

2014 Ocean Beach Sand Management Project

PROJECT DESCRIPTION

Project Purpose

The Ocean Beach Sand Management Project will gather excess sand built up along the O'Shaughnessy Seawall and place this sand in the erosion hotspot south of Sloat Boulevard. A successful project will:

- Remove sand from in front of the O'Shaughnessy Seawall in order to reduce future sand maintenance efforts;
- Maintain public access on promenade and stairwells that have been blocked by sand build-up;
- Enhance beach access in the erosion hotspot area south of Sloat Boulevard;
- Provide for bluff protection in high risk areas that threaten CCSF infrastructure;
- Reduce the need to implement more engineered bluff protection measures in the short-term.

Need for the Project

The project is necessary because excess sand built up along the O'Shaughnessy seawall is overtopping the seawall and flowing into the stairwells, promenade, parking lots, Great Highway, and adjacent neighborhoods. The sand levels at the north end of Ocean Beach continue to be extremely high, two years after the 2012 sand backpass which relocated 73,300 cubic yards (cy) of sand. A monitoring survey performed in July 2013 indicated that the borrow area had by that time filled back up with sand since the excavation in September 2012. Without removal of this excess sand, National Park Service (NPS) and City and County of San Francisco (CCSF) maintenance crews will need to expend an extraordinary amount of resources to manage the overflow of sand. The face of the seawall continues to be buried in sand. It has been estimated that there is over 70,000 cubic yards of excess sand within a 4,200-foot long reach of beach.

Since the 1970s due to various natural and manmade factors, the beach at the northern end of Ocean Beach has been widening while the southern end has been shrinking. The effects are especially notable during the spring, when shifting winds and currents deposit significant amount of sand and create large sand mounds in the north while the beach drops by many feet in the south.

At the same time, the bluffs from Santiago Street to Fort Funston are eroding at an unprecedented rate. To protect critical infrastructure, the City and County of San Francisco (CCSF) has placed approximately 1,000 feet of temporary rock revetments in two strategic locations south of Sloat Boulevard over the past 15 years. However, erosion from storms each year requires constant maintenance of the bluffs to protect the City's wastewater and transportation infrastructure which are threatened by the ongoing erosion (see Figures 2-3).

To address the issues of excess sand and sand deficit at opposite ends of Ocean Beach, the National Park Service (NPS) in cooperation with the City's two departments, the San Francisco Public Utilities Commission (SFPUC) and Department of Public Works (DPW) propose to transport approximately 30,000 cubic yards (cy) of sand from the overwidened backbeach area in front of the O'Shaughnessy Seawall to the erosion hot spot south of Sloat Boulevard to provide temporary shoreline stabilization and protection for the Lake Merced Transport Tunnel, which connects to a large wastewater treatment facility, as well as the Great Highway.

NPS and the City are actively participating in the comprehensive planning efforts at Ocean Beach lead by San Francisco Planning and Urban Research Association (SPUR), which aim to develop long-term solutions that would address the complicated land use, resource protection, public recreation, and shoreline stabilization issues at Ocean Beach. The proposed project would serve as an interim measure until a more permanent solution is developed.

NPS owns and manages Ocean Beach as part of the Golden Gate National Recreation Area (GGNRA), the SFPUC operates the City's wastewater infrastructure, notably the Lake Merced Transport Tunnel located under the Great Highway, and DPW maintains the Great Highway.

Detailed Project Description

The 2014 project includes four components – sand backpass, wind-erosion control measures, bank swallow nesting impact avoidance measures, and access improvement with cable & post fencing and signage.

Sand Backpass

The proposed project involves excavation of sand at the beach along the O'Shaughnessy Seawall, transporting the sand via 30 cubic yard (cy) dump trucks, and placing the sand in front of the bluffs south of Sloat Boulevard for temporary protection from erosion during high wave winter storm events.

Excavators, loaders, and bulldozers would be used to move and load sand into 30 cubic-yard articulated off- road dump trucks from the area of excavation indicated on Figure 1. The dimensions for the areas of excavation are approximately 150-200 feet wide, 4200 feet long, and up to 13 feet deep. Equipment would enter and exit on the equipment access point at the south end of the O'Shaughnessy Seawall near Lincoln. The excavation area will include stairwells 1-28, north of Lincoln Boulevard along the Promenade.

Stairwells 21-28 are just inside the Snowy Plover Protection Area. Excavation in this area will be under the condition that all equipment stay within 150 feet of the Seawall. The rationale for excavating in this area is 1) Stairwells 21-28 have more sand than 1-20 because they were not excavated in 2012; 2) excavation equipment used this

section of beach as a travel corridor in 2012 so the presence of equipment in the area is not a change from the 2012 project; 3) Snowy plovers aren't known to use the beach this high up by the Seawall without dunes backing the beach, and snowy plovers have been observed no closer than 500 meters (1,640 feet) from the project area.

