

NERI WIP Report

NPS Retaining Wall Inventory Program New River Gorge National River



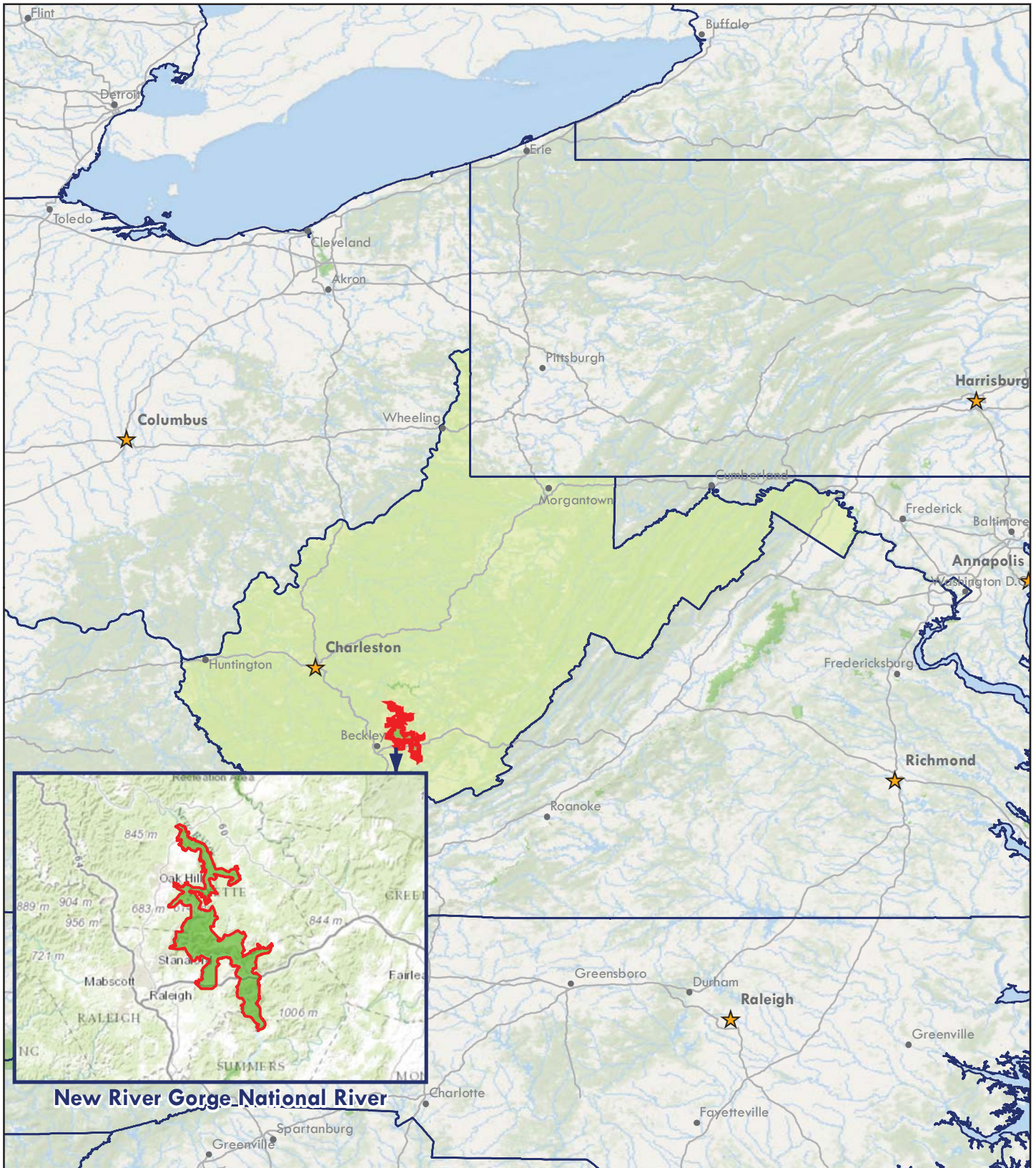
**Federal Lands Highway
Road Inventory Program**

Prepared By:

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

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New River Gorge National River in West Virginia



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
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Introduction



