CALIFORNIA COASTAL COMMISSION
SAN DIEGO AREA
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SAN DIEGO, CA 92108-4402
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W10a

Addendum

July 12, 2016

To: Commissioners and Interested Persons

From: California Coastal Commission
San Diego Staff

Subject: Addendum to **Item W10a** Coastal Commission Permit Application **#A-6-ENC-13-0210 (Lindstrom)**, for the Commission Meeting of July 13, 2016

The purpose of this addendum is to make minor revisions and corrections to the staff report and to respond to concerns raised by the applicant. Staff recommends the following changes be made to the above-referenced staff report. Deletions shall be marked by a ~~strikethrough~~ and additions shall be underlined:

1. On Page 2 of the staff report, the fourth complete paragraph shall be revised as follows:

   The City's certified LCP requires that new development on bluff top lots be set back such that it will be safe from failure and erosion over its lifetime. In order to find the appropriate geologic setback, the Certified LCP requires that not only must an adequate factor of safety of 1.5 be shown under present conditions, but that it must also demonstrate an adequate factor of safety of 1.5 will be maintained over 75 years and cover all types of slope failure. The LCP defines the economic life of new development as 75 years. In this case, the City approved a setback of 40 ft. from the bluff edge based on a flawed geotechnical analysis that the Commission's geologist has determined did not accurately calculate the factor of safety or the long-term erosion rate. Subsequent to the City's action to approve this project, the applicants' geotechnical engineer submitted a revised geotechnical report which found that the setbacks required to obtain a factor of safety of 1.5 under present conditions would be significantly farther landward than what was initially determined and approved by the city. As revised by the applicant, a 1.5 factor of safety under present conditions would be obtained at 23 ft. from the bluff edge on the northern side of the site and 25 ft. from the bluff edge on the southern side of the site (the necessary setback varies due to slightly differing bluff configurations in the two cross sections examined.). Furthermore, the applicant initially projected an erosion rate of 0.13 feet per year (~10 ft. over 75 years). Subsequent to the City's action to approve this project, the applicants revised their

expected long term erosion rate upward to 0.40 feet per year (30 ft. over 75 years). However, ~~while~~ the Commission's geologist has determined that the appropriate erosion rate for this site is 0.49 feet per year (~37 ft. over 75 years). Thus, maintaining a factor of safety of 1.5 over 75 years of erosion without having to propose any shore or bluff stabilization to protect the structure in the future requires a setback of 60 to 62 ft. (23 to 25 ft. 1.5 factor of safety setback plus 37 ft. of erosion over 75 years). Therefore, the 40 foot setback approved by the City places the home at risk from erosion and raises a substantial issue.

2. On Page 5 of the staff report, the following shall be added to the list of exhibits:

   Exhibit 10 – Property Owner Response to the Staff Report, dated July 8, 2016
   Exhibit 11 – Public Comment Letter from the Surfrider Foundation, dated July 7, 2016

3. On Page 9 of the staff report, the first paragraph of the project description shall be revised as follows:

   The coastal permit approved by the City of Encinitas allows for the construction of a 2-story, 3,553 sq. ft. home with a 1,355 sq. ft. basement and a 950 sq. ft. attached garage on a 6,776 sq. ft. vacant blufftop lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge. The basement is proposed to be constructed using 24 steel shoring beams that will be excavated down to a maximum elevation of 14.5 feet below existing grade, which is also the proposed depth of the basement foundation. In addition, the applicants propose to install 17 (12 inch diameter) piers at a depth of 18 inches, located from 7 feet to 40 feet from the bluff edge, to support planter boxes and an above ground spa.

4. On Page 21 of the staff report, Special Condition 8 shall be modified as follows:

   8. **Bluff Deed Restriction.**

      a) No development, as defined in Section 30106 of the Coastal Act, shall occur in the open space area between the bluff edge and the western property line without an amendment to CDP A-6-ENC-13-0210, unless the Executive Director determines an amendment is not legally required. The western property line is currently located approximately 10 ft. seaward of the existing bluff edge.

      b) PRIOR TO THE 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, reflecting the above restrictions on development in the designated open space area. ~~The recorded document(s) shall include a legal description and corresponding graphic depiction of the legal parcel(s) subject to this permit and a metes and bounds legal description and a corresponding graphic depiction, drawn~~

~~to scale, of the designated open space area prepared by a licensed surveyor based on an on-site inspection of the open space area~~ This prohibition on development shall apply to the bluff face as the location of the bluff edge ("bluff edge" as defined in Section 30.04 of the certified Encinitas Implementation Plan) changes over time, due to the landward retreat of the bluff edge. The current location of the bluff face shall be described and depicted in an Exhibit attached to the Notice of Intent to Issue Permit (NOI) that the Executive Director issues for this permit.

~~c) The deed restriction shall be recorded free of prior liens and any other encumbrances that the Executive Director determines may affect the interest being conveyed.~~

~~c)~~ d)The deed restriction shall run with the land in favor of the People of the State of California, binding successors and assigns of the applicant or landowner in perpetuity.

5. On Page 23 of the staff report, the following LCP Policies shall be added prior to Policy 23.24.020:

Section 30.34.020(B)1a of the City's certified IP states, in part:

1. With the following exceptions, no principal structure, accessory structure, facility or improvement shall be constructed, placed or installed within 40 feet of the top edge of the coastal bluff ...

a. Principal and accessory structures closer than 40 feet but not closer than 25 feet from the top edge of the coastal bluff, as reviewed and approved pursuant to subsection C "Development Processing and Approval" below. This exception to allow a minimum setback of no less than 25 feet shall be limited to additions or expansions to existing principal structures which are already located seaward of the 40 foot coastal blufftop setback, provided the proposed addition or expansion is located no further seaward than the existing principal structure, is setback a minimum of25 feet from the coastal blufftop edge and the applicant agrees to remove the proposed addition or expansion, either in part or entirely, should it become threatened in the future. Any new construction shall be specifically designed and constructed such that it could be removed in the event of endangerment...

Public Safety Policy 1.6g of the City's certified LUP states, in part:

The City shall provide for the reduction of unnatural causes of bluff erosion, as detailed in the Zoning Code, by:

[. . .]

g. Permanently conserving the bluff face within an open space easement or other suitable instrument.

6. On Page 27 of the staff report, the following paragraph shall be added after the first incomplete paragraph:

   The applicant also contends that the new home, as proposed to be located 40 ft. from the bluff edge, is expected to result in a Factor of Safety of 1.29 after 75 years of erosion (assuming an erosion rate of 0.40 ft./yr.). The applicants argue that with a 1.29 Factor of Safety the home will be safe throughout its 75 year economic life and will not require protection from shoreline armoring. However, the LCP requires a Factor of Safety of 1.5 at 75 years. Thus the applicants' argument is not consistent with the requirements of the LCP. In addition, if the erosion rate recommended by the Commission geologist were used in the applicants' stability analysis, the resulting factor of safety would be significantly lower than 1.29 and after 75 years the home would most likely require shoreline armoring. The industry standard for new development is a Factor of Safety of 1.5. Therefore, to establish a safe setback from slope stability from the edge of a coastal bluff, a new home must be sufficiently setback from the bluff edge to ensure that the 1.5 Factor of Safety is maintained throughout the economic life of the structure.

7. On Page 27 of the staff report, the third complete paragraph shall be revised as follows:

   A building footprint of 1,725 sq. ft. would allow the ~~The~~ applicants ~~could~~ to construct an approximately 3,500 sq. ft. 2-story home, including the garage, taking into consideration the City's required setbacks. A reduction in floor area would likely need to occur to design a home with reasonable articulation and design (rather than just a box). However, the applicant could also construct ~~and~~ a 12 ft. by 25 ft. second floor cantilever on the western side of the home, which would result in an additional 300 sq. ft. of floor area and would potentially cancel out floor area lost from articulation. In addition, there is ample space ~~of~~ on the site for the applicants to also construct a large basement landward of the 60 to 62 ft. geologic setback. A potential variance from the City to allow a reduction of the front yard setback would result in an even larger building envelope.

8. On Page 28 of the staff report, the last complete paragraph shall be corrected as follows:

   Special Condition 3 requires that the applicants waive any rights that may exist under Public Resources Code Section 30235 or under the certified Solana Beach LUP to construct new shoreline protection to protect the new blufftop residence. In addition, the condition states that the residence may remain only as long as it is reasonably safe from failure and erosion without having to propose any shore or bluff stabilization to protect the residence in the future. Should the blufftop residence become unstable or structurally unsound, without construction of new shoreline armoring~~, including reconstruction of the existing shoreline armoring~~, or if any government agency orders that the structure is not to be occupied due to failure and erosion of the bluff, the applicants must agree to remove the subject

structure, in part or entirely and remove and dispose of any debris that fall to the beach.

9. On Page 30 of the staff report, the first sentence of the second complete paragraph shall be modified as follows:

   In addition, Special Condition 8 requires the applicant to record an open space restriction over the portion of the face of the bluff that is owned by the applicant, which prohibits future development on such bluff face, including as its location changes over time without an amendment to this CDP...

10. On Page 31 of the staff report, the last sentence of the first complete paragraph shall be corrected as follows:

    …In addition, the requirement of ~~Special Condition 8~~ Special Condition 2 that limits landscaping to native, drought-tolerant plants along with the restriction on irrigation will minimize the amount of polluted runoff from the property to the extent feasible. Therefore, the Commission finds the proposed project consistent with Resource Management Policies 2.1 and 2.3 of the Certified LCP.

11. On Page 33 of the staff report, the last incomplete paragraph shall be modified/corrected as follows:

    In addition, to assure that the bluff face at the subject site remains in its natural state, Special Condition 8 has been attached to require the bluff face on the subject property be protected by the application of a deed restriction ~~an open space dedication with the exception of any needed and approved repair/maintenance of any exposed sections of the below grade caisson foundation system~~. Most of the bluff at the subject site is already in public ownership. However, the applicants' western property line extends approximately 10 ft. seaward of the current bluff edge. The deed restriction required by Special Condition 8 applies to the bluff face as the location of the bluff edge ("bluff edge" as defined in Section 30.04 of the certified Encinitas Implementation Plan) changes over time, due to the landward retreat of the bluff edge. In this way, the applicant and all future property owners will be advised that no development including landscape walls or other structures are permitted on the bluff face. As such, the visual quality of these natural bluffs will be protected...

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July 8, 2016

Steve Kinsey, Chairman and
Honorable Coastal Commissioners
California Coastal Commission
45 Freemont Street, No. 2000
San Francisco, CA 94105

W10a
This letter has been provided to Coastal Staff.

Re: Lindstrom Family Home 132 Neptune Avenue, Encinitas
#A-6-ENC-13-0210

Dear Chairman Kinsey and Honorable Coastal Commissioners:

I represent the Lindstrom Family who owns the property at 132 Neptune Avenue. The standard of review in this case is the Encinitas Certified LCP. The Staff report states that the City's LCP requires a bluff edge setback at the location on the blufftop parcel that will maintain a factor of safety (FOS) of 1.5 or greater over 75 years. This is incorrect.

The LCP was certified in 1996, about 9 years prior to Dr. Johnsson's paper upon which the Staff report essentially relies (See Exhibit 6 to the Staff report), and has not been amended. The LCP allows for a minimum 40-foot setback if certified by a qualified engineer that it will be "reasonably safe" at this location without the need for bluff stabilization over its lifetime. See, *Encinitas Municipal Code* §30.34.020(C)(1) and (D). While the LCP requires a 1.5 FOS at the time of construction (in accord with the California Building Code), it does NOT require that the 1.5 FOS be maintained over a 75 year time period. This is a critical distinction, and the issue at the heart of this appeal.

The approved location for the Lindstrom home is appropriately certified by a qualified engineer (Walter Crampton, TerraCosta Consultants)[1] and meets the criteria of the Encinitas LCP. The engineer's certification is attached as Exhibit 7 to the Staff Report. Pertinent excerpts are as follows:

> **OPINIONS AND CERTIFICATION**
>
> Based on our investigations, research and review of documents, it is our opinion, and we would and do certify, that your proposed development, as approved by the City of Encinitas, will have no adverse affect on the stability of the bluff, will not endanger life or property, and is expected to be reasonably safe from failure and erosion over its lifetime (75 years) without having to propose any shore or bluff stabilization to protect the proposed structure in the future.

[1] Mr. Crampton's CV is attached to this letter.

> In our opinion, the proposed structure will be perfectly safe for at least 75 years, and will not require a seawall or other bluff stabilization structure during this time. Structures are stable as long as the factor of safety is 1.0 or greater. A 1.29 factor of safety implies a 29 percent safety margin against collapse. It is for this reason that the Coastal Commission does not typically approve seawalls unless the factor of safety at the structure is less than 1.2 and other instability factors are present. There is no engineering reason that a 75-year-old structure near the end of its useful life would be required to have a factor of safety in excess of 1.29 in order to be considered safe. For this reason, we certify without hesitation that the proposed structure will be reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the proposed structure in the future.

Mr. Crampton's certification makes perfect sense and meets the criteria of the LCP. Using a conservative erosion rate of 0.4 feet per year, he determined that the Lindstrom home as approved would have a 1.29 FOS after 75 years. As stated by Mr. Crampton, "structures are stable as long as the factor of safety is 1.0 or greater" and a 1.29 FOS implies a 29% margin of safety.

This is exactly why the Coastal Commission itself does not allow a seawall unless the FOS is *less* than 1.2. If the Coastal Commission does not allow seawalls when the FOS is *greater* than 1.2, that strongly indicates that even the Commission agrees that a home with a 1.29 FOS is safe, as certified by Mr. Crampton.

For these reasons, and for the additional reasons to be discussed at the hearing next Wednesday, the Lindstroms object to Special Conditions Nos. 1, 3, and 4. We respectfully request that the Lindstrom home be approved without these objectionable special conditions.

Respectfully submitted,

AXELSON & CORN, P.C.

Jon Corn

cc: Jim Lindstrom
Karla Lindstrom
Walt Crampton
James Knowlton
Manjeet Ranu

TerraCosta Consulting Group

Geotechnical Engineering
Coastal Engineering
Maritime Engineering

WALTER F. CRAMPTON
PRINCIPAL ENGINEER

PROFESSIONAL HISTORY

2001 - Present:	TerraCosta Consulting Group, Inc., San Diego, CA Principal Engineer
1986 - 2001	Group Delta Consultants, Inc., San Diego, CA Principal Engineer
1984 - 1986:	Schaefer Dixon Associates, Inc., San Diego, CA Principal Engineer
1971 - 1984:	Woodward-Clyde Consultants, San Diego, CA Senior Project Engineer

EXPERIENCE SUMMARY

Mr. Crampton has over 40 years of experience in geotechnical, coastal, and hydraulic engineering for a variety of construction projects, with particularly extensive work on coastal structures. His responsibilities encompass the initial field and design phases to final construction, including specifications and bid proposal documents. Mr. Crampton has managed numerous coastal and hydraulic projects, ranging from major flood control facilities and shoreline protection structures, including stone revetments, bulkheads, groins, and various patented products, to dams and detention structures. Mr. Crampton has had considerable experience with sedimentation and fluvial processes in inland streams and littoral processes in the nearshore zone. While at Scripps Institution of Oceanography, he studied under Douglas Inman at the Shore Processes Lab.

For over 30 years, Mr. Crampton has specialized in the geotechnical aspects of coastal engineering, addressing coastal-induced erosion and the geomorphology of coastlines. He also has considerable experience in landslide and coastal bluff stabilization, and has pioneered the use of free-form structural tied-back shotcrete walls, textured and colored to blend in with surrounding natural bluffs. Mr. Crampton has managed seven extensive coastwide coastal erosion studies, all of which focused on variations in erosion rates from a coastwide perspective and the sensitivity of the various geomorphic indicators for estimating future trends in coastal erosion. All seven studies presented in-depth alternatives analyses for mitigating coastal erosion, and all seven projects/studies were ultimately approved by the California Coastal Commission.

Since 2009, Mr. Crampton has managed seven shoreline stabilization projects in the City of Pismo Beach. Three of these projects were for the City, providing emergency design-build shoreline stabilization, in two instances stabilizing city streets, and the third protecting a sewer lift station threatened by shoreline erosion. Mr. Crampton also recently completed a seawall project for a private property owner in Shell Beach, along with a 4,000-foot-long coastal erosion assessment for a hotel group ultimately recommending shoreline stabilization measures for 12 separate sites. He is also currently working with the U.S. Army Corps of Engineers in stabilizing a second sewer pump station on St. Andrews, also owned by the City of Pismo Beach.

Mr. Crampton was the Project Manager for stabilizing the 90^{+}-foot-high coastal bluffs supporting the City of San Diego's Pt. Loma Sewer Treatment Plant, a project that included an extensive evaluation of bluff retreat and the effectiveness of only limited coastal stabilization. Mr. Crampton has been involved in numerous bluff-top development studies evaluating the 50- and 75-year bluff-retreat line, addressing the need for and effectiveness of shoreline and/or upper bluff stabilization.

Mr. Crampton managed and was the principal author for the geotechnical and coastal erosion technical appendix for both the 1996 Reconnaissance Report and the 2003 Feasibility Report for the Encinitas and Solana Beach Shoreline Study for the U.S. Army Corps of Engineers.

Mr. Crampton has been responsible for providing recommendations for new coastal development, relative to wave and flooding protection; designing remedial actions to mitigate wave damage and flooding of existing facilities; recommending methods of shoreline and slope stabilization through sand replenishment or structural methods; monitoring rates of sea cliff retreat and evaluating the effect of retreat on slope stability; performing bathymetry, barge drilling, vibracore bottom sampling, sub-bottom acoustic profiling, side-scan sonar and diving inspections.

Mr. Crampton spent five years as a technical reviewer for the ASCE Hydraulics Division on sedimentation.

EDUCATION

Scripps Institution of Oceanography: Post Graduate Studies in Oceanography
San Diego State University, M.S.C.E., 1974; San Diego State University, B.S.C.E., 1971

PROFESSIONAL REGISTRATION

Registered Civil Engineer: California R.C.E. 23792
Registered Geotechnical Engineer: California R.G.E. 245
Diplomate-Coastal Engineering, Academy of Coastal, Ocean, Port & Navigation Engineers

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
California Shore and Beach Preservation Association
Academy of Coastal, Ocean, Port & Navigation Engineers
San Diego Association of Geologists

PUBLICATIONS AND PAPERS

"Estimating Cliff Retreat in Southern California Considering Sea Level Using a Sand Balance Approach," 2014, Marine Geology 348:15-26, with A.P. Young, R.E. Flick, W.C. O'Reilly, D.B. Chadwick, and J.J. Helly.

"Spelunking on San Diego's Coastline," 2012 Annual Coastal Tour Guidebook, San Diego Association of Geologists, with G.A. Spaulding.

"A Case for the Clean Sand Layer within the Bay Point Formation in Solana Beach," 2012, for San Diego Assn. of Geologists Guide Book, with J. Knowlton, G.A. Spaulding, and B.R. Smillie.

PUBLICATIONS AND PAPERS (continued)

"A Framework for Sea Level Rise Vulnerability Assessment for Southwest U.S. Military Installations," 2011, Proc. Oceans 11, Mar. Tech. Soc., Inst. Electrical and Electronic Eng., 110426-001, with D.B. Chadwick, R.E. Flick, J. Helly, T. Nishikawa, P.F. Wang, W. O'Reilly, R. Guza, P. Bromirski, A. Young, B. Wild, and I. Canner.

"The Challenges of Permitting Coastal Projects in the 21st Century," in ASCE Proceedings of the 2011 Conference on Coastal Engineering Practice, August 22 – 24th, 2011, San Diego, California.

"The Point Project - Landslide Stabilization," 2007, in Proceedings of First North American Landslide Conference, Landslides and Society: Integrated Science, Engineering, Management, and Mitigation, June 3-8, 2007, Vail, Colorado.

"A Different Perspective on the Concept of Planned Retreat," 2002, in California and the World Ocean '02 Proceedings of the Conference, October 27-30, 2002, Santa Barbara, CA, American Society of Civil Engineers, pp. 417-426.

"Restoring the Beach: Science, Policy and Funding. Coastal Field Trip Itinerary and Guide," November 10, 2001, prepared in association with Dr. Reinhard E. Flick for the California Shore & Beach Preservation Assn. 2001 Annual Conference in San Diego, California.

"Sand Beaches vs. Seawalls – A Geomorphic Perspective," 2001, in Coastal Processes and Engineering Geology of San Diego, California, San Diego Assn. of Geologists, pp. 55-63.

"National Marine Fisheries Service Center – Effects of Tectonics and Faulting on Coastal Erosion," 2001, in Coastal Processes and Engineering Geology of San Diego, California, San Diego Assn. of Geologists, with B.R. Smillie, pp. 65-73

"Pump Station 35, Assessing Coastal Stability – A Geomorphic Perspective," 2001, in Coastal Processes and Engineering Geology of San Diego, California, San Diego Assn. of Geologists, with G.A. Spaulding, pp. 75-91.

"Face Lift" [article regarding geogrid-reinforced landslide stabilization], September 1998, Geotechnical Fabrics Report, with Paulo DiPietro.

"A Landslide of Litigation," 1996, Civil Engineering, ASCE, Vol. 66, No. 10, October 1996, pp. 61-63.

"Flood Problems and Solutions in the Southwestern Desert," presented at the 1987 Assn. of State Floodplain Management Conference, Seattle, Washington, with J.C. Hill.

"Sunset Cliffs Stabilization Project - San Diego, CA," presented at the 1984 International Erosion Control Assn. Conference, Denver, Colorado.

"Sunset Cliffs Shoreline Stabilization Project - The Politics of Coastal Engineering in California," presented at the 1983 Coastal Zone Conference, San Diego, California, with R.E. Cain.

"Sunset Cliffs Stabilization Project - San Diego, CA," presented at the 1980 Coastal Zone Conference, Hollywood, Florida, with L.J. Lee.

Surfrider Foundation San Diego County Chapter

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July 7, 2016

Delivered via email

To: Eric Stevens
California Coastal Commission
7575 Metropolitan Drive Ste 103
San Diego, CA 92108-4402

Re: Item W10a, Appeal Number: A-6-ENC-13-0210, Jim and Karla Lindstrom

Dear Mr. Stevens,

The Surfrider Foundation San Diego County Chapter recognizes beaches as a public resource held in the public trust. Surfrider Foundation is an organization representing 250,000 surfers and beach-goers worldwide that value the protection and enjoyment of oceans, waves and beaches. For the past decade, San Diego Chapter has reviewed and commented on coastal construction projects and policy in San Diego County. We appreciate the opportunity to provide comments to the California Coastal Commission about these important issues.

We support the staff recommendation of Substantial Issue for this appeal, and feel this project can only be approved in a De Novo hearing if the project is conditioned as recommended in the staff report. Anything less would not only threaten our coastal resources, but set a dangerous precedent. The new home must be sited to maintain a factor of safety of 1.5 over 75 years. This is required to comply with Section 30.34.020 (D) of the IP, which states: "*The review/report shall certify that the development proposed will have no adverse effect on the stability of the bluff, will not endanger life or property, and that any proposed structure or facility is expected to be reasonably safe from failure and erosion over its lifetime without having to propose an shore or bluff stabilization to protect the structure in the future."* Furthermore, Policy 1.3 of the LUP requires that *"new development have an appropriate safe setback to ensure that the residence is reasonably safe from failure and erosion over its lifetime."* Lastly, Section 30253 of the Coastal Act requires new development to be stable for its economic life, and the industry standard for stability is a factor of safety of 1.5. The Commission would be doing the applicant a favor – and right by the public – by permitting only a responsibly sited structure in this location.

With respect to the erosion rates, what's past is prologue. We need to look to the future with caution and flexibility in order to appropriately handle the unknowns associated with Climate Change and Sea Level Rise. Section 30.34.020 (D) of the IP requires that a geotechnical report analyze "*Historic, current and foreseeable-cliffs erosion."* Respected and peer-reviewed coastal experts such as Ben Benumof and Gary Griggs estimate the erosion rates along Encinitas to be up to .49 ft per year,

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which is much more reflective of the erosion rates we will see as opposed to the overly conservative estimates the applicants erroneously selected.

Surfrider implores you to remove the basements and shoring beams as they are not necessary and pose an unnecessary risk in the future. This is supported by the LUP in Section 30.34.020 (B)1a of the City's certified IP, which states: "*Any new construction shall be specifically designed and constructed such that it could be removed in the event of endangerment…"* As such, Surfrider believes the basement is an undue risk in this hazardous zone and should not be allowed wherever the house is located so that the home could be moved if threatened from erosion. There are many unknowns associated with Climate Change and sea level rise (SLR) and we may see changes much more rapidly than we have in the past. As the agency charged with protecting and maintaining the coastline, you should keep all available tools and options in the toolbox, in order to deal with unknown future conditions.

As required by the LCP, alternatives to current proposal should have been analyzed. The good news is that an averaged sized home can be built on this lot as a compromise. There is no substantiated risk of a "takings" here. First off, it is Surfrider's experience that public access and coastal habitat protection are often sacrificed over a fear of future takings claims even if those fears are not well founded. Second, in order for a "takings" claim to be successful, the agency would have to take a right the homeowner had in the first place. For instance, homeowners don't have a right to create a nuisance. To knowingly build on an eroding coastline, and then later require shoreline protection, which destroys the public beach, could be considered creating a nuisance.

Special Conditions 3 and 7 must be required of the applicant before they are allowed to proceed. The applicant must assume the risk of building in this hazardous location and waive the right to future protection, including removal or relocation of threatened portions of the home. The Coastal Act provides protections for "existing" structures, because they were built before we knew better; now we know better! Any risk associated with building on an eroding coastline must be born by the applicant choosing to do so, not the public's right to enjoy the beach. Furthermore, the deed restriction of Special Condition 7 should be carefully worded to avoid unintended consequences like we have seen with the Bannasch property in Solana Beach.

According to the LCP, the three elements listed below are all requirements of a geotechnical report. "*This slope failure analysis shall be performed according to geotechnical engineering standards, and shall:*

-Cover all types of slope failure.
-Demonstrate a safely factor against slope failure of 1.5.
-Address a time period of analysis of 75 years…"

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The list is clearly meant to be inclusive. It would not make sense to leave out the first item "*Cover all types of slope failure."* So why would anyone let the applicant chose between the second and third items, when it is obvious that both need to be considered together? The either/or logic of choosing between the last two items is truly problematic. If the home is sited at a location to achieve a factor of safety of 1.5 today, and there is any erosion, the home will immediately be below the established industry standard for safety, let alone over the next 75 years! All three elements must be taken together – to do anything less would set a terrible precedent. More applications, one on this very agenda, and two in the immediate future raise this same question.

Thank you for your time and consideration of this important issue, and please let me know if you have any questions.

Sincerely,

Julia Chunn-Heer
Policy Manager
San Diego County Chapter of the Surfrider Foundation

Jennifer Savage
California Policy Manager
Surfrider Foundation

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W10a

Filed:	6/6/2013
49th Day:	7/25/2013
Staff:	E. Stevens-SD
Staff Report:	06/30/2016
Hearing Date:	07/13/2016

STAFF REPORT AND RECOMMENDATION ON APPEAL SUBSTANTIAL ISSUE & DE NOVO

Local Government:	**City of Encinitas**
Decision:	**Approved with Conditions**
Appeal Number:	**A-6-ENC-13-0210**
Applicants:	**Jim and Karla Lindstrom**
Location:	132 Neptune Avenue, Encinitas, San Diego County (APN No.: 256-371-14)
Project Description:	Construction of a new 2-story, 3,553 sq. ft. home with a 950 sq. ft. garage over a 1,355 sq. ft. basement on an existing 6,776 sq. ft. vacant lot; installation of 17 (12 inch diameter) piers at a depth of 18 inches to support planter boxes; above ground spa.
Appellants:	Commissioners Shallenberger and Sanchez
Staff Recommendation:	Substantial Issue and Approval with Conditions on De Novo

IMPORTANT HEARING PROCEDURE NOTE

The Commission will not take testimony on this "substantial issue" recommendation unless at least three commissioners request it. The Commission may ask questions of the applicants any aggrieved person, the Attorney General, or the Executive Director prior to determining whether or not to take testimony regarding whether the appeal raises a substantial issue. If the Commission takes testimony regarding whether the appeal raises a substantial issue, testimony is generally at the discretion of the Chair limited to 3 minutes total per side. Only the applicants, persons who opposed the application before the local government (or their representatives), and the local government shall be qualified to testify during this phase of the hearing. Others may submit comments in writing.