Dump trucks would be used to transport the sand to areas south of Sloat Boulevard. The proposed project would place sand on approximately 0.5 mile stretch of bluff south of Sloat Boulevard (see Figure 1). The project would prioritize sand placement at two different locations: the bluffs approximately 600 feet south of Sloat Boulevard, which is called Reach 3 in the 2011 *Lake Merced Tunnel/Great Highway/Ocean Beach Emergency Project Design Report* by Moffat and Nichols; and another area approximately 2,000 feet south of Sloat Boulevard, known as Reach 2 in the same report, across the Great Highway from the SFPUC's Oceanside Water Pollution Control Plant. Sand placement decisions depend on the erosion rate and bluff protection needs in a given year. Reaches 2 and 3 have been identified as where the Lake Merced Transport Tunnel and the Great Highway are most threatened by erosion. Details of sand placement within the two areas are as follows:

- **Reach 2.** The sand would be placed on the existing beach surface over a length of approximately 300-ft (see Figure 1). All sand placed at Reach 2 in 2012 has been eroded. [Note that the northern placement limit extends a short distance into a transitional area that was designated as part of the Rubble Reach; for the purposes of this project description this transitional area will be considered part of Reach 2]. This reach has capacity to receive approximately 18,000 cy; the actual amount of sand placed will depend on the beach profile present at the time of placement.
- **Reach 3 and the southern portion of the North Lot Reach.** A thin layer of sand was placed over the existing sandbag revetment in Reach 3 and essentially all this sand has been eroded. About half of the sand in the southern portion of the North Lot Reach has eroded (see Figures 4-5 and 6). The length of the potential placement area is approximately 400-ft long (see Figure 1). This reach has capacity to receive approximately 12,000 cy; the actual amount of sand placed will depend on the beach profile present at the time of placement.

A conceptual depiction of the proposed sand placement is provided in Figure 7; this concept is shown with 2h:1v slopes and a mid-height bench which was shown to be effective in reducing wind-induced erosion. Figure 8 shows the anticipated typical cross-section and associated volume of sand to be placed based on a high beach profile (as surveyed in February 2014).

Prior to placing the sand on the beach, the project would remove hazardous rubble such as sharp pieces of metal and asphalt.

Vehicles and equipment that would be used include 8 30-cubic yard articulated dump trucks, 1 excavator, 1 loader, and up to 4 bulldozers.

Staging would occur at the southern end of the parking lot near the O'Shaughnessy Seawall and the Sloat parking lot at the southern end. These staging areas would be used to store, refuel and service the construction vehicles at the end of each day. These two staging areas would be partially closed during construction, allowing for as much public parking as possible without affecting the construction operation.

To expedite the construction, south bound 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 dump trucks would move north and south on the closed lanes accessing the beach at both ends. The construction contractor will implement a San Francisco Municipal Transportation Agency (SFMTA) approved traffic plan. The proposed construction duration is approximately 5 weeks.

Wind-Erosion Control Measures

After sand has been placed, the finished surface will receive one or more of the following measures to resist wind erosion: straw punch, shell lag, sand fencing, and native planting; see Figure 9 for conceptual sketch of potential wind-blown sand management measures. The specific type of measure to be used will be determined during the design phase.

To provide access to the beach, access ways will be delineated by placement of brushwood or wood-slat fencing. These access ways will not receive wind-erosion control measures described previously. The fencing will help discourage pedestrians from walking through areas that receive erosion control measures. Figure 9 shows a conceptual layout of multiple access paths from the parking lot to the beach; the number and alignment of access paths will be determined during design.

Bank Swallow Nesting Impact Avoidance Measures

Work in Reach 2 will be done to avoid impacts to the existing bank swallow nesting area in Reach 1 to the south; the northern limit of the active nesting area is located approximately 200-ft south of the SWOO outfall. The bluff in this area receded approximately 30-ft during the 2010 storm event, and at the conclusion of armor rock placement in 2010, the bank swallows nested in the newly exposed bluff.

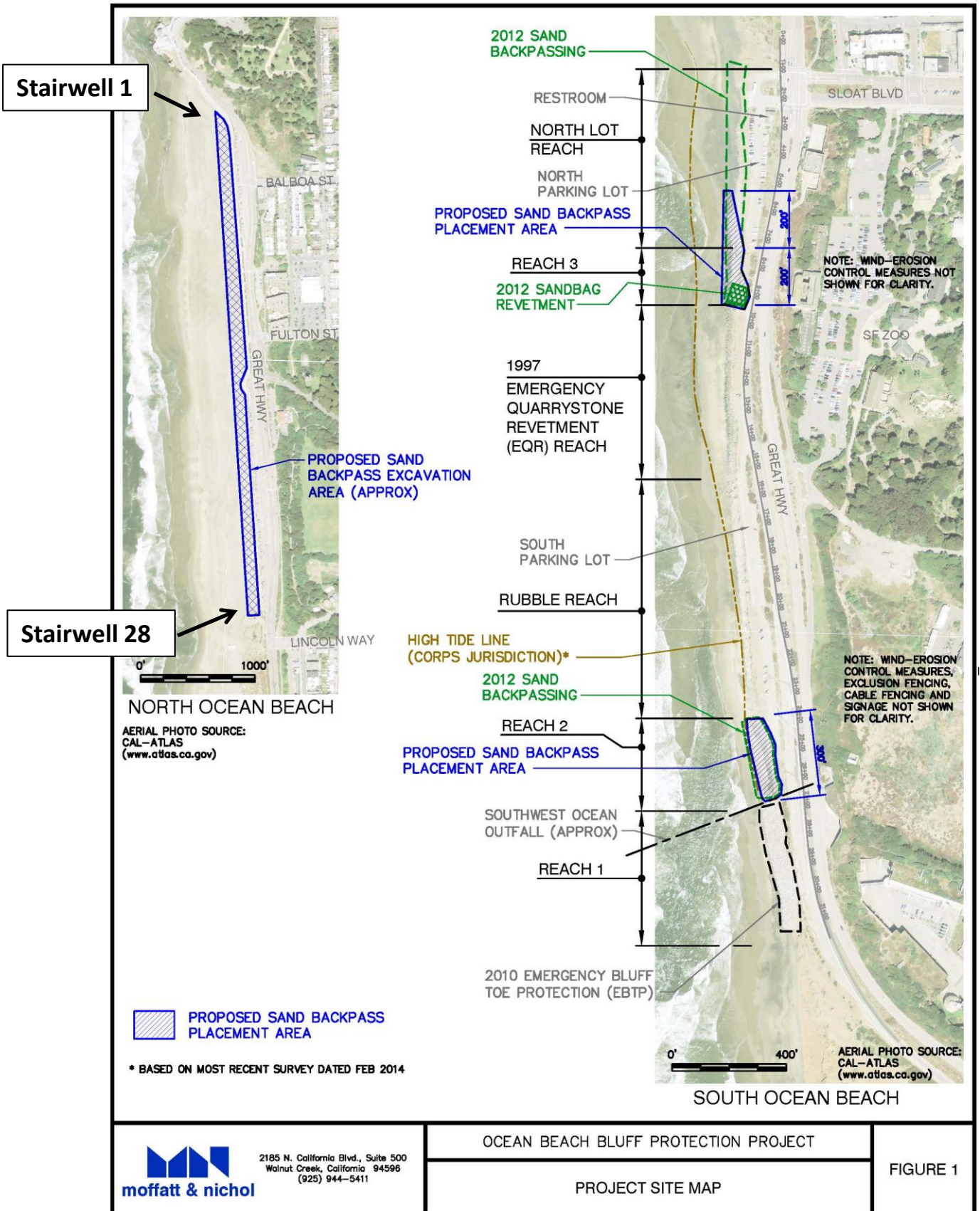
The area is accessible by walking on the crest of the armor rock or by climbing up the face of the armor rock from the beach. To discourage people from disturbing the sensitive bank swallow habitat, exclusion fencing and signage will be installed at the northern end of the 2010 armor rock (adjacent to the SWOO outfall), and signage will be provided near the toe of the armor rock to inform the public of the sensitive nature of the bank swallow habitat. The exclusion fencing will be a continuation of the existing chain link fencing that is currently at the site (see Figures 10- 11).

