

GOGA WIP Report

NPS Retaining Wall Inventory Program Golden Gate National Recreation Area



**Federal Lands Highway
Road Inventory Program**

Prepared By:

**Federal Highway Administration
Eastern Federal Lands Highway Division
Road Inventory Program (RIP)**

**Data Collection Date: November 2007
Report Date: November 2015**

Golden Gate National Recreation Area in California



Golden Gate National Recreation Area

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors



Table of Contents

SECTION	PAGE NO.
1. INTRODUCTION	1 - 1
2. PARK RETAINING WALL LOCATION MAPS Retaining Wall Location Maps	2 - 1
3. TIER 1 - PARK RETAINING WALL OVERVIEW	3 - 1
4. TIER 2 - ROUTE RETAINING WALL OVERVIEW	4 - 1
5. TIER 3 - RETAINING WALL DETAILS	5 - 1
6. APPENDIX A - SUMMARY OF WIP DEFINITIONS AND ASSESSMENT CATEGORIES	A - 1

Introduction



Golden Gate National Recreation Area



Federal Lands Highway
Road Inventory Program

Introduction

The Federal Lands Highway Division (FLH) of the Federal Highway Administration (FHWA), in partnership with the National Park Service (NPS), has conducted a retaining wall inventory and condition assessment as part of the NPS Retaining Wall Inventory Program (WIP). This inventory provides information to the NPS Facility Management Software System (FMSS) regarding such things as type, size and location of retaining structures, as well as the condition of these facilities and consequences of failure. In addition, when wall and/or adjacent element deficiencies are identified, repair recommendations and estimated costs are also provided, suitable for use as FMSS work orders.

The main intent of this effort is to determine the backlog of needs associated with retaining wall assets – equipment features ascribed to the “parent” roadway asset. Inventory and condition assessments (pavement only) for the roads themselves are conducted under the NPS Road Inventory Program (RIP). Prior to development of the WIP, the vast majority of retaining walls were not accounted for in FMSS. Based on WIP inventory work to date, NPS wall assets are valued at well over \$400M. A second and equally important intent of this effort is to inform and improve project selection, prioritization, and development activities and processes at NPS regions/parks, FLH Division offices and the NPS Denver Service Center.

In support of WIP, a comprehensive procedures manual (available at the following link: <http://www.cflhd.gov/programs/techDevelopment/geotech/WIP/>) was developed to document the data collection and management process, wall attribute and element definitions, and team member responsibilities for conducting retaining wall inventories and condition assessments. This manual was used for nearly 3,500 wall assessments initially conducted between 2007 and 2008 within 34 national parks. WIP is supported by several key components described in the procedures manual, including a comprehensive training program for field inspectors, an Oracle-based database for long-term data management, unique data collection forms, a supporting field guide, and a wall repair/replace cost estimate guide.

Ultimately, condition assessments for retaining wall structures are expressed as deferred maintenance costs, which are then divided by current year replacement costs to arrive at a “Facility Condition Index” (FCI). Coupling this condition prioritization index with an “Asset Priority Index” (API), which measures the feature’s importance to the mission of the park, capital asset investments are made more efficiently. This approach appropriately focuses maintenance and construction priorities on value, rather than solely on cost. Wall inventory condition and cost data are transferred from the WIP database to FMSS, the primary asset documentation, management and planning platform maintained at each park. In addition, wall data are also provided to the Road Inventory Program to update equipment assets associated with the parent roadway asset.

Initial inventories were conducted based on RIP Cycle 3 data, but future planning has ensured updates to WIP will occur simultaneously with RIP. For long-term data management purposes, the WIP database will be linked to the larger, parent RIP database and be updated under the responsibility of the RIP Database Administrator.

This report is organized in a tiered approach from the broad park overview perspective (Tier 1) to a route overview perspective (Tier 2), then down to the details of each wall (Tier 3). Tier 1 presents park wall location maps and an overall park-specific summary narrative of the results of the wall inventory program. Tier 2 presents route overview maps with associated wall summary information. Tier 3 presents individual wall information in a three-page detailed format, including a photograph of each wall. Appendix A provides a condensed summary of wall inventory definitions and assessment categories to assist in reading this report.

Park Retaining Wall Location Maps



Golden Gate National Recreation Area

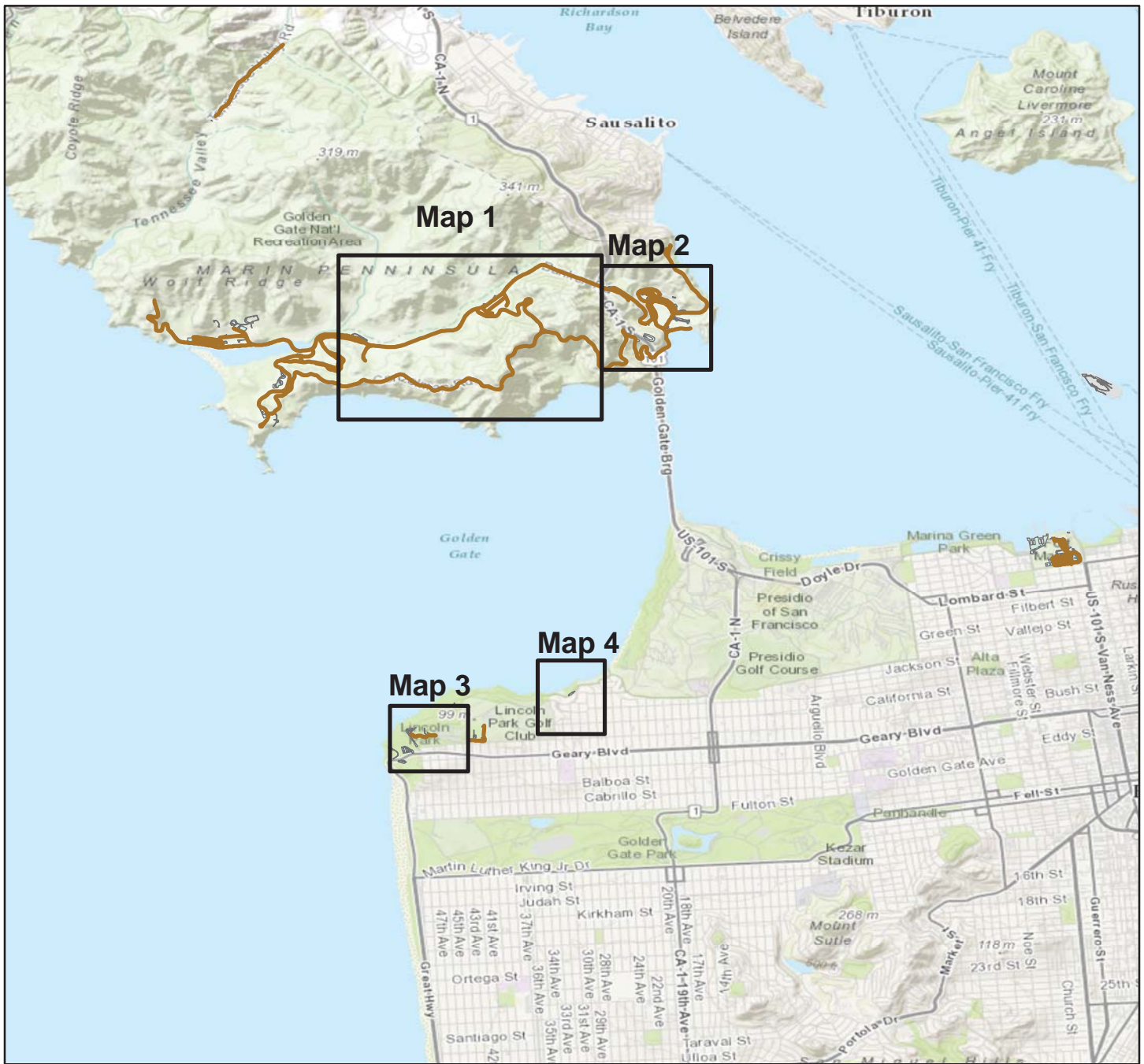


**Federal Lands Highway
Road Inventory Program**

Golden Gate National Recreation Area

WALL LOCATION MAP

Key Map



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

— RIP Collected Routes



Golden Gate National Recreation Area

WALL LOCATION MAP

Map 1



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

- Wall Locations
- RIP Collected Routes
- RIP Collected Parking



Golden Gate National Recreation Area

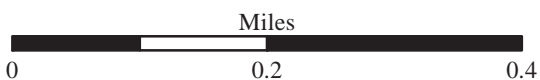
WALL LOCATION MAP

Map 2



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

- Wall Locations
- RIP Collected Routes
- RIP Collected Parking



Golden Gate National Recreation Area

WALL LOCATION MAP

Map 3

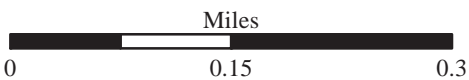


Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

● Wall Locations

— RIP Collected Routes

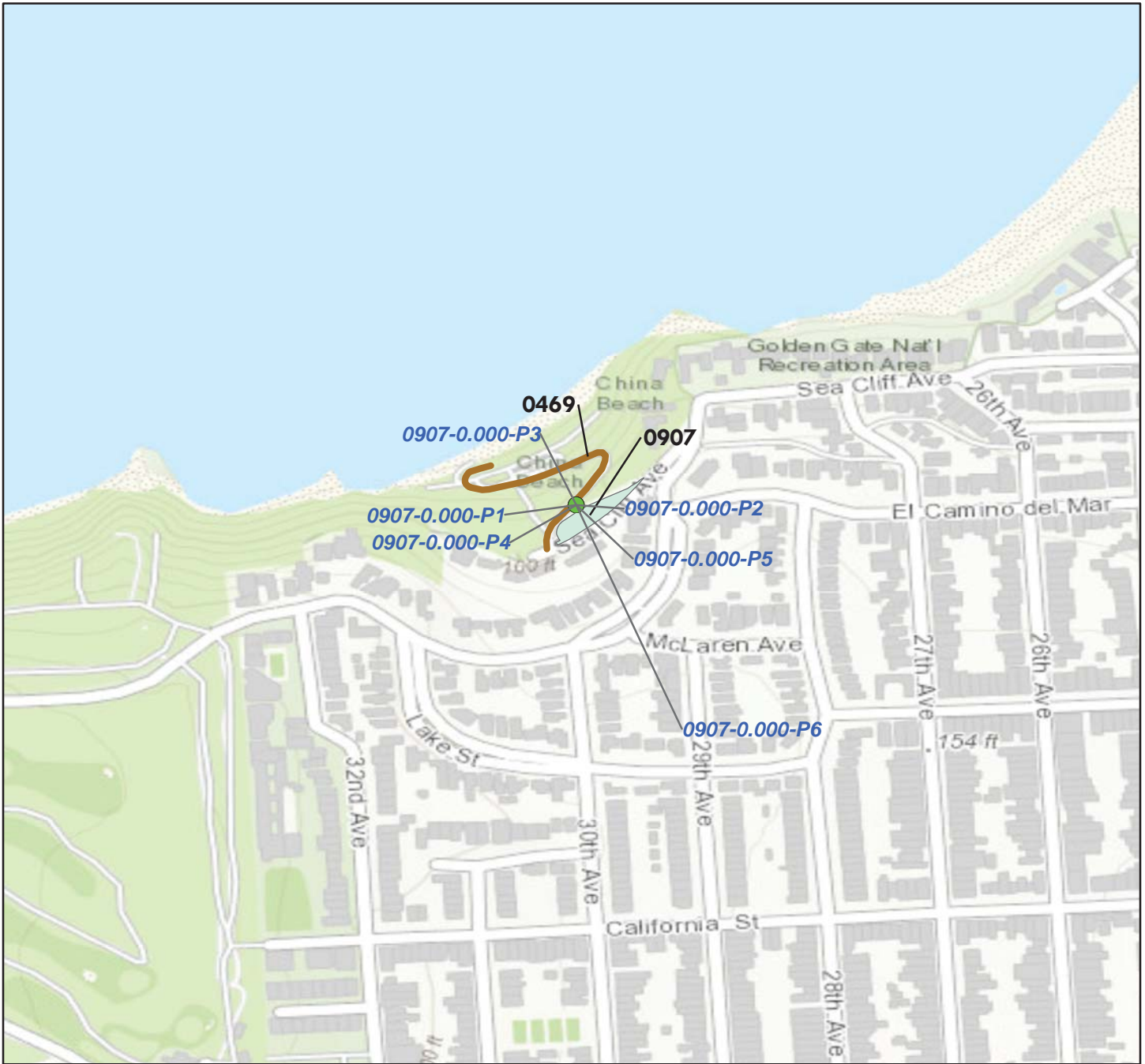
■ RIP Collected Parking



Golden Gate National Recreation Area

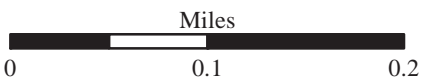
WALL LOCATION MAP

Map 4



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

- Wall Locations
- RIP Collected Routes
- RIP Collected Parking



Tier 1 Park Retaining Wall Overview



Golden Gate National Recreation Area



Federal Lands Highway
Road Inventory Program

Parkwide Summary: Golden Gate National Recreation Area

Initial retaining wall inspections were conducted at Golden Gate National Recreation Area in 2007, and encompassed all known retaining wall structures associated with Park roadways - including structure's retaining cuts and fills, as well as qualifying headwalls at culverts. For the purposes of the assessment, walls must be a minimum of 4 feet in maximum height of retained earth and greater than 6 feet in maximum height for culvert headwalls. This does not include the height of parapet or guardwall above a retaining wall. In general, guardwall or parapets are not included in this assessment, but were inspected for Golden Gate National Recreation Area in 2009 under a separate effort as part of the Guardwall/Rail Inventory Program (GIP). A report for GIP is available under separate cover.

All paved roadways and parking areas listed in the RIP Route Identification Report were inspected for walls. Occasionally, unpaved routes not in RIP were inventoried due to their future programmatic addition at the park, which was a decision made on site specific to each park.

The following tables provide an overview of the findings of this inspection and assessment effort. In all, 62 walls were inventoried on the routes listed below.

Table 1: Number of Walls by Route

Route Number	Route Name	No. of Walls
0105	BUNKER ROAD	3
0109ZZ	CONZELMAN ROAD	9
0405	MCDOWELL AVENUE	3
0413	SIMMONDS ROAD	1
0419	MOORE ROAD	3
0420ZZ	MCREYNOLDS ROADS	1
0425	SOMMERVILLE ROAD	4
0501	MACARTHUR AVENUE LOOP EAST	1
0502A	ROAD FROM GUARDHOUSE TO TOP OF ISLAND	8
0502B	ROAD FROM WHARF TO NW END OF ISLAND	14
0503	ALCATRAZ ISLAND MILITARY MORGUE ROAD	1
0700	UNKNOWN ROUTE	3
0905	MERRIE WAY PARKING LOT	2
0907	CHINA BEACH PARKING LOT	6
0917	LOWER FORT MASON PARKING LOT	3

The following table shows the number of walls broken out by seven possible categories of basic wall function.

Table 2: Number of Walls by Wall Function

Wall Function	No. of Walls
CW - Cut Wall	24
FW - Fill Wall	38

The following table shows the primary wall types that were inventoried and assessed. There are 24 possible primary wall types, which are summarized in Appendix A.

Table 3: Number of Walls by Primary Wall Type

Primary Wall Type	No. of Walls
BM, Bin - Metal	4
CC, Crib - Concrete	1
CL, Cantilever - Concrete	4
CP, Cantilever - Soldier Pile	1
CT, Crib - Timber	1
GB, Gravity - Concrete Block/Brick	12
GC, Gravity - Mass Concrete	17
GD, Gravity - Dry Stone	1
GG, Gravity - Gabion	4
GM, Gravity - Mortared Stone	15
MW, MSE - Welded Wire Face	1
TB, Other - Timber	1

The following table shows the number of walls by one of six categories of recommended action along with associated 2007 costs and the number of walls that are in each recommended action category. The majority of walls have a recommendation of *No Action* or *Monitor*; work orders were created for all other recommended actions.

Table 4: Number of Walls by Recommended Action and Associated 2007 Cost

Recommended Action	2007 Repair Costs*	No. of Walls
No Action	\$0	38
Monitor	\$0	0
Maintenance	\$9,490	5
Repair Elements	\$201,795	8
Replace Elements	\$93,000	5
Replace Wall	\$1,212,600	6
Totals	\$1,516,885	62

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

The following table categorizes the number of walls that fall into one of ten cost ranges, based on the prepared work orders. The locations, work descriptions, and cost of the recommended repairs for these walls are listed by individual wall in Tier 3 of this report.

Table 5: Number of Walls Grouped by Associated 2007 Cost

Cost Range*	No. of Walls
\$0	38
\$1 - \$25,000	14
\$25,001 - \$50,000	2
\$50,001 - \$100,000	2
\$100,001 - \$250,000	3
\$250,001 - \$500,000	3
\$500,001 - \$1,000,000	0
\$1,000,001 - \$2,000,000	0
\$2,000,001 - \$3,000,000	0
\$3,000,001 - \$4,000,000	0
Total Number of Walls	62

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Routine inspection and performing the noted maintenance will greatly aid in the continued performance of all walls at Golden Gate National Recreation Area. Work orders for walls needing maintenance generally included items such as replacing missing stones, replacing mortar, filling voids at the top or bottom of fill walls, and clearing vegetation.

Work orders for walls needing localized element repairs generally included items such as adding riprap protection to the wall foundation, replacing missing sections of dry stone walls, replacing culverts, grouting voids in walls, and patching/restoring roadway pavement. While decaying mortar generally does not threaten wall stability in the near term, grout repair will extend the life of these walls.

Work orders for walls needing major repairs (replace elements or replace wall) generally include items such as foundation repair or replacement, fill voids, repair roadway shoulder, replace or extend retaining wall in either height or length, rebuild failed segments of walls, repair elements across 50% or more of the wall, remove and recompact backfill material, add scour protection (typically with riprap, concrete, or rock fill), and remove/reset culvert headwalls. Due to the large unit items associated with major repairs, recommendations vary by specific wall and are presented in Tier 3 of this report.

WIP identified 55 critically deficient walls nationally based on wall ratings less than 49 (poor/critical overall condition). The following table presents the walls in Golden Gate National Recreation Area that are on this list and have been elevated to the Park Regional Coordinators in a Regional Park Summary Memorandum. Generally, these are walls with major repair element recommendations that may be a priority for repair work in your park.

Table 6: Number of Walls by Route

Wall Identification	Failure Consequence⁽¹⁾	Wall Rating⁽²⁾	Recommended Action⁽³⁾	2007 Repair Costs⁽⁴⁾
GOGA-0109ZZ-0.835-L	HIGH	10	REPLACE WALL	\$51,500
GOGA-0425-0.004-R	HIGH	36	REPLACE WALL	\$200,000
GOGA-0502B-0.120-L	LOW	43	NO ACTION	\$0

Notes: 1) Low consequence of failure and/or no recommended action may indicate repairs are not needed.

2) Wall ratings listed range from 0-49 (Poor/Critical).

3) Information was prepared for project planning purposes only. Actual repair work order scopes and actual costs will need to be evaluated based on current pay item unit prices for specific locations.

