

Ocean Blvd. (Bluff) Erosion and Enhancement Phase 2 Project

July 1, 2014

Project Description

- The purpose of the Ocean Blvd. (Bluff) Erosion and Enhancement Phase 2 Project (Project) is to stabilize the bluffs between 20th Place and 36th Place using soil nailing technology and a tan-stained shotcrete facing that contains planter pockets
- The project also includes the replacement of the sidewalk, railing and irrigation system at Bluff Park
- On July 9, 2013 the City Council adopted Plans and Specifications No R-6959 for the Project and awarded a construction contract to Drill Tech Drilling & Shoring Inc.

Site Map

20th PI.



Background

- On April 29, 2014 the City Council voted to delay the Project for 45 days and directed staff to:
 1. Conduct an engineering analysis (peer review);
 2. Consider other alternatives to Bluff stabilization, other than shotcrete;
 3. Advise the Council on community improvements that do not involve shotcrete;
 4. Report the results and stabilization alternatives to the City Council and online to the public.

Geotechnical Engineering Peer Review Committee

- Djan Chandra, PE, GE; Leighton Consulting, Inc.
 - Lead Peer Review Engineer
- Dr. Arul K. Arulmoli, PE, GE; DGE, Earth Mechanics, Inc.
- Dr. Daniel Pradel, PE, GE, DGE; Group Delta Consultants, Inc.

Peer Review Scope of Work

- Review the City's geotechnical study and perform a peer review of the findings
- Verify appropriateness of selected slope improvements
- Evaluate available alternatives

Parameters

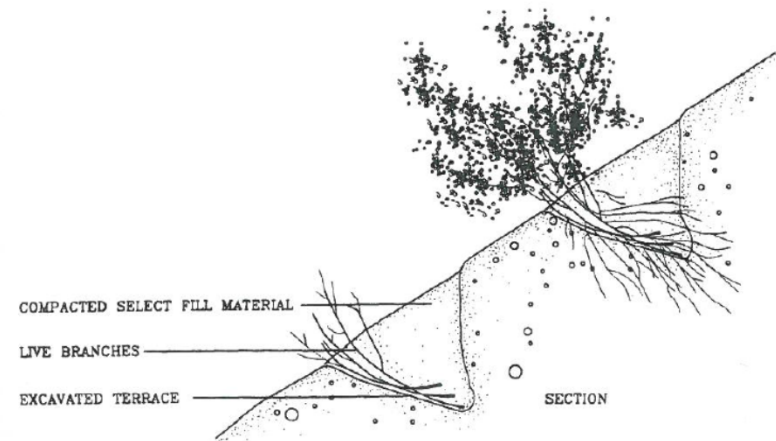
- The peer review consisted of reviewing the data available, and using the same assumptions, which included:
 - Maintain top and toe of slope due to community input
 - No retaining walls
 - Meet seismic design requirements

Findings

- Field exploration
- Soils parameters
- Seismic parameters
- Slope stability analyses

Findings (continued)

- Soil nailing
- Shotcrete with planter pockets
- Option: Biotechnical techniques (for slope areas with no shotcrete)



Conclusions

- The soil nail system is an appropriate solution
 - Soil nailing with shotcrete facing is commonly used in Southern California for bluff stabilization, and is considered an appropriate solution that provides long-term stability with minimal maintenance requirements
- Biotechnical techniques may be considered for slope areas where shotcrete has not been installed
- Removal of existing shotcrete is not recommended

Biotechnical Options and Shotcrete Pictures



Biotechnical Options and Shotcrete Pictures



Biotechnical Alternatives

- While shotcrete is a common method to mitigate surficial slope instability in conjunction with soil nails, other biotechnical options are also available
 - However, biotechnical solutions require significantly more maintenance
- For areas with soil nails only (no shotcrete), a biotechnical alternative would cost:
 - Phase 2 Area 1: \$1,040,000
 - Phase 2 Area 2: \$683,000 (Final Shotcrete Installed on Portion of Area)
 - Phase 2 Area 3: N/A (Final Shotcrete Installed)
 - Phase 1 Area: N/A (Shotcrete Installed in 2011)