If the Commission finds that the appeal raises a substantial issue, the de novo phase of the hearing will follow, unless it has been postponed, during which the Commission will take public testimony.

SUMMARY OF STAFF RECOMMENDATION

The staff recommends that the Commission, after public hearing, determine that substantial issue exists with respect to the grounds on which the appeal has been filed.

The proposed project involves the construction of a 2-story, 3,553 sq. ft. home with a 1,355 sq. ft. basement and a 950 sq. ft. attached garage on a 6,776 square foot vacant blufftop property. The project site is a coastal blufftop lot located on the west side of Neptune Avenue, approximately two blocks north of Moonlight State Beach. The existing property is vacant and no shoreline armoring fronts the site. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to be cantilevered 8 feet west to within approximately 32 ft. of the bluff edge.

The City found that the subject single-family residence is consistent with the public access, public recreation, and blufftop development provisions of the certified Local Coastal Program (LCP). However, the development, as approved by the City, raises several LCP consistency issues with regard to the geologic stability analysis, visual resources, and grading adjacent to the bluff edge.

The City's certified LCP requires that new development on bluff top lots be set back such that it will be safe from failure and erosion over its lifetime. In order to find the appropriate geologic setback, the Certified LCP requires that not only must an adequate factor of safety of 1.5 be shown under present conditions, but that it must also demonstrate an adequate factor of safety of 1.5 will be maintained over 75 years and cover all types of slope failure. In this case, the City approved a setback of 40 ft. from the bluff edge based on a geotechnical analysis that the Commission's geologist has determined did not accurately calculate the factor of safety. Subsequent to the City's action to approve this project, the applicants' geotechnical engineer submitted a revised geotechnical report which found that the setbacks required to obtain a factor of safety of 1.5 would be significantly farther landward, at 23 ft. from the bluff edge on the northern side of the site and 25 ft. from the bluff edge on the southern side of the site (the necessary setback varies due to slightly differing bluff configurations in the two cross sections examined.). Furthermore, the applicant initially projected an erosion rate of 0.13 feet per year, while the Commission's geologist has determined that the appropriate erosion rate for this site is 0.49 feet per year. Thus, maintaining a factor of safety of 1.5 over 75 years of erosion without having to propose any shore or bluff stabilization to protect the structure in the future requires a setback of 60 to 62 ft. Therefore, the 40 foot setback approved by the City places the home at risk from erosion and raises a substantial issue.

The precedential value of the local government's decision for future interpretations of its LCP is also important with regard to this project. On the same agenda as the subject project, the Commission is reviewing an appeal for a new single-family residence located

approximately ½ mile north of the subject site that similarly did not fully assess stability factors over 75 years (A-6-ENC-16-0060/Martin), and as of the writing of this staff report, staff has received notice from the City of two additional projects approved with inadequate site stability analyses (6-ENC-16-0619/Hurst and 6-ENC-16-0624/Meardon). If the potential for bluff erosion in Encinitas is not accurately and fully evaluated, new development along the shoreline will likely result in the need for shoreline protection in the future.

The proposed project also includes a large basement area and shoring beams located as close as 40 ft. from the bluff edge. As indicated above, the location on the site that is safe for new development is significantly further landward than 40 ft. Although the proposed large basement area and shoring beams would initially be buried under the home, the basement area and shoring beams may become exposed in the future as the bluff erodes. Thus, as proposed at 40 ft. from the bluff edge, shoring beams and the western wall of the basement have the potential to create adverse visual impacts if exposed by erosion in the future. The potential exposure of the shoring beams and basement wall raises a substantial issue as it would be inconsistent with the LCP policy requiring structures visible from public vantage points to be protective of the natural scenic qualities of the surrounding coastal bluffs.

The applicants are also proposing to grade within 40 ft. of the bluff edge to support planter boxes and an above ground spa. To ensure bluff stability, the LCP prohibits improvement within 40 feet of the top edge of the coastal bluff except for minor at grade improvements. Thus, the proposed grading is inconsistent with the grading and bluff stability policies of the LCP, and therefore raises a substantial issue.

Because of the above-described inconsistencies with the LCP and the Coastal Act, staff recommends that the Commission determine that the project raises a substantial issue regarding conformance with the certified LCP and the Chapter 3 policies of the Coastal Act.

Staff also recommends that the Commission **approve** the de novo permit with several special conditions. The primary issue raised by the subject development relates to the appropriate siting of the home. The Commission's staff geologist and coastal engineer have reviewed the project and have determined that in order for the residence to be reasonably expected to be safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization, the foundation and the proposed basement and shoring beams must be sited 60 to 62 ft. from the bluff edge. The setback required to assure geologic stability would still allow for a reasonably sized home to be constructed on the site. The average size of bluff top homes on the same block as the subject site is approximately 2,900 sq. ft. As conditioned, the applicant would be able to construct a new home that is at approximately 3,500 sq. ft. Thus, Special Condition 1 requires that the applicant submit revised plans incorporating a 60 to 62 ft. foundation setback from the bluff edge and that all grading within 40 ft. of the coastal bluff edge be eliminated.

Special Condition 2 also requires that the applicants provide side yard view corridors. In addition, Special Condition 3 has been included that requires the applicant to waive any rights to construct shoreline armoring in the future to protect the new home and requires the applicants to acknowledge that the development must be removed if threatened with damage or destruction from waves, erosion, storm conditions, bluff retreat, landslides, or other natural hazards in the future. Special Condition 4 requires that the applicant submit an amendment to this CDP to remove any cantilevered portions of the home if a portion ever becomes located seaward of the bluff edge as a result of future erosion.

Standard of Review: Certified City of Encinitas Local Coastal Program and the public access and recreation policies of Chapter 3 of the Coastal Act.

STAFF NOTES

Commission staff reviewed this project and provided written comments to the City and the Applicant on April 18, 2013, prior to City approval. The comments provided by staff at that time identify all of the above concerns raised in the subject appeal. This project was appealed to the Commission approximately three years ago, on June 6, 2013.

Following the appeal, Commission planning and technical staff met with or contacted the applicants and their representatives on multiple occasions to discuss the project specifics and timing to bring this appeal to the Commission. The applicants requested that staff not bring the application to the Commission until they had time to prepare an updated geotechnical study. The updated geotechnical study was ultimately submitted to Commission staff on October 25, 2015.

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APPENDICES

EXHIBITS

I. APPELLANTS CONTEND

The project as approved by the City does not conform to the City of Encinitas' certified Local Coastal Program (LCP). Commissioners Shallenberger and Sanchez appealed, and contend that 1) the site-specific geotechnical report supporting the siting of the structure at 40 feet inland of the bluff edge is inadequate and inaccurate because it significantly underestimates the erosion potential of the blufftop site and thus, the proposed residence would not be sited in a safe location, and would therefore likely require shoreline protection over its lifetime; 2) the proposed home has the potential to create adverse visual impacts in the future because the amount of erosion expected at the site over the lifetime of the structure may lead to the exposure of the proposed basement and shoring beams, which is inconsistent with the visual resources policies of the certified LCP that requires new development to preserve the scenic qualities of the surrounding bluffs; and 3) grading is proposed within 40 ft. of the bluff edge to support planter boxes and an above ground spa, which is inconsistent with the geologic stability requirements of the LCP.

II. LOCAL GOVERNMENT ACTION

The coastal development permit was approved by the City of Encinitas Planning Commission on May 2, 2013. Specific conditions were attached which, among other things, require the use of Best Management Practices to control and filter polluted runoff and implementation of grading and drainage controls to assure no runoff occurs over the bluff, that the applicants submit a letter to the City stating "the building as designed could be removed in the event of endangerment, and the property owner agrees to participate in any comprehensive plan adopted by the City to address coastal bluff recession and shoreline erosion problems in the City," the use of only native plants, a prohibition of permanent irrigation within 40 ft. of the coastal bluff edge setback, a prohibition on continuous footings within 40 ft. of the coastal bluff edge setback, the recordation of an open space easement over the coastal bluff face which does not preclude the exercise of emergency measures if authorized in the future, submission of an "as built geotechnical report" to verify recommendations of the Geotechnical Report are implemented, and submission of final construction plans and structural calculations for the new residence.

III. APPEAL PROCEDURES

After certification of a Local Coastal Program (LCP), the Coastal Act provides for limited appeals to the Coastal Commission of certain local government actions on coastal development permits.

Section 30603(b)(1) of the Coastal Act states:

> The grounds for an appeal pursuant to subdivision (a) shall be limited to an allegation that the development does not conform to the standards set forth in the certified local coastal program or the public access policies set forth in this division.

Coastal Act Section 30625(b) states that the Commission shall hear an appeal unless it determines:

> With respect to appeals to the commission after certification of a local coastal program that no substantial issue exists with respect to the grounds on which an appeal has been filed pursuant to Section 30603.

If the staff recommends "substantial issue" and no Commissioner objects, the Commission will proceed directly to the de novo portion of the hearing on the merits of the project, then, or at a later date. If the staff recommends "no substantial issue" or the Commission decides to hear arguments and vote on the substantial issue question, those allowed to testify at the hearing will have 3 minutes per side to address whether the appeal raises a substantial issue. It takes a majority of Commissioners present to find that no substantial issue is raised. If substantial issue is found, the Commission will proceed to a full public hearing on the merits of the project then, or at a later date, reviewing the project de novo in accordance with sections 13057-13096 of the Commission's regulations. If the Commission conducts the de novo portion of the hearing on the permit application, the applicable standard of review for the Commission to consider is whether the proposed development is in conformity with the certified Local Coastal Program (LCP).

In addition, for projects located between the sea and the first public road paralleling the sea, Section 30604(c) of the Act requires that a finding must be made by the approving agency, whether the local government or the Coastal Commission on appeal, that the development is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act. In other words, in regard to public access questions, the Commission is required to consider not only the certified LCP, but also applicable Chapter 3 policies when reviewing a project on appeal.

The only persons qualified to testify before the Commission at the "substantial issue" stage of the appeal process are the applicants, persons who opposed the application before the local government (or their representatives), and the local government. Testimony from other persons must be submitted in writing. At the time of the de novo portion of the hearing, any person may testify.

The term "substantial issue" is not defined in the Coastal Act or its implementing regulations. The Commission's regulations indicate simply that the Commission will hear an appeal unless it "finds that the appeal raises no significant question as to conformity with the certified local coastal program" or, if applicable, the public access and public

recreation policies of Chapter 3 of the Coastal Act (Cal. Code Regs., tit. 14 section 13115(b)). In previous decisions on whether to find substantial issue, the Commission has been guided by the following factors:

1. The degree of factual and legal support for the local government's decision that the development is consistent or inconsistent with the certified LCP;

2. The extent and scope of the development as approved or denied by the local government;

3. The significance of the coastal resources affected by the decision;

4. The precedential value of the local government's decision for future interpretations of its LCP; and

5. Whether the appeal raises only local issues, or those of regional or statewide significance.

Even when the Commission chooses not to hear an appeal, appellants nevertheless may obtain judicial review of the local government's coastal permit decision by filing a petition for a writ of mandate pursuant to the Code of Civil Procedure, section 1094.5.

The City of Encinitas has a certified Local Coastal Program (LCP), and the subject site is located in an area where the Commission retains appeal jurisdiction because it is located between the first public road and the sea. Therefore, before the Commission considers the appeal de novo, the appeal must establish that a substantial issue exists with respect to the grounds on which an appeal has been filed pursuant to Section 30603. In this case, for the reasons discussed further below, the Commission exercises its discretion to determine that the development approved by the City raises substantial issue with regard to the appellant's contentions regarding coastal resources.

IV. SUBSTANTIAL ISSUE MOTION AND RESOLUTION

The staff recommends the Commission adopt the following resolution:

MOTION: **I move that the Commission determine that Appeal No. A-6-ENC-13-0210 raises NO substantial issue with respect to the grounds on which the appeal has been filed under § 30603 of the Coastal Act.**

STAFF RECOMMENDATION:

Staff recommends a **NO** vote. Failure of this motion will result in a de novo hearing on the application, and adoption of the following resolution and findings. Passage of this motion will result in a finding of No Substantial Issue and the local action will become final and effective. The motion passes only by an affirmative vote of the majority of the appointed Commissioners present.

RESOLUTION: **The Commission hereby finds that Appeal No. A-6-ENC-13-0210 presents a substantial issue with respect to the grounds on which the appeal has been filed under § 30603 of the Coastal Act regarding consistency with the certified Local Coastal Plan and/or the public access and recreation policies of the Coastal Act.**

V. SUBSTANTIAL ISSUE FINDINGS AND DECLARATION

The Commission finds and declares as follows:

A. PROJECT DESCRIPTION

The coastal permit approved by the City of Encinitas allows for the construction of a 2-story, 3,553 sq. ft. home with a 1,355 sq. ft. basement and a 950 sq. ft. attached garage on a 6,776 sq. ft. vacant blufftop lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge. The basement is proposed to be constructed using 24 steel shoring beams that will be excavated down to a maximum elevation of 14.5 feet, which is also the proposed depth of the basement foundation. In addition, the applicants propose to install 17 (12 inch diameter) piers at a depth of 18 inches, located from 7 feet to 40 feet from the bluff edge, to support planter boxes and an above ground spa.

The subject property is currently not protected by any shoreline armoring (Exhibits 2-3) and there is no Commission permit history for the site. The subject site is located on the west side of Neptune Avenue, approximately ¼ mile north of the Moonlight State Beach in the City of Encinitas (Exhibit 1). The standard of review is the certified City of Encinitas Local Coastal Program and the public access policies of the Coastal Act.

B. LCP CONSISTENCY

Geologic Stability

The appellants contend that the development as approved by the City is inconsistent with Policy 1.3 of the LUP, and Sections 30.34.020(C), and 30.34.020(D) of the City's Certified Implementation Plan (IP). Section 3034.020(D) requires that a geotechnical report be submitted that documents the development will be stable over 75 years so as to not require "any shore or bluff stabilization to protect the structure in the future." In addition, the appellants assert the project as approved by the City is inconsistent with the requirement of Section 30.34.020(D) which states that the erosion rate used in the required geotechnical report be based on current and historical data.

Public Safety Policy 1.3 of the City's Land Use Plan (LUP) requires that:

> *The City will rely on the Coastal Bluff and Hillside/Inland Bluff Overlay Zones to prevent future development or redevelopment that will represent a hazard to its owner or occupants, and which may require structural measures to prevent destructive erosion or collapse.*

Section 30.34.020(C) of the IP states, in part:

> DEVELOPMENT PROCESSING AND APPROVAL. In addition to findings and processing requirements otherwise applicable, the following establishes specific processing and finding requirements for proposed development within the Coastal Bluff Overlay Zone…
>
> 1. Development and improvement in compliance with the development standards in paragraph B "Development Standards," proposing no structure or facility on or within 40 feet of the top edge of the coastal bluff (except for minor accessory structures and improvements allowed pursuant to Section 30.34.02(B)1b, and proposing no preemptive measure as defined below, shall be subject to the following: submittal and acceptance of a site-specific soils report and geotechnical review described by paragraph D "Application Submittal Requirements" below. The authorized decision-making authority for the proposal shall make the findings required based on the soils report and geotechnical review for any project approval. A Second Story cantilevered portion of a structure which is demonstrated through standard engineering practices not to create an unnecessary surcharge load upon the bluff area may be permitted 20% beyond the top edge of bluff setback if a finding can be made by the authorized agency that no private or public views would be significantly impacted by the construction of the cantilevered portion of the structure.

Section 30.34.020(D) of the IP states, in part:

> APPLICATION SUBMITTAL REQUIREMENTS. Each application to the City for a permit or development approval for property under the Coastal Bluff Overlay Zone shall be accompanied by a soils report, and either a geotechnical review or geotechnical report as specified in paragraph C "Development Processing and Approval" above. Each review/report shall be prepared by a certified engineering geologist who has been pre-qualified as knowledgeable in City standards, coastal engineering and engineering geology. The review/report shall certify that the development proposed will have no adverse effect on the stability of the bluff, will not endanger life or property, and that any proposed structure or facility is expected to be reasonably safe from failure and erosion **over its lifetime** without having to propose any shore or bluff stabilization to protect the structure in the future. Each review/report shall consider, describe and analyze the following [emphasis added]:
>
> 1. Cliff geometry and site topography, extending the surveying work beyond the site as needed to depict unusual geomorphic conditions that might affect the site;

2. Historic, current and foreseeable-cliffs erosion, including investigation or recorded land surveys and tax assessment records in addition to land use of historic maps and photographs where available and possible changes in shore configuration and sand transport;

3. Geologic conditions, including soil, sediment and rock types and characteristics in addition to structural features, such as bedding, joints and faults;

4. Evidence of past or potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity;

5. Impact of construction activity on the stability of the site and adjacent area;

6. Ground and surface water conditions and variations, including hydrologic changes caused by the development e.g., introduction of irrigation water to the ground water system; alterations in surface drainage);

7. Potential erodibility of site and mitigating measures to be used to ensure minimized erosion problems during and after construction (i.e., landscaping and drainage design);

8. Effects of marine erosion on seacliffs and estimated rate of erosion at the base of the bluff fronting the subject site based on current and historical data;

9. Potential effects of seismic forces resulting from a maximum credible earthquake;

10. Any other factors that might affect slope stability;

11. Mitigation measures and alternative solutions for any potential impacts.

The report shall also express a professional opinion as to whether the project can be designed or located so that it will neither be subject to nor contribute to significant geologic instability **throughout the life span of the project**. The report shall use a current acceptable engineering stability analysis method and shall also describe the degree of uncertainty of analytical results due to assumptions and unknowns. The degree of analysis required shall be appropriate to the degree of potential risk presented by the site and the proposed project [Emphasis added].

In addition to the above, each geotechnical report shall include identification of the daylight line behind the top of the bluff established by a bluff slope failure plane analysis. This slope failure analysis shall be performed according to geotechnical engineering standards, and shall:

- **Cover all types of slope failure.**

- **Demonstrate a safety factor against slope failure of 1.5.**

- **Address a time period of analysis of 75 years… [Emphasis added]**

The project approved by the City is located within the certified IP Coastal Bluff Overlay Zone and the foundation of the residence will be sited approximately 40 ft. from the edge of an approximately 65 ft.-high coastal bluff subject to marine erosion. Public Safety Policy 1.3 of the LUP requires that new development have an appropriate safe setback to ensure that the residence is reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the structure in the future. Thus, in order to find the appropriate geologic setback, the Certified LCP requires that not only must an adequate factor of safety of 1.5 be shown under present conditions, but that it must also demonstrate an adequate factor of safety of 1.5 will be maintained over 75 years, and cover all types of slope failure.

Assessing the stability of slopes against landsliding is undertaken through a quantitative slope stability analysis. In such an analysis, the forces resisting a potential landslide are first determined. These are essentially the strength of the rocks or soils making up the bluff. Next, the forces driving a potential landslide are determined. These forces are the weight of the rocks as projected along a potential slide surface. The resisting forces are divided by the driving forces to determine the "factor of safety." A value below 1.0 is theoretically impossible, as the slope would have failed already. A value of 1.0 indicates that failure is imminent. Factors of safety at increasing values above 1.0 lend increasing confidence in the stability of the slope. The industry-standard for new development is a factor of safety of 1.5. A slope stability analysis is performed by testing hundreds of potential sliding surfaces. The surface with the minimum factor of safety will be the one on which failure is most likely to occur. Generally, as one moves back from the top edge of a slope, the factor of safety against landsliding increases. Therefore, to establish a safe setback for slope stability from the edge of a coastal bluff, one needs to find the distance from the bluff edge at which the factor of safety is at least equal to 1.5.

In this case, the geotechnical report submitted by applicant at the time the project was approved by the City found that a factor of safety of 1.5 would be attained at a distance of 18.3 feet landward of the bluff edge. The applicants' finding of the 1.5 factor of safety at 18.3 foot is at the low end of the spectrum; the 1.5 factor of safety distance from the bluff edge obtained for similar bluff geometries and geologic makeup has varied from 17 feet to 56 feet in Encinitas over the past 16 years (Ref: A-6-ENC-00-193/Robinson and A-6-ENC-09-002/Wellman). However, more significantly, the Commission's geologist reviewed the submitted geotechnical report and found that the failure model used was unrealistic; the Torrey Sandstone generally collapses as block failures, followed by circular or wedge failures in the overlying terrace deposits, rather than the modeled circular failure through both units. In addition, the soil strength parameters used in this analysis were not well supported in the referenced documents. Commission staff described these concerns to the applicant, and subsequent to the City's action to approve this project, the applicants' geotechnical engineer submitted a revised geotechnical report which showing that the factor of safety of 1.5 would be significantly further landward, at

23 ft. from the bluff edge on the northern side of the site and 25 ft. from the bluff edge on the southern side of the site.

In addition to problems with the way the factor of safety was determined, the Commission's geologist determined that the erosion rate used by the geotechnical report approved by the City failed to use current scientific data. Section 30.34.020(D) of the IP requires that a geotechnical report analyze "Historic, current and foreseeable-cliffs erosion" and that the estimated rate of erosion of the bluff be based on "current and historical data." The geotechnical report states that the long term erosion rate over the next 75 years for this property is predicted to be 10 feet (0.13 ft. /year). The applicants' geotechnical report states that the bluff is grossly stable, and that the Torrey Sandstone is "exceptionally resistant to erosion and recession below the subject property," despite the numerous bluff failures and requests for bluff stabilization that have occurred in geologically similar areas throughout the City. A review of neighboring bluff-top properties in the City of Encinitas that have conducted slope stability analysis in the last 15 years shows that the accepted historic erosion rates vary between 0.23 ft./year and 0.49 ft./year (Ref: A-6-ENC-01-047/Conway & Associates & A-6-ENC-09-040/Okun). Thus, the erosion rate chosen by the applicants is significantly lower than any erosion rate accepted for a past project in the City of Encinitas and is not well supported by the data. Further, these are long-term average historic rates, and do not include likely acceleration of bluff retreat rates in the future due to sea level rise and increased exposure of the bluffs to wave attack. Subsequent to the City's action to approve this project, after discussions with Commission staff, the applicants' geotechnical engineer submitted a revised geotechnical report which stated that he believed a more accurate long term erosion rate would be 0.40 ft. /yr.

However, according to the Coastal Commission's staff geologist, the current published state-of-the-art for establishing bluff retreat rates in this area is a FEMA-funded study done as part of a nationwide assessment of coastal erosion hazards [Ref. Benumof and Griggs (1999)], which estimates the erosion rate along the Encinitas shoreline to be up to 0.49 feet per year. Over 75 years, this translates into a bluff retreat of approximately 36.75 ft. rounded up to 37 ft. The Commission has found that 0.49 feet per year was the correct long term erosion rate for the life of the development for the four most recent new bluff top home approvals in Encinitas, all of which were approved on appeal by the Commission (Ref: CDP Nos. A-6-ENC-09-002Wellman, A-6-ENC-09-003/Wellman, A-6-ENC-09-040/Okun, and A-6-ENC-09-041/Okun).

Thus, in this case, the geotechnical report approved by the City failed to adequately calculate a safe setback from the bluff edge because it used an outdated erosion rate and failed to demonstrate that an adequate factor of safety of 1.5 will be maintained over 75 years. The City only required a setback of 40 ft. which appears to be an insufficient distance to assure the residence will be safe over its lifetime. In order for the home to maintain a factor of safety of 1.5 over 75 years, the home's foundation would need to be set back at the factor of safety line (23 to 25 feet), plus the erosion rate (37 feet), to 60 to 62 ft. from the bluff edge. Because the City failed to adequately site the home so that it

would not require shoreline protection over its lifetime, the appellants have raised a substantial issue of conformity with the certified LCP.

Visual Quality

A second contention of the appellants is that the proposed home has the potential to create adverse visual impacts in the future if erosion exposes the proposed shoring beams and the western wall of the proposed basement, which is inconsistent with the visual resources policies of the certified LCP that require new development to preserve the scenic qualities of the surrounding bluffs.

Section 30.34.020B.8 of the Implementation Program states:

> The design and exterior appearance of buildings and other structures visible from public vantage points shall be compatible with the scale and character of the surrounding development and protective of the natural scenic qualities of the bluffs.

The seaward-most wall of the basement and steel shoring beams of the home are proposed to be located 40 feet from the bluff edge. As stated previously, the applicants' updated geotechnical report found that the factor of safety of 1.5 at the site is 23 to 25 ft. from the bluff edge, which would result in a distance of only 15-17 ft. remaining to account for long term erosion over the economic life of the new home. At an erosion rate of 0.49 ft. /yr., the basement wall and shoring beams could be expected to become exposed. The exposure of the basement wall and shoring beams would be inconsistent with the LCP policies requiring structures visible from public vantage points to be protective of the natural scenic qualities of the surrounding, which are for the most part un-armored, natural bluffs. This inconsistency also raises a substantial issue.

Grading

A third contention of the appellants is that grading, specifically, the installation of 17 (12 inch diameter) piers at a depth of 18 inches, located from 7 feet to 40 feet from the bluff edge to support planter boxes and an above ground spa, is inconsistent with the requirements of the LCP.

Policy 30.34.20.B.1 of the City's certified Implementation Plan (IP) states, in part:

> 1. With the following exceptions, no principal structure, accessory structure, facility or improvement shall be constructed, placed or installed within 40 feet of the top edge of the coastal bluff. Exceptions are as follows:
>
> […]
>
> b. **Minor accessory structures and improvements located at grade**, including landscaping, shall be allowed to within 5 feet of the top edge of the coastal bluff. Precautions must be taken when placing structures close to the bluff edge to ensure that the integrity of the bluff is not threatened. For the

> purposes of the Coastal Bluff Overlay Zones, "minor accessory structures and improvements" are defined as those requiring no City approval or permit including a building or grading permit, and not attached to any principal or accessory structure which would require a permit. Grading for reasonable pedestrian access in and around a principal or accessory structure may be permitted by the City Engineer following review of a site specific soils report. [Emphasis added]

As detailed in Policy 30.34.20.B.1 of the City's IP, only at grade accessory structures and improvements are allowed within 40 ft. of the bluff edge. The purpose of limiting improvements within 40 feet of the bluff's edge it that grading seaward of the 40 ft. bluff edge setback has the potential to substantially alter the natural landform of the coastal bluff. Furthermore, grading in such close proximity to the bluff edge may destabilize the eroding coastal bluff. Precautions must be taken when placing structures close to the bluff edge to ensure that the integrity of the bluff is not threatened. This inconsistency also raises a substantial issue.

C. CONCLUSION

Based on the information cited above, it appears the City approval of the construction of a new home is inconsistent with various sections of the City's certified Implementation Plan (IP) relating to siting of new development on a coastal blufftop so as to assure it will be safe from failure and erosion over its lifetime without requiring shoreline protection, protection of the natural scenic qualities of the bluffs, and grading within 40 ft. of the coastal bluff. Therefore, the Commission finds that a substantial issue exists with respect to the consistency of the local government action with the City's certified Local Coastal Program.

