

**Attachment A**

**Project Description**

**for**

**SFPUC's Immediate Action Plan at Ocean Beach**

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**BACKGROUND**

Chronic erosion problems at the south end of Ocean Beach threaten the San Francisco Public Utilities Commission's (SFPUC) Lake Merced Tunnel (LMT), one of the SFPUC's critical wastewater conveyance and storage facilities located under the Great Highway south of Sloat Boulevard. In support of a comprehensive solution to the erosion problem, the SFPUC actively participated in the development of the 2012 Ocean Beach Master Plan (OBMP). The OBMP, led by SPUR, was an interagency effort to develop a sustainable long-term vision for Ocean Beach, addressing public access, environmental protection and infrastructure needs in the context of erosion and climate-related sea level rise. The OBMP presents a framework for understanding the wide range of issues and challenges at Ocean Beach and identifies a series of recommendations for balancing the many priorities and objectives identified by local agencies and stakeholders, including protecting critical sewer infrastructure south of Sloat Boulevard or South Ocean Beach (SOB).

To carry out the OBMP recommendations related to erosion hazards and protection of the LMT, the SFPUC, in coordination with SPUR, the National Park Service (NPS) and other partner agencies, has been working to develop short and long-term coastal protection measures and a management strategy that focuses on a multi-objective approach that protects critical wastewater infrastructure and promotes environmental stewardship. These short and long-term measures would be implemented as a two-phased approach. Phase I (short-term) would include the implementation of temporary "soft" measures (e.g. sand back passing and sand bags), to protect the LMT from risk of exposure due to erosion until Phase II (long-term) is ready for implementation (approximately 5 years). It should be noted that there is a high likelihood (~90% likelihood) that these measures would be adequate if storms of 2010 magnitude (1 in 30 year return) or larger do not occur. Phase II would involve the implementation of a long-term plan that adheres to the coastal management approach that is outlined in the OBMP and includes managed retreat, beach nourishment, and structural protection through adaptive management. The long-term plan proposes removal of existing coastal armoring and installation of a subsurface, low-profile structure that would protect vulnerable segments of the Lake Merced Tunnel south of Sloat Boulevard. The structural protection measures under consideration is a pile wall, or similar, which would be constructed from the existing ground surface landward of the bluff face. Installation of the structural protection of the Lake Merced Tunnel would facilitate

the removal of existing rock revetments, rubble, and any interim protection devices installed at South Ocean Beach.

As described below, Phase I would be implemented on an as-needed basis, based upon triggers, or pre-established thresholds for determining when it is necessary to intervene. The thresholds would be described in a monitoring program and be based upon beach and bluff erosion and infrastructure exposure. The Phase I program would be implemented between 2015 and 2021. Phase II implementation is anticipated to begin in 2020 and may proceed in phases, based upon triggers identified in the *Coastal Protection Measures & Management Strategy for South Ocean Beach* (SPUR et al. 2015), over a period of 40 or more years. Removal of rock revetments and other shoreline protection measures, along with restoration of the bluffs and beach, would be among the first Phase II actions expected to be completed by the end of 2021.

The design, environmental review, and permitting of Phase II are expected to take approximately 5 years to complete. Until Phase II measures are cleared for implementation, temporary shoreline protection measures (Phase I) would be needed to manage the erosion hazard that threatens the Lake Merced Tunnel. Thus, the Phase I measures are the subject of this application. The coastal development permit application for Phase II measures is expected to be submitted in 2018.

## **DESCRIPTION OF THE PROPOSED PROJECT**

The SFPUC proposes to implement the Phase I project, which involves temporary erosion protection measures, over the next 5 years. As described more fully below, the Phase I project includes sand backpassing (a measure that has already been implemented twice) and installation of sand bags. Sand backpassing may occur as frequently as once annually. Sandbag construction would occur on an as-needed basis. Triggers for sand backpassing and sandbag placement would be outlined in a monitoring program developed for this project.

