Proposed Amendment to the Goleta Beach County Park Coastal Development Permit (CDP No. 4-14-0687)

Introduction

Goleta Beach County Park is a 29-acre park with the 2,400 feet of shoreline west of Goleta Pier partially protected by 1,200 feet of existing permitted rock revetment, which is generally buried beneath beach sand. As described below, the 2015/2016 El Niño created abnormally high tides and repeated large swells, which caused substantial erosion damage to unprotected areas of lawn at Goleta Beach County Park, which threatened park facilities and infrastructure and the safety of visitors and workers. These conditions required emergency actions and repairs to protect the park which included construction of a winter sand beach berm and backfill of erosion damage with earth, cobbles, and a vertical layer of geotextile filter fabric under emergency Coastal Development Permits (CDP). However, as discussed below, these measures proved inadequate to protect the rapidly eroding lawn area at this public park and the County responded with emergency installation of geotextile filter fabric cells of compacted earth and cobble. Following the storm season, natural and mechanical sand deposits have covered these repairs. As the geotextile fabric is buried and would remain in place to provide additional protection of the park from future erosion, the County seeks approval to permit the geotextile layered filter fabric cells in place through an amendment to the issued CDP No. 4-14-0687.

Although Goleta Beach is generally sheltered from big surf, it can experience extreme surf conditions, particularly during El Niño storm events or when waves arrive with a west swell.

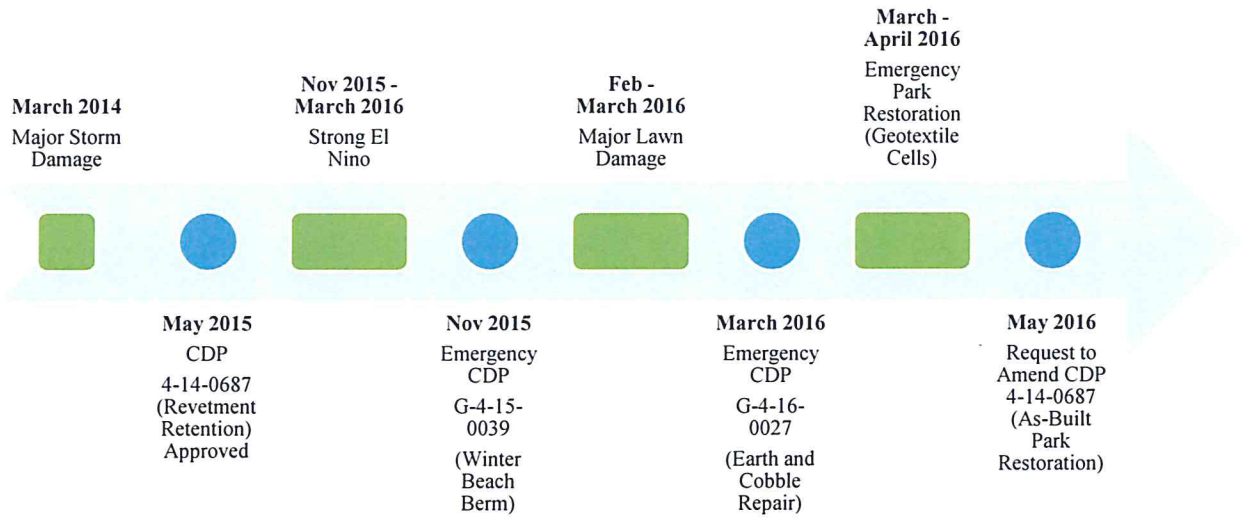
Background

Since a large storm in March 2014 severely damaged Goleta Beach, the sand levels along the beach have been depleted and have failed to fully recover. By November 2015, Goleta Beach had been critically eroded and sand volumes on the beach were at the lowest volumes measured over the last 14 years. In anticipation of the potential threats of substantial shoreline erosion and damage to park facilities associated with a strong El Niño event forecasted for winter/spring 2015/2016, the County of Santa Barbara was permitted, under Emergency CDP G-4-15-0039, to construct a winter beach berm along 2,400 feet of Goleta Beach west of Goleta Pier; this berm was constructed in December of 2015. In spite of repeated maintenance, unusually high tides and frequent large swells continually eroded the

Following completion of the sand berm in December, frequent maintenance involved use of excavators to rebuild the eroding sand berm.

berm. By late February of 2016, low sand levels fronting unprotected areas of the public lawn reduced the effectiveness of ongoing sand berm maintenance, resulting in substantial erosion and damage to the lawn and County facilities. Erosion severely damaged eight locations of the park, creating sinkholes and associated crevasses that eroded 15 to 20 feet landward into the lawn area by March 6, 2015. This removed approximately 10,000 sq. ft. of lawn, which is heavily used by the public. On March 9, 2016, the California Coastal Commission (CCC) approved emergency work under CDP G-4-16-0027 including backfilling of the sinkholes with imported earth and cobbles; however, these repairs were ineffective and damage accelerated, thereby threatening key park facilities. In response, the County undertook additional repair and protective work as described below. The County requests as-built permits for these emergency repairs through an amendment to the CDP (No. 4-14-0687) and to the Goleta Beach Adaptive Management Plan (AMP) (i.e., Goleta Beach Project).

