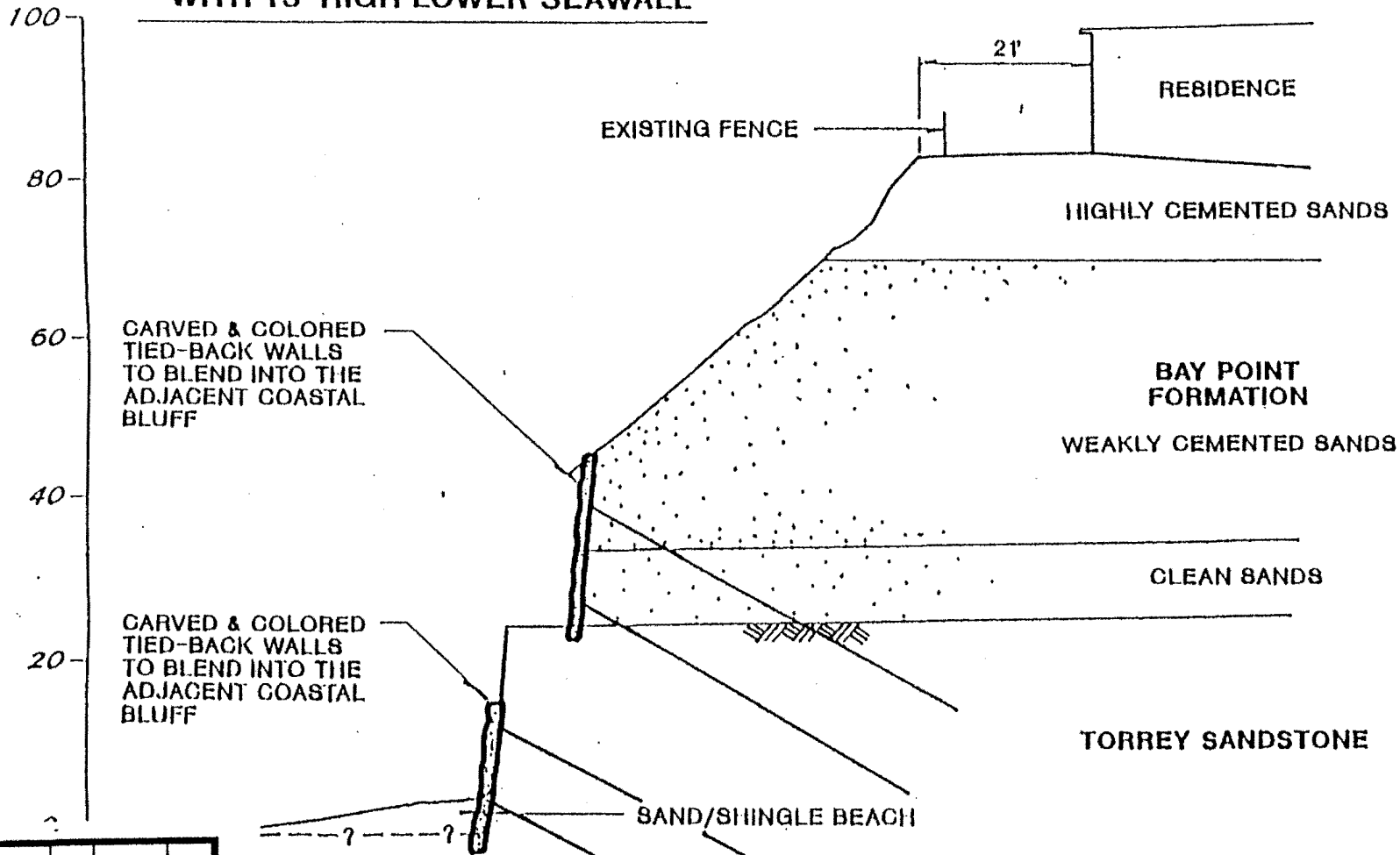
UPPER BLUFF REPAIR ALTERNATE




261 PACIFIC AVE
SCALE: 1"=20' (HORIZ. VERT.)

 California Coastal Commission	EXHIBIT NO. 6
	APPLICATION NO. 6-99-56
	Upper Bluff
	Alternative