New River Gorge National River



**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



New River Gorge National River

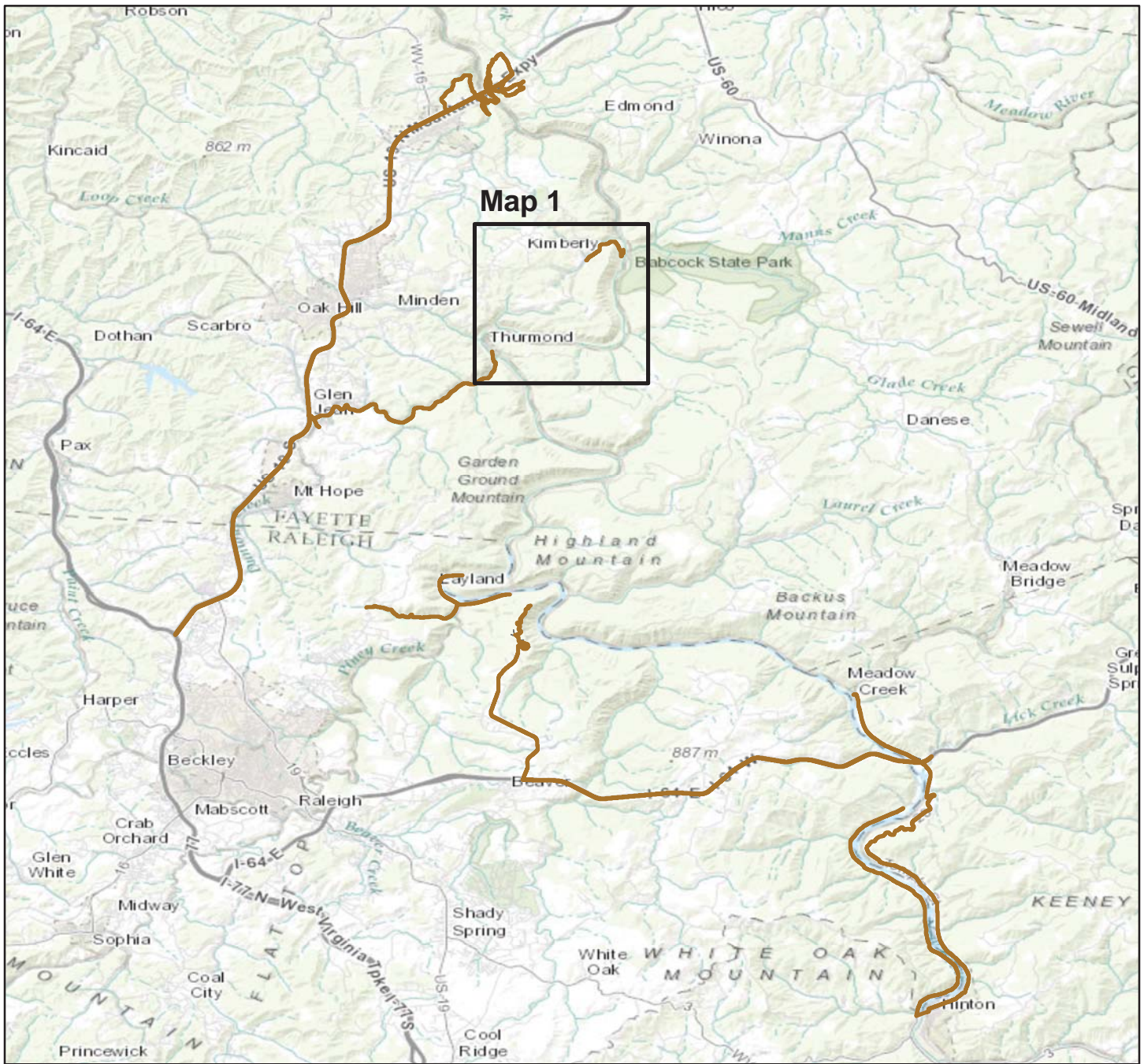


**Federal Lands Highway
Road Inventory Program**

New River Gorge National River

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

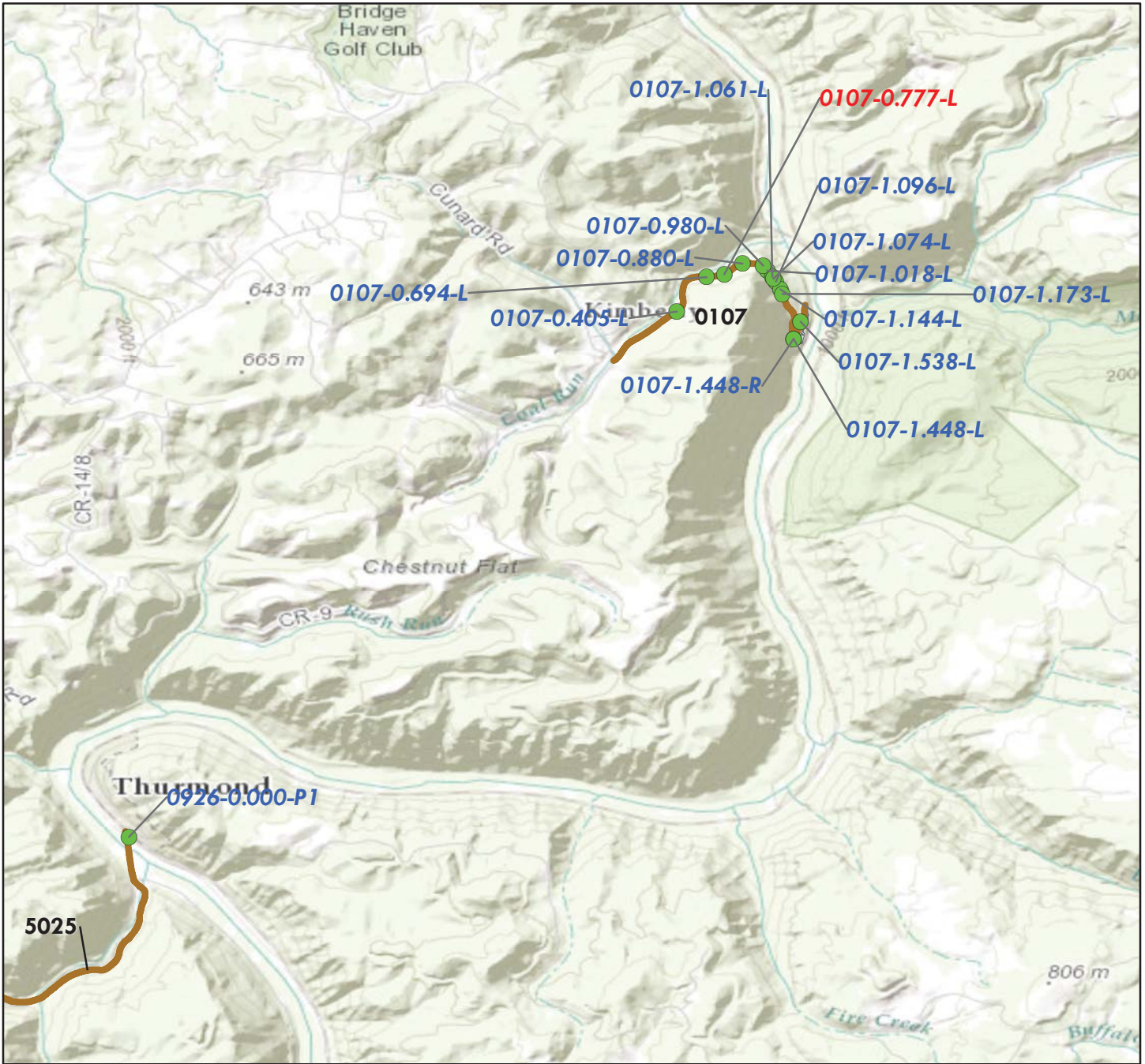
 RIP Collected Routes



New River Gorge National River

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



Tier 1 Park Retaining Wall Overview



New River Gorge National River



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Parkwide Summary: New River Gorge National River

Initial retaining wall inspections were conducted at New River Gorge National River in 2008, 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.

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, 51 walls were inventoried on the routes listed below.

Table 1: Number of Walls by Route

Route Number	Route Name	No. of Walls
0107	CUNARD ROAD	14
0108	COAL RUN (FISHERMAN'S ACCESS) ROAD	3
0117	GLADE CREEK ROAD	14
0402	KAYMOOR SERVICE ROAD	2
0700	UNKNOWN ROUTE	17
0926	THURMOND DEPOT PARKING AREA	1

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	11
FW - Fill Wall	37
HW - Head Wall	2
SP - Slope Protection	1

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
CC, Crib - Concrete	1
CP, Cantilever - Soldier Pile	5
CT, Crib - Timber	7
GC, Gravity - Mass Concrete	6
GD, Gravity - Dry Stone	7
GG, Gravity - Gabion	15
GM, Gravity - Mortared Stone	3
MG, MSE - Geosynthetic Wrapped Face	1
MW, MSE - Welded Wire Face	5
RR, Other - Riprap	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	36
Monitor	\$0	0
Maintenance	\$33,700	11
Repair Elements	\$0	0
Replace Elements	\$280,488	2
Replace Wall	\$906,500	2
Totals	\$1,220,688	51

*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	36
\$1 - \$25,000	11
\$25,001 - \$50,000	1
\$50,001 - \$100,000	0
\$100,001 - \$250,000	2
\$250,001 - \$500,000	0
\$500,001 - \$1,000,000	1
\$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	51

*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 New River Gorge National River. 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 New River Gorge National River 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⁾
NERI-0402-4.136-R	LOW	44	REPLACE ELEMENTS	\$124,440
NERI-0700-1.838-L	LOW	37	REPLACE WALL	\$860,250

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



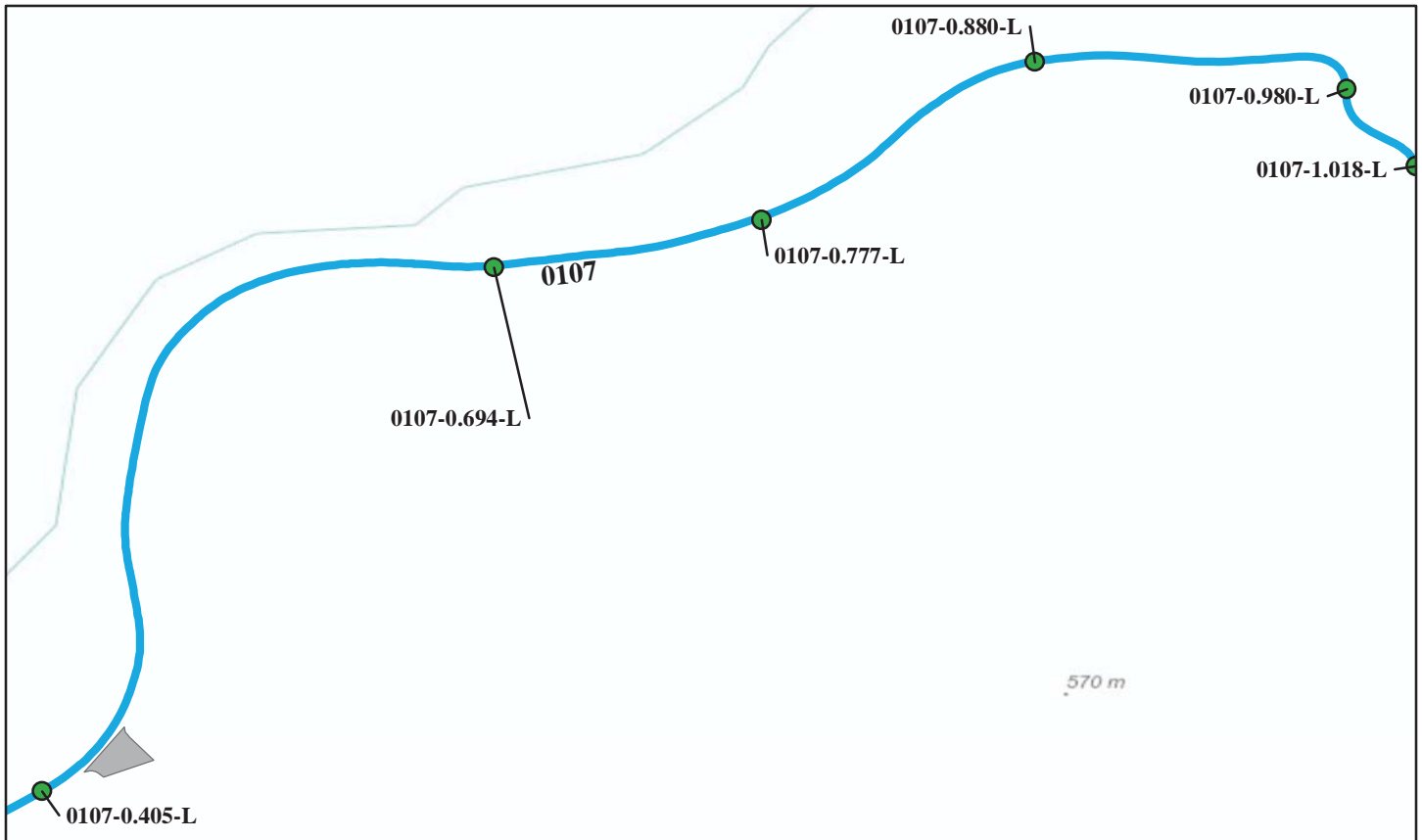
New River Gorge National River



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ROUTE 0107: CUNARD 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)

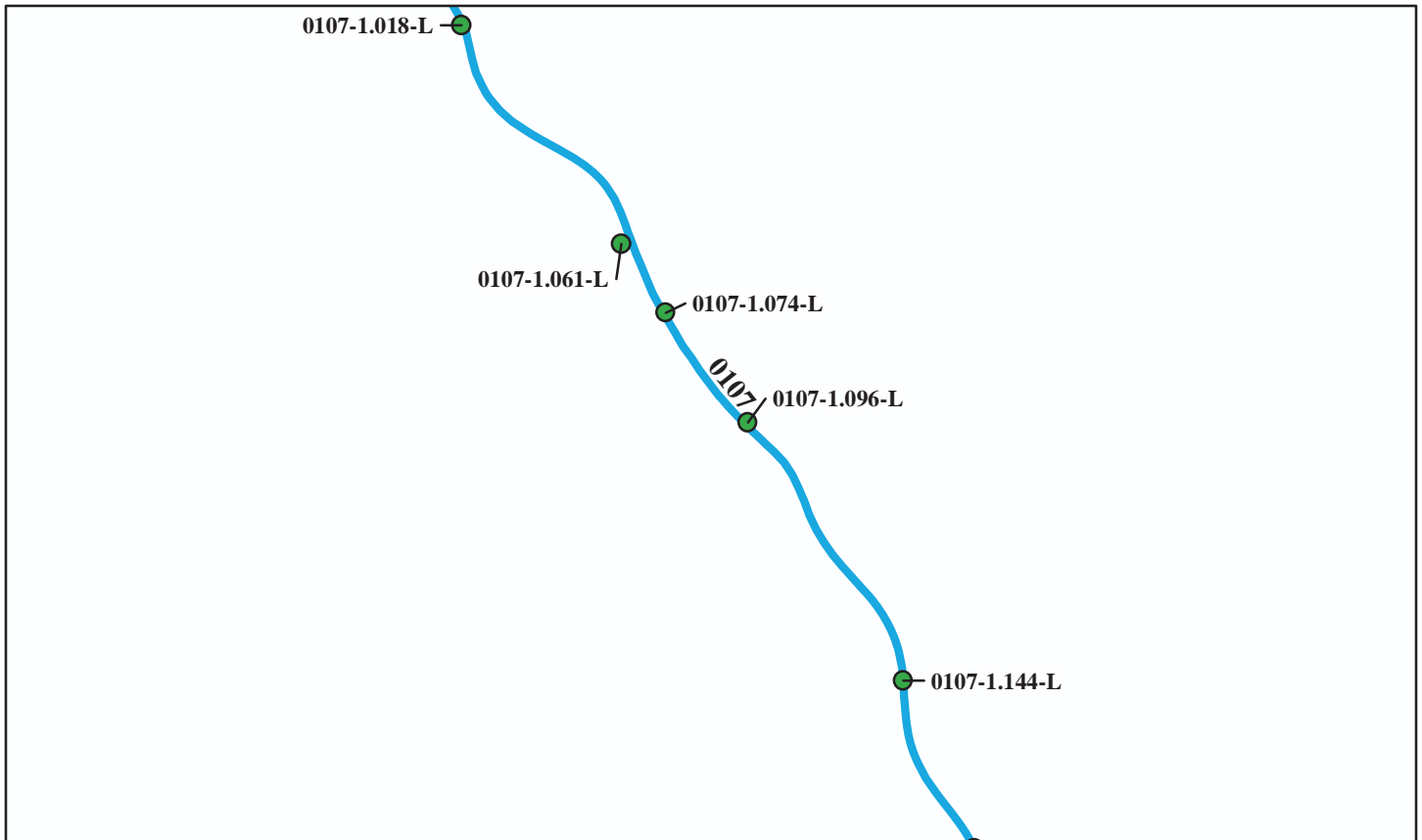
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
NERI-0107-0.405-L 6/25/2008	4,100	673	Gravity - Gabion	Fill Wall	89	\$0.00
NERI-0107-0.694-L 6/25/2008	200	36	Gravity - Gabion	Fill Wall	89	\$0.00
NERI-0107-0.777-L 6/25/2008	250	63	Gravity - Gabion	Fill Wall	89	\$0.00
NERI-0107-0.880-L 6/25/2008	600	97	Gravity - Gabion	Fill Wall	89	\$0.00
NERI-0107-0.980-L 6/25/2008	700	116	Gravity - Gabion	Fill Wall	89	\$0.00