Goleta Beach Permit History 2014 -2016



Storm Damage

The 2015/2016 El Niño storm season resulted in much more severe conditions at Goleta Beach than a typical winter storm season and the winter beach berm alone was insufficient to protect park facilities from damage by March 2016. Goleta Beach experienced elevated tides and high surf ranging from 2 to 6 feet every day. In contrast, a typical fall or winter day at Goleta Beach has surf ranging from 0 to 2 feet every day, and a typical spring or summer day at Goleta Beach has little to no surf conditions. On most days, Goleta Beach is very sheltered from wave energy from Channel Islands. However, during unique El Niño storm conditions, as occurred during the 2015/2016 storm season, wave energy reaches Goleta Beach. Due to this long period of unusually strong conditions, the winter beach berm was constantly being damaged by wave action. With ongoing maintenance, the berm effectively protected the park facilities until February 2016 when sand along the beach was exhausted and maintenance of the entire berm was no longer viable.

Consequently, in the early weeks of March 2016, substantial damage occurred to the park's lawn area, including sinkholes and crevasses that appeared in at least eight locations on March 6, 2015

and March 7, 2016. This erosion created substantial damage to park facilities and infrastructure and threatened health and safety of visitors and workers. As an emergency response, damaged regions of the park were fenced off to the public and the County submitted an application for an emergency permit to repair the damaged areas of the park.

On March 9, 2016, the CCC approved emergency work under CDP G-4-16-0027, including backfilling of the sinkholes with imported earth and cobbles (see Figure 1).[1] However, these measures proved ineffective and erosion and damage to park facilities accelerated along with release of compacted earth and cobbles into the surf zone due to high tides and strong wave action.

Sink holes that developed in March 2016 exceeded more than 10 feet in depth in some locations (left), with crevasses extended 15-20 feet deep into the lawn resulting in imminent substantial impacts to public safety at the park. The County took permitted emergency action to cordon off and fill these areas and to initiate repairs.

[1] The County had sought use of filter fabric draped vertically across the exposed scarp at the edge of the eroding lawn; however, this configuration was deemed ineffective by the project engineer and contractor.

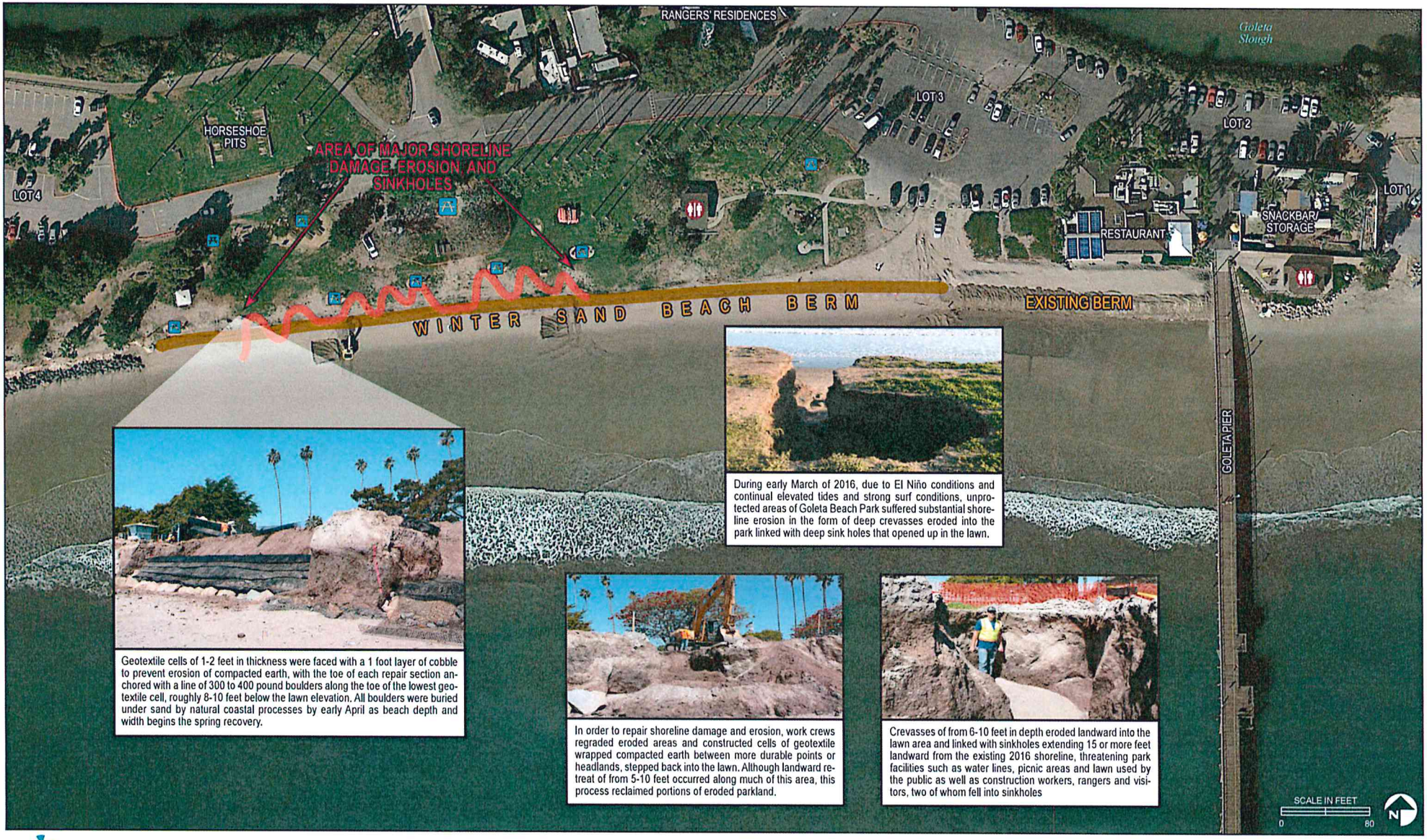


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Figure 1. Goleta Beach Repairs