4) 2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Tier 2 Route Retaining Wall Overview



Golden Gate National Recreation Area



Federal Lands Highway
Road Inventory Program

Golden Gate National Recreation Area

ROUTE 0105: BUNKER ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0105-0.073-R 11/7/2007	490	128	Cantilever - Concrete	Cut Wall	79	\$0.00
GOGA-0105-0.508-L 11/7/2007	60	14	Gravity - Dry Stone	Cut Wall	69	\$0.00
GOGA-0105-0.550-L 11/7/2007	1,400	280	Gravity - Mortared Stone	Cut Wall	80	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

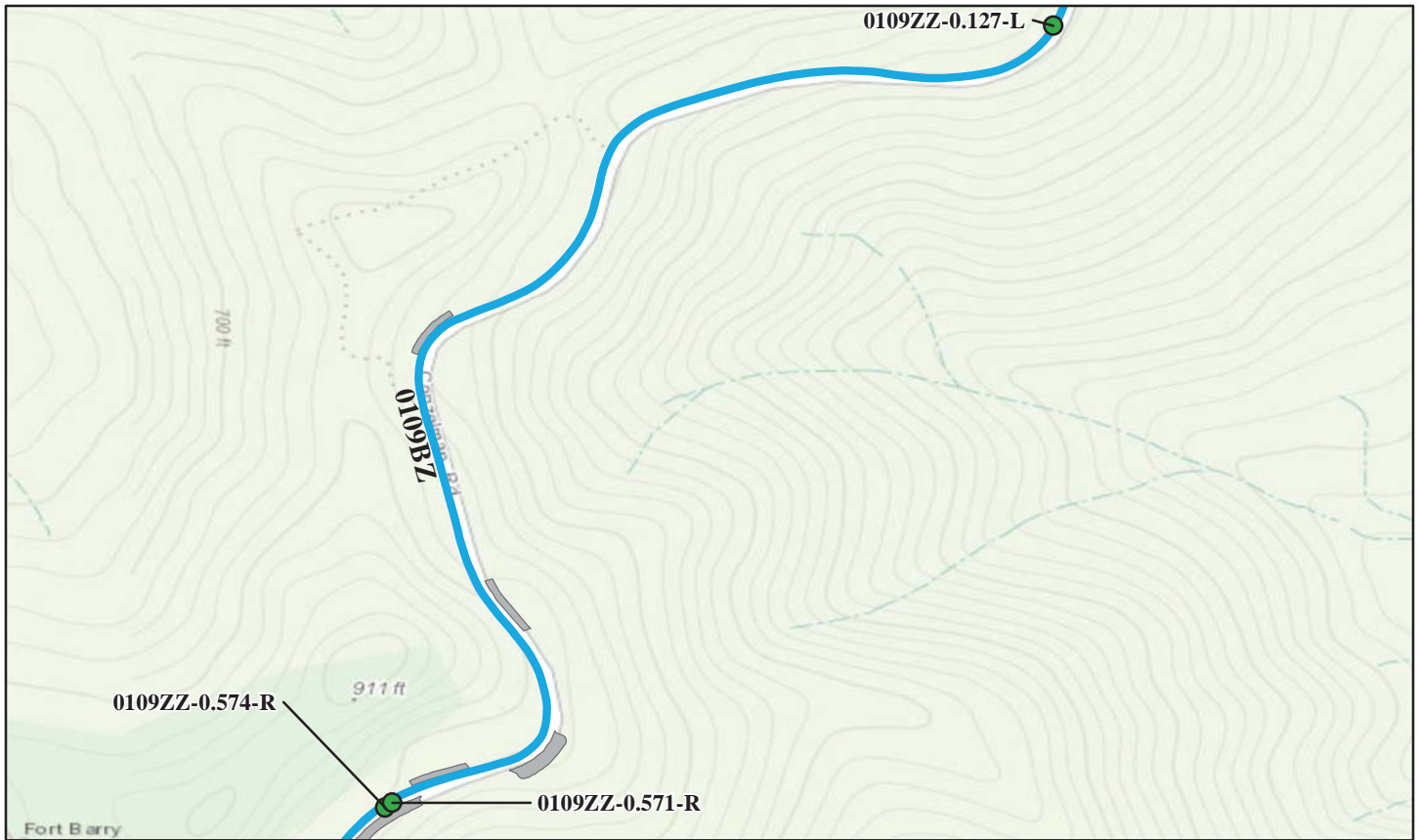
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0109ZZ-0.126-R 11/9/2007	515	103	Crib - Timber	Cut Wall	88	\$0.00
GOGA-0109ZZ-0.384-L 11/9/2007	165	25	Gravity - Gabion	Fill Wall	89	\$0.00
GOGA-0109ZZ-0.835-L 11/9/2007	600	50	Gravity - Gabion	Fill Wall	10	\$51,500.00
GOGA-0109ZZ-0.910-L 11/9/2007	780	105	Gravity - Gabion	Fill Wall	90	\$0.00
GOGA-0109ZZ-1.027-L 11/9/2007	400	100	MSE - Welded Wire Face	Fill Wall	83	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0109ZZ-0.127-L 11/9/2007	240	20	Gravity - Gabion	Fill Wall	77	\$0.00
GOGA-0109ZZ-0.571-R 11/9/2007	375	25	Gravity - Mortared Stone	Cut Wall	72	\$28,125.00
GOGA-0109ZZ-0.574-R 11/9/2007	600	40	Gravity - Mortared Stone	Cut Wall	72	\$45,000.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

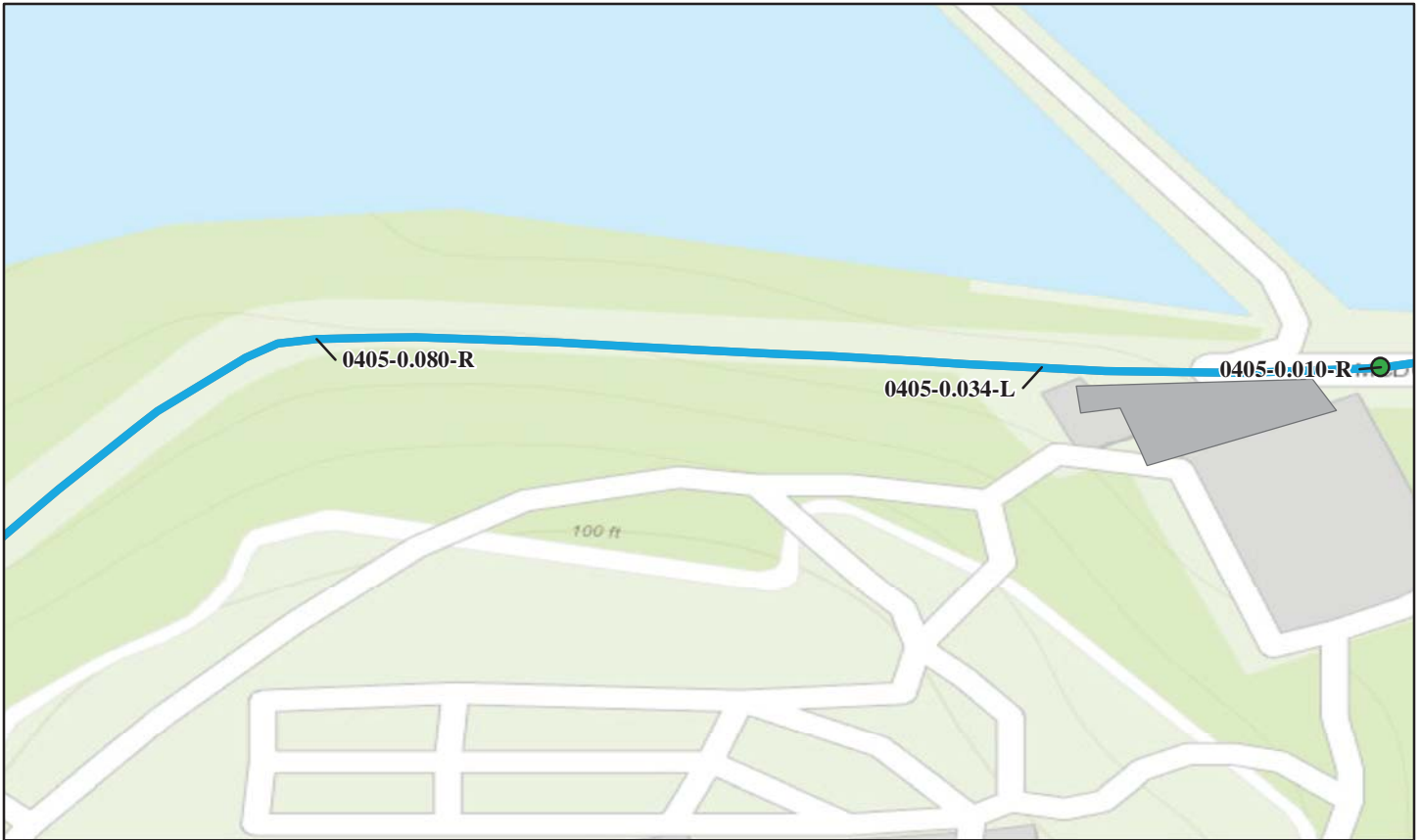
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0109ZZ-0.455-L 11/9/2007	110	18	Gravity - Mass Concrete	Fill Wall	77	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0405: MCDOWELL AVENUE



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

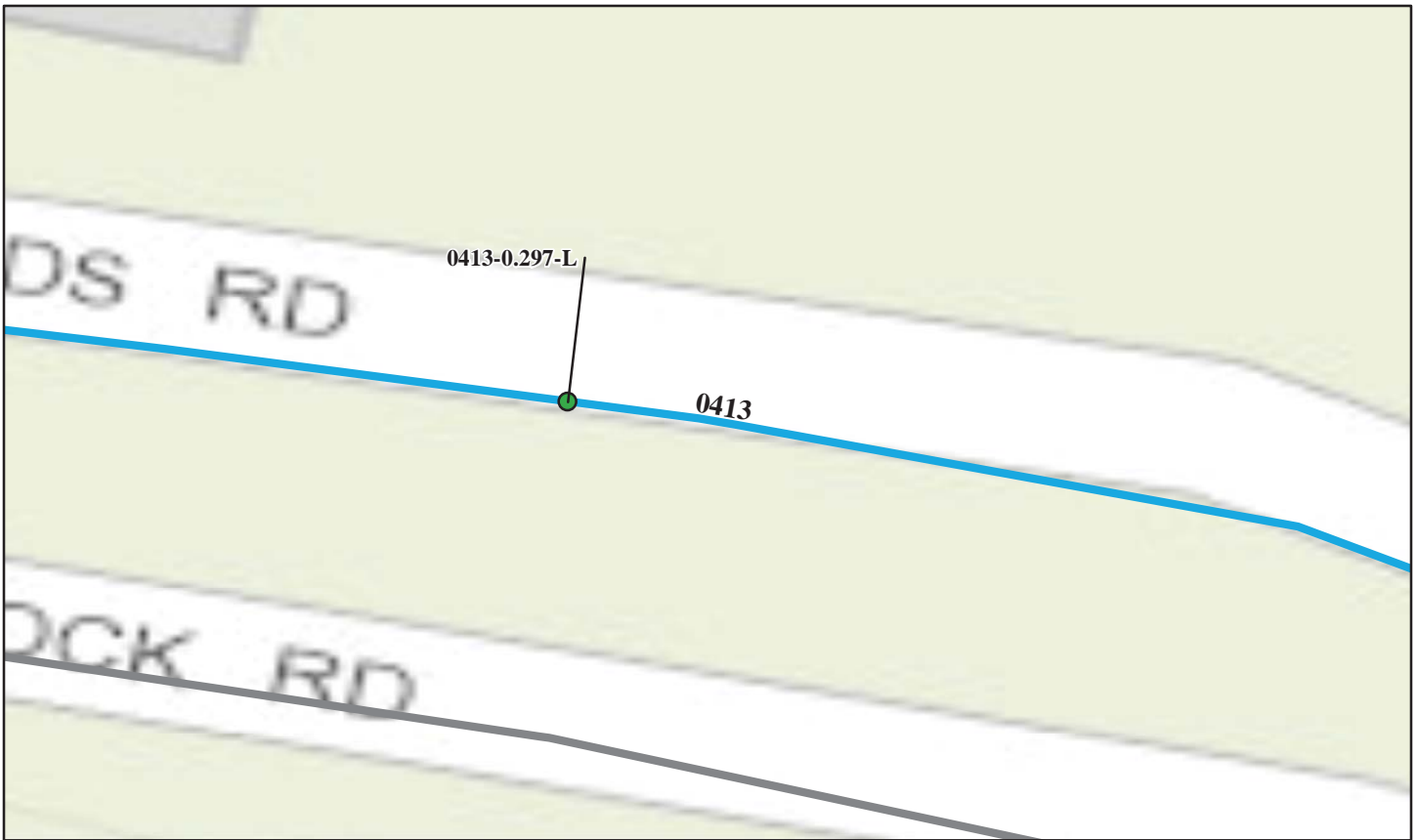
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0405-0.010-R 11/6/2007	1,450	208	Gravity - Mortared Stone	Fill Wall	78	\$0.00
GOGA-0405-0.034-L 11/6/2007	950	190	Crib - Concrete	Fill Wall	56	\$143,500.00
GOGA-0405-0.080-R 11/6/2007	550	100	Gravity - Mortared Stone	Fill Wall	62	\$107,500.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0413: SIMMONDS ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0413-0.297-L 11/7/2007	231	55	Cantilever - Concrete	Fill Wall	70	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0419: MOORE ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

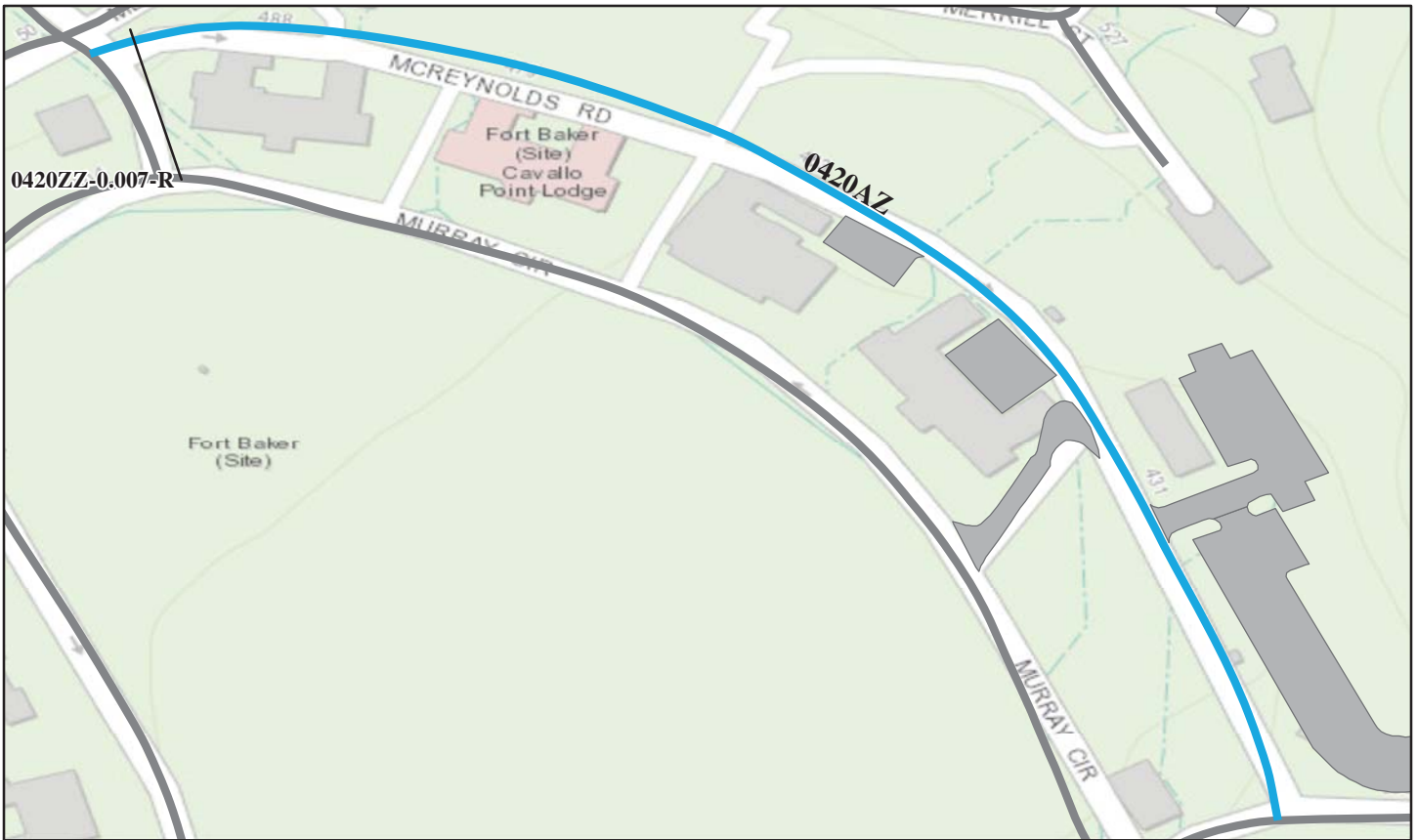
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0419-0.050-L 11/7/2007	4,470	447	Gravity - Mass Concrete	Fill Wall	66	\$0.00
GOGA-0419-0.134-L 11/7/2007	2,048	256	Gravity - Mass Concrete	Fill Wall	65	\$2,400.00
GOGA-0419-0.160-L 11/9/2007	100	23	Gravity - Mass Concrete	Fill Wall	69	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0420ZZ: MCREYNOLDS ROADS



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

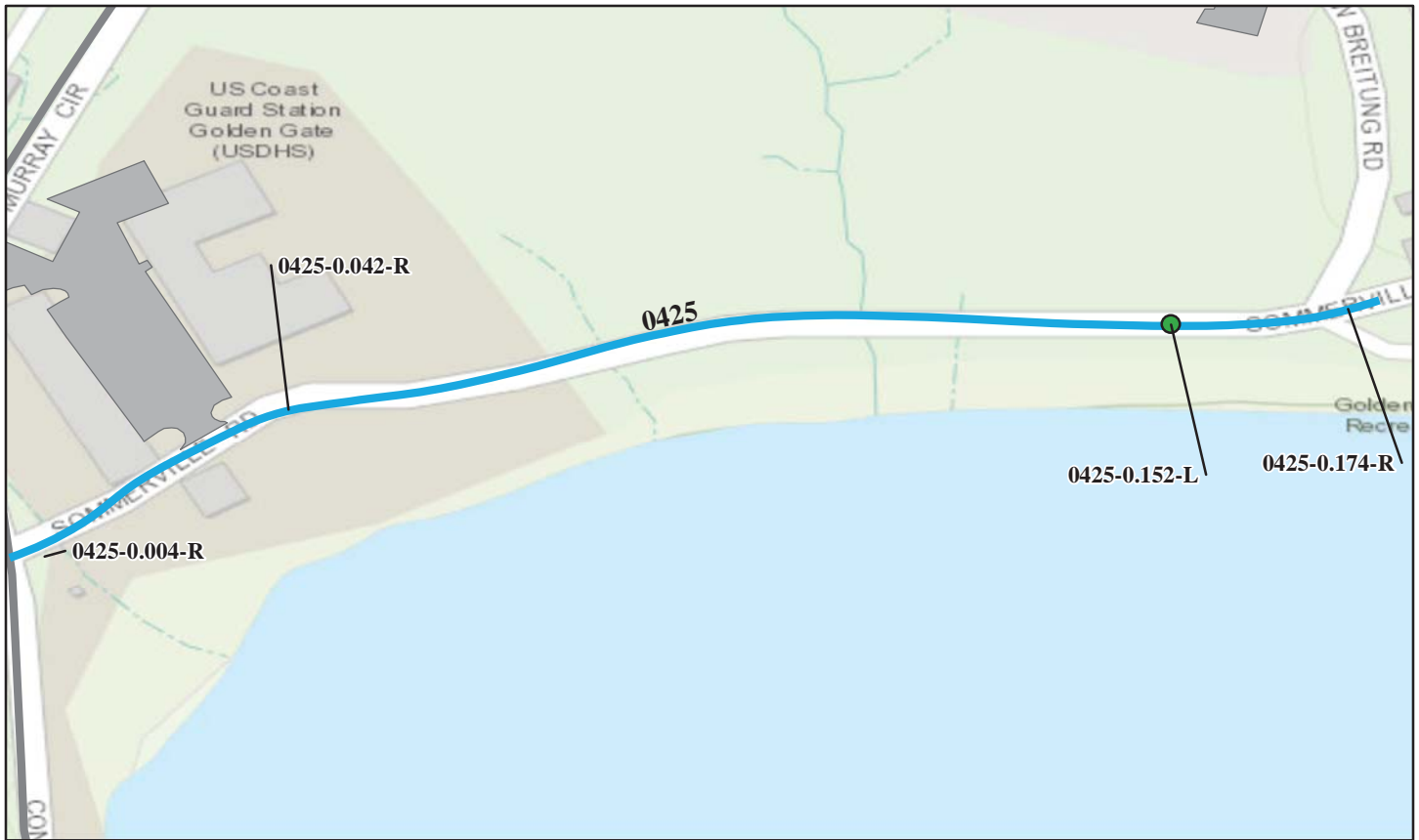
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0420ZZ-0.007-R 11/7/2007	4,756	1,189	Gravity - Mortared Stone	Cut Wall	54	\$2,400.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0425: SOMMERVILLE ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0425-0.004-R 11/7/2007	800	100	Cantilever - Concrete	Fill Wall	36	\$200,000.00
GOGA-0425-0.042-R 11/7/2007	6,216	777	Cantilever - Soldier Pile	Fill Wall	60	\$4,200.00
GOGA-0425-0.152-L 11/7/2007	548	137	Cantilever - Concrete	Fill Wall	83	\$0.00
GOGA-0425-0.174-R 11/7/2007	320	40	Gravity - Concrete Block/Brick	Fill Wall	59	\$1,300.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0501: MACARTHUR AVENUE LOOP EAST