### **Sand Backpass**

The Phase I project involves excavation of sand from the beach along the O'Shaughnessy Seawall at the northern reach of Ocean Beach, placing the sand west of the bluffs south of Sloat Boulevard for temporary protection from erosion during winter storms, and the installation of measures, if needed, to reduce windblown sand onto the parking lots and Great Highway south of Sloat Boulevard.

### **Excavation in North Ocean Beach**

Excavators, loaders, and dozers would be used to move and load sand into 30 cubic-yard articulated off-road dump trucks from the area of excavation indicated on the attached map. The areas to be excavated would be approximately 150-feet wide, 750 feet long for each sand backpassing occurrence (up to 2,250 linear feet maximum), and to a maximum depth of 6 feet (Figure 1). Equipment would enter and exit through an access point at the south end of the O'Shaughnessy Seawall near Lincoln Way. This description mimics previous sand backpassing efforts that have already been implemented and have been shown to provide erosion protection.

## **Sand Placement South of Sloat Boulevard**

The proposed project would place sand on an approximately 0.5 mile stretch of bluff south of Sloat Boulevard. The project would prioritize sand placement at two different locations, referred to as Reach 2 and Reach 3, as shown in Figure 2. Reach 2 includes the bluff and beach approximately 2,000 feet south of Sloat Boulevard, west of the Great Highway. Reach 3 includes the bluff and beach approximately 600 feet south of Sloat Boulevard.

Two sacrificial berms would be established at Reach 2 and Reach 3. Approximate dimensions of the berm at Reach 2 would be 140 feet wide by 360 feet long and 25 feet high. Nominal dimensions of the berm at Reach 3 would be 170 feet wide by 300 feet long and 25 feet high. The actual berm dimensions may likely vary due to beach conditions at the time of sand placement. Sand would be end dumped from a fixed location at the north end of the reach and bulldozers would build up the berms from the beach. This method of berm development would avoid disturbance of potential bank swallow habitat at the top of the bluffs at Reach 2. At Reach 3, sand would be dumped from the top of the bluff and spread by bulldozers and loaders, as necessary. The Reach 3 berm would cover an area of the existing rock revetment and also improve beach access.

## **Wind Erosion Control Measures**

The SFPUC would employ several measures to limit sand being blown from the proposed berms onto the Great Highway and further inland. Sand berm stabilization measures may include readily available natural materials, such as European beachgrass (treated with saltwater or left to dry prior to installation to guarantee it is non-viable) that exists on-site and locally obtainable Eucalyptus branches. Placement of beachgrass straw punch would provide sand deflation to minimize the transport of sand by increasing the surface roughness. The beachgrass could be removed by hand and shovel from stable dune backslopes (leeward) in the vicinity of Irving and Judah Streets. The beachgrass thatch planting units (plugs) could be placed along the sand berm crest and slope in high to low density. The entire sand berm surface above the 12-foot elevation could receive straw punch, with the exception of areas set aside for public access.

Brushwood fences made of eucalyptus branches may be placed as sand trapping units to encourage deposition of sand. Buildup of sand behind the fences would be anticipated, and therefore the brushwood fences could be placed at least 5 feet seaward of the parking lots. The size of the branches could be approximately 6 to 8 feet in length. The brushwood fences could include single and double lines of brush to be placed on the outer edge and interior of the berm crest, respectively. The single line of brushwood fence could include between 2 and 4 branches per 10 feet of fence and would be placed along the outer edge of the berm crest. This single line of brushwood fence would be considered sacrificial and could likely become obscured by sand buildup. The double line of brushwood fence would be constructed of approximately 4 to 5 branches per 10 feet of fence, and could be located toward the middle of the berm crest. The double line of fence could persist and would promote a significant sand deposit on the leeward side of the fence. The fencing could be placed a minimum of 5 feet from the parking infrastructure. To provide access to the beach, placement of brushwood fencing could delineate

access ways. The fencing could help discourage pedestrians from walking through areas improved with erosion control measures. Brushwood fencing could also be installed to delineate access pathways from the bluff to the beach.