Coastal Development Permit Overview

In May of 2015 the County received approval of, and in December 2015 issuance of, CDP No. 4-14-0687 for retention of 1,200 feet of existing rock revetments and an AMP to protect the park facilities. The revetment is permitted to remain in place for up to twenty (20) years or until the reevaluation triggers of Special Condition 2(E-F) are reached, whichever occurs first. However, due to forecasted conditions and eventual damage to park facilities as described above, two distinct emergency CDPs were issued, one in November 2015 (G-4-15-0039: November 2015 Emergency Winter Sand Berm) and one in March 2016 (G-4-16-0027: March 2016 Emergency Sinkhole Repair and Geotextiles), to permit actions required to protect Goleta Beach Park from severe El Niño conditions.

Substantial erosion along Goleta Beach County Park (left) during the 2015/2016 El Niño season threatened facilities at the park. Heavy equipment were used to create an emergency sand berm (right) to protect Park facilities from wave action and coastal processes.

Sinkhole Repair

Subsequent to erosion of the winter beach berm and the failure of ongoing berm maintenance to protect un-reveted areas of the park, wave action and high tides created eight affected areas with sinkholes and associated crevasses at Goleta Beach County Park in March 2016. These sinkholes and crevasses were 5 to 10 feet deep and extended 15 to 20 feet landward into the lawn area. These features threatened public safety as well as infrastructure and facilities at the park, including picnic tables and other structures. In response, on March 9, 2016, the CCC approved additional emergency work under Permit G-4-16-0027, including backfill of the sinkholes with imported earth and cobbles. However, the use of compacted earth and cobble proved ineffective, and erosion accelerated with associated release of sediments into nearshore waters along with imminent pending damage to major park facilities.

Geotextile Cell Emergency Repair Actions

In response, the County worked with contractors and engineers to craft a viable variation to avoid use of rock revetments, but provide protection for the park. The solution included installation of geotextile fabric earth-filled cells supported by a beach cobble base cell along four reaches of the shoreline associated with the eight regions affected by sinkholes and crevasses. This variation of previously proposed emergency measures improved protection of the eroding lawn and prevented sediment from eroding into the surf zone along the shoreline fronting the park. Measurements and spatial orientation of the repairs are provided in Table 1. Geotextile bags with earthen fill, approximately 1 to 2 feet in height, were laid down sloping up to the lawn area (refer to Figure 2 and attached engineered plans). Placement of the geotextile cells resulted in the seaward toe of cells approximately 5 to 10 feet landward of the historic shoreline of Goleta Beach County Park prior to 2015/2016 erosion. Following installation of the geotextile fabric, the area was covered with sand by both natural spring time accretion and heavy equipment.[2]

Construction of the geotextile cells used a mix of compacted earthen fill cells and a 1-2 foot thick base cell of beach quality cobbles. Approximately 90 percent of the earthen fill was imported from the County of Santa Barbara debris basin on Cravens Lane, which originated from the Carpinteria Slough, and therefore was similar to the existing park fill. The remainder was exported from a UCSB capital improvement project that included grading activities. The earthen fill was carried to the site in 220 truck trips. Along with the earthen fill, cobbles were also used to provide additional structural stability. The cobbles, totaling over 600 tons in 40 truck trips, were taken from restoration areas across multiple areas in Santa Barbara County. Construction crews, including between 7-8 laborers, used excavators, front loaders, skip loaders, bulldozers, and compactors to fill each of the sinkholes and the eroded areas behind the existing revetment to the existing grade of the lawn area. Emergency actions lasted a total of 28 days and the geotextile

In response to damaging erosion, work crews installed geotextile fabric earth filled cells to protect park facilities in areas that were not already protected by the existing revetment (boulders were temporary and have been removed).

Areas subject to emergency repairs have now been covered with sand by both natural spring time accretion and heavy equipment.

[2] A single line of small boulders (200-400 pounds) were originally laid on the sand approximately 5 to 10 feet back from the original shoreline to help secure the base of the geotextile fabric from wave action. However, these boulders have been removed.

fabric as well as the permitted revetment have since been covered completely with sand, largely by natural processes, but with upper elevation portions covered by mechanical means.