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

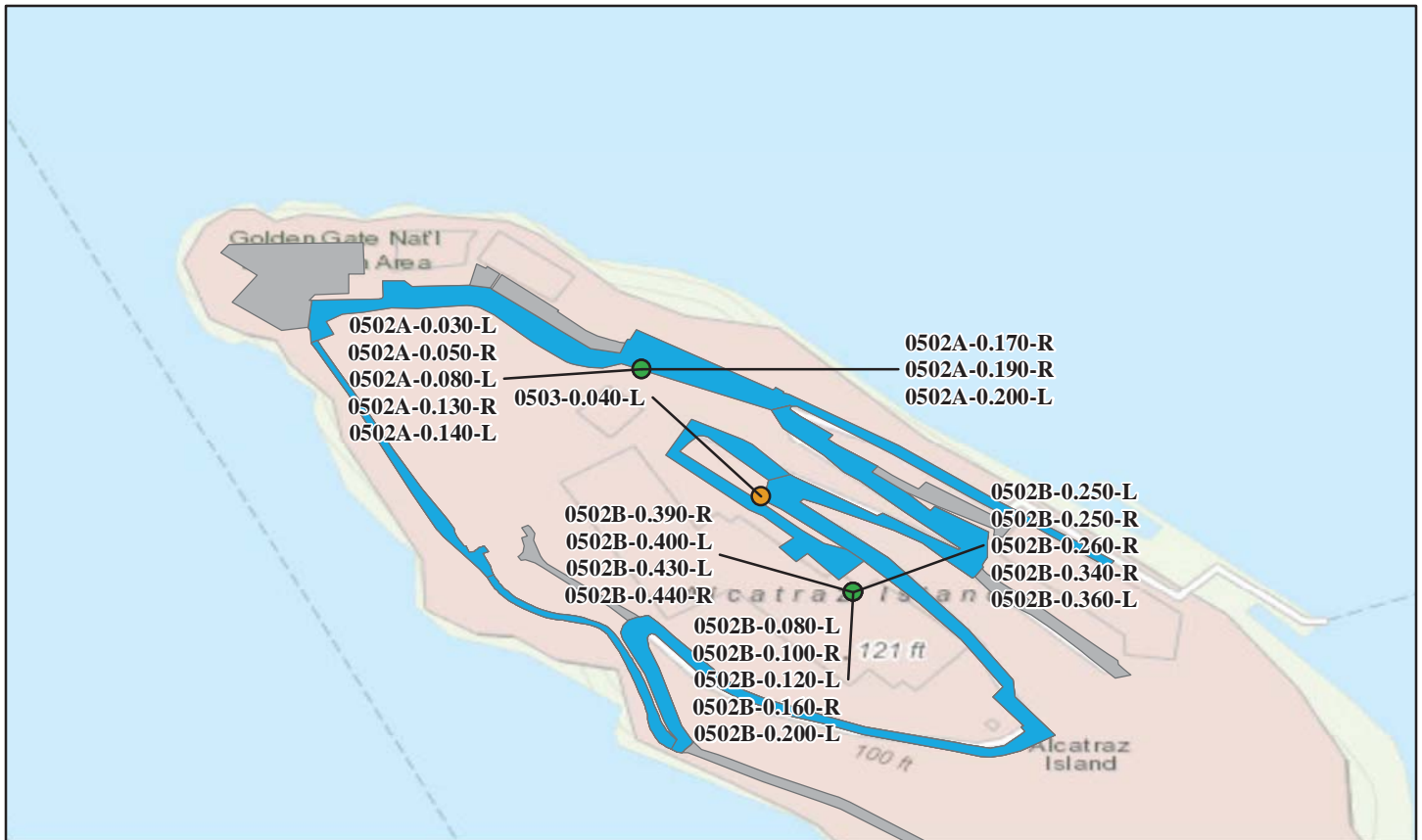
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0501-0.008-L 11/6/2007	17,172	962	Gravity - Mass Concrete	Fill Wall	77	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

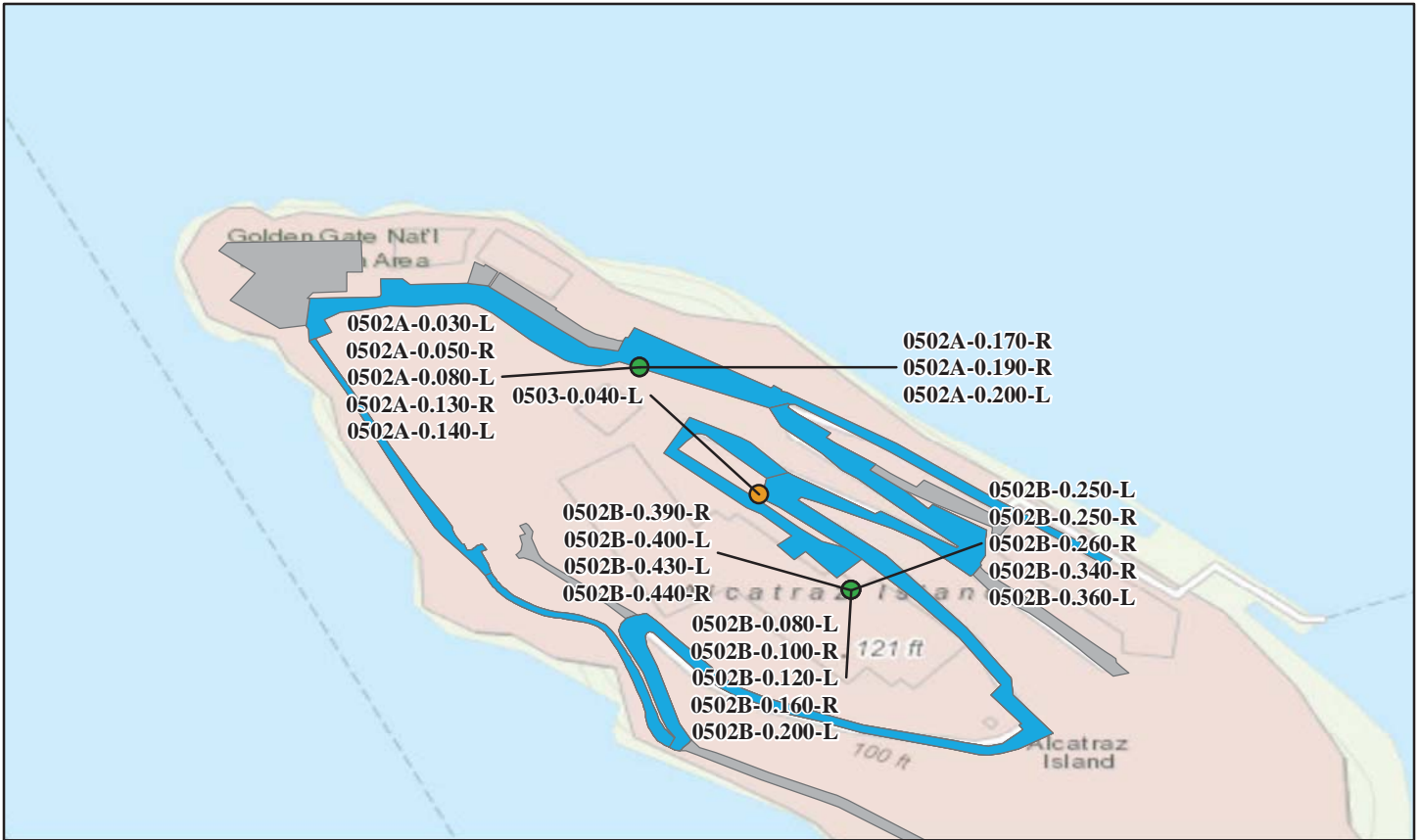
Critical / Poor (0 - 49)	Fair (50 - 69)	Good to Excellent (70 - 100)	No Data
---------------------------------	-----------------------	-------------------------------------	----------------

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0502A-0.030-L 11/8/2007	858	78	Gravity - Concrete Block/Brick	Cut Wall	77	\$0.00
GOGA-0502A-0.050-R 11/8/2007	4072	294	Gravity - Concrete Block/Brick	Fill Wall	78	\$0.00
GOGA-0502A-0.080-L 11/8/2007	370	82	Gravity - Concrete Block/Brick	Cut Wall	68	\$4,040.00
GOGA-0502A-0.130-R 11/8/2007	2256	188	Gravity - Concrete Block/Brick	Fill Wall	74	\$0.00
GOGA-0502A-0.140-L 11/8/2007	700	163	Gravity - Mass Concrete	Cut Wall	73	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

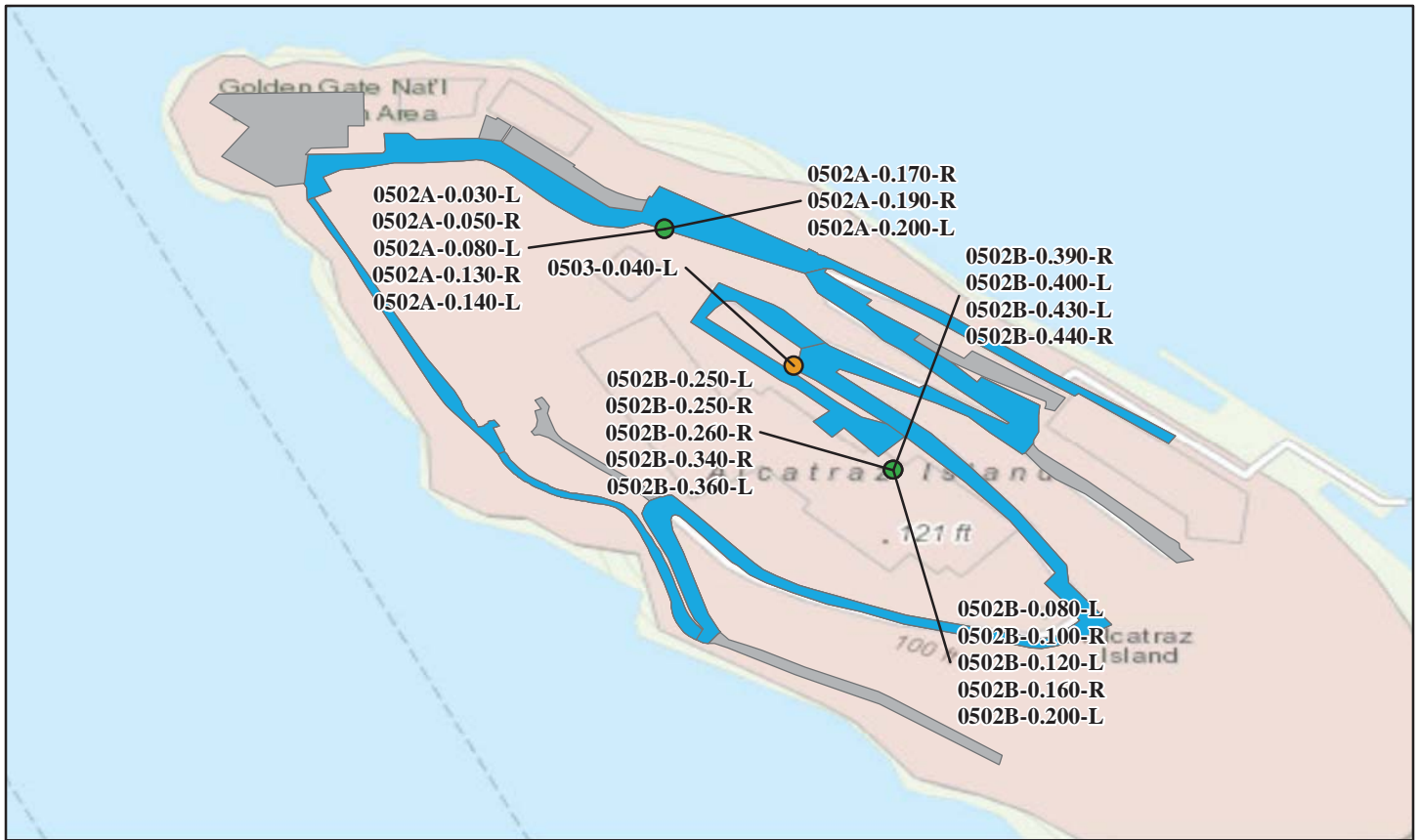
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0502A-0.170-R 11/8/2007	864	96	Gravity - Concrete Block/Brick	Fill Wall	70	\$0.00
GOGA-0502A-0.190-R 11/8/2007	630	45	Gravity - Concrete Block/Brick	Fill Wall	79	\$0.00
GOGA-0502A-0.200-L 11/8/2007	568	82	Gravity - Mass Concrete	Fill Wall	74	\$1,080.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

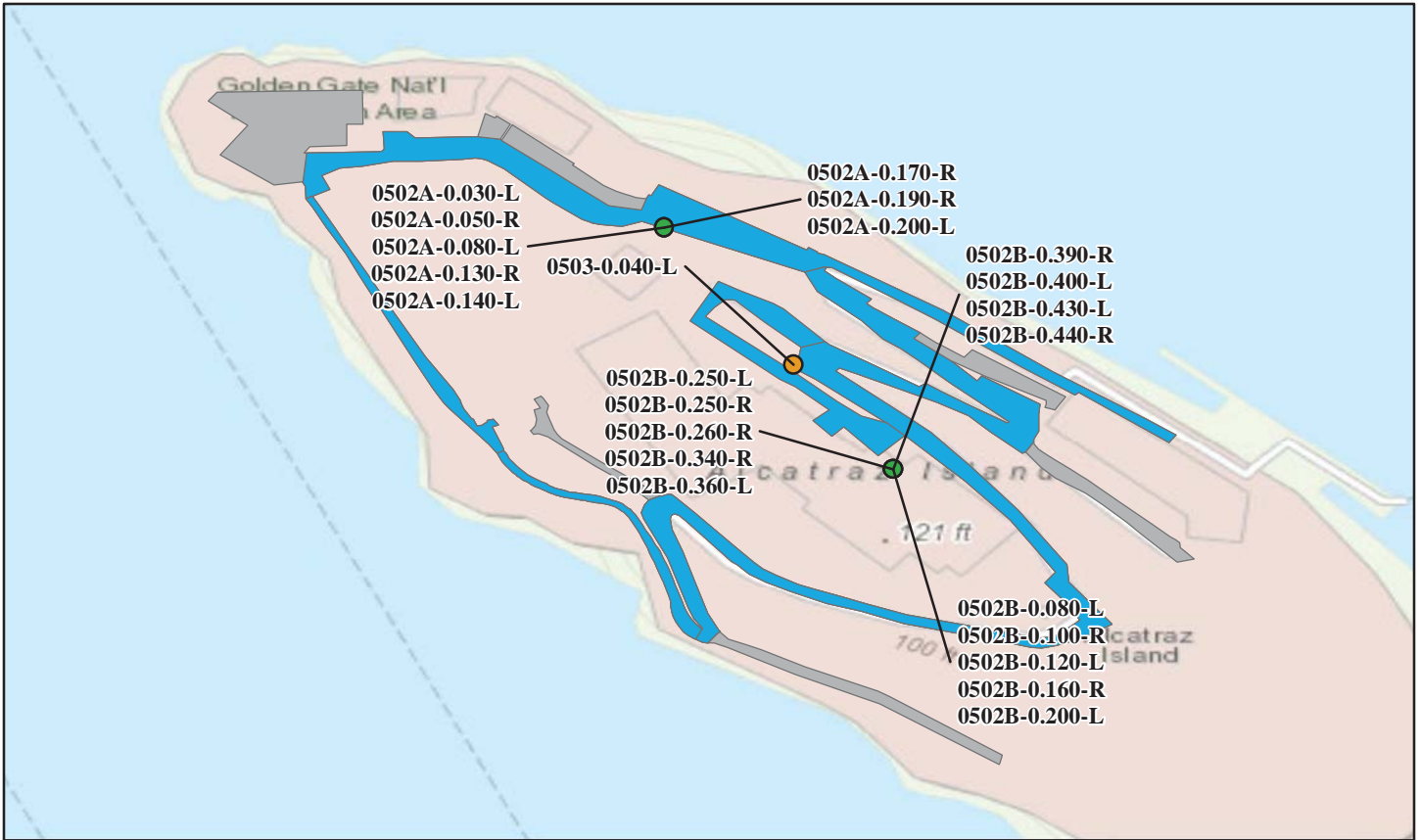
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0502B-0.080-L 11/8/2007	1800	158	Gravity - Mortared Stone	Fill Wall	87	\$0.00
GOGA-0502B-0.100-R 11/8/2007	3340	464	Gravity - Mortared Stone	Fill Wall	68	\$0.00
GOGA-0502B-0.120-L 11/8/2007	2968	212	Gravity - Concrete Block/Brick	Cut Wall	43	\$0.00
GOGA-0502B-0.160-R 11/8/2007	752	215	Gravity - Mass Concrete	Cut Wall	69	\$0.00
GOGA-0502B-0.200-L 11/8/2007	120	40	Gravity - Concrete Block/Brick	Cut Wall	66	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

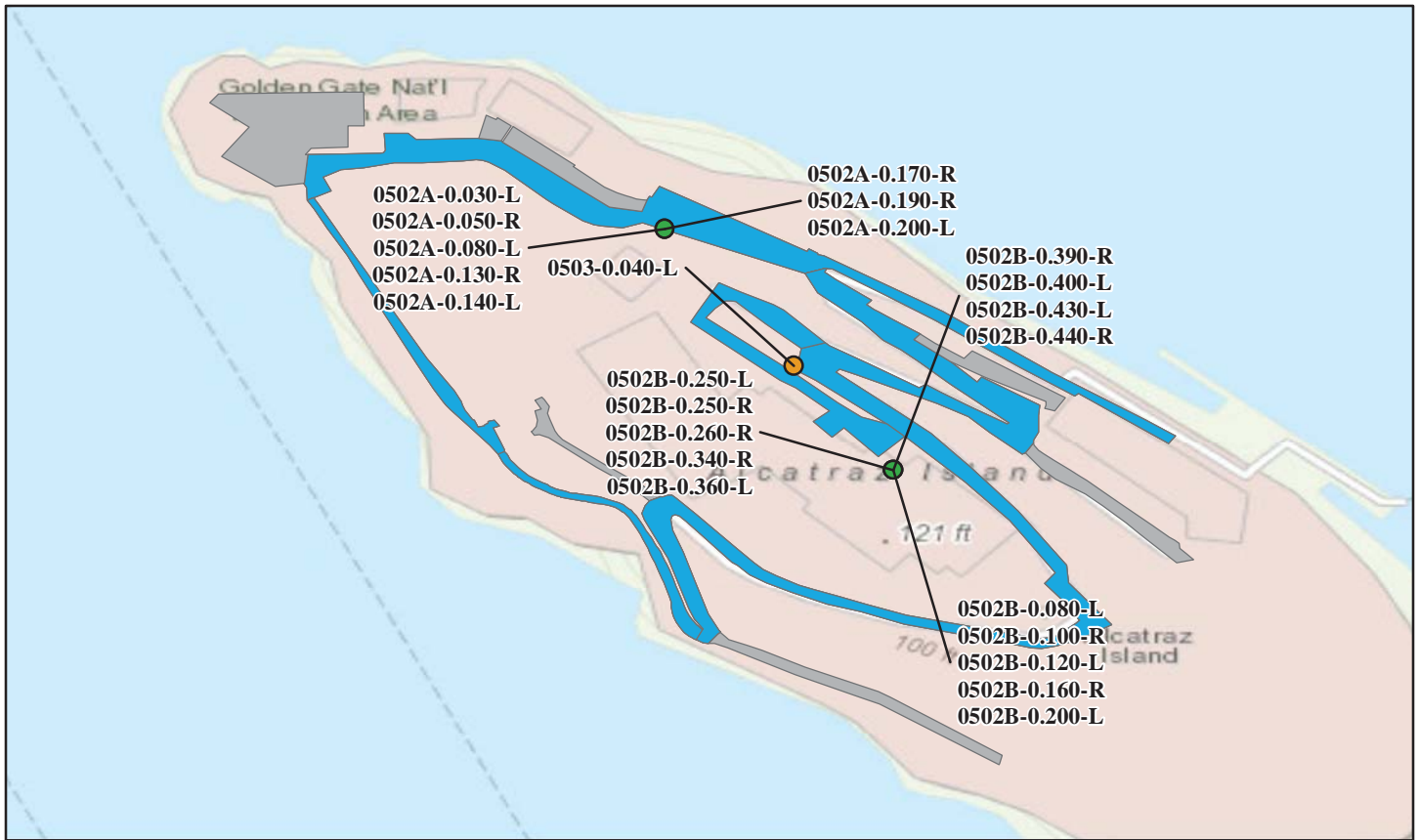
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0502B-0.250-L 11/8/2007	1272	212	Gravity - Mortared Stone	Cut Wall	63	\$2,600.00
GOGA-0502B-0.250-R 11/8/2007	350	58	Gravity - Mortared Stone	Fill Wall	69	\$1,200.00
GOGA-0502B-0.260-R 11/8/2007	605	175	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GOGA-0502B-0.340-R 11/8/2007	2233	319	Gravity - Mortared Stone	Fill Wall	70	\$0.00
GOGA-0502B-0.360-L 11/8/2007	1600	109	Gravity - Concrete Block/Brick	Fill Wall	65	\$1,200.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