D. SUBSTANTIAL ISSUE FACTORS

As discussed above, there is inadequate factual and legal support for the City's determination that the proposed development is consistent with the certified LCP. The other factors that the Commission usually considers when evaluating whether a local government's action raises a substantial issue also support a finding of substantial issue. While the extent and scope of the particular development is a single home, the objections to the project suggested by the appellants raise substantial issues of regional and statewide significance due to the frequency of development on the state's hazardous blufftops. The decision creates a poor precedent with respect to the proper interpretation of the City's LCP, as the City's failure to require an adequate geotechnical analysis is not only an incorrect interpretation of the LCP, but could also set an adverse precedent elsewhere along the coast. In addition, the coastal resources affected by the decision are significant.

STAFF RECOMMENDATION ON THE COASTAL PERMIT

VI. MOTION AND RESOLUTION ON DE NOVO

The staff recommends the Commission adopt the following resolution:

MOTION: I move that the Commission approve Coastal Development Permit No. A-6-ENC-13-0210 pursuant to the staff recommendation.

STAFF RECOMMENDATION OF APPROVAL:

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

RESOLUTION TO APPROVE THE PERMIT:

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

VII. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

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

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

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

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

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

VIII. SPECIAL CONDITIONS

The permit is subject to the following conditions:

1. **Revised Final Plans.** PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit for review and written approval of the Executive Director, revised final plans in substantial conformance with the submitted plans dated December 15, 2012, by Wolf Design Build Inc. The revised final plans shall be approved by the City of Encinitas and include the following:

   a) The foundation of the proposed home and the proposed basement and shoring beams shall be located no less than 60 to 62 ft. feet landward of the existing upper bluff edge on the northern and southern portions of the site, respectively.

   b) The residence may include a reduced front yard setback, if approved pursuant to a variance from the City of Encinitas.

   c) The proposed development shall be specifically designed and constructed such that it could be removed in the event of endangerment of the residential structure.

   d) All grading and excavation shall be prohibited within 40 ft. of the existing bluff edge and all references to the 17 piers on all plans shall be eliminated.

   e) All runoff from impervious surfaces on the top of the bluff shall be collected and directed away from the bluff edge towards the street.

   f) Approved accessory improvements (i.e., decks, patios, walls, windscreens, etc.) located on the bluff top property shall be detailed and drawn to scale on the final approved site plan and shall include measurements of the distance between the accessory improvements and the bluff edge taken at three or more locations. The locations for these measurements shall be identified through permanent markers, benchmarks, survey position, written description, or other method that enables accurate determination of the location of all structures on the site. The plans shall indicate that the approved accessory improvements are not entitled to protection from shoreline armoring. Any new Plexiglas or other glass wall shall be detailed on the final plans and shall be non-clear, tinted, frosted or incorporate other elements to inhibit bird strikes.

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 legally required.

2. **Revised Landscape Plans.** PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and written approval, final landscaping and fence plans approved by the City of Encinitas. The landscaping and fence plans shall include the following:

   a) A view corridor a minimum of 5 feet wide shall be created in the north and south side yards of the subject site. All proposed landscaping in this yard area shall be maintained at a height of three feet or lower (including raised planters) to preserve views from the street toward the ocean. All landscape materials within the identified side yard setbacks shall be species with a growth potential not to exceed three feet at maturity.

   b) Any fencing or gates within the side yard setbacks shall permit public views and have at least 75 percent of its surface area open to light.

   c) All landscaping shall be drought-tolerant and native or non-invasive plant species. No plant species listed as problematic or invasive by the California Native Plant Society, the California Invasive Plant Council, or as may be identified from time to time by the State of California, may be employed or allowed to naturalize or persist on the site. No plant species listed as noxious weed by the State of California or the U.S. Federal Government may be utilized within the property.

   d) New permanent irrigation systems on the blufftop property are prohibited.

   e) A written commitment by the applicants that, five years from the date of the issuance of the coastal development permit for the residence, the applicants will submit for the review and written approval of the Executive Director, a landscape monitoring report prepared by a licensed Landscape Architect or qualified Resource Specialist, that certifies whether the on-site landscaping is in conformance with the landscape plan approved pursuant to this Special Condition. The monitoring report shall include photographic documentation of plant species and plant coverage.

      If the landscape monitoring report indicates the landscaping is not in conformance with or has failed to meet the performance standards specified in the landscaping plan approved pursuant to this permit, the applicants, or successors in interest, shall submit a revised or supplemental landscape plan for the review and written approval of the Executive Director. The revised landscaping plan must be prepared by a licensed Landscape Architect or Resource Specialist and shall specify measures to remediate those portions of the original plan that have failed or are not in conformance with the original approved plan.

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

3. **No Future Bluff or Shoreline Protective Device.**

   a) By acceptance of this Permit, the applicants agree, on behalf of themselves and all successors and assigns, that no bluff or shoreline protective device(s) shall ever be constructed to protect the development approved pursuant to Coastal Development Permit No. A-6-ENC-13-0210 including, but not limited to, the residence and foundation in the event that the development is threatened with damage or destruction from waves, erosion, storm conditions, bluff retreat, landslides, or other natural hazards in the future. By acceptance of this Permit, the applicants hereby waive, on behalf of themselves and all successors and assigns, any rights to construct such devices that may exist under Public Resources Code Section 30235.

   b) By acceptance of this Permit, the applicants further agree, on behalf of themselves and all successors and assigns, that the landowner shall remove the development authorized by this Permit, including the residence and foundation, if any government agency has ordered that the structures are not to be occupied due to any of the hazards identified above. In the event that portions of the development fall to the beach before they are removed, the landowner shall remove all recoverable debris associated with the development from the beach and ocean and lawfully dispose of the material in an approved disposal site. Such removal shall require a coastal development permit.

   c) In the event the edge of the bluff recedes to within 10 feet of the principal residence but no government agency has ordered that the structures not be occupied, a geotechnical investigation shall be prepared by a licensed coastal engineer and geologist retained by the applicants, that addresses whether any portions of the residence are threatened by wave, erosion, storm conditions, or other natural hazards. The report shall identify all those immediate or potential future measures that could stabilize the principal residence without shore or bluff protection, including but not limited to removal or relocation of portions of the residence. The report shall be submitted to the Executive Director and the appropriate local government official. If the geotechnical report concludes that the residence or any portion of the residence is unsafe for occupancy, the permittee shall, within 90 days of submitting the report, apply for a coastal development permit amendment to remedy the hazard, which shall include removal of the threatened portion of the structure.

4. **Monitoring and Future Removal of the Cantilever Portion of Structure.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and written approval, a plan prepared by a licensed geologist or geotechnical engineer for a bluff monitoring plan which includes the following:

   a) Current measurements of the distance between the cantilevered portion of the home and the bluff edge (as defined by Section 13577 of Title 14 of the California Code of Regulations), and provisions for these measurements to be taken every five years after completion of construction for the life of the project. The locations for these measurements shall be identified through permanent markers, benchmarks, survey position, written description, etc. so that annual measurements can be taken at the same location and comparisons between years can provide information on bluff retreat.

   b) Provisions for submittal of a report to the Executive Director of the Coastal Commission on June 1st every five years beginning on the date of Commission approval of this CDP. Each report shall be prepared by a licensed geologist or geotechnical engineer. The report shall contain the measurements and evaluation required by subsection a) of this Special Condition. The report shall also summarize all measurements and provide analysis of trends, annual retreat or rate of retreat, and the stability of the overall bluff face and the impact of the cantilevered portion of the home on the natural bluff. The report shall include recommendations on how to remove any cantilevered portion of the home that is seaward of the bluff edge.

   c) An agreement that if after inspection, it is apparent that any cantilevered portion of the home is seaward of the bluff edge, the permittee shall apply for a Coastal Development Permit amendment within 90 days of submittal of the monitoring report to remove the cantilevered portion of the home located seaward of the bluff edge.

   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 amendment unless the Executive Director determines that no amendment is legally required.

5. **Best Management Practices and Construction Responsibilities.** The permittee(s) shall comply with the following construction-related requirements:

   a) All debris resulting from demolition and construction activities shall be removed and disposed of at an authorized disposal site.

   b) Temporary sediment control Best Management Practices (BMPs) such as straw bales, fiber rolls, or silt fencing shall be installed prior to, and maintained throughout, the construction period to intercept and slow or detain runoff from the construction, staging, and storage/stockpile areas, allow entrained sediment and

other pollutants to settle and be removed and prevent discharge of sediment and pollutants toward the bluff edge. When no longer required, the temporary sediment control BMPs shall be removed. Fiber rolls shall be 100% biodegradable, and shall be bound with non-plastic biodegradable netting such as jute, sisal, or coir fiber; photodegradable plastic netting is not an acceptable alternative. Rope used to secure fiber rolls shall also be biodegradable, such as sisal or manila.

6. **Assumption of Risk, Waiver of Liability and Indemnity Agreement.** By acceptance of this permit, the applicants acknowledge and agree (i) that the site may be subject to hazards from erosion and coastal bluff collapse; (ii) to assume the risks to the applicants and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

7. **Deed Restriction.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and approval, documentation demonstrating that the landowner has executed and recorded a deed restriction, in a form and content acceptable to the Executive Director: (1) indicating that, pursuant to this permit, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property (hereinafter referred to as the "Standard and Special Conditions"); and (2) imposing all Standard and Special Conditions of this permit as covenants, conditions and restrictions on the use and enjoyment of the Property. The deed restriction shall include a legal description of the applicants' entire parcel. The deed restriction shall also indicate that, in the event of an extinguishment or termination of the deed restriction for any reason, the terms and conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this permit or the development it authorizes, or any part, modification, or amendment thereof, remains in existence on or with respect to the subject property.

8. **Bluff Deed Restriction.**

   a) No development, as defined in Section 30106 of the Coastal Act, shall occur in the open space area between the bluff edge and the western property line.

   b) PRIOR TO THE 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, reflecting the above restrictions on

development in the designated open space area. The recorded document(s) shall include a legal description and corresponding graphic depiction of the legal parcel(s) subject to this permit and a metes and bounds legal description and a corresponding graphic depiction, drawn to scale, of the designated open space area prepared by a licensed surveyor based on an on-site inspection of the open space area.

c) The deed restriction shall be recorded free of prior liens and any other encumbrances that the Executive Director determines may affect the interest being conveyed.

d) The deed restriction shall run with the land in favor of the People of the State of California, binding successors and assigns of the applicant or landowner in perpetuity.

IX. FINDINGS AND DECLARATIONS

The Commission finds and declares as follows:

A. PROJECT DESCRIPTION

The detailed project description is described above under the substantial issue findings of this report and is incorporated herein by reference.

The standard of review is the certified Local Coastal Program and the public access and recreation policies of Chapter 3 of the Coastal Act.

B. GEOLOGIC STABILITY/BLUFFTOP DEVELOPMENT

Relevant portions of the City of Encinitas' certified LCP are cited in the Substantial Issue portion of the staff report, and are incorporated herein. In addition, Public Safety Policy 1.6 of the City's Land Use Plan requires, in part, that:

> The City shall provide for the reduction of unnatural causes of bluff erosion, as detailed in the Zoning Code, by:
>
> [. . .]
>
> e. Permitting pursuant to the Coastal Bluff Overlay Zone, bluff repair and erosion control measures on the face and at the top of the bluff that are necessary to repair human-caused damage to the bluff, and to retard erosion which may be caused or accelerated by land-based forces such as surface drainage or ground water seepage, providing that no alteration of the natural character of the bluff shall result from such measures, where such measures are designed to minimize encroachment onto beach areas through an alignment at and parallel to the toe of the coastal bluff, where such measures receive coloring and other exterior treatments and provided that such measures shall be permitted only when

required to serve coastal-dependent uses or to protect existing principal structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply; and

f. Requiring new structures and improvements to existing structures to be set back 25 feet from the inland blufftop edge, and 40 feet from coastal blufftop edge with exceptions to allow a minimum coastal blufftop setback of no less than 25 feet. For all development proposed on coastal blufftops, a site-specific geotechnical report shall be required. The report shall indicate that the coastal setback will not result in risk of foundation damage resulting from bluff erosion or retreat to the principal structure within its economic life and with other engineering evidence to justify the coastal blufftop setback. [. . .]

[. . .] **In all cases, all new construction shall be specifically designed and constructed such that it could be removed in the event of endangerment** and the applicants shall agree to participate in any comprehensive plan adopted by the City to address coastal bluff recession and shoreline erosion problems in the City. [Emphasis added]

This does not apply to minor structures that do not require a building permit, except that no structures, including walkways, patios, patio covers, cabanas, windscreens, sundecks, lighting standards, walls, temporary accessory buildings not exceeding 200 square feet in area, and similar structures shall be allowed within five feet from the bluff top edge; and

Policy 23.24.020 of the City's certified Implementation Plan (IP) states, in part:

23.24.020 - Purpose and Goals. The purpose of this Chapter is to establish minimum requirements for grading, excavating and filling of land, to provide for the issuance of grading permits and to provide for the enforcement of the requirements. This Chapter is adopted pursuant to, and to implement provisions of, the Encinitas General Plan and certified Local Coastal Program Land Use Plan (LUP). It is the intent of the City to protect life and property and promote the general welfare; enhance and preserve the physical environment of the community; and maintain the natural scenic character of the City. The provisions of this Chapter shall be administered to achieve, to the extent possible, appropriate goals and policies of the General Plan/LUP as well as the following goals: Ord. 94 -06)

[…]

U. Grading: Any land disturbance or land fill, or removal and recompaction, or combination thereof that results in the displacement, removal, excavation, import, export or recompaction of soil. (Ord. 2008- 03)

Policy 23.24.090 of the City's certified Implementation Plan (IP) states, in part:

> 23.24.090 - General Exemptions. All land -disturbing or land-filling activities or soil storage shall be under taken in a manner designed to minimize surface runoff, erosion and sedimentation and to safeguard life, limb, property, and the public welfare. A person performing such activities need not apply for a permit pursuant to this Chapter, if all the following criteria are met:
>
> […]
>
> G. The activity does not take place on an inland or coastal bluff, within 100 feet by horizontal measurement from the top of an inland or coastal bluff, the bank of a watercourse, the mean high water mark (line of vegetation) of a body of water or within the wetlands associated with a watercourse or water body, whichever distance is greater. (Ord. 2008 -03)

As proposed, the project will include the construction of a nearly 6,000 sq. ft. two story single family home including a basement and attached garage on a coastal bluff that is subject to erosion. The proposed residence will be located within the City's Coastal Bluff Overlay Zone and the home's foundation is proposed to be sited 40 ft. from the edge and a cantilevered second floor will be sited 32 ft. from the bluff edge of an approximately 65 ft.-high coastal bluff, subject to marine erosion.

Coastal bluffs in Encinitas are subject to a variety of erosive forces and conditions (e.g., wave action, reduction in beach width, block failures and landslides). As a result, the bluffs and blufftop lots in the Encinitas area are considered a hazard area. Furthermore, in 1986 the Division of Mines and Geology mapped the entire Encinitas shoreline as an area susceptible to landslides, i.e., mapped as either "Generally Susceptible" or "Most Susceptible Areas" for landslide susceptibility (ref. Open File Report, "Landslide Hazards in the Encinitas Quadrangle, San Diego County, California," dated 1986). The Encinitas shoreline has been the subject of numerous Commission and City approved permits for shoreline armoring. Although the subject site does not currently have coastal armoring, a 13 ft. high, approximately 80 ft. long seawall was approved by the Commission in 1998 to protect two existing homes on the same block as the subject site at 164 and 172 Neptune Avenue (CDP #6-98-039) (Exhibit 4); and, in 1994 and 1995, the Commission approved seawalls two blocks north of the subject site at 312 Neptune Avenue, 354 Neptune Avenue, 370 Neptune Avenue, 378 Neptune Avenue, and 396 Neptune Avenue (Ref: CDP Nos. 6-93-085/Auerbach & 6-95-066/Han). Thus, the subject site is clearly subject to risk from erosion.

Section 30.34.020(D) of the City's certified IP and Public Safety Policy 1.6 of the LUP require that an applicant provide extensive geotechnical information documenting that any new development on the coastal bluff top will be safe over its lifetime from the threat of erosion so as to not require shoreline protection. In documenting that information, the geotechnical report must evaluate many factors including an estimate of the long-term erosion rate at the site. In determining the long-term erosion rate, the applicant's geotechnical report states that the erosion rate along this reach of coastline is expected to be 0.4 ft. per year. At a rate of 0.4 ft. per year, approximately 30 ft. of bluff retreat would

be expected over a 75-year period. However, the estimated average bluff recession rate that the Coastal Commission typically applies to the calculation of setbacks for new blufftop development in this portion of Encinitas is 0.49 feet per year. The erosion rate used by the Commission is the upper bound of the historic rate (1932-1994) measured by Benumof and Griggs (1999) in a peer-reviewed, FEMA-funded study making use of then recognized state of the art photogrammetic techniques. The upper bound is used as a proxy for the average rate expected over the life of proposed new blufftop development (75 years) to account for increases in bluff retreat rate due to sea level rise. The estimated bluff recession over a period of 75 years at a rate of 0.49 feet per year is approximately 37 feet.

In order to find the appropriate geologic setback for the bluff top home, the Certified LCP requires not only that a long-term erosion rate be adequately identified but also that the geotechnical report demonstrate an adequate factor of safety against slope failure (i.e., landsliding) of 1.5 will be maintained over 75 years (See Section 30.34.020(D) above). The applicant's geotechnical report of October 23, 2015 identified that a 1.5 factor of safety under present conditions is located at approximately 23 to 25 ft. from the bluff edge. Thus, applying the estimated 37 ft. of erosion over the next 75 years to the 23 to 25 ft. location of the current 1.5 factor of safety would establish a minimum setback for new development at approximately 60 to 62 ft. (37 ft. + (23 to 25 ft.)) from the coastal bluff.

The applicants do not agree that the certified Encinitas LCP requires new bluff top homes to obtain a Factor of Safety of 1.5 after 75 years of expected erosion. The applicants' representative submitted a letter to Commission staff, dated May 26, 2016, which made various contentions about how the geologic setback policies of the LCP should be interpreted (Applicants letter is attached as Exhibit 7). The applicants contend that the LCP only requires a "…40-foot setback, supported by a site-specific soils report that meets certain criteria…" and "…the report must contain a qualified engineer's certification that the home will be safe as proposed and not contribute to bluff instability or give rise to the need for bluff retention devices." In addition, the applicants argue that requiring a new home to obtain a Factor of Safety of 1.5 after 75 years of expected erosion is not required by the California Building Code. The applicants also assert that the setback required to obtain a Factor of Safety of 1.5 after 75 years of expected erosion would result in a "take" of a portion of the their property.

The Commission's geologist has reviewed the applicants' assertion in relation to the California Building Code, which is guidance and not the standard of review for this application, and determined that it is without merit. The requirements of the California Building Code are for static slopes, not for dynamic coastal bluffs.

Coastal Act section 30253 requires new development to be stable for its economic life, and the industry standard for stability is a factor of safety of 1.5. This is the approach that has been applied throughout the state wherever the Coastal Act is the standard of review or the Local Coastal Plan has the similar language to the Coastal Act with regard to geologic hazards. Many geotechnical reports that have recommended setbacks not based on these criteria in Encinitas, have proven to be flawed such that shoreline protection was

required after construction of the blufftop homes (Ref. CDP #F6360 (in 1977)/Pate residence at 638 Neptune and #6-93-36/Clayton seawall; 6-86-570/Richards duplex at 524 Neptune and #6-93-131/Richards seawall; #F3891 (in 1976)/Bardacos residence at 378 Neptune and #6-93-85/Auerbach et al seawall; #F5473 (in 1977)/Bardacos residence at 402 Neptune and #6-93-85/Auerbach, et al seawall and; #F9833 (1981)/Canter residence at 172 Neptune, #6-84-461 (1985) Denver residence at 164 Neptune and #6-98-39/Denver, Canter seawall). The reason that many of the geotechnical reports submitted by the applicants for new development in Encinitas did not accurately assess the risk to new development consistent with the requirement of the LCP is that the 1.5 factor of safety against sliding was not being calculated over the life of the structures in addition to determining the rate of erosion. The language of Policy Section 30.34.020(D) of the LCP is very specific:

> This slope failure analysis shall be performed according to geotechnical engineering standards, and shall:
>
> - Cover all types of slope failure.
>
> - Demonstrate a safety factor against slope failure of 1.5.
>
> - Address a time period of analysis of 75 years.

The applicant and staff at the City have suggested that this policy requires that the analysis only take into account one of these three factors; that is, that the project must demonstrate a factor of safety of 1.5, OR erosion over 75 years, OR the analysis must cover all types of slope failure, rather than addressing all three considerations.

However, the Commission has interpreted the City's LCP as requiring development look at all of these elements for at least the past 15 years (Ref: CDP A-6-ENC-02-003/Berg). The Commission Geologist, Dr. Mark Johnsson, provided a policy memorandum for a workshop to the Commission in 2003 with a more detailed explanation of this methodology. The memorandum was later published in 2005 (Exhibit 6). The Commission generally considers 75 years as the economic life of new single family homes. Thus, a factor of safety of 1.5 must be maintained throughout the 75 year life of the home to be consistent with Coastal Act section 30253. The easiest way to assure this is to find the distance from the bluff edge necessary to achieve a factor of safety of 1.5 today and add to that the expected bluff retreat over the next 75 years. The Encinitas LCP explicitly states that new development must achieve a factor of safety of 1.5 and that 75 years is the length of time to be considered. Any other interpretation of this policy would result in a significant underestimate of the setback necessary to ensure development will be safe from failure and erosion over its lifetime. The applicant may not arbitrarily select a single standard and ignore the other two.

Taking into account either the factor of safety or the erosion rate, but not both, would also set a significant adverse precedence for siting blufftop development in Encinitas. On the same agenda as the subject project, the Commission is reviewing an appeal for a new single-family residence located approximately ½ mile north of the subject site that similarly did not fully assess stability factors over 75 years (A-6-ENC-16-0060/Martin),

and as of the writing of this staff report, staff has received notice from the City of two additional projects approved with inadequate site stability analyses (6-ENC-16-0619/Hurst and 6-ENC-16-0624/Meardon). If the potential for bluff erosion is not accurately and fully evaluated, new development will likely require shoreline protection in the future.

There have been circumstances where the Commission has not required development to be set back the sum of the factor of safety and the erosion rate over 75 years. Previous setbacks for Encinitas blufftop homes have ranged from 40 to 46 ft. from the bluff edge. Many of these analyses did not correctly apply the 1.5 Factor of safety for the life of the new structure according to current Commission practice. Other homes were situated on blufftop sites with a less steep bluff face and did not require as large a setback as needed at the subject site to ensure safety for the life of the structure. In addition, four of the homes had constrained lots and a reasonably sized home could not be built on the sites consistent with the appropriate geologic setback. In these situations, the Commission either approved the use of caisson foundations (Ref: CDPs 6-ENC-09-002 & 003/Wellman and A-6-ENC-06-101/Albani) or allowed homes to be built with the expectation that they may not be safe for 75 years and would need to be removed if threatened in the future (A-6-ENC-09-040 & 041/Okun).

However, in the case of the proposed project there is sufficient room to site a home such that it will be safe for 75 years, and have enough room to construct a reasonably sized single-family residence. The subject lot from edge of the bluff to the street is an average of approximately 155 ft. in length and 40 ft. in width. Therefore, a 60 to 62 ft. geologic setback would still leave approximately 1,725 sq. ft. of buildable area (69 ft. x 25 ft.), subject to front yard and side yard setbacks.[1] For context, the most recent new bluff top home approved by the Commission in North San Diego County was constrained to an 800 sq. ft. development envelope (Ref: 6-15-1717/Barr, approved June 2016).

The applicant could construct an approximately 3,500 sq. ft. 2-story home, including the garage and a 12 ft. second floor cantilever on the western side of the home. In addition, there is ample space of the site for the applicants to also construct a large basement landward of the 60 to 62 ft. geologic setback. A potential variance from the City to allow a reduction of the front yard setback would result in an even larger building envelope.

Commission staff analyzed approximate square footage of existing single family residences on the seaward side of Neptune Avenue on the same block as the subject site by using the figures for property square footage listed on the website www.zillow.com. This analysis of 13 similarly situated residences demonstrates that the surrounding residential developments in the immediate area average approximately 2,900 sq. ft. floor area (Exhibit 5). Accordingly, the Commission finds that a development envelope

[1] The required frontyard setback is 25 ft. from the street and the required sideyard setbacks are 5 ft. and a 10 ft.

allowing a home that is similar in size to surrounding residential development is reasonable.

Thus, the applicants' assertion that the required setback would constitute a "take" is without merit, as the setback required to assure geologic stability would still allow for a reasonably sized home to be constructed on the site. Coastal Act section 30010 bars the Commission from taking private property for public use without payment of just compensation; however, the intention of the section is not to "increase or decrease" the rights of the landowner. (Pub. Resources Code, § 30010.) Conditioning approval on the home to be built smaller than the proposed size does not constitute a taking, in which a landowner uses all or nearly all economic value of the land. (See *Penn Central Transportation Co. v. New York City* ((1978) 438 U.S. 104, 130 [finding claim "untenable" that interference with an undeveloped property interest, while viable economic uses continued, constituted a taking].) The Commission has previously required homes to be built on a modest scale to minimize impacts to coastal resources while allowing economic use of the land. (See e.g., CDP Nos. 1-12-023/Winget and 6-15-1717/Barr; Appeal No. A-2-SMC-11-040/Hodge). It may be that for bluff top properties in Encinitas with smaller sites, building homes smaller than existing surrounding homes will be necessary in order to meet the geologic setback requirements. But on the subject site, there is a building envelope that allows the applicant enough room and flexibility, taking into consideration the City's required side yard setbacks, to design a home with reasonable articulation and design (rather than just a box) at similar bulk and scale to surrounding development. Special Condition 1 allows the applicant to seek a reduction in the City's required front yard setback to achieve an even larger building envelope in which to construct the residential development.

As stated previously, the bluffs along the Encinitas shoreline are known to be hazardous and unpredictable. Given that the applicant has chosen to construct a residence in this location despite these risks, the applicant must assume the risks. Accordingly, Special Condition 6 requires the applicant to acknowledge the risks and indemnify the Commission against claims for damages that may occur as a result of its approval of this permit. In addition, the Commission's staff geologist and coastal engineer have reviewed the submitted geotechnical reports and as conditioned to require a 60 to 62 ft. setback, concur that the proposed development can be constructed without the need for shoreline protection in the future.

Special Condition 3 requires that the applicants waive any rights that may exist under Public Resources Code Section 30235 or under the certified Solana Beach LUP to construct new shoreline protection to protect the new blufftop residence. In addition, the condition states that the residence may remain only as long as it is reasonably safe from failure and erosion without having to propose any shore or bluff stabilization to protect the residence in the future. Should the blufftop residence become unstable or structurally unsound, without construction of new shoreline armoring, including reconstruction of the existing shoreline armoring, or if any government agency orders that the structure is not to be occupied due to failure and erosion of the bluff, the applicants must agree to remove the subject structure, in part or entirely and remove and dispose of any debris that fall to the beach.

Special Condition 3 also requires that if the bluff recedes to within 10 ft. of the foundation of the blufftop residence, the applicants must submit a geotechnical investigation to determine whether any portions of the blufftop residence are threatened and identify measures to stabilize the blufftop residence without new shoreline armoring, including, but not limited to, removal or relocation of portions of the blufftop residence. If the Executive Director determines based on the geotechnical investigation that any portion of the blufftop residence is no longer sited in a safe location, the applicant must submit an application to resolve the hazard, which could include removal of the entire blufftop residence or the threatened portion of the blufftop residence. Thus, as conditioned, approval of the existing blufftop residence will not precipitate the need for any new shoreline armoring in the future, and will allow the Commission to make various adaptation decisions in the future for the subject site.

Since the applicant has submitted conceptual plans based only on a 40 ft. geologic setback, Special Condition 1 requires the submission of revised final plans that conform to a 60 to 62 ft. setback for the foundation, basement, and shoring beams.