Access Improvement: Cable & Post Fencing and Signage

Cable & post fencing will be added along the edge of the eroding asphalt at Reach 2 in accordance with NPS design guidelines consistent with similar installation in the vicinity of Reach 3. This will guide the public to a safe beach access route across the sand berm at Reach 2 and will help minimize erosion of the berm or the bluffs by foot traffic (see Figures 10-11). Wayfinding signs will also direct visitors to beach access (see Figure 11.)

2014 Sand Excavation and Placement Areas

Figure 1



Figures 2 and 3

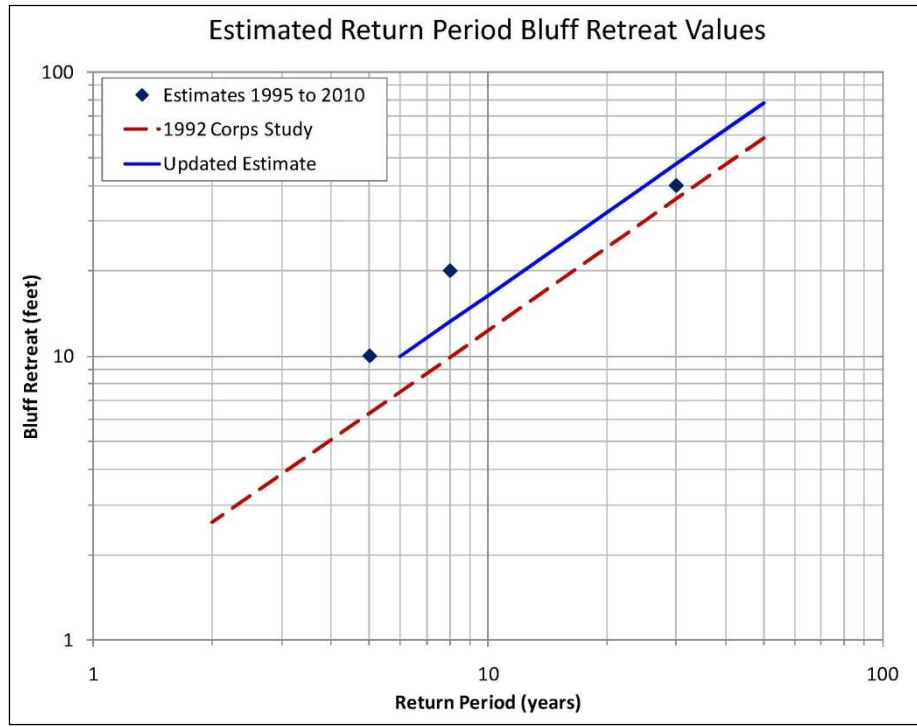


Figure 2 – Bluff Retreat Analysis

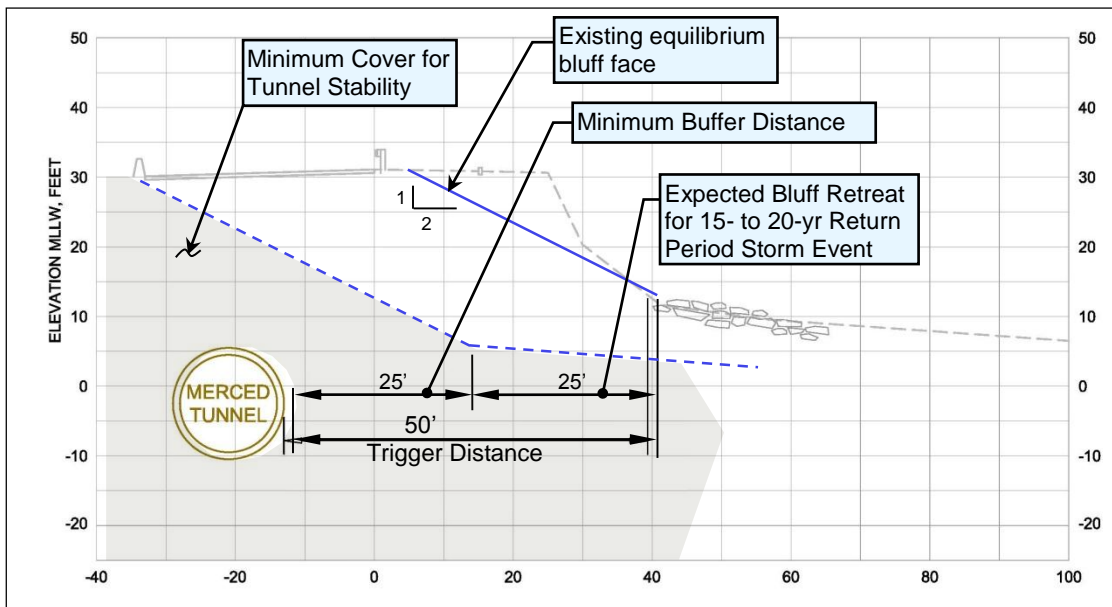


Figure 3 – Reach 3 Cross-Section and Trigger Distance

Figures 2 and 3

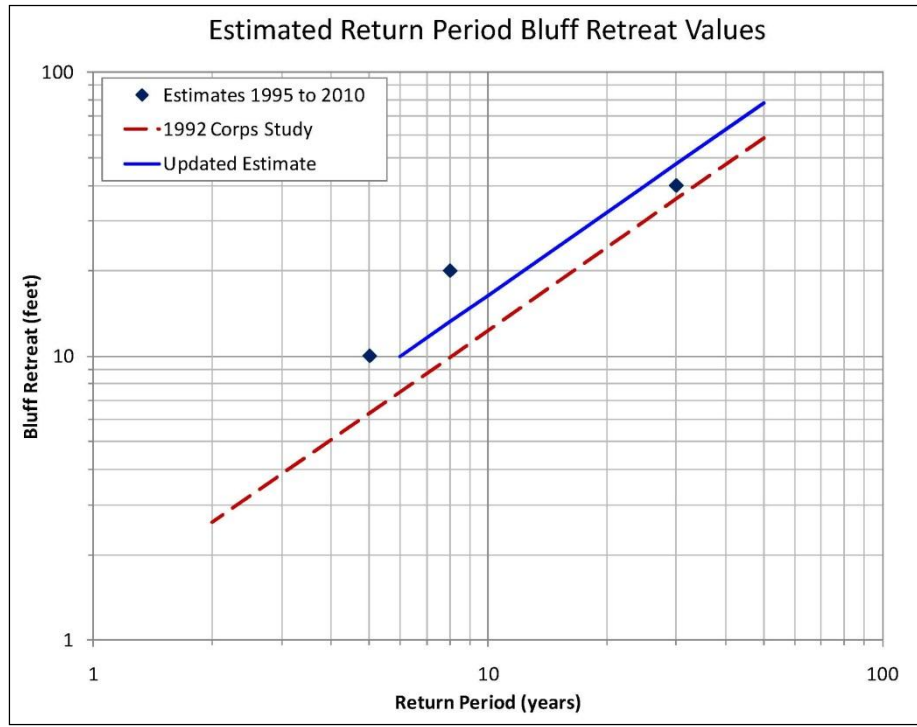