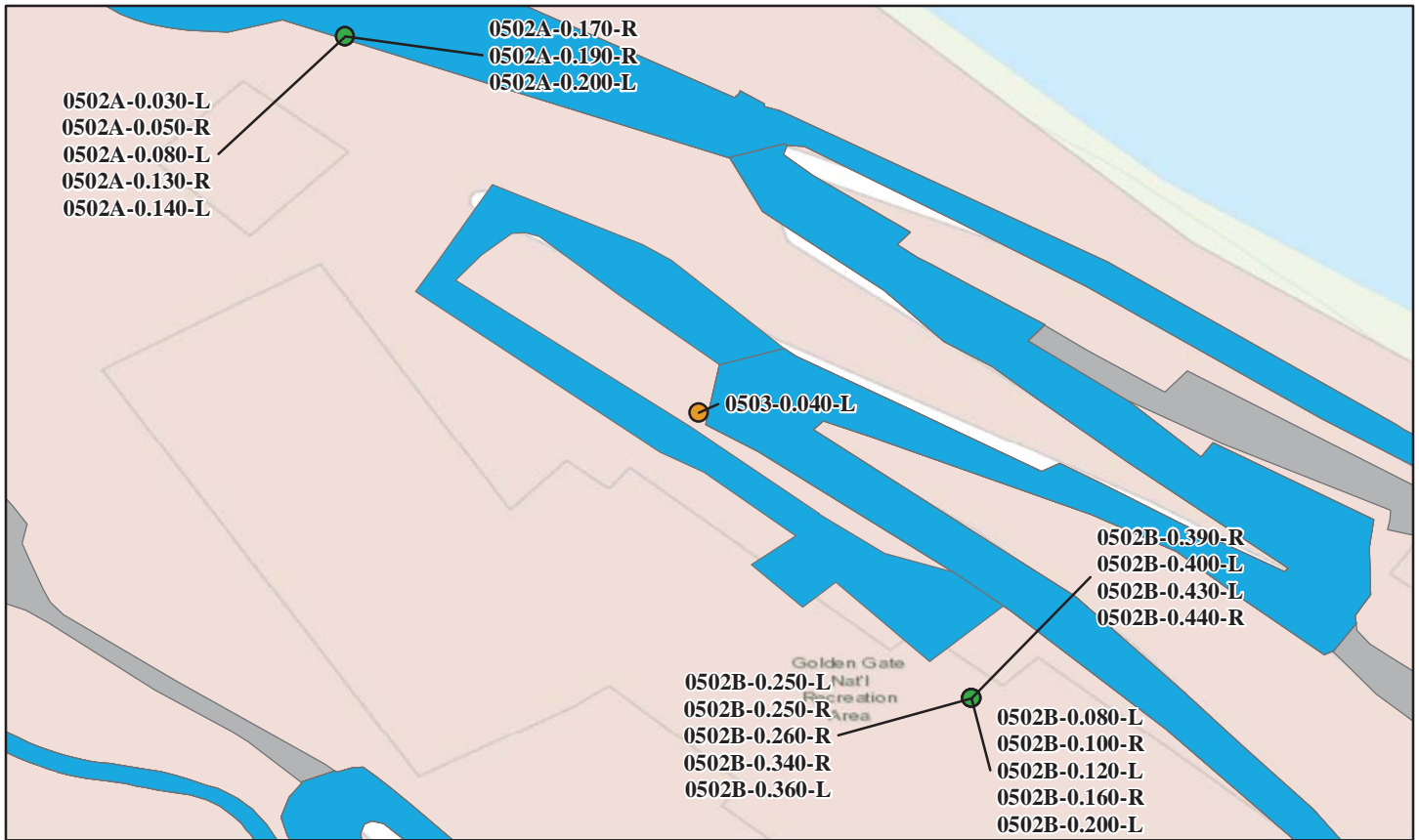
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0502B-0.390-R 11/8/2007	1950	195	Gravity - Concrete Block/Brick	Cut Wall	70	\$75,000.00
GOGA-0502B-0.400-L 11/8/2007	3400	283	Gravity - Mortared Stone	Fill Wall	72	\$0.00
GOGA-0502B-0.430-L 11/8/2007	3000	250	Gravity - Mass Concrete	Cut Wall	71	\$10,000.00
GOGA-0502B-0.440-R 11/8/2007	2416	151	Gravity - Mortared Stone	Fill Wall	84	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0503: ALCATRAZ ISLAND MILITARY MORGUE ROAD



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)	Fair (50 - 69)	Good to Excellent (70 - 100)	No Data
---------------------------------	-----------------------	-------------------------------------	----------------

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0503-0.040-L 11/8/2007	472	118	Gravity - Concrete Block/Brick	Fill Wall	59	\$8,810.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0700: UNKNOWN ROUTE

Wall location is unknown.

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0700-0.000-L 11/7/2007	1,040	260	Other -Timber	Cut Wall	65	\$550.00
GOGA-0700-0.000-L 11/6/2007	815	102	Gravity - Mass Concrete	Fill Wall	68	\$8,500.00
GOGA-0700-0.000-L 11/6/2007	1,284	153	Gravity - Mass Concrete	Fill Wall	78	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0905: MERRIE WAY PARKING LOT



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

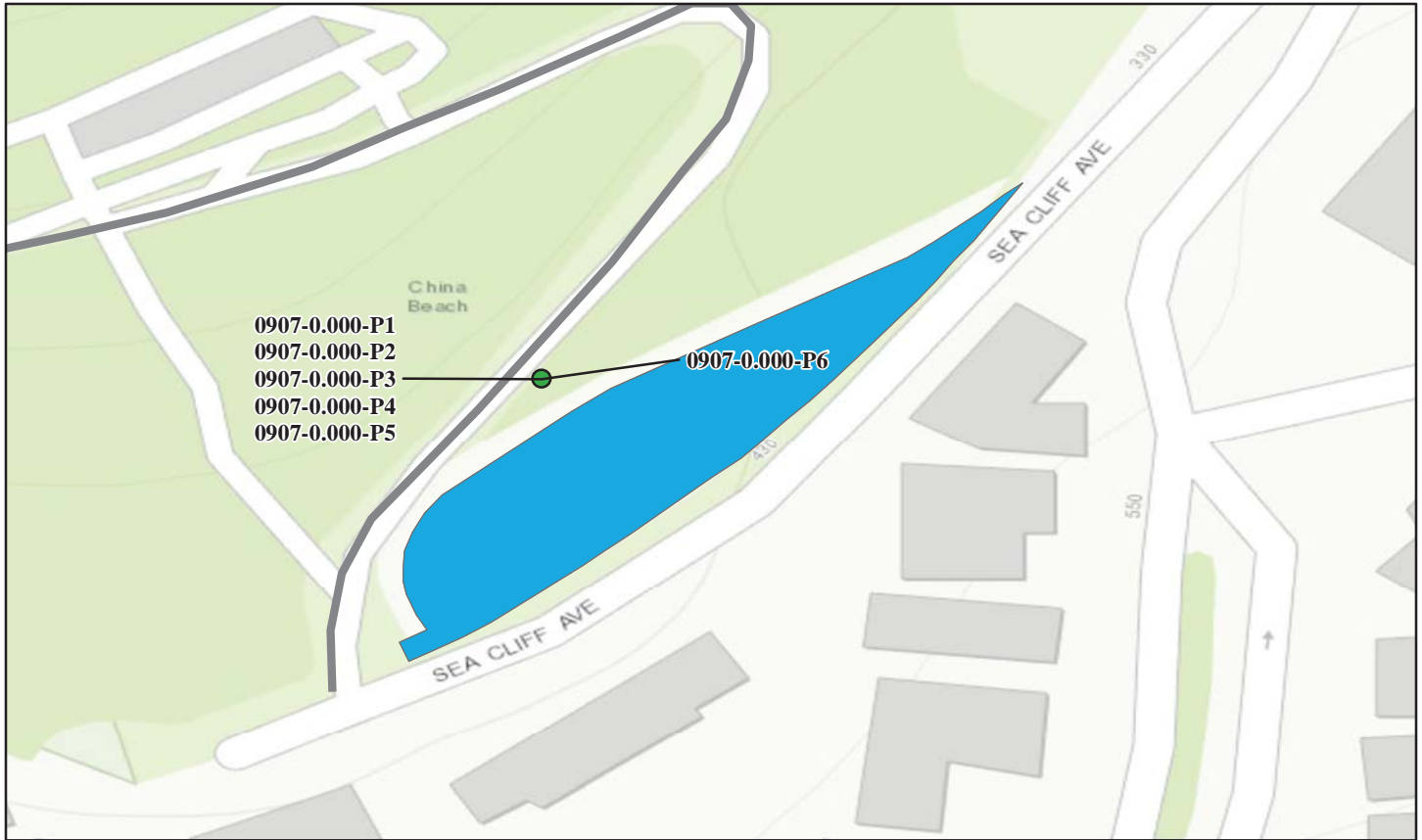
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0905-0.000-P1 11/7/2007	2066	128	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GOGA-0905-0.000-P2 11/7/2007	645	120	Gravity - Mass Concrete	Fill Wall	78	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

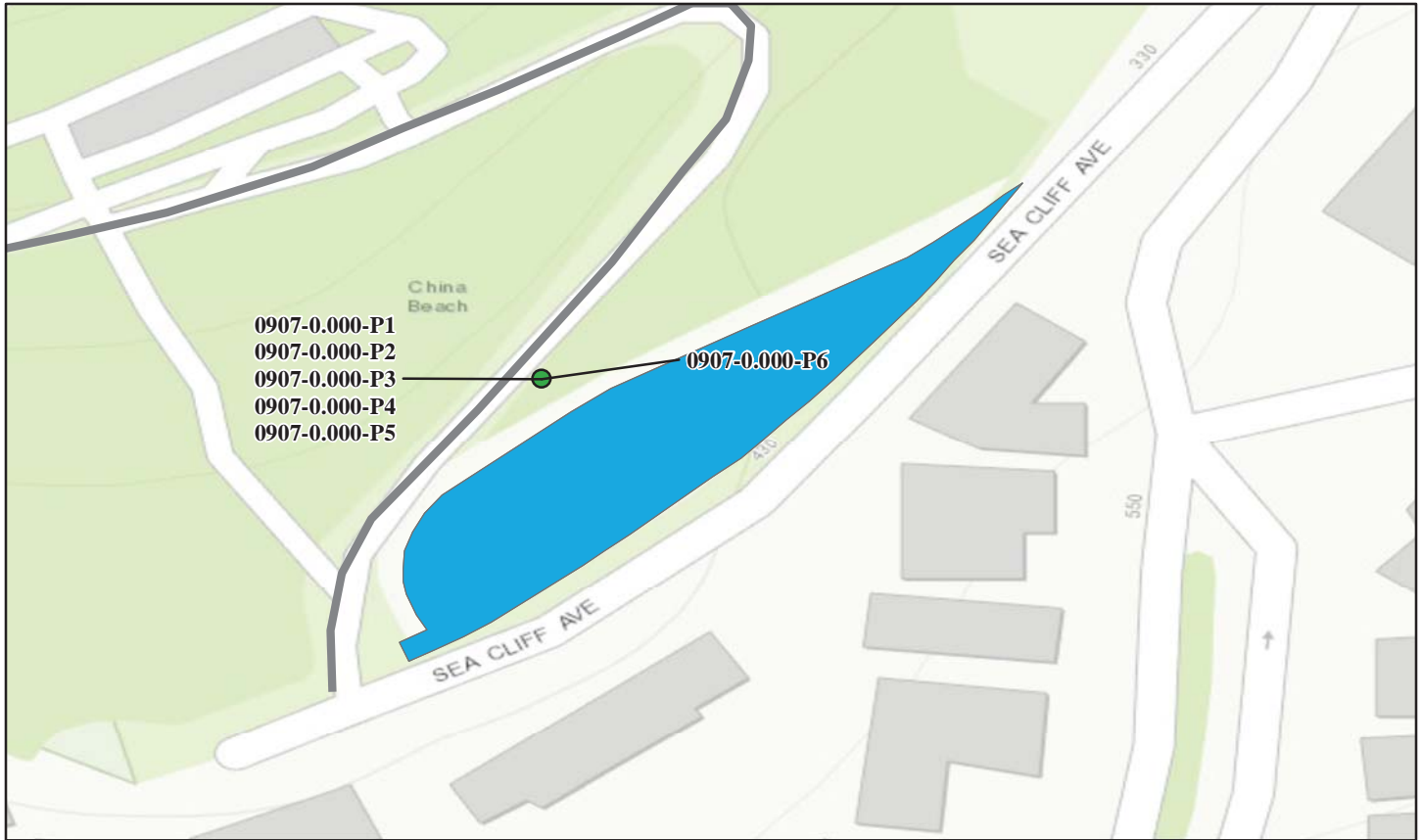
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0907-0.000-P1 11/7/2007	810	90	Gravity - Mass Concrete	Fill Wall	78	\$380.00
GOGA-0907-0.000-P2 11/7/2007	1980	180	Bin - Metal	Fill Wall	54	\$280,300.00
GOGA-0907-0.000-P3 11/7/2007	1900	200	Bin - Metal	Cut Wall	62	\$271,500.00
GOGA-0907-0.000-P4 11/7/2007	312	78	Bin - Metal	Cut Wall	74	\$0.00
GOGA-0907-0.000-P5 11/7/2007	1464	244	Gravity - Mass Concrete	Cut Wall	93	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

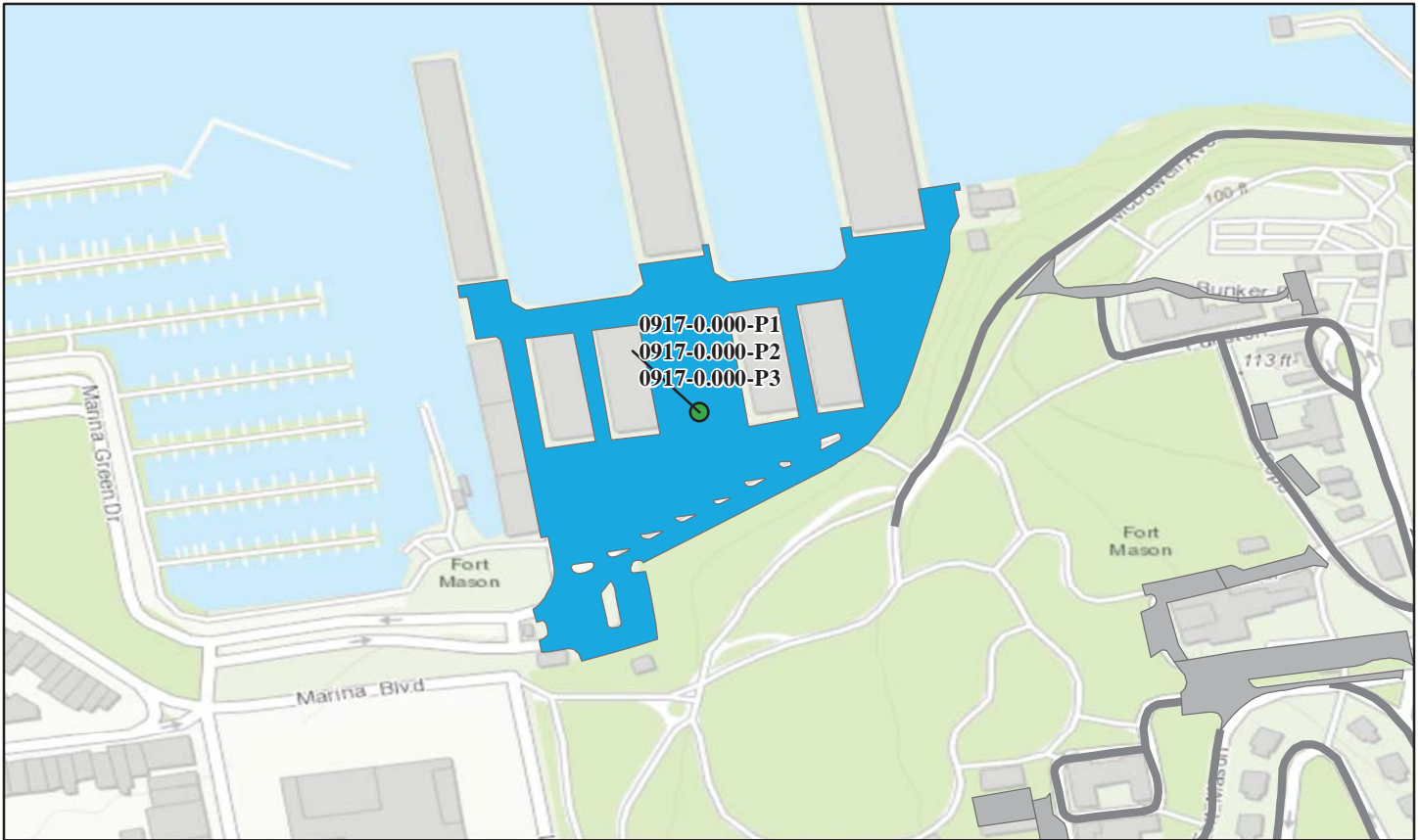
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0907-0.000-P6 11/7/2007	1830	240	Bin - Metal	Cut Wall	55	\$265,800.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0917: LOWER FORT MASON PARKING LOT



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GOGA-0917-0.000-P1 11/6/2007	2880	137	Gravity - Mass Concrete	Cut Wall	93	\$0.00
GOGA-0917-0.000-P2 11/6/2007	2530	370	Gravity - Mass Concrete	Cut Wall	87	\$0.00
GOGA-0917-0.000-P3 11/6/2007	15750	630	Gravity - Mass Concrete	Cut Wall	83	\$0.00

*2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Tier 3 Retaining Wall Details



Golden Gate National Recreation Area



Federal Lands Highway
Road Inventory Program

Wall ID:	GOGA-0105-0.073-R		
Route Name:	BUNKER ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in place cantilever concrete cut wall in good condition to retain soil in a parking area.		

Wall Measurements

Wall Length (ft.):	128	Face Area (sq.):	490
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of failure or global distress.	8
WALL FOUNDATION MATERIAL 8.00	Paved excellent condition.	8
CONCRETE 8.00	Some water staining; fair condition with some minor cracking.	8
DOWNSLOPE 0.50	Paved asphalt, no distress issues.	8
VEGETATION 0.50	No vegetation on the wall that affects wall stability.	8
LATERAL SLOPE 1.00	Soil with vegetation; no signs of erosion.	7
UPSLOPE 1.00	Soil with vegetation; no signs of erosion.	7
WALL DRAINS 1.00	None, no signs of water-related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0105: BUNKER ROAD

Retaining Wall Condition Photos



GOGA_0105_0.073_R_1.jpg



GOGA_0105_0.073_R_2.jpg

Wall ID:	GOGA-0105-0.508-L		
Route Name:	BUNKER ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	69	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Dry stack wall with broken concrete elements. Wall is an extension to a wingwall for tunnel to control erosion.		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	60
Average Wall Height (ft.):	4	Face Angle (deg.):	70
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair; no signs of failure or global instability.	7
WALL FOUNDATION MATERIAL 8.00	Soil fill, sufficient to support the wall.	7
PLACED STONE 8.00	Stone elements are made of broken grouted aggregate concrete; many gaps and some missing elements.	7
DOWNSLOPE 1.00	Soil with cobbles, some erosion.	6
UPSLOPE 1.00	Eroded soil with some vegetation; grass and brush.	6
LATERAL SLOPE 1.00	Tunnel wingwall on one side. Very steep slope with heavy vegetation on other side.	7
VEGETATION 1.00	None that impacts the wall.	7
WALL DRAINS 1.00	None, no signs of water-related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0105: BUNKER ROAD

Retaining Wall Condition Photos



GOGA_0105_0.508_L_1.jpg



GOGA_0105_0.508_L_2.jpg

Wall ID:	GOGA-0105-0.550-L		
Route Name:	BUNKER ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone cut wall functioning as a retaining wall and as an extension to a tunnel wingwall.		

Wall Measurements

Wall Length (ft.):	280	Face Area (sq.):	1400
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good; no signs of failure or global instability.	8
WALL FOUNDATION MATERIAL 8.00	Concrete, excellent condition, no failure or distress.	8
MORTAR 8.00	Minor shrinkage, mostly intact.	8
STONE MASONRY 8.00	Minor cracking and chemical erosion; generally good condition.	8
LATERAL SLOPE 0.50	One side is a tunnel wingwall, other side is well vegetated fill; no signs of erosion.	8
UPSLOPE 0.50	Fill with excellent vegetation; no signs of erosion.	8
WALL DRAINS 0.50	Week holes, functioning well.	8
DOWNSLOPE 0.50	Paved road; no distress.	9
CULVERT 1.00	A 1foot culvert exists and is filled with soil and debris; not functioning.	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0105: BUNKER ROAD

Retaining Wall Condition Photos



GOGA_0105_0.550_L_1.jpg

Wall ID:	GOGA-0109ZZ-0.126-R		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Timber crib cut wall. 6 in drain pipe from hiking trail above wall. Cobble size rock fill. Timber vertical whalers.		