**UPPER BLUFF REPAIR ALTERNATE
WITH 15' HIGH LOWER SEAWALL**



255 PACIFIC AVE
SCALE: 1"=20' (HORIZ. VERT.)

 California Coastal Commission	EXHIBIT NO. 7
	APPLICATION NO.
	6-99-56
	Two-Wall
Alternative	

CALCULATION OF MITIGATION FEE
FOR IMPACTS TO SAND SUPPLY
PROPOSED SEAWALL
255 - 265 PACIFIC AVENUE
SOLANA BEACH, CALIFORNIA

Basic Equations:

$$M = V_t \times C \quad (1)$$

where,

M = mitigation fee,

V_t = total volume of sand required to replace losses due to the structure, and

C = cost per cubic yard of sand

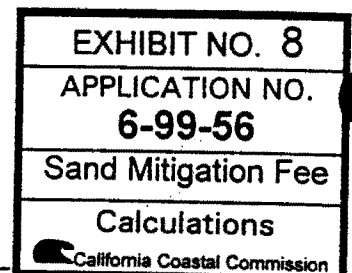
$$V_t = V_b + V_w + V_e \quad (2)$$

where,

V_b = the amount of beach material that would have been supplied to the beach if natural erosion continued or the long-term reduction in the supply of bluff material to the beach, over the life of the structure; based on the long-term average retreat rate, design life of the structure, percent of beach quality material in the bluff, and bluff geometry (cubic yards)

V_w = the long-term erosion of the beach and nearshore resulting from stabilization of the bluff face and prevention of landward migration of the beach profile; based on the long-term average retreat rate, and beach and near-surface profiles (cubic yards)

V_e = the 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)



$$V_b = (R \times L \times W \times h \times S) / 27 \quad (3)$$

where,

R = long-term regional bluff retreat rate (ft/yr),

L = design life of armoring without maintenance (yr),

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,

$$V_w = R \times L \times v \times W \quad (4)$$

where,

R = long-term regional bluff retreat rate (ft/yr),

L = design life of armoring without maintenance (yr),

v = volume of material required, per unit width of beach, to replace or reestablish one foot of beach seaward of the seawall, and

W = width of property to be armored (ft),

$$V_e = E \times W \times v \quad (5)$$

where,

E = encroachment of seawall, measured from toe of the bluff or back beach (ft),

W = width of property to be armored (ft), and

v = volume of material required, per unit width of beach, to replace or reestablish one foot of beach seaward of the seawall.

Site-specific values for equation variables:

C = \$13.00 per cubic yard to purchase and deliver sand

R = 0.2 ft/yr

L = 30.0 years

W = 90 feet

S = 0.75

h = 84 feet

v = 0.9 yard³ per foot of width and foot or retreat

E = 2.5 feet

Utilizing equation (3):

$$V_b = \frac{0.2 \times 30 \times 90 \times 84 \times 0.75}{27}$$

$$V_b = 1260 \text{ yard}^3$$

Utilizing equation (4):

$$V_w = 0.2 \times 30 \times 0.9 \times 90$$

$$V_w = 486 \text{ yard}^3$$

Utilizing equation (5):

$$V_e = 2.5 \times 90 \times 0.9$$

$$V_e = 203 \text{ yard}^3$$

Utilizing equation (2):

$$V_i = 1260 + 486 + 203$$

$$V_i = 1949 \text{ yard}^3$$

Utilizing equation (1):

$$M = 1949 \times \$13.00/\text{yd}$$

$$M = \$25,337$$

Sand Mitigation Fee Parameters

W	=	90 ft
E	=	2½ ft
v	=	0.9
R	=	0.2 ft/yr
L	=	30 yr
S	=	75%
h_s	=	36 ft
h_u	=	48 ft
R_{cu}	=	0.2
R_{cs}	=	0
C	=	\$13/cy

GROUP

DELTA
CONSULTANTS

6-99-56

RECEIVED

FEB 24 1999

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

February 22, 1999

California Coastal Commissioners
3111 Camino del Rio North #200
San Diego, CA 92108-1725

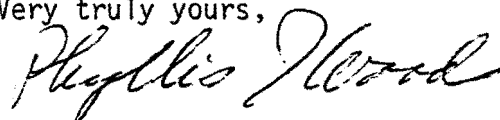
Re: Permits for Bluff Stabilization Solana Beach for future hearings

Dear Members of the Coastal Commissions and Fellow Citizens:

I do not understand why homeowners on the bluff should not be allowed to construct a sea wall with their own money. This will protect not only their property but also the sandy beach, not to mention the safety of beach-goers. As well as protecting against personal loss, the sea wall can protect against tax revenue losses to the city and county.