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

New River Gorge National River

ROUTE 0107: CUNARD 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)

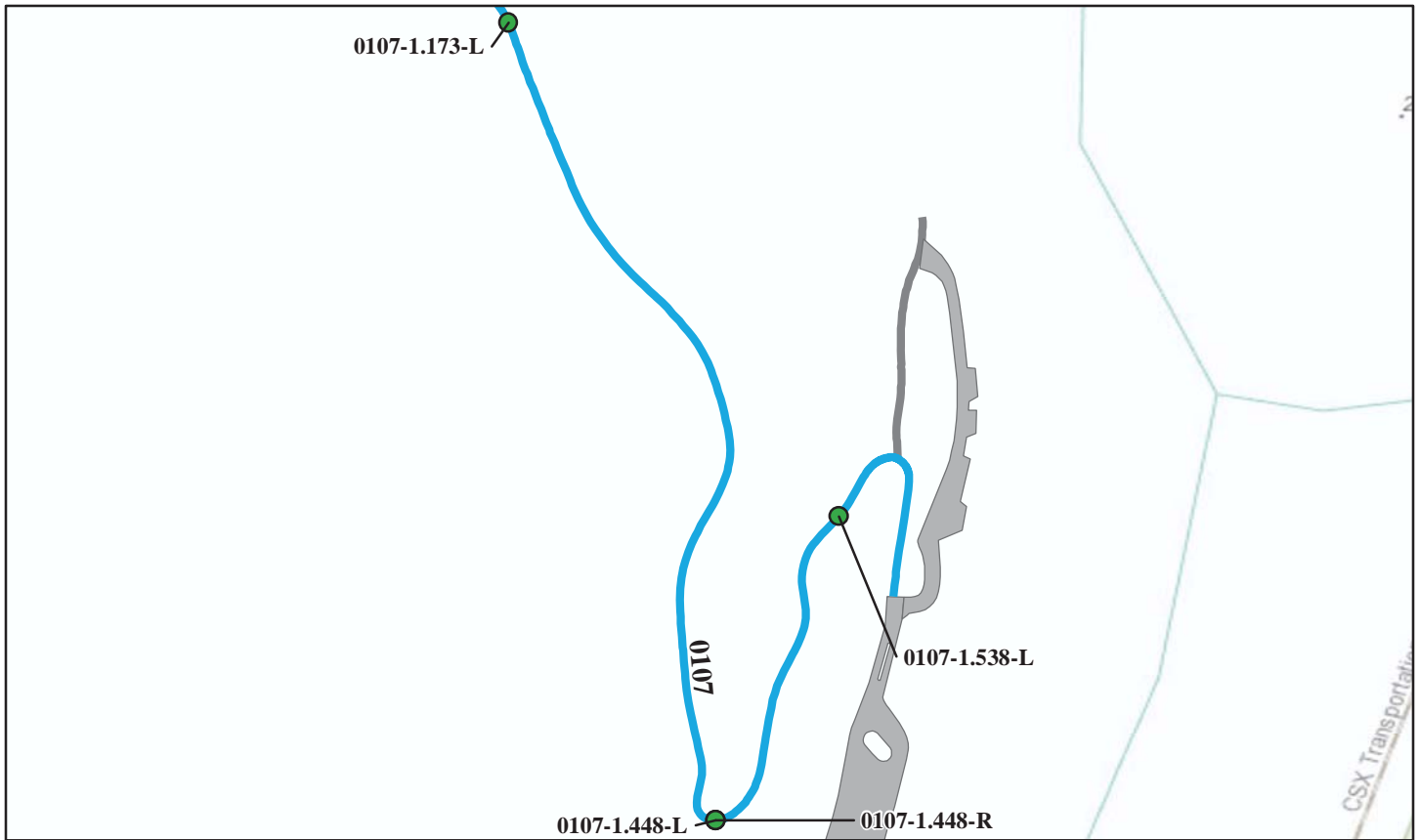
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
NERI-0107-1.018-L 6/25/2008	400	64	Gravity - Gabion	Fill Wall	84	\$0.00
NERI-0107-1.061-L 6/25/2008	200	50	Gravity - Gabion	Fill Wall	84	\$0.00
NERI-0107-1.074-L 6/25/2008	550	53	Gravity - Gabion	Fill Wall	86	\$0.00
NERI-0107-1.096-L 6/25/2008	400	67	Gravity - Gabion	Fill Wall	90	\$0.00
NERI-0107-1.144-L 6/25/2008	800	126	Gravity - Gabion	Fill Wall	86	\$0.00

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

New River Gorge National River

ROUTE 0107: CUNARD 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)

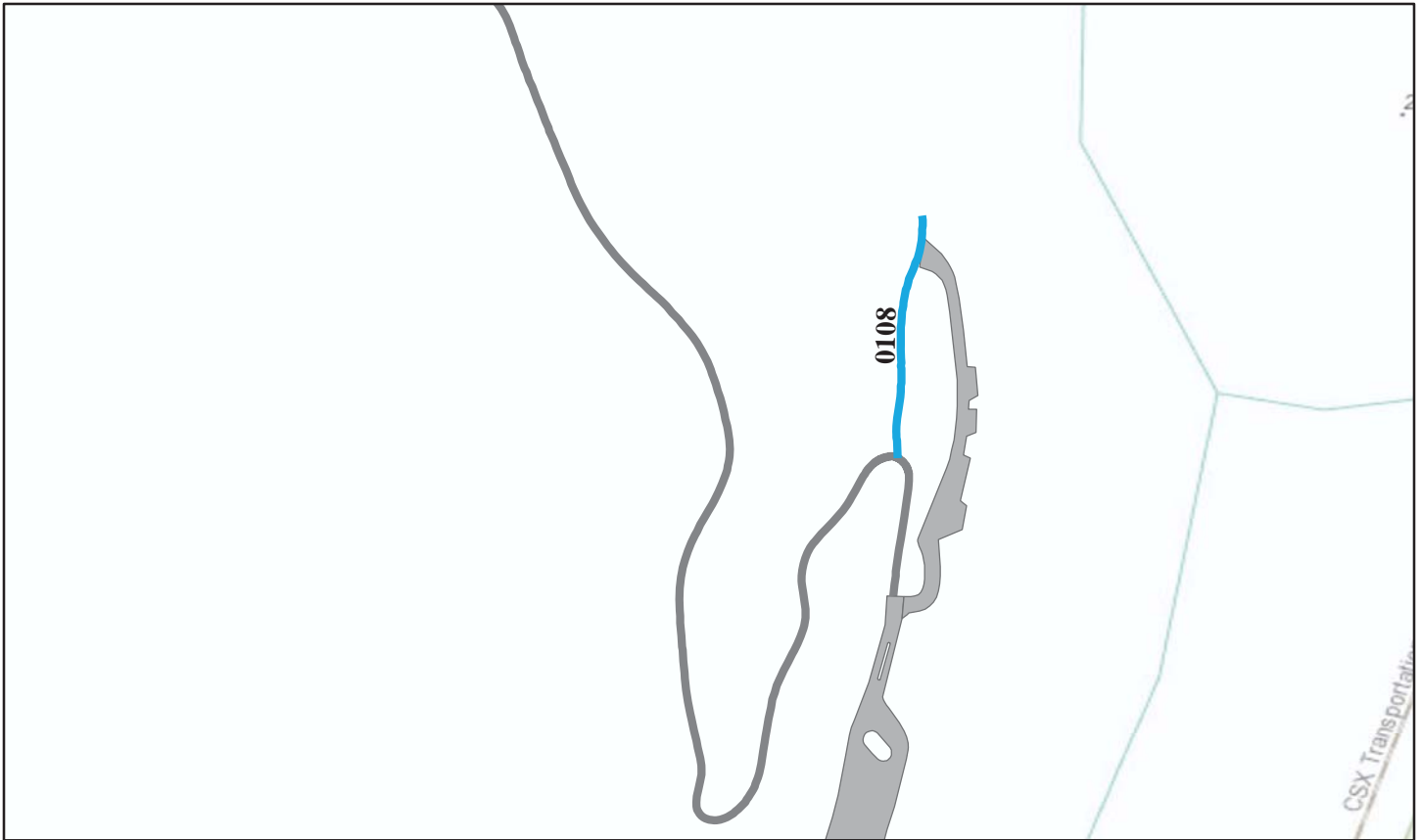
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
NERI-0107-1.173-L 6/25/2008	7,400	644	Gravity - Gabion	Fill Wall	86	\$0.00
NERI-0107-1.448-L 6/25/2008	380	68	Gravity - Dry Stone	Cut Wall	89	\$0.00
NERI-0107-1.448-R 6/25/2008	370	6	Gravity - Gabion	Fill Wall	88	\$0.00
NERI-0107-1.538-L 6/25/2008	3,340	341	Gravity - Gabion	Fill Wall	87	\$0.00

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

New River Gorge National River

ROUTE 0108: COAL RUN (FISHERMAN'S ACCESS) 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
NERI-0108-0.225-R 6/25/2008	2,300	193	Gravity - Mass Concrete	Cut Wall	72	\$13,000.00
NERI-0108-0.261-R 6/25/2008	625	53	Gravity - Mortared Stone	Cut Wall	70	\$3,000.00
NERI-0108-0.271-R 6/25/2008	110	10	Gravity - Mass Concrete	Cut Wall	72	\$13,000.00

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

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

GPS is not available because this route is unpaved.