Wall Measurements

Wall Length (ft.):	103	Face Area (sq.):	515
Average Wall Height (ft.):	5	Face Angle (deg.):	80
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Very good condition.	9
WALL FOUNDATION MATERIAL 8.00	Soil, shallow short slope.	9
BIN OR CRIB 8.00	Slightly weathered timber in good condition. No signs of distress.	9
DOWNSLOPE 0.50	Well vegetated. No signs of distress.	8
ROAD/SIDEWALK/SHOULDER 0.50	Hiking trail above wall. No signs of distress.	8
TRAFFIC BARRIER/FENCE 0.50	No signs of distress.	8
WALL DRAINS 0.50	None, no signs of water-related distress.	8
LATERAL SLOPE 1.00	Some erosion due to pedestrian access.	7
UPSLOPE 1.00	Moderate erosion.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.126_R_1.jpg

Wall ID:	GOGA-0109ZZ-0.127-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gabion fill wall in good condition. Too steep to access this wall for inventory. Wall geometry and condition is estimated based on limited visibility of wall.		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	240
Average Wall Height (ft.):	12	Face Angle (deg.):	75
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of global distress.	8
WALL FOUNDATION MATERIAL 8.00	Soil, steep slope. No signs of distress.	7
WIRE/GEOSYNTHETIC FACING 8.00	Gabion wall elements are in good condition. No signs of distress.	8
DOWNSLOPE 0.50	Well vegetated, no erosion evident.	8
LATERAL SLOPE 0.50	Well vegetated, no erosion evident, no signs of slope failure.	8
WALL DRAINS 0.50	None, no signs of water-related distress.	8
UPSLOPE 1.00	Moderate erosion, but stable.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.127_L_1.jpg

Wall ID:	GOGA-0109ZZ-0.384-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wire gabion fill wall in good condition.		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	165
Average Wall Height (ft.):	6	Face Angle (deg.):	75
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, wall shows no signs of distress, deformation, or settlement. Looks very new.	9
WALL FOUNDATION MATERIAL 8.00	Weathered bedrock. No signs of settlement. Ground is firm with high bearing capacity.	9
WIRE/GEOSYNTHETIC FACING 8.00	No broken wires on gabion, no missing elements, rock is hard and angular. Very little weathering. Very nearly new in appearance.	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor longitudinal crack in center outbound lane. No patching evident. Minor settlement due to wall construction.	9
TRAFFIC BARRIER/FENCE 0.50	Guardrail shows no signs of wall-related distress.	10
WALL DRAINS 0.50	Open face/free draining. No signs of water-related distress.	10
DOWNSLOPE 1.00	Weathered, durable rock outcrop. Erosion gully directly below all toe.	7
LATERAL SLOPE 1.00	Well vegetated stable slopes. Construction boundary at either end shows minor erosion.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.384_L_1.jpg

Wall ID:	GOGA-0109ZZ-0.455-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in place gravity concrete wall in good condition.		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	110
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of global distress.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock. No signs of distress.	8
CONCRETE 8.00	Minor weathering. No cracks, durable.	8
DOWNSLOPE 0.50	Steep bedrock, escarpment, no signs of slope failure.	8
WALL DRAINS 0.50	None. No signs of distress.	8
LATERAL SLOPE 1.00	Minor erosion, not impacting wall at this time.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.455_L_1.jpg

Wall ID:	GOGA-0109ZZ-0.571-R		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Grouted rock cut wall abuts up to tunnel head wall.		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	375
Average Wall Height (ft.):	15	Face Angle (deg.):	65
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair due to cracks, missing mortar, erosion and rotated upper wall area.	7
WALL FOUNDATION MATERIAL 8.00	Excellent, assumed stable bedrock.	9
MORTAR 8.00	Cracked, spalling, some mortar is missing.	6
STONE MASONRY 8.00	Moderately weathered stones.	7
WALL DRAINS 1.00	Drains are not functioning.	5
LATERAL SLOPE 1.00	Moderately steep, gravel and some vegetation, with evidence of erosion.	7
UPSLOPE 1.00	Moderately steep, gravel and some vegetation, with evidence of erosion.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repoint mortared stone wall. Replace, reset, and repoint approximately 375 sq.ft. of wall @ \$75/sf = \$28,125
Repair Cost:	\$28,125

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0109ZZ-0.571-R

Wall ID:	GOGA-0109ZZ-0.574-R		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared rockery cut wall with wood wall extension of 3.5 ft H x 18 ft W. Wall serving as wing walls to a tunnel portal. Needs repairing.		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	600
Average Wall Height (ft.):	15	Face Angle (deg.):	65
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair, with missing grout, several cracks in wall, and evidence of erosion.	7
WALL FOUNDATION MATERIAL 8.00	Excellent, no signs of distress.	9
MORTAR 8.00	Cracking, spalling, and missing mortar.	6
STONE MASONRY 8.00	Moderately weathered.	7
WALL DRAINS 1.00	Drains appear to be non-functioning.	5
LATERAL SLOPE 1.00	Moderately steep, gravel and some vegetation on slope.	7
UPSLOPE 1.00	Moderately steep, gravel and some vegetation on slope.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repoint mortared stone wall. Replace, reset and repoint approximately 600 sq.ft. of wall face @ \$75/sf = \$45,000
Repair Cost:	\$45,000

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0109ZZ-0.574-R.

Wall ID:	GOGA-0109ZZ-0.835-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	10	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gabion fill wall in good condition. Too steep to access this wall for inventory. Wall geometry and condition is estimated based on limited visibility of wall.		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	600
Average Wall Height (ft.):	12	Face Angle (deg.):	60
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-15

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Failed wall.	1
WALL FOUNDATION MATERIAL 8.00	Soil, steep slope, eroded, surficial instability, sliding evident.	1
WIRE/GEOSYNTHETIC FACING 8.00	Gabions have failed and need to be rebuilt/replaced.	1
LATERAL SLOPE 5.00	Moderately steep, moderate vegetation with evidence of erosion, sliding.	1
WALL DRAINS 5.00	None.	1

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace entire gabion wall due to substantial wall failure. Note: Slope was too steep for visual inspection, so investigation is required. 50' x 20' gabion wall replacement, approximately 600 sq. ft. @ \$40 per sq. ft. = \$24,000. Traffic control = \$5,000
Repair Cost:	\$51,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.835_L_1.jpg

Wall ID:	GOGA-0109ZZ-0.910-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	PVC coated wire gabion baskets with 6 in basket rock in good condition.		

Wall Measurements

Wall Length (ft.):	105	Face Area (sq.):	780
Average Wall Height (ft.):	7	Face Angle (deg.):	55
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-18

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, wall shows minor basket damage at localized areas. No global distress.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock to competent granular material. Excellent bearing platform. No erosion or signs of settlement.	9
WIRE/GEOSYNTHETIC FACING 8.00	Minor basket deformation in localized spots. PVC coating is weathered but intact. Basket rock is hard, durable, unweathered.	9
LATERAL SLOPE 0.50	Stable granular fill slope. Moderately vegetated. No signs of distress. Minor erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Long half-moon crack deforms back of gabion construction Minor roadway settlement.	8
UPSLOPE 0.50	Gentle, granular material fill, moderately vegetated. Very stable with only minor erosion at roadway edge.	8
TRAFFIC BARRIER/FENCE 0.50	No signs of wall-related distress along guardrail.	9
DOWNSLOPE 0.50	Flat construction bench about 20' wide. Very stable, No signs of distress,.	10
WALL DRAINS 0.50	Free draining. No signs of water issues.	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_0.910_L_1.jpg

Wall ID:	GOGA-0109ZZ-1.027-L		
Route Name:	CONZELMAN ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	2000
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Welded Wire Face
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wire faced gabion wall largely obscured by dense brush and poison oak.		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	400
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No signs of global distress or significant settlement.	8
WALL FOUNDATION MATERIAL 8.00	Known to bear on granular materials from as built.	9
WIRE/GEOSYNTHETIC FACING 8.00	Minor weathering of steel basket and hardware cloth. Difficult to inspect due to heavy growth.	8
DOWNSLOPE 0.50	Heavily vegetated. Unknown slope condition, but no evidence of significant sliding.	8
LATERAL SLOPE 0.50	Heavily vegetated. No signs of distress.	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor settlement (localized) in outboard lane.	8
TRAFFIC BARRIER/FENCE 0.50	No evidence of wall-related distress.	8
VEGETATION 0.50	Thick shrubs and brush above and below Unknown impacts to wall, presumed minor.	8
WALL DRAINS 0.50	No drains. No evidence of drainage problems.	8

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0109ZZ: CONZELMAN ROAD

Retaining Wall Condition Photos



GOGA_0109ZZ_1.027_L_1.jpg



GOGA_0109ZZ_1.027_L_2.jpg

Wall ID:	GOGA-0405-0.010-R		
Route Name:	MCDOWELL AVENUE		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone masonry seawall next to roadway, with a concrete/stone masonry guardwall.		

Wall Measurements

Wall Length (ft.):	208	Face Area (sq.):	1450
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No significant distress; mostly weathering from wave action. No global distress.	8
WALL FOUNDATION MATERIAL 8.00	Unknown, underwater. No wall or roadway settlement is evident. Presumed bedrock.	8
MORTAR 8.00	Cracked, weathered, some areas missing in the face. Most is still hard. Durability is good.	7
STONE MASONRY 8.00	Hard, durable stone. Hard, durable tone. Water worn.	8
LATERAL SLOPE 0.50	Van Ness Street side continues on to Aqua Park. West end had bedrock lateral slope. Very stable.	8
ROAD/SIDEWALK/SHOULDER 0.50	No signs of wall-related distress. Concrete roadway is cracked du to utility lines.	8
TRAFFIC BARRIER/FENCE 0.50	Concrete-capped stone masonry guardwall. Cracked and spalling, but not related to wall distress.	8
WALL DRAINS 0.50	None. No groundwater-related distress evident.	8

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0405: MCDOWELL AVENUE

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0405-0.010-R.

Wall ID:	GOGA-0405-0.034-L		
Route Name:	MCDOWELL AVENUE		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	56	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete crib fill wall along inbound section of road, with 20 in concrete curbing. Box is lined with rusting galvanized corrugated steel sheets. Two wall overlapping by 20 in		

Wall Measurements

Wall Length (ft.):	190	Face Area (sq.):	950
Average Wall Height (ft.):	5	Face Angle (deg.):	80
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is in imminent failure. Sever distress to crib elements.	4
WALL FOUNDATION MATERIAL 8.00	No signs of wall-related distress. No settlement or soil erosion.	8
BIN OR CRIB 8.00	Heavily weathered, reinforcing steel exposed/rusting, crib concrete is spalling badly. Corrugated steel material is rusted through, fill migrating out of wall face.	4
LATERAL SLOPE 0.50	Well vegetated side slopes with no sign of distress, slumping or erosion.	8
UPSLOPE 0.50	Steep, well vegetated stable slope.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road below the wall shows no sign of wall-related distress.	9
VEGETATION 0.50	Brush and shrubs grown over the wall, but do not appear to be impacting wall performance.	9
WALL DRAINS 1.00	Wall is free-draining. Water migration of fill is evident.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Retrofit wall with Soil Nail wall: Soil Nail wall - 950 sq.ft. @ \$110/sf = \$104,500. Heavy equipment @ \$800/day for 10 days = \$8,000. Misc. Labor - 200 hours @ \$55/hr = \$11,000. Roadway HACP - 2,000 sq. ft @ \$10/sf = \$20,000. Total = \$143,500.00
Repair Cost:	\$143,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0405: MCDOWELL AVENUE

Retaining Wall Condition Photos



GOGA_0405_0.034_L_1.jpg



GOGA_0405_0.034_L_2.jpg

Wall ID:	GOGA-0405-0.080-R		
Route Name:	MCDOWELL AVENUE		
Inspection Date:	November 06, 2007	Approximate Year Built:	Unknown
*Wall Rating:	62	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Historic mortared stone masonry wall with cementitious overlay to top of concrete guardwall.		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	550
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is showing signs of bearing capacity failure either due to toe erosion or slope fatigue.	4
WALL FOUNDATION MATERIAL 8.00	Steep, highly eroded slope. Damaged section is settling, rotating out slightly.	4
MORTAR 8.00	Encased in concrete overlay. Missing in exposed areas requiring remortaring.	7
CONCRETE 8.00	Cracked concrete overlay, with minor spalling along toe of wall.	8
STONE MASONRY 8.00	Encased in concrete overlay. Exposed at wall toe. Needs to be mortared over, wall section is settling.	8
WALL DRAINS 0.50	Occasional wall drain, functioning properly.	8
DOWNSLOPE 1.00	Very steep slope onto bedrock. Highly eroded at some locations, undermining wall location.	5
ROAD/SIDEWALK/SHOULDER 1.00	Obvious signs of settlement, some minor patching has occurred. Needs more patching.	5
TRAFFIC BARRIER/FENCE 1.00	30" high concrete parapet. Severe cracks defining sections of wall that are settling with the slope.	5

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Mortar patch the guardwall and wall face cracks. Mortar the exposed stone masonry at toe of wall. Underpin rotating wall section. Micropile underpinning - 500 sq.ft @ \$170/sf = \$85,000. Cementitious overlay - 100 sq ft @ \$65/sf = \$6,500. Roadway patch
Repair Cost:	\$107,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0405: MCDOWELL AVENUE

Retaining Wall Condition Photos



GOGA_0405_0.080_R_1.jpg



GOGA_0405_0.080_R_2.jpg

Wall ID:	GOGA-0413-0.297-L		
Route Name:	SIMMONDS ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in place concrete fill wall for parking area.		

Wall Measurements

Wall Length (ft.):	55	Face Area (sq.):	231
Average Wall Height (ft.):	4	Face Angle (deg.):	89
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of failure or global distress.	8
WALL FOUNDATION MATERIAL 8.00	Fill soil with vegetation sufficient to support wall.	7
CONCRETE 8.00	Several longitudinal and transverse cracks, some extending from top to bottom of wall.	6
VEGETATION 0.50	No vegetation on the wall that affects wall stability.	8
WALL DRAINS 1.00	None, no signs of water-related distress.	6
DOWNSLOPE 1.00	Fill soil with grass, minor erosion.	7
LATERAL SLOPE 1.00	Fill soil with grass, minor erosion.	7
UPSLOPE 1.00	Flat parking area.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0413: SIMMONDS ROAD

Retaining Wall Condition Photos



GOGA_0413_0.297_L_1.jpg

Wall ID:	GOGA-0419-0.050-L		
Route Name:	MOORE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	66	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mass concrete fill wall constructed as a seawall to support a road.		

Wall Measurements

Wall Length (ft.):	447	Face Area (sq.):	4470
Average Wall Height (ft.):	10	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is performing well, but the concrete is in distress and unstable.	7
WALL FOUNDATION MATERIAL 8.00	Foundation is under water and not visible. Assuming stable bedrock sufficient to support wall.	7
CONCRETE 8.00	Concrete has lost some durability and strength. There is exposed rebar and chemical degradation due to salt water exposure and wave action.	6
VEGETATION 0.50	No impacts to wall.	8
TRAFFIC BARRIER/FENCE 1.00	Concrete traffic barrier shows cracking and fatigue.	5
WALL DRAINS 1.00	12" water pipes provide drainage; appear to be clogged.	5
CULVERT 1.00	Some culverts are functional and some are not.	6
LATERAL SLOPE 1.00	No lateral slopes; this is a seawall.	7
ROAD/SIDEWALK/SHOULDER 1.00	No signs of distress caused by wall.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0419: MOORE ROAD

Retaining Wall Condition Photos



GOGA_0419_0.050_L_1.jpg



GOGA_0419_0.050_L_2.jpg

Wall ID:	GOGA-0419-0.134-L		
Route Name:	MOORE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	65	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity concrete wall installed as a seawall. Foundation repair is recommended.		

Wall Measurements

Wall Length (ft.):	256	Face Area (sq.):	2048
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good wall performance, but concrete is degrading caused by sea water and wave action. Some repairs have been done previously, but more are recommended.	7
WALL FOUNDATION MATERIAL 8.00	Foundation is below water in areas and sand and cobbles in part of the wall. Sufficient to support wall yet undermined but on bedrock.	5
CONCRETE 8.00	Concrete damaged, aggregate is exposed, loss of durability and strength. Also, chemical degradation.	7
UPSLOPE 0.50	Upslope consists of a paved road with a gravel sidewalk; stable condition.	8
TRAFFIC BARRIER/FENCE 1.00	Concrete barrier with cracking and degradation. Missing concrete in some segments.	6
CULVERT 1.00	A culvert is present and appears to be functioning properly.	7
LATERAL SLOPE 1.00	Piers on one side and large concrete blocks on the other.	7
ROAD/SIDEWALK/SHOULDER 1.00	No signs of roadway distress due to wall.	7
VEGETATION 1.00	Minor vegetation, not affecting wall stability.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Apply concrete patch along scoured toe of wall. Labor - 40 hours @ \$55/hr = \$2,200 Concrete, 2 cubic yards @ \$100/c.y. = \$200
Repair Cost:	\$2,400

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0419: MOORE ROAD

Retaining Wall Condition Photos



GOGA_0419_0.134_L_1.jpg



GOGA_0419_0.134_L_2.jpg

Wall ID:	GOGA-0419-0.160-L		
Route Name:	MOORE ROAD		
Inspection Date:	November 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	69	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	MSE - Welded Wire Face
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete, CIP gravity wall with MSE wire face geosynthetic reinforcement added to control scour.		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	100
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair due to foundation and slope erosion distress.	6
WALL FOUNDATION MATERIAL 8.00	Foundation under the MSE is eroded. Concrete area shows no distress.	7
WIRE/GEOSYNTHETIC FACING 8.00	Some corrosion, fabric intact.	7
CONCRETE 8.00	Looks good. Slightly weathered.	8
TRAFFIC BARRIER/FENCE 0.50	Pedestrian barrier fence. No signs of distress.	8
WALL DRAINS 0.50	None. No signs of distress.	8
DOWNSLOPE 1.00	Evidence of erosion underpinning the wall.	5
LATERAL SLOPE 1.00	Evidence of erosion cutting into wall ends.	6

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0419: MOORE ROAD

Retaining Wall Condition Photos



GOGA_0419_0.160_L_1.jpg

Wall ID:	GOGA-0420ZZ-0.007-R		
Route Name:	MCREYNOLDS ROADS		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	54	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity mortared stone cut wall with concrete boxes installed every 15-200 ft.		

Wall Measurements

Wall Length (ft.):	1189	Face Area (sq.):	4756
Average Wall Height (ft.):	4	Face Angle (deg.):	95
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall rotation caused by soil pressure behind wall.	5
WALL FOUNDATION MATERIAL 8.00	Concrete foundation in good condition, some cracking and missing segments.	6
MORTAR 8.00	Some shrinkage, cracking, missing sections.	5
OTHER PRIMARY ELEMENT 8.00	Concrete boxes ~ 6' long installed at different locations.	5
STONE MASONRY 8.00	Varying sizes of missing elements, minor cracking, wall rotating and bulging.	5
DOWNSLOPE 1.00	Paved roadway.	7
LATERAL SLOPE 1.00	Fill soil with vegetation; no signs of erosion.	7
UPSLOPE 1.00	Soil fill with vegetation ~ 8:1. Trees and no signs of erosion.	7
VEGETATION 1.00	None affecting wall stability.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace and reset missing wall elements: Labor - 40 hours @ \$55.00/hour = \$2,200. Stones = \$100, Concrete = \$100
Repair Cost:	\$2,400

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0420ZZ: MCREYNOLDS ROADS

Retaining Wall Condition Photos



GOGA_0420ZZ_0.007_R_1.jpg

Wall ID:	GOGA-0425-0.004-R		
Route Name:	SOMMERVILLE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	36	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilever fill wall failed, rotated and cracked with exposed foundation.		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	800
Average Wall Height (ft.):	8	Face Angle (deg.):	97
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Very poor condition and wall must be replaced or the building stability will be affected.	3
WALL FOUNDATION MATERIAL 8.00	Foundation is exposed and failed causing wall element rotation.	3
CONCRETE 8.00	Concrete wall has failed and rotated severely. Concrete elements have severe vertical cracks extending the entire wall length.	3
DOWNSLOPE 1.00	Seawater in the bay.	4
UPSLOPE 1.00	Upslope materials are washed out and back of wall is exposed. There is a building on the upslope that will be impacted in the event of wall failure.	4
VEGETATION 0.50	None visible on wall face; none affecting wall stability.	8
CULVERT 1.00	No culverts in the wall.	7
LATERAL SLOPE 1.00	Seawater in the bay.	7
WALL DRAINS 1.00	Weep holes are visible and functioning as designed.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace wall: Replace 800 sq. feet concrete wall @ \$200 per sq. ft. = \$160,000. Remove existing failed wall: Remove 800 sq. feet concrete wall, approximate cost = \$40,000
Repair Cost:	\$200,000

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0425: SOMMERVILLE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0425-0.004-R.

Wall ID:	GOGA-0425-0.042-R		
Route Name:	SOMMERVILLE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	60	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wooden post soldier pile with wood lagging functioning as a seawall with deadman anchors.		

Wall Measurements

Wall Length (ft.):	777	Face Area (sq.):	6216
Average Wall Height (ft.):	8	Face Angle (deg.):	100
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair, wall requires some maintenance due to issues with wood posts.	6
WALL FOUNDATION MATERIAL 8.00	Boulders and cobbles with some areas have old concrete dumped on it. Sufficient to support the wall. No signs of erosion.	7
CONCRETE 8.00	Concrete lagging is severely deteriorated, cracked and exposed steel.	5
LAGGING 8.00	6" x 8" wood planks with occasional concrete lagging at the footing.	6
PILES AND SHAFTS 8.00	Round wood post deteriorated and slightly rotated. 8 feet section has separated	6
UPSLOPE 1.00	Gravel with some erosion in areas around wood posts.	5
LATERAL SLOPE 1.00	Not applicable. Wall bounded by the bay on both sides.	7
VEGETATION 1.00	No impacts to wall due to vegetation.	7
WALL DRAINS 1.00	No wall drains are visible.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace several timber piles and perform erosion control in the upslope: Replace timber piles - 10 @ \$80/each = \$800. Replace fill - 5 cubic yards @ \$40/c.y. = \$200. Labor - 40 hours @ \$55/hour = \$2,200. Heavy equipment, estimate = \$1,000. Total = \$4,200
Repair Cost:	\$4,200

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0425: SOMMERVILLE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0425-0.042-R.