### **Sandbag Structure**

The SFPUC proposes placing sandbags stacked upon each other to form a layer protecting the bluff face from direct wave action. Based on monitoring prior to and during the storm season, sandbags would be placed if a sufficient erosion “notch” develops due to a winter storm on the existing bluff such the bluff toe is 50 feet or less from the edge of the Lake Merced Tunnel.

The sandbags would consist of permeable plastic bags filled with sand from either north Ocean Beach or a commercial source. If north Ocean Beach is the source of sand for the sandbags, a maximum of 1,000 cubic yards would be used. Sandbags would be typically placed in local erosion hot spots, (i.e., where erosion is occurring more rapidly than in adjacent areas) covering a length of bluff on the order of 50 to 100 feet to a maximum extent of 300 feet long, 70 feet wide, 20 feet high for each sandbag structure. At Reach 2, to avoid impacts to potential bank swallow habitat, 6 feet of vertical clearance would be provided between the top of the sandbag structure and the top of the bluff. Up to 3 sandbag structures may be constructed, each up to 100 feet long. However, if conditions warrant, all sandbag structures may be combined into a single 300-foot long structure built all at once. As shown in Figure 3, potential locations for the sandbag structures start 400 feet south of Sloat near the location of the sand bag installation constructed in 2011.

Sandbags could be prepared in advance and stockpiled in a nearby site, such as SFPUC property at the Oceanside Treatment Plant or San Francisco Zoo property. The sandbags would be transported to a project location and lowered onto the beach with a crane. Excavation of the beach may be necessary to prepare and level the beach at the sandbag structure location. Excavated area may be up to 300 feet long, 20 feet wide and 4 feet deep. Once sandbags have been installed, the structure would be covered by a 2-foot layer of sand.

The sandbags would be considered temporary, would be maintained, and ultimately would be removed. Maintenance would consist of re-filling and sealing bags, repositioning bags, and replacing and appropriately disposing of any damaged bags. Removal would require excavation, but could also include removal of the fabric while leaving the sand on the shore.

### **Construction Equipment, Duration, and Staging**

Vehicles and equipment to be used would include dump trucks, excavators, loaders and bulldozers.

The construction duration would be approximately 6 weeks for sand backpassing and 4 weeks for sand bag placement, if constructed separately, although the two different measures could be implemented simultaneously. Overall, construction duration in a single year would not exceed 10 weeks and the maximum duration for each even event would not exceed 8 weeks.

Staging would occur at the southern end of the parking lot near the O'Shaughnessy Seawall, the Sloat parking lot, the parking lot south of Sloat, and the paved area next to the Great Highway south of Reach 2 (Figure 4). The project would take up approximately 20 parking spaces at the parking lot near the O'Shaughnessy Seawall and would take up the majority of the parking spaces at the Sloat parking lot and the parking lot south of Sloat. These three staging areas would be closed to the public during construction which would be limited to the weekdays.

**Sand Backpassing:** To expedite the construction, southbound lanes of the Great Highway would be closed during normal construction hours, Monday through Friday between 7:00 AM and 8:00 PM. No night or weekend work would occur. The construction contractor would implement a San Francisco Municipal Transportation Agency approved traffic routing plan.

During construction, any incidental and hazardous rubble that have fallen onto the beach adjacent to the construction area would be removed by the SFPUC contractor.

**Sandbag installation:** Work would occur during normal construction hours, Monday through Friday between 7:00 AM and 8:00 PM. No night or weekend work would be anticipated, except during an emergency.

## **Monitoring**

Monitoring would occur in accordance with the terms of a monitoring program approved by CCC staff. The monitoring program would establish locations of survey control, identify the Lake Merced Tunnel and offsets used as triggers for intervention (i.e., backpassing or sandbag placement), and specify monitoring protocols and reporting requirements. The monitoring program would specify that land surveys be conducted twice annually at a minimum, typically spring and fall, with additional event-based surveys if warranted due to substantial storm or erosion events. The land surveys would be used to characterize shore profiles from top of bluff to intertidal zone, contours, and extents and conditions of erosion management measures. The land surveys would also include photographic documentation of the shoreline, both from aerial and land perspectives. The annual monitoring reports would summarize the prior year's monitoring efforts, describe any physical changes at South Ocean Beach over the monitoring period, provide details of any activities (e.g., construction) and events (e.g., episodic erosion) during the reporting period, and include recommendations for actions to mitigate coastal erosion risks to the Lake Merced Tunnel. Each monitoring report will also include integration of regional data with interpretation to help diagnose erosion problems, determine actions, and inform development of future engineering solutions.