Figure 2 – Bluff Retreat Analysis

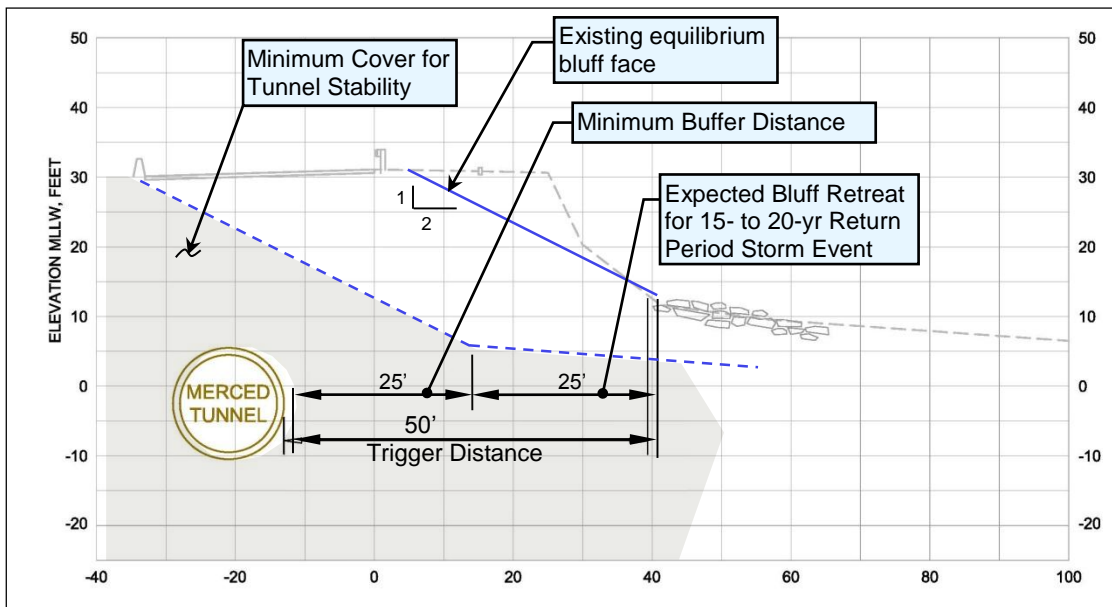


Figure 3 – Reach 3 Cross-Section and Trigger Distance

Figures 4 and 5



Figure 4 – Aerial Photo of North Lot Reach; June 2013



Figure 5 – Aerial Photo of North Lot Reach, Reach 3 and EQR (L to R); June 2013

Figure 6

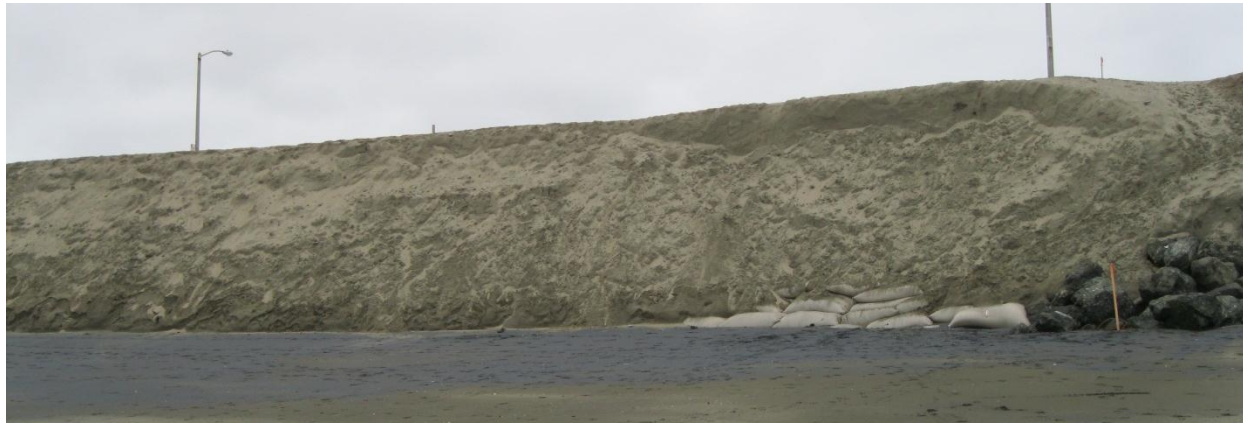
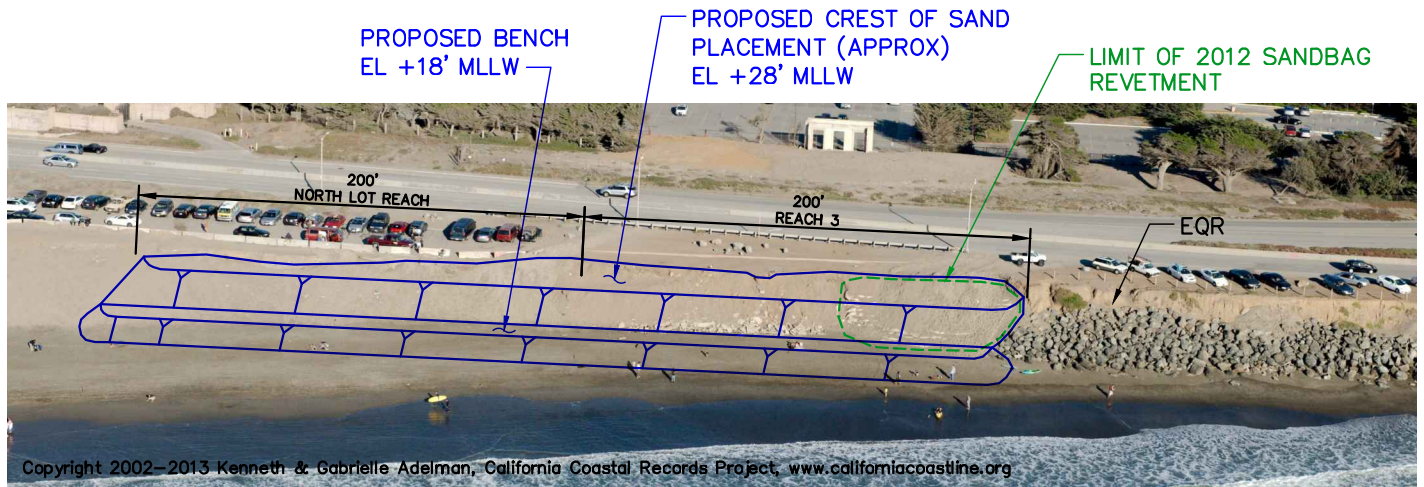
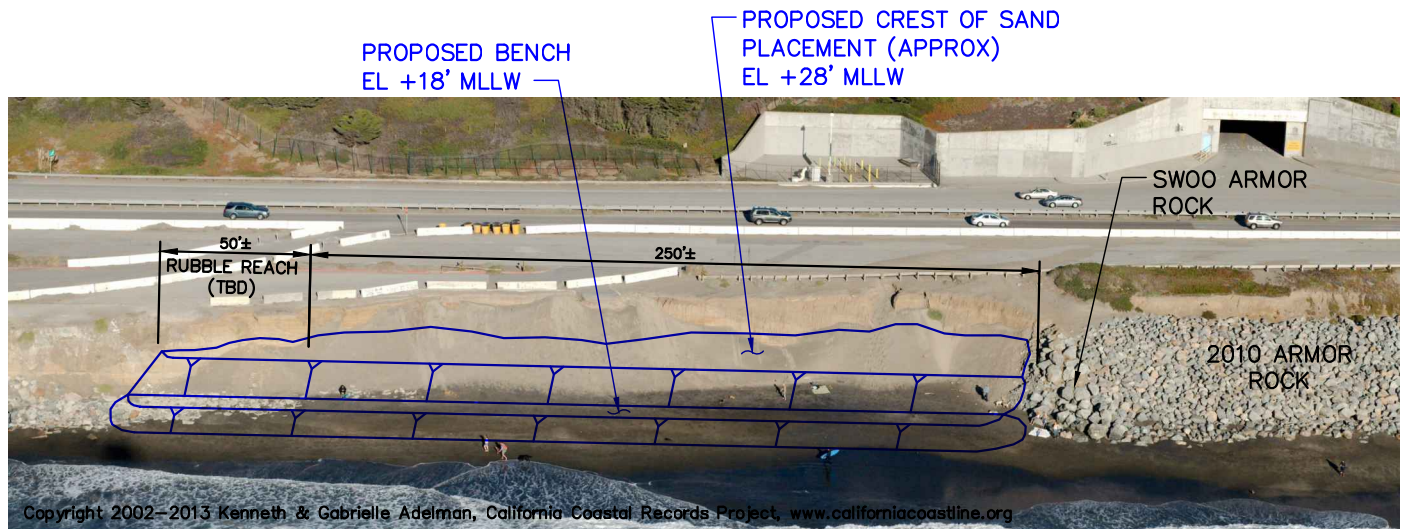