Wall ID:	GOGA-0425-0.152-L		
Route Name:	SOMMERVILLE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cantilever CIP concrete fill wall in good condition.		

Wall Measurements

Wall Length (ft.):	137	Face Area (sq.):	548
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Excellent performance; no signs of global instability.	9
WALL FOUNDATION MATERIAL 8.00	Fill with concrete side walk; sufficient to support wall. No signs of erosion.	8
CONCRETE 8.00	Good condition, no signs of cracking or degradation.	8
LATERAL SLOPE 0.50	Well vegetated soil with some brush and trees.	8
WALL DRAINS 0.50	Weep holes are visible; functioning well.	8
DOWNSLOPE 0.50	Parking lot with gravel. Excellent condition.	9
UPSLOPE 0.50	Well vegetated soil with bushes.	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0425: SOMMERVILLE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0425-0.152-L.

Wall ID:	GOGA-0425-0.174-R		
Route Name:	SOMMERVILLE ROAD		
Inspection Date:	November 07, 2007	Approximate Year Built:	Unknown
*Wall Rating:	59	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	3 ft x 3 ft x 3 ft concrete block fill wall.		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	320
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair, maintenance is required.	6
WALL FOUNDATION MATERIAL 8.00	Gravel foundation has become undermined.	5
CONCRETE 8.00	Concrete blocks show severe degradation, exposed aggregate on some blocks. Steel plates that are holding some blocks together have corrosion; some blocks are missing.	6
DOWNSLOPE 1.00	Gravel and the sea.	7
LATERAL SLOPE 1.00	Gravel. No signs of distress.	7
UPSLOPE 1.00	Gravel with some erosion.	7
VEGETATION 1.00	None affecting wall stability.	7
WALL DRAINS 1.00	None visible.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace missing elements, stabilize the foundation. All the elements are available on site. Labor - 20 hours @ \$55 per hour = \$1,100. Grout = \$200
Repair Cost:	\$1,300

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0425: SOMMERVILLE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0425-0.174-R.

Wall ID:	GOGA-0501-0.008-L		
Route Name:	MACARTHUR AVENUE LOOP EAST		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete gravity wall along east border of Ft. Mason along Van Ness Street. Wall is adjacent to MacArthur Ave. but extends to Ft. Mason Tunnel along Van Ness.		

Wall Measurements

Wall Length (ft.):	962	Face Area (sq.):	17172
Average Wall Height (ft.):	17	Face Angle (deg.):	80
Maximum Wall Height (ft.):	38	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Cracking and seepage throughout, but no bulging, sliding or rotation. No global instability.	7
WALL FOUNDATION MATERIAL 8.00	Sidewalk at street level. No signs of settlement or heave. No signs of foundation distress.	9
CONCRETE 8.00	Minor surficial spalling, occasional vertical cracking, weathered seeps near top of wall groundline.	7
ROAD/SIDEWALK/SHOULDER 0.50	Route 0501 is well back from road; no signs of wall related distress. Sidewalk below wall shows no heave or shoving.	8
TRAFFIC BARRIER/FENCE 0.50	Concrete parapet with chain link fence, and section of just link. Performing well. No apparent impacts to the wall.	8
UPSLOPE 0.50	Flat grassy area with minor indications of settlement. Portion of wall has heavily vegetated side slope, with known slumps/slides.	8
VEGETATION 0.50	Heavy brush and small trees over ~ 1/2 of wall length. No apparent impacts to the wall.	8
DOWNSLOPE 0.50	Sidewalk and Van Ness St.. No signs of wall related distress.	10
LATERAL SLOPE 0.50	Wall terminates at Ft. Mason Tunnel and Bay St. No lateral slope issues at either end.	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0501: MACARTHUR AVENUE LOOP EAST

Retaining Wall Condition Photos



GOGA_0501_0.008_L_1.jpg



GOGA_0501_0.008_L_2.jpg

Wall ID:	GOGA-0502A-0.030-L		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1850
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared brick cut wall, very old, but still functioning as designed.		

Wall Measurements

Wall Length (ft.):	78	Face Area (sq.):	858
Average Wall Height (ft.):	11	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of failure or global distress; no settlement or rotation.	8
WALL FOUNDATION MATERIAL 8.00	Concrete, excellent condition.	8
MORTAR 8.00	Minor cracking, missing mortar in some locations, very weathered, but intact.	7
MANUFACTURED BLOCK/BRICK 8.00	Bricks are highly weathered, but still appear intact and durable; none are missing.	8
CULVERT 0.50	One 6" drain pipe at ball beginning appears to be functioning well.	8
DOWNSLOPE 0.50	Flat concrete road; good condition.	8
LATERAL SLOPE 0.50	Buildings on both sides of wall.	8
UPSLOPE 0.50	Flat concrete road; good condition.	8
VEGETATION 0.50	No vegetation on the wall that affects wall stability.	8

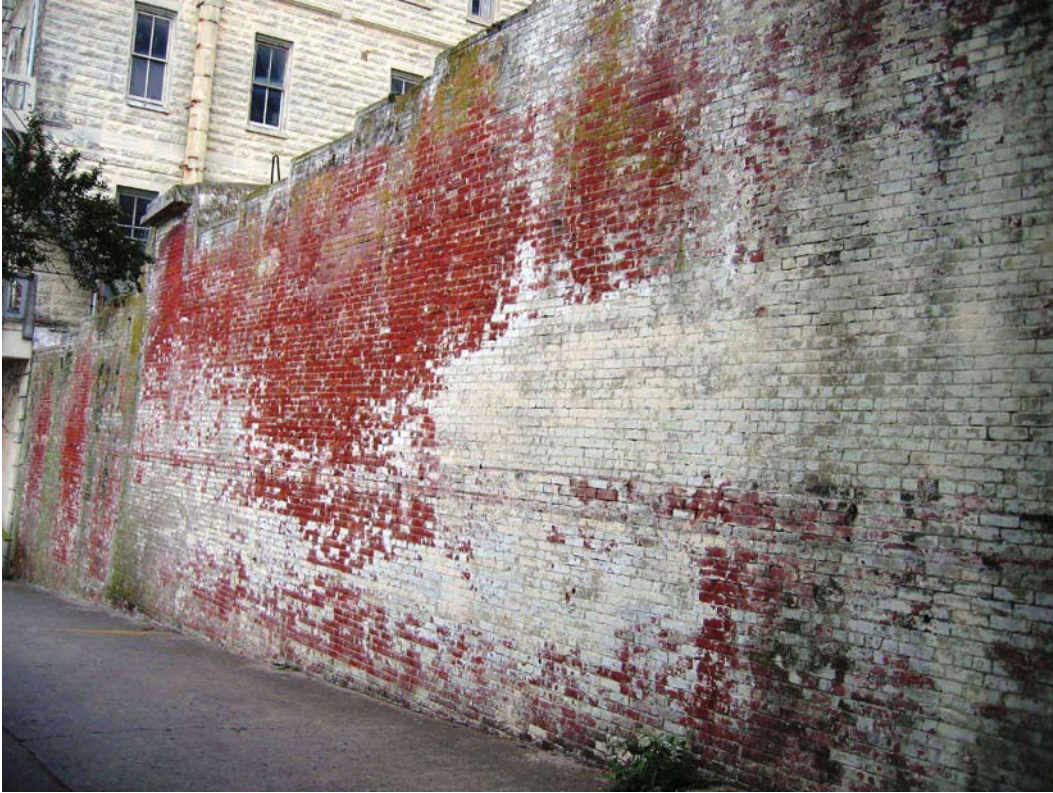
Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.030_L_1.jpg

Wall ID:	GOGA-0502A-0.050-R		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1850
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity brick wall (8 ft thick) built in 1850. Ballast block (cinder block) addition built to accommodate fire truck turnout.		

Wall Measurements			
Wall Length (ft.):	294	Face Area (sq.):	4072
Average Wall Height (ft.):	13	Face Angle (deg.):	85
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No signs of global distress, bulging, or water-related issues. Wall is still performing well as intended.	8
WALL FOUNDATION MATERIAL 8.00	No signs of foundation distress. Purported to be built on bedrock. No erosion along wall toe.	9
MANUFACTURED BLOCK/BRICK 8.00	Red brick is weathered, but generally intact, hard and appears durable. "Ballast block" is also weathered but strong and intact. No cracking through the wall.	7
MORTAR 8.00	Mortar has weathered to ~ 1/4 - 1/2 " in from face, but is retaining all brickwork. Paint is highly weathered, peeling, or missing over large areas.	7
DOWNSLOPE 0.50	Concrete deck transitioning along wall to gentle soil slope. Well vegetated slope, w/no signs of slumping/erosion.	9
LATERAL SLOPE 0.50	Abuts building foundation on one end, and rubble/soil fill on other; next to Officers Club. No distress.	9
TRAFFIC BARRIER/FENCE 0.50	Concrete guardwall/parapet with wire mesh/steel post at top of wall. No indication of wall-related distress.	9
VEGETATION 1.00	Minor to moderate ivy on wall face. No structural impact.	7
WALL DRAINS 1.00	No visible wall drains. Areas of noted seepage around one small drain pipe, and near top of wall.	7

Repair Recommendations	
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.050_R_1.jpg



GOGA_0502A_0.050_R_2.jpg

Wall ID:	GOGA-0502A-0.080-L		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	Unknown
*Wall Rating:	68	Maintenance Action:	Maintenance

Wall Description			
Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared brick cut wall for retaining soil overlaid by a mortared cinder block wall.		

Wall Measurements			
Wall Length (ft.):	82	Face Area (sq.):	370
Average Wall Height (ft.):	4	Face Angle (deg.):	95
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as designed, with only slight rotation to outside.	7
WALL FOUNDATION MATERIAL 8.00	Minor undercutting at the wall end.	6
MANUFACTURED BLOCK/BRICK 8.00	Minor cracking, weathering of bricks; some vertical fracturing of the wall end. Cinder blocks are intact and in good condition.	7
MORTAR 8.00	Minor cracking and shrinkage, no missing segments.	7
DOWNSLOPE 0.50	Concrete road. No wall related distress.	8
LATERAL SLOPE 0.50	A building on one side and roadway on upper side. No signs of distress or impacts to wall.	8
UPSLOPE 0.50	6:1 soil fill slope with minor vegetation.	8
WALL DRAINS 1.00	Weep holes, functioning as designed.	7

Repair Recommendations	
Failure Consequence:	HIGH
Recommendation Narrative:	Stabilize wall foundation around the wall end ~ 10 feet: Labor - 20 hours @ \$55/hour = \$1,100 Concrete plus equipment costs for 2 cubic yards of wall @ \$1,470/cy = \$2,940
Repair Cost:	\$4,040

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.080_L_1.jpg

Wall ID:	GOGA-0502A-0.130-R		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	Unknown
*Wall Rating:	74	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity fill wall consisting of a mortared brick wall on top of large granite blocks.		

Wall Measurements

Wall Length (ft.):	188	Face Area (sq.):	2256
Average Wall Height (ft.):	12	Face Angle (deg.):	90
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performing wall, no signs of global instability.	8
WALL FOUNDATION MATERIAL 8.00	Concrete sufficient to support wall.	8
MANUFACTURED BLOCK/BRICK 8.00	Moderately to highly weathered bricks and granite blocks; all are intact and appear to be durable.	7
MORTAR 8.00	Minor cracking and weathering, one missing segment.	7
VEGETATION 0.50	There is no vegetation on the wall.	8
DOWNSLOPE 1.00	Concrete roadway, no signs of wall-related distress.	7
LATERAL SLOPE 1.00	Paved concrete roads on both sides of wall. No issues.	7
ROAD/SIDEWALK/SHOULDER 1.00	No signs of distress or settlement.	7
UPSLOPE 1.00	Concrete roadway, no signs of wall-related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.130_R_1.jpg

Wall ID:	GOGA-0502A-0.140-L		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	73	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity mass concrete wall used to retain a sidewalk above the roadway.		

Wall Measurements

Wall Length (ft.):	163	Face Area (sq.):	700
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement problems.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock in the wall begin section and fill on wall end section. Sufficient to support wall.	8
CONCRETE 8.00	Highly weathered and fractured concrete; small segments are missing	6
DOWNSLOPE 0.50	Bedrock followed by concrete roadway. Stable, no signs of distress.	8
LATERAL SLOPE 0.50	Bedrock at wall begin section and paved concrete at wall end section. Stable, no signs of distress.	8
VEGETATION 0.50	No vegetation affecting wall stability.	8
UPSLOPE 1.00	Concrete flat side walk followed by a 3:1 soil slope with vegetation. Stable, no signs of distress.	7
WALL DRAINS 1.00	No drains are visible; no signs of drainage related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.140_L_1.jpg

Wall ID:	GOGA-0502A-0.170-R		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	Maintenance Action:	No Action

Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared brick wall built to retain the road. Built over 2 tunnels and concrete structures.		

Wall Measurements			
Wall Length (ft.):	96	Face Area (sq.):	864
Average Wall Height (ft.):	9	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement.	7
WALL FOUNDATION MATERIAL 8.00	Concrete, undercut in some areas/tunnels and concrete structures. No issues.	7
MANUFACTURED BLOCK/BRICK 8.00	Moderately to highly weathered brick with a few bricks missing.	7
MORTAR 8.00	Minor cracking and weathering.	7
DOWNSLOPE 1.00	Concrete structures and some areas have fill. Stable, no signs of distress	7
LATERAL SLOPE 1.00	Paved lateral slopes and structure; stable, no signs of distress.	7
UPSLOPE 1.00	Concrete road. Stable, no signs of distress	7
VEGETATION 1.00	No vegetation affecting wall stability.	7
WALL DRAINS 1.00	None visible; no drainage related distress.	7

Repair Recommendations	
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.170_R_1.jpg

Wall ID:	GOGA-0502A-0.190-R		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared brick fill wall overlaid by mortared cinder blocks.		

Wall Measurements

Wall Length (ft.):	45	Face Area (sq.):	630
Average Wall Height (ft.):	14	Face Angle (deg.):	90
Maximum Wall Height (ft.):	151	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement.	8
WALL FOUNDATION MATERIAL 8.00	Flat fill, no signs of erosion or failure. Upper part is on concrete.	8
MANUFACTURED BLOCK/BRICK 8.00	Slightly weathered; cinder blocks are fractured.	8
MORTAR 8.00	Good condition; minor cracking.	8
DOWNSLOPE 1.00	Flat fill; concrete slab. No signs of distress.	7
LATERAL SLOPE 1.00	Bedrock at wall end; concrete road at wall beginning. Good condition.	7
UPSLOPE 1.00	Paved road. No signs of distress.	7
VEGETATION 1.00	No vegetation affecting wall stability.	7
WALL DRAINS 1.00	None visible; no drainage related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.190_R_1.jpg

Wall ID:	GOGA-0502A-0.200-L		
Route Name:	ROAD FROM GUARDHOUSE TO TOP OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	74	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	CIP gravity concrete wall.		

Wall Measurements

Wall Length (ft.):	82	Face Area (sq.):	568
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance. No signs of distress.	9
WALL FOUNDATION MATERIAL 8.00	No signs of settlement or missing elements. Very stable.	9
CONCRETE 8.00	Strong, hard, intact concrete with no significant cracking.	8
DOWNSLOPE 0.50	Concrete roadway. No signs of distress.	9
LATERAL SLOPE 0.50	Terminates at a building and driveway. No signs of distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No signs of wall-related distress.	9
TRAFFIC BARRIER/FENCE 0.50	Steel railing is corroded, but shows no wall-related distress.	9
WALL DRAINS 0.50	No wall drains. No signs of seepage or water problems.	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repoint end of granite stone masonry wall: Labor - 16 hours @ \$55.00/hour = \$880.00 Mortar = \$200.00
Repair Cost:	\$1,080

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502A: ROAD FROM GUARDHOUSE TO TOP OF ISLAND

Retaining Wall Condition Photos



GOGA_0502A_0.200_L_1.jpg



GOGA_0502A_0.200_L_2.jpg

Wall ID:	GOGA-0502B-0.080-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Tiered stone masonry and brick wall. Wall used for slope stabilization. Wall has failed through most of the upper tiers.		

Wall Measurements			
Wall Length (ft.):	158	Face Area (sq.):	1800
Average Wall Height (ft.):	11	Face Angle (deg.):	45
Maximum Wall Height (ft.):	21	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall has largely failed in upper tiers. Some tiers are missing. Bearing and overturning failures throughout wall.	2
WALL FOUNDATION MATERIAL 8.00	No signs of distress.	8
MORTAR 8.00	Cracked, broken, highly weathered, some mortar is missing.	2
STONE MASONRY 8.00	Hard, durable stone. Some stones are missing. Wall has failed through most of the upper tiers.	2
MANUFACTURED BLOCK/BRICK 8.00	Hard, durable, intact, newer than rock portion of wall.	7
VEGETATION 1.00	Half of uppers section completely obscured by vegetation.	4
DOWNSLOPE 0.50	Flat soil/bird waste slope. No signs of distress.	9
LATERAL SLOPE 1.00	Rock outcrop on one end; failed slope/wall stains on other end.	6
WALL DRAINS 1.00	No wall drains.	6

Repair Recommendations	
Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.080_L_1.jpg



GOGA_0502B_0.080_L_2.jpg

Wall ID:	GOGA-0502B-0.100-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1850
*Wall Rating:	68	Maintenance Action:	No Action

Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone masonry and brick wall overlain by a CIP concrete guardwall and brick parapet. Wall is located in a bird sanctuary area.		

Wall Measurements			
Wall Length (ft.):	464	Face Area (sq.):	3340
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	19	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall has numerous bulges, but may be constructed that way. Poor constructed by mixing structural elements.	6
WALL FOUNDATION MATERIAL 8.00	Bedrock. Cannot determine soundness due to thick layers of bird droppings.	9
MANUFACTURED BLOCK/BRICK 8.00	Weathered, but intact and functioning.	6
MORTAR 8.00	Cracked and missing in ~ 20% of wall; durable and performing elsewhere.	6
STONE MASONRY 8.00	Hard, durable stone; some stone is missing.	6
CONCRETE 8.00	CIP concrete parapet is solid, hard, durable with minor cracking at top of rock wall.	7
DOWNSLOPE 0.50	Rock cliff. No slope failure evident.	8
TRAFFIC BARRIER/FENCE 0.50	Parapet is brick/rock mortared sometime after the wall was built. No signs of wall-related distress.	8
LATERAL SLOPE 1.00	Start termini is along flat ground. End terminates at major slope/wall failure in bird sanctuary grounds.	5

Repair Recommendations	
Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.100_R_1.jpg

Wall ID:	GOGA-0502B-0.120-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1850
*Wall Rating:	43	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Mass Concrete
Secondary Surface Treatment:		Architectural Facing:	
General Description:	A primary mortared brick wall built in 1850 and extended with a CIP concrete wall in 1920. The face angle on this wall is variable due to age, ranges from 90 degrees to 75 degrees.		

Wall Measurements

Wall Length (ft.):	212	Face Area (sq.):	2968
Average Wall Height (ft.):	14	Face Angle (deg.):	90
Maximum Wall Height (ft.):	27	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition; some rotation and failures are apparent. Highly weathered concrete.	6
WALL FOUNDATION MATERIAL 8.00	Flat fill sufficient to support the wall.	7
CONCRETE 8.00	Highly weathered and chemically altered, exposed rebar, fatigue, missing segments, cracks.	5
MANUFACTURED BLOCK/BRICK 8.00	The brick is not visible, but has been painted and appears to be in good condition.	8
MORTAR 8.00	Good condition, no signs of weathering; protected by paint.	8
DOWNSLOPE 0.50	Flat gravel roadway. No signs of distress.	8
LATERAL SLOPE 0.50	Bedrock. No signs of distress.	8
UPSLOPE 0.50	Concrete roadway. No signs of distress.	8
VEGETATION 0.50	No vegetation affecting wall stability.	8

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.120_L_1.jpg



GOGA_0502B_0.120_L_2.jpg

Wall ID:	GOGA-0502B-0.160-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	69	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete CIP cut wall to retain a slope above roadway with two segments of drystack stone walls at each end.		