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
NERI-0117-0.534-L 6/25/2008	1,700	97	Cantilever - Soldier Pile	Cut Wall	89	\$0.00
NERI-0117-0.670-L 6/25/2008	2,600	130	Cantilever - Soldier Pile	Fill Wall	90	\$0.00
NERI-0117-0.712-L 6/25/2008	1,350	90	Cantilever - Soldier Pile	Fill Wall	89	\$0.00
NERI-0117-0.794-L 6/25/2008	1,650	85	Cantilever - Soldier Pile	Fill Wall	86	\$0.00
NERI-0117-0.828-L 6/25/2008	2,320	166	MSE - Welded Wire Face	Fill Wall	89	\$0.00

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

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

GPS is not available because this route is unpaved.

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
NERI-0117-1.283-L 6/26/2008	2,350	129	Cantilever - Soldier Pile	Fill Wall	89	\$0.00
NERI-0117-1.702-L 6/26/2008	480	55	MSE - Welded Wire Face	Fill Wall	83	\$0.00
NERI-0117-1.713-L 6/28/2008	1,260	170	MSE - Geosynthetic Wrapped Face	Fill Wall	81	\$0.00
NERI-0117-1.752-L 6/26/2008	2,714	329	MSE - Welded Wire Face	Fill Wall	79	\$0.00
NERI-0117-2.392-L 6/26/2008	810	108	MSE - Welded Wire Face	Fill Wall	82	\$0.00

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

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

GPS is not available because this route is unpaved.

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
NERI-0117-3.596-L 6/26/2008	1,872	56	Other - Riprap	Slope Protection	84	\$0.00
NERI-0117-4.093-L 6/25/2008	930	46	Gravity - Dry Stone	Head Wall	87	\$0.00
NERI-0117-4.110-L 6/25/2008	15,500	1,000	Gravity - Gabion	Cut Wall	79	\$0.00
NERI-0117-4.814-L 6/28/2008	1,920	163	MSE - Welded Wire Face	Fill Wall	85	\$0.00

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

New River Gorge National River

ROUTE 0402: KAYMOOR SERVICE ROAD

GPS is not available because this route is unpaved.

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
NERI-0402-4.136-R 6/25/2008	1,347	155	Gravity - Mass Concrete	Fill Wall	44	\$124,440.00
NERI-0402-4.161-L 6/25/2008	530	68	Gravity - Mass Concrete	Cut Wall	63	\$880.00

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

New River Gorge National River

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
NERI-0700-0.390-L 6/25/2008	350	75	Gravity - Mortared Stone	Fill Wall	64	\$440.00
NERI-0700-0.530-R 6/24/2008	560	90	Gravity - Dry Stone	Cut Wall	80	\$800.00
NERI-0700-0.668-R 6/24/2008	250	30	Crib - Timber	Cut Wall	50	\$46,250.00
NERI-0700-1.099-R 6/24/2008	126	18	Gravity - Dry Stone	Head Wall	67	\$0.00
NERI-0700-1.111-L 6/24/2008	104	24	Gravity - Gabion	Fill Wall	73	\$0.00

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

New River Gorge National River

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
NERI-0700-1.197-L 10/24/2008	675	125	Gravity - Dry Stone	Fill Wall	66	\$440.00
NERI-0700-1.224-L 6/24/2008	890	92	Gravity - Mortared Stone	Fill Wall	64	\$440.00
NERI-0700-1.541-L 6/24/2008	108	27	Crib - Timber	Fill Wall	72	\$0.00
NERI-0700-1.609-L 6/24/2008	625	120	Gravity - Mass Concrete	Fill Wall	69	\$660.00
NERI-0700-1.787-L 6/24/2008	2,240	205	Gravity - Dry Stone	Fill Wall	70	\$440.00

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

New River Gorge National River

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
NERI-0700-1.827-L 6/24/2008	280	70	Gravity - Mass Concrete	Fill Wall	70	\$0.00
NERI-0700-1.838-L 6/24/2008	465	55	Crib - Timber	Fill Wall	37	\$860,250.00

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

New River Gorge National River

ROUTE 0701: 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
NERI-0701-1.081-L 6/24/2008	360	70	Crib - Concrete	Cut Wall	80	\$0.00

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

New River Gorge National River

ROUTE 0702: 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
NERI-0702-1.794-L 6/25/2008	180	42	Crib - Timber	Fill Wall	53	\$0.00
NERI-0702-1.846-L 6/25/2008	520	69	Gravity - Dry Stone	Fill Wall	74	\$600.00
NERI-0702-1.892-L 6/25/2008	264	33	Crib - Timber	Fill Wall	64	\$0.00

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

New River Gorge National River

ROUTE 0703: 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)

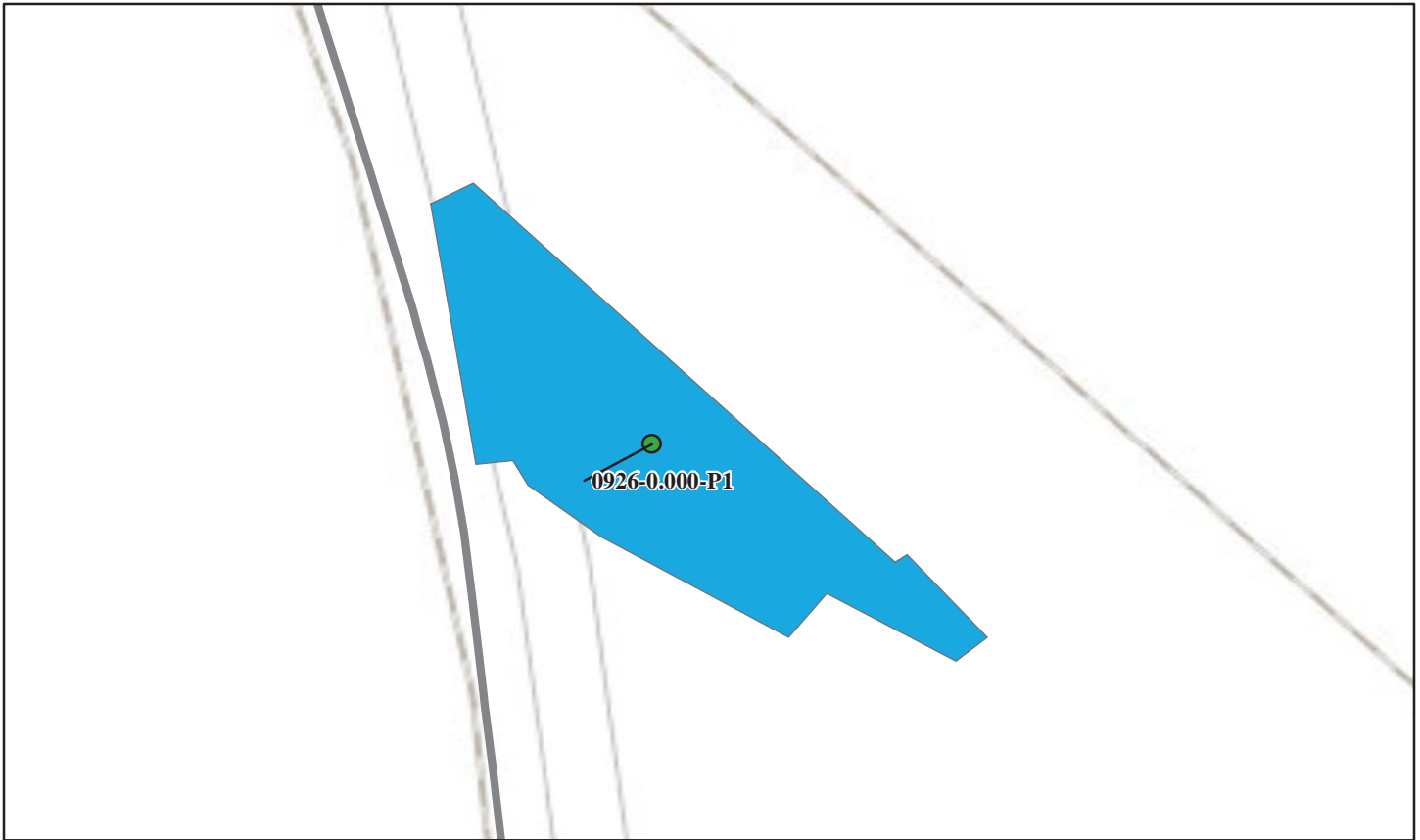
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
NERI-0703-0.000-L 6/25/2008	987	136	Crib - Timber	Cut Wall	64	\$156,048.00

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

New River Gorge National River

ROUTE 0926: THURMOND DEPOT PARKING 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