Figure 6 – Reach 3 Sand Backpassing Photo (top: Dec 2012; bottom L: Mar 2013; bottom R: Jan 2014)

Figure 7



REACH 3 AND NORTH LOT REACH
(NOT TO SCALE)

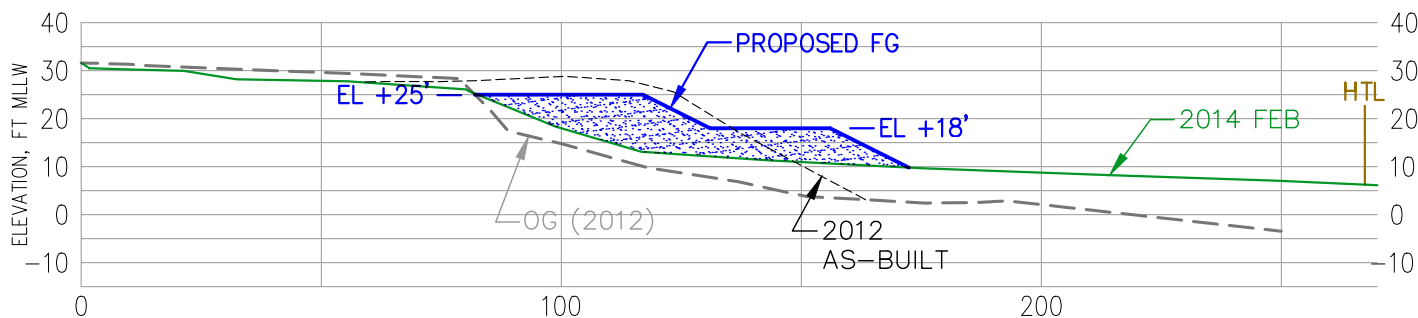


REACH 2
(NOT TO SCALE)

Figure 8

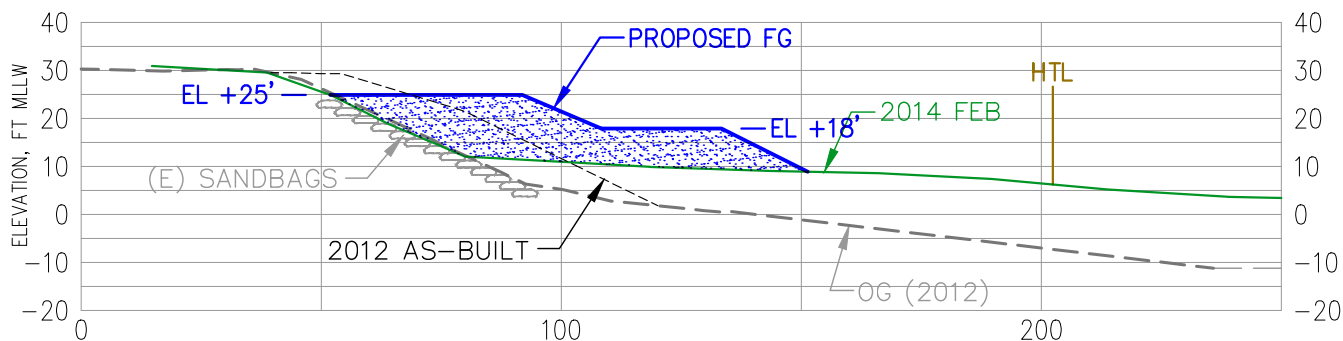
7+00 NORTH LOT REACH (L=200')

ANTICIPATED VOLUME *
5,000 CY



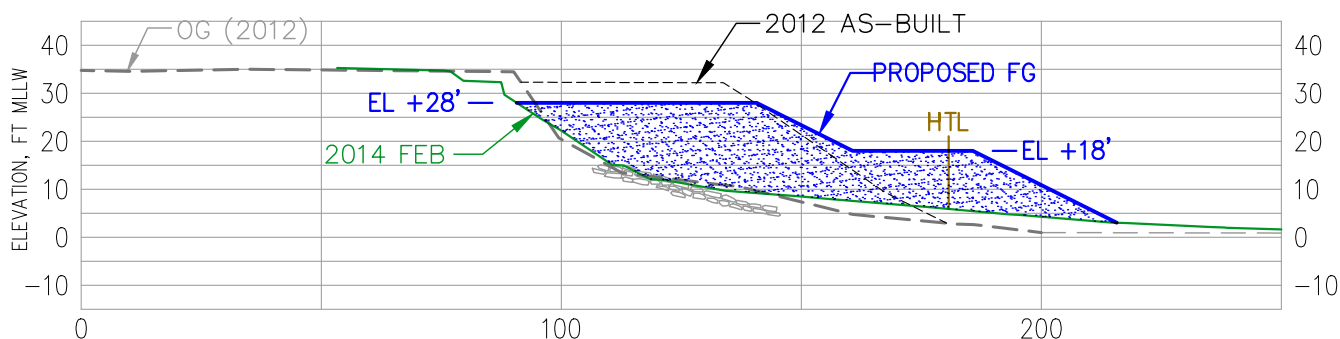
9+25 REACH 3 (L=200')