Table 1: Geotextile Cell Measurements and Spatial Orientation

Reach Number	Length (x)	Width of Geo-Textile (y)	Base of Geo-Textile (toe-slope) to Top of Sand Crest (z)	GPS Coordinates[3]	Comments
1 (M1)	21 ft	n/a	n/a	Middle Point (M1) **N 34°25.014** **W 119°49.817** *34°25'0.85"N* *119°49'48.71"W*	**No geo-textile was used** in this section. About 6-7 rocks (2-4ft in diameter) were removed from the toe-slope
2 (S2-N2)	341 ft	10-15 ft	9-12 ft	Southern Reach (S2) **N 34°25.012** **W 119°49.827** *34°25'0.84"N* *119°49'49.57"W* Northern Reach (N2) **N 34°25.009** **W 119°49.895** *34°25'0.53"N* *119°49'53.62"W*	-Largest reach of project -Geo-textile varied slightly from 9-12 ft from toe-slope to sand crest throughout -8ft separate reach 2 & 3
3 (S3-N3)	52 ft	10-15 ft	9-12 ft	Southern Reach (S3) **N 34°25.008** **W 119°49.895** *34°25'0.51"N* *119°49'53.72"W* Northern Reach (N3) **N 34°25.006** **W 119°49.905** *34°25'0.44"N* *119°49'54.33"W*	-5ft separate reaches 3 & 4
4 (S4-N4)	22 ft	15-20 ft	9-11 ft	Southern Reach (S4) **N 34°25.007** **W 119°49.905** *34°25'0.44"N* *119°49'54.40"W* Northern Reach (N4) **N 34°25.008** **W 119°49.911** *34°25'0.41"N* *119°49'54.64"W*	-Only reach where geo-textile goes back into an eroded fill. Approximately 15-20 ft of geo-textile goes into sand berm

[3] The **bolded** coordinates are in DDD.MM.mmm format and were the obtained directly with a handheld GPS in the field. The *italicized* coordinates are in DMS format and based on Google Earth estimations, of which, correlate to the figures 1, 2, and 3 below.

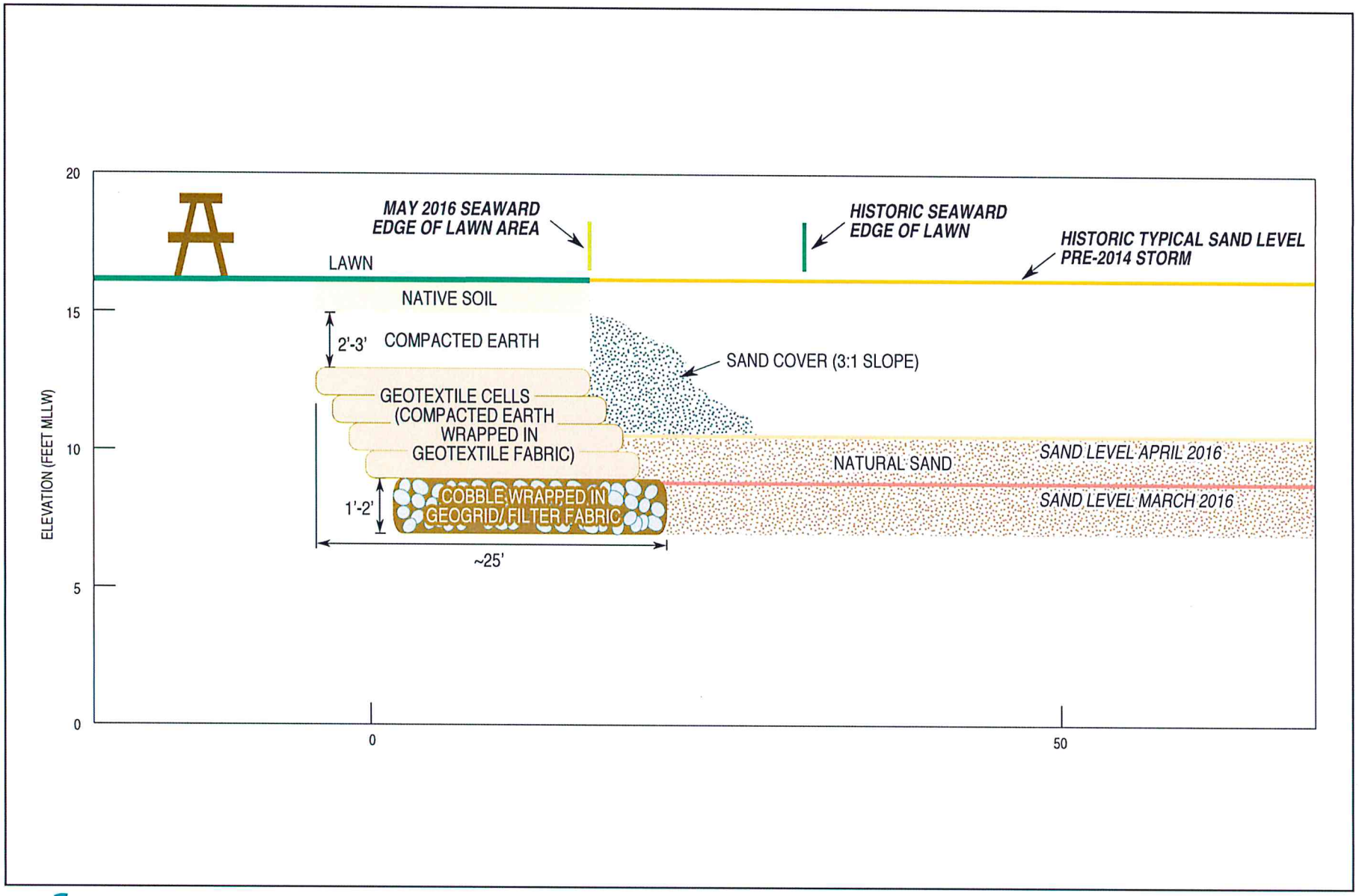

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Figure 2. Goleta Beach Park Emergency Restoration Project
Geotextile Cell Conceptual Cross Section

Proposed Permit Amendment: CDP No. No. 4-14-0687

The County of Santa Barbara proposes to permit the geotextile layered filter fabric through an amendment to the CDP No. 4-14-0687.