## **Biological Resources**

The project site is not located within designated critical habitat and does not involve any vegetation removal or any permanent development.

Habitat for the western snowy plover (*Charadrius alexandrinus nivosus*), a federally threatened species, and a California species of special concern is found on Ocean Beach, but it is not designated critical habitat. In 2008 the NPS, through formal rulemaking, established a Snowy

Plover Protection Area (SPPA) on Ocean Beach in order to provide a protection zone for western snowy plovers overwintering on Ocean Beach (snowy plover nesting has not been documented on Ocean Beach). The NPS designated the SPPA to require dogs to be kept on leash from July 1 until May 15 (period when SNPL have been observed on Ocean Beach) and thereby attempt to minimize this activity's effect on SNPL. In relation to the SPPA, excavation would be limited to within 150 feet of the O'Shaughnessy Seawall between Stairwells 1 and 28. This was determined by U.S. Fish and Wildlife Service to "Not Likely Adversely Affect" western snowy plovers.

The bank swallow (*Riparia riparia*) is a state-listed threatened species that burrows in beach bluffs. An important nesting colony of bank swallows has been identified at Fort Funston approximately 2.5 miles south of Reach 2. Active bank swallow burrows have been recorded approximately 200 feet south of Reach 2. There are no active bank swallow burrows in the project area and bank swallows have never been observed at Reach 2 or Reach 3. Reach 2 may contain some potential bank swallow habitat due to the presence of some natural bluff material. However, geological testing is confirming whether this is native colma formation or consolidated fill. In the case Reach 2 is considered consolidated fill, this area would not require bank swallow protection measures. the proposed project would not affect bank swallows for the following reasons:

- If work at Reach 2 is conducted during bank swallow nesting season, from March to July, then a preconstruction survey for nesting bank swallows would be performed. If nesting bank swallows are found at Reach 2, construction would not begin until the juveniles have fledged.

No other vertebrate, invertebrate or plant species of concern have been identified in the project vicinity.

Because the project would not affect the western snowy plover or the bank swallow, adverse effects on biological resources are not anticipated.

## **Water Quality**

The proposed project would be constructed during dry weather to the maximum extent feasible and equipment would not be used below the mean high tide line. All vehicle staging and fueling would be located in the parking lots adjacent to the beach. Based on the size of land disturbance, an erosion and sediment control plan (less than 1 acre of disturbance) or a SWPPP (more than one acre of disturbance) would be prepared to protect water quality during construction. Post construction water quality impacts are not anticipated since the proposed project would not increase impervious surfaces or significantly alter the drainage pattern at Ocean Beach.

## **Visual Resources**

The proposed sand backpassing and sandbag structures that would be covered in sand would create sandy bluffs at South Ocean Beach which would be an improvement in overall visual quality because existing bluffs often reveal the various debris that have been used as fill material under the Great Highway. The sandbag structures may become exposed due to wave

action or wind erosion, however, because they are placed adjacent to eroding bluffs that have exposed debris and other fill material, the sandbag structures would not be visually incompatible with their surrounding area.

The proposed measures to minimize wind erosion would use natural materials including dune grass and tree branches to provide a natural appearance that would blend in with the existing visual qualities of Ocean Beach. Dune grasses are prevalent elsewhere along Ocean Beach and it is anticipated that most of the wood brush fence would be partially covered by sand. In addition, the shell lag armor would be minimally noticeable since it would consist of natural materials found at the beach. Finally, sand at the north end of Ocean Beach shifts naturally with the seasons, therefore removing the excess sand would not result in any drastic changes in appearance.