ANTICIPATED VOLUME *
7,000 CY



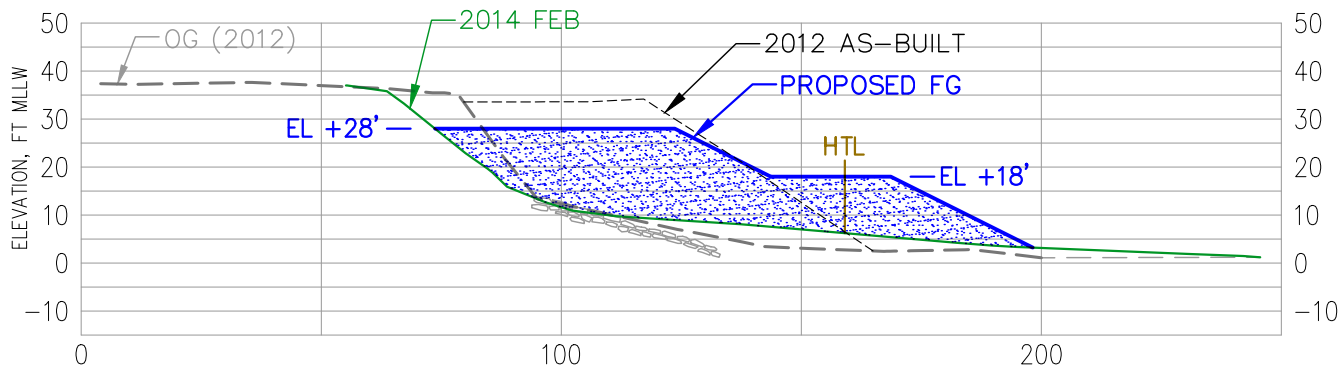
25+25 REACH 2 (L=200')

ANTICIPATED VOLUME *
12,000 CY



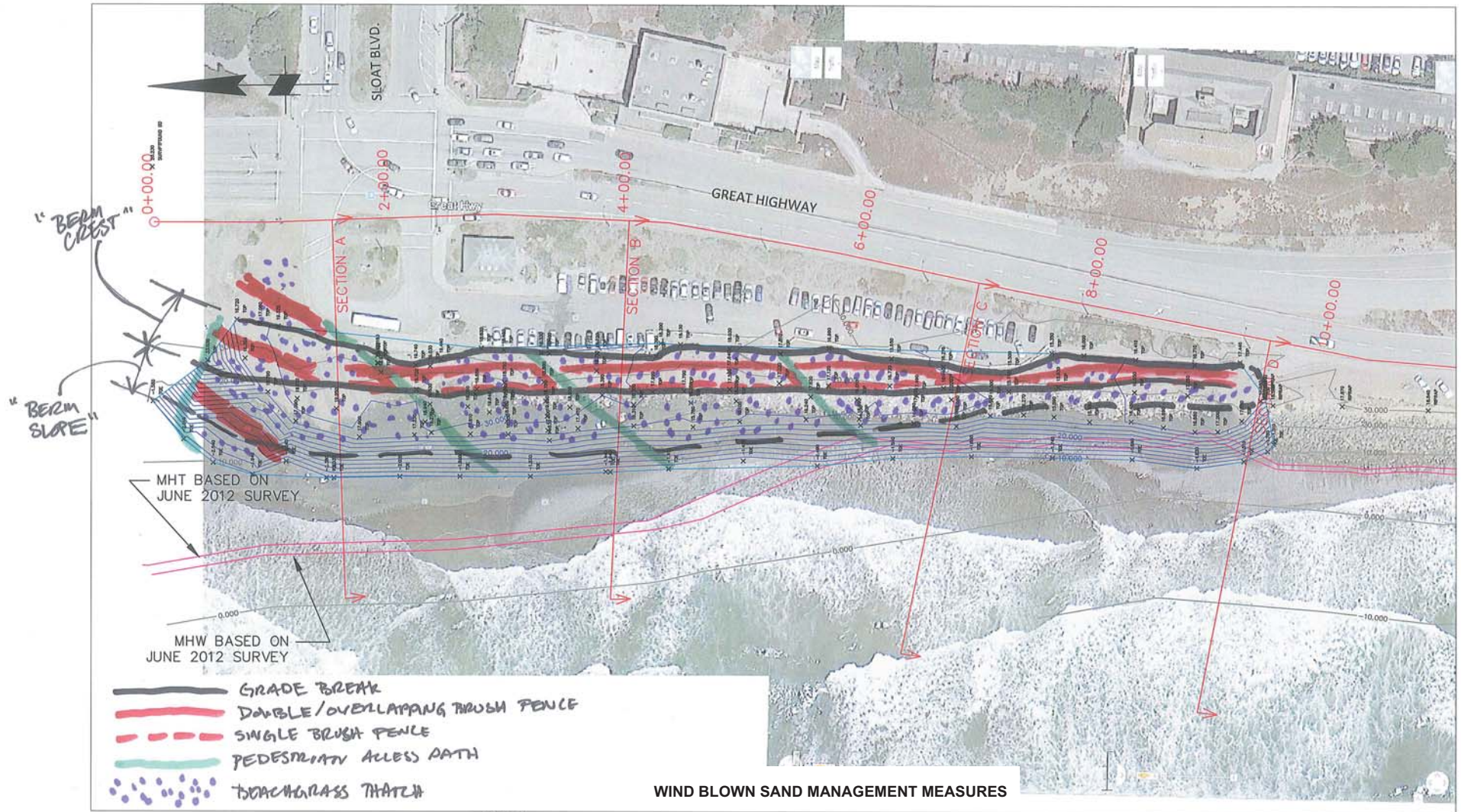
26+50 REACH 2 (L=100')