I think that a properly designed wall will stabilize our sandy beaches and everybody will win.

Very truly yours,



Phyllis J. Woods
1061 Woodside Way
Solana Beach, CA 92014

cc: Mayor Dodson, Solana Beach City Hall
635 S. Highway 101
Solana Beach, CA 92075

EXHIBIT NO. 9
APPLICATION NO. 6-99-56
Letters of Support
For Seawall Concept
 California Coastal Commission

Louise Abbott
407 Marview Drive
Solana Beach, CA 92075
619-755-8046 619-755-7046 (FAX)

RECEIVED

FEB 22 1999

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

February 19, 1999

California Coastal Commissioners
3111 Camino del Rio North #200
San Diego, CA 92108-1725

Ref: Permits for Bluff Stabilization in Solana Beach
Please include this letter in all packages for all future hearings on this subject

Dear Members of the Coastal Commission;

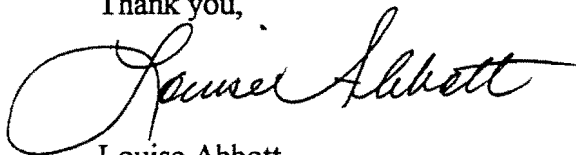
I am writing this letter to implore you to approve the installation of a natural looking seawall to help stabilize the crumbling Solana Beach bluffs. I quite frankly can see no legitimate reason for denial of this improvement being paid for by private citizens for the benefit of all.

There have been homes on the bluff for approximately 75 years. With the improvements that have been made to homes with state of the art building technology and geological reports these homes have not contributed to the decline of the bluff. These homeowners are restricted on watering and are doing everything possible to protect the bluffs as well as their considerable investments. The bluffs are eroding due to natural attrition. A seawall that looks exactly like the bluffs would slow this process, protect beach goes from falling debris and protect private property. This could only be called a win win situation.

I feel that any resistance to the installation of a long contiguous seawall is misplaced. There is no benefit to the beach or anyone by letting the bluff crumble. The reason we don't have sand on our beaches is not because the bluffs haven't been allowed to crumble. In fact they have been allowed to fall into ruin and we have no sand. The sand issue stems from the railroad and Interstate 5 not allowing the sand to wash down its natural riverbed.

Please allow the building of an ascetically pleasing, natural looking, seawall as soon as possible before there is further danger to life and property.

Thank you,



Louise Abbott
cc: City Council, City of Solana Beach

California Coastal Commission
3111 Camino Del Rio North
Suite 200
San Diego, CA 92108

^{DL}
RECEIVED

JAN 22 1999

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

Re: Coastal permits, Solana Beach (north of Fletcher Cove)

Dear members of this Commission;

I understand that the members of Surfriders and friends are putting up roadblocks that are hindering the homeowners on Pacific Ave. in Solana Beach from putting up walls to protect their homes. I want to delineate a few of the **facts** in the petitions to you.

#1. The homeowners have hired at great cost one of the best Geotechnical engineers they could find. Walter Crampton has had much experience with the coastal condition and the environment. Mr. Crampton has shown pictures and has a history of building the kind of wall that will look probably better than the bluff itself.

#2. Mr. Crampton has brought in both Steve Aceti and a Mr. Flick PhD who are renown coastal experts. They have testified that a wall has no ill effects on neighboring sites or on beach erosion.

#3. I have lived near Fletcher Cove for seven years. We walk almost daily. For more than a year we have been able to walk South **only** at a very low tide. There has almost never been a walkable beach going North of Fletcher Cove. It is dangerous to try to walk North. They have had bluff failures and the waves wash vigorously against the bluff. The Surfriders claim they only want to protect the beach. I only wish there was a beach to protect in that area.

#4. Once when our City Council was about to launch a Trash for Sand program, the Surfriders said we would be hurting the grunion. I have **Never** seen or heard of grunion on our beach. Yet they managed to delay the sand which we so desperately needed until we never got it.