Repairs at Goleta Beach Park have been completed and lie buried beneath the sand (April 2016).

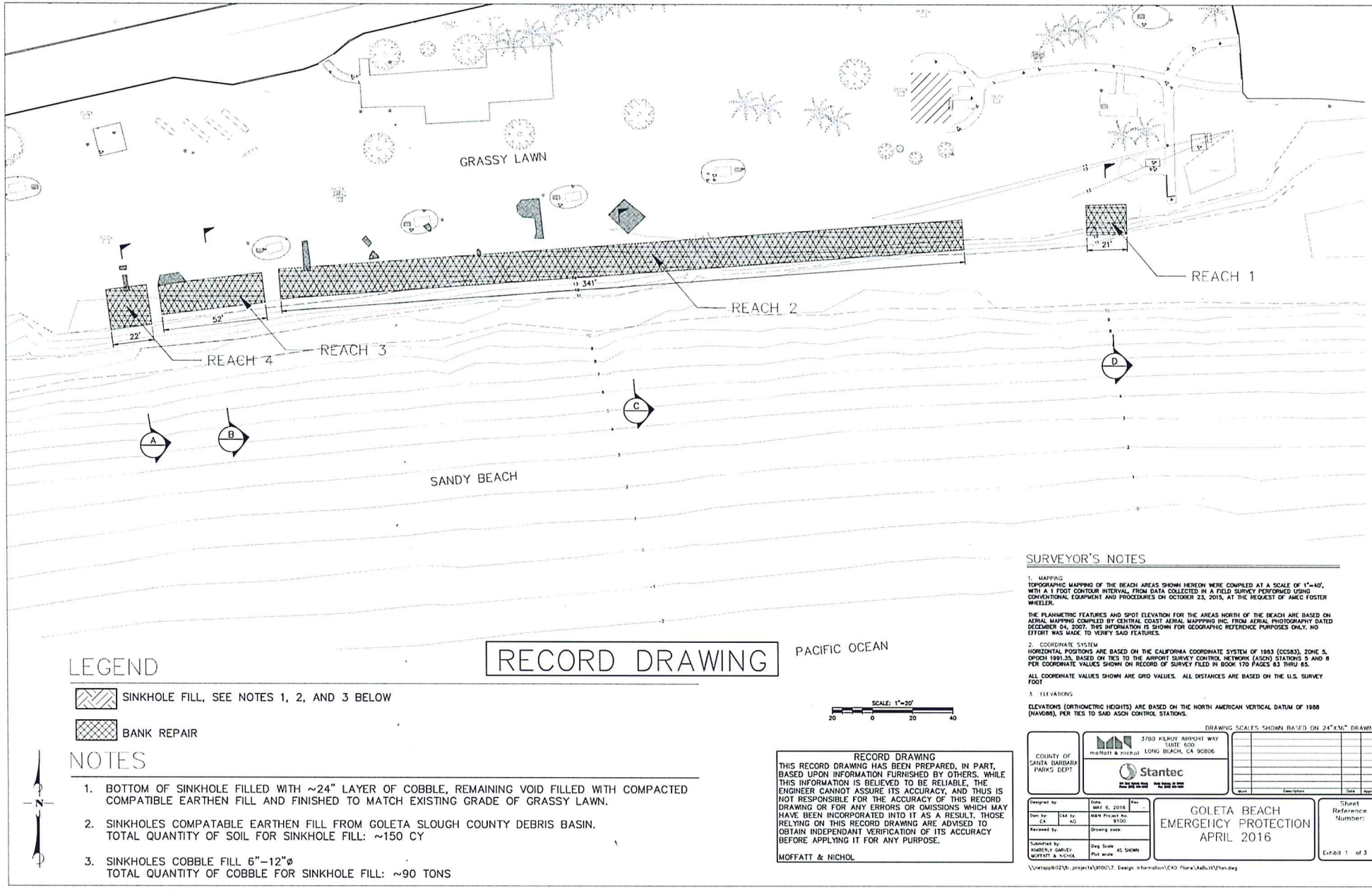
If granted, the amendment would allow the geotextile cells to remain in place buried beneath the sand along approximately 436 feet of Goleta Beach fronting Goleta Beach County Park facilities. Each geotextile cell is composed of compacted earthen fill and a 1-2 foot thick cell of cobbles within geotextile fabric. Each cell ranges in width from 10 to 15 feet and are 1 to 2 feet tall. The seaward toe of each geotextile cell lies approximately 5-10 feet landward of the shoreline (i.e., edge of developed lawn) as of February of 2016 prior to shoreline erosion in March of 2016. As such, these geotextile cells do not intrude onto the public beach (Figure 2 and attached engineered plans).

The geotextile cells lie within the recent historic shoreline at Goleta Beach and are approximately 7 to 12 feet below the lawn and current sand levels, which fully cover these repairs. Natural (and ongoing) spring sand accretion following installation covered approximately 3 to 5 feet (50 percent) of the geotextile cells height and mechanical processes covered the remaining height. Currently, the sand cover slopes down the natural grade beach at approximately a 3:1 slope, which provides the public with easy and safe access from Goleta Beach County Park to the sandy beach areas. As the beach naturally replenishes over the late spring and summer, sand levels are expected to more fully recover.