As conditioned to be setback at least 60 to 62 ft. from the bluff edge, the proposed basement is not expected to be exposed by erosion or landslides within the 75 year economic life of the structure. Without the increased setback required by Special Condition 1, the basement wall and shoring beams could become exposed within the economic life of the structure if bluff retreat proceeds slightly more rapidly than anticipated or the bluff collapses. The exposure of the basement wall and shoring beams would be inconsistent with the LCP policies requiring structures visible from public vantage points to be protective of the natural scenic qualities of the surrounding natural bluffs, which are for the most part un-armored. Public Safety Policy 1.6 of the City's Land Use Plan requires that all new construction be designed and constructed such that it could such that it could be removed in the event of endangerment. Special Condition 1 requires revised plans be submitted that include this requirement.

As currently proposed, the home would have an eight ft. second story cantilever on the western side. The LCP allows for the construction of a second story cantilever of up to 20% of the distance of the bluff edge setback. Thus, the applicant has the option to construct an approximately 12 ft. second story cantilever. Special Condition 4 is required to ensure that the proposed cantilevered portion of the home does not project over the bluff edge at any time in the future. Special Condition 4 requires that the applicants submit a monitoring program which includes current measurements of the distance between the cantilevered portion of the home and the bluff edge. Monitoring plans are then required to be submitted to the Commission every five years. The subsequent five year monitoring plans must summarize all measurements and provide analysis of trends, annual rate of retreat, and the stability of the overall bluff face and the impact of the cantilevered portion of the home on the natural bluff. The report shall include recommendations on how to remove any cantilevered portion of the home that is seaward of the bluff edge. Furthermore, Special Condition 4 requires that if after inspection, it is apparent that any cantilevered portion of the home is seaward of the bluff edge, the permittee shall apply for a Coastal Development Permit amendment within 90 days of

submittal of the monitoring report to remove any portion of the home located seaward of the bluff edge.

As described previously, the applicants are proposing to grade within 40 ft. of the bluff edge to support planter boxes and an above ground spa. As detailed in Policy 30.34.20.B.1 of the City's IP, only at grade accessory structures and improvements are allowed within 40 ft. of the bluff edge. Policy 23.24.020 of the City's IP clarifies that any land disturbance or land fill is defined as grading. Policy 23.24.090.G describes that grading within 100 ft. of a coastal bluff is not exempt. Grading seaward of the 40 ft. bluff edge setback has the potential to substantially alter the natural landform of the coastal bluff. Furthermore, grading in such close proximity to the bluff edge may destabilize the eroding coastal bluff. Thus, Special Condition 1 prohibits grading within 40 ft. of the existing bluff edge. Drought-tolerant landscaping and accessory improvements, including walkways, patios, patio covers, cabanas, windscreens, sundecks, lighting standards, walls, and temporary accessory buildings not exceeding 200 square feet in area, are permitted within 40 feet of the bluff edge, as long as they do not involve grading.

In addition, Special Condition 8 requires the applicant to record an open space restriction over the portion of the face of the bluff that is owned by the applicant, which prohibits future development on such bluff face, including as its location changes over time. In this way, existing and any future property owner(s) will be made aware of the prohibition against the placement or erection of any structure on the bluff face. Special Condition 7 requires the applicant to record a deed restriction imposing the conditions of this permit as covenants, conditions and restrictions on the use and enjoyment of the property.

In summary, the proposed development, as conditioned, has been sited and designed to be safe over its lifetime so as to not require shoreline protective devices. With conditions to assure that no future shoreline devices will be constructed and that provide protection against adverse impacts to geologic stability, the proposed development is consistent with Section 30.34.020(D), P.S. Policy 1.6 and RM Policy 8.5 of the Certified LCP.

C. WATER QUALITY

Recognizing the value of protecting the water quality of oceans and waterways for residents and visitors alike, the City's LCP requires that preventive measures be taken to protect coastal waters from pollution. The following policies are applicable:

Resource Management Policy 2.1 of the LCP states:

> In that the ocean water quality conditions are of utmost importance, the City shall aggressively pursue the elimination of all forms of potential unacceptable pollution that threatens marine and human health.

Resource Management Policy 2.3 of the LCP states in part:

> To minimize harmful pollutants from entering the ocean environment from lagoons, streams, storm drains and other waterways containing potential contaminants, the City shall mandate the reduction or the elimination of contaminants entering all such waterways . . .

The proposed development will be located at the top of the bluffs overlooking the Pacific Ocean. As such, drainage and run-off from the development could potentially affect water quality of coastal waters as well as adversely affect the stability of the bluffs. To reduce the risk associated with unattended running or broken irrigation systems, Special Condition 2 restricts the property owner from installing permanent irrigation devices anywhere on the subject lot. In addition, Special Condition 1 requires that all runoff be directed away from the bluffs and toward the street. In order to protect coastal waters from the adverse effects of polluted runoff, the Commission has typically required that all runoff from impervious surfaces be directed through landscaping as a filter mechanism prior to its discharge into the street. In this case, however, directing runoff into blufftop landscape areas could have an adverse effect on bluff stability because increasing the amount of ground water within the bluff material can lead to bluff failures. Therefore, in this case, reducing the potential for water to be retained on the site and directing the runoff toward the street, will be more protective of coastal resources. In addition, the requirement of Special Condition 8 that limits landscaping to native, drought-tolerant plants along with the restriction on irrigation will minimize the amount of polluted runoff from the property to the extent feasible. Therefore, the Commission finds the proposed project consistent with Resource Management Policies 2.1 and 2.3 of the Certified LCP.

D. PUBLIC ACCESS

The project site is located on the blufftop on the seaward side of Neptune Avenue in Encinitas, which is designated as the first public roadway along this section of coastline. As the proposed development will occur between the first public roadway and the sea, pursuant to Section 30.80.090 of the City's LCP, a public access finding must be made that such development is in conformity with the public access and public recreation policies of the Coastal Act. Additionally, Coastal Act section 30604(c) requires that a CDP issued for development between the first public road and the sea shall include specific findings that the development is in conformity with the Coastal Act public access and public recreation policies.

Section 30210 of the Coastal Act 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:
>
> (l) 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 beach fronting this location is used by local residents and visitors for a variety of recreational activities. As proposed, the development at the top of the bluff will not affect existing public access to the shoreline, since no public access across the property to the beach currently exists because of the hazardous nature of the approximately 65 ft. high coastal bluff. In addition, public access to beach is currently available approximately 2 blocks south of the subject site at the Moonlight State Beach. By siting and designing the proposed development at a safe location so as to not require shoreline protection in the future and as conditioned to require the conservation of the bluff face in open space and a waiver of future shoreline protection, the Commission can be assured that no future shoreline devices will be constructed at this location that might otherwise impact public access and recreation along the shoreline or affect the contribution of sand to the beach from the bluff. Therefore, as conditioned, the proposed development is consistent with the public access and recreation policies of the certified Local Coastal Program and Sections 30210, 30212 and 30220 of the Coastal Act.

E. VISUAL RESOURCES

The relevant portions of the City of Encinitas' certified LCP are cited in the Substantial Issue portion of the staff report, and are incorporated herein. In addition to the visual resource policy cited in the Substantial Issue portion of the staff report, the LCP contains several other policies relating to the requirement that new development be designed to be compatible with existing development and the visual resources of the area.

Land Use (LU) Policies 6.5 and 6.6 state as follows:

> The design of future development shall consider the constraints and opportunities that are provided by adjacent existing development. (LU Policy 6.5)
>
> The construction of very large buildings shall be discouraged where such structures are incompatible with surrounding development. The building height of both residential and non-residential structures shall be compatible with surrounding development, given topographic and other considerations, and shall protect public views of regional or statewide significance. (LU Policy 6.6)

In addition, RM Policy 8.5 of the LUP states, in part, that:

> The City will encourage the retention of the coastal bluffs in their natural state to minimize geologic hazards and as a scenic resource. Construction of structures for bluff protection shall only be permitted when an existing principal structure is endangered and no other means of protection of that structure is possible.

The proposed residence will be located in a residential neighborhood containing one to two story single-family residences. As conditioned, the proposed home does not exceed the height, bulk and scale of the existing surrounding development and is consistent with all of the City's development standards. However, because the project has been conditioned to be sited approximately 20 feet landward of its proposed location, revised project plans are required. Special Condition 1 requires the applicant to submit final plans that have been approved by the City prior to release of the subject coastal development permit. In this way, the City will assure that any proposed changes to the design continue to be consistent with the development and design standards of the City.

The subject site slopes upward from east to west. The elevation of the sidewalk fronting the site is approximately 17 ft. lower in elevation than the rear yard of the site and thus there is no potential for public views of the ocean through the side yards of the property. However, the home is located directly between the first public road and the sea, and requiring open fencing will prevent a walling off effect of the area from Neptune Avenue. Therefore, Special Condition 2 requires that 5 ft. wide view corridors shall be created in the north and south side yards of the subject site. The condition requires that any fencing or gates within the side yard setbacks shall permit public views and have at least 75% of its surface area open to light. Furthermore, to preserve public views from the street, all proposed landscaping in these yard areas must be maintained at a height of three feet or lower (including raised planters) and landscape materials within the view corridors shall be species with a growth potential not expected to exceed three ft. at maturity. Five years from the date of issuance of this coastal development permit, the applicants are required to submit a monitoring report to the Executive Director that certifies whether the on-site landscaping and fencing is in conformance with the landscape plan approved pursuant to Special Condition 2.

In addition, to assure that the bluff face at the subject site remains in its natural state, Special Condition 8 has been attached to require the bluff face on the subject property be protected by the application of an open space dedication with the exception of any needed and approved repair/maintenance of any exposed sections of the below grade caisson foundation system. In this way, the applicant and all future property owners will be advised that no development including landscape walls or other structures are permitted on the bluff face. As such, the visual quality of these natural bluffs will be protected. Therefore, as conditioned, the Commission finds that potential visual impacts associated with the proposed development have been reduced to the maximum extent feasible; the

proposed development will not adversely affect visual resources, and is consistent with LUP Policies 6.5 and 6.6, RM Policy 8.5, and Section 30.34.020B.8 of the City's IP.

F. LOCAL COASTAL PLANNING

In November of 1994, the Commission approved, with suggested modifications, the City of Encinitas Local Coastal Program (LCP). Subsequently, on May 15, 1995, coastal development permit authority was transferred to the City. The project site is located within the City's permit jurisdiction and, therefore, the standard of review is the City's LCP.

Based on specific policy and ordinance language requirements placed in the LCP by the Commission, the City of Encinitas is in the process of developing a comprehensive program addressing the shoreline erosion problem in the City. The intent of the plan is to look at the shoreline issues facing the City and to establish goals, policies, standards and strategies to comprehensively address the identified issues. To date, the City has conducted several public workshops and meetings on the comprehensive plan to identify issues and present draft plans for comment. However, at this time it is uncertain when it will be scheduled for local review by the Encinitas City Council or when the plan will come before the Commission as an LCP amendment.

Based on the above findings, the proposed residence, only as conditioned to require it be sited no closer than 60 to 62 ft. inland of the bluff edge, can the project be found consistent with the Sections 30.34.020(D) of the City's Certified IP and Public Safety Policy 1.3 and 1.6 of the LUP which prohibits development in hazardous locations that would require the construction of shoreline protective devices. Therefore, the Commission finds that approval of the proposed residence, as conditioned, would not prejudice the ability of the City of Encinitas to continue to implement its certified LCP or to prepare a comprehensive plan addressing the City's coastline as required in the certified LCP.

G. CONSISTENCY WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 13096 of the Commission's administrative regulations requires Commission approval of a Coastal Development Permit to be supported by a finding showing the permit is 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 City has found that the proposed project is categorically exempt from environmental review pursuant to Section 15303(a) of the CEQA Guidelines [construction of small structures]. The proposed project, as conditioned, is consistent with the policies of the City's LCP relating to geologic stability, water quality, public access and visual resources. In addition, as conditioned, the project is consistent with all applicable Chapter

3 policies of the Coastal Act. Mitigation measures including a required waiver of future shoreline protection 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, as conditioned, is the least environmentally-damaging feasible alternative and is consistent with the requirements of the City's LCP and the public access and recreation policies of the Coastal Act to conform to CEQA.

(G:\San Diego\Reports\Appeals\2013\A-6-ENC-13-0210 Staff Report Lindstrom.docx)

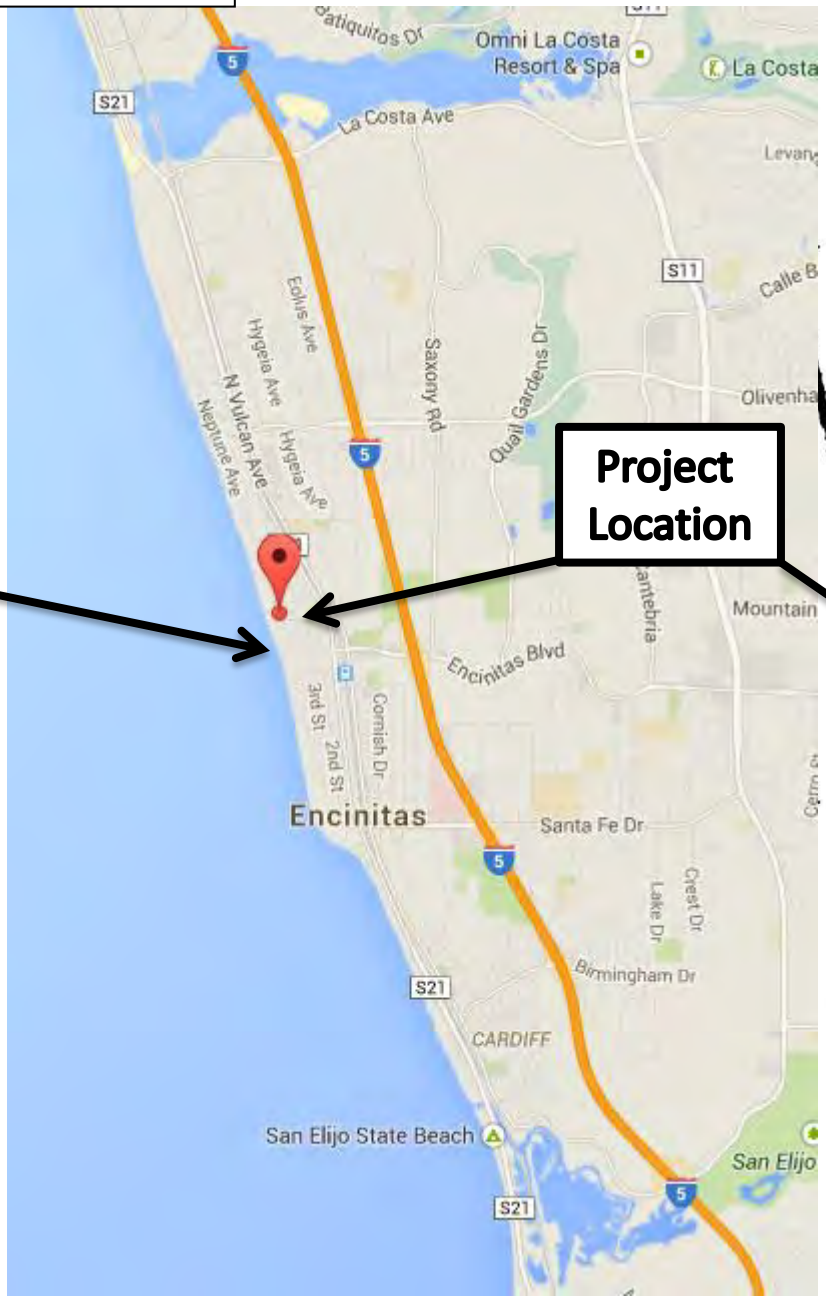
APPENDIX A

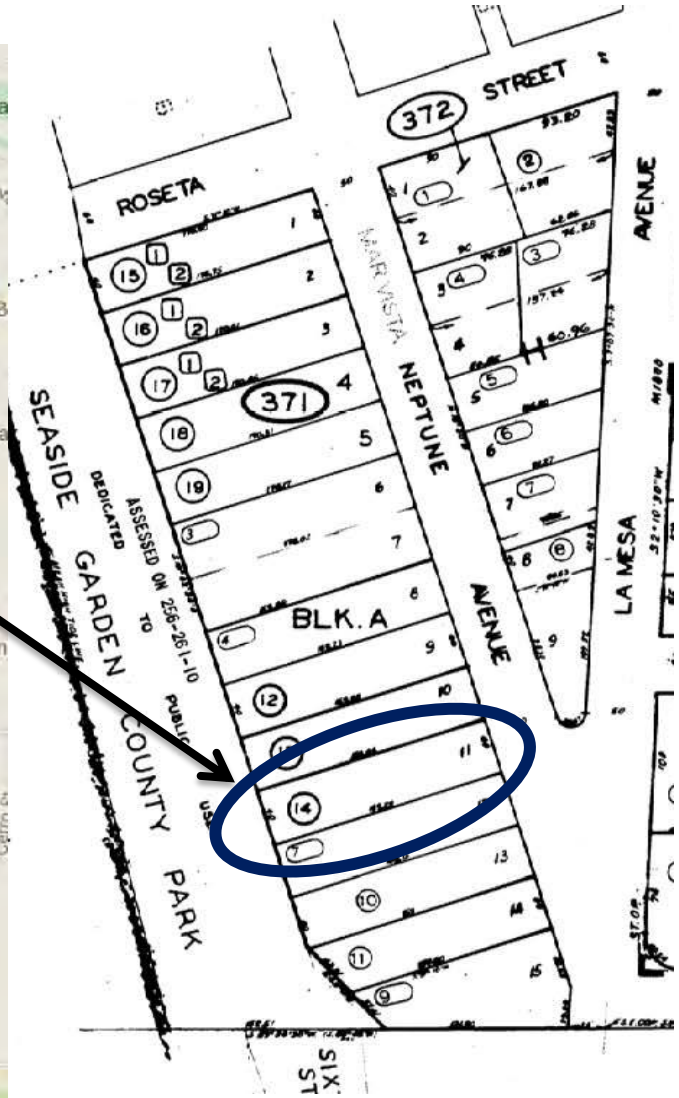
SUBSTANTIVE FILE DOCUMENTS:

- Appeal applications by Commissioner Mary Shallenberger and Commission Esther Sanchez
- Johnsson, M.J., 2005, Establishing development setbacks from coastal bluffs, in Magoon, O.T., Converse, H., Baird, B., Jines, B., and Miller-Henson, M., eds., California and the World Ocean '02: Revisiting and revising California's Ocean Agenda: Reston, Virginia, American Society of Civil Engineers, p. 396-416.
- City of Encinitas Certified LCP
- Report of Preliminary Geotechnical Exploration and Coastal Bluff Stability Evaluation dated December 5, 2012 by Geotechnical Exploration, Inc.
- Response to California Coastal Commission Letter dated 4/18/2013 by Geotechnical Exploration, Inc.
- Coastal Bluff Stability Analysis dated October 23, 2015 by TerraCosta Consulting Group
- City CDP 12-201
- Project Plans received May 22, 2013 by BHA Inc., Wolf Design Build Inc., and Hayward Baker
- Open File Report, "Landslide Hazards in the Encinitas Quadrangle, San Diego County, California", dated 1986
- CDP Nos:
  - 1-12-023/Winget
  - 6-15-1717/Barr
  - 6-84-461/Denver
  - 6-86-570/Richards
  - 6-93-085/Auerbach
  - 6-93-131/Richards
  - 6-93-36/Clayton
  - 6-95-066/Han
  - 6-98-039
  - 6-98-39/Denver
  - 6-ENC-16-0619/Hurst
  - 6-ENC-16-0624/Meardon
  - A-2-SMC-11-040/Hodge
  - A-6-ENC-00-193/Robinson
  - A-6-ENC-01-047/Conway & Associates
  - A-6-ENC-02-003/Berg
  - A-6-ENC-06-101/Albani
  - A-6-ENC-09-002/Wellman
  - A-6-ENC-09-003/Wellman
  - A-6-ENC-09-040/Okun
  - A-6-ENC-09-041/Okun

- A-6-ENC-16-0060/Martin
- F3891/Bardacos
- F5473/Bardacos
- F6360/Pate
- F9833/Cantor

PROJECT LOCATION





Google Maps

EXHIBIT NO. 1
APPLICATION NO.
A-6-ENC-13-0210
Project Location
California Coastal Commission

EXHIBIT NO. 2
APPLICATION NO.
A-6-ENC-13-0210
Site Photo 1
California Coastal Commission

EXHIBIT NO. 3
APPLICATION NO.
A-6-ENC-13-0210
Site Photo 2
California Coastal Commission

NEARBY SHORELINE ARMORING

EXHIBIT NO. 4
APPLICATION NO.
A-6-ENC-13-0210
Nearby Armoring
California Coastal Commission

SIZE OF BLUFFTOP HOMES ON SAME BLOCK AS SUBJECT SITE

Address	Street	Sq. Ft.
104	Neptune	6,000
112	Neptune	2,252
120	Neptune	2,845
126	Neptune	3,102
132	Neptune	Subject Site
138	Neptune	1,990
142	Neptune	3,980
150	Neptune	4,052
160	Neptune	1,892
164	Neptune	3,145
172	Neptune	3,908
180	Neptune	1,425
186	Neptune	1,425
194	Neptune	1,282
	Average	2,869

Johnsson, M.J., 2005, Establishing development setbacks from coastal bluffs, in Magoon, O.T., Converse, H., Baird, B., Jines, B., and Miller-Henson, M., eds., California and the World Ocean '02: Revisiting and revising California's Ocean Agenda: Reston, Virginia, American Society of Civil Engineers, p. 396-416.

Establishing Development Setbacks from Coastal Bluffs

Mark J. Johnsson[1]

Abstract

Responsible development, and California law, requires that coastal development be sited a sufficient distance landward of coastal bluffs that it will neither be endangered by erosion nor lead to the construction of protective coastal armoring. In order to assure that this is the case, a development setback line must be established that places the proposed structures a sufficient distance from unstable or marginally stable bluffs to assure their safety, and that takes into account bluff retreat over the life of the structures, thus assuring the stability of the structures over their design life. The goal is to assure that by the time the bluff retreats sufficiently to threaten the development, the structures themselves are obsolete. Replacement development can then be appropriately sited behind a new setback line. Uncertainty in the analysis should be considered, as should potential changes in the rate of bluff retreat and in slope stability. The deterministic approach presented here is based on established geologic and engineering principals, and similar approaches have been used to establish development setbacks from slope edges throughout the world for some time. Alternative approaches based on probabilistic methods may allow, however, for better quantification of uncertainties in the analysis. Although probabilistic coastal hazard assessment is in its infancy and data needs are large, the approach shows great promise. Developing probabilistic methods for establishing development setbacks should be a goal for future coastal zone management in California.

Introduction

In an era of sea-level rise such as has persisted on Earth for the past ~20,000 years (Curray 1965; Emery and Garrison 1967; Milliman and Emery 1968), the landward recession of coastal bluffs is an inevitable natural process wherever tectonic or isostatic uplift rates are lower than the rate of sea-level rise. New structures should be sited a sufficient distance landward of coastal bluffs that they will neither be endangered by erosion nor require the construction of coastal armoring to protect them from erosion over their design life. Because coastal bluffs are dynamic, evolving landforms, establishing responsible development setbacks from coastal bluffs is far more challenging than it is for manufactured or natural slopes not subject to erosion at the base of slope. Although internationally agreed-upon methods for establishing setbacks from static slopes have been developed, and codified in the International Building Code, no such consensus has emerged with respect to setbacks from dynamic slopes such as coastal bluffs. This paper presents a methodology for establishing such setbacks given the types of data generally available through relatively inexpensive geologic studies.

Relatively little work has been undertaken towards developing rational methodologies for establishing development setbacks from bluffs and cliffs. Coastal development setbacks have generally focused primarily on beach erosion, rather than on coastal bluff recession (*e.g.*, Healy 2002). Generally, the approach has been to simply

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extrapolate historic long-term erosion rates into the future, and establish setbacks at a particular predicted future shoreline position. This approach does not work well for shorelines with coastal bluffs, where the setback also must consider the possibility of bluff collapse (see Priest 1999 for a discussion of these issues). Komar and others (2002) presented a methodology for establishing setbacks for use on coasts where the principal hazards are wave runup and storm surge. They showed how their method could be extended to use on coasts with sea cliffs by determining the average number of hours that a sea cliff would be subject to wave attack. Their method does not, however, include a quantitative assessment of bluff stability. Given the significance of the coastal erosion threat in California, where public safety, financial investments, and environmental resources are at stake, and given the call for action urged by such recent national studies as the Heinz Center's FEMA-sponsored studies (The Heinz Center 2000a; 2000b), it is critical that a rational method be established for establishing development setbacks on coastal bluff tops.

The California Coastal Act (California Public Resource Code Sections 30000 *et seq.*) regulates coastal development in California. Section 30253 states, in part, that:

> 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.
>
> …

This law requires that new development be sited in such a way that it will not be subject to erosion or stability hazard over the course of its design life. Further, the last clause requires the finding that no seawall, revetment, jetty, groin, retaining wall, or other shoreline protective structure will be needed to protect the development over the course of its design life.

The principal challenge in meeting these requirements is predicting the amount and timing of coastal erosion to be expected at a particular site. The landward retreat of coastal bluffs is far from uniform in space or time (Komar 2000). Marine erosion tends to be concentrated at points and headlands due to wave refraction, occurs more quickly in weak rocks, and may vary along a coastline as these and other factors vary (Honeycutt et al. 2002). Further, coastal bluff retreat tends to be temporally episodic due to a variety of external and internal factors.

The mechanisms of coastal bluff retreat are complex (Emery and Kuhn 1982; Sunamura 1983; Vallejo 2002), but can be grouped into two broad categories. Bluff retreat may occur suddenly and catastrophically through slope failure involving the entire bluff, or more gradually through grain-by-grain erosion by marine, subaerial, and ground water processes. The distinction between the two categories may be blurred in

some cases—"grains" may consist of relatively large blocks of rock or shallow slumps, for example. Nevertheless, in establishing structural setbacks it is important to evaluate the susceptibility of the bluff to both catastrophic collapse and to more gradual erosion and retreat.

For both slope stability and long-term bluff retreat by "grain-by-grain" erosion, the setback must be adequate to assure safety over the design life of the development. For this reason, it is necessary to specify the design life of the structure. Many Local Coastal Programs (the implementation of the California Coastal Act at the local government level) specify a particular value, although the Coastal Act itself does not. The most commonly assumed design lives for new development range from 50 to 100 years; the most common value is 75 years. The reasoning behind establishing a setback based on the design life is that by the time the bluff retreats sufficiently to threaten the structure, the structure is obsolete and is ready to be demolished for reasons other than encroaching erosion. Replacement development can then be appropriately sited at a new setback, appropriate for conditions at the time of its construction. This process may be thwarted by limitations imposed by parcel size, and Constitutional takings issues may complicate land use decisions. Nevertheless, the only alternative to an armored coast—with all of its attendant impacts—is to continually site, and reposition, development in harmony with coastal erosion as it inevitably moves the shoreline landward.

What follows is the methodology employed by the staff of the California Coastal Commission in evaluating setbacks for bluff top development. I would suggest that this methodology is useful on other coasts with coastal bluffs, as well. This methodology does not represent a formal policy or position of the Coastal Commission. In fact, there may be other appropriate methodologies to establish development setbacks, and the Commission has the discretion to base a decision on any method that it finds technically and legally valid. Any such alternative methods should, however, be at least as protective of coastal zone resources as those outlined here. Further, as new techniques and information become available, these methodologies may change. Nevertheless, the type of analysis outlined here represents the current analytical process carried out by Coastal Commission staff in evaluating proposals for new development on the California coast, and in recommending action upon those proposals to the Commission. The Commission then makes its decisions on a case-by-case basis, based upon the site-specific evidence related to the particular development proposal.