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
NERI-0926-0.000-P1 6/25/2008	667	58	Crib - Timber	Fill Wall	87	\$0.00

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

Tier 3 Retaining Wall Details



New River Gorge National River



Federal Lands Highway
Road Inventory Program

Wall ID:	NERI-0107-.405-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2003
*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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced gabion baskets wall for embankment - fill failure Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	673	Face Area (sq.):	4100
Average Wall Height (ft.):	6	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	Wall in perfect condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
CULVERT 0.50	2 culverts at wall ends - good condition	8
CURB/BERM/DITCH 0.50	New curb and gutter - good condition	8
LATERAL SLOPE 0.50	Relatively steep, good condition	8
ARCHITECTURAL FACING 0.50	4" stone fill	9
ROAD/SIDEWALK/SHOULDER 0.50	Grass shoulder	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (timber) in good condition	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_0.405_L_1.JPG



NERI_0107_0.405_L_2.JPG

Wall ID:	NERI-0107-.694-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2003
*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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced gabion headwall with 2 in pipe Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	200
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	Good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
CULVERT 0.50	1 PVC culvert 3' diameter, good condition	8
LATERAL SLOPE 0.50	Relatively steep, good condition	8
ARCHITECTURAL FACING 0.50	4" stone fill	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway, good condition	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_0.694_L_1.JPG

Wall ID:	NERI-0107-.777-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	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:	Other - 4 inch Sone Fill
General Description:	Short fill wall at slide area, geogrid reinforced gabion baskets Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	63	Face Area (sq.):	250
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, no settlement	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
ARCHITECTURAL FACING 0.50	4" stone fill	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	9
DOWNSLOPE 1.00	Steep, vegetated to wooded, does not affect wall performance	7
LATERAL SLOPE 1.00	Relatively steep, good condition, does not affect wall performance	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_0.777_L_1.JPG

Wall ID:	NERI-0107-.88-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced wall for repair of a slide on fill side above steep slope Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	97	Face Area (sq.):	600
Average Wall Height (ft.):	6	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 in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
LATERAL SLOPE 0.50	Relatively steep, good condition, does not affect wall performance	8
ARCHITECTURAL FACING 0.50	4” stone fill	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_0.880_L_1.JPG



NERI_0107_0.880_L_2.JPG

Wall ID:	NERI-0107-98-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced gabion baskets at an embankment failure above a very steep slope (>70 degrees) Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	116	Face Area (sq.):	700
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	New wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	9
DOWNSLOPE 1.00	Very steep slope (>70 degrees), vegetated to wooded, does not affect wall performance	7
LATERAL SLOPE 1.00	Very steep, good condition, does not affect wall performance	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_0.980_L_1.JPG



NERI_0107_0.980_L_2.JPG

Wall ID:	NERI-0107-1.018-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	84	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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced wall for widening roadway embankment at a very narrow section, above a very steep slope (>70 degrees) Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	64	Face Area (sq.):	400
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale (filled material that might slough), no settlement cracks	7
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
DOWNSLOPE 0.50	Very steep, wooded, does not affect wall performance	8
LATERAL SLOPE 0.50	Very steep, wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	8
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.018_L_1.JPG



NERI_0107_1.018_L_2.JPG

Wall ID:	NERI-0107-1.061-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	84	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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced wall for widening roadway embankment at a very narrow section above a very steep slope (>70 degrees) Supporting a 2-lane paved road with low ADT		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	200
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	40

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale fill, no settlement cracks	7
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
CULVERT 0.50	24" PVC pipe culvert in good condition	8
DOWNSLOPE 0.50	Very steep, wooded, does not affect wall performance	8
LATERAL SLOPE 0.50	Relatively steep, good condition, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.061_L_1.JPG



NERI_0107_1.061_L_2.JPG

Wall ID:	NERI-0107-1.074-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	86	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:	Other - 4 inch Stone Fill
General Description:	Geogrid reinforced wall for widening roadway embankment at a very narrow section above very steep slope (>70 degrees) and repair of slide at very steep slope Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	53	Face Area (sq.):	550
Average Wall Height (ft.):	10	Face Angle (deg.):	90
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	41

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered rock and silty sand fill, no settlement cracks	8
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
LATERAL SLOPE 0.50	Relatively steep, wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	9
DOWNSLOPE 1.00	Very steep (>70 degrees), wooded, does not affect wall performance	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.074_L_1.JPG



NERI_0107_1.074_L_2.JPG

Wall ID:	NERI-0107-1.096-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*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:	Other - 4 inch Stone Fill
General Description:	Geogrid reinforced soil for widening roadway embankment at a very narrow section above a very steep slope (>70 degrees) Supporting a 2-lane paved road		

Wall Measurements

Wall Length (ft.):	67	Face Area (sq.):	400
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	90

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	New wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed rock and soil fill, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
LATERAL SLOPE 0.50	Relatively steep, good condition, does not affect wall performance	8
CULVERT 0.50	24" PVC pipe culvert through wall face	9
DOWNSLOPE 0.50	Very steep, wooded, does not affect wall performance	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
UPSLOPE 0.50	Gravel roadway in good condition	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.096_L_1.JPG



NERI_0107_1.096_L_2.JPG

Wall ID:	NERI-0107-1.144-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	86	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:	Other - 4 inch Stone Fill
General Description:	Geogrid reinforced wall for widening roadway embankment at very narrow section above very steep slope. Supporting a 2-lane paved road with low ADT		

Wall Measurements

Wall Length (ft.):	126	Face Area (sq.):	800
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	8
WALL FOUNDATION MATERIAL 8.00	On soil, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
DOWNSLOPE 0.50	Very steep, heavily wooded, does not affect wall performance	8
LATERAL SLOPE 0.50	Very steep, heavily wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road and shoulder in good condition	8
UPSLOPE 0.50	Gravel roadway in good condition	8
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.144_L_1.JPG



NERI_0107_1.144_L_2.JPG

Wall ID:	NERI-0107-1.173-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	86	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:	Other - 4 inch Sone Fill
General Description:	Widening roadway embankment, 2 tier wall with bottom geofabric reinforced foundation Supporting a 2-lane gravel road		

Wall Measurements

Wall Length (ft.):	644	Face Area (sq.):	7400
Average Wall Height (ft.):	11	Face Angle (deg.):	90
Maximum Wall Height (ft.):	23	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	8
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
DOWNSLOPE 0.50	Steep and heavily wooded, does not affect wall performance	8
LATERAL SLOPE 0.50	Steep and heavily wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road and shoulder in good condition	8
UPSLOPE 0.50	Gravel roadway in good condition	8
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.173_L_1.JPG



NERI_0107_1.173_L_2.JPG

Wall ID:	NERI-0107-1.448-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	89	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:	Stone
General Description:	Dry stacked stone (Rockery) wall on cut side of the road		

Wall Measurements

Wall Length (ft.):	68	Face Area (sq.):	380
Average Wall Height (ft.):	5	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	New wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered rock, no settlement or distress cracks	9
STONE MASONRY 8.00	New dry stacked wall in good condition	9
LATERAL SLOPE 0.50	Steep grade, wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel in good condition	8
ARCHITECTURAL FACING 0.50	Stone	9
WALL DRAINS 0.50	Drainable wall type, no problems associated with drainage	9
UPSLOPE 1.00	Steep slope - soil and rock, does not affect wall performance	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.448_L_1.JPG



NERI_0107_1.448_L_2.JPG

Wall ID:	NERI-0107-1.448-R		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	88	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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced fill wall on right side of road Supporting a 2-lane paved road with low ADT		

Wall Measurements

Wall Length (ft.):	6	Face Area (sq.):	370
Average Wall Height (ft.):	61	Face Angle (deg.):	90
Maximum Wall Height (ft.):	63	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, no settlement cracks	9
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
CULVERT 0.50	24" pipe culvert in good condition	8
LATERAL SLOPE 0.50	Relatively steep, wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road and shoulder in good condition	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition (under construction)	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	9
DOWNSLOPE 1.00	Steep, vegetated to wooded, does not affect wall performance	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.448_R_1.JPG



NERI_0107_1.448_R_2.JPG

Wall ID:	NERI-0107-1.538-L		
Route Name:	CUNARD ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	87	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:	Other - 4 inch Sone Fill
General Description:	Geogrid reinforced gabion basket wall for embankment - fill failure Supporting a 2-lane paved road with low ADT		

Wall Measurements

Wall Length (ft.):	341	Face Area (sq.):	3340
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	New wall in good condition	9
WALL FOUNDATION MATERIAL 8.00	Weathered to jointed sandstone and shale, bearing on weathered rock and compacted fill, no settlement cracks	8
WIRE/GEOSYNTHETIC FACING 8.00	New – good condition – no settlement, no bulging, no wire corrosion	9
LATERAL SLOPE 0.50	Mild slope, wooded, does not affect wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	2-lane gravel road in good condition	8
DOWNSLOPE 0.50	Mild slope, vegetated to wooded, does not affect wall performance	9
TRAFFIC BARRIER/FENCE 0.50	New guardrail (steel) in good condition (under construction)	9
WALL DRAINS 0.50	Drainable wall type with drainable fill and underdrain culverts	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.

