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Title:	Recommendation to receive report and provide direction to staff on the options addressing biotechnical and various other alternatives for the Ocean Boulevard (Bluff) Erosion and Enhancement Phase 2 Project. (District 3)				
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Date	Ver.	Action By	Action	Result
12/16/2014	1	City Council	approve recommendation	Pass

Recommendation to receive report and provide direction to staff on the options addressing biotechnical and various other alternatives for the Ocean Boulevard (Bluff) Erosion and Enhancement Phase 2 Project. (District 3)

Background

On April 22, 2014, the City Council asked staff to consider delaying the continued implementation of the Ocean Boulevard (Bluff) Erosion and Enhancement Phase 2 Project (Project). The City Council adopted the Plans and Specifications (No. R-6959) for the Project on July 9, 2013, and awarded a contract to Drill Tech Drilling & Shoring, Inc. for the work, which included the use of stained, sculpted and landscaped shotcrete to provide bluff erosion control and secure the bluff in the event of a major seismic event.

On April 29, 2014, the City Council held a special meeting and took action to delay the Project for 45 days and directed staff to: (1) conduct an engineering analysis (peer review) of the Bluff; (2) consider other alternatives to Bluff stabilization, other than shotcrete; (3) advise the Council on community improvements to the Bluff that do not involve shotcrete; and (4) report the results of staff's analysis and stabilization alternatives to the Council and online to the public. In response to the City Council's direction, City staff provided the attached May 13, 2014 memorandum (Attachment A).

On July 1, 2014, the City Council considered a geotechnical peer review report (Attachment B) and directed the City Manager to: 1) move forward expeditiously with the top park portion of the Bluff (including the new required irrigation system) and with any of the other infrastructure improvements, such as railing and sidewalk work; 2) evaluate biotechnical alternatives for the remaining portions of the slope that have not received the final shotcrete

treatment, as discussed in Section 3.0 of the Peer Review Report and report back to the Council; 3) conduct limited additional shotcrete in transitional areas, complete the staining of the completed shotcrete areas; and, 4) meet with the Bluff Park Neighborhood Association and other interested residents to obtain input on the concepts.

On July 28, 2014, the City Manager provided the Mayor and City Council with an update on efforts taken as a result of City Council direction (Attachment C).

Since July, significant work has occurred in the park, resulting in the completion of a majority of the project. The contractor has completed installing a brand new railing that retains its historic look, and a new sidewalk adjacent to the rail at the edge of Bluff Park. The Bluff Park irrigation system, which for years would continuously fail and require constant repairs, has also been fully replaced with a brand new and more water efficient system, which uses recycled water. The landscaping plan for the top, middle and bottom of the bluff slope was enhanced to maximize vegetative coverage of the shotcrete and improve aesthetics. Most of the enhanced landscaping is also completed, except in those areas that were not completed with the shotcrete treatment. The part of the project that remains incomplete are the two sections that received soil nailing for stability purposes, but did not receive the final shotcrete treatment.

As directed by the City Council, staff has completed the review and evaluation of biotechnical alternatives; however, staff's recommendation is to complete the Project in accordance with the original plans and specifications, especially considering that shotcrete and soil nails are fairly common bluff stabilization techniques used throughout urban areas in coastal California. The options to complete the project are outlined below.

Option #1 - Complete Original Project

Staff has worked with the community over the past several months to design a landscaping plan in previous shotcrete areas that will help maximize coverage of the shotcrete at full implementation (see Attachment D for rendering). Previous experience in other areas demonstrate that shotcrete is the most cost-effective method of erosion control and seismic stabilization and, that with a proper landscape plan and sufficient time, the aesthetic appearance of the shotcrete can be mitigated and allow it to blend in with the existing bluff. Of the alternatives outlined below, completing the project as originally planned with shotcrete would be the most cost-effective and expedient option as well as provide the necessary seismic and bluff stability.

Option #2 - Biotechnical Alternatives

Staff has completed the review and evaluation of biotechnical alternatives for surficial erosion protection for the Project's uncompleted areas as discussed in the Geotechnical Peer Review Report. Staff has researched biotechnical bluff stabilization options applied throughout the State of California and also interviewed biotechnical experts and contractors regarding the feasibility of applying biotechnical alternatives in Long Beach. While biotechnical alternatives

in areas with steep slopes have been more widely used in inland areas, they are also feasible in coastal areas, but will likely require active adaptive management to ensure the landscaping takes hold as designed. The City's geotechnical engineer has developed feasible site-specific biotechnical concepts that take the following criteria into consideration: 1) durability and seismic stability; 2) erosion control; 3) vegetation/planting quality (including irrigation); 4) construction and maintenance costs; 5) implementation schedule; and, 6) regulatory permitting requirements.