Definition of "Bluff Edge"

Development setbacks normally are measured from the upper edge of the bluff top. Accordingly, a great deal of effort often is focused on defining that "bluff edge." The bluff edge is simply the line of intersection between the steeply sloping bluff face and the flat or more gently sloping bluff top. Defining this line can be complicated, however, by the presence of irregularities in the bluff edge, a rounded or

stepped bluff edge, a sloping bluff top, or previous grading or development near the bluff edge. Accordingly, a set of standards for defining the bluff edge is necessary.

Under the California Coastal Act, the bluff edge is defined as:

> … the upper termination of a bluff, cliff, or seacliff. In cases where the top edge of the cliff is rounded away from the face of the cliff as a result of erosional processes related to the presence of the steep cliff face, the bluff line or edge shall be defined as that point nearest the cliff beyond which the downward gradient of the surface increases more or less continuously until it reaches the general gradient of the cliff. In a case where there is a steplike feature at the top of the cliff face, the landward edge of the topmost riser shall be taken to be the cliff edge…" (California Code of Regulations, Title 14, §13577 (h) (2).

This definition is largely qualitative, and the interpretation of the topographic profile to yield a bluff edge determination at any given coastal bluff may be subject to various interpretations. Accordingly, it may be useful to use more quantitative means to define "bluff edge." One approach, adopted, for example, by the City of Laguna Beach, is to define the bluff edge as that point at which the coastal bluff attains a certain specified steepness. This steepness is equivalent to the first derivative of the topographic profile. Such a definition may, however, be inconsistent with the legal definition above. Further, ambiguous results may be obtained when the upper portion of the bluff fluctuates around the specified steepness value. Better results may be obtained by finding the point at which the second derivative, the rate of change in steepness, of the topographic profile increases sharply. This approach may be amenable to computer analysis, although such analysis is rarely employed.

The position of the bluff edge may be changed by a variety of processes, natural and anthropogenic. Most obvious is the landward retreat of the bluff edge through coastal erosion. A bluff edge also may move seaward, through tectonic processes, but such movement is rare and usually small on human time scales. More significant is the anthropogenic modification of the bluff edge by grading or the construction of structures. A landward shift of the bluff edge commonly occurs through cutting into and removing natural materials during grading operations or the construction of seawalls. Conversely, placing artificial fill on or near the bluff edge generally does not alter the position of the natural bluff edge; the natural bluff edge still exists, buried beneath fill, and the natural bluff edge is used for purposes of defining development setbacks.

Slope Stability

Once the bluff edge is located, the first aspect to consider in establishing development setbacks from the bluff edge is to determine whether the existing coastal bluff meets minimum requirements for slope stability. If the answer to this question is "yes," then no setback is necessary for slope stability considerations. If the answer is "no," then the distance from the bluff edge to a position where sufficient stability exists to assure safety must be found. In other words, we must determine how far back from the unstable or marginally slope must development be sited to assure its safety.

We are guided in this analysis by the industry-accepted standards for artificial slopes (codified in many local grading ordinances), which require that a particular minimum "factor of safety" against landsliding be attained. A more difficult situation is the case of overhanging or notched coastal bluffs, or bluffs undermined by sea caves.

Landslides. Assessing the stability of slopes against landsliding is undertaken through a quantitative slope stability analysis. In such an analysis, the forces resisting a potential landslide are first determined. These are essentially the strength of the rocks or soils making up the bluff. Next, the forces driving a potential landslide are determined. These forces are the weight of the rocks as projected along a potential slide surface. The resisting forces are divided by the driving forces to determine the "factor of safety." A value below 1.0 is theoretically impossible, as the slope would have failed already. A value of 1.0 indicates that failure is imminent. Factors of safety at increasing values above 1.0 lend increasing confidence in the stability of the slope. The industry-standard for new development is a factor of safety of 1.5, and many local grading ordinances in California and elsewhere (including the County of Los Angeles, and the Cities of Irvine, Malibu, and Saratoga, among others) require that artificial slopes meet this factor of safety.

A slope stability analysis is performed by testing hundreds of potential sliding surfaces. The surface with the minimum factor of safety will be the one on which failure is most likely to occur. Generally, as one moves back from the top edge of a slope, the factor of safety against landsliding increases. Therefore, to establish a safe setback for slope stability from the edge of a coastal bluff, one needs to find the distance from the bluff edge at which the factor of safety is equal to 1.5.

Inherent in the calculation of a slope stability analysis is the shape (topographic profile) and geologic makeup of the coastal bluff. There are many ways to calculate the forces involved in slope stability analyses. All methods must consider such factors as rock or soil strength, variations in rock and soil strength values due to different types of materials making up the slope, anisotropy in these values, and any weak planes or surfaces that may exist in the slope (Abramson et al. 1995). More subtly, other factors that must be considered include: pore water pressure, which produces a buoyant force that reduces the resisting forces, the particular failure mechanism that is most likely (*e.g.*, a block slide mechanism vs a circular failure mechanism), and seismic forces. Seismic forces normally are considered through a separate analysis, in which a force equal to 15% of the force of gravity is added to the driving forces. Because seismic driving forces are of short duration, a factor of safety of 1.1 generally is considered adequate to assure stability during an earthquake. This type of analysis is fairly crude, and other methods for evaluating slope stability based on maximum permanent displacement experienced during earthquakes do exist, but the pseudo-static method represents the current standard of practice for most development in California (Geotechnical Group of the Los Angeles Section of the American Society of Civil Engineers 2002). Guidelines for conducting slope stability analyses for review by the California Coastal Commission are presented in Table 1.

Table 1. Guidelines for performing quantitative slope stability analyses

1) The analyses should demonstrate a factor of safety greater than or equal to 1.5 for the static condition and greater than or equal to 1.1 for the seismic condition. Seismic analyses may be performed by the pseudostatic method or by displacement methods, but in any case should demonstrate a permanent displacement of less than 50 mm.

2) Slope stability analyses should be undertaken through cross-sections modeling worst case geologic and slope gradient conditions. Analyses should include postulated failure surfaces such that both the overall stability of the slope and the stability of the surficial units is examined.

3) The effects of earthquakes on slope stability (seismic stability) may be addressed through pseudostatic slope analyses assuming a horizontal seismic coefficient of 0.15g. Alternative (displacement) methods may be useful, but should be in conformance with the guidelines published by the Geotechnical Group, American Society of Civil Engineers, Los Angeles Section (2002).

4) All slope analyses should ideally be performed using shear strength parameters (friction angle and cohesion), and unit weights determined from relatively undisturbed samples collected at the site. The choice of shear strength parameters should be supported by direct shear tests, triaxial shear test, or literature references, and should be in conformance with the guidelines published by the Geotechnical Group, American Society of Civil Engineers, Los Angeles Section (2002).

5) All slope stability analyses should be undertaken with water table or potentiometric surfaces for the highest potential ground water conditions.

6) If anisotropic conditions are assumed for any geologic unit, strike and dip of weakness planes should be provided, and shear strength parameters for each orientation should be supported by reference to pertinent direct sheer tests, triaxial shear test, or literature references.

7) When planes of weakness are oriented normal to the slope or dip into the slope, or when the strength of materials is considered homogenous, circular failure surfaces should be sought through a search routine to analyze the factor of safety along postulated critical failure surfaces. In general, methods that satisfy both force and moment equilibrium, such as Spencer's (Spencer 1967; 1973), Morgenstern-Price (Morgenstern and Price 1965), and General Limit Equilibrium (Fredlund et al. 1981; Chugh 1986) are preferred. Methods based on moment equilibrium alone, such as Simplified Bishop's Method (Bishop 1955) also are acceptable. In general, methods that solve only for force equilibrium, such as Janbu's method (Janbu 1973) are discouraged due to their sensitivity to the ratio of normal to shear forces between slices (Abramson et al. 1995).

8) If anisotropic conditions are assumed for units containing critical failure surfaces determined above, and when planes of weakness are inclined at angles ranging from nearly parallel to the slope to dipping out of slope, factors of safety for translational failure surfaces should also be calculated. The use of a block failure model should be supported by geologic evidence for anisotropy in rock or soil strength. Shear strength parameters for such weak surfaces should be supported through direct shear tests, triaxial shear test, or literature references.

Establishing a safe setback line. Once the stability of the coastal bluff has been assessed, the development setback line to assure safety from marginally stable slopes is simply the line corresponding to a factor of safety of 1.5 (static) or 1.1 (pseudostatic), whichever is further landward. In establishing this line one can either use a single cross section and specify a single distance from the bluff edge at which the factor of safety rises to 1.5 (or 1.1 for the pseudostatic case), or use several cross sections and contour the factors of safety on the bluff top. Then, by choosing the 1.5 contour (or 1.1 for the pseudostatic case, if it lies further landward), a setback line is established. The latter method generally is necessary for large or complicated sites.

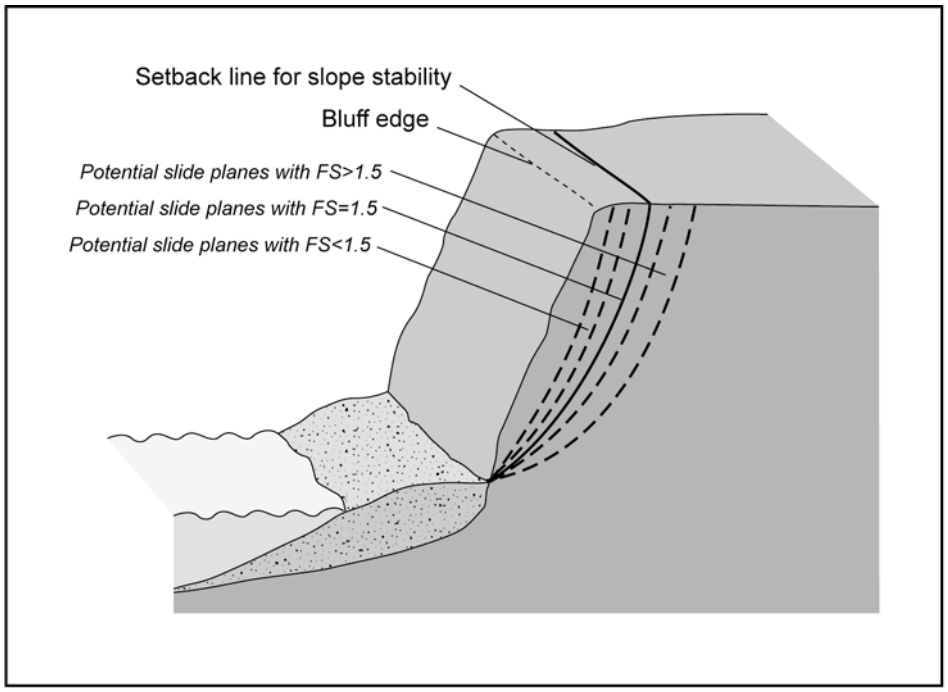

Figure 1. Establishing a development setback for slope stability. The potential slide plane possessing a defined minimum standard of stability is identified, and its intersection with the bluff edge is taken as a minimum development setback. The minimum standard for stability is usually defined as a factor of safety (FS) against sliding of 1.5 for the static case, or 1.1 for a pseudostatic (seismic) case, whichever is further landward.

Block failure of overhanging bluffs and sea caves. Assessing the factor of safety against block failure for overhanging or notched coastal bluffs, or bluffs undermined by sea caves, is far more difficult than conducting a slope stability analysis against landsliding. This is due to several factors, the most important of which are: 1) uncertainty as to the presence of local heterogeneities or planes of weakness, hidden in the bluff, that commonly control block failures, 2) difficulty in assigning shear strength values to such heterogeneities even if they can be identified, and 3) greater complexity in modeling the stress field within a bluff in terms of heterogeneities or planes of weakness as compared to a modeling a homogenous slope. The current state of the science does not allow for the calculation of a factor of safety against block failure

for such overhanging or notched coastal bluffs, or bluffs undermined by sea caves, and even makes any form of quantitative assessment of the risk of failure extremely difficult. Promise is shown in mathematical models such as that of Belov and others (1999), but translating such process-oriented models into setback methodologies has not yet been attempted.

Accordingly, establishing appropriate setbacks from overhanging or undermined coastal bluffs is problematic at best. An appropriate conservative approach is to project a vertical plane upward from the rear wall of the overhang, notch, or sea cave, and establish this as the minimum setback line. This approach has been adopted by the City of San Diego, and codified in the City's Local Coastal Program. Although it is certainly possible that failure could occur along a line inclined either seaward or landward from the rear wall of the overhang, notch, or sea cave, a vertical plane would seem to be a good default configuration to assume in the absence of more compelling evidence for another configuration. Further, vertical, bluff-parallel fractures—perhaps related to stress-relief at the free face represented by the bluff face—are a common feature of otherwise homogenous coastal bluffs. In many cases, such a plane will intersect the sloping bluff face seaward of the bluff edge, and no setback from the bluff edge would be necessary to assure stability from block collapse. In cases where the plane intersects the bluff top seaward of a setback line established for landsliding, as discussed above, no additional setback would be necessary to assure stability from block collapse. In the rather rare case, however, in which the plane intersects the bluff top landward of both the bluff edge and any setback line for landsliding, the line of intersection of the plane and the bluff top would be an appropriate setback line for slope stability considerations.

Long Term Bluff Retreat

The second aspect to be considered in the establishment of a development setback line from the edge of a coastal bluff is the issue of more gradual, or "grain by grain" erosion. In order to develop appropriate setbacks for bluff top development, we need to predict the position of the bluff edge into the future. In other words, at what distance from the bluff edge will bluff top development be safe from long-term coastal erosion?

The long-term bluff retreat rate can be defined as the average value of bluff retreat as measured over a sufficient time interval that increasing the time interval has negligible effect on the average value (a statistical basis could be applied to the term "negligible," but this is rarely done). This definition implies that the long-term bluff retreat rate is linear, an assumption that certainly is not valid over time scales of more than a few centuries, or in periods of rapid sea-level change such as the late Pleistocene/early Holocene (Curray 1965; Emery and Garrison 1967; Milliman and Emery 1968). There is some overlap between slope stability issues and long-term bluff retreat issues, in that the "grains" may be fairly large rocks, and in that shallow slump

ing is a common mechanism for gradual bluff retreat. In addition even gradual bluff retreat tends to be highly episodic due to a host of internal and external factors.

The rate at which gradual bluff retreat occurs generally is measured by examining historic data. This is somewhat problematic in that the historic bluff retreat rate may not accurately predict the future bluff retreat rate (Watson 2002). This is a particularly issue in light of the likelihood of an acceleration in the rate of sea level rise as a result of global warming (Intergovernmental Panel on Climate Change 2001) and the resulting likely increase in bluff retreat rate (Bray and Hooke 1997; Watson 2002).

Nevertheless, historic data currently are our best indicators of future erosion at any given site. Such data may include surveys that identify the bluff edge, in which case the criteria used to identify the bluff edge must be the same in the surveys that are compared. Sufficiently detailed surveys are rare, however, and vertical aerial photography is more commonly used to assess changes in bluff position through time. The best data are those compiled photogrammetrically, whereby distortions inherent to aerial photography (due, for example, to tilting of the camera, variations in the distance from the camera to various parts of the photograph, and differences in elevation across the photograph) are corrected (see, for example, Moore 2000). Sometimes such data have been gathered as parts of specific studies of coastal bluff retreat, but more commonly they are collected as part of other work, and must be sought out for coastal erosion studies.

Coastal bluff retreat tends to be temporally episodic due to a variety of external and internal factors. External factors include tides, episodic wave events (spurred by either local or distant storms), episodic rainfall events (Kuhn 2000), El Niño-Southern Oscillation events (Griggs and Johnson 1983; Griggs 1998; Griggs and Brown 1998; Lajoie and Mathieson 1998; Storlazzi and Griggs 2000), major earthquakes (Plant and Griggs 1990; Griggs and Scholar 1997) and long-term climate change on a multidecadal to century scale (Inman and Jenkins 1999). Internal factors include the autocyclicity inherent to many bluff failure mechanisms (Leighton and Associates Inc. 1979; Hampton and Dingler 1998) and bluff response to continued toe erosion (Sunamura 1992).

Despite the episodic nature of coastal bluff retreat, it is necessary to identify the future long-term bluff retreat rate in order to establish appropriate development setbacks. The episodic nature of bluff retreat makes any calculated rate highly dependent on sampling interval. To illustrate the dependence of calculated long-term bluff retreat rates on sampling interval, it is useful to perform a sensitivity analysis from real data. Unfortunately, there are insufficient data to perform a meaningful analysis for any one site in California. Accordingly, a synthetic data set was created as part of this study.

A Synthetic Data Set. Creating and examining a synthetic data set allows for testing the effects of sampling on the determination of long-term bluff retreat rates. The long-term retreat rate is, by definition, known for the synthetic data set. Further, a

synthetic data set can be created that is both longer and more complete than any such data set available from nature. The data set considered here (available upon request from the author) was created for a hypothetical 200-year period, assigned the dates 1800-2000. Figure 2 is a graphical representation of the data set, and charts the progressive retreat of the hypothetical bluff edge through that time period. Although the data are fictitious, they roughly correlate with well-known periods of episodic erosion in coastal California, at least for the second half of the data set.

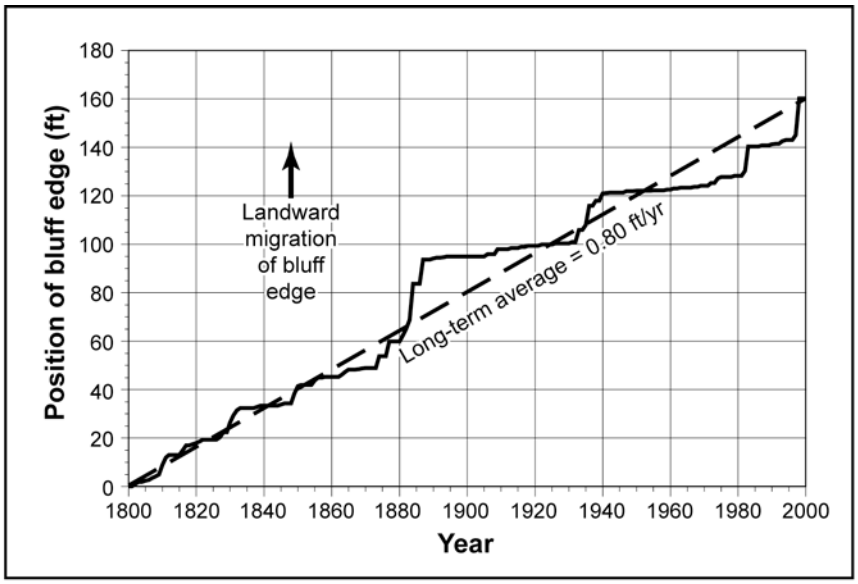

Figure 2. Plot of the position of the top edge of a hypothetical coastal bluff over time. These data represent a synthetic data set that is meant to roughly mimic typical episodic bluff retreat. Although fictitious, the data correlate well with what is know of temporal variations in erosion rate for a typical California bluff experiencing moderate erosion. The data set is far more complete than actual data available at any given site, however, making possible a sensitivity analysis of sampling interval on the calculation of the long-term bluff retreat rate.

Moving averages. A standard statistical method to smooth spikes in data is to average the data over a window of some width, while moving that window through the data set. Figure 3 shows the effect of applying this technique to the synthetic data set, using averaging windows of various widths. The first derivative of the curve representing bluff edge position through time (Figure 2) is the "instantaneous" bluff-retreat rate, and varies from 0 to 15 ft/yr for the synthetic data set (Figure 3). As the averaging window increases in width, the maximum retreat rate values decrease and the minimum values increase, effectively smoothing and broadening the "peaks" representing episodic erosion events. Depending on how the window is centered on the point representing the window average, peaks may be offset in time as well. With the widest sampling windows, peaks are essentially eliminated, and the retreat rate calculated approaches the average long-term retreat rate for the entire data set (0.80

ft/yr). Note that it is only when the window width approaches (and exceeds) 50 years in width that the calculated bluff retreat rate approaches the long-term average rate.

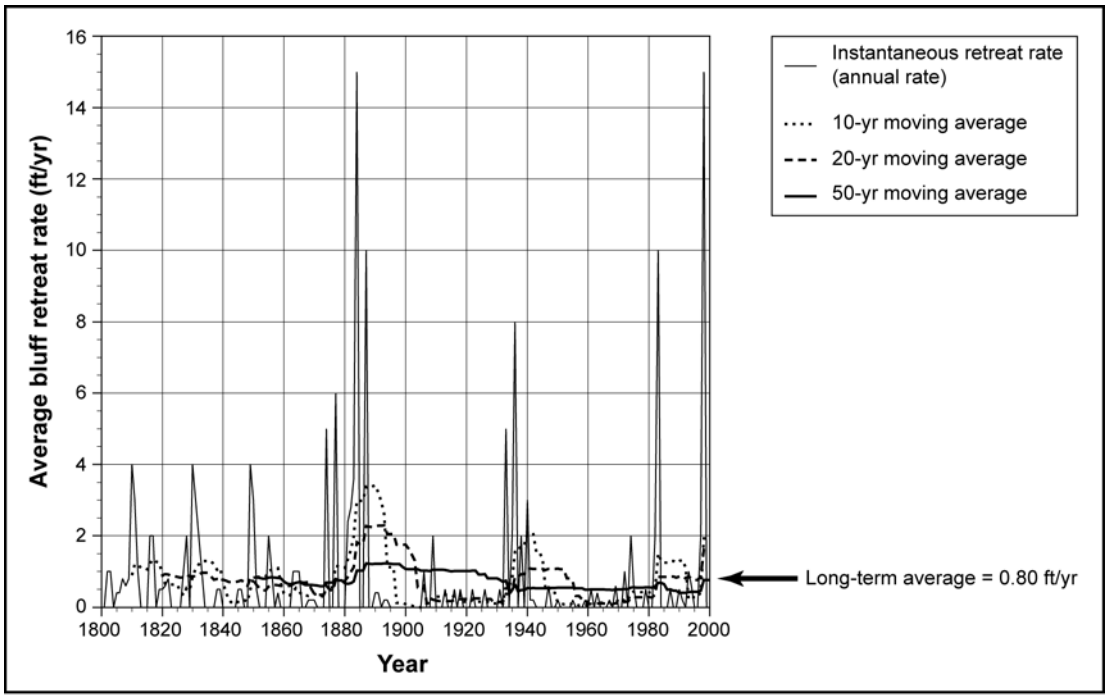

Figure 3. Average annual bluff retreat rate calculated from the synthetic data set using moving averages with various averaging window sizes. Only when data are averaged over ~50 years or more does the calculated annual bluff retreat rate approach the known long-term average for the data set.

Data gathered at intervals. Data regarding bluff edge position are almost always gathered at widely spaced intervals, corresponding to the dates of surveys or photographs. This precludes the use of a moving average technique, which depends on continuous data. Figure 4 shows the calculated bluff retreat rates at regularly spaced intervals of 10, 20, and 50 years. A wide range of values for the bluff retreat rate are obtained at the shorter sampling intervals. Although short sampling intervals give the most information on the variability of bluff retreat, the best estimate of the long-term bluff retreat rate is provided by sampling at long time intervals. Even at these long time intervals, if a statistically greater- or lesser-than-average number of "episodic events" are included in the sample, then the bluff retreat rate calculated for that interval will seriously over- or underestimate actual the long-term average bluff retreat rate.

Principal observations from the synthetic data set. A few simple generalities can be made from this limited analysis. First, instantaneous bluff retreat rates can exceed the long term average rate by a factor of many times. This is also true for data collected at short ($\leq$ ~10 years for the synthetic data set) time intervals. Second, data collected at relatively short time intervals give useful information on the episodic nature of bluff retreat, but do not provide accurate estimates of long-term average

bluff retreat rates. Third, the best estimate of long-term average bluff retreat rate is obtained by sampling over long (≥ ~50 years for the synthetic data set) time intervals. Finally, in order to accurately estimate the long-term bluff retreat rate, a stochastically appropriate number of episodic events must be included in the sampling interval. These observations, as well as similar observations from real data, lead to the general guidelines for estimating the long-term average bluff retreat rate at a site that are presented in Table 2.

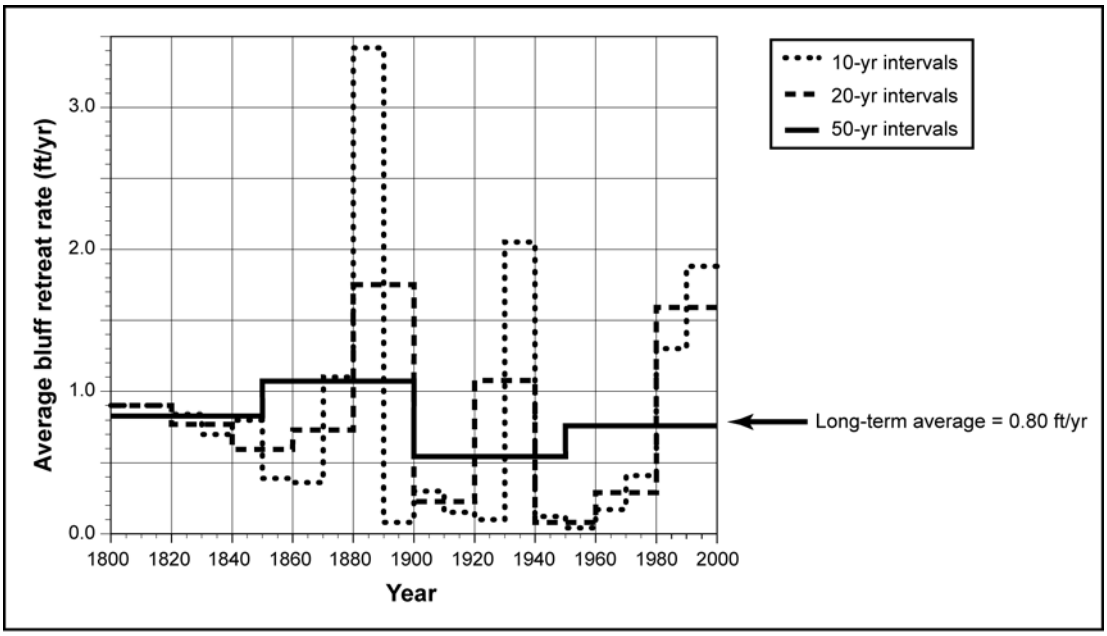

Figure 4. Average annual bluff retreat rate calculated from the synthetic data set using discrete sampling intervals of various sizes. Only when data are sampled at intervals of ~50 years or more does the calculated annual bluff retreat rate approach the known long-term average for the data set.

Establishing setbacks for long-term bluff retreat. Once an historic long-term bluff retreat rate has been estimated, establishing a setback for long-term bluff retreat rate is a simple matter of multiplying that rate, *B*, by the design life of the development, *t*. This is equivalent to predicting the position of the coastal bluff edge at the end of the design life of the structure (Figure 5).

Although this is the usual method of establishing setbacks for long-term bluff retreat in California, inherent assumptions and difficulties must be born in mind. Foremost among these is the necessity of defining the design life of the development. Because the landward retreat of an unarmored shoreline is inevitable and ongoing during a period of relative sea level rise, it is impossible to assure the safety of development from coastal erosion unless a time frame is assigned at the onset. But assigning a design life is difficult, and there is nothing in land use law that requires the abandonment of development at the end of its assigned design life.

Other problems associated with this type of analysis revolve around its inherently historic approach. There is no *a priori* reason to believe that bluff retreat rates are, or will continue to be, linear. This is especially relevant in light of expected acceleration of the historic rate of sea level rise as a result of global warming (Intergovernmental Panel on Climate Change 2001). Further, there is good evidence that erosion rates can be highly variable through time (Jones and Rogers 2002). For all of these reasons it is important to adopt a conservative approach to estimating long-term bluff retreat rates.