Without this permit amendment, the existing emergency geotextile materials would have to be removed. This would result in leaving the lawn area unprotected in the event of another severe storm season that could lead to further loss of park facilities and recreational space, as well as additional disturbance to biological resources and potential short-term water quality impacts resulting from the additional disturbance of intertidal habitat and sediments. Public access to beach resources would also be impaired with the removal of the geotextile cell revetments during construction and during future storm events that may damage park facilities. This area is now covered with sand and the advent of calmer conditions through spring, summer and fall will permit additional sand accrual and these facilities are likely to remain buried absent another severe storm season.

The proposed permit amendment to CDP 4-14-0687 is subject to the California Coastal Act and the California Environmental Quality Act (CEQA) and may include conditions in addition to the existing standard and special conditions for CDP 4-14-0687. For example, if future coastal processes result in exposure of the geotextile cells, maintenance actions to repair the geotextile cells or remove any loose fabric released into the surf zone might be required. Additional conditions proposed to be included as part of permitting the geotextile fabric layered cell repairs in accordance with the existing CDPs required adaptive management plan are:

- Monthly inspections would occur along all four reaches of geotextile cells, and daily inspections would occur during major storm events and potential period of exposure.
- If any section of the geotextile fabric is exposed, a minimal amount of beach-compatible sand would be imported for maintenance cover, consistent with the existing permit.
- County Park rangers would ensure immediate cleanup of any loose geotextile fabric.
- If more than 200 linear feet or more of the approved repairs are exposed for two years, the County shall submit a new CDP application for reevaluation of an additional shoreline protection plan.



RECORD DRAWING

LEGEND

- SINKHOLE FILL, SEE NOTES 1, 2, AND 3 BELOW
- BANK REPAIR

NOTES

1. BOTTOM OF SINKHOLE FILLED WITH ~24" LAYER OF COBBLE, REMAINING VOID FILLED WITH COMPACTED COMPATIBLE EARTHEN FILL AND FINISHED TO MATCH EXISTING GRADE OF GRASSY LAWN.
2. SINKHOLES COMPATABLE EARTHEN FILL FROM GOLETA SLOUGH COUNTY DEBRIS BASIN. TOTAL QUANTITY OF SOIL FOR SINKHOLE FILL: ~150 CY
3. SINKHOLES COBBLE FILL 6"–12"ø TOTAL QUANTITY OF COBBLE FOR SINKHOLE FILL: ~90 TONS

SCALE: 1"=20'
20 0 20 40

RECORD DRAWING
THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DRAWING ARE ADVISED TO OBTAIN INDEPENDANT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

MOFFATT & NICHOL

SURVEYOR'S NOTES

1. MAPPING

TOPOGRAPHIC MAPPING OF THE BEACH AREAS SHOWN HEREON WERE COMPILED AT A SCALE OF 1"=40', WITH A 1 FOOT CONTOUR INTERVAL, FROM DATA COLLECTED IN A FIELD SURVEY PERFORMED USING CONVENTIONAL EQUIPMENT AND PROCEDURES ON OCTOBER 23, 2015, AT THE REQUEST OF AMEC FOSTER WHEELER.

THE PLANIMETRIC FEATURES AND SPOT ELEVATION FOR THE AREAS NORTH OF THE BEACH ARE BASED ON AERIAL MAPPING COMPILED BY CENTRAL COAST AERIAL MAPPING INC. FROM AERIAL PHOTOGRAPHY DATED DECEMBER 04, 2007. THIS INFORMATION IS SHOWN FOR GEOGRAPHIC REFERENCE PURPOSES ONLY. NO EFFORT WAS MADE TO VERIFY SAID FEATURES.

2. COORDINATE SYSTEM

HORIZONTAL POSITIONS ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), ZONE 5, OPOCH 1991.35, BASED ON TIES TO THE AIRPORT SURVEY CONTROL NETWORK (ASCN) STATIONS 5 AND 8 PER COORDINATE VALUES SHOWN ON RECORD OF SURVEY FILED IN BOOK 170 PAGES 63 THRU 65.

ALL COORDINATE VALUES SHOWN ARE GRID VALUES. ALL DISTANCES ARE BASED ON THE U.S. SURVEY FOOT

3. ELEVATIONS

ELEVATIONS (ORTHOMETRIC HEIGHTS) ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), PER TIES TO SAID ASCN CONTROL STATIONS.