New River Gorge National River

ROUTE 0107: CUNARD ROAD

Retaining Wall Condition Photos



NERI_0107_1.538_L_1.JPG



NERI_0107_1.538_L_2.JPG

Wall ID:	NERI-0108-.225-R		
Route Name:	COAL RUN (FISHERMAN'S ACCESS) ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Plain Concrete
General Description:	An old retaining wall on the right side of the road Supporting a 2-lane gravel road with low ADT		

Wall Measurements

Wall Length (ft.):	193	Face Area (sq.):	2300
Average Wall Height (ft.):	11	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 in fair condition	7
WALL FOUNDATION MATERIAL 8.00	Weathered rock or dense soil	8
CONCRETE 8.00	Old crumbled concrete with patched areas	7
MORTAR 8.00	Good condition, 10% lost	7
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road and shoulder in good condition	8
ARCHITECTURAL FACING 1.00	Deteriorated mortar face	6
DOWNSLOPE 1.00	Gravel roadway	7
LATERAL SLOPE 1.00	Mild, vegetated slope, does not affect wall performance	7
UPSLOPE 1.00	Mild slope, wooded, does not affect wall performance	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repair/Patch Concrete Wall Face - Patch Mortar - \$10,000, Clean up Vegetation - \$3,000. Total - \$13,000.
Repair Cost:	\$13,000

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

New River Gorge National River
ROUTE 0108: COAL RUN (FISHERMAN'S ACCESS) ROAD

Retaining Wall Condition Photos



NERI_0108_0.225_R_1.JPG



NERI_0108_0.225_R_2.JPG

Wall ID:	NERI-0108-.261-R		
Route Name:	COAL RUN (FISHERMAN'S ACCESS) ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Mortare stone gravity wall in fair condition with some cracks		

Wall Measurements

Wall Length (ft.):	53	Face Area (sq.):	625
Average Wall Height (ft.):	11	Face Angle (deg.):	88
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in fair condition	7
WALL FOUNDATION MATERIAL 8.00	Weathered rock or dense soil	8
MORTAR 8.00	Loss at joints, deteriorated	6
STONE MASONRY 8.00	Mortared stone wall with cracks at some locations	7
CULVERT 1.00	Vegetated and trees behind wall	7
DOWNSLOPE 1.00	Gravel roadway	7
LATERAL SLOPE 1.00	mild slope, vegetated	7
UPSLOPE 1.00	Mild slope	7
WALL DRAINS 1.00	None	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Mortar joints - \$2,000. Clear vegetation - \$1,000. Total - \$3,000
Repair Cost:	\$3,000

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

New River Gorge National River
ROUTE 0108: COAL RUN (FISHERMAN'S ACCESS) ROAD

Retaining Wall Condition Photos

Condition photos are not available for NERI-0108-0.261-R.

Wall ID:	NERI-0108-.271-R		
Route Name:	COAL RUN (FISHERMAN'S ACCESS) ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Plain Concrete
General Description:	An old retaining wall on the right side of the road Supporting a 2-lane gravel road with low ADT		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	110
Average Wall Height (ft.):	11	Face Angle (deg.):	88
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall in fair condition	7
WALL FOUNDATION MATERIAL 8.00	Weathered rock or dense soil	8
CONCRETE 8.00	Old crumbled concrete	7
ARCHITECTURAL FACING 1.00	Deteriorated mortar face	6
DOWNSLOPE 1.00	Gravel roadway	7
LATERAL SLOPE 1.00	Mild vegetated slope	7
UPSLOPE 1.00	Mild slope	7
VEGETATION 1.00	Vegetation and trees behind wall	7
WALL DRAINS 1.00	No drains observed	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repair/patch concrete wall face - \$10,000. Remove vegetation - \$3,000
Repair Cost:	\$13,000

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

New River Gorge National River
ROUTE 0108: COAL RUN (FISHERMAN'S ACCESS) ROAD

Retaining Wall Condition Photos

Condition photos are not available for NERI-0108-0.271-R.

Wall ID:	NERI-0117-.534-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2005
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Soldier pile and timber lagging cantilevered wall for embankment slide repair.		

Wall Measurements

Wall Length (ft.):	97	Face Area (sq.):	1700
Average Wall Height (ft.):	17	Face Angle (deg.):	90
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	In good condition.	9
WALL FOUNDATION MATERIAL 8.00	Shafts socketed into shale bedrock about 7ft.	9
LAGGING 8.00	9" thick lagging in good condition.	9
PILES AND SHAFTS 8.00	H Pile installed into drilled concrete shafts in good conditions.	9
CULVERT 0.50	39" diameter pipe culvert through mid wall in good conditions.	8
LATERAL SLOPE 0.50	Mild slope, vegetated, does not affect wall performance.	8
VEGETATION 0.50	Trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	Vegetated narrow shoulder.	9
TRAFFIC BARRIER/FENCE 0.50	Stell guardrail; in good condition.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_0.534_L_1.JPG



NERI_0117_0.534_L_2.JPG

Wall ID:	NERI-0117--67-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2005
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cantilevered soldier pile wall with geogrid reinforced wire basket on one end. 36 in diameter pipe culvert at mid wall.		

Wall Measurements

Wall Length (ft.):	130	Face Area (sq.):	2600
Average Wall Height (ft.):	20	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	In good conditions.	9
WALL FOUNDATION MATERIAL 8.00	Shafts socket into shale bedrock about 7 ft.	9
LAGGING 8.00	9" thick timber lagging in good conditions.	9
PILES AND SHAFTS 8.00	H Pile installed into drilled concrete shafts in good conditions.	9
LATERAL SLOPE 0.50	Mild slope, vegetated.	8
VEGETATION 0.50	Vegetation and tress.	8
CULVERT 0.50	36" diameter pipe culvert in good conditions.	9
DOWNSLOPE 0.50	Steep, vegetated and wooded.	9
ROAD/SIDEWALK/SHOULDER 0.50	Vegetated, narrow shoulder.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_0.670_L_1.JPG



NERI_0117_0.670_L_2.JPG

Wall ID:	NERI-0117-.712-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2005
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cantilevered soldier pile wall with 9 in timber lagging steel H piles socket into bedrock by drilled shafts.		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	1350
Average Wall Height (ft.):	15	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	In good conditions.	9
WALL FOUNDATION MATERIAL 8.00	Shafts socket into shale bedrock about 7 ft.	9
LAGGING 8.00	9" thick timber lagging in good conditions.	9
PILES AND SHAFTS 8.00	H Pile installed into drilled concrete shafts in good conditions.	9
CULVERT 0.50	4 in diameter PVC pipes.	8
LATERAL SLOPE 0.50	Mild slope vegetation.	8
VEGETATION 0.50	Vegetation and trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	Vegetated, narrow shoulder.	9
TRAFFIC BARRIER/FENCE 0.50	Steel guardrail; in good condition.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_0.712_L_1.JPG



NERI_0117_0.712_L_2.JPG

Wall ID:	NERI-0117-.794-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2005
*Wall Rating:	86	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	MSE - Welded Wire Face
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Lower wall is a soldier pile cantilever wall, H pile installed in concrete drilled shafts socketed into bedrock. Upper wall is a geogrid reinforced wire basket.		

Wall Measurements

Wall Length (ft.):	85	Face Area (sq.):	1650
Average Wall Height (ft.):	19	Face Angle (deg.):	90
Maximum Wall Height (ft.):	23	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition.	7
WALL FOUNDATION MATERIAL 8.00	Socketed into bedrock formation.	9
LAGGING 8.00	9" thick timber lagging in good conditions.	9
PILES AND SHAFTS 8.00	Concrete shafts socketed into bedrock with steel H piles in good conditions.	9
WIRE/GEOSYNTHETIC FACING 8.00	Geogrid reinforced wire baskets (biaxial).	9
CULVERT 0.50	36" diameter pipe culvert through wall.	9
DOWNSLOPE 0.50	Very steep slope, vegetated.	9
LATERAL SLOPE 0.50	Mild slope, vegetated.	9
ROAD/SIDEWALK/SHOULDER 0.50	Vegetated and narrow stone shoulder.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_0.794_L_1.JPG



NERI_0117_0.794_L_2.JPG

Wall ID:	NERI-0117-828-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2006
*Wall Rating:	89	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:	Geogrid reinforced wire basket wall with vegetated face for embankment slope slide repair.		

Wall Measurements

Wall Length (ft.):	166	Face Area (sq.):	2320
Average Wall Height (ft.):	13	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	Good condition - new wall.	9
WALL FOUNDATION MATERIAL 8.00	dense soil or weathered to jointed rock.	9
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, no settlement.	9
CULVERT 0.50	24" diameter pipe culvert through wall.	8
DOWNSLOPE 0.50	Very steep slope, vegetated and trees.	8
LATERAL SLOPE 0.50	Mild slope, vegetated and trees.	8
VEGETATION 0.50	Heavily vegetated and wooded.	8
ROAD/SIDEWALK/SHOULDER 0.50	Narrow aggregate shoulder.	9
TRAFFIC BARRIER/FENCE 0.50	Steel guardrail.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_0.828_L_1.JPG



NERI_0117_0.828_L_2.JPG

Wall ID:	NERI-0117-1.283-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 26, 2008	Approximate Year Built:	2006
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Soldier Pile
Surface Treatment:		Secondary Wall Type:	MSE - Welded Wire Face
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Lower wall (1) is a cantilevered soldier pile with timber lagging. Upper wall (2) is a vegetated geogrid reinforced wire basket.		

Wall Measurements

Wall Length (ft.):	129	Face Area (sq.):	2350
Average Wall Height (ft.):	18	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	Wall in good conditions.	9
WALL FOUNDATION MATERIAL 8.00	Shafts socketed 7ft into bedrock in good conditions.	9
LAGGING 8.00	Timber lagging in good conditions.	9
PILES AND SHAFTS 8.00	H Piles in concrete drilled shafts are in good conditions.	9
WIRE/GEOSYNTHETIC FACING 8.00	Biaxial geogrid and wire baskets are in good conditions.	9
LATERAL SLOPE 0.50	Mild slope heavily wooded and vegetated.	8
VEGETATION 0.50	Heavily vegetated and wooded.	8
CULVERT 0.50	36" pipe culvert through wall in good conditions.	9
ROAD/SIDEWALK/SHOULDER 0.50	Aggregate surface road in good conditions.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_1.283_L_1.JPG



NERI_0117_1.283_L_2.JPG

Wall ID:	NERI-0117-1.702-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 26, 2008	Approximate Year Built:	2002
*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:	MSE wall with welded wire basket to support a 2-lane gravel road with low ADT.		