Table 2. Guidelines for establishing long-term bluff retreat rates

1) Determine bluff edge positions at as many times as possible, but covering a minimum of about 50 years and extending to the present. Common data sets include vertical aerial photographs, surveys that identify the bluff edge, and detailed topographic maps. These sources must be of sufficient scale or precision to locate accurately the position of the bluff edge to within a few feet.

2) If aerial photographs are used, the best results are obtained through photogrammetric methods, whereby distortions inherent to aerial photography are corrected (orthorectified). Even if photogrammetric methods are not used, the scale of the photographs must be carefully determined by comparison of the image size of known features to their actual size.

3) When comparing bluff edge positions on aerial photographs or unanchored surveys, a "shoreline reference feature" must be identified that has been static through time and is identifiable in each data set. Bluff positions throughout the area of reference can be measured relative to this feature. Common shoreline reference features are road centerlines, structures, large rock outcrops, or trees.

4) When comparing bluff edge positions on surveys, it is critical that the same criteria for the identification of the bluff edge was used in each survey. The Coastal Act definition of a bluff edge can be found in California Code of Regulations, Title 14, § 13577 (h) (2).

5) Although the short-term erosion rate for each time interval between data points provides valuable information regarding the nature of bluff retreat at the site, the long-term erosion rate should be determined from the extreme end-points of the time series examined. This time series should exceed 50 years in length, and should include both relatively quiet periods, such as the 1950's-1960's; and the more erosive subsequent time periods (especially the 1982-1983 and 1997-1998 El Niño winters).

6) In larger study areas, the bluff retreat rate should be determined at intervals along the bluff edge, paying special attention to potential differences in retreat rate between headlands and coves, and amongst areas underlain by differing geologic materials.

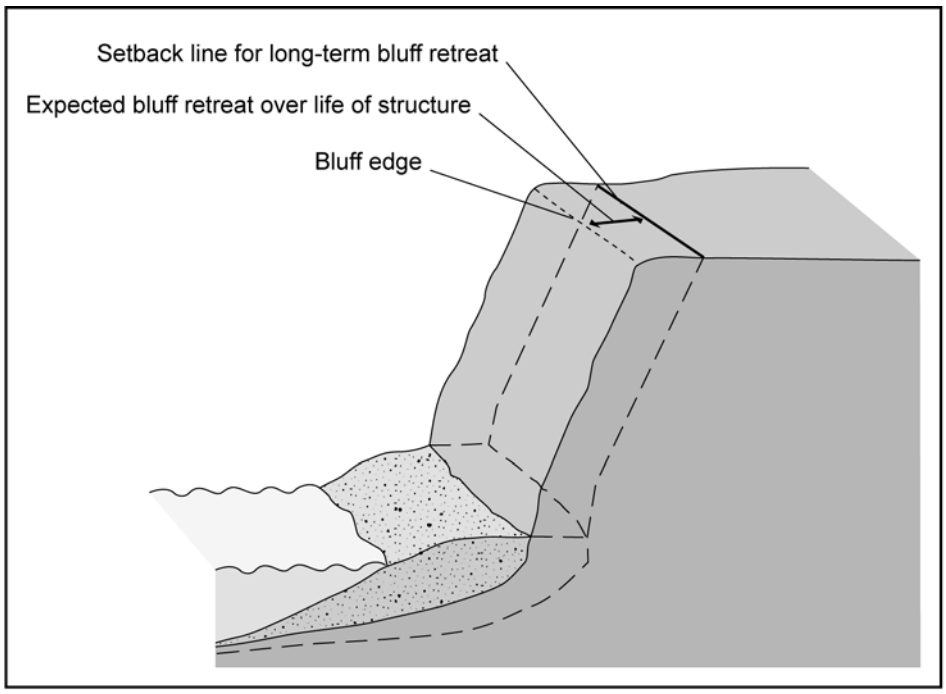

Figure 5. Establishing a development setback for long term bluff retreat. The expected bluff position at the end of the development's useful life is found by multiplying the average annual bluff retreat rate by the design life of the development; this line is taken to represent the minimum setback for long-term bluff retreat.

Uncertainty

There is a great deal of uncertainty in many parts of the analysis discussed above. The deterministic approach outlined here does not deal well with such uncertainty. Various methods have been used to build in some margin for error in establishing safe building setbacks. One approach, commonly used by geologists working in northern California, is to multiply the long-term bluff retreat rate by a factor of safety (used in a different sense than for slope stability), generally ranging from 1.5 to 4.0. More commonly, a simple "buffer" is added to the setback generated by multiplying the long-term bluff retreat rate by the design life of the structure. This buffer, generally on the order of ten feet, serves several functions: 1) it allows for uncertainty in all aspects of the analysis; 2) it allows for any future increase in bluff retreat rate due, for example, to an increase in the rate of sea level rise (Bray and Hooke 1997; Watson 2002); 3) it assures that at the end of the design life of the structure the foundations are not actually being undermined (if that were to be the case the structure would actually be imperiled well before the end of its design life); and 4) it allows access so that remedial measures, such as relocation of the structure, can be taken as erosion approaches the foundations. If a slope stability setback is required (*i.e.*, if the bluff does not meet minimum slope stability standards), that setback can do double duty as this buffer.

Summary: Defining the Total Setbacks for Bluff-Top Development

To define the total development setback, one must combine the two aspects of the setback considered above: the setback to assure safety from landsliding or block failure, and the setback for long-term bluff retreat. The resulting setback assures that minimal slope stability standards are maintained for the design life of the structure.

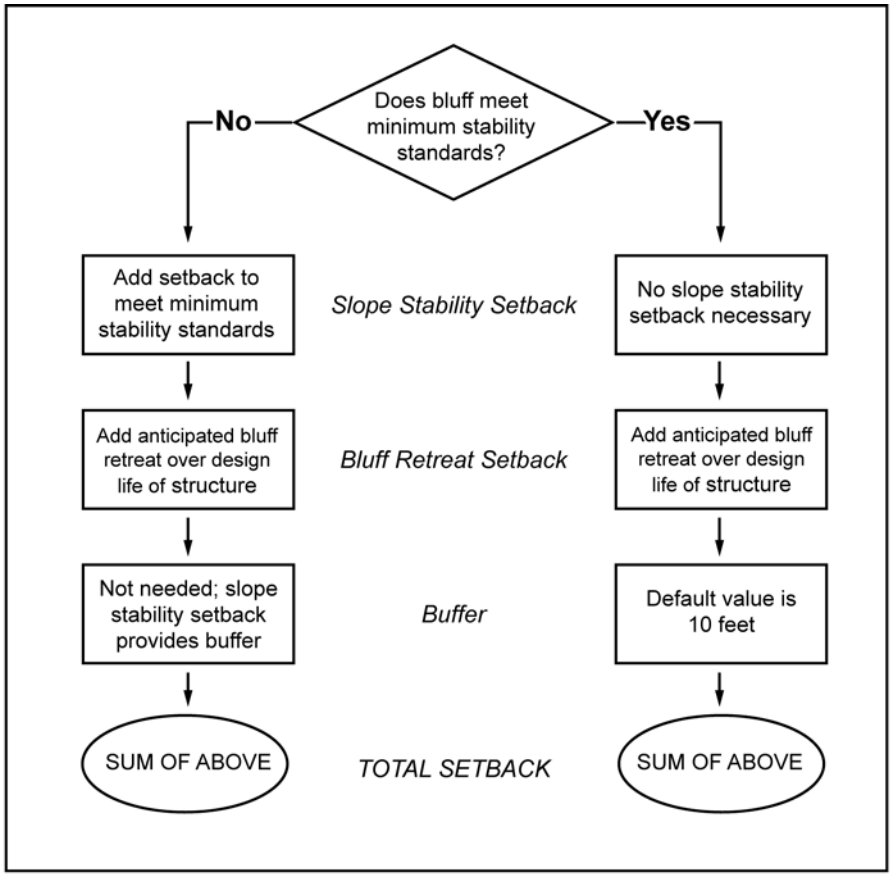

Figure 6. Flowchart for establishing bluff edge setback for development, taking into account stability of the bluff, long-term bluff retreat, and uncertainty in the analysis.

A methodology for combining these setbacks is outlined in Figure 6. First, it must be determined whether the coastal bluff meets minimum slope stability standards. Normally, this will be a factor of safety of 1.5 (static) or 1.1 (pseudostatic). If the answer to this question is “yes,” then no setback is necessary to assure slope stability. If the answer is “no,” then it is necessary to determine the position on the bluff top where the minimum slope stability standards are attained. This position, as measured relative to the bluff edge, is the setback necessary for slope stability determined as described above. In the case of block failure of an overhanging bluff or collapse of a sea cave, the setback necessary to assure stability from this type of collapse is equivalent to the slope stability setback. Although the current state of the science makes it impossible to quantitatively assess stability relative to this type of failure, a conservative, yet realistic, setback line is the projection of a vertical plane from the rear wall

of the overhang or sea cave on the bluff top. If the plane does not intersect the bluff top (*i.e.*, intersects the inclined bluff face seaward of the bluff edge), then no setback for this type of collapse is necessary.

The next step is to determine the expected bluff retreat over the design life of the structure, as described above. This setback is added to the slope stability setback, if any.

Finally, a buffer, generally a minimum of 10 feet, should be added to address uncertainty in the analysis, to allow for any future increase in the long-term bluff retreat rate, to assures that the foundation elements aren't actually undermined at the end of the design life of the development, and to allow access for remedial measures. A buffer is not necessary if the slope stability setback equals or exceeds about ten feet, as it can do "double duty" as both a setback to assure slope stability and a buffer for the purposes listed above.

The total setback is meant to assure that minimum slope stability standards are maintained for the design life of the development. Inherent in this analysis is the assumption that factors affecting slope stability (steepness and shape of the slope, ground water conditions, geometry of rock types exposed in the bluff) will remain constant through the design life of the development, that the future bluff-retreat rate will be linear and of comparable magnitude to the historic rate, and that the nature of erosion processes at the site will remain unchanged. All of these assumptions are potentially flawed, but in the absence of convincing evidence to the contrary, are a means of establishing reasonable development setbacks.

Towards Probabilistic Coastal Erosion Hazard Assessment

The deterministic approach presented above is based on established geologic and engineering principals, and similar approaches have been used to establish development setbacks from slope edges throughout the world for some time. However, the approach suffers from its limited ability to consider uncertainties in the analysis. Probabilistic approaches, on the other hand, inherently consider analytical uncertainties, and allow for a better definition of risk. This type of risk assessment has been routine for decades in the field of hydrology, where design basis and land use priorities are based on the magnitude of the "100-year flood," for example. Probabilistic coastal hazard assessment similarly can be used to quantify the likelihood that the bluff edge will erode to any particular point on a bluff top in a given time. Then, by establishing an acceptable level of risk (for example, a probability of <5% that the bluff edge will reach a certain point over the design life of the development) a setback line can be established that inherently includes uncertainties in the analysis. Just as the seismological community has moved away from deterministic methods towards probabilistic ones, such an approach allows for better consideration of the uncertainties in estimating future coastal erosion.

Probabilistic coastal hazard assessment is in its infancy, and no standardized methods have won acceptance—or even much discussion. The failure of coastal bluffs along Lake Michigan through landsliding has been assessed probabilistically by Chapman and others (2002), through the use of probabilistic slope stability analyses. Lee and others (2001) applied a variety of probabilistic methods to questions of coastal bluff retreat in England. Methods that they evaluated include the simulation of recession of episodically eroding cliffs through Monte Carlo techniques, the use of historical records and statistical experiments to model the behavior of cliffs affected by episodic landslide events, event-tree approaches, and the evaluation of the likelihood of the reactivation of ancient landslides. All of these techniques show promise, but the authors restricted themselves to specific cases. What is needed is the development of probabilistic methods that will work in more general cases, and combine both slope stability and long-term bluff retreat considerations. One way to approach this problem is to consider separately the two aspects of defining a development setback as outlined above.

Probabilistic slope stability analyses already are routine (Mostyn and Li 1993; Yang et al. 1993). In addition to quantifying the probability of slope failure (something not done in a deterministic slope stability analysis, which only establishes whether or not failure will occur), probabilistic slope stability analysis allows for consideration of variability or uncertainty in soil or rock strength parameters (Lumb 1970). Uncertainties in these input parameters are quantified by the standard deviation of each parameter. Then, using Monte Carlo techniques, a probability distribution for the factor of safety associated with any given failure plane is produced. From this, the probability of failure along the chosen potential failure plane can be calculated. The probability of failure is the probability that the factor of safety will be less than 1.0, and can be calculated for any given potential failure surface. By performing such analyses on a variety of potential failure surfaces intersecting different portions of the bluff top, a probability could be assigned to any position on the bluff top quantifying the likelihood that a failure will occur landward of that point.

Although not routine, several possibilities present themselves for developing probabilistic models for gradual, episodic, bluff retreat. Perhaps the simplest method of quantifying uncertainty is the application of a confidence interval to the estimate of the long-term average bluff retreat rate. Each time interval examined in estimating this rate is one sample of the mean value. For normally distributed data (or data that can be transformed to a normal distribution by, for example, a log transform), the sample standard deviation is a traditional estimate of uncertainty. There is a ~68.26% probability that the true mean value will lie within ±1 standard deviation of the sample mean. Different probabilities apply to different multiples of the standard deviation. Thus, uncertainties in the product (B x t), above, can be quantified and contoured on the bluff top. For populations that cannot be shown to be normally distributed (likely the case with the small sample sizes available for bluff retreat rates), a better estimate of uncertainty may be a confidence interval based on Student's t distribution, or on nonparametric statistics.

A second approach to probabilistic assessment of coastal bluff recession is to treat annual bluff retreat in a manner analogous to river floods. Thus, the recurrence interval of a particular amount of annual bluff retreat can be calculated by the formula

$$R = \frac{N+1}{M}$$

where R is the recurrence interval, N is the number of years of record, and M is the rank of the annual bluff retreat in the total data set. For the synthetic data set considered above, there are many duplicate values due to the limited precision with which bluff retreat data are generally reported. Eliminating duplicates, and ranking the annual bluff retreat rates, recurrence intervals can be calculated. These data can be graphed in order to arrive at the expected amount of bluff retreat for any particular recurrence interval (Figure 7). The inverse of the recurrence interval is the annual probability that a given amount of bluff retreat will be exceeded. Such data may be especially valuable in assessing the risk of occurrence of an episodic event sufficient to threaten an existing structure.

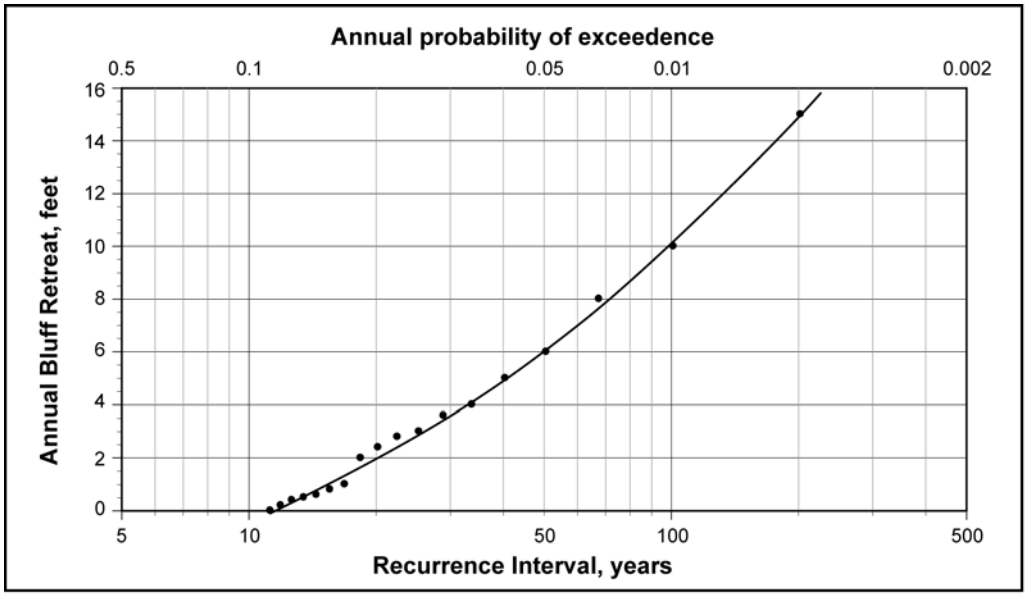

Figure 7. Recurrence interval for annual bluff retreat, calculated for the synthetic data set. The recurrence interval, calculated in a manner analogous to flood recurrence interval, gives the average time between years with a given amount of bluff retreat. The inverse of the recurrence interval is the statistical probability that a given amount of bluff retreat will occur (or be exceeded) in any given year.

The total risk to bluff-top development, which includes both long-term bluff retreat and slope failure, can be calculated by multiplying the probability of slope failure at a given position by the probability that bluff retreat will reach that point by a given time. The geotechnical and planning communities will need to establish what is an acceptable probability, or risk, that the bluff will reach a given point in order to de

velop setback criteria. Once that probability is established, the setback line can be defined as the locus of points on the bluff top at that probability.

A prime difficulty in applying probabilistic methods to assessing coastal erosion risk will be the difficulty in acquiring sufficiently rich data sets with which to work. More effort is needed at acquiring long, precise data sets on coastal erosion in a variety of geologic conditions throughout the state.

Acknowledgements

This paper grew out of the need to clarify and make public the analytic methods of Coastal Commission staff in evaluating proposals for bluff-top development. As such, the ideas presented here grew out of numerous discussions with various members of the Commission staff, especially Lesley Ewing and others on the Shoreline Erosion Task Force, and with members of the geotechnical and coastal geology community at large. The State of California provided support to develop this paper, and the manuscript benefited from critical reviews by Ralph Faust, Sandy Goldberg, and Amy Roach.

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CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

May 26, 2016

Eric Stevens
Coastal Program Analyst II
California Coastal Commission
7575 Metropolitan Drive, Suite 103
San Diego, CA 92108

Re: A-6-ENC-13-0210/Lindtrom
132 Neptune Avenue, Encinitas

Dear Eric:

I write in response to your email dated April 22, 2016. The standard of review for this appeal is the Encinitas certified LCP, and the grounds for the appeal are statutorily limited to an allegation that the development does not conform to the standards set forth in the LCP. Public Resources Code §30603(b)(1). For new bluff top homes, the Encinitas LCP requires a 40-foot setback, supported by a site-specific soils report that meets certain criteria. Encinitas Municipal Code §30.34.020. Essentially, the report must contain a qualified engineer's certification that the home will be safe as proposed and not contribute to bluff instability or give rise to the need for bluff retention devices.

Contrary to the statement in your April 22 email, the LCP **does not** require a setback that is the 1.5 factor of safety line plus 30 years of erosion at 0.49 feet per year. This methodology is not part of the Encinitas LCP. We recognize that the Commission's staff geologist opined in his January 2003 memorandum that bluff edge setbacks should be generally calculated in this manner. However, we respectfully disagree with Dr. Johnsson's opinions in this regard; especially since he has not conducted any site-specific examination for this property. Not only is Dr. Johnsson's controversial methodology inconsistent with the Encinitas LCP, it is also contrary to the California Building Code. See, e.g., 24 CCR, Part 2, 1808.7.2. Moreover, it imposes an exaggerated and unnecessarily large setback that "takes" more than half of the Lindstrom's property.

As explained by Mr. Crampton, there is no engineering basis or need for such a large setback in this case. Mr. Crampton's opinions are based on site-specific data and analysis and his more than 40 years' of engineering experience along the San Diego coastline. In his detailed and well-reasoned report, another copy of which is attached hereto for convenience, Mr. Crampton certifies that the home will be "perfectly safe for at least 75 years, and will not require a seawall or other bluff stabilization structure during this time." Mr. Crampton also certifies "without hesitation" that the development "will have no adverse affect on the stability of the bluff, will not endanger life or property, and is expected to be reasonably safe from failure and erosion over its lifetime (75 years) without having to propose any shore or bluff stabilization to protect the structure in the future." This certification completely satisfies the LCP requirements.

If Commission Staff disagrees with Mr. Crampton's opinions and certification, please inform us in writing of the specific objections and provide the supporting data so that we may analyze them ahead of the hearing. Lastly, we also take issue with Staff's imposition of an erosion rate of 0.49 feet/year for this site. This rate is not supported by the collected data. Please provide us with your data in support of this erosion rate.

In conclusion, given that the LCP is the standard of review and that the Lindstrom home meets these standards, the appeal initiated by Commissioner Shallenberger and former Commissioner Sanchez lacks merit. Therefore, we respectfully request a staff recommendation for no substantial issue and a recommendation that the appeal be denied.

Sincerely yours,

Jon Corn

cc: Jim Lindstrom
Walt Crampton

Enclosure

TerraCosta
Consulting Group
Geotechnical Engineering
Coastal Engineering
Maritime Engineering

Project No. 2873
October 23, 2015

Mr. Eric Stevens
CALIFORNIA COASTAL COMMISSION
7575 Metropolitan Drive, Suite 103
San Diego, California 92108

COASTAL BLUFF STABILITY ANALYSIS
132 NEPTUNE AVENUE
ENCINITAS, CALIFORNIA

REFERENCE: A-6-ENC-13-0210, LINDSTROM APPEAL

Dear Mr. Stevens:

As requested by Jim and Karla Lindstrom, TerraCosta Consulting Group, Inc. (TerraCosta) has completed a coastal bluff stability analysis for the property located at 132 Neptune Avenue in Encinitas, California. It is our understanding that the development approved by the City of Encinitas consists of a new single-family residence and associated improvements on an existing vacant legal lot. We also understand that construction will consist of a new two-story, 3,535 square foot home over a 1,355 square foot basement with a 950 square foot garage, and will be constructed of conventional building materials using a standard foundation system. Geotechnical Exploration, Inc. (GEI) completed a geotechnical investigation and report for the project in December 2012.

SCOPE OF WORK

Our work consisted of:

- A site reconnaissance of the property;
- Review of the geotechnical report prepared by GEI titled, "Report of Preliminary Geotechnical Investigation and Coastal Bluff Stability Evaluation, Lindstrom Residential Property, 132 Neptune Avenue, Encinitas, California," dated December 5, 2012;

- Review of City Resolution No. PC2013-09, Case No. 12-201CDP;
- Review of California Coastal Commission Appeal from Coastal Permit Decision of Local Government dated June 6, 2013;
- Review of available published maps, reports, and photographs pertaining to the project and site area;
- Perform a geotechnical site characterization to assign soil strengths representative of the site geology;
- Perform stability analyses using the computer program *GSTABL7* at two locations, shown on Figure 1; and
- Evaluate coastal bluff erosion rates in compliance with City and Coastal Commission criteria for assessing bluff-top setbacks.

GEOLOGIC STABILITY

The City of Encinitas Local Coastal Program (LCP) requires that new structures and improvements be located at least 40 feet from the bluff edge, and that a site-specific geotechnical report be prepared certifying that the proposed development will have no adverse effect on bluff stability, will not endanger life or property, and that the proposed structure "is expected to be reasonably safe from failure or erosion over its lifetime without having to propose any shore or bluff stabilization to protect the structure in the future."

Geotechnical Site Characterization

While much of the reported data in GEI's December 2012 geotechnical investigation is useful, we find certain inconsistencies in the reported soil strengths and geologic characterization, particularly the soil strengths of the various reported units. These assumed soil strengths also result in unreasonable calculated slope failure geometries, with calculated failures passing through the cliff-forming Torrey Sandstone the result of unreasonably low soil strengths within the Eocene-age Torrey Sandstone. Moreover, GEI reports the upper 10 to 15 feet of the terrace deposits as containing iron oxide

cementation, with these upper deposits inclined at an inclination of about 45 degrees near the top of the bluff, with reported soil strengths having a friction angle of 33 degrees and a cohesion intercept of 300 psf. The middle portion of the bluff, below the upper 15 feet, is at an inclination ranging from 38 to 48 degrees, a condition that would indicate less soil cohesion, yet GEI reports both a higher friction angle and cohesion intercept for the lower terrace unit (φ = 38 degrees and C = 350 psf).

GEI also assigns cohesion of 450 psf and a friction angle of 48 degrees for the cliff-forming Eocene-age Torrey Sandstone, which, as indicated by the results of their stability analyses, results in hypothetical failure geometries exiting the toe of the slope near the base of the Torrey Sandstone. This, of course, is an unreasonable site characterization resulting from unreasonable soil strengths.

The coastal terrace deposits throughout virtually the entire San Diego north county are capped by an approximately 10-foot-thick iron oxide-cemented residual clayey sand deposit. This upper Bay Point erosion-resistant capping material, formed by the concentration of clayey weathering products, secondary oxides of iron and aluminum, and leached and re-precipitated salts is the result of long exposure to the elements during a period of tropical to temperate climate. This upper 10± foot cap is easily visible in aerial photographs (for example, in Image 201312144 on the California Coastal Records Project website at www.californiacoastline.org). This iron oxide-cemented cap is often also referred to as a beach ridge deposit and known to be significantly less friable, with reported shear strengths with friction angles on the order of 33 degrees and cohesion intercepts of about 600 psf. Notably, it is the increased cohesion in this upper unit that allows the near-vertical more erosion-resistant exposures near the top of the bluff. As a practical matter, in order to sustain this steeper section of upper-bluff slope, this subunit must have a higher cohesion than the lower section of terrace deposits.

The U.S. Army Corps of Engineers, in their Encinitas and Solana Beach Shoreline Feasibility Study, reported soil strengths for the terrace deposits as having a friction angle of 33 degrees, a cohesion intercept of 300 psf, and a total soil density of 120 pcf. TerraCosta has also conducted numerous geotechnical investigations along the Encinitas and Solana Beach coastline, including several back-calculations on recent slope failures, developing similar strengths for the terrace deposits. Recognizing that geomorphically, the Bay Point Formation, which was laid down after the last high still stand about

120,000 years ago, tends to exhibit relatively uniform soil properties along the Encinitas/Solana Beach coastline.

TerraCosta's in-house data indicates the following soil strengths for the Encinitas/Solana Beach geologic profile:

Upper Beach Ridge Deposits:	$\varphi = 33$ degrees
	$c = 600$ psf
	$\gamma_t = 120$ pcf
Mid-Bluff Terrace Deposits:	$\varphi = 33$ degrees
	$c = 300$ psf
	$\gamma_t = 120$ pcf

Throughout the Encinitas/Solana Beach shoreline, the lower cliff-forming geologic units, all Eocene in age, consist of the Santiago Formation exposed north of the 700 block of Neptune Avenue; the Torrey Sandstone, which is exposed down to E Street in Encinitas 1,200 feet southerly of Moonlight State Beach; and the Delmar Formation, extending down to San Elijo Lagoon. The Eocene-age cliff-forming unit in Solana Beach is entirely Torrey Sandstone.

The geologic structure of the Encinitas/Solana Beach coastline is the result of faulting and folding in the current tectonic regime, which began approximately 5 million years ago when the Gulf of California began to open in association with renewed movement on the San Andreas fault system (Fisher and Mills, 1991). Movement along the fault appears to have caused gentle folding on the coastal side of the fault, which has resulted in a small southeast dip in the Eocene-age formation, thus exposing progressively older formations northerly along the coast. Interestingly, all three of these Eocene-age geologic units exhibit similar erosion resistance, and hence the fairly linear Encinitas shoreline. Since erosion resistance is generally a function of unconfined compressive strength, the linearity of the Encinitas shoreline would suggest that all three of these Eocene-age cliff-forming geologic units have similar unconfined compressive strengths. The limited testing performed by TerraCosta would suggest that, for the Torrey Sandstone, reasonable soil strengths would include a friction angle of 35 degrees and a cohesion intercept of 3,500 psf.