DRAWING SCALES SHOWN BASED ON 24"X36" DRAWING

COUNTY OF SANTA BARBARA PARKS DEPT

moffatt & nichol 3780 KILROY AIRPORT WAY SUITE 600 LONG BEACH, CA 90806
Stantec

Work	Description	Date	Appr

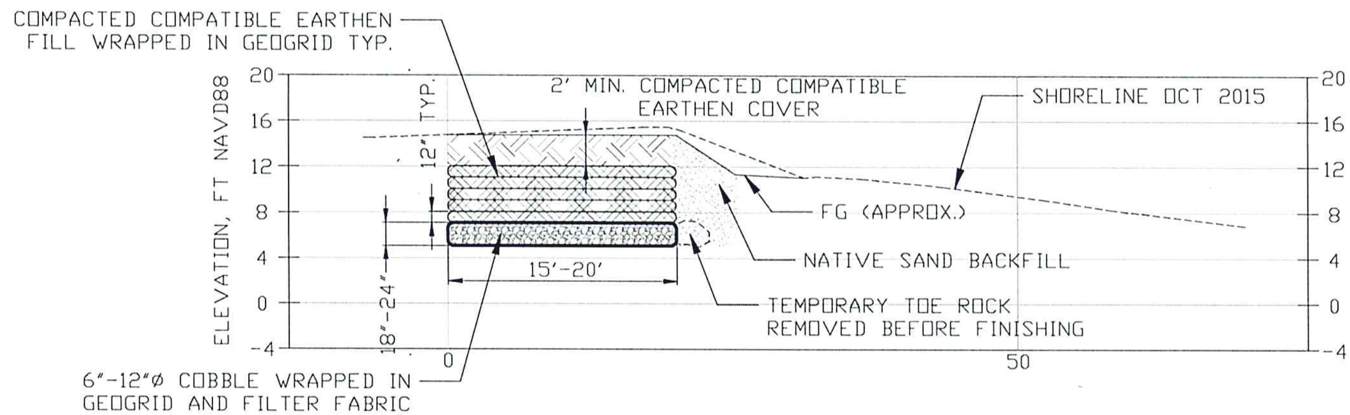
Designed by:		Date: MAY 6, 2016	Rev
Drawn by: CA	Ckd by: KG	M&N Project No. 9100	
Reviewed by:		Drawing scale:	
Submitted by: KIMBERLY GARLEY MOFFATT & NICHOL		Dwg Scale: AS SHOWN Plot scale:	

GOLETA BEACH EMERGENCY PROTECTION APRIL 2016

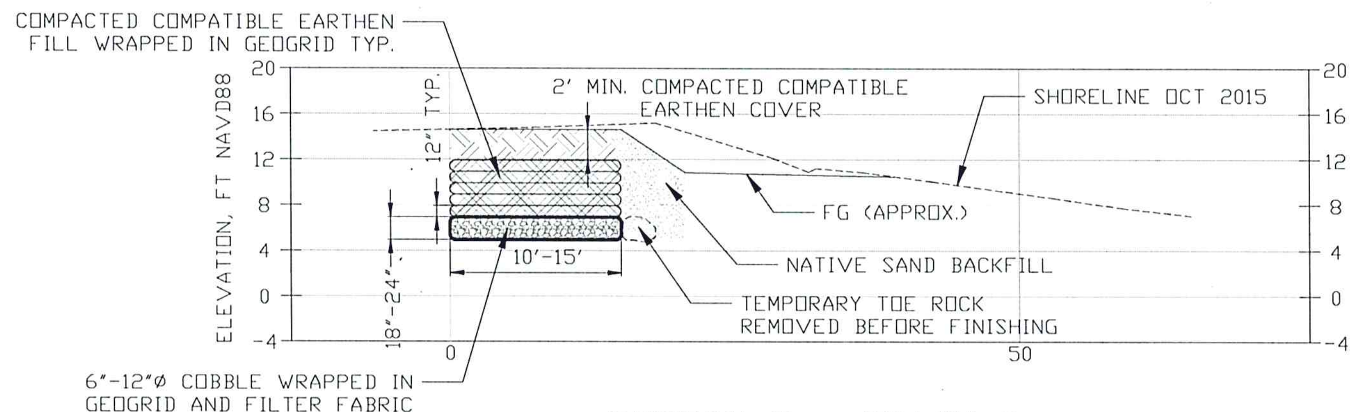
Sheet Reference Number: Exhibit 1 of 3

\\netapp802\lb_projects\9100\7. Design Information\CAD Plans\As-Built\Plan.dwg

12


COMPACTED COMPATIBLE EARTHEN FILL WRAPPED IN GEOGRID TYP.
2' MIN. COMPACTED COMPATIBLE EARTHEN COVER
SHORELINE OCT 2015
12" TYP.
FG (APPROX.)
NATIVE SAND BACKFILL
TEMPORARY TOE ROCK REMOVED BEFORE FINISHING
15'-20'
18"-24"
ELEVATION, FT NAVD88
20
16
12
8
4
0
-4
0
50
6"-12"Ø COBBLE WRAPPED IN GEOGRID AND FILTER FABRIC

SECTION A – REACH 4


COMPACTED COMPATIBLE EARTHEN FILL WRAPPED IN GEOGRID TYP.
2' MIN. COMPACTED COMPATIBLE EARTHEN COVER
SHORELINE OCT 2015
12" TYP.
FG (APPROX.)
NATIVE SAND BACKFILL
TEMPORARY TOE ROCK REMOVED BEFORE FINISHING
10'-15'
18"-24"
ELEVATION, FT NAVD88
20
16
12
8
4
0
-4
0
50
6"-12"Ø COBBLE WRAPPED IN GEOGRID AND FILTER FABRIC

SECTION B – REACH 3

SCALE: 1"=5'

RECORD DRAWING

NOTES

1. GEOGRID INSTALLED: TENSAR BX1200.
2. FILTER FABRIC INSTALLED: MIRIFI NC140.
3. COMPATIBLE EARTHEN FILL FROM GOLETA SLOUGH COUNTY DEBRIS BASIN. TOTAL QUANTITY OF SOIL FOR BANK REPAIR: ~1,000 CY
4. TOTAL QUANTITY OF COBBLE FILL FOR BANK REPAIR: ~510 TONS
5. TEMPORARY TOE ROCK REMOVED BEFORE FINISHING AND STOCKPILED IN COUNTY YARD.