ANTICIPATED VOLUME *
6,000 CY



* INCLUDES CONTINGENCY AND ALLOWANCE FOR LOSSES DURING PLACEMENT

Figure 9



NOTES:

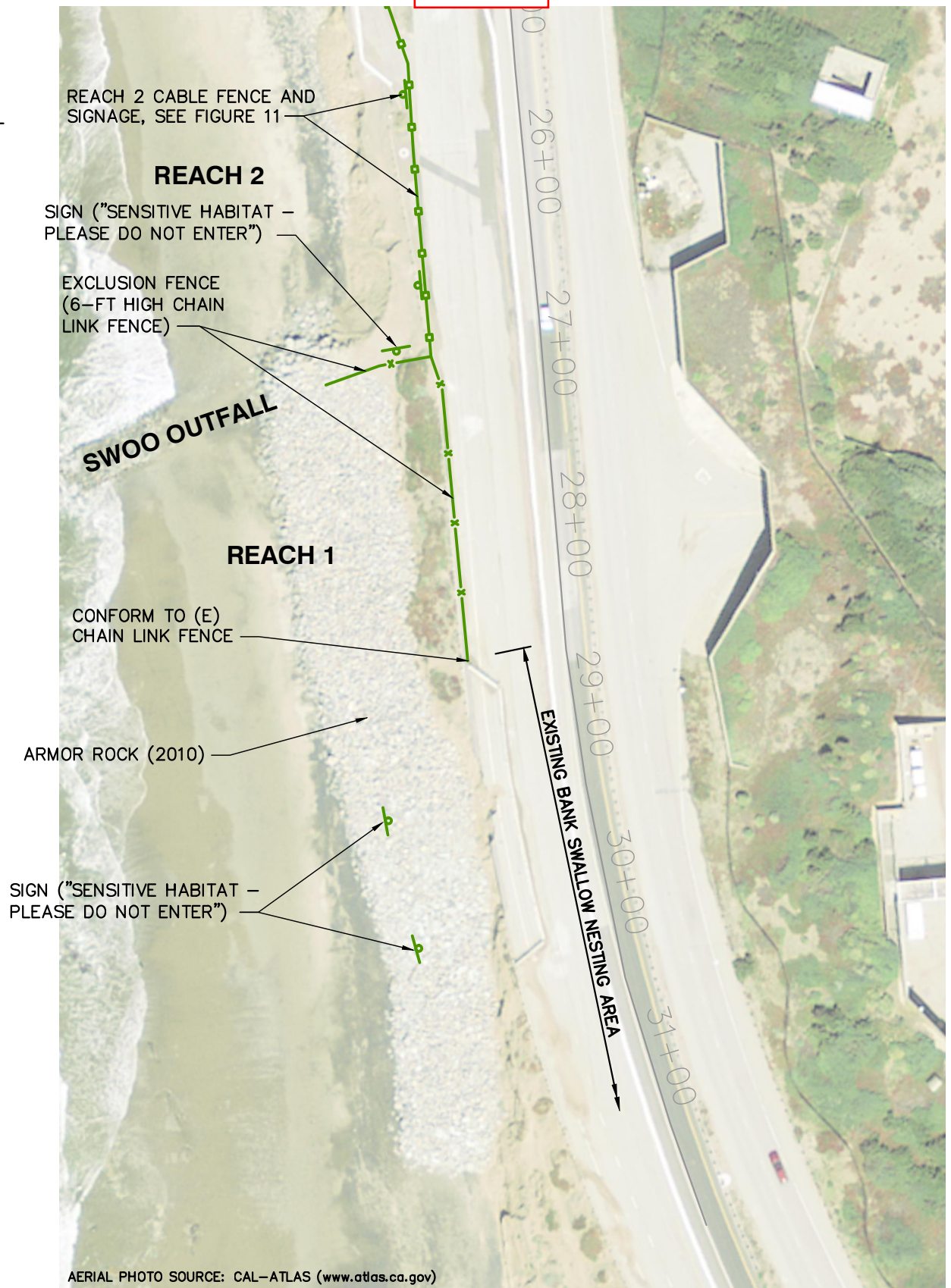
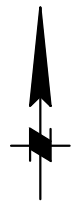
1. OG FROM SURVEY DATED JUNE, 2012
HORIZONTAL DATUM: CALIFORNIA ZONE 3 - NAD1983 (CORS96), VERTICAL DATUM: ORIGINALLY CITY OF SAN FRANCISCO DATUM, ADJUSTED TO MLLW IN DRAWINGS
2. FG FROM SURVEYS SEPTEMBER AND OCTOBER, 2012
HORIZONTAL DATUM: CALIFORNIA ZONE 3 - NAD1983 (CORS96), VERTICAL DATUM: ORIGINALLY CITY OF SAN FRANCISCO DATUM, ADJUSTED TO MLLW IN DRAWINGS
3. SURVEY POINTS FROM SURVEYS SEPTEMBER AND OCTOBER, 2012
HORIZONTAL DATUM: CALIFORNIA ZONE 3 - NAD1983 (CORS96), VERTICAL DATUM: ORIGINALLY CITY OF SAN FRANCISCO DATUM
4. TO CONVERT FROM MLLW TO CITY DATUM, SUBTRACT 11.666 FT

OCEAN BEACH SAND BACKPASSING
PROJECT



**FIGURE
9**

Figure 10



PLAN - BANK SWALLOW HABITAT (REACH 1)



Figure 11