Wall Measurements

Wall Length (ft.):	55	Face Area (sq.):	480
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition; wall should be monitored to see if bulging/buckling persists.	9
WALL FOUNDATION MATERIAL 8.00	Good condition, no settlement or distressed cracks.	8
WIRE/GEOSYNTHETIC FACING 8.00	Good condition.	8
DOWNSLOPE 0.50	Good condition; steep, lightly forested slope.	8
LATERAL SLOPE 0.50	Minor erosion at both ends of the wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, good drainage to ditch along back edge of road.	8
WALL DRAINS 0.50	No evidence of internal drainage distress; sheet flow across face of wall contributing to distress.	8
CULVERT 0.50	18" diameter CPP culvert, good condition.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_1.702_L_1.JPG

Wall ID:	NERI-0117-1.713-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 28, 2008	Approximate Year Built:	2007
*Wall Rating:	81	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Geosynthetic Wrapped Face
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	MSE Wall with welded wire basket face directly supports the left shoulder of roadway low consequence of failure.		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	1260
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	Good to excellent condition.	8
WALL FOUNDATION MATERIAL 8.00	On soil, no settlement cracks.	8
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, no corrosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel roadway; good condition; no observed distress.	8
TRAFFIC BARRIER/FENCE 0.50	Guardrail; in good condition.	8
UPSLOPE 0.50	Very steep.	8
WALL DRAINS 0.50	Self drainage.	8
CULVERT 0.50	24" diameter CPP at base of wall, good conditions with no observed distress.	9
DOWNSLOPE 0.50	No observed distress, riprap erosion protection at outlet of culvert.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_1.713_L_1.JPG

Wall ID:	NERI-0117-1.752-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 26, 2008	Approximate Year Built:	Unknown
*Wall Rating:	79	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:	Retaining wall to support a 2 lane gravel road with low ADT.		

Wall Measurements

Wall Length (ft.):	329	Face Area (sq.):	2714
Average Wall Height (ft.):	8	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	Good condition.	8
WALL FOUNDATION MATERIAL 8.00	On soil, no settlement or distressed cracks.	8
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, grass growing, minor buckling in the wirebasket.	8
CULVERT 0.50	15" diameter CPP.	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road.	8
TRAFFIC BARRIER/FENCE 0.50	Guardrail; in good condition.	8
WALL DRAINS 0.50	Self draining.	9
DOWNSLOPE 1.00	Very steep, heavily wooded, no distressed vegetation.	7
LATERAL SLOPE 1.00	Very steep, heavily wooded.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_1.752_L_1.JPG



NERI_0117_1.752_L_2.JPG

Wall ID:	NERI-0117-2.392-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 26, 2008	Approximate Year Built:	2007
*Wall Rating:	82	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:	New retaining wall to support a 2 lane gravel road with low ADT.		

Wall Measurements

Wall Length (ft.):	108	Face Area (sq.):	810
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	Good condition.	8
WALL FOUNDATION MATERIAL 8.00	On soil, no settlement or distressed cracks.	8
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, vegetation at the face of the wall.	9
CULVERT 0.50	30" diameter CPP, good conditions.	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel Road.	9
TRAFFIC BARRIER/FENCE 0.50	Gravel road.	9
WALL DRAINS 0.50	Self drainage, no problem related with drainage.	9
DOWNSLOPE 1.00	Very steep, heavily wooded.	7
LATERAL SLOPE 1.00	Very steep, heavily wooded.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_2.392_L_1.JPG

Wall ID:	NERI-0117-3.596-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 26, 2008	Approximate Year Built:	Unknown
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Slope Protection	Primary Wall Type:	Other - Riprap
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Boulder 4 riprap to protect a 30 in diameter CPP.		

Wall Measurements

Wall Length (ft.):	56	Face Area (sq.):	1872
Average Wall Height (ft.):	33	Face Angle (deg.):	45
Maximum Wall Height (ft.):	52	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good conditions.	9
CULVERT 0.50	30" diameter PCC.	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road.	8
DOWNSLOPE 1.00	Very steep, heavily wooded.	7
LATERAL SLOPE 1.00	Very steep, heavily wooded.	7
UPSLOPE 1.00	Gravel road, very steep, heavily wooded.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_3.596_L_1.JPG

Wall ID:	NERI-0117-4.093-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Head wall for a 36 in culvert constructed along left shoulder of a 2-lane road		

Wall Measurements

Wall Length (ft.):	46	Face Area (sq.):	930
Average Wall Height (ft.):	20	Face Angle (deg.):	45
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent, new construction	8
WALL FOUNDATION MATERIAL 8.00	No evidence of movement or loss of bearing	9
PLACED STONE 8.00	Good condition, new construction, no observed distress	9
DOWNSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
CULVERT 0.50	36" CCP in a good condition, newconstruction	9
ROAD/SIDEWALK/SHOULDER 0.50	2 lane gravel road in a good condition	9
UPSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	9
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	9

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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_4.093_L_1.JPG

Wall ID:	NERI-0117-4.11-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	2007
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Newly constructed retaining wall supporting 2-lane gravel road with low ADT		

Wall Measurements

Wall Length (ft.):	1000	Face Area (sq.):	15500
Average Wall Height (ft.):	15	Face Angle (deg.):	90
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, new construction	8
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	8
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, no wire corrosion or deteriorated baskets, good basket to basket contact	8
CURB/BERM/DITCH 0.50	2 pipe culverts 36"D in a good condition, new construction	8
ROAD/SIDEWALK/SHOULDER 0.50	2-lane gravel road in a good condition	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_4.110_L_1.JPG

Wall ID:	NERI-0117-4.814-L		
Route Name:	GLADE CREEK ROAD		
Inspection Date:	June 28, 2008	Approximate Year Built:	2007
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Welded Wire Face
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	New retaining wall to support a 2 lane gravel road with low ADT.		

Wall Measurements

Wall Length (ft.):	163	Face Area (sq.):	1920
Average Wall Height (ft.):	11	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 conditions.	9
WALL FOUNDATION MATERIAL 8.00	On soil, no settlement or distressed cracks.	9
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, no distress.	8
PLACED STONE 8.00	Class 3 riprap slope location at north end of wall 20'W x 13'H x 17'L.	9
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road, flat.	9
TRAFFIC BARRIER/FENCE 0.50	Guardrail road.	9
WALL DRAINS 0.50	Self draining.	9
VEGETATION 1.00	Heavily wooded.	6
DOWNSLOPE 1.00	Very steep, heavily wooded.	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.

New River Gorge National River

ROUTE 0117: GLADE CREEK ROAD

Retaining Wall Condition Photos



NERI_0117_4.814_L_1.JPG



NERI_0117_4.814_L_2.JPG

Wall ID:	NERI-0402-4.136-R		
Route Name:	KAYMOOR SERVICE ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	1950
*Wall Rating:	44	Maintenance Action:	Replace 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:	Retaining wall supporting the abandoned mining station and the administrative road		

Wall Measurements

Wall Length (ft.):	155	Face Area (sq.):	1347
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to poor, middle section of the wall should be replaced	4
WALL FOUNDATION MATERIAL 8.00	Fair condition, evidence of foundation and wall movement. Wall is approx 12" out of plumb	4
CONCRETE 8.00	Fair condition, some cracks and discoloration	4
DOWNSLOPE 0.50	Flat slope at base transitions to steep slope, no observed distress, heavily vegetated	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
VEGETATION 0.50	Several small trees along the base, does not affect the wall performance	8
WALL DRAINS 1.00	Fair condition, weepholes were observed in the wall	4
ROAD/SIDEWALK/SHOULDER 1.00	Good condition, minor subsidence along the back of the wall	7
TRAFFIC BARRIER/FENCE 1.00	Steel rail, minor to moderate rusting	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Replace middle section of the wall
Repair Cost:	\$124,440

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

New River Gorge National River

ROUTE 0402: KAYMOOR SERVICE ROAD

Retaining Wall Condition Photos

Condition photos are not available for NERI-0402-4.136-R.

Wall ID:	NERI-0402-4.161-L		
Route Name:	KAYMOOR SERVICE ROAD		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	63	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	Gravity - Mortared Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	retaining wall in an abandoned mining entrance/station		

Wall Measurements

Wall Length (ft.):	68	Face Area (sq.):	530
Average Wall Height (ft.):	7	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 performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	6
MORTAR 8.00	Good condition, some moss, 40% lost	5
CONCRETE 8.00	Good condition, cast in place, minor cracks, efflorescence, and moss	6
PLACED STONE 8.00	Good condition, good block to block contact, some disintegrated stones, minor moss	7
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
ROAD/SIDEWALK/SHOULDER 1.00	Gravel parking lot in a good condition	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Cut trees and clear vegetation
Repair Cost:	\$880

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

New River Gorge National River

ROUTE 0402: KAYMOOR SERVICE ROAD

Retaining Wall Condition Photos



NERI_0402_4.161_L_1.JPG



NERI_0402_4.161_L_2.JPG

Wall ID:	NERI-0700-.39-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	64	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Retaining wall on the left side of a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	350
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on rock, no settlement or distress cracks	7
MORTAR 8.00	Poor condition, almost gone	4
PLACED STONE 8.00	Good condition, good block to block contact, some disintegrated stones	7
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
ROAD/SIDEWALK/SHOULDER 1.00	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
WALL DRAINS 1.00	No problems associated with drainage	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut trees
Repair Cost:	\$440

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-.39-L.

Wall ID:	NERI-0700-.53-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	Maintenance

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 stacked rock wall on the right side of a 1-lane gravel maintenance road with very low ADT		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	560
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 global distress	8
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	8
PLACED STONE 8.00	Good condition, good block to block contact, few missing sections	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
UPSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
WALL DRAINS 0.50	No problems associated with drainage	8
DOWNSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	9
ROAD/SIDEWALK/SHOULDER 0.50	1-lane gravel road in a good condition	9
VEGETATION 1.00	Several small trees grown from the face and top of the wall	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Cut trees
Repair Cost:	\$800

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-.53-R.

Wall ID:	NERI-0700-.668-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	50	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Retaining wall with wood lagging supporting out of use rail line, located on the right side of a 1-lane gravel road with very low ADT		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	250
Average Wall Height (ft.):	8	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	Poor performance, need to replace the entire wall	4
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	7
BIN OR CRIB 8.00	Old structure, poor condition, some rotten and fallen units	4
LAGGING 8.00	Wood lagging in a poor condition, some rotten and fallen units	4
ROAD/SIDEWALK/SHOULDER 0.50	1-lane gravel road in a good condition	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
WALL DRAINS 1.00	Self draining, no problems associated with drainage	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Replace the entire wall
Repair Cost:	\$46,250

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-0.668-R.