RECORD DRAWING
THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DRAWING ARE ADVISED TO OBTAIN INDEPENDANT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.
MOFFATT & NICHOL

DRAWING SCALES SHOWN BASED ON 24"X36" DRAWING

CONTY OF SANTA BARBARA PARKS DEPT

moffatt & nichol 3780 KILROY AIRPORT WAY SUITE 600 LONG BEACH, CA 90806

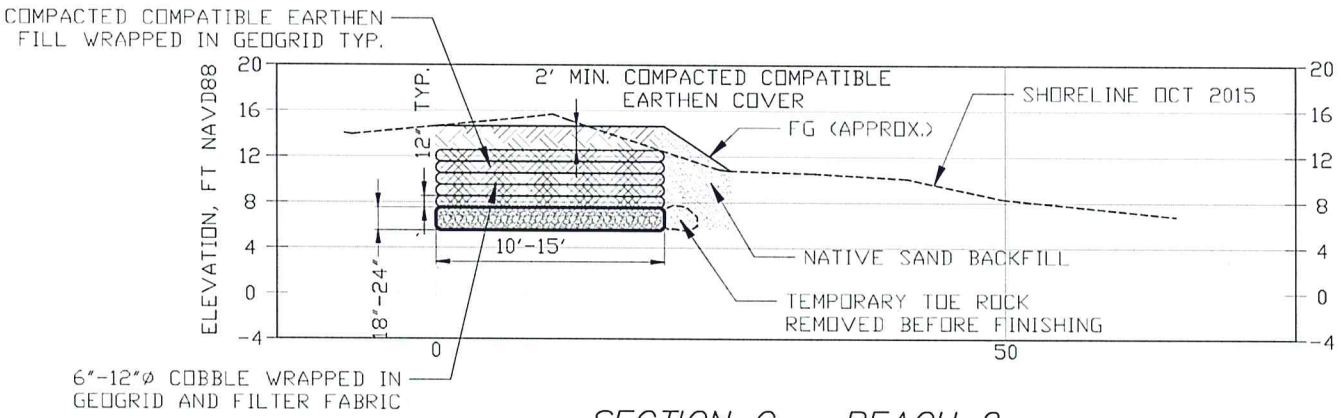
Stantec

Designed by:
Dwn by: CA | Chd by: KG
Reviewed by:
Submitted by: KIMBERLY CARVEY MOFFATT & NICHOL

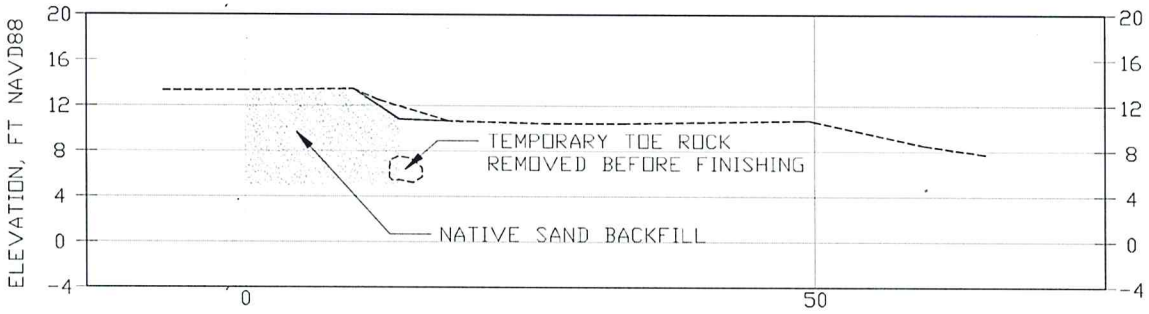
Date: MAY 6, 2016 | Rev: -
M&N Project No. 9100
Drawing code:
Dwg Scale: AS SHOWN
Plot scale:

GOLETA BEACH EMERGENCY PROTECTION APRIL 2016

Sheet Reference Number:
Exhibit 2 of 3



SECTION C – REACH 2



SECTION D – REACH 1

RECORD DRAWING

NOTES

1. GEOGRID INSTALLED: TENSAR BX1200.
2. FILTER FABRIC INSTALLED: MIRIFI NC140.
3. COMPATIBLE EARTHEN FILL FROM GOLETA SLOUGH COUNTY DEBRIS BASIN. TOTAL QUANTITY OF SOIL FOR BANK REPAIR ~1,000 CY
4. TOTAL QUANTITY OF COBBLE FILL FOR BANK REPAIR: ~510 TONS
5. TEMPORARY TOE ROCK REMOVED BEFORE FINISHING AND STOCKPILED IN COUNTY YARD.
6. NO COBBLE, GEOGRID, OR FILTER FABRIC WAS USED IN REACH 1 SHOWN BY SECTION D.

RECORD DRAWING
THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DRAWING ARE ADVISED TO OBTAIN INDEPENDANT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.
MOFFATT & NICHOL

5' 0' 5' 10'
SCALE: 1"=5'

DRAWING SCALES SHOWN BASED ON 24"X36" DRAWING

COUNTY OF SANTA BARBARA PARKS DEPT

moffatt & nichol 3780 KILROY AIRPORT WAY SUITE 600 LONG BEACH, CA 90806

Stantec

Mark	Description	Date	Appr

Designed by:
Date: MAY 6, 2016
Rev.
Det. by: CA
Chk. by: KG
M&N Project No. 9100
Reviewed by:
Drawing scale:
Submitted by: KIMBERLY OAKLEY MOFFATT & NICHOL
Dwg Scale: Plot scale: AS SHOWN

GOLETA BEACH EMERGENCY PROTECTION APRIL 2016

Sheet Reference Number:
Exhibit 3 of 3