#5. I was at a Coastal Commission meeting when a councilman from Encinitas did a wonderful "Show & Tell" (I'm a former school teacher.). He showed kelp that had been kept in a plastic sealed container. It was alive and growing. He gave the research figures to show that the stuff is almost invincible. Again the Surfrider foundation had used the kelp as an excuse to hold up any sand projects that we might have been successful in negotiating.

The Surfrider Foundation might have been founded on some decent environmental principles but like many causes they have forgotten their mission. They are now "Downright Mean Spirited". That is the only explanation for their recent protest re homeowners building walls to protect their property or even the filling in of seacaves.

February 12, 1999

California Coastal Commissioners
3111 Camino Del Rio North #200
San Diego, CA 92109-1725

Re: Permits for Bluff Stabilization Solana Beach
For future hearings

Members of the Coastal Commissions and Fellow Citizens,

As a resident of the state of California and as one that goes to the beach, I think the commission should do everything possible to let citizens on the coast of Solana Beach protect the bluffs from crumbling into the ocean.

Bluffs disintegrating into the ocean are of no benefit to any of us. When do you stop the erosion? When it gets to the street? When it gets to the next row of homes? When it gets to Highway 101? I have a hard time understanding what you are trying to accomplish.

If this were an undeveloped area, there might be different considerations. But much of this area has been developed over 50 years. Some of the homeowners have lived in their homes for 50 years and others for ten, fifteen and twenty years.

The beach erosion is not a condition that the homeowners have created. As we keep reading in the newspapers most of the sand erosion has come about as the public policy of allowing marinas, jetties, dams, and much of the development that has gone on to the north and inland over the last 50 years.

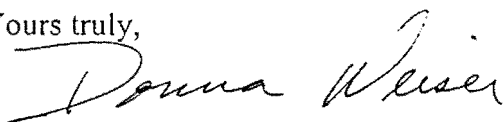
The policy of making people wait until their homes are on the verge of falling into the ocean does not make sense. **Do you wait until the floods come to start building a flood control project?**

I understand that at the request of the Coastal Commission many of the involved homeowners banded together and spent over \$100,000 in studies by experts in the field of oceanography and engineers experts in coastal erosion. "A wave does not know if it is hitting a wall or a sandstone bluff, so it does not cause more erosion to have some type of revetment to protect the bluff." Does anyone read those studies? It seems it has been studied to death.

I think an attractive, natural looking revetment should be done. Waiting until homes are falling into the ocean makes no sense (I see from the newspapers, some have lost all their patios and the bluff is up to their back door. I hear their costs to do the emergency work runs into the hundreds of thousands of dollars. Had they been allowed to do something even a year ago the cost would have been negligible in comparison.)

When the homeowners want to save the bluffs at their expense and also make them safer for the rest of us, why shouldn't they be allowed to do so?

Yours truly,



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Cc/Marion Dodson, Mayor Solana Beach, 635 So. Hwy 101, Solana Beach 92075

February 12, 1999

California Coastal Commissioners
3111 Camino Del Rio North #200
San Diego, CA 92109-1725

DL
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FEB 18 1999

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

Re: Permits for Bluff Stabilization Solana Beach
For future hearings

Members of the Coastal Commissions and Fellow Citizens

We think that homeowners should be able to protect their bluffs in a natural looking way. Letting the bluffs erode away helps no one. Where do you stop it? When it gets to the streets? When it gets to the houses across the street? When it gets to Coast Highway?

The erosion has gotten worse due to building of jetties, dams and marinas that the homeowners had no say in and no control over. We used to be able to walk the beach all the time, but there is not much beach left to walk on in Solana Beach anymore. So what beach are you saving by allowing erosion to continue at what has become an excessive rate?

There are ugly seawalls and riprap walls all up and down the coast **as well as many nice looking ones**. Why not let the Solana Beach homeowners come up with a plan for some natural looking protection for the bluffs and yes for their property.

We think it benefits everyone. If they want to make the necessary repairs at their expense, then why not?

Yours truly,

John Bernhewel

cc/Solana Beach, Mayor Dobson, City Hall
635 So. Hwy 101, Solana Beach, CA 92075

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