Gross Stability

We performed a stability analysis of the bluff at two different locations using the computer program GSTABL7. Based on our analysis, the stability of the bluff, in its current configuration, was determined to have a current factor of safety of 1.32 at Section 1 located on the north side of the lot, and a current factor of safety of 1.29 for Section 2 located on the south side of the lot. For Section 1, the intercept of the ground failure was determined to be 7 feet behind the face of the bluff, and 9 feet behind the face of the bluff for Section 2. As part of our work, we calculated the intercept for both sections where a failure would occur using a factor of safety of 1.5. For Section 1, the ground intercept was determined to be located at 22.5 feet behind the face of the bluff. For Section 2, the ground intercept for a factor of safety of 1.5 was determined to be located 24.5 feet behind the face of the bluff. Our stability analysis calculations are presented in Appendix A.

Determination of Erosion Rates

As part of our work, we also reviewed our in-house files, along with available published and unpublished documents, to assist us in determining the rates of erosion along this reach of the coastline. Documents reviewed include the U.S.G.S. Open File Report 2006-1219 - National Assessment of Shoreline Change, Part 3, Historical Shoreline Change and Associated Coastal Land Loss Along Sandy Shorelines of the California Coast (Hapke, et al., 2006), and U.S.G.S. Open File Report 2007-1133 – National Assessment of Shoreline Change, Part 4, Historical Coastal Cliff Retreat Along the California Coast (Hapke, et al., 2007). Based on our review of these reports, average rates of erosion were determined to be 0.33 feet for the Oceanside Littoral Cell OFR 2006-1219 Table 6C. We understand that these are averaged rates along various reaches of the California coastline, and may not be reflective of the local rate of erosion or bluff retreat. Based on our own studies of the Encinitas shoreline, we have recognized that bluff geology, faulting, and groundwater play a significant role in the rate of bluff retreat locally. While studies indicate that the Torrey Sandstone can experience a higher rate of erosion due to abrasion versus the Ardath Formation to the north and the Delmar Formation to the south, both the Ardath and Delmar Formations have been weakened locally by faulting, resulting in locally higher rates of erosion. Studies have indicated that the interception of groundwater migration from inland can cause increased erosion

along faults and fractures and, over time, that will result in spring sapping and local block failures, resulting in failures of the upper-bluff terrace deposits. This failure mechanism does not appear to affect those coastal bluffs that are comprised of the more permeable Torrey Sandstone. This faulting accounts for the rates of erosion being higher south of Moonlight Beach and in the 700 and 800 blocks of Neptune Avenue to the north.

Based on our review of documents and experience along this reach of the coastline, 0.4 feet per year is a conservative estimate for bluff retreat for the calculation of setbacks. Using this rate would result in a minimum setback for bluff retreat of 30 feet over a 75-year period.

We understand that California Coastal Commission Staff has indicated concern regarding seawalls that have been constructed along this reach of the coastline, specifically fronting 164 and 172 Neptune Avenue to the north. Many of the homes that are currently protected by those seawalls were constructed in the 1970s, when setback requirements were on the order of 25 feet, or less with a variance. A review of the Google Earth image for 164 Neptune Avenue suggests that the house is on the order of 23 feet from the top of the bluff, and that the house at 172 Neptune Avenue is on the order of 21 feet from the top of the bluff. A review of other properties further north indicates that many of those properties requiring a coastal protective structure may even be closer to the top of the bluff.

Our review of these protective devices also indicates that they were likely constructed to mitigate and infill notching of the lower bluff, which is currently not observable at your location.

OPINIONS AND CERTIFICATION

Based on our investigations, research and review of documents, it is our opinion, and we would and do certify, that your proposed development, as approved by the City of Encinitas, will have no adverse affect on the stability of the bluff, will not endanger life or property, and is expected to be reasonably safe from failure and erosion over its lifetime (75 years) without having to propose any shore or bluff stabilization to protect the proposed structure in the future.

TerraCosta Consulting Group

The California Building Code requires that structures be sited behind the 1.5 factor of safety at the time of construction. Based on our analysis, the 1.5 factor of safety line exists on your property between 23 and 25 feet from the top of bluff. However, the City of Encinitas LCP (Coastal Bluff Overlay Zone, EMC §30.34.020) requires a minimum setback of 40 feet from the bluff edge. Your proposed residence is at least 40 feet from the top of bluff. Therefore, under either standard, we believe your structure is both safe and legal under the California Building Code and the City's LCP, and that no design changes are required.

As stated above, we are also under the firm opinion that the proposed structure will be reasonably safe from failure and erosion over its lifetime without the need for any shore or bluff stabilization structures. In 75 years, the factor of safety at the most seaward reach of the proposed structure will be above 1.29. This is because the minimum factor of safety of the existing bluff is 1.29 per Section 2 (1.32 at Section 1). However, this factor of safety of 1.29 exists along the top of the bluff about 9 feet behind the face of the bluff. If we were to now assume 30 feet of erosion essentially translating the existing coastal bluff profile 30 feet landward, or 39 feet from the existing top-of-bluff along Section 2, this would mean that in 75 years, the actual computed factor of safety 1 foot westerly of the 40-foot setback would be 1.29, and slightly greater when calculated at the existing 40-foot setback.

In our opinion, the proposed structure will be perfectly safe for at least 75 years, and will not require a seawall or other bluff stabilization structure during this time. Structures are stable as long as the factor of safety is 1.0 or greater. A 1.29 factor of safety implies a 29 percent safety margin against collapse. It is for this reason that the Coastal Commission does not typically approve seawalls unless the factor of safety at the structure is less than 1.2 and other instability factors are present. There is no engineering reason that a 75-year-old structure near the end of its useful life would be required to have a factor of safety in excess of 1.29 in order to be considered safe. For this reason, we certify without hesitation that the proposed structure will be reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the proposed structure in the future.

LIMITATIONS

Geotechnical engineering and the earth sciences are characterized by uncertainty. Professional judgments presented herein are based partly on our evaluation of the technical information gathered, partly on our understanding of the proposed construction, and partly on our general experience in the field of coastal engineering. Our engineering work and judgments rendered meet the current professional standards. We do not guarantee the performance of the project in any respect.

We have investigated only a small portion of the pertinent soil, rock, and groundwater conditions of the subject site. The opinions and conclusions made herein were based on the assumption that those rock and soil conditions do not deviate appreciably from those encountered during our investigation. We recommend that a soil engineer from our office observe construction to assist in identifying soil conditions that may be significantly different from those encountered in our borings. Additional recommendations may be required at that time.

We appreciate the opportunity to be of service and trust this information meets your needs. If you have any questions, please give us a call.

Very truly yours,

TERRACOSTA CONSULTING GROUP, INC.

Walter F. Crampton, Principal Engineer
R.C.E. 23792, R.G.E. 245

Gregory A. Spaulding, Project Geologist
P.G. 5892, C.E.G. 1863

WFC/GAS/jg
Attachments

cc: Jim and Karla Lindstrom
Jon Corn, Esq.

TerraCosta Consulting Group

RESOLUTION NO. PC 2013-

A RESOLUTION OF THE CITY OF ENCINITAS PLANNING COMMISSION APPROVING A COASTAL DEVELOPMENT PERMIT TO ALLOW FOR THE CONSTRUCTION OF A NEW SINGLE-FAMILY RESIDENCE WITH A SECOND STORY DECK ELEMENT WHICH CANTILEVERS 8 FEET INTO THE 40-FOOT BLUFF SETBACK, SHORING PLAN, TEMPORARY CONSTRUCTION TRAILER AND ASSOCIATED IMPROVEMENTS, FOR THE PROPERTY LOCATED AT 132 NEPTUNE AVENUE.

(CASE NO. 12-201 CDP; APN: 256-371-14)

WHEREAS, a request for consideration of a Coastal Development Permit was filed by James and Karla Lindstrom to allow for the construction of a single-family residence, shoring plan, temporary construction trailer and associated improvements in accordance with Chapter 30.80 (Coastal Development Permit) and Section 30.34.020 (Coastal Bluff Overlay Zone) of the Encinitas Municipal Code, for the property located in the Residential 8 (R-8) zoning district, the Coastal Bluff Overlay Zone and the Coastal Appeal Zone of the California Coastal Commission in the community of Old Encinitas of the City of Encinitas, legally described as:

LOT 11, BLOCK "A" SEASIDE GARDENS, IN THE CITY OF ENCINITAS, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 1800, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, AUGUTS 6, 1924.

EXCEPTING THEREFROM ANY PORTION NOW OR HERETOFORE LYING BELOW THE MEAN HIGH TIDE LINE OF THE PACIFIC OCEAN.

WHEREAS, the Planning Commission conducted a noticed public hearing on the application on May 2, 2013, at which time all those desiring to be heard were heard; and

WHEREAS, the Planning Commission considered, without limitation:

1. The May 2, 2013 agenda report to the Planning Commission with attachments; and

2. The General Plan, Local Coastal Program, Municipal Code, and associated Land Use Maps; and

3. Written and oral evidence submitted at the hearing; and

4. Project drawings stamped received by the City on March 14, 2013, consisting of 15 sheets, including title sheet/site plan (Sheet C1), factor of safety site plan (Sheet C2), existing floor plan (Sheets A1, A2 and A3), exterior elevations and sections (Sheets A4, A5 and A6), topographical survey (Sheets SUV-1 and SUV-2), shoring plan (Sheets SH1 – SH4) and landscape plan (Sheet L1), all designated as

approved by the Planning Commission on May 2, 2013, and shall not be altered without express authorization by the Planning and Building Department; and

WHEREAS, the Planning Commission made the following findings pursuant to Section 30.80.090 (Coastal Development Permit) of the Encinitas Municipal Code:

(SEE ATTACHMENT "A")

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission of the City of Encinitas hereby approves application Case No. 12-201 CDP subject to the following conditions:

(SEE ATTACHMENT "B")

BE IT FURTHER RESOLVED that the Planning Commission, in its independent judgment, finds that this project is categorically exempt from environmental review pursuant to Section 15303(a) which exempts the construction of single-family residence.

PASSED AND ADOPTED this 2nd day of May, 2013, by the following vote, to wit:

AYES:

NAYS:

ABSENT:

ABSTAIN:

_____
Jo Ann Shannon, Chair of the
Encinitas Planning Commission

ATTEST:

_____
Jeff Murphy
Secretary

NOTE: This action is subject to Chapter 1.04 of the Municipal Code, which specifies time limits for legal challenges.

ATTACHMENT "A"
Resolution No. PC 2013-
Case No. 12-201 CDP

FINDINGS FOR A COASTAL DEVELOPMENT PERMIT

STANDARD: Section 30.80.090 of the Municipal Code provides that the authorized agency must make the following findings of fact, based upon the information presented in the application and during the Public Hearing, in order to approve a coastal development permit:

1. The project is consistent with the certified Local Coastal Program of the City of Encinitas; and

2. The proposed development conforms with Public Resources Code Section 21000 and following (CEQA) in that there are no feasible mitigation measures or feasible alternatives available which would substantially lessen any significant adverse impact that the activity may have on the environment; and

3. For projects involving development between the sea or other body of water and the nearest public road, approval shall include a specific finding that such development is in conformity with the public access and public recreation policies of Section 30200 et. seq. of the Coastal Act.

Facts: The applicant requests approval of a Coastal Development Permit for the construction of a new single-family residence, shoring plan, temporary construction trailer and associated improvements on the Coastal Bluff in the Old Encinitas Community Area of the City of Encinitas. The project proposes a single-family home consisting of 3,553 square feet of area, including a basement of 1,355 square feet. A 950-square foot four car garage is also proposed with this application. Pursuant to Section 30.34.020C1 of the Municipal Code, a second story cantilevered portion of a structure is permitted to encroach 20% beyond the bluff edge setback if demonstrated through standard engineering practices not to create an unnecessary surcharge load upon the bluff area and if a finding can be made that no public or private views would be significantly impacted by the construction of the cantilevered portion of the structure. The new residence also includes a second story deck element cantilevered 8 feet into the 40-foot bluff edge setback. The building is a contemporary beachfront home design, including extensive glass glazing and art glass details, stone veneer, copper roof, and copper clad windows. Improvements are proposed within the 40-foot bluff setback area, including planter walls and a small concrete pad for future above ground spa all on pier footings. A 30-inch high glass rail fence is shown adjacent to the bluff, setback 5 feet from the bluff edge. Hardscape, along with planter walls are shown within the front yard setback.

Discussion: The improvements listed above are consistent with the R-8 zoning standards outlined in Chapter 30.16 (Residential Zones) and requirements contained in Section 30.34.020 (Coastal Bluff Overlay Zone) of the Encinitas Municipal Code (EMC). The setbacks shown on the site plan include 20 feet for the front yard setback and 10 feet on

the south sideyard and 5 feet on the north sideyard. As outlined in the "Report of Preliminary Geotechnical Investigation and Coastal Bluff Stability Evaluation" received by the City on February 8, 2013, the appropriate setback distance from the bluff edge with a 1.5 factor of safety plus a 75 year estimated erosion rate was determined to be 29 feet from bluff edge by Geotechnical Exploration, Inc. However, the minimum coastal bluff edge setback is 40 feet as required per Section 30.34.020 of the Encinitas Municipal Code. The proposed single-family residence is setback 40 feet, with an 8-foot cantilevered deck shown off the rear of the home into the 40-foot bluff set back (also permissible per Section 30.34.020 of the EMC). Shoring beams are also proposed along the west edge of the proposed single-family dwelling due to the proposed excavation of the basement. The bluff fronting the subject property does not currently have (nor is it proposed at this time) any form of shoreline armoring.

Geopacifica, Inc. (the City's Third Party Geotechnical Engineering firm) has reviewed the proposed project and Preliminary Geotechnical Investigation and Coastal Bluff Stability Evaluation report prepared by Geotechnical Exploration, Inc. Geopacifica, Inc. concurs that the reports are in conformance with City of Encinitas Municipal Code requirements. The project as designed could be removed in the event of endangerment and the property owner has been conditioned herein (Specific Condition of Approval SCD) to participate in any comprehensive plan adopted by the City to address coastal bluff recession and shoreline erosion problems in the City.

Related to finding No. 1, the project complies with or is conditioned to comply with the City's Local Coastal Program and the Municipal Code. Related to finding No. 2, the project is exempt from the California Environmental Quality Act (CEQA) Guidelines pursuant to Section 15303(a). Finding No. 3, the project is in conformity with the public access and public recreation policies of Section 30200 et. seq. of the Coastal Act, and, based on the City's Third Party Geotechnical review, complies with the City's Municipal Code requirements as designed. No direct public access is available through the property as it is an interior lot along the west side of Neptune Avenue with no direct access to the beach. Public access to the shore is available in the near vicinity at Stone Steps beach access.

Conclusion: The Planning and Building Department finds that 1) the Coastal Development Permit complies with the City's Local Coastal Plan including policies of the General Plan and Municipal Code requirements, and all other applicable development and design standards; 2) no potentially significant adverse impacts to the environment will result from the project and the project is exempt from environmental review pursuant to the California Environmental Quality Act (CEQA) Guidelines; and 3) finding No. 3, the project is in conformity with the public access and public recreation policies of Section 30200 et. seq. of the Coastal Act. No direct public access is available through the property as it is an interior lot along the west side of Neptune Avenue with no direct access to the beach.

ATTACHMENT "B"
Resolution No. PC 2013-
Case No. 12-201 CDP

Applicant: Jim and Karla Lindstrom

Location: 132 Neptune Avenue (APN: 256-371-14)

This approval is subject to the following **conditions:**

SC1 **SPECIFIC CONDITIONS:**

SC2 At any time after two years from the date of this approval, May 2, 2015 at 5:00 P.M., or the expiration date of any extension granted in accordance with the Municipal Code, the City may require a noticed public hearing to be scheduled before the authorized agency to determine if there has been demonstrated a good faith intent to proceed in reliance on this approval. If the authorized agency finds that a good faith intent to proceed has not been demonstrated, the Coastal Development Permit shall be deemed expired as of the above date (or the expiration date of any extension). The determination of the authorized agency may be appealed to the City Council within 15 days of the date of the determination as listed on this Permit.

SC5 This project is conditionally approved as set forth on the application and project drawings stamped received by the City on March 14, 2013, consisting of 15 sheets, including title sheet/site plan (Sheet C1), factor of safety site plan (Sheet C2), site plan floor plans (Sheets A1, A2 and A3), exterior elevations and sections (Sheets A4, A5 and A6), topographical survey (Sheets SUV-1 and SUV-2), shoring plan (Sheets SH1 – SH4) and landscape plan (Sheet L1), all designated as approved by the Planning Commission on May 2, 2013, and shall not be altered without express authorization by the Planning and Building Department.

SCA The following conditions shall be included on the building and/or grading plans and performed to specification of the Engineering Services Department:

1. As shown on the CDP site plan the applicant shall design and construct post construction BMP/IMP facilities to collect and treat all runoff generated by all new impervious surfaces including roof, hardscape, and driveways. Because of the proximity to the bluff, these facilities shall prohibit or limit infiltration. Additionally, all runoff shall drain to Neptune Avenue and no runoff shall be permitted to drain over the face of the bluff.

2. Per SDRSD G-16 driveway standards, the driveway apron curbcut shall be a maximum of 40% of the property frontage with a minimum driveway size of 12'.

3. The applicant shall provide an ADA compliant pedestrian ramp to allow for pedestrian traffic to cross from that corner to the west side of Neptune. The pedestrian ramp may be designed in conjunction with the proposed driveway as shown on the CDP site plan.
4. Any existing public improvements along the property frontage that are damaged during construction shall be repaired or removed and replaced to the satisfaction of the Engineering Inspector.

5. This project proposes shoring for the construction of the basement. The shoring shall be designed and permitted on an approved grading plan by the Engineering Department.

SCB The following conditions shall be satisfied prior to building permit issuance to the satisfaction of the San Dieguito Water District (SDWD):

1. The subject property is currently not being served. The fire department requires fire sprinklers for the new development. The owner/applicant will need to have installed the meter and service at his expense. The district will require that water meters be located in front of the parcel they are serving and outside of any existing or proposed travel way.

2. The owner/applicant will be required to show all existing and proposed water facilities on improvement or grading plans for District approval.

SCC The owner/applicant shall provide a letter in writing stating that "the building as designed could be removed in the event of endangerment, and the property owner agrees to participate in any comprehensive plan adopted by the City to address coastal bluff recession and shoreline erosion problems in the City". This letter shall be provided to the Planning and Building Department prior to building permit issuance.

SCD All landscaping plant materials proposed shall be of native species appropriate for coastal bluff application.

SCE No permanent irrigation shall be allowed within the 40-foot bluff setback.

SCF No continuous footing shall be allowed within the 40-foot bluff setback.

SCG An open space easement shall be executed and recorded to the satisfaction of the Planning and Building Department to conserve the coastal bluff face between the coastal bluff edge and the most westerly property line. Said coastal bluff conservation action shall prohibit the alteration of land forms, removal of vegetation, or the removal/erection of structures of any type except as permitted herein and/or by written authorization by the City of Encinitas Planning and Building Department. This does not preclude the exercise of emergency measures as directed and authorized by the City of Encinitas Planning and Building Department and California Coastal Commission in accordance with Section 30.34.0202B2 of the Encinitas Municipal Code. Said open space easement shall be clearly depicted on the plans submitted for building and grading permit issuance in reliance on this approval to the satisfaction of the Planning and Building Department and

Engineering Services Department and shall be recorded prior to issuance of said building and grading permits.

G1 **STANDARD CONDITIONS:**

CONTACT THE PLANNING DEPARTMENT REGARDING COMPLIANCE WITH THE FOLLOWING CONDITIONS:

G2 This approval may be appealed to the City Council within 15 calendar days from the date of this approval in accordance with Chapter 1.12 of the Municipal Code.

G3 This project is located within the Coastal Appeal Zone and may be appealed to the California Coastal Commission pursuant to Coastal Act Section 30603 and Chapter 30.04 of the City of Encinitas Municipal Code. An appeal of the Planning Commission's decision must be filed with the Coastal Commission within 10 days following the Coastal Commission's receipt of the Notice of Final Action. Applicants will be notified by the Coastal Commission as to the date the Commission's appeal period will conclude. Appeals must be in writing to the Coastal Commission, San Diego Coast District office.

G4 Prior to **building permit issuance**, the owner shall cause a covenant regarding real property to be recorded. Said covenant shall set forth the terms and conditions of this grant of approval and shall be of a form and content satisfactory to the Planning and Building Director. The Owner(s) agree, in acceptance of the conditions of this approval, to waive any claims of liability against the City and agrees to indemnify, hold harmless and defend the City and City's employees relative to the action to approve the project.

G7 Prior to issuing a final inspection on framing, the applicant shall provide a survey from a licensed surveyor or a registered civil engineer verifying that the building height is in compliance with the approved plans. The height certification/survey shall be supplemented with a reduced (8 ½" x 11") copy of the site plan and elevations depicting the exact point(s) of certification. The engineer/surveyor shall contact the Planning and Building Department to identify and finalize the exact point(s) to be certified prior to conducting the survey.

G5 Approval of this request shall not waive compliance with any sections of the Municipal Code and all other applicable City regulations in effect at the time of Building Permit issuance unless specifically waived herein.

G12 Prior to any use of the project site pursuant to this permit, all conditions of approval contained herein shall be completed or secured to the satisfaction of the Planning and Building Department.

G13 The applicant shall pay development fees at the established rate. Such fees may include, but not be limited to: Permit and Plan Checking Fees, Water and Sewer Service Fees, School Fees, Traffic Mitigation Fees, Flood Control Mitigation Fees, Park Mitigation Fees, and Fire Mitigation/Cost Recovery Fees. Arrangements to pay these fees shall be made prior to **building permit issuance** to the satisfaction of the Planning and Building and Engineering

Services Departments. The applicant is advised to contact the Planning and Building Department regarding Park Mitigation Fees, the Engineering Services Department regarding Flood Control and Traffic Fees, applicable School District(s) regarding School Fees, the Fire Department regarding Fire Mitigation/Cost Recovery Fees, and the applicable Utility Departments or Districts regarding Water and/or Sewer Fees.

G19 Garages enclosing required parking spaces shall be kept available and usable for the parking of owner/tenant vehicles at all times, and may not be rented or conveyed separately from the appurtenant dwelling unit.

BL1 Owner(s) shall enter into and record a covenant satisfactory to the City Attorney waiving any claims of liability against the City and agreeing to indemnify and hold harmless the City and City's employees relative to the approved project. This covenant is applicable to any bluff failure and erosion resulting from the development project.

BL4 An "as-built geotechnical report", reviewed and signed by both the soils/geotechnical engineer and the project engineering geologist, shall be completed and submitted to the City within 15 working days after completion of the project. The project shall not be considered complete (and thereby approved for use or occupancy) until the as-built report is received and the content of the report is found acceptable by the Planning and Building and Engineering Services Departments.

B1 **BUILDING CONDITION:**

CONTACT THE ENCINITAS BUILDING DIVISION REGARDING COMPLIANCE WITH THE FOLLOWING CONDITION:

B2R The applicant shall submit a complete set of construction plans to the Building Division for plancheck processing. The submittal shall include a Soils/Geotechnical Report, structural calculations, and State Energy compliance documentation (Title 24). Construction plans shall include a site plan, a foundation plan, floor and roof framing plans, floor plan(s), section details, exterior elevations, and materials specifications. Submitted plans must show compliance with the latest adopted editions of the California Building Code (The Uniform Building Code with California Amendments, the California Mechanical, Electrical and Plumbing Codes). These comments are preliminary only. A comprehensive plancheck will be completed prior to permit issuance and additional technical code requirements may be identified and changes to the originally submitted plans may be required.

F1 **FIRE CONDITIONS:**

CONTACT THE ENCINITAS FIRE DEPARTMENT REGARDING COMPLIANCE WITH THE FOLLOWING CONDITIONS:

F7 **RESPONSE MAPS:** Any new development, which necessitates updating of emergency response maps by virtue of new structures, hydrants, roadways or similar features, shall be required to provide map updates in one of the following formats (AutoCad DWG,

DXF, ESRI shapefile, ESRI personal geodatabase, or XML format) and shall be charged a reasonable fee for updating all response maps.

F13 **ADDRESS NUMBERS:** Approved numbers and/or addresses shall be placed on all new and existing buildings and at appropriate additional locations as to be plainly visible and legible from the street or roadway fronting the property from either direction of approach. Said numbers shall contrast with their background, and shall meet the following minimum standards as to size: 4" high with a 3/8" stroke for residential buildings, 8" high with a ½" stroke for commercial and multi-family residential buildings, 12" high with a 1" stroke for industrial buildings. Additional numbers shall be required where deemed necessary by the Fire Marshal, such as rear access doors, building corners, and entrances to commercial centers.

F15A **AUTOMATIC FIRE SPRINKLER SYSTEM-ONE AND TWO FAMILY DWELLINGS: Structures shall be protected** by an automatic fire sprinkler system designed and installed to the satisfaction of the Fire Department. Plans for the automatic fire sprinkler system shall be approved by the Fire Department prior to the issuance of building permit(s).

F17 **SMOKE DETECTORS/FIRE SPRINKLER SYSTEMS:** Smoke detectors/fire sprinklers shall be inspected by the Encinitas Fire Department.

F18 **CLASS "A" ROOF:** All structures shall be provided with a Class "A" Roof covering to the satisfaction of the Encinitas Fire Department.

F21 **SOLAR PHOTOVOLTAIC INSTALLATIONS (Solar Panels):** Solar Photovoltaic systems shall be installed per Encinitas Fire Department installation guidelines.

F22 **Basement:**

- All basements shall be designed and equipped with emergency exit systems consisting of operable windows, lightwells or exit door that's leads directly outside via staircase and exit door or exit door at grade.

- Lightwells that intrude into side yard or backyard setbacks of five feet or less, shall require a hinged grating covering the lightwell opening. The grating shall be capable of supporting a weight of 250lb person; yet must be able to be opened by someone of minimal strength with no special knowledge, effort or use of key or tool. Any modification of previously approved plans related to this condition shall be subject to re-submittal and review by City staff (Fire, Building, Planning).

E1 **ENGINEERING CONDITIONS:**

CONTACT THE ENGINEERING SERVICES DEPARTMENT REGARDING COMPLIANCE WITH THE FOLLOWING CONDITION(S):

E2 All City Codes, regulations, and policies in effect at the time of building/grading permit issuance shall apply.

E3 All drawings submitted for Engineering permits are required to reference the NAVD 88 datum; the NGVD 29 datum will not be accepted.

EG1 **Grading Conditions**

EG3 The developer shall obtain a grading permit prior to the commencement of any clearing or grading of the site.

EG4 The grading for this project is defined in Chapter 23.24 of the Encinitas Municipal Code. Grading shall be performed under the observation of a civil engineer whose responsibility it shall be to coordinate site inspection and testing to ensure compliance of the work with the approved grading plan, submit required reports to the Engineering Services Director and verify compliance with Chapter 23.24 of the Encinitas Municipal Code.

EG5 No grading shall occur outside the limits of the project unless a letter of permission is obtained from the owners of the affected properties.

EG6 Separate grading plans shall be submitted and approved and separate grading permits issued for borrow or disposal sites if located within the city limits.

EG7 All newly created slopes within this project shall be no steeper than 2:1.

EG8 A soils/geological/hydraulic report (as applicable) shall be prepared by a qualified engineer licensed by the State of California to perform such work. The report shall be submitted with the first grading plan submittal and shall be approved prior to issuance of any grading permit for the project.

EG9 Prior to hauling dirt or construction materials to any proposed construction site within this project the developer shall submit to and receive approval from the Engineering Services Director for the proposed haul route. The developer shall comply with all conditions and requirements the Engineering Services Director may impose with regards to the hauling operation.