Biotechnical Alternatives

- The total estimated cost to remove all existing shotcrete and install a biotechnical alternative is between \$9,783,000 - \$11,473,000
 - The removal of shotcrete (Phase 1 and 2 Areas) is estimated to cost between \$5,070,000 - \$6,760,000
 - The installation of a biotechnical alternative for all Phase 1 and 2 Areas is estimated to cost \$4,713,000

Timeline for Biotechnical Alternative

- If a biotechnical treatment is selected, the timeline to design and implement it would be:
 - Engineering, design, plan check, permitting and bidding will take 7-9 months
 - Construction Duration (TBD)

Timeline for Removal of Shotcrete

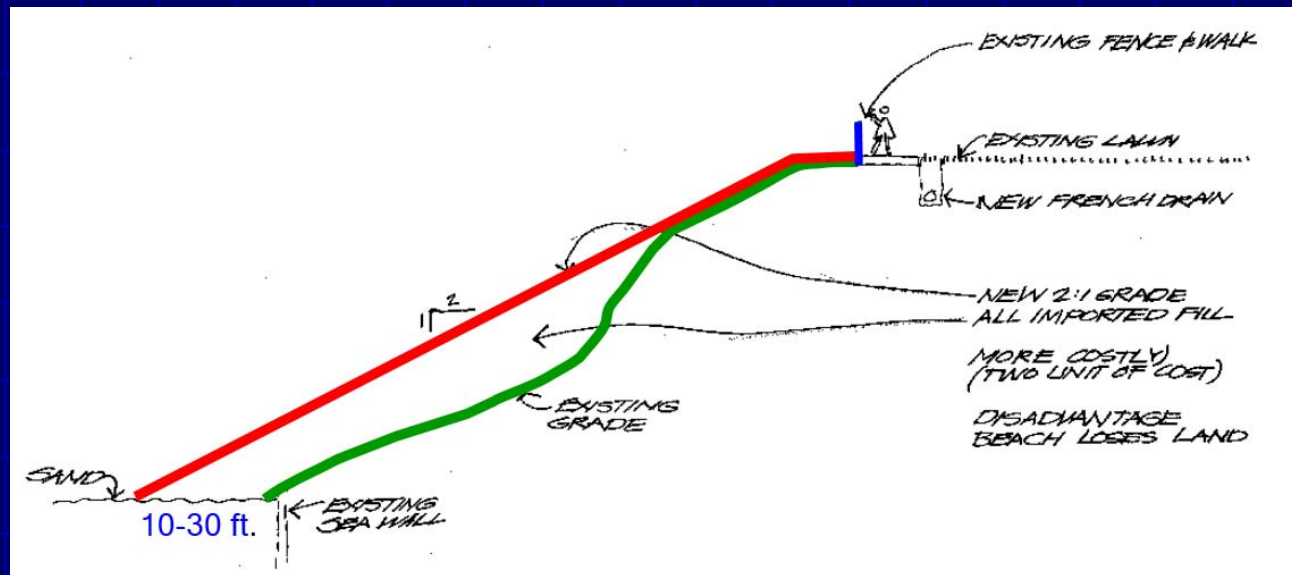
- If existing shotcrete is removed to install a biotechnical option, an additional 2-3 months should be added to the schedule to allow time to develop the required engineering plans and obtain necessary permits for a total 9-12 month duration
- The duration of construction will also increase

Timeline to Complete Per Plans and Specifications

- Remobilization (1 month)
- Complete Major Construction: August 29, 2014



Timeline to Evaluate Option that Extends onto Beach or Bluff Park



- Engineering, design, plan check, permitting and bidding will take 14-23 months
 - Requires new Coastal Development Permit and may require a Local Coastal Program Amendment

Options Council May Consider

1. Proceed with existing plans, improve landscaping and finish park improvements
2. Finish shotcrete where incomplete, improve landscaping, finish park, and evaluate biotechnical solution for Phase 2 Area 1
3. Remove shotcrete and study biotechnical alternatives for the entire bluff
4. Study other alternatives