Wall ID:	NERI-0700-1.099-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	67	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Head wall for a small culvert on the right side, supporting a 1-lane gravel maintenance road with very low ADT		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	126
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on rock, no settlement or distress cracks	7
PLACED STONE 8.00	Good condition, good block to block contact, few voids sections, minor cracks	6
ROAD/SIDEWALK/SHOULDER 0.50	1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	6
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	6
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	6
CULVERT 1.00	2 ft diam in a good condition	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.

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.099-R.

Wall ID:	NERI-0700-1.111-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	73	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 wall on the left side of 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	104
Average Wall Height (ft.):	4	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 global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	7
WIRE/GEOSYNTHETIC FACING 8.00	Good condition, no wire corrosion or deteriorated baskets, good basket to basket contact	8
ROAD/SIDEWALK/SHOULDER 0.50	1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	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.

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.111-L.

Wall ID:	NERI-0700-1.197-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	October 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	66	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	Crib - Timber
Secondary Surface Treatment:		Architectural Facing:	
General Description:	The wall consists of 2 sections: a 96 ft timber lagging and the remaining is dry stack, supporting a 1-lane gravel maintenance road with very low ADT		

Wall Measurements

Wall Length (ft.):	125	Face Area (sq.):	675
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil/rock, no settlement or distress cracks	6
PLACED STONE 8.00	Good condition, good block to block contact, few missing sections, minor vegetation grow	6
LAGGING 8.00	Wood lagging in a good condition, minor rotting	7
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut trees
Repair Cost:	\$440

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.197-L.

Wall ID:	NERI-0700-1.224-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	64	Maintenance Action:	Maintenance

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:	An old retaining wall supporting a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	92	Face Area (sq.):	890
Average Wall Height (ft.):	9	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	6
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	7
MORTAR 8.00	Fair condition, complete deterioration of the upper 3 ft of mortar	5
PLACED STONE 8.00	Good condition, good block to block contact, few missing sections	7
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
CULVERT 1.00	36" CMP, some degradation of bitumen lining and rusting	6
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut trees and clear vegetation
Repair Cost:	\$440

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.224-L.

Wall ID:	NERI-0700-1.541-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall on the left side supporting a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	108
Average Wall Height (ft.):	4	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 global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	8
BIN OR CRIB 8.00	Good condition, minor rotting	7
LAGGING 8.00	Good condition, minor rotting	7
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, minor erosion in both sides, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	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.

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.541-L.

Wall ID:	NERI-0700-1.609-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	69	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	retaining wall on the left side supporting a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	625
Average Wall Height (ft.):	5	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 performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	7
CONCRETE 8.00	Good condition, minor cracks and moss	7
PLACED STONE 8.00	Good condition, good block to block contact, some disintegrated stones	7
CULVERT 1.00	18 inch CMP culvert, moderate to severe rutting	4
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut trees and clear vegetation
Repair Cost:	\$660

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.609-L.

Wall ID:	NERI-0700-1.787-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	70	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Retaining wall on the left side of 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	205	Face Area (sq.):	2240
Average Wall Height (ft.):	10	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil/rock, no settlement or distress cracks	7
PLACED STONE 8.00	Good condition, good block to block contact, some disintegrated stones, minor moss	7
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut trees and clear vegetation
Repair Cost:	\$440

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.787-L.

Wall ID:	NERI-0700-1.827-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Reinforced concrete retaining wall on the left side supporting a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	70	Face Area (sq.):	280
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil/rock, no settlement or distress cracks	7
CONCRETE 8.00	Good condition, cast in place, minor cracks and moss	7
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
WALL DRAINS 1.00	No problems associated with drainage	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.

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.827-L.

Wall ID:	NERI-0700-1.838-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	37	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Timber crib wall supporting a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	55	Face Area (sq.):	465
Average Wall Height (ft.):	8	Face Angle (deg.):	75
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor to critical condition, needs to be replaced	3
WALL FOUNDATION MATERIAL 8.00	Evidence of settlement of the wall and backfill	5
BIN OR CRIB 8.00	Timber crib in a critical condition, lagging is completely rotted throughout	1
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	5
VEGETATION 1.00	Minor vegetation on the face and top of the wall, does not affect the wall performance	6
WALL DRAINS 1.00	Self draining wall, no problems associated with drainage	6
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	7
LATERAL SLOPE 1.00	Steep, wooded, minor orrosion at both ends, does not affect the wall performance	7
ROAD/SIDEWALK/SHOULDER 1.00	Good condition, 1-lane gravel road in a good condition, used by the maintenance crew	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Replace entire wall
Repair Cost:	\$860,250

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

New River Gorge National River

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0700-1.838-L.

Wall ID:	NERI-0701-1.081-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 24, 2008	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	reinforced concrete buttress wall protecting some rock blocks, on the left side of 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	70	Face Area (sq.):	360
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 condition, no global distress	8
WALL FOUNDATION MATERIAL 8.00	Good condition, on rock, no settlement or distress cracks	8
BIN OR CRIB 8.00	Reinforced concrete, good condition, no cracks	8
CONCRETE 8.00	Good condition, cast in place, no cracks	8
DOWNSLOPE 0.50	Almost vertical, rock outcrop, minor vegetation, does not affect the wall performance	8
LATERAL SLOPE 0.50	Almost vertical, rock outcrop, minor vegetation, does not affect the wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	1-lane gravel road in a good condition, used by the maintenance crew	8
UPSLOPE 0.50	Almost vertical, rock outcrop, minor vegetation, does not affect the wall performance	8
WALL DRAINS 0.50	No problems associated with drainage	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.

New River Gorge National River

ROUTE 0701: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0701-1.081-L.

Wall ID:	NERI-0702-1.794-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	53	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Timber crib wall supporting the left shoulder of a gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	42	Face Area (sq.):	180
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 performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Fair condition, evidence of loss of bearing along the center of the wall	4
BIN OR CRIB 8.00	Timber cribb, moderate rotting of members, some loose bolts	4
DOWNSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Gravel road in a good condition	8
UPSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
WALL DRAINS 1.00	Self draining wall, no problems associated with drainage	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.

New River Gorge National River

ROUTE 0702: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0702-1.794-L.

Wall ID:	NERI-0702-1.846-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	74	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Dry stacked rock wall supporting the fill side of a gravel road with very low ADT		

Wall Measurements

Wall Length (ft.):	69	Face Area (sq.):	520
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	21	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil/rock, no settlement or distress cracks	8
PLACED STONE 8.00	Good condition, good block to block contact, some disintegrated stones and discoloration	7
DOWNSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road	9
UPSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	9
VEGETATION 1.00	Minor vegetation on the face and top of the wall, does not affect the wall performance	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Cut trees
Repair Cost:	\$600

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

New River Gorge National River

ROUTE 0702: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0702-1.846-L.

Wall ID:	NERI-0702-1.892-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	64	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Timber crib wall supporting the left shoulder of a 1-lane gravel maintenance road with a very low ADT		

Wall Measurements

Wall Length (ft.):	33	Face Area (sq.):	264
Average Wall Height (ft.):	0	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-11

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, no global distress	7
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	7
BIN OR CRIB 8.00	Poor condition, timber crib with some rotten areas and loose bolts	5
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, 1-lane gravel road, used by the maintenance crew	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	8
DOWNSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	6
LATERAL SLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	6
UPSLOPE 1.00	Steep, wooded, no evidence of erosion, does not affect the wall performance	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.

New River Gorge National River

ROUTE 0702: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0702-1.892-L.

Wall ID:	NERI-0703-0-L		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	64	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Timber crib and dry stacked rock wall supporting a flat parking lot below a steep slope		

Wall Measurements

Wall Length (ft.):	136	Face Area (sq.):	987
Average Wall Height (ft.):	7	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 condition, the timber crib wall needs to be replaced	5
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	9
BIN OR CRIB 8.00	Timber crib, elemnts in good condition, some areas with moderate rotting and some missing members	4
OTHER PRIMARY ELEMENT 8.00	Ongoing loss of backfill due to missing members	5
PLACED STONE 8.00	Good condition, good block to block contact, no missing sections	9
LATERAL SLOPE 0.50	Wooded, no evidence of erosion, does not affect the wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress in the roadway	9
WALL DRAINS 1.00	Self draining wall, no problems associated with drainage	5
CULVERT 1.00	12" clay pipe at the beginning is plugged with leaves	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace timber cribb wall
Repair Cost:	\$156,048

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

New River Gorge National River

ROUTE 0703: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for NERI-0703-0-L.

Wall ID:	NERI-0926-0-P1		
Route Name:	THURMOND DEPOT PARKING AREA		
Inspection Date:	June 25, 2008	Approximate Year Built:	Unknown
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Timber
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	New timber crib wall supporting a paved parking lot		

Wall Measurements

Wall Length (ft.):	58	Face Area (sq.):	667
Average Wall Height (ft.):	11	Face Angle (deg.):	90
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance, new construction, no global distress	9
WALL FOUNDATION MATERIAL 8.00	Good condition, on soil, no settlement or distress cracks	8
BIN OR CRIB 8.00	Timber, good condition, new construction	9
LAGGING 8.00	Timber, good condition, new construction	9
DOWNSLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
LATERAL SLOPE 0.50	Steep, wooded, no evidence of erosion, does not affect the wall performance	8
ROAD/SIDEWALK/SHOULDER 0.50	Good condition, paved parking lot	8
WALL DRAINS 0.50	Self draining wall, no problems associated with drainage	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.

New River Gorge National River
ROUTE 0926: THURMOND DEPOT PARKING AREA

Retaining Wall Condition Photos



NERI_0926_0.000_P1_1.JPG

Appendix A

Summary of WIP Definitions



New River Gorge National River



**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.