EG10 In accordance with Section 23.24.370 (A) of the Municipal Code, no grading permit shall be issued for work occurring between October 1st of any year and April 15th of the following year, unless the plans for such work include details of protective measures, including desilting basins or other temporary drainage or control measures, or both, as may be deemed necessary by the field inspector to protect the adjoining public and private property from

damage by erosion, flooding, or the deposition of mud or debris which may originate from the site or result from such grading operations.

ED1 **Drainage Conditions**

ED2A An erosion control system shall be designed and installed onsite during all construction activity. The system shall prevent discharge of sediment and all other pollutants onto adjacent streets and into the storm drain system. The City of Encinitas Best Management Practice Manual shall be employed to determine appropriate storm water pollution control practices during construction.

ED3 A drainage system capable of handling and disposing of all surface water originating within the project site, and all surface waters that may flow onto the project site from adjacent lands, shall be required. Said drainage system shall include any easements and structures required by the Engineering Services Director to properly handle the drainage.

ED5 The owner shall pay the current local drainage area fee prior to issuance of the building permit for this project or shall construct drainage systems in conformance with the Master Drainage Plan and City of Encinitas Standards as required by the Engineering Services Director.

ES1 **Street Conditions**

ES5 Prior to any work being performed in the public right-of-way, a right-of-way construction permit shall be obtained from the Engineering Services Director and appropriate fees paid, in addition to any other permits required.

EU1 **Utilities Conditions**

EU4 All proposed utilities within the project shall be installed underground including existing utilities unless exempt by the Municipal Code.

ESW1 **Storm Water Pollution Control Conditions**

ESW5 The project must meet storm water quality and pollution control requirements. The applicant shall design and construct landscape and/or turf areas and ensure that all flows from impervious surfaces are directed across these areas prior to discharging onto the street. A **Grading Plan** identifying all landscape areas designed for storm water pollution control (SWPC) and Best Management Practice shall be submitted to the City for Engineering Services Department approval. A note shall be placed on the plans indicating that the modification or removal of the SWPC facilities without a permit from the City is prohibited.

ESW6 Storm Water Pollution Control (SWPC) facilities shall be designed and approved by the City Engineer, and secured with a performance bond prior to the issuance of a **grading** permit for this project.

ESW9 For storm water pollution control purposes, all runoff from all roof drains shall discharge onto grass and landscape areas prior to collection and discharge onto the street and/or into the public storm drain system. Grass and landscape areas designated for storm water pollution control shall not be modified without a permit from the City. A note to this effect shall be placed on the **Grading** plan.

ECB1: Coastal Bluff Conditions

ECB3 If an automatic irrigation system is proposed for this project, it shall be designed to avoid any excess watering. The system shall also be designed to automatically shut off in case of a pipe break. Automatic shut-off system, moisture shut-off sensors, and other advanced controls will be required for the installation of an automatic irrigation system.

EB1: Underground Basement/Garage Conditions

EB3 The developer shall design and have approved the shoring and construction dewatering systems necessary for the construction of the underground garage prior to issuance of any grading permit for the project.

EB4 No permanent dewatering system shall be allowed for the underground garage. The underground garage shall be designed to withstand the hydrostatic pressure without any dewatering.

CALIFORNIA COASTAL COMMISSION
SAN DIEGO AREA
7575 METROPOLITAN DRIVE, SUITE 103
SAN DIEGO, CA 92108-4402
(619) 767-2370

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT

Please Review Attached Appeal Information Sheet Prior To Completing This Form.

SECTION I. Appellant(s)

Name: Esther Sanchez
Mailing Address: City of Oceanside
300 North Coast Hwy
Oceanside, CA 92054
Phone Number: (760) 435-0971

RECEIVED
JUN 06 2013
CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT

SECTION II. Decision Being Appealed

1. Name of local/port government: City of Encinitas
2. Brief description of development being appealed: Construction of a new 2-story, 3,553 sq. ft. home over a 1,355 sq. ft. basement with a 950 sq. ft. garage on an existing 6,776 sq. ft. vacant lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge.
3. Development's location (street address, assessor's parcel no., cross street, etc:) 132 Neptune Avenue, Encinitas, CA 92024, APN No. 256-371-14
4. Description of decision being appealed:
   a. Approval; no special conditions: ☐ b. Approval with special conditions: ☒
   c. Denial: ☐ d. Other : ☐ _____
   Note: For jurisdictions with a total LCP, denial decisions by a local government cannot be appealed unless the development is a major energy or public works project. Denial decisions by port governments are not appealable.

TO BE COMPLETED BY COMMISSION:

APPEAL NO: A-6-ENC-13-0210

DATE FILED: 6/6/13

DISTRICT: San Diego

EXHIBIT NO. 9
APPLICATION NO.
A-6-ENC-13-0210
Appeals
Page 1 of 16
California Coastal Commission

5. Decision being appealed was made by (check one):

a. ☐ Planning Director/Zoning Administrator

c. ☒ Planning Commission

b. ☐ City Council/Board of Supervisors

d. ☐ Other

Date of local government's decision: 5/2/2013

Local government's file number (if any): 12-201

SECTION III. Identification of Other Interested Persons

Give the names and addresses of the following parties. (Use additional paper as necessary.)

Name and mailing address of permit applicant:

James And Karla Lindstrom
3378 Jasmine Crest
Encinitas, CA 92024

Names and mailing addresses as available of those who testified (either verbally or in writing) at the city/county/port hearing(s). Include other parties which you know to be interested and should receive notice of this appeal.

SECTION IV. Reasons Supporting This Appeal

Note: Appeals of local government coastal permit decisions are limited by a variety of factors and requirements of the Coastal Act. Please review the appeal information sheet for assistance in completing this section, which continues on the next page.

State briefly your reasons for this appeal. Include a summary description of Local Coastal Program, Land Use Plan, or Port Master Plan policies and requirements in which you believe the project is inconsistent and the reasons the decision warrants a new hearing. (Use additional paper as necessary.)

Note: The above description need not be a complete or exhaustive statement of your reasons of appeal; however, there must be sufficient discussion for staff to determine that the appeal is allowed by law. The appellant, subsequent to filing the appeal, may submit additional information to the staff and/or Commission to support the appeal request.

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

Signed: *Signature on File*
Appellant or A[illegible]

Date: 6/6/13

Agent Authorization: I designate the above identified person(s) to act as my agent in all matters pertaining to this appeal.

Signed: _____

Date: _____

Attachment A
Lindstrom Family Trust Appeal
06/6/2013

The project approved by the City of Encinitas ("City") consists of the construction of a new 2-story, 3,553 sq. ft. home over a 1,355 sq. ft. basement with a 950 sq. ft. garage on an existing 6,776 sq. ft. vacant lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge. The basement is proposed to be constructed using 24 steel shoring beams that will be excavated down to a maximum elevation of 14.5 feet. In addition, the applicant proposes to install 17 (12 inch) piers at a depth of 18 inches to support planter boxes and an above ground spa. The project raises LCP consistency issues and the pertinent LCP provisions are as follows:

Geologic Stability

The City's decision is inconsistent with several provisions of the City's LCP which relate to the siting of new development in a safe location so as to not require shoreline protection and prohibits grading within 40 ft. of the coastal bluff edge.

Public Safety (PS) Policy 1.3 of the City's LUP requires that:

> *The City will rely on the Coastal Bluff and Hillside/Inland Bluff Overlay Zones to prevent future development or redevelopment that will represent a hazard to its owner or occupants, and which may require structural measures to prevent destructive erosion or collapse.*

Section 30.34.020.C of the City's Certified Implementation Plan (IP), states in part:

> *DEVELOPMENT PROCESSING AND APPROVAL. In addition to findings and processing requirements otherwise applicable, the following establishes specific processing and finding requirements for proposed development within the Coastal Bluff Overlay Zone...*
>
> *1. Development and improvement in compliance with the development standards in paragraph B "Development Standards", proposing no structure or facility on or within 40 feet of the top edge of the coastal bluff (except for minor accessory structures and improvements allowed pursuant to Section 30.34.02(B)1b, and proposing no preemptive measure as defined below, shall be subject to the following: submittal and acceptance of a site-specific soils report and geotechnical review described by paragraph D "Application Submittal Requirements" below. The authorized decision-making authority for the proposal shall make the findings required based on the soils report and geotechnical review for any project approval...*

Section 30.34.020(D) of the City's Certified IP states, in part:

> *APPLICATION SUBMITTAL REQUIREMENTS. Each application to the City for a permit or development approval for property under the Coastal Bluff Overlay Zone shall be accompanied by a soils report, and either a geotechnical review or geotechnical report as specified in paragraph C "Development Processing and Approval" above. Each review/report shall be prepared by a certified engineering geologist who has been pre-qualified as knowledgeable in City standards, coastal engineering and engineering geology. The review/report shall certify that the development proposed will have no adverse effect on the stability of the bluff, will not endanger life or property, and that any proposed structure or facility is expected to be reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the structure in the future. Each review/report shall consider, describe and analyze the following:*
>
> *[...]*
>
> *...The report shall use a current acceptable engineering stability analysis method and shall also describe the degree of uncertainty of analytical results due to assumptions and unknowns. The degree of analysis required shall be appropriate to the degree of potential risk presented by the site and the proposed project.*
>
> *In addition to the above, each geotechnical report shall include identification of the daylight line behind the top of the bluff established by a bluff slope failure plane analysis. This slope failure analysis shall be performed according to geotechnical engineering stands, and shall:*
>
> *-Cover all types of slope failure.*
>
> *-Demonstrate a safety factor against slope failure of 1.5.*
>
> *-Address a time period of analysis of 75 years.*
>
> *[...]*

Policy 30.34.20.B.1 of the City's certified Implementation Plan (IP) states, in part:

> *1. With the following exceptions, no principal structure, accessory structure, facility or improvement shall be constructed, placed or installed within 40 feet of the top edge of the coastal bluff. Exceptions are as follows:*
>
> *[...]*

b. Minor accessory structures and improvements located at grade, including landscaping, shall be allowed to within 5 feet of the top edge of the coastal bluff. Precautions must be taken when placing structures close to the bluff edge to ensure that the integrity of the bluff is not threatened. For the purposes of the Coastal Bluff Overlay Zones, "minor accessory structures and improvements" are defined as those requiring no City approval or permit including a building or grading permit, and not attached to any principal or accessory structure which would require a permit. Grading for reasonable pedestrian access in and around a principal or accessory structure may be permitted by the City Engineer following review of a site specific soils report. [Emphasis added]

The proposed single family residence will be located on a blufftop lot that is subject to erosion. Although the subject site does not currently have coastal armoring, a 13 ft. high, approximately 80 ft. long seawall was approved by the Commission in 1998 to protect two existing homes on the same block as the subject site at 164 and 172 Neptune Avenue (CDP #6-98-039); and, in 1994 and 1995, the Commission approved seawalls two blocks north of the subject site at 312 Neptune Avenue, 354 Neptune Avenue, 370 Neptune Avenue, 378 Neptune Avenue, and 396 Neptune Avenue (Ref: CDP Nos. 6-93-085/Auerbach & 6-95-066/Han).

The City's LCP, as cited above, requires that new structures and improvements be located at least 40 feet from the bluff edge and that a site-specific geotechnical report, which includes a slope stability analysis, be prepared that demonstrates the development will be sited in a safe location for the life of the structure so as to not require shoreline protection in the future. The applicant's geotechnical report *"Report of Preliminary Geotechnical Exploration and Coastal Bluff Stability Evaluation,"* dated December 5, 2012, found that the long term erosion rate over 75 years for this property is predicted to be approximately 10 feet (0.13 ft. /year). Additionally, the geotechnical report found that a factor of safety of 1.5 would be attained at a distance of 18.3 feet landward of the bluff edge. Thus, a total setback of 28.3 feet was determined to be adequate to achieve a 1.5 factor of safety and to account for 75 years of erosion.

This information was evaluated by the Commission's staff geologist who identified the following concerns about the analysis. The long term erosion rate chosen by the applicant was significantly lower than any erosion rate accepted for a past project in the City of Encinitas and was not well supported. Specifically, the applicant used long-term average *historic* rates, did not utilize the most recent long-term study for erosion rates in Encinitas (Benumof and Griggs) and did not factor in likely acceleration of bluff retreat rates in the future due to sea level rise and increased exposure of the bluffs to wave attack. The failure model used to determine the 1.5 factor of safety setback was also unrealistic; the Torrey Sandstone at the base of the subject bluff generally collapses as block failures, followed by circular or wedge failures in the overlying terrace deposits, rather than the modeled circular failure through both units. Thus, it does not appear that the analysis was adequate to support that the proposed development would be safe for 75 years.

Subsequent to the City's approval of this project, the applicant submitted a revised geotechnical memo to Commission staff referenced as "*Response to California Coastal Commission Letter dated 4/18/13*," dated May 28, 2013. This updated geotechnical memo was in response to a comment letter sent by Commission staff to the applicant and the City prior to the City's action. The updated geotechnical memo however was not available when the City approved the project on May 2, 2013; and, therefore, it is only used as reference for this appeal. Any appeal must be based on what was in the City record at the time of the decision. This updated report found that both the long term erosion rate and the methodology of determining the 1.5 factor of safety line previously used were incorrect. The long term erosion rate for the site was increased from 0.13 to 0.40 feet per year and the 1.5 factor of safety setback was increased from 28.3 feet to 42.25 feet. Thus, the applicant's geotechnical consultant determined that a total setback of 72.25 feet would be adequate to achieve a 1.5 factor of safety and to account for 75 years of erosion. However, it should be noted that the proposed 40 ft. bluff setback for the residence would still be inadequate if only the adjusted 1.5 factor of safety setback was considered (42.25 feet).

The Commission's staff geologist has reviewed the updated geotechnical report and concurs with the new 1.5 factor of safety setback, but not with the long term erosion rate. Most recently, a long term erosion rate of 0.49 feet per year has been required for new development in the City of Encinitas (A-6-ENC-09-002/Wellman & A-6-ENC-09-003/Wellman). Thus, the setback in order for the structure to be safe for 75 years may need to be extended to79 feet from the bluff edge.

The applicant's geotechnical consultant has found that a home would have to be sited greater than 72.25 feet from the bluff edge to be safe from erosion over a period of 75 years; nonetheless, the consultant is still attempting to justify only a 40 ft. setback is required either through alternative bluff failure modeling or the possible use of caissons. However, this amended geologic stability analysis and the possible use of caissons was not considered by the City in its local decision. The approved setback of 40 feet from the bluff edge is inadequate. Therefore, because the City's action included an inadequate geotechnical report, the City's approval raises a substantial issue regarding its consistency with the requirements of the LCP that the addition "...be reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the structure in the future."

In addition, the certified LCP clearly states that only minor, at grade; accessory structures and improvement are permitted to be located within 40 feet of the bluff edge. The 17 (12 inch) diameter piers at a depth of 18 inches to support planter boxes and an above ground spa are not at grade and are therefore inconsistent with the certified LCP.

Visual Resources

In addition, the approved home has the potential to create adverse visual impacts in the future which is inconsistent with the certified LCP.

Section 30.34.020B.8 of the Implementation Program states:

> *The design and exterior appearance of buildings and other structures visible from public vantage points shall be compatible with the scale and character of the surrounding development and protective of the natural scenic qualities of the bluffs.*

The seaward-most wall of the basement and steel shoring beams of the home are proposed to be located 40 feet from the bluff edge. As stated previously, the applicant's updated geotechnical report predicts that long term erosion will be 30 feet over a 75 year period. In addition, the report predicts that the bluff will lie back an additional 9.7 feet to an angle of repose of 45 degrees. Thus, the report predicts that the daylight line of the bluff after 75 years will be nearly 40 feet. However, if a long term erosion rate of 0.49 feet per year is applied, the daylight line after 75 years would be 46.75 feet from the bluff edge and the western wall of the basement would be exposed. The exposure of the basement wall would be inconsistent with the LCP policy requiring structures visible from public vantage points to be protective of the natural scenic qualities of the surrounding, for the most part un-armored, natural bluffs.

Conclusion

The City's approval of the proposed single family residence appears inconsistent with the policies of the LCP relating to the requirement that new development be sited in a safe location that will not require shoreline protection in the future and that no grading occur within 40 feet of the bluff edge. In addition, the proposed structure is inconsistent with the visual resources policy of the certified LCP that requires new development to preserve the scenic qualities of the surrounding bluffs.

CALIFORNIA COASTAL COMMISSION
SAN DIEGO AREA
7575 METROPOLITAN DRIVE, SUITE 103
SAN DIEGO, CA 92108-4402
(619) 767-2370

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT

Please Review Attached Appeal Information Sheet Prior To Completing This Form.

SECTION I. Appellant(s)

Name: Mary Shallenberger
Mailing Address: P.O. Box 354
Clements, CA 95227-0354

Phone Number: (415) 904-5200

SECTION II. Decision Being Appealed

1. Name of local/port government: City of Encinitas
2. Brief description of development being appealed: Construction of a new 2-story, 3,553 sq. ft. home over a 1,355 sq. ft. basement with a 950 sq. ft. garage on an existing 6,776 sq. ft. vacant lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge.
3. Development's location (street address, assessor's parcel no., cross street, etc:) 132 Neptune Avenue, Encinitas, CA 92024, APN No. 256-371-14
4. Description of decision being appealed:
   a. Approval; no special conditions: ☐ b. Approval with special conditions: ☒
   c. Denial: ☐ d. Other : ☐ _____
   Note: For jurisdictions with a total LCP, denial decisions by a local government cannot be appealed unless the development is a major energy or public works project. Denial decisions by port governments are not appealable.

TO BE COMPLETED BY COMMISSION:

APPEAL NO: A-6-ENC-13-0210

DATE FILED: 6/6/13

DISTRICT: San Diego

5. Decision being appealed was made by (check one):

a. ☐ Planning Director/Zoning Administrator

c. ☒ Planning Commission

b. ☐ City Council/Board of Supervisors

d. ☐ Other

Date of local government's decision: 5/2/2013

Local government's file number (if any): 12-201

SECTION III. Identification of Other Interested Persons

Give the names and addresses of the following parties. (Use additional paper as necessary.)

Name and mailing address of permit applicant:

James And Karla Lindstrom
3378 Jasmine Crest
Encinitas, CA 92024

Names and mailing addresses as available of those who testified (either verbally or in writing) at the city/county/port hearing(s). Include other parties which you know to be interested and should receive notice of this appeal.

SECTION IV. Reasons Supporting This Appeal

Note: Appeals of local government coastal permit decisions are limited by a variety of factors and requirements of the Coastal Act. Please review the appeal information sheet for assistance in completing this section, which continues on the next page.

State briefly your reasons for this appeal. Include a summary description of Local Coastal Program, Land Use Plan, or Port Master Plan policies and requirements in which you believe the project is inconsistent and the reasons the decision warrants a new hearing. (Use additional paper as necessary.)

Note: The above description need not be a complete or exhaustive statement of your reasons of appeal; however, there must be sufficient discussion for staff to determine that the appeal is allowed by law. The appellant, subsequent to filing the appeal, may submit additional information to the staff and/or Commission to support the appeal request.

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

Signed: Signature on File
Appellant or Agent

Date: 6/6/13

Agent Authorization: I designate the above identified person(s) to act as my agent in all matters pertaining to this appeal.

Signed: _____

Date: _____

Attachment A
Lindstrom Family Trust Appeal
06/6/2013

The project approved by the City of Encinitas ("City") consists of the construction of a new 2-story, 3,553 sq. ft. home over a 1,355 sq. ft. basement with a 950 sq. ft. garage on an existing 6,776 sq. ft. vacant lot. The basement and first floor are proposed to be located approximately 40 ft. from the coastal bluff edge and the second floor is proposed to cantilever within 32 ft. of the bluff edge. The basement is proposed to be constructed using 24 steel shoring beams that will be excavated down to a maximum elevation of 14.5 feet. In addition, the applicant proposes to install 17 (12 inch) piers at a depth of 18 inches to support planter boxes and an above ground spa. The project raises LCP consistency issues and the pertinent LCP provisions are as follows:

Geologic Stability

The City's decision is inconsistent with several provisions of the City's LCP which relate to the siting of new development in a safe location so as to not require shoreline protection and prohibits grading within 40 ft. of the coastal bluff edge.

Public Safety (PS) Policy 1.3 of the City's LUP requires that:

> *The City will rely on the Coastal Bluff and Hillside/Inland Bluff Overlay Zones to prevent future development or redevelopment that will represent a hazard to its owner or occupants, and which may require structural measures to prevent destructive erosion or collapse.*

Section 30.34.020.C of the City's Certified Implementation Plan (IP), states in part:

> *DEVELOPMENT PROCESSING AND APPROVAL. In addition to findings and processing requirements otherwise applicable, the following establishes specific processing and finding requirements for proposed development within the Coastal Bluff Overlay Zone...*
>
> *1. Development and improvement in compliance with the development standards in paragraph B "Development Standards", proposing no structure or facility on or within 40 feet of the top edge of the coastal bluff (except for minor accessory structures and improvements allowed pursuant to Section 30.34.02(B)1b, and proposing no preemptive measure as defined below, shall be subject to the following: submittal and acceptance of a site-specific soils report and geotechnical review described by paragraph D "Application Submittal Requirements" below. The authorized decision-making authority for the proposal shall make the findings required based on the soils report and geotechnical review for any project approval...*

Section 30.34.020(D) of the City's Certified IP states, in part:

> *APPLICATION SUBMITTAL REQUIREMENTS. Each application to the City for a permit or development approval for property under the Coastal Bluff Overlay Zone shall be accompanied by a soils report, and either a geotechnical review or geotechnical report as specified in paragraph C "Development Processing and Approval" above. Each review/report shall be prepared by a certified engineering geologist who has been pre-qualified as knowledgeable in City standards, coastal engineering and engineering geology. The review/report shall certify that the development proposed will have no adverse effect on the stability of the bluff, will not endanger life or property, and that any proposed structure or facility is expected to be reasonably safe from failure and erosion over its lifetime without having to propose any shore or bluff stabilization to protect the structure in the future. Each review/report shall consider, describe and analyze the following:*
>
> *[...]*
>
> *...The report shall use a current acceptable engineering stability analysis method and shall also describe the degree of uncertainty of analytical results due to assumptions and unknowns. The degree of analysis required shall be appropriate to the degree of potential risk presented by the site and the proposed project.*
>
> *In addition to the above, each geotechnical report shall include identification of the daylight line behind the top of the bluff established by a bluff slope failure plane analysis. This slope failure analysis shall be performed according to geotechnical engineering stands, and shall:*
>
> *-Cover all types of slope failure.*
>
> *-Demonstrate a safety factor against slope failure of 1.5.*
>
> *-Address a time period of analysis of 75 years.*
>
> *[...]*

Policy 30.34.20.B.1 of the City's certified Implementation Plan (IP) states, in part:

> *1. With the following exceptions, no principal structure, accessory structure, facility or improvement shall be constructed, placed or installed within 40 feet of the top edge of the coastal bluff. Exceptions are as follows:*
>
> *[...]*

b. Minor accessory structures and improvements located at grade, including landscaping, shall be allowed to within 5 feet of the top edge of the coastal bluff. Precautions must be taken when placing structures close to the bluff edge to ensure that the integrity of the bluff is not threatened. For the purposes of the Coastal Bluff Overlay Zones, "minor accessory structures and improvements" are defined as those requiring no City approval or permit including a building or grading permit, and not attached to any principal or accessory structure which would require a permit. Grading for reasonable pedestrian access in and around a principal or accessory structure may be permitted by the City Engineer following review of a site specific soils report. [Emphasis added]

The proposed single family residence will be located on a blufftop lot that is subject to erosion. Although the subject site does not currently have coastal armoring, a 13 ft. high, approximately 80 ft. long seawall was approved by the Commission in 1998 to protect two existing homes on the same block as the subject site at 164 and 172 Neptune Avenue (CDP #6-98-039); and, in 1994 and 1995, the Commission approved seawalls two blocks north of the subject site at 312 Neptune Avenue, 354 Neptune Avenue, 370 Neptune Avenue, 378 Neptune Avenue, and 396 Neptune Avenue (Ref: CDP Nos. 6-93-085/Auerbach & 6-95-066/Han).

The City's LCP, as cited above, requires that new structures and improvements be located at least 40 feet from the bluff edge and that a site-specific geotechnical report, which includes a slope stability analysis, be prepared that demonstrates the development will be sited in a safe location for the life of the structure so as to not require shoreline protection in the future. The applicant's geotechnical report *"Report of Preliminary Geotechnical Exploration and Coastal Bluff Stability Evaluation,"* dated December 5, 2012, found that the long term erosion rate over 75 years for this property is predicted to be approximately 10 feet (0.13 ft. /year). Additionally, the geotechnical report found that a factor of safety of 1.5 would be attained at a distance of 18.3 feet landward of the bluff edge. Thus, a total setback of 28.3 feet was determined to be adequate to achieve a 1.5 factor of safety and to account for 75 years of erosion.

This information was evaluated by the Commission's staff geologist who identified the following concerns about the analysis. The long term erosion rate chosen by the applicant was significantly lower than any erosion rate accepted for a past project in the City of Encinitas and was not well supported. Specifically, the applicant used long-term average *historic* rates, did not utilize the most recent long-term study for erosion rates in Encinitas (Benumof and Griggs) and did not factor in likely acceleration of bluff retreat rates in the future due to sea level rise and increased exposure of the bluffs to wave attack. The failure model used to determine the 1.5 factor of safety setback was also unrealistic; the Torrey Sandstone at the base of the subject bluff generally collapses as block failures, followed by circular or wedge failures in the overlying terrace deposits, rather than the modeled circular failure through both units. Thus, it does not appear that the analysis was adequate to support that the proposed development would be safe for 75 years.

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The Commission's staff geologist has reviewed the updated geotechnical report and concurs with the new 1.5 factor of safety setback, but not with the long term erosion rate. Most recently, a long term erosion rate of 0.49 feet per year has been required for new development in the City of Encinitas (A-6-ENC-09-002/Wellman & A-6-ENC-09-003/Wellman). Thus, the setback in order for the structure to be safe for 75 years may need to be extended to79 feet from the bluff edge.

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In addition, the certified LCP clearly states that only minor, at grade; accessory structures and improvement are permitted to be located within 40 feet of the bluff edge. The 17 (12 inch) diameter piers at a depth of 18 inches to support planter boxes and an above ground spa are not at grade and are therefore inconsistent with the certified LCP.

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In addition, the approved home has the potential to create adverse visual impacts in the future which is inconsistent with the certified LCP.

Section 30.34.020B.8 of the Implementation Program states:

> *The design and exterior appearance of buildings and other structures visible from public vantage points shall be compatible with the scale and character of the surrounding development and protective of the natural scenic qualities of the bluffs.*

The seaward-most wall of the basement and steel shoring beams of the home are proposed to be located 40 feet from the bluff edge. As stated previously, the applicant's updated geotechnical report predicts that long term erosion will be 30 feet over a 75 year period. In addition, the report predicts that the bluff will lie back an additional 9.7 feet to an angle of repose of 45 degrees. Thus, the report predicts that the daylight line of the bluff after 75 years will be nearly 40 feet. However, if a long term erosion rate of 0.49 feet per year is applied, the daylight line after 75 years would be 46.75 feet from the bluff edge and the western wall of the basement would be exposed. The exposure of the basement wall would be inconsistent with the LCP policy requiring structures visible from public vantage points to be protective of the natural scenic qualities of the surrounding, for the most part un-armored, natural bluffs.

Conclusion

The City's approval of the proposed single family residence appears inconsistent with the policies of the LCP relating to the requirement that new development be sited in a safe location that will not require shoreline protection in the future and that no grading occur within 40 feet of the bluff edge. In addition, the proposed structure is inconsistent with the visual resources policy of the certified LCP that requires new development to preserve the scenic qualities of the surrounding bluffs.