Wall Measurements

Wall Length (ft.):	215	Face Area (sq.):	752
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement.	7
WALL FOUNDATION MATERIAL 8.00	Partially flat fill and other side is concrete; sufficient to support wall.	7
PLACED STONE 8.00	The dry stack wall elements have failed, are missing, but the wall is only 2; high at this segment.	5
CONCRETE 8.00	Generally good condition with minor cracking, weathering.	7
DOWNSLOPE 0.50	Concrete paved roadway. No signs of distress.	8
UPSLOPE 0.50	Steep soil slope with heavy vegetation and several layers of dry stack retaining structures.	8
LATERAL SLOPE 1.00	Bedrock at one end and concrete pavement at at the other end. No signs of distress.	7
VEGETATION 1.00	Some vegetation on the wall, but not affecting stability.	7
WALL DRAINS 1.00	None visible; no drainage related distress.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.160_R_1.jpg



GOGA_0502B_0.160_R_2.jpg

Wall ID:	GOGA-0502B-0.200-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	66	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Concrete block cut wall with cementitious overlay in need of minor repairs.		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	120
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall should be replaced due to potential for total wall failures.	6
WALL FOUNDATION MATERIAL 8.00	One end is undermined causing wall to fail. One wall segment is missing and causing internal erosion. Wall should be repaired.	7
MANUFACTURED BLOCK/BRICK 8.00	Good condition; painted, some mortar is missing.	6
MORTAR 8.00	Fair condition.	6
UPSLOPE 0.50	Well vegetated. No erosion. No distress.	8
WALL DRAINS 1.00	Not functioning.	5
ARCHITECTURAL FACING 1.00	Mortar is flaking off wall face.	6
LATERAL SLOPE 1.00	Erosion on lateral slopes at both wall beginning and wall end.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0502B-0.200-L.

Wall ID:	GOGA-0502B-0.250-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	63	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone cut wall with granite stones and some bricks.		

Wall Measurements

Wall Length (ft.):	212	Face Area (sq.):	1272
Average Wall Height (ft.):	6	Face Angle (deg.):	87
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair performance; signs of movement are evident.	6
WALL FOUNDATION MATERIAL 8.00	Concrete, good condition, no signs of failure, sufficient to support wall.	8
MORTAR 8.00	Generally in good condition, some mortar missing in segments.	7
STONE MASONRY 8.00	Stones are strong granite and sandstone. Some cracking and weathering, some missing segments.	7
UPSLOPE 1.00	Steep 3:1 slope fill with moderate erosion. Wooden planks with rebar were install to slow erosion.	5
DOWNSLOPE 1.00	Concrete roadway, good condition.	7
LATERAL SLOPE 1.00	Bedrock on one side and stairs at the other end; stable condition.	7
VEGETATION 1.00	No vegetation affecting wall stability.	7
WALL DRAINS 1.00	None visible; no drainage related distress.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Rebuild and grout wall end. Rebuild 24 sq. ft. of wall @ \$100/sf = \$2500. Footing/leveling pad (unreinforced concrete at 4000 psi) for an area 5' x 2' x .5' = \$100.
Repair Cost:	\$2,600

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.250_L_1.jpg

Wall ID:	GOGA-0502B-0.250-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1920
*Wall Rating:	69	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone masonry and brick fill wall in good condition.		

Wall Measurements

Wall Length (ft.):	58	Face Area (sq.):	350
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of global distress.	9
WALL FOUNDATION MATERIAL 8.00	Highly weathered bedrock. Erosion in the rock is evident, but does not encroach on wall base.	9
MANUFACTURED BLOCK/BRICK 8.00	Weathered brick comprises <10% of wall. Intact, strong, hard.	7
MORTAR 8.00	Thin mortar between cut granite blocks. Generally weathered but intact.	7
STONE MASONRY 8.00	Hard, minor weathering, well-cut granite.	9
WALL DRAINS 0.50	None visible. No seepage visible.	8
ROAD/SIDEWALK/SHOULDER 0.50	Roadway shows no signs of settlement or wall-related deformation.	9
TRAFFIC BARRIER/FENCE 0.50	Steep pipe rail shows no sign of wall-related distress.	9
DOWNSLOPE 1.00	Steep, eroded, sandstone cliff/slope.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace missing blocks and re-grout: Labor - 20 hours @ \$55/hour = \$1,100. Grout = \$100. Blocks for wall are available on site and should incur no additional costs.
Repair Cost:	\$1,200

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.250_R_1.jpg



GOGA_0502B_0.250_R_2.jpg

Wall ID:	GOGA-0502B-0.260-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1920
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone masonry wall. Wall shortens substantially uphill, and a section is missing, but the roadway appears stable.		

Wall Measurements

Wall Length (ft.):	175	Face Area (sq.):	605
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No sign of global instability for intact wall. Section of wall has failed, but not encroaching on roadway.	5
WALL FOUNDATION MATERIAL 8.00	Weathered bedrock. Although eroded, does not encroach on wall foundation.	7
MANUFACTURED BLOCK/BRICK 8.00	Weathered brick, but intact, none missing, no signs of cracking.	7
MORTAR 8.00	Thin mortar between brick work/granite blocks appears to be intact, though weathered.	7
STONE MASONRY 8.00	Hard, durable, minor weathering, well-cut granite blocks.	9
TRAFFIC BARRIER/FENCE 0.50	Steel railing shows no signs of wall-related distress.	8
WALL DRAINS 0.50	None visible. No signs of significant seepage.	8
DOWNSLOPE 1.00	Highly weathered rock escarpment, with substantial erosion.	6
LATERAL SLOPE 1.00	One end terminates at stairs, other end terminates at bedrock. Eroded at both ends.	6

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.260_R_1.jpg



GOGA_0502B_0.260_R_2.jpg

Wall ID:	GOGA-0502B-0.340-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1870
*Wall Rating:	70	Maintenance Action:	No Action

Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared cut sandstone fill wall with several segments of mortared brick, built to retain the fill underneath the roadway. Some maintenance is recommended.		

Wall Measurements			
Wall Length (ft.):	319	Face Area (sq.):	2233
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements		
Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement.	8
WALL FOUNDATION MATERIAL 8.00	Minor undercutting of the foundation; in general however the foundation is soil, flat and sufficient to support the wall.	6
MANUFACTURED BLOCK/BRICK 8.00	Brick slightly weathered, missing elements.	6
MORTAR 8.00	Cracking, missing, weathered especially in the brick segments.	6
STONE MASONRY 8.00	Sandstone slight weathered.	6
ROAD/SIDEWALK/SHOULDER 0.50	No signs of stress or cracking on road caused by wall movement.	8
UPSLOPE 0.50	Paved concrete roadway.	8
DOWNSLOPE 1.00	Flat flower garden fill soil, table condition.	7
LATERAL SLOPE 1.00	Paved at each end of wall with building at wall beginning.	7

Repair Recommendations	
Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.340_R_1.jpg



GOGA_0502B_0.340_R_2.jpg

Wall ID:	GOGA-0502B-0.360-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1850
*Wall Rating:	65	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Mortared Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared brick wall transitioning downhill to a mortared sandstone masonry wall that transitions to a mortared granite block masonry wall. Minor repairs are recommended.		

Wall Measurements

Wall Length (ft.):	109	Face Area (sq.):	1600
Average Wall Height (ft.):	14	Face Angle (deg.):	85
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor bulge in sandstone block section (as constructed?). Overall, very stable with no signs of distress.	7
WALL FOUNDATION MATERIAL 8.00	Not visible. No signs of settlement in wall face.	9
MORTAR 8.00	Mortar is strong and durable in brick and sandstone block section. Missing at top/end of granite section.	4
MANUFACTURED BLOCK/BRICK 8.00	Weathered brick is intact, no significant cracking.	8
STONE MASONRY 8.00	Sandstone is highly weathered (mortar stronger than the rock). Granite is hard, minimally weathered, no cracking/spalling.	9
LATERAL SLOPE 0.50	Building "moat" on one end, bedrock outcrop at other end.	8
ROAD/SIDEWALK/SHOULDER 0.50	Concrete roadway is in good condition, no sign of wall-related distress.	8
VEGETATION 0.50	Shrubs all along top of wall, but do not appear to impact the wall.	8
WALL DRAINS 1.00	Wall drains are only in granite block section. Seepage from rock section is evident, but not impacting the wall.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stabilize foundation at beginning wall segment and replace missing mortar: Labor - 20 hours @ \$55.00 per hour = \$1,100 Grout = \$100
Repair Cost:	\$1,200

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.360_L_1.jpg



GOGA_0502B_0.360_L_2.jpg

Wall ID:	GOGA-0502B-0.390-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1970
*Wall Rating:	70	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared concrete cut wall with concrete blocks of varying sizes. It appears that the wall may be missing a segment of 53 ft at the wall beginning and 36 f at the middle of the wall. Wall does not need replacing because it is still performing as intended.		

Wall Measurements

Wall Length (ft.):	195	Face Area (sq.):	1950
Average Wall Height (ft.):	10	Face Angle (deg.):	80
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, with the exception of missing segments. Wall is stable, no settlement. Performing as intended.	7
WALL FOUNDATION MATERIAL 8.00	Concrete, no signs of failure, sufficient to support wall.	8
MANUFACTURED BLOCK/BRICK 8.00	Varying shapes and sizes; some show major weathering, others are intact.	6
MORTAR 8.00	Weathered, missing segments, cracking.	6
PLACED STONE 8.00	Granite blocks are strong with no weathering.	8
DOWNSLOPE 0.50	Concrete roadway; no signs of distress.	8
LATERAL SLOPE 0.50	Stairways on both sides.	8
UPSLOPE 1.00	Steep soil/bedrock, stable with vegetation.	7
VEGETATION 1.00	No vegetation affecting wall stability.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace missing wall segments: replacing wall segments of approximately 750 square feet of wall @ \$100 per sq.ft. = \$75,000
Repair Cost:	\$75,000

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.390_R_1.jpg



GOGA_0502B_0.390_R_2.jpg

Wall ID:	GOGA-0502B-0.400-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1920
*Wall Rating:	72	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Mass Concrete
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Mortared stone masonry wall with cementitious overlay, transitioning to a CIP gravity concrete wall, in good condition.		

Wall Measurements

Wall Length (ft.):	283	Face Area (sq.):	3400
Average Wall Height (ft.):	12	Face Angle (deg.):	88
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall structure is cracked and shows some displacement along vertical cracks. No global instability.	7
WALL FOUNDATION MATERIAL 8.00	No signs of settlement or eroded materials. Good bearing soil. Bedrock toward end of wall.	8
CONCRETE 8.00	Weathered, spalling in thin plates, with longitudinal cracks in upper one third of wall. Wall has offset crack mid-length.	6
STONE MASONRY 8.00	Weathered sandstone blocks of variable size. Painted, so cannot determine if they are cracked or mortar condition.	7
MORTAR 8.00	Mortar is strong and intact (stronger than sandstone rock). Appears intact and durable.	8
DOWNSLOPE 0.50	Flat soil slope showing no slumping or erosion.	8
LATERAL SLOPE 0.50	Roadway at one end, exposed bedrock at other end.	8
TRAFFIC BARRIER/FENCE 0.50	Reinforced decorative concrete fence and pipe railing show no signs of wall-related distress.	8
VEGETATION 0.50	Minor ivy vegetation. No impacts.	8

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0502B-0.400-L.

Wall ID:	GOGA-0502B-0.430-L		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1930
*Wall Rating:	71	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	A gravity dry stack cut granite stone wall that transitions to a mass concrete CIP wall. It appears there is a section of the wall that is missing at the wall beginning. Repairs are recommended.		

Wall Measurements

Wall Length (ft.):	250	Face Area (sq.):	3000
Average Wall Height (ft.):	12	Face Angle (deg.):	75
Maximum Wall Height (ft.):	25	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; no signs of global instability or settlement.	8
WALL FOUNDATION MATERIAL 8.00	Concrete roadway is the foundation; very stable.	8
STONE MASONRY 8.00	Granite, strong competent with some sandstone elements. Some elements missing in different locations.	5
CONCRETE 8.00	Slightly weathered with some cracking.	7
DOWNSLOPE 0.50	Concrete roadway, no signs of distress.	8
LATERAL SLOPE 0.50	Concrete at wall start and bedrock at wall end. Stable, no erosion.	8
UPSLOPE 0.50	Very steep; 1:1 fill slope with bushes and trees. Not impacting wall stability.	8
VEGETATION 0.50	Some vegetation on dry stack wall, but no affecting wall stability.	8
WALL DRAINS 0.50	Weep holes exist at bottom of concrete wall; functioning as designed.	8

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace missing dry stack granite and stone segment at wall start: Approximately 100 sq. feet of dry stack wall replacement @ \$100/sf. = \$10,000
Repair Cost:	\$10,000

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.430_L_1.jpg



GOGA_0502B_0.430_L_2.jpg

Wall ID:	GOGA-0502B-0.440-R		
Route Name:	ROAD FROM WHARF TO NW END OF ISLAND		
Inspection Date:	November 08, 2007	Approximate Year Built:	1920
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Concrete Block/Brick
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone masonry and concrete block fill wall in good condition.		

Wall Measurements

Wall Length (ft.):	151	Face Area (sq.):	2416
Average Wall Height (ft.):	16	Face Angle (deg.):	80
Maximum Wall Height (ft.):	32	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, although wall bulges along entire length (undulates outward); this may be as constructed. No global instability.	8
WALL FOUNDATION MATERIAL 8.00	No signs of settlement distress. Presumed bedrock.	9
MANUFACTURED BLOCK/BRICK 8.00	Concrete block is hard, durable, and shows only minor vertical crack at one location near top of wall.	8
MORTAR 8.00	Hard, durable and intact. Minor weathering.	8
STONE MASONRY 8.00	Strong, hard, slightly weathered granite stones, well-cut and placed.	9
ROAD/SIDEWALK/SHOULDER 0.50	Roadway above wall shows no wall-related distress.	8
DOWNSLOPE 0.50	Paved roadway showing no wall-related distress.	9
LATERAL SLOPE 0.50	Terminates at building and roadway. No lateral slope.	9
WALL DRAINS 0.50	Regularly placed, open, functioning drains.	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0502B: ROAD FROM WHARF TO NW END OF ISLAND

Retaining Wall Condition Photos



GOGA_0502B_0.440_R_1.jpg



GOGA_0502B_0.440_R_2.jpg

Wall ID:	GOGA-0503-0.040-L		
Route Name:	ALCATRAZ ISLAND MILITARY MORGUE ROAD		
Inspection Date:	November 08, 2007	Approximate Year Built:	1970
*Wall Rating:	59	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	A fill wall formed of a mortared brick segment and a mortared concrete/granite block segment. Some maintenance is recommended.		

Wall Measurements

Wall Length (ft.):	118	Face Area (sq.):	472
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, generally stable, missing segment, but no signs of rotation or settlement.	6
WALL FOUNDATION MATERIAL 8.00	Bedrock undermined in certain areas, but generally stable.	6
MANUFACTURED BLOCK/BRICK 8.00	Variable size of concrete blocks in good condition. Bricks are slightly weathered; some elements missing.	5
MORTAR 8.00	Weathered, missing segment, cracking.	6
CULVERT 1.00	A 6" culvert performing as intended.	7
DOWNSLOPE 1.00	Fill and another retaining wall. Heavily vegetated.	7
LATERAL SLOPE 1.00	[This is missing from the original data form; see Khamis]	7
UPSLOPE 1.00	Paved roadway, no signs of wall-related distress.	7
VEGETATION 1.00	No vegetation affecting wall stability.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stabilize rock foundation: Concrete for foundation repair, including equipment costs for ~ 3 cubic yards @ \$1,470/cy = \$4,410 Labor - 80 hours @ \$55.00/hour = \$4,400
Repair Cost:	\$8,810

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area
ROUTE 0503: ALCATRAZ ISLAND MILITARY MORGUE ROAD

Retaining Wall Condition Photos



GOGA_0503_0.040_L_1.jpg

Wall ID:	GOGA-0700-0.000-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Historic concrete gravity wall to the right of Ft. Mason Tunnel east portal and below old water tanks. No roadway associated with this wall. Offsets measured to Van Ness Street.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	815
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is cracked at several locations suggesting water pressure behind the wall.	6
PERFORMANCE 8.00	Approximately 70' of wall is rotating due to unrestrained lateral/earth loads. Additional timber piles were added as a fix and appear to be partially working.	6
WALL FOUNDATION MATERIAL 8.00	No signs of settlement, missing foundation soils, or heave associated with the wall. Ground is damp below the wall with soft soils.	7
WALL FOUNDATION MATERIAL 8.00	Soft soils that may not offer enough passive resistance to piles to resist lateral loads.	7
WALL FOUNDATION MATERIAL 8.00	No signs of settlement. Soft soils-grass parkway. No signs of wall related distress.	8
CONCRETE 8.00	Weathered, cracked veneer. Large cracks with minor impacts at several locations.	6
PILES AND SHAFTS 8.00	1' x 1' timber piles on 5' centers. Weathered but intact. No wood splits above ground. Several are rotating out at top.	6
LAGGING 8.00	10" x 3" timber lagging. Weathered, but intact.	7
LAGGING 8.00	10' x 3" timber lagging. Weathered but intact.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Patch cracking and install wall toe drains: Labor - 80 hours @ \$55.00/hour = \$4,400. Mortar patch, \$500 in materials, lump sum = \$500. Drill in wall drains - 6' x 15' = 90' @ \$40/sf = \$3,600. Total = \$8,500
Repair Cost:	\$8,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0700-0.000-L.

Wall ID:	GOGA-0700-0.000-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Historic concrete gravity wall to the right of Ft. Mason Tunnel east portal and below old water tanks. No roadway associated with this wall. Offsets measured to Van Ness Street.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	815
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is cracked at several locations suggesting water pressure behind the wall.	6
PERFORMANCE 8.00	Approximately 70' of wall is rotating due to unrestrained lateral/earth loads. Additional timber piles were added as a fix and appear to be partially working.	6
WALL FOUNDATION MATERIAL 8.00	No signs of settlement, missing foundation soils, or heave associated with the wall. Ground is damp below the wall with soft soils.	7
WALL FOUNDATION MATERIAL 8.00	Soft soils that may not offer enough passive resistance to piles to resist lateral loads.	7
WALL FOUNDATION MATERIAL 8.00	No signs of settlement. Soft soils-grass parkway. No signs of wall related distress.	8
CONCRETE 8.00	Weathered, cracked veneer. Large cracks with minor impacts at several locations.	6
PILES AND SHAFTS 8.00	1' x 1' timber piles on 5' centers. Weathered but intact. No wood splits above ground. Several are rotating out at top.	6
LAGGING 8.00	10" x 3" timber lagging. Weathered, but intact.	7
LAGGING 8.00	10' x 3" timber lagging. Weathered but intact.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Patch cracking and install wall toe drains: Labor - 80 hours @ \$55.00/hour = \$4,400. Mortar patch, \$500 in materials, lump sum = \$500. Drill in wall drains - 6' x 15' = 90' @ \$40/sf = \$3,600. Total = \$8,500
Repair Cost:	\$8,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0700-0.000-L.

Wall ID:	GOGA-0700-0.000-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Cementitious Overlay
General Description:	Historic concrete gravity wall to the right of Ft. Mason Tunnel east portal and below old water tanks. No roadway associated with this wall. Offsets measured to Van Ness Street.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	815
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is cracked at several locations suggesting water pressure behind the wall.	6
PERFORMANCE 8.00	Approximately 70' of wall is rotating due to unrestrained lateral/earth loads. Additional timber piles were added as a fix and appear to be partially working.	6
WALL FOUNDATION MATERIAL 8.00	No signs of settlement, missing foundation soils, or heave associated with the wall. Ground is damp below the wall with soft soils.	7
WALL FOUNDATION MATERIAL 8.00	Soft soils that may not offer enough passive resistance to piles to resist lateral loads.	7
WALL FOUNDATION MATERIAL 8.00	No signs of settlement. Soft soils-grass parkway. No signs of wall related distress.	8
CONCRETE 8.00	Weathered, cracked veneer. Large cracks with minor impacts at several locations.	6
PILES AND SHAFTS 8.00	1' x 1' timber piles on 5' centers. Weathered but intact. No wood splits above ground. Several are rotating out at top.	6
LAGGING 8.00	10" x 3" timber lagging. Weathered, but intact.	7
LAGGING 8.00	10' x 3" timber lagging. Weathered but intact.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Patch cracking and install wall toe drains: Labor - 80 hours @ \$55.00/hour = \$4,400. Mortar patch, \$500 in materials, lump sum = \$500. Drill in wall drains - 6' x 15' = 90' @ \$40/sf = \$3,600. Total = \$8,500
Repair Cost:	\$8,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GOGA-0700-0.000-L.

Wall ID:	GOGA-0905-0.000-P1		
Route Name:	MERRIE WAY PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1937
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Historic rock wall along Point Lobos, just west of Merrie Way Parking. Dry laid stone wall over mortared stone masonry wall.		

Wall Measurements

Wall Length (ft.):	128	Face Area (sq.):	2066
Average Wall Height (ft.):	16	Face Angle (deg.):	50
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No signs of global distress. Well-built dry laid section on 1:1 batter. Very stable.	8
WALL FOUNDATION MATERIAL 8.00	No signs of settlement or foundation distress.	8
MORTAR 8.00	Minor cracking, intact strong and durable w/minor weathering. West section of wall mortared when lower wall constructed.	8
STONE MASONRY 8.00	Angular, well-place, chinked, hard, durable stone. Some rock is cracked/broken due to weathering/placement.	8
DOWNSLOPE 0.50	Flat-to-gentle, sparsely vegetated stable slope w/no significant erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	No signs of wall-related distress.	8
VEGETATION 0.50	Minor bushes sparsely growing through dry-laid wall face. No impact to the wall.	8
WALL DRAINS 0.50	Regular functioning drains through lower mortared wall section. No signs of water-related distress.	8
LATERAL SLOPE 1.00	One end is the gravity concrete wall. East end is eroding solid slope, with stone added at wall corner for stabilization;	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0905: MERRIE WAY PARKING LOT

Retaining Wall Condition Photos



GOGA_0905_0.000_P1_1.jpg



GOGA_0905_0.000_P1_2.jpg

Wall ID:	GOGA-0905-0.000-P2		
Route Name:	MERRIE WAY PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1937
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall is actually between Merrie Way Parking and Louis Restaurant. CIP concrete gravity wall in good condition.		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	645
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of global distress. Minor cracking only.	8
WALL FOUNDATION MATERIAL 8.00	Soils at foundation show no settlement or erosion. Good bearing. Asphalt in front of wall.	8
CONCRETE 8.00	Cracked at several location, but remains intact and hard. Appears to have secondary concrete wall behind it.	7
SHOTCRETE 8.00	Minor cracking, but intact, strong durable w/minor weathering. Uppers section may have been mortared at later date	8
STONE MASONRY 8.00	Angular, well-placed, strong, durable stone. Battered at 1:1.	8
ROAD/SIDEWALK/SHOULDER 0.50	No signs of wall-related distress.	8
DOWNSLOPE 0.50	Flat to gentle, modestly vegetated soil slope. Very stable. No distress.	9
LATERAL SLOPE 1.00	Minor erosion in soil slope at east end of wall. Some protective rock placed at west end.	7
VEGETATION 1.00	Small tree growing at top of GC wall, but no impact.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0905: MERRIE WAY PARKING LOT

Retaining Wall Condition Photos



GOGA_0905_0.000_P2_1.jpg



GOGA_0905_0.000_P2_2.jpg

Wall ID:	GOGA-0907-0.000-P1		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1965
*Wall Rating:	78	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity concrete wall supporting upper China Beach parking lot.		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	810
Average Wall Height (ft.):	9	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, no signs of global distress.	8
WALL FOUNDATION MATERIAL 8.00	No signs of settlement or foundation distress. Paved below wall.	8
CONCRETE 8.00	Generally strong and intact. Weathered and broken along short section at top of wall due to fencing posts.	7
DOWNSLOPE 0.50	Paved roadway showing no signs of distress.	9
LATERAL SLOPE 0.50	Corroding bin wall at one end. Termination is parking lot. No distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No signs of wall-related distress. Newly paved.	9
TRAFFIC BARRIER/FENCE 0.50	Chain link fence at top of wall shows no sign of wall-related distress.	9
WALL DRAINS 0.50	Numerous functioning drains at wall toe. Minor seepage at cracked wall section.	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repair concrete at top of wall. Mortar patch 10 foot section of wall. Mortar - \$50. Labor - 6 hours @ \$55/hour = \$330.
Repair Cost:	\$380

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P1_1.jpg



GOGA_0907_0.000_P1_2.jpg

Wall ID:	GOGA-0907-0.000-P2		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1965
*Wall Rating:	54	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Bin - Metal
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Highly corroded metal bin fill wall.		

Wall Measurements

Wall Length (ft.):	180	Face Area (sq.):	1980
Average Wall Height (ft.):	11	Face Angle (deg.):	80
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Severely corroded facing. No signs of global distress.	5
WALL FOUNDATION MATERIAL 8.00	Soil foundation shows no signs of settlement or erosion.	8
BIN OR CRIB 8.00	Severely corroded bin facing. Broken/missing elements. Retained fill migration through face.	3
DOWNSLOPE 0.50	Paved roadway and soil slope. No signs of distress.	8
LATERAL SLOPE 0.50	Heavily vegetated on one end. Abuts with concrete wall at other end. No signs of distress.	8
VEGETATION 1.00	Large bushes growing from wall face and impacting facing.	4
WALL DRAINS 1.00	No wall drains. Seepage is evident through the corroded wall face.	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Retrofit metal bin wall with soil nail wall. Investigate embedded bin metal wall and slope condition: Lump sum = \$30,000. Soil Nail wall - 1,980 sq.ft. @ \$110/s.f. = \$217,800. Misc. Labor - 300 hours @ \$55/hour = \$16,500. Heavy equipment - 80 hours @ \$200/hr
Repair Cost:	\$280,300

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P2_1.jpg



GOGA_0907_0.000_P2_2.jpg

Wall ID:	GOGA-0907-0.000-P3		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1965
*Wall Rating:	62	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Bin - Metal
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Metal bin wall along beach access road. Highly corroded.		

Wall Measurements

Wall Length (ft.):	200	Face Area (sq.):	1900
Average Wall Height (ft.):	10	Face Angle (deg.):	80
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No signs of global distress, rotation, bulging or sliding. Face is highly corroded.	6
WALL FOUNDATION MATERIAL 8.00	Paved roadway. No signs of settlement or eroded foundation materials.	8
BIN OR CRIB 8.00	Highly corroded wall face. Some bin ribs deformed and/or rusted through <5%. Facing is stil functioning. Severe corrosion in some isolated locations.	4
LATERAL SLOPE 0.50	Well vegetated, stable slopes.	8
UPSLOPE 0.50	Heavily vegetated, moderately steep. No signs of slumping or erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Paved roadway. No signs of wall-related distress. Excellent condition.	9
VEGETATION 1.00	Heavy vegetation possibly reinforcing one end of wall. Generally, no visible impact due to vegetation.	7
WALL DRAINS 1.00	No wall drains. Seepage is evident through the corroded wall face.	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Retrofit metal bin wall with soil nail wall. Investigate embedded bin metal quality and slope condition: Lump sum = \$30,000. Soil Nail wall: 1,900 sq.ft. @ \$110/s.f. = \$209,000. Misc. Labor: 300 hours @ \$55/hour = \$16,500. Heavy equipment: 80 hours @ \$200/hr
Repair Cost:	\$271,500

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P3_1.jpg



GOGA_0907_0.000_P3_2.jpg

Wall ID:	GOGA-0907-0.000-P4		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1965
*Wall Rating:	74	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Bin - Metal
Surface Treatment:		Secondary Wall Type:	Gravity - Mass Concrete
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Highly corroded short bin wall on gentle slope. Wall could be removed with slope grading. Short gravity concrete wall underlying half of wall.		

Wall Measurements

Wall Length (ft.):	78	Face Area (sq.):	312
Average Wall Height (ft.):	4	Face Angle (deg.):	80
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good but facing is highly corroded. No signs of global distress.	7
WALL FOUNDATION MATERIAL 8.00	Soil foundation appears to provide good bearing. No distress.	9
BIN OR CRIB 8.00	Highly corroded metal facing. Broken in one location, but still retaining slope soil.	6
UPSLOPE 0.50	Very gentle upslope. Indications of settlement over the back of the bin. No signs of slope instability.	8
LATERAL SLOPE 0.50	Very gentle, modestly vegetated slopes showing no distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	Roadway was recently paved but shows no wall-related distress.	9
WALL DRAINS 1.00	No wall drains. Seepage is evident through the corroded wall face.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P4_1.jpg



GOGA_0907_0.000_P4_2.jpg

Wall ID:	GOGA-0907-0.000-P5		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	2004
*Wall Rating:	93	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recently constructed concrete gravity wall.		

Wall Measurements

Wall Length (ft.):	244	Face Area (sq.):	1464
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	New wall. Excellent condition. No distress.	9
WALL FOUNDATION MATERIAL 8.00	Asphalt roadway at wall toe indicates no settlement or eroded foundation materials.	9
CONCRETE 8.00	Hard, durable, fresh. No cracking or spalling.	10
LATERAL SLOPE 0.50	Stable lateral slopes showing no distress.	9
UPSLOPE 0.50	Gentle slope showing minor slumping. No significant erosion. Moderately vegetated.	9
ROAD/SIDEWALK/SHOULDER 0.50	Roadway recently paved. No signs of wall-related distress.	10
WALL DRAINS 0.50	Many toe drain pipes. All functioning very well. No seepage evident.	10

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P5_1.jpg



GOGA_0907_0.000_P5_2.jpg

Wall ID:	GOGA-0907-0.000-P6		
Route Name:	CHINA BEACH PARKING LOT		
Inspection Date:	November 07, 2007	Approximate Year Built:	1965
*Wall Rating:	55	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Bin - Metal
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Metal bin wall below beach access road. Highly corroded.		

Wall Measurements

Wall Length (ft.):	240	Face Area (sq.):	1830
Average Wall Height (ft.):	7	Face Angle (deg.):	80
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-15

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall facing is highly corroded and barely functioning to retain crib fill. No signs of global distress, rotation, bulging or sliding.	5
WALL FOUNDATION MATERIAL 8.00	No signs of settlement or foundation distress.	8
BIN OR CRIB 8.00	Metal crib facing is severely corroded, gill is migrating slowly through the face. Facing ribs are sagging in some sections. Unknown condition of embedded bin material.	3
DOWNSLOPE 0.50	Park greenbelt/beach building sidewalk. Flat. No signs of wall-related distress.	8
LATERAL SLOPE 1.00	Far end terminates at steep, coastal escarpment. End of wall is damaged due to erosion, possible slope movement.	4
UPSLOPE 0.50	Heavily vegetated. Appears stable with no signs of slumps or slides.	8
WALL DRAINS 1.00	No wall drains. Seepage is evident through the corroded wall face.	6
VEGETATION 1.00	Heavily vegetated along top of wall. Roots do not appear to be impacting wall.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Retrofit metal bin wall with soil nail wall. Investigate steel condition and slope condition in embedded section: Lump sum = \$40,000. Soil Nail wall - 1,830 sq.ft. @ \$110/s.f. = \$201,300. Misc. Labor - 300 hours @ \$55/hour = \$16,500. Heavy equipment - 40 hours
Repair Cost:	\$265,800

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0907: CHINA BEACH PARKING LOT

Retaining Wall Condition Photos



GOGA_0907_0.000_P6_1.jpg



GOGA_0907_0.000_P6_2.jpg

Wall ID:	GOGA-0917-0.000-P1		
Route Name:	LOWER FORT MASON PARKING LOT		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	93	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Concrete cast in place gravity cut wall in the parking lot of Fort Mason Center/ on the side toward upper Ft. Mason.		

Wall Measurements

Wall Length (ft.):	137	Face Area (sq.):	2880
Average Wall Height (ft.):	21	Face Angle (deg.):	85
Maximum Wall Height (ft.):	24	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Excellent. Minor cracking. Minor deterioration at construction. No global distress.	9
WALL FOUNDATION MATERIAL 8.00	Asphalt parking to wall toe. No signs of settlement, heave, or water problems.	10
CONCRETE 8.00	Difficult to see due to fresh paint. Minor cracking. Patched. Sound, appears to be hard, durable concrete.	9
LATERAL SLOPE 0.50	Fort Mason tunnel portal to the right, grassy slope to the left. No signs of slumping or erosion.	9
TRAFFIC BARRIER/FENCE 0.50	Chain link fence at top of wall shows no signs of wall related distress.	9
UPSLOPE 0.50	Flat upslope with no signs of distress.	9
WALL DRAINS 0.50	No wall drains. No signs of seepage, staining.	9
ROAD/SIDEWALK/SHOULDER 0.50	No signs of distress in roadway at toe of wall.	10

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0917: LOWER FORT MASON PARKING LOT

Retaining Wall Condition Photos



GOGA_0917_0.000_P1_1.jpg

Wall ID:	GOGA-0917-0.000-P2		
Route Name:	LOWER FORT MASON PARKING LOT		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete CIP cut wall in Fort Mason Center parking area adjacent to upper Ft. Mason.		

Wall Measurements

Wall Length (ft.):	370	Face Area (sq.):	2530
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Very good, minor cracking but no signs of global distress.	9
WALL FOUNDATION MATERIAL 8.00	Parking lot. No signs of settlement or foundation distress.	9
CONCRETE 8.00	Painted CIP wall. No significant signs of distress, but fine cracking evident in some areas.	8
LATERAL SLOPE 0.50	Gentle grassy slopes with no signs of slumping, erosion, or water issues.	9
ROAD/SIDEWALK/SHOULDER 0.50	Roadway/parking below wall shows no distress.	9
UPSLOPE 0.50	Grassy, gentle slope showing minor erosion. Large trees have no impact on wall.	9
WALL DRAINS 0.50	No wall drains. No signs of water-related distress.	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0917: LOWER FORT MASON PARKING LOT

Retaining Wall Condition Photos



GOGA_0917_0.000_P2_1.jpg

Wall ID:	GOGA-0917-0.000-P3		
Route Name:	LOWER FORT MASON PARKING LOT		
Inspection Date:	November 06, 2007	Approximate Year Built:	1940
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:	Painted	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete CIP cutwall in Fort Mason Center parking area adjacent to upper Ft. Mason.		

Wall Measurements

Wall Length (ft.):	630	Face Area (sq.):	15750
Average Wall Height (ft.):	25	Face Angle (deg.):	80
Maximum Wall Height (ft.):	28	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Cracked in a few locations and some seepage, but no global or structural distress.	8
WALL FOUNDATION MATERIAL 8.00	Asphalt parking area showing no signs of settlement or heave.	9
CONCRETE 8.00	Painted CIP concrete gravity. Long vertical cracks at joints. Some patched. Generally appears strong, durable and intact. No spalling except around drains, utility lines or large cracks.	8
LATERAL SLOPE 0.50	Gentle slope with no erosion on one end, rock outcrop on other . Very stable lateral slopes.	9
UPSLOPE 0.50	Gentle grassy slopes with large trees. Very stable.	9
WALL DRAINS 1.00	Very few drains. All are open and draining. Some seepage from a couple of wall cracks. No water related distress.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Golden Gate National Recreation Area

ROUTE 0917: LOWER FORT MASON PARKING LOT

Retaining Wall Condition Photos



GOGA_0917_0.000_P3_1.jpg



GOGA_0917_0.000_P3_2.jpg

Appendix A

Summary of WIP Definitions



Golden Gate National Recreation Area



Federal Lands Highway
Road Inventory Program

Appendix A

Summary of WIP Definitions and Assessment Categories

Wall Naming Convention

Unique “Wall Identification” names were assigned to the retaining walls that were inventoried. The Wall Identification includes the Park Name, the RIP Route Number (e.g., **0013**), the beginning milepoint of a wall (e.g., **0.622**) and the side of the road the wall is located on (e.g., **L.**) relative to the primary direction of travel (direction of increasing mileposts). Thus, a typical wall identified would have the following format: **YOSE-0013-0.622-L.**

For roadways not in RIP, park-supplied route numbers were used or the convention RRR#. Similarly, for parking areas not in RIP, the park-supplied parking area number or the convention PPP# was used. Also for parking areas, walls are numbered in ascending order as they are encountered when traveling counterclockwise around the parking area (most common direction of traffic flow). Parking area walls are designated P1, P2, P3, etc. as new walls are encountered.

- NPS Retaining Wall Inventory Program Field Guide (WIFG)-

Retaining Wall Acceptance Criteria

- *All classes of paved roadways and parking areas included in the RIP Route Investigation Report and/or identified by park staff.
- *Walls must reside within the constructed roadway/parking area prism.
- *Maximum wall height, including only that portion actively retaining soil and/or rock, must be ≥ 4 ft. (>6ft for culvert headwalls).
- *Consider known/verifiable wall embedment in determining maximum retaining wall height. Include fully buried retaining structures.
- *Walls have an internal wall face angle $\geq 45^\circ$ ($\geq 1H:1V$ face slope ratio).
- *Include all walls where the intent is to support/protect the travelway, and where failure would require replacement with a retaining wall.

Definitions

Design Criteria	Measure of how well current design criteria are satisfied: None - Does not meet any known standards. Non-AASHTO - Does not meet AASHTO, but is consistent with other structures of its type/period with good performance. AASHTO - Apparently meets current AASHTO Geometric, Design, Materials, and Construction Standards.
Consequence of Failure	Low - No loss of roadway, no to low public risk, no impact to traffic during wall repair/replacement Moderate - Hourly to short-term closure of roadway, low-to-moderate public risk, multiple alternate routes available High - Seasonal to long-term loss of roadway, substantial loss-of-life risk, no alternate routes available
Action	Select from: No Action, Monitor, Maintenance, Repair Elements, Replace Elements, and Replace Wall
Weighting Factor	Weighting Factor to be applied to the Condition Rating (CR). When indicated on the Condition Assessment Input Form: WF=0.5 for CR=8-10; WF=1.0 for CR=4-7; and WF=5 for CR=1-3.
Data Reliability	Estimate of how well observed conditions represent wall performance, and if additional investigations may be warranted. 1-Poor Conditions cannot be sufficiently observed to rate element(s), warranting additional investigations to better define element performance and/or to determine the cause(s) or poor performance. 2-Good Observed conditions are sufficient to rate the conditions of wall element(s); however, additional investigations would be useful to better understand element performance. 3-Very Good Observed conditions clearly describe wall performance. Additional investigations are not needed.

Wall Function Codes

[FW] Fill Wall	[BW] Bridge Wall	[SW] Switchback Wall
[CW] Cut Wall	[HW] Head Wall	[SP] Slope Protection [FL] Flood Wall

Wall Type Codes

[AH] Anchor, Tieback H-Pile	[CC] Crib, Concrete	[MG] MSE, Geosynthetic Wrapped Face
[AM] Anchor, Micropile	[CM] Crib, Metal	[MP] MSE, Precast Panel
[AS] Anchor, Tieback Sheet Pile	[CT] Crib, Timber	[MS] MSE, Segmental Block
[BC] Bin, Concrete	[GB] Gravity, Concrete Block/ Brick	[MW] MSE, Welded Wire Face
[BM] Bin, Metal	[GC] Gravity, Mass Concrete	[SN] Soil Nail
[CL] Cantilever, Concrete	[GD] Gravity, Dry Stone	[TP] Tangent/ Secant Pile
[CP] Cantilever, Soldier Pile	[GG] Gravity, Gabion	[OT] Other, User Defined
[CS] Cantilever, Sheet Pile	[GM] Gravity, Mortared Stone	[NO] None

Architectural Facing Type Codes

[BV] Brick Veneer	[PF] Planted Face	[SS] Simulated Stone
[CO] Cementitious Overlay	[SC] Sculpted Shotcrete	[SV] Stone Veneer
[FF] Fractured Fin Concrete	[SH] Shotcrete (nozzle finish)	[TI] Timber
[FL] Formlined Concrete	[SM] Steel/Metal	[OT] Other, User Defined
[PC] Plain Concrete (float finish or light texture)	[SO] Stone	[NO] None

Surface Treatment Codes

[BG] Bush Gun (tool-textured concrete)	[PS] Preservative	[WS] Weathering Steel
[CA] Color Additive	[SE] Silane Sealer	[OT] Other, User Defined
[GL] Galvanized	[ST] Stain	[NO] None
[PA] Painted	[TR] Tar Coated	

Condition Ratings

Condition Ratings apply to all Primary and Secondary Wall Elements, and are intended to assist in consistently defining element **severity**, **extent**, and **repair/replace urgency** of wall element distresses.

9-10 (Excellent)	-Any defects are minor and are within normal range for <i>newly constructed or fabricated</i> elements. -Defects may include those typically caused from fabrication or construction.
7-8 (Good)	-Low-to-moderate extent of low severity distress. -Distress present does not significantly compromise the element function, nor is there significantly severe distress to major structural components of an element.
5-6 (Fair)	-High extent of low severity distress and/or low-to-medium extent of medium to high severity distress. -Distress present does not compromise element function, but lack of treatment may lead to impaired function/elevated risk of element failure in the near term.
3-4 (Poor)	-Medium-to-high extent of medium-to-high severity distress. -Distress present threatens element function, and strength is obviously compromised and/or structural analysis is warranted. -The element condition does not pose an immediate threat to wall stability and road closure is not necessary.
1-2 (Critical)	-Medium-to-high extent of high severity distress. -Element is no longer serving intended function. Element performance threatening overall stability of the wall at the time of inspection.

Wall Performance Condition Ratings

Performance	Evaluation of overall wall performance as indicated by observations not necessarily captured by observed distresses for specific elements, including global wall distresses (rotation, settlement, translation, displacement, etc.) and/or evidence of prior repairs that may further indicate component problems.	Good to Excellent - No observation of distresses not already captured by individual element condition assessment. No combination of element distresses indicating unseen problems or creating significant performance problems. No history of remediation or repair to wall or adjacent elements.
		Fair - Some observed global distress is not associated with specific elements. Some observation of element distress combinations that indicate wall component problems. Minor work on primary elements or major work on secondary elements has occurred improving overall wall function.
		Poor to Critical - Global wall rotation, settlement, and/or overturning is readily apparent. Combined element distresses clearly indicate serious stability problems with components or global wall stability. Major repairs have occurred to wall structural elements, though functionality has not improved significantly.