The two uncompleted areas that require surficial erosion protection are Area 1 and a portion of Area 2 (Attachment E). Area 1 is located adjacent to the Long Beach Museum of Art, approximately between 20th Place and Lindero Avenue. Area 2 is approximately located between Temple Avenue and Orizaba Avenue. Because of varying site conditions between Area 1 and the uncompleted portion of Area 2, there are important differences in the biotechnical solutions. Existing site conditions and the two biotechnical options (Biotechnical Option 1 and Biotechnical Option 2) are outlined in greater detail in Attachment F.

Option # 3 - Major Regrading Alternative

Staff was also asked to evaluate the feasibility of re-grading the entire slope of Area 1 and the uncompleted portion of Area 2 to an inclination of 2H:1V. In order to be feasible, this alternative would require encroachment onto the beach by 15 - 20 feet, or consequently, encroachment into the park by the same amount or a combination thereof. Large amounts of additional soil would need to be imported, estimated at 21,500 cubic yards (or equivalent to 2,150 truck trips). This soil would have to be carefully compacted to ensure structural soundness of the slope. If this option encroached into the park, it would result in the loss of up to 16,000 square feet of current park space, and would have to take into account constraints created by the existing soil nails. If this alternative encroached into the beach, it would not impact the bike or pedestrian paths in Areas 1 and 2, but would result in the loss of sandy beach area and potentially encourage climbing of the re-sloped bluff area. It is anticipated that this project would require a new permit from the California Coastal Commission, and potentially an amendment to the City's Local Coastal Program, which may take 8 to 12 months to secure. Area 2 would also require a retaining wall, additional shotcrete or a concrete drainage trench in the transitional zones to keep the regraded area from losing its integrity as it connects with the shotcreted areas. In Area 1, the stairway to the beach would also have to be rebuilt to accommodate the significant change in slope. The initial shotcrete layer in the uncompleted portion of Area 2 would also need to be demolished; however, it would not have to be disposed off-site and could be reused as fill for the regrading. The imported soil would need to be highly compacted.

This option was considered during the Project's early planning phase, but was not recommended as a result of community concerns and expected permitting challenges. If this option were selected, it would require extensive planning, engineering, design, plan check, and permitting work before the project could be bid to a potential contractor. Construction would likely not begin until 2016 or 2017.

Cost Estimates

The estimated costs for each option are identified in the table below. These estimates include the required engineering, construction management and inspections, project management, and a 20% contingency. The completion of the original Project, currently budgeted at \$5.8 million, includes the estimated cost to remobilize the contractor's shotcrete equipment and complete the project (including all delay related costs).

Option #Option	Area 1	Area 2	Total	
1	Completion of Original Project	\$794,000	\$529,000	\$1,323,000
2	Biotechnical Option 1	\$1,650,000	\$2,700,000	\$4,350,000
	Biotechnical Option 2	\$3,800,000	\$3,950,000	\$7,750,000
3	Regrading	\$3,000,000	\$2,450,000	\$5,450,000

Maintenance costs also differ for the various alternatives, with Biotechnical Option 1 being the most expensive, and the completion of the original Project being the least expensive. On an annual basis, maintenance costs for Option 1 are estimated to be \$11,000. Annual maintenance costs for the biotechnical options are estimated to be \$26,000 for Biotechnical Option 1, and \$19,000 for Biotechnical Option 2. The annual maintenance costs for the major regrading option is also estimated at \$19,000.

This matter was reviewed by Deputy City Attorney Linda Vu on December 5, 2014, and by the Director of Financial Management, John Gross on December 8, 2014.

City Council action is requested on December 16, 2014. Continuing to leave the current soil nails and slope surfaces exposed risks undermining the integrity of the soil nails and the surface of the slope. A recent storm has already caused erosion in Area 1, and leaving the area exposed for more than 6 months may create additional complications, especially if there is significant rainfall during the winter and spring. The current contractor has advised that they would be able to finish the current project in 2015. Any option other than completing the current Project as originally designed will have to be bid. Staff estimates that biotechnical alternative construction could begin in Fall 2015. Existing concepts and additional technical specifications would be used to bid the project. For the regrading option, construction would be estimated to begin in 2016 or 2017.

There is \$5,800,000 budgeted for the Project in the Tidelands Operations Fund (TF 401) in the City Manager Department (CM). That amount has been fully expended or encumbered. The bulk of the budget is for the construction contract with Drill Tech Drilling and Shoring, Inc. The contract is for \$4,442,768, plus a 15 percent contingency in the amount of \$666,415 for a total not to exceed amount of \$5,109,183. Staff has had lengthy discussions with Drill Tech to determine the cost to cancel the remaining shotcrete and landscaping work, and allow another contractor to implement a biotechnical alternative, if selected. Drill Tech has stated they are not interested in partnering to implement a biotechnical or regrading alternative. Therefore, with the biotechnical or regrading option, the project would have to be rebid.

Approve recommendation.

APPROVED:

PATRICK H. WEST
CITY